Bioarchaeology in the Urban Context

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INTRODUCTION

This chapter describes a new archaeology in a new setting: bioarchaeology in the urban context. In the past, many biological anthropologists deceived themselves into thinking that they were part of conjunctive, bioarchaeological investigations when they provided descriptive addenda to site reports. This deception was, of course, but one symptom of a common malaise, revealed also in the traditional monograph through which most anthropologists appeared as technicians or data bearers. Osteologist-anthropologists were, in fact, until recently, preoccupied with counting and measuring "good" (well-preserved adult male) cranial, primarily with an eye toward constructing racial typologies and macroevolutionary trends. At the same time, archaeologists were principally concerned with constructing ceramic and lithic typologies and culture histories, which were not necessarily related to issues addressed by biological anthropologists. Thus the goals of the archaeologist and biological anthropologist were, in the past, quite different and, as a result, were unsuited for conjunctive research designs.

Today, however, while some of the procedural tools of the biological anthropologist remain the same as before, they are being put to new uses. The objectives are changing. Following the cross-disciplinary approaches of Buikstra

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1 This research was supported, in part, by grants from Historic Oakland Cemetery, Inc., Marion F. Combs, Chairman; and the Dean's Advisory Committee for the Support of Research, College of Arts and Sciences, Georgia State University.
(1972), Peebles (1973), Blakely (1977), and others, both biological anthropologists and archaeologists are beginning to reframe their goals in order to contribute to a more holistic picture of human culture. This bioarchaeological perspective comes, in part, from an increased awareness of the integrated ecological, cultural, and biological systems that contribute to human behavior. It should be pointed out that this recognition in itself is not new to anthropology. In 1942, Chapple and Coon first introduced to the anthropological community the concept of behavioral anthropology and the attendant necessity for a systems approach. It is the widespread acceptance of this cross-disciplinary framework among students of past human biology that is new.

This new orientation is undoubtedly the result of many related and unrelated events. They include Washburn's delineation in 1952 of the "new physical anthropology." He urged that the study of processes should replace descriptive enumeration, that interpretation of population dynamics should supplant typology, and that anthropometry should be but one of many techniques employed to answer specific questions, rather than being an end in itself. In addition, the advent of advanced analytical techniques—for example, multivariate statistics (Howells 1972), the identification of genetic markers on bones (Anderson 1968), trace element analysis (Gilbert 1973), the extension of demographic and epidemiological models to skeletal populations (Weiss 1973), and differential diagnoses of skeletal lesions (Buikstra 1976)—has vastly expanded the resources available for interpretation. And, this new perspective has been enjoined by the invitation for joint endeavors extended to biological anthropologists by advocates of the "new archaeology" and cultural ecology (Binford 1968; Vayda and Rappaport 1968).

**BIOARCHAEOLOGY**

At present, bioarchaeology is becoming accepted as a viable, indeed necessary, approach to problem solving in the context of prehistoric mortuary sites. It is being used to reconstruct mortuary practices (Buikstra 1972), subsistence patterns (Gilbert 1975), demographic structure (Acsádi and Nemeskéri 1970), and social organization (Blakely 1977) of prehistoric populations. As bioarchaeology has developed, American archaeologists have turned increasing attention to historic investigations in the urban arena. Urban archaeology has come about as a result of heightened public awareness of the need for cultural resource management and stepped-up interest in recent sites and material culture. This movement now raises the attractive possibility of applying the new perspective, objectives, and methods of bioarchaeology to historic mortuary sites, among them, the urban cemetery.

Unique to the bioarchaeology of historic, urban cemeteries is the intriguing prospect of including the methods and findings of forensic anthropology. The combined approaches of bioarchaeology and forensic anthropology are of potentially great value in interpreting the physical remains and behavior patterns of individuals interred in unmarked graves or burial grounds. For example, one could use funeral parlor records of burial plots to identify, by name, people buried in unmarked graves. Dental charts, as employed by medical examiners in modern-day cases of missing and x-ray analysis health environments with the age and age to skeletons demographic proportional hazards lesions. And hist bone could be n resulting from st.

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cases of missing persons, also could be used for the same purpose. Trace element and x-ray analyses, coupled with historic records, might permit reconstruction of health environment, diet, and socioeconomic status. Correlation of grave pit sizes with the age and sex of excavated skeletons should permit the assignment of sex and age to skeletons in unexcavated graves, thus allowing the investigator to generate a demographic profile of the larger burial population. Historic records detailing occupational hazards could be employed to elucidate the causes of traumatic skeletal lesions. And historic accounts of epidemic diseases that rarely produce symptoms on bone could be related to the densities of graves, from which differential mortality resulting from such diseases might be inferred.

To date, probably the most ambitious attempt to combine historical research, forensic anthropology, and bioarchaeology was the project directed by Ivor Noël Hume (1979) at the seventeenth-century site of Wolstenholme Towne, Virginia. Historic records indicated that at Martin’s Hundred, a part of Wolstenholme Towne, an Indian massacre on March 22, 1622, had resulted in the deaths of many of the town’s residents and soldiers. Excavation at Martin’s Hundred in 1976 uncovered the skeletons of 23 individuals, apparently victims of the massacre and of disease and famine (Noël Hume 1979). Aided by J. Lawrence Angel, curator of physical anthropology at the Smithsonian Institution, Noël Hume and his colleagues succeeded in tentatively identifying the battered and scalped remains of one Richard Kean, a Wolstenholme lieutenant (Noël Hume 1979:767). Impressive and significant as this piece of sleuthing is, it does not constitute bioarchaeological inquiry in an urban setting.

To illustrate the prospects and problems of bioarchaeology in the urban context, we herein present the results of excavation, analysis, and interpretation of skeletal remains from late-nineteenth-century interments in an unmarked field at Oakland Cemetery in Atlanta, Georgia. Unlike the Martin’s Hundred sample of some two dozen interments, Oakland Cemetery contained a potential burial population of several thousand.

