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AN ARCHAEOLOGY OF CERRO PORTEZUELO BIOARCHAEOLOGY: BURIAL ANALYSIS AND THE (RE)EXCAVATION OF CONTEXTS FROM A 1950s PROJECT

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Abstract

Only about 19 of the 70 or so skeletons excavated at Cerro Portezuelo were brought back to UCLA, and adequate information is lacking for most of these. A detailed analysis of the excavation and curation records, as well as of the skeletons, was conducted in an attempt to identify their contexts and to evaluate their potential for contribution to our knowledge of the Cerro Portezuelo community. Although subadult dental health was good, adult levels of caries and antemortem loss were comparable to those of other Mesoamerican populations. Oxygen-isotope data suggest only limited long-distance immigration into the area. Further interpretation, however, is hampered by poor contextual data and the inability to assign most individuals to a specific period.

The excavations at Cerro Portezuelo, in the eastern Valley of Mexico, were directed by George Brainerd in 1954 and 1955. After his death in 1955, a further 1957 season was directed by Henry B. Nicholson. Unfortunately Brainerd's death, together with a number of recording and cataloging problems in the field, have severely compromised the value of the human skeletal material recovered from the site. In the following pages we attempt to restore some of this value, analyzing the available site and collection records to reconstruct burial contexts and allow some inferences about the health, burial practices, and mobility of the Cerro Portezuelo people.

HISTORY AND METHODS

According to the site records at least 68 burial features (including some identified as caches containing human bones) were excavated in the three seasons of work at Cerro Portezuelo. Two of these features contained two individuals each, for a site total of 70 individuals. Unfortunately, most of these were left in Mexico in the expectation of future analysis, an expectation unfulfilled because of George Brainerd's untimely death. These missing skeletons, which include virtually all of those from the extensive excavations in Trenches 93 and 96 (see below), may now be in the collections of the Instituto Nacional de Antropología e Historia.

A smaller collection of skeletons was taken from Mexico to the University of California, Los Angeles (UCLA), where it was catalogued and stored. Further curatorial work was done there in the late 1990s, but by then the collection and data had suffered significant losses. The collection was later transferred to Arizona State University, where Spence analyzed it in June of 2006 and December of 2009. Those burials that offered at least some information included approximately 19 individuals from approximately 15 features (Table 1). The reasons for this uncertainty about the numbers will become apparent in the following pages.

There are numerous problems with this series. Some of them stem from Brainerd's unexpected death and the disruption that it caused. Others were common in archaeological work in the 1950s, and still others are deficiencies of that particular project. One problem is that all of the skeletons are incomplete to some degree. In a few cases only small elements are missing—for example, teeth, phalanges, and carpals. These are the ones most likely to be overlooked by inexperienced or careless excavators, especially when (as with Cerro Portezuelo) preservation is poor and no screening is done. However, these are also among the first elements to separate from the corpse with decomposition, so we cannot completely eliminate the possibility that in some cases these were secondary burials, moved to their graves after some time in a primary burial elsewhere.

Frequently the skeletons are much less complete. In some cases this may be a result of the bad preservation, coupled with poor excavation methods. Nevertheless, a few skeletons either lack their crania or consist of little more than their crania, suggesting that some crania had been removed for analysis or display and then stored apart from their postcranial skeletons. Also, a few burials were divided and handled separately in the original cataloging, while in other cases it seems that skeletons from different features were combined. We will not present here detailed inventories of the skeletons since their representation is more likely a product of recovery and curation biases than of cultural practice. However, we will go into some detail on the project records and our attempts to reconcile them with the osteological evidence. This is, in effect,

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Table 1. Individuals of Cerro Portezuelo