The Urban Context

In the United States, large, urban cemeteries such as Oakland were established during the early and middle nineteenth century as alternatives to the small, neglected, unkempt, and potentially hazardous graveyards that pervaded urban areas throughout the seventeenth and eighteenth centuries. By the beginning of the nineteenth century, these old cemeteries were so crowded that they were frequently little more than stinking quagmires, overgrown with vegetation and strewn with bones, fallen markers, rotting coffins, and putrefying flesh. In New York City, for example, it was observed that the yellow fever epidemic of 1822 centered around the Trinity Church burial ground (French 1975). Speaking of this period, French (1975:70–71) states “It is obvious from the dearth of comments about early New England graveyards, from the nature of the comments that do exist and from the grim symbolism of the period’s monuments, that graveyards were treated simply as unattractive necessities to be avoided as much as possible by the living.”
Thus, by the early nineteenth century, in response to health hazards posed by inner-city graveyards, community leaders began to create large, municipal burial grounds on the outskirts of the cities. The establishment of these facilities—typified by Mount Auburn Cemetery near Boston—marked a change in attitudes about death and burial. Such “garden cemeteries” served not only as places of interment, but as recreational parks with landscaped vistas, walkways, and benches. This shift in attitudes about, and location of, cemeteries is known misleadingly as the “rural cemetery movement.” These expansive cemeteries adjoining metropolitan areas stand in stark contrast to nonurban burial grounds such as family plots, church graveyards, and community cemeteries. And today, like Oakland Cemetery in Atlanta, they are surrounded by the residences, factories, and commercial structures that make up the urban milieu.

**OAKLAND CEMETERY**

Oakland Cemetery was founded in 1850 when the City of Atlanta purchased six acres of land to serve as its municipal burial ground (Figure 8.1). It remained the city’s only cemetery until the opening of Westview in 1884. Some sections of the cemetery were assigned to various of Atlanta’s churches and private organizations, but nearly everyone who died in the city between 1850 and 1884, from the wealthiest citizen to the poorest slave, was buried in Oakland (Sherry and Combs 1977). As a result of this heavy use, it was not long before Oakland began to run out of burial space. In 1864, the Civil War came to Atlanta, leaving behind a desecrated cemetery and further increasing the number of dead awaiting formal burial. This forced a long-needed expansion of the cemetery (Harwell 1976).

By the end of the war, the city had purchased several adjacent parcels of land, bringing Oakland to its present 88 acres (Sherry and Combs 1977). Much of the newly acquired land was subdivided into burial lots for sale to private owners. Other sections were used for the reburial of the vast numbers of Confederate dead that previously had been interred in hastily dug graves on the battlefields where they had died (Harwell 1976). And a substantial, but unidentified, portion of the acquired land was set aside for pauper interments (Moore 1976).

Writing of the period before 1884, Moore reports that:

> A dramatic increase in Atlanta's black population had been accompanied by related expenses for the city, which could more easily overlook the needs of blacks when alive than the need for the quick disposal of their corpses. The cost of pauper burial weighed on the budget (albeit comparatively lightly), and the space they required reduced Oakland's capacity and revenues. In 1879, for instance, black paupers accounted for nearly thirty-five percent of all Oakland interments and nearly eighty-five percent of the pauper interments [1976:29].

Records dated after 1884 refer to the transferal of pauper interments from one area to another within Oakland, and to other cemeteries, in an attempt to secure more space for the ever-increasing number of corpses brought to Oakland’s gates.

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FIGURE 8.1. An 1982 aerial view of Atlanta. "Oakland Cemetery is shown in the lower right corner of the painting. (The area covered by this study is marked with a dashed line.)
ing efforts to preserve this historic landmark in downtown Atlanta. In 1976, in a
search for new sources of income for Oakland, this association earmarked a 5.7 acre
(2.3 ha.) tract of land within the cemetery’s walls as a potential area for develop-
ment. Few monuments or markers were apparent in the field and, except for the
record of its purchase in 1866, there were no written records pertaining to this
section of the cemetery. Prior to development, however, an assessment of the
cultural resources was mandated by two factors:

1. HOCl’s application for a federal grant for restoration brought the proposed
action under the requirements of the National Historic Preservation Act of
2. In 1976, the cemetery had been placed on the National Register of Historic
Places.

In 1978, HOCl took the initial step toward development of the tract when they
contracted with the Department of Anthropology at Georgia State University for an
archaeological survey, to be conducted under the direction of Roy S. Dickens, Jr.
and Robert L. Blakely.

THE STUDY TRACT

The study tract consists of 5.7 acres (2.3 ha.) of undulating terrain in the north-
eastern section of the cemetery (Figure 8.2). It is roughly hourglass in shape, with a
northwest-southeast orientation. The area is a grassy field broken by widely dis-
persed small trees and is impinged upon by two zones of modern disturbance: a 3-ft
(9-m) deep, oval trash mound (recent city garbage) near the center of the hourglass
and a dumping and storage ground near the western periphery.

Preliminary investigation revealed the following evidence that the field had been
utilized for interments:

1. Several elderly informants recalled that they had been told that the grounds had
once been known as a “potter’s field.”
2. Former Oakland Cemetery Sexton, Ed Walters, reported stepping through
what he assumed was part of a buried wooden coffin near the east edge of the
study tract.
3. Rectangular patches of dense grass and scattered bricks suggested the presence
of subsurface disturbances in the field.
4. Workers installing a stone monument on the southeast edge of the tract
encountered what they described as “human bones.”
5. Cemetery records listed the names of at least 10,000 paupers, but with no
reference to specific burial location (Dickens and Blakely 1979).