Number	Complex	Accession	Sex	Age (years)	Period
T24-1	A	204-35		4.5–6	Epiclassic
T43-1	A	204-30		1–1.5	Epiclassic or Early Postclassic
T27-1	C	204-39?		10–11	Epiclassic or Early Postclassic
T27-2	C	204-34		12–15	Epiclassic or Early Postclassic
T27-3	C	204-37	M	16–18	Epiclassic or Early Postclassic
T93-18:1	C	204-32	F	40–44	Classic or Epiclassic
T93-18:2	C	204-32		1–3	Classic or Epiclassic
T29-1	D	N/A	M	25–50	Early or Late Postclassic
T29-2	D	204-28	F	45–65	Early or Late Postclassic
T29-3:1	D	204-29	M	25–29	Early or Late Postclassic
T29-3:2	D	204-29		Adult	Early or Late Postclassic
T29-3:3	D	204-29		6–10	Early or Late Postclassic
T29-x:1	D	204-36		Adult	Early or Late Postclassic
T29-x:2	D	204-36		9–12	Early or Late Postclassic
T35-x:1	D			Perinatal	Early or Late Postclassic
U-1:1		204-31		13–15	Unknown
U-1:2		204-31		Infant	Unknown
U-2		N/A		12–14	Unknown
U-3		N/A		1–1.5	Unknown

an archaeology of the archaeology, which we hope will clarify the strengths and weaknesses of our interpretations and help readers to evaluate them.

Reference to the original field notes and photographs helps to resolve a few puzzles, but the notes and photographs themselves are often inadequate or have been lost. No physical anthropologists were on site, and none of the excavators were familiar with the human skeleton. Burial positions were not usually described in sufficient detail, and some of the descriptions are suspect.

The poor contextual data make it very difficult to date the Cerro Portezuelo burials in the UCLA collection. Compounding this difficulty is the possibility that some burials may have been intruded into earlier architecture from overlying levels that have often been eradicated or reduced to fragments by centuries of agricultural activity (Hicks 2005:4–9). The date of the major architecture in a complex is thus not always a good guide to the date of the burials there. Most of the missing burials from Trench 93, for example, were Epiclassic period burials intruded into the Classic period architecture. Only one of the UCLA burials, Burial 1 of Trench 24, can be assigned to a single period (Table 1). This is particularly unfortunate because each period marks a significant change in Cerro Portezuelo's wider political environment.

In 1957 Henry B. Nicholson joined the project, and in August of that year he prepared a handwritten catalog of the 1954 and 1955 burials that had been transferred to UCLA. But he had not been present for those seasons, so there are some gaps and errors in his catalog. In 1959 F.J. Clune Jr. prepared a more formal accession record for the burials stored at UCLA, but he apparently knew little about the site and had little or no access to the field notes and excavators. He was forced to rely largely on Nicholson's catalog and seems to have made a few questionable assumptions in his use of it. More recently, Frederic Hicks (2005) has prepared a detailed report on the excavation that presents helpful information on the missing burials.

Despite these problems, a number of skeletons could be assigned with some confidence to particular features, even if these cannot be dated, and osteological analysis was productive. Sex determination was based, where possible, on pelvic characteristics (Buikstra and Ubelaker 1994; Phenice 1969). The ages of juveniles were assessed through dental development (Moorrees et al. 1963a, 1963b; Smith 1991; Ubelaker 1978:Figure 62), bone dimensions, and epiphyseal fusion (Baker et al. 2005; Scheuer and Black 2000). Adult age was based on symphysis pubis morphology (Suchey and Katz 1998), auricular area morphology (Lovejoy et al. 1985), and ectocranial suture closure (Meindl and Lovejoy 1985). Any evidence of dental and skeletal pathology was recorded. A collection of 23 dental and bone samples was obtained for oxygen-isotope analysis at the University of Western Ontario.

Hicks (2005, 2013) has grouped most of the numerous excavation units (trenches) into four major complexes, described as Complexes A–D (Figure 1). The UCLA collection includes skeletal material only from Complexes A, C, and D. The data will be presented in terms of these complexes and, within each complex, in terms of the trenches in which the burial features were located. Each individual has a trench number and a feature number based, for the most part, on those assigned to them in the field. Their accession numbers in the UCLA system will also be presented but will not be used in discussion. If there is more than one set of remains in a burial feature, each receives a third number in the sequence, separated from the previous numbers by a colon. For example, the three people in Burial 3 of Trench 29 are T29-3:1, T29-3:2, and T29-3:3. For those individuals who cannot be assigned to a particular trench, the provenience designation will be U (for unprovenienced).