Therefore, it was not unreasonable to suspect that the study tract had been used
by the cemetery for the interment of paupers. If it had been put to that use, it could
only have been during the period between 1866 and 1884. This conclusion is based
upon the following information:
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FIGURE 8.2. Map of Oakland Cemetery. The study tract is the open area in the upper right, adjacent to Boulevard Drive.
1. The tract was purchased by the city as part of the 1866 expansion of Oakland Cemetery.
2. Written records show that pauper interments at Oakland ceased in 1884 with the opening of Westview Cemetery.
3. A picture taken in the cemetery about 1885 (Sherry 1976:14) shows the study tract overgrown with weeds and scrubby vegetation, suggesting that the area was no longer in use.

In addition to the probability that the grassy field held nineteenth-century interments, the general area had been one of historical significance since Atlanta’s beginning. It seemed likely, for example, that the tract contained evidence of Civil War activity. Indeed, Confederate General Hood had positioned himself on one of Oakland’s hills to observe the Battle of Atlanta. And a turn-of-the-century mill community had been established adjacent to the field. Clearly, an archaeological investigation would be necessary to evaluate these potential cultural resources.

**Sampling Design**

Because the study tract encompassed several acres of uneven topography in an irregular shape, it was decided, for sampling purposes, to divide the field into three sections, labeled Area A, Area B, and Area C, proceeding from southeast to northwest and excluding the two major zones of modern disturbance (Figure 8.3). Area A was roughly triangular in shape, and comprised 77,796 ft² (7002 m²) or 1.79 acres (4.4 ha.) of generally sloping terrain, with its highest point at the southwest and its lowest point at the northeast. Area B formed the connection between the two “bulbs” of the hourglass, and contained, 38,736 ft² (3486 m²) or .89 acres (2.2 ha.); it sloped downward from due west to due east. Area C was nearly rectangular in shape and consisted of 78,804 ft² (7092 m²) or 1.81 acres (4.47 ha.), sloping gently from a high point at its west-northwest extension to a low point in the east-southeast, where it was bounded by the oval refuse heap. Each of the three areas was further divided by means of a grid having 50 × 50 ft (15 × 15 m) units. The axes of the grid were oriented north–south and east–west in Areas A and B. In Area C, the long axis was shifted to 300° to align with the configuration of that section of the field.

It was necessary to adopt a sampling strategy that would permit an adequate survey of the possible subsurface intrusions without exposing the entire 5.7 acre (2.3 ha.) tract. To this end, it was decided to employ a “strip-sampling” technique. This method entailed the use of a motor grader to remove the topsoil in shallow trenches systematically cut according to the coordinates of the grid. Motor graders have previously been utilized in archaeological investigations to remove overburden, plowzone, mound fill, and roof fall (e.g., Coe 1964). Dickens (1976) utilized the technique at Horseshoe Bend National Military Park in central Alabama to search for subsurface evidence of an early-nineteenth-century Indian fortification. At that site, parallel trenches were cut perpendicular to the linear fortification in order to transect the feature (which the grading eventually revealed).
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FIGURE 8.3. Map of the east end of Oakland Cemetery, showing the study tract, sampling areas, and grader trenches.
Oakland Cemetery required numerous closely spaced trenches because of the expectation of discontinuous, and possibly scattered, features. Trenches were cut perpendicular to the contour lines of each of the three areas to maximize control of the grading operation. Successive scrapings, each removing about .1 ft (.03 m) of soil, eventually produced "clean" unobstructed surfaces on which intrusions could be easily observed. Six trenches, 40 ft (12 m) apart, were cut in Area A; four trenches, 40 ft (12 m) apart, were cut in Area B; and three trenches, 20 ft (6 m) apart, were cut in Area C. This produced a total of thirteen trenches (Figure 8.3).

Each trench was 10 ft (3 m) wide. Some trenches, or portions of them, contained areas disturbed by modern filling and construction, and were subject to deeper stripping. In still other places, it was not possible for the grader to penetrate to subsoil because of the thickness of landfill or erosional deposition. It was felt, however, that this did not appreciably detract from the efficacy of the sampling design. Upon completion of the grading, each exposed intrusion was mapped into the grid of the site. (For a more detailed description of the strip-sampling procedure, see Dickens and Blakely 1979.)

Disposition of Graves

The grader operation revealed grave pits in all three areas of the study tract. In addition, some artifacts, such as a .58-caliber Union regular-issue minie ball, undoubtedly were associated with Civil War activities in and around the cemetery. Several trash middens, which may have resulted from the nearby mill community, also were delineated. And a small prehistoric Indian site in Area B attests to the longevity of human occupation in the area. This site, represented by a scatter of quartz cores and flakes, probably dates to the Middle Archaic Period (ca. 4500 B.C.). These findings notwithstanding, the major resources were the human interments.

In most cases, the grave pits were quite closely spaced. In Areas A and B, some of the graves were placed less than a foot apart. In all sections, they were systematically arranged in parallel rows running north-south (Figure 8.4). Area C seems to have been less intensively utilized for burial purposes, yet the density of graves in this area remains high. In Area A, the grading operation revealed 207 grave pits and exposed 5200 ft² (483 m²) of subsoil. (Exposed footage does not include those parts of the trenches where subsoil could not be penetrated by the grader.) The exposed footage constitutes 6.7% of the total area of Area A. By applying this frequency to the entire square footage of the area (i.e., 207:5200 = x:77,796, where x is the total number of expected burials), it is estimated that Area A contains about 3097 graves. This works out to one burial per 25.1 ft² (2.3 m²), or a grave for every 4 x 6 ft (1.2 x 1.8 m) plot of land in that portion of the study tract. In Area B, 2900 ft² (269 m²) of subsoil were exposed (7.5% of the total area), and 90 features were uncovered. Our formula yields an expectation of 1202 graves for Area B. The density is one burial per 32.2 ft² (3 m²), or one grave for every 4 x 8 ft (1.2 x 2.4 m) section of ground. Area C appears to be the least densely populated of the three zones. In this area, 6% of the subsoil was exposed (4700 ft² or 437 m²), and 94
enchases because of the trenches. Trenches were cut to maximize control of about 1 ft (.03 m) of which intrusions could be cut in Area A; four trenches, 20 ft (6 m) trenches (Figure 8.3). Some of them, contained were subject to deeper grading to penetrate to eposition. It was felt, icacy of the sampling vison was mapped into p-sampling procedure, of the study tract. In issue minie ball, unaround the cemetery, rby mill community, Area B attests to the sentsed by a scatter of period (ca. 4500 B.C.). human interments. In Areas A and B, l sections, they were (Figure 8.4). Area C es, yet the density of 3 operation revealed exposed footage does d not be penetrated al area of Area A. By ca (i.e., 207:5200 = estimated that Area A 5.1 ft² (2.3 m²), or a of the study tract. In total area), and 90 1202 graves for Area every 4 × 8 ft (1.2 × 2.4 m) likely populated of the m², or 437 m²), and 94

FIGURE 8.4. Trench 2 in Area A, showing exposed features. View is to the south.
features were uncovered. It is calculated that Area C contains roughly 1576 graves—one burial per 50 ft² (4.6 m²), or a grave for every 5 × 10 ft (1.5 × 3 m) area of soil.

Combining the above data, the grader operation exposed 12,800 ft² (1189 m²) of subsoil, yielding 391 graves. It is estimated that the sampled sections (excluding disturbed zones) contain in excess of 5967 graves in an area of 195,336 ft² (18,147 m²). By extending this estimate to the entire 5.7 acre (2.3 ha.) study tract, the total number of graves is 7575. This extension to the entire tract seems justified for two reasons:

1. The use of these areas for trash dumps and fill postdates the use of the tract for burial purposes.
2. In the spring of 1979, further excavation associated with construction on the western periphery of the tract revealed the same pattern of grave outlines beneath several feet of fill.

This means that, overall, there was an average of one burial per 32.7 ft², or a grave in every 4 × 8 ft parcel of land in the field. (Phelps, Green, and Hartsell [1979] report uncovering—by a similar strip-sampling technique—comparable densities of graves in a much smaller late-nineteenth-to-early-twentieth-century cemetery near New Bern, North Carolina.)

**Mortuary Practices**

Regardless of location within the study tract, every exposed grave pit was oriented with its long axis east–west. The outlines were symmetrical, with sharply squared corners. The pits ranged in size from as small as 2.5 × 1.0 ft (.76 × .3 m) to as large as 8.0 × 3.0 ft (2.4 × .9 m). It was later confirmed that the dimensions of a pit were dictated by coffin size, which in turn was determined by the size of the individual being interred.

Many broken and intact artifacts were uncovered in the grader trenches. These items included medicine bottles, ceramic and glass cups and vases, and oyster and conch shells (Dickens and Blakely 1979). Some of the glass and ceramic artifacts were embossed or marked with manufacture dates from the mid-to-late 1800s. Vlach (1977) states that the adornment of burial sites with such artifacts is a common mortuary practice among blacks and their African antecedents. And Combos (1972:56) reports that the grave sites of coastal South Carolina blacks from the nineteenth century were adorned with “cups, saucers, bowls, dishes, tumblers, kerosene lamps, clocks, medicine bottles, pitchers, various cut glass pieces and just about every other household item imaginable...and] many pretty sea shells with the conch being the most popular.” The presence of these artifacts in apparent association with the Oakland graves initially suggested that the study tract not only served as a potter’s field, but also may have been a segregated burial ground for less affluent black Atlantans in general. The fact that a portion of the cemetery adjoin-
FIGURE 8.5. Burial pit with fill partly removed. Chamber for the coffin is, as yet, unexcavated.
ing the study tract was known as the “black section” added credence to this supposition.

The final phase of the field project involved complete excavation of seventeen graves. These were distributed throughout the study tract, and were selected so as to include a representative sample of the different grave sizes. In addition, each area was sampled according to the relative number of graves it contained.

Excavation revealed that the grave pits had been dug with vertical walls to a depth of approximately 3.5 ft (1 m). At this point, the floor had been leveled off and a small excavation made in the exact shape of the coffin (Figure 8.5). The depth of these smaller chambers was determined by the size of the coffin; for adults they averaged 1 ft (0.3 m) deep, while for children they were about .7 ft (0.2 m) deep. After the coffin had been lowered into the pit, a covering of wooden planks was placed over the coffin and across the dirt ledge at a right angle to the long axis of the grave. The director of an Atlanta funeral home described these planks as “grave arches.” They were used with wooden coffins to prevent collapse of the coffin under the weight of the fill dirt. Around 1930, wooden planks were replaced by metal supports, which are still used today whenever a person is buried in a wooden casket (Jane Dillon, personal communication).

In all 17 graves the bodies had been placed in wooden coffins. In most instances the wood of the coffins had completely decayed, leaving only thin lenses of darkened soil and a number of cut nails as clues to their existence. The coffins ranged in shape from rectangular, to oblong hexagonal, to oblong octagonal (Figure 8.6). The presence of three rectangular coffins in the sample confirms that these burials took place after 1850, a date generally accepted for the earliest use of straight-sided caskets (Kline and Kline n.d.). One of the rectangular coffins contained, in the lid and over the face and shoulders of the deceased, an oval glass. Patents for coffins of this style were filed between 1860 and 1900 (Kline and Kline n.d.). Such coffins were more expensive than the plain boxes commonly used during this period. The presence of this relatively expensive casket in the study tract suggests that at least some of the individuals had access to more expensive caskets than one might expect for “paupers.” A retired employee of the National Casket Company informed us that the hexagonal or “pigeon-toed” coffins were the earliest of the three styles, and were largely replaced by octagonally shaped coffins. After the introduction of the rectangular casket, the use of octagonal coffins became limited to members of lower socioeconomic classes (Lawrence Moore, personal communication).