THE BURIALS

Complex A

Complex A, located in the southern part of the site, was explored through a number of trenches in the first field season. Much of the work focused on an Epiclassic structure. The only burials from the Complex A area for which we have skeletal material, however, are from two small trenches in what appear to have been residential areas well to the east of the structure (Figure 1).

Trench 24 is located about 65 m northeast of the public structure. A subadult burial (T24-1) was found there beneath an intact plaster floor. With the bones were two jadeite beads, a shell bead, part of a small ceramic ladle, and a miniature jar, according to the excavator's field notes. The burial is described as a flexed child with the head oriented to the south. The ladle indicates an Epiclassic or Early Postclassic date. But the burial is beneath an intact floor that, to judge by the ceramics from Trench 24, is Epiclassic, so T24-1 may be considered an Epiclassic period burial.

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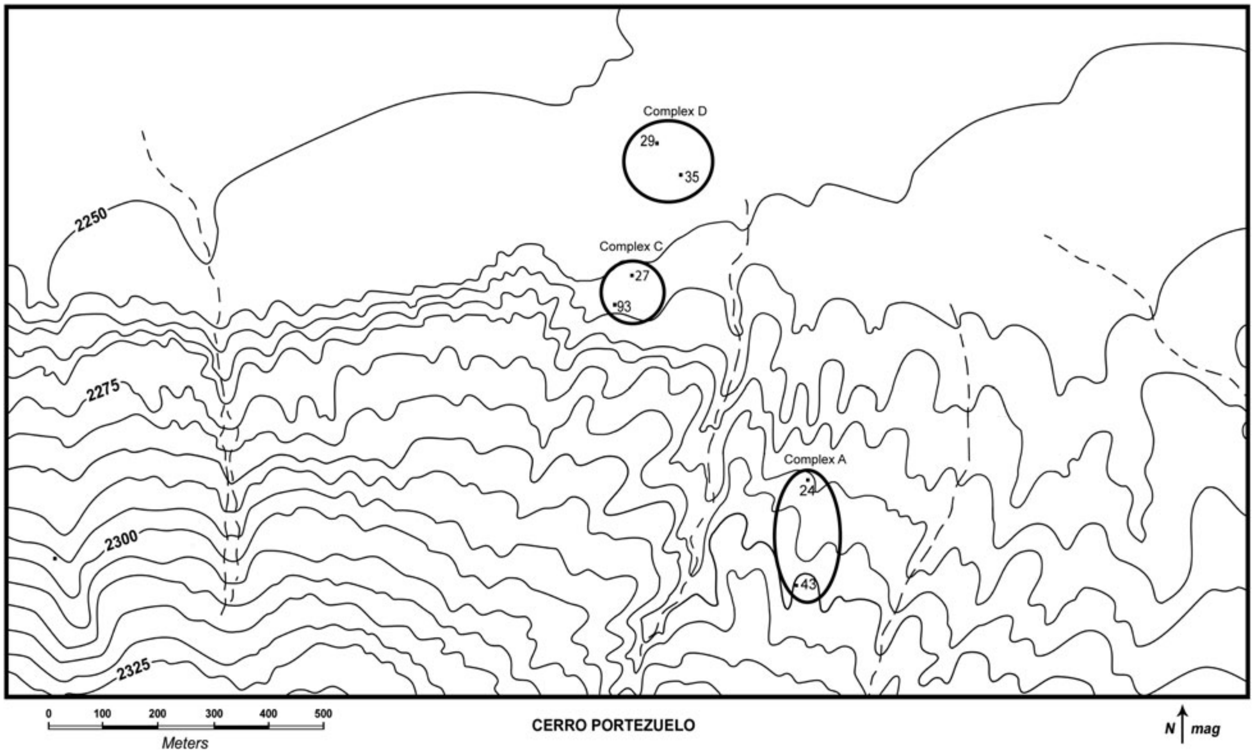

Figure 1. Cerro Portezuelo complexes and trenches.