The variety of coffin styles was accompanied by a variety of casket fixtures and items of personal adornment. In no instance, however, was there elaborate coffin decoration or expensive personal effects. Items of personal adornment were limited mainly to buttons and buckles from clothing. No shoes were found, but none were expected since custom—and economics—dictated that the dead were buried without shoes (Jane Dillon, personal communication). The modest attire corroborates other information in suggesting that the deceased had been economically disadvantaged in life. (One individual, a young adult male whose remains were poorly preserved, appeared to have had his feet severed. Taylor [1976] notes that, after
COFFIN SHAPES

A RECTANGULAR  B HEXAGONAL  C OCTAGONAL

FIGURE 8.6. Coffin shapes encountered in the Oakland Cemetery excavations.

Disease, the greatest cause of death among nineteenth-century black men in Atlanta was railroad accidents. And Moore [personal communication] told us that a person killed in a railroad accident most commonly lost either his feet or head.

Demography

As noted earlier, it became obvious during the course of excavation that the size of the grave pit was determined by the size of the coffin placed in it, which in turn was dictated by the size of the individual interred. Therefore, by correlating the sizes of grave outlines with the ages and sexes of excavated skeletons, one could develop a model for predicting the age and sex of unexhumed remains. Were this the case, meaningful demographic data could be generated without excavating the entire burial population. Although we still adhere to that proposition, the small size of the excavated Oakland sample limited its utility as a predictive model. (It should be pointed out that the archaeological investigations at Oakland were not intended to secure a representative population sample; rather, they were designed to permit assessment of cultural resources within the tract. Neither time nor money was available for more extensive excavation, and the objectives of the project were fully met.) It was observed, however, that infants and children were recovered from grave pits with a size less than 6 × 2 ft (1.8 × .6 m). One 15-year-old was placed in a grave measuring 6.25 × 2.5 ft (1.9 × .76 m) or 15.6 ft² (1.45 m²). All adults were interred in graves that exceeded 6.5 × 2.5 ft (2 × .76 m) or 16.25 ft² (1.5 m²). It is
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not unreasonable, then, to select 6 × 2 ft (1.8 × .6 m) as a size by which to
differentiate the graves of subadults and adults. Using this criterion, of the 204
measurable graves pits in the study tract, about 108 held subadults and 96 contained
adults. Thus, roughly 53% of the dead were infants, children, and adolescents, and
the remaining 47% were adults. (Interestingly, of the 17 excavated graves, 9 or 53%
contained subadults.) If these data are diagnostic, they suggest, not unexpectedly,
that over half of the deaths occurred among the young. Taylor (1976:117) reports
that for the period 1853–1873, 54–66% of Atlanta’s dead were under 10 years of age
(blacks and whites combined).

For excavated adults, grave size was a crude indicator of stature and, therefore, of
sex. The mean surface area of grave pits containing individuals who stood between 5
ft (1.5 m) and 5 ft 7 in. (1.7 m) was 18.5 ft² (1.7 m²); those ranging in height from 5 ft
9 in. (1.75 m) to 6 ft (1.8 m) were placed in graves with surface areas averaging 19.8
ft² (1.8 m²). The former included only females, and the latter only males. There-
fore, a surface area of 19 ft² (1.76 m²) was arbitrarily selected to distinguish grave pits
of females from males. But when this criterion was used to assign sex to the
excavated adults, three of seven were misclassified.

If a larger excavated sample had been available, we are confident that grave sizes
would have yielded the approximate numbers of infants, children, adolescents,
adult males, and adult females in the overall study tract. It then would have been
possible to construct a demographic profile from which to calculate differential
mortality, life expectancy, fecundity, and even population growth rate. If one were
armed with these data, together with historic accounts, it then would be possible to
interpret the effects of episodic and epidemic diseases upon a segment of Atlanta’s
citizenry (or any other historic group) for which few medical records exist. Ideally,
future archaeological investigations in urban cemeteries should include exposure of
a sufficient number of graves and excavation of a large enough skeletal sample to
allow biological anthropologists to reconstruct demographic patterns.

FORENSIC ANTHROPOLOGY

An intensive biological analysis of the human skeletal remains was undertaken to
augment information gained from excavation. The objectives of this study were to
determine the age at death, sex, racial makeup, stature, diet, disease states, and
possible causes of death of the individuals exhumed from the cemetery. (For details
of the procedures used to derive these data, see Beck 1980 and Blakely and Beck
1982.)

Of the 17 graves excavated, four contained adult females, four contained adult
males, one held an adolescent female, and eight contained infants or young children (Table 8.1). Preservation ranged from excellent, with two individuals having
traces of human hair clinging to the occipital bones, to burials with no bone
present. Most of the graves in the latter category were those of infants. The presence
of milk teeth, glass buttons, and cut nails characterized these burials. Only four of
the skeletons were complete enough to permit comprehensive analysis. They con-

<table>
<thead>
<tr>
<th>Feature 2.</th>
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</thead>
<tbody>
<tr>
<td>Feature wood rem; latches wer the individ the skeleton cranium.</td>
</tr>
</tbody>
</table>