The skeletal material of T24-1 was cataloged as 204-35. Cranial and mandibular fragments and most of the teeth are present, as well as a few rib fragments and parts of four long bones. T24-1 was probably about 4.5–6 years at death (Moorrees et al. 1963b; Scheuer and Black 2000; Smith 1991). None of the teeth have caries. An unerupted permanent maxillary canine has two hypoplasia lines at .08 and 6.05 mm above the cementum-enamel junction. By Wright's (1997:Table 1) Maya equations and Storey's (1992:Figure 7-3) Teotihuacan data, this suggests stress episodes in the fourth and last years of life.

Trench 43 was located about 30 m southeast of the public structure in an area of Epiclassic residential structures. Individual T43-1 (Figure 2) was found in fill above a floor. The floor was probably part of an Epiclassic period residence, but since the burial was above it, we cannot say whether it was from a later Epiclassic occupation or an Early Postclassic use of the area documented in the ceramics. The burial was in the seated position, facing north, with the legs drawn tightly up in front of it. A necklace of small shell beads with a shell pendant was found in the neck area.

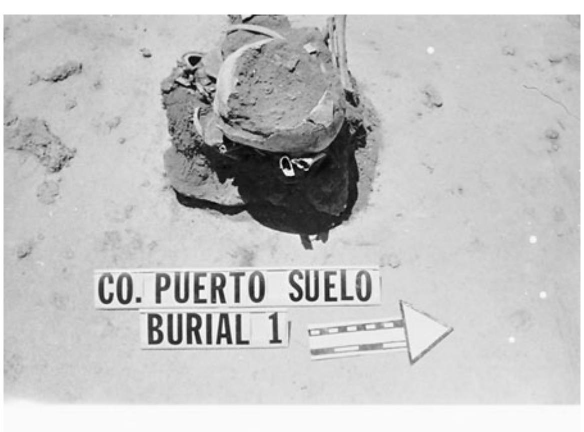

Figure 2. Burial T43-1. UCLA photograph A204.5.44A.

T43-1 is a subadult, accessioned into the UCLA collection as 204-30, B1. Most of the skeleton is present. Absent are the majority of hand and foot bones, both scapulae, and some ribs and teeth. The poor condition of the bones, combined with the inexperience of the excavators and the lack of screening, explain the elements that are missing from what the notes and photos show to be a primary burial. All of the deciduous teeth had fully erupted except for the second molars, which had not reached the occlusal plane. An age of 1–1.5 years at death seems likely. There are no caries or abscesses. The occipital squama has a persisting lack of fusion between its superior and inferior segments. Since the two should have fused by this age, it seems that T43-1 had an Inca bone (Hauser and De Stefano 1989:99–103). The presence of mild but active cribra orbitalia suggests some anemia.

Complex C

The excavations in Complex C revealed a Classic period ceremonial structure. A few burials and caches were directly associated with it, while a number of Epiclassic burials were later placed in and around it from a higher level that has been largely destroyed. The tight clustering of 17 burial features, most of them less than half a meter apart, suggests that they were part of an Epiclassic cemetery rather than burials beneath residence floors (Hicks 2005, 2013). Excavations in Trench 93 focused on this area.

The smaller Trench 27 was located about 80 m to the north of the structure and covered only about 9 m^2 in an area that may have been either Epiclassic or Early Postclassic residences. There are some problems with the Trench 27 burials. The field records indicate only two burials from the trench, but there are three individuals in the UCLA collection said to be from there. Also, some skeletal materials appear to be missing. The only useful field data consist of two crudely drawn scale plans (Figure 3), the brief notes handwritten on those plans, and a photograph of Burial 1 (Figure 4). The only information about the photo is that it is from 1954, the year that Trench 27 was excavated, but the unusual position of the burial leaves no doubt that it is Burial 1. This photo shows a juvenile skeleton resting on its back, the legs flexed tightly back over the torso and the arms tightly flexed at its sides, to place the hands by their respective shoulders. Some bones, probably dislodged during the excavation, have apparently been deposited on top of the skeleton. The head is turned to the right. This is also the position of Burial 1 drawn in the plan (Figure 3), which provides additional information that the head is to the west, turned to face south, and that the person is an adolescent with unfused long bone epiphyses. Two "large sherds" are by the right shoulder in the plan, but these are not visible in the photo because the excavation edge blocks the view at that point.