8. Bioarchae

Table 8.1

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13</td>
</tr>
<tr>
<td>1.16</td>
</tr>
<tr>
<td>2.3</td>
</tr>
<tr>
<td>2.38</td>
</tr>
<tr>
<td>3.32</td>
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<td>7.9</td>
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<td>7.19</td>
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<td>8.10</td>
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<td>9.5</td>
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<td>11.20</td>
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<td>11.48</td>
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<td>12.34</td>
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<tr>
<td>14.1</td>
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<td>14.2</td>
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<tr>
<td>14.3</td>
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</tbody>
</table>
Table 8.1 Summary of Excavated Features, by Age, Sex, and State of Preservation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sex</th>
<th>Age</th>
<th>Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.13</td>
<td>male</td>
<td>18-25 years</td>
<td>poor (cranial fragments and teeth)</td>
</tr>
<tr>
<td>1.16</td>
<td>indeterminate</td>
<td>juvenile</td>
<td>poor (no bone or teeth)</td>
</tr>
<tr>
<td>2.3</td>
<td>female</td>
<td>26 years</td>
<td>excellent</td>
</tr>
<tr>
<td>2.38</td>
<td>indeterminate</td>
<td>juvenile</td>
<td>poor (no bone or teeth)</td>
</tr>
<tr>
<td>3.32</td>
<td>male</td>
<td>50+ years</td>
<td>excellent</td>
</tr>
<tr>
<td>7.9</td>
<td>female</td>
<td>70+ years</td>
<td>fair</td>
</tr>
<tr>
<td>7.19</td>
<td>male</td>
<td>65+ years</td>
<td>excellent</td>
</tr>
<tr>
<td>8.10</td>
<td>female</td>
<td>15 years</td>
<td>fair to poor</td>
</tr>
<tr>
<td>9.5</td>
<td>indeterminate</td>
<td>4 years</td>
<td>poor (cranial fragments and teeth)</td>
</tr>
<tr>
<td>10.22</td>
<td>indeterminate</td>
<td>juvenile</td>
<td>poor (no bone or teeth)</td>
</tr>
<tr>
<td>10.23</td>
<td>male</td>
<td>adult</td>
<td>poor (skeletal fragments)</td>
</tr>
<tr>
<td>11.20</td>
<td>indeterminate</td>
<td>2 years</td>
<td>poor (teeth only)</td>
</tr>
<tr>
<td>11.48</td>
<td>female</td>
<td>50-60 years</td>
<td>poor (skeletal fragments)</td>
</tr>
<tr>
<td>12.34</td>
<td>female</td>
<td>18-30 years</td>
<td>poor (skeletal fragments)</td>
</tr>
<tr>
<td>14.1</td>
<td>indeterminate</td>
<td>6 years</td>
<td>poor (skeletal fragments)</td>
</tr>
<tr>
<td>14.2</td>
<td>indeterminate</td>
<td>juvenile</td>
<td>poor (no bone or teeth)</td>
</tr>
<tr>
<td>14.3</td>
<td>indeterminate</td>
<td>juvenile</td>
<td>poor (no bone or teeth)</td>
</tr>
</tbody>
</table>

...sisted of Features 2.3, 3.32, 7.9, and 7.19. To follow is a description and forensic analysis of these burials.

**Feature 2.3**

Feature 2.3 was a grave containing a hexagonal wooden coffin (Figure 8.7). No wood remained from the coffin, but six metal handles, many nails, and several latches were recovered. A single white glass button, presumed to have been a part of the individual's clothing, was the only item of personal adornment. Preservation of the skeletal remains was excellent and included hair adhering to the back of the cranium.
FIGURE 8.7. Feature 2.3 in situ, the remains of a black female in her mid-twenties. Note the hexagonal shape of the coffin.

The Trotter coronal sagittal complex was slightly supra-epiphyseal, premat and parietal. The nonexiia and frontals:

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growth.

A circ
The skeleton is that of a female in her middle twenties. Her stature, using the Trotter-Gleser formula (1958), was computed to have been 5 ft 6 in. (1.67 m). Age determination of this skeleton was complicated by contradictory evidence: Her coronal suture had completely closed, suggesting an age over 37 years; but the sagittal suture was active, indicating an age under 29 years. Tooth eruption was complete, although the upper third molars were congenitally absent; dental attrition was slight. The medial epiphysis of the clavicle had not yet fused, but all other epiphyses had united (21–28 years). Thus, the additional aging criteria suggest premature closure of the coronal suture, which supports the age indicated by the sagittal suture (22–29 years). The skull and pelvis clearly demonstrate that this person is female. She has delicate bone structure with a small degree of musculature. The gonial angle is obtuse and the chin is median. Supraorbital ridges are nonexistent and the forehead is vertically placed. The mastoid processes are small, and frontal and parietal eminences are well developed. On the pelvis, the greater sciatic notch and subpubic arch are wide and shallow.

Her racial attributes strongly suggest that she was black. Of course, American blacks, a sociologically defined ethnic group, evidence varying degrees of Caucasoid admixture upon what is principally a Negroid substratum of phenotypes. Nevertheless, she possesses a clustering of attributes that are quite characteristic of blacks (Figure 8.8). The long cranial vault and broad nasals, as well as the nasal gutters in the lower margin, fit well the craniofacial traits of Negroids listed by Krogman (1962:190). Prognathism is pronounced, producing a downward slant to her facial profile; her interorbital distance is wide and orbital openings square; and the lateral direction of her superior sagittal sinus also suggests African heritage. Although not racially diagnostic, the presence of bilateral septal apertures in the distal portion of the humeri is most common among black females (Trotter 1934). Possible evidence of Caucasoid admixture are the broad face and high, narrow cranial vault. On the other hand, these traits may simply reflect individual variation.

Pathological conditions included moderate-to-severe osteosclerosis of the bones throughout the skeleton. All bones are far heavier than their size would suggest. The surface of the skull is abnormally smooth and resembles marble in both its appearance and texture (Figure 8.8). The removal of a section of bone from the femur for trace element analysis revealed an extremely dense cortex. X-rays confirm this observation (Figure 8.9). This generalized osteosclerosis is probably due to an anemia, possibly sickle-cell anemia (Dan Morse, personal communication). The low level of copper in the bones supports this diagnosis (Gilbert 1977; Underwood 1971).

Dislocation of the left hip is indicated by the presence of an accessory articulating facet for the femur on the back of the pelvis. From the shallow depth of this facet and the lack of new bone growth, it can be assumed that the injury occurred shortly before death. Had the injury occurred earlier, and remained unreduced, the facet would have become much deeper. If the dislocation had been reduced, new bone growth would have begun to fill in the facet.

A circular area of denuded bone, approximately 9 cm in diameter, on the left side
of the cranial vault is suggestive of soft tissue infection. Within this area is an irregular hole measuring $20 \times 5$ mm. Close examination shows signs of slight bone regeneration. X-rays of the cranial vault (Figure 8.9) reveal 10–20 small metallic opacities in the area of this lesion. These objects appear to be the remains of a bullet that produced the hole and subsequent infection. Thus, the probable cause of death was infection resulting from a gunshot wound.

Feature 3.32

Feature 3.32 contained the bones of a rather robust and elderly male buried in a rectangular wooden coffin (Figure 8.10). A portion of the lid of the coffin had collapsed a layered and the pelvis. that it orig around gra nineteenth appear to h forehead or green discr. Skeletal falls into a Tracy 1939 usually ass fronto-nasal of hai section it v most compr.
collapsed and was draped over the skeletal remains. The skull rested on a multilayered and tasseled pillow. Several small buttons were recovered from the area of the pelvis. A partial brick wall was found around the top of the grave pit, suggesting that it originally had been marked. Combes (1972) cites the use of brick borders around graves, in lieu of stone markers, as a common mortuary practice among nineteenth-century blacks in coastal South Carolina. Several brass objects that appear to have been coffin fittings were recovered from the base of the grave pit. The forehead of the skull is discolored from the coffin wood, and the left parietal shows green discoloration from the pillow upon which the head rested.

Skeletal morphology indicates that 3.32 also was black (Figure 8.11). The skull falls into a qualified version of the formula for “U-type” or Negroid skulls (Todd and Tracy 1930). Qualification is due to the presence of blunt upper orbital margins, usually associated with whites. The brow ridge is undulating, glabella rounded, fronto-nasal junction plain, and interorbital distance wide. Microscopic examination of hair recovered with the skull (and with Feature 2.3) revealed that in cross-section it was ovoid, demonstrating that the hair form was wooly or “afro,” a type most commonly found among blacks. The presence of bilateral septal apertures of
FIGURE 8.10. Feature 3.32 in situ, the remains of an elderly black male. Note the wooden remnants of the rectangular coffin draped over the bones.
FIGURE 8.11. Anterior view of the skull of Feature 3.32. The dark stain on the forehead is from coffin wood that rested on the skull. The fracture in the right eye orbit resulted from a gunshot wound.

the lower humeri is unusual in males of all races, but is found more commonly among blacks than whites. The presence of an anomalous sixth lumbar vertebra is also more frequent among blacks, but cannot be regarded as conclusive evidence of racial affiliation (Lanier 1939). Stature for Feature 3.32 was computed at 5 ft 9 in. (1.75 m) using the Trotter-Gleser formula.

A highly unusual anomaly is present in the vertebral column where, in addition to 25 presacral vertebrae (instead of the normal 24), there is spondylolysis of the fourth, fifth, and sixth lumbar vertebrae. Spondylolysis is a defect in the neural arch, resulting in its separation from the vertebral body; it is of genetic derivation. Some individuals possessing similar defects have been known to walk with a waddling gait (Morse 1978). Slight arthritic buildup is visible throughout the vertebral column, the tarsals, and the distal femora. Periostitic inflammation is apparent on the posterior-distal femora, anterior surfaces of the proximal ulnae, and inferior surfaces of both clavicles.

A small piece of metal, possibly the tip of an ice pick or knife, is embedded in the
left parietal. Sclerotic bone growth surrounding the injury clearly demonstrates healing. A fracture of the right humerus also shows healing, as does a fracture of the left tenth rib. A moderate-to-severe fracture of the right maxilla with callus buildup is easily seen. The inner portion of the right orbital margin and the margin of the right nasal opening are also implicated. X-rays reveal many irregular, metallic opacities in this area (Figure 8.12). It appears that this individual sustained a gunshot wound to the face. Following this diagnosis, a spent .32-caliber bullet was found in laboratory screening of soil from beneath the skull. The fragments in the maxilla match, both in size and shape, sections missing from this bullet. If these are indeed parts of the bullet, it must have remained lodged somewhere in the soft tissues of the nasal or orbital areas, possibly in the brain itself. Such an occurrence matches well the evidence of infection seen in the cranial vault. There is an excessive thickening and porotic appearance to the endocranial aspects of both parietals, with the intensity of disease following the venous drainage of the brain.

FIGURE 8.12. X-ray photograph of the anterior view of the skull of Feature 3.32. The white speck in the nasal region is an embedded fragment of a .32-caliber bullet, which was later found in dirt taken from beneath the skull.

Feature 7.9

Feature 7.9 was a simple, headdress, and the features were small, black glazed. Four shells were noted.

The cranial sutures on both iliums, as determined by the transverse suture, are closed between 65 and 70 years of age. The presence of nasal ancestry and the remains of the palate and teeth indicate an age.

All teeth, except the left maxilla, are intact and remaining teeth are intact. The sepsis is present in the maxilla, and the maxillary sinus disease (Dan M bones) suggests a related chain of events, including undiagnosed or neglected aspect of both parietals’ cranial vault, its growth, and tissue. It seems like an infection.

Feature 7.19

Feature 7.19 was of the wood, decorative plate glass, which had broken over the similar coffin lid “bust windows”
This suggests a blood infection resulting from the presence of the bullet in the soft tissue. It seems reasonable to suggest that this individual died of an infection resulting from a gunshot wound to the face.

**Feature 7.9**

Feature 7.9 contained the remains of an elderly female (Figure 8.13). Her coffin was a simple, hexagonal wooden box, without handles. The only items of personal adornment were a brass ring on the middle finger of the right hand, and nearly 600 small, black glass beads from the neck region (possibly decoration on a dress or gown). Four shell buttons also were recovered.