The plan also shows, 70 cm southeast of Burial 1, a roughly scrawled figure labeled Burial 2, with two notes by it. One refers the reader to the following page for more on Burial 2, while the other reads "Broken skull left in place here." About 50 cm west of the Burial 2 figure are two other notes. The original note reads "Probable burial here left in place." Later, the word "Probable" was crossed out, and a note was added reading "no burial here."

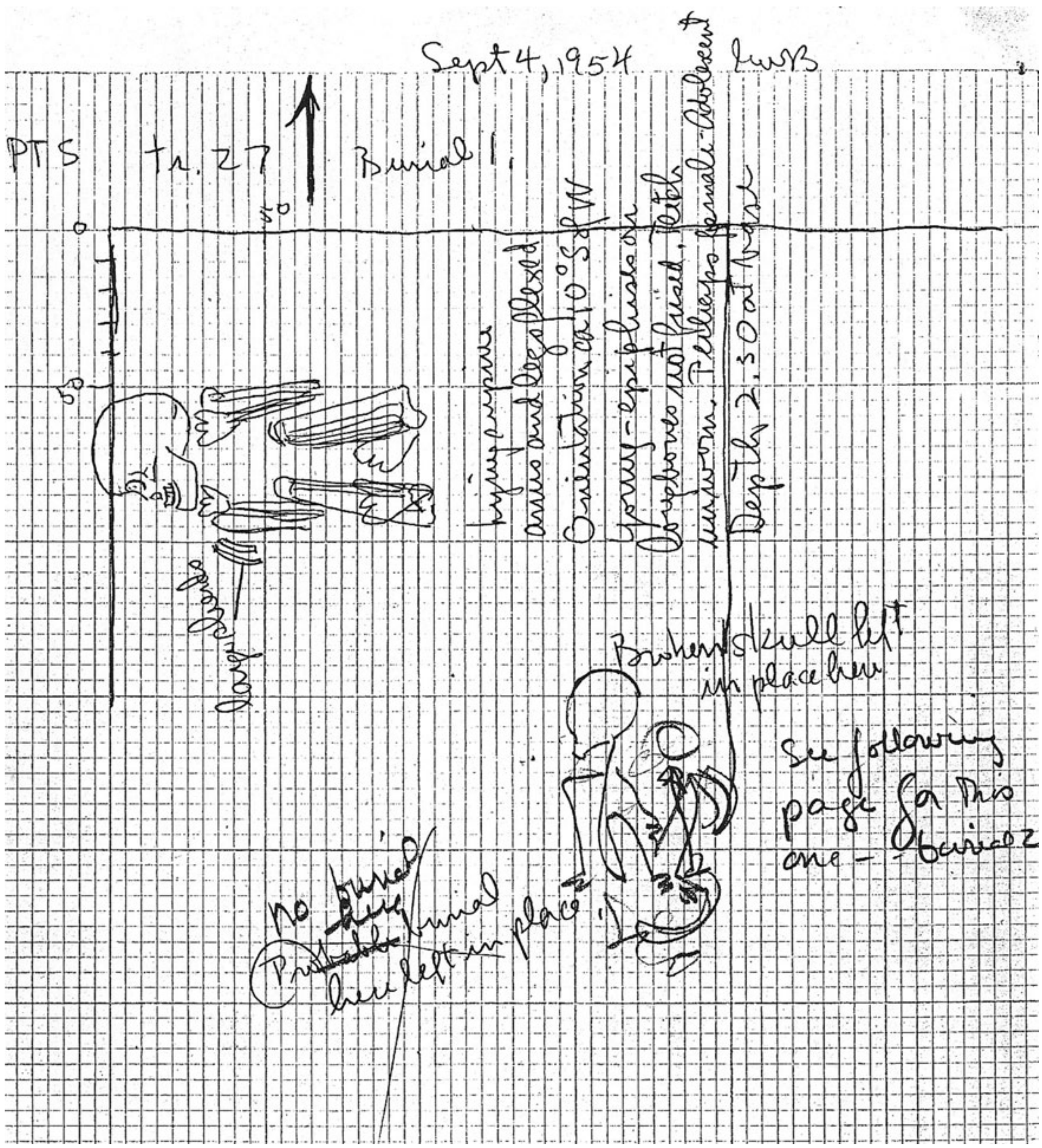

Figure 3. Plan from field notes of Burial T27-1.

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Figure 4. Burial T27-1. UCLA photograph A204.6P.188.

The following page has the plan of Burial 2 and its grave goods. The skeleton is shown resting on its back, head to the north. The legs are flexed to the left, the right leg raised and the left lying flat. The right arm is slightly flexed along the side to place the hand at the right hip, but the position of the left arm is not shown. Just to the east of the skeleton are several items: an incised bowl, a ring-base bowl, a plate, and a ladle censer with an effigy handle that may be either Epiclassic or Early Postclassic (Hicks 2005:8–10, Figure 8-5c).

Nicholson's 1957 catalog identifies collection 204-34 as Trench 27, Field 2, and Clune later accessioned it as Trench 27, Burial 2. The two bags of 204-34 material contain the skeleton of a single subadult individual, whom we shall identify as T27-2, accepting the identification provided by Nicholson and Clune. However, the cranium is present. Perhaps the note on the second plan, stating that the head had been left in place, referred only to a temporary situation.

Two other bags are labeled "Trench 27-B1-Individual 1" and "Trench 27-B1-Individual 2." There is no accession number, and both bags contain elements of the same individual, another juvenile. It appears from a note on the first bag that Burial 1 was placed in more than one bag. Clune, knowing little of the field situation and evidently not familiar with the human skeleton, seems to have assumed that the second bag represented a second individual in Burial 1. Nicholson's catalog lists 204-39 as Trench 27, Field 1. No material in the collection bears a 204-39 designation, but presumably these two bags without an accession number are the 204-39 bones. We have designated the skeleton as T27-1 and accept it as the Burial 1 of the field plan and photograph. However, the T27-1 skeleton is very incomplete. There are no cranial or mandibular fragments or teeth, although it is obvious from the plan and photo that these were originally present.

We have designated the third person as T27-3. The bag is labeled 204-37 and is entered in Nicholson's catalog as Trench 27, Level G. A femur has "27G" written on it in pencil. The bag contains numerous bones from a single individual and one additional right scapula that, to judge by its size, is actually from the T27-1 individual. T27-3 may be whatever was originally referred to as the "Probable burial" on the field plan. Although later amended on the plan and the presence of a third burial denied, perhaps further excavation did actually find one there. It should also be noted that Level G is about 180–210 cm deep, just above the level of Burial 1.

The T27-1 skeleton is very incomplete. Missing are the cranium, mandible, teeth, all vertebrae, manubrium, sternum, both clavicles, most of the ribs, both patellae, some pelvic elements, and the bones of the hands and feet. It seems that one or more bags of material from this burial are missing. None of the T27-1 long bone epiphyses have fused, and the ilium, ischium, and pubis have not yet joined in the acetabulum. The lengths of the long bones indicate an age of 10–11 years (Scheuer and Black 2000).

The T27-2 assemblage includes a cranium and mandible, although they are in fragments. All of the teeth were recovered. The poor condition of the bones prevents precise identification of many of the postcranial elements, but most parts of the body are represented. Bones from both hands and feet were recovered, although most of the phalanges are missing. Given this level of representation, T27-2 had probably been a complete primary burial. The dental development and epiphyseal fusion suggest an age of about 12–15 years at death for this individual. There are no dental caries or antemortem tooth loss. No abscesses are present, at least in those parts of the alveoli intact enough for observation. Hypoplasia lines are absent in the teeth. A slightly depressed band extends across the parietals posterior to the coronal suture, indicating that cranial modification had been practiced on T27-2.