The cranial features and pelvis are small and delicate in appearance. Preauricular sulci on both ilia suggest that she had given birth to children. Her stature, calculated by the Trotter-Gleser formula, was 5 ft 7 in. (1.7 m). The sphenoparietal suture is closed, but the parieto-temporal suture is open. This suggests an age between 65 and 80 years. Extensive arthritic buildup and ossification of cartilage argue for an age near the upper end of that range. Her skull is long and narrow, and the palate and nasal aperture broad (Figure 8.14). These traits, together with the presence of nasal gutters and pronounced prognathism, are suggestive of Negroid ancestry.

All teeth, except the upper canines, lower lateral incisors, and lower right canine, were lost antemortem; bone resorption of the tooth sockets is complete. The five remaining teeth evidence many caries and extreme attrition. And, extensive osteoarthritis is present on the vertebrae. Together with a severe case of gerontal osteoporosis, these attributes are common indicators of progressive aging. However, the severity of their expression in this individual also may reflect advanced states of disease (Dan Morse, personal communication). The low level of copper in her bones suggests a chronic disease state. What appears to be a bony tumor is located in the left maxilla near the molar and premolars. This probably is a benign tumor related to an infection of the tooth roots (Dan Morse, personal communication). An undiagnosed undulating sclerotic buildup of bone is present on the endocranial aspect of both parietsals and temporals. Although the condition is widespread in the cranial vault, its etiology remains unknown.

**Feature 7.19**

Feature 7.19 contained an unusual rectangular coffin (Figure 8.15). Although all of the wood of the coffin had deteriorated, six ornate metal handles and several decorative plates, apparently used as bolt covers, were recovered. An oval piece of glass, which had formed a viewing window in the coffin lid, had collapsed and was broken over the skull and upper torso of the skeleton. Combes (1972) describes a similar coffin from a nineteenth-century black cemetery in South Carolina. These “bust windows” simply may be of decorative origin. Others have argued that they
allowed the body to be viewed without opening the coffin (Dickens and Blakely 1979), an advantage in a time when embalming techniques were less sophisticated than today. The only items of personal adornment associated with this burial were buttons and a metal buckle. Four of the buttons appear to have been two pairs of cuff or glove buttons.
The remains are those of a black male, probably in his sixties. His bones are uniformly large and rugged, showing pronounced musculature (Figure 8.16). Using the Trotter-Gleser formula for predicting adult stature, it is estimated that he stood 6 ft (1.8 m) tall. There are few signs of trauma. Slight arthritis is present on the lumbar vertebrae and distal articulating surfaces of both femora. Dental attrition is slight and only two caries are present. The lack of trauma and seemingly good health of this individual, along with burial in an apparently expensive container, suggest that he was not a pauper.

Trace Element Analysis

In general, the trace element analysis showed that these individuals enjoyed a balanced and varied diet. The only consistently low measurement was for copper, yet in all instances except Feature 7.9 the readings fell within the range anticipated for healthy human bone. The level of 9 parts per million of copper for Feature 7.9 may be explained as a result of an extended illness. Macroscopic pathological lesions support the existence of such a disease state. Thus, this reading probably does not reflect a dietary imbalance. All other elements tested (strontium, magnesium, and zinc) had readings within the ranges expected for modern Western diets. No correlation was found between trace element level and burial location, age, or sex.
FIGURE 8.15. Feature 7.19 in situ, the remains of an elderly black male. The broken glass once formed an oval viewing window in the lid of the coffin.
CONCLUSIONS

For investigations of archaeological sites containing human skeletal remains, the interpretative power of the bioarchaeological approach is greater than those of either biological anthropology or archaeology alone. This is, of course, true of both historic and prehistoric mortuary sites. But at historic—and particularly urban—sites, the bioarchaeological research design can also include forensic and documen-
tary inquiries. Together, they constitute the most powerful investigative tool yet devised by students of mortuary site archaeology.

Oakland Cemetery was not an ideal laboratory for this approach, however, because of the limited size of the skeletal sample and paucity of historical records. It is too small a sample size that we attribute our failure to generate a predictive demographic model. For the same reason, few generalizations could be reached concerning the health environment and genetic structure of the population from which the skeletal sample was extracted. And the absence of historical records thwarted an attempt to identify, by name, individuals interred in unmarked graves. Full realization of the conjunctive, bioarchaeological approach, therefore, lies in securing a statistically valid skeletal sample and sufficient written records to link skeletal remains to funerary, epidemiological, and dietary behavior.

Regardless of the limitations of the Oakland project, the amount of information gleaned from such a small-scale excavation and analysis is encouraging. The remains represent a segment of southern urban society conspicuous by its absence in written records of the period. By contrast, extensive histories tell of the lives of white Atlantans who helped rebuild the city in the years following the Civil War. In Oakland Cemetery, these more affluent individuals lie in graves marked by elaborate stone monuments. The most imposing monuments in the black section are modest by comparison. "In most instances, less than adequate markers indicate the burial plots of individuals who left behind legacies of valuable service and worthwhile lives in what Reverend E. R. Carter in 1894 referred to as the 'Black Side' [Henderson 1976:58]." This field, assumed to be empty, and apparently long forgotten, is a vivid reminder of an overlooked segment of Atlanta's population.

Most of the interments in the study tract probably are those of paupers buried in simple pine boxes at the city's expense. Other burials appear not to represent paupers in the strictest sense of the word. The glass viewing plate present in one grave indicates a casket of more expensive manufacture than one might expect to have been provided by a city already deeply concerned with the cost of pauper interment. And the range of coffin fixtures, items of personal adornment, and grave offerings suggest that some of the individuals interred in this field were not indigents. This speaks for at least occasional, private, family mortuary preparations. It seems probable, therefore, that in addition to being a potter's field, this area once constituted a segregated burial ground for economically and socially deprived black Atlantans.

ACKNOWLEDGMENTS

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