T27-3 is also largely present but in very fragmented condition. It had probably been a full primary burial. Cranial features indicate a male. Skeletal development was slightly more advanced than was the case with T27-2 and suggests an age of 16–18 years by the Scheuer and Black (2000) standards for males. Few observations are possible on dental pathology. Most of the mandible is present and shows no abscesses or antemortem loss. The form of the frontal and parietal bones indicates no cranial modification.

The 1955 excavations in Trench 93 uncovered a few Classic period caches and burials and a much larger number of Epiclassic period burials, but none of these are in the extant UCLA collection. However, the smaller 1957 excavation at Cerro Portezuelo focused on Trench 93, and another burial was found. There is no available field record for this burial, and a notation in Clune's accession record says only that two "plain ware vessels" were associated with it. Given the location, it could be of either the Classic or Epiclassic period. It was cataloged by Nicholson as 204-32. There are actually two individuals represented in this collection, an adult and a child. Since the numbered burials in Trench 93 end with Burial 17, we will designate the adult as T93-18:1 and the child as T93-18:2.

T93-18:1's head is represented only by the left half of the mandible and half of the left parietal bone. The postcranial skeleton includes the left humerus, radius, and ulna; both femora, tibiae, fibulae, and patellae; the manubrium and sternum, fused together; the left scapula and clavicle; the left innominate; four vertebrae, the sacrum, and coccyx; and several ribs. Of the hands there are a left carpal, three left metacarpals and six phalanges. The feet are represented by three left and three right tarsals, four left metatarsals, one right metatarsal, and three phalanges. Throughout the body the bones of the left side are better represented than those of the right, but the reason for this bias is unknown. Despite the missing elements, T93-18:1 had probably been a primary burial. Pelvic traits indicate a female. The auricular area suggests an age of 40–44 years (Lovejoy et al. 1985).

The only teeth recovered are from the left half of the mandible. The second and third molars had been lost antemortem, with full resorption of the alveolus. There are no caries or hypoplasia lines on the remaining teeth. One left typical rib has a healed fracture. The right tibia and fibula show evidence of infection, still active at the time of death. The distal halves of both shafts are sclerotic

Figure 5. Osteomyelitis of right tibia, Burial T93-18:1. Photograph by Destiny Crider.

with some layers of new bone not yet integrated (Figure 5). There are no cloacae or sequestra. None of the other recovered bones are affected, so the osteomyelitis is probably a response to some localized trauma or infection.

T93-18:2 is represented only by six ribs and two thoracic vertebral arches. The arches have not yet fused to the bodies. An age between one and three years is likely (Baker et al. 2005: Table 10.3). T93-18:2 is very incomplete. Nicholson's catalog describes Burial 1 of 1957 as a primary burial, but given the osteological innocence of the excavators, it is possible that some additional bones in the grave, the incomplete and disarticulated remains of a young child, went unnoticed or at least unrecorded. Unfortunately, without field data we cannot say with certainty that T93-18:2 was a secondary burial accompanying T93-18:1. We will treat it that way, however, largely because the two individuals were packaged, cataloged, and accessioned as such. Multiple burials including both primary and secondary individuals are very rare at Cerro Portezuelo (Hicks 2005). They do, however, occur in the Epiclassic Corral phase at Tula (Gómez Serafín 1994:84–85; Gómez Serafín et al. 1994:143).

Complex D

Complex D, at the north end of the site, has evidence of both Early Postclassic and Late Postclassic residential use (Hicks 2013). Trenches 29, 35, and 96 were placed in this area. Trench 96 uncovered a large series of burials, most of them dating to the Early Postclassic period, but all of them were left in Mexico.

Trench 29 was a small operation in a residential area. Field notes, a plan, and photographs show four burials there. Burials 1 and 2 are briefly described in field notes and shown in photos and a plan. Although the heads of the two individuals are only about 10 cm apart in the plan and photos (Figure 6), the skeletons are oriented at right angles to one another and so were probably separate burials. Burial 1 was made by digging through an overlying step, as indicated by the plastered fragments around the skeleton. The notes do not say whether the step had been repaired or whether similar evidence was found with Burial 2. There were evidently no grave goods with either individual. The notes and photographs of Burials 3 and 4 have not been found. All we know about them is their locations, noted on the plan of Burials 1 and 2. They were at a deeper level, Burial 4 beneath Burial 1 and Burial 3 about

Figure 6. Burials T29-1 (left) and T29-2 (right). UCLA photograph CPZ A204.t29b1&2.

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70 cm north of there. With no grave goods, it is impossible to say whether the four burials were Early or Late Postclassic.

According to the field notes, plan, and photos, Burial 1 was the primary burial of a single individual, flexed on the right side and head oriented to the west, facing south. The legs were flexed tightly in front of the torso. The left arm was flexed to place the hand by the left knee, but the right arm was extended beneath the torso to put the right hand behind the pelvis.

Neither Nicholson's catalog nor Clune's accession record lists any bones from Trench 29, Burial 1. However, some material in the collection is labeled "Pit 29 Skull 1." We are designating this material as T29-1. Included are the left capitate, the right side of the first cervical vertebra, a relatively complete but fragmented cranium, a mandible, and teeth. All teeth are present except the maxillary and mandibular third molars, which apparently had never developed. This was a congenital failure, not an indication of youth; the second molars are all worn flat. Cranial features indicate that T29-1 is a male. Cranial suture closure suggests an age ranging anywhere from the late 20s to the late 40s (Meindl and Lovejoy 1985:Table 3).

Occlusal caries are present in the maxillary right first and left second molars, and the crown of an unidentifiable anterior tooth has been completely destroyed by caries. There are no abscesses or antemortem losses. The crowns of the two maxillary second molars are partially encased in calculus, and their roots are thickened and blended, indicating some alveolar infection at these sites.

There are two hypoplasia lines on the maxillary medial incisors, at 2.85 and 3.48 mm above the cementum-enamel junction, suggesting two episodes of health stress in the fourth year of life (Storey 1992:Figure 7-3; Wright 1997:Table 1). The healed porotic hyperostosis visible on the parietal and frontal bones also reflects some early health stress. The ages of the episodes visible in the incisors point to problems associated with weaning.

T29-1 shows no cranial modification. The congenital failure of the third molars to develop is unusual for an ancient population. Also, both of the maxillary lateral incisors are peg-shaped and very small.

The only postcranial elements present are the atlas and capitate. The plan and photos show a complete skeleton and the notes state that it was in good condition. Apparently the head has been stored separately from the rest of the skeleton, and none of T29-1, head or postcranial bones, was formally cataloged or accessioned. The postcranial skeleton has not been found in the UCLA collection.

Burial 2 of Trench 29 rested immediately to the south of Burial 1 (Figure 7). The skeleton was flexed on its back, head to the north but turned to face west. The legs were drawn tightly back over the torso. According to the field record, the arms and hands were crossed beneath the body, as if tied behind the back. If true, this would imply that Burial 2 was a human sacrifice (see Spence and Pereira 2007; Sugiyama 2005). However, a close examination of the photo (Figure 7) shows that the right radius is resting on top of, not beneath, the lower torso, with the right femur lying over the radius. The hands, then, had not been tied behind the back. Although it would have required some form of binding to maintain the tight flexion of this burial position, the binding would have been a sort of mortuary bundle rather than bonds.

Nicholson's 1957 catalog lists collection 204-28 as Trench 29 Field 2. There are two bags of 204-28 material containing the skeleton of a single adult that we have designated T29-2. Another collection, 204-36, is said in Nicholson's catalog to be from "Pit 29, field #2" and was accessioned by Clune as Pit 29 Burial 2.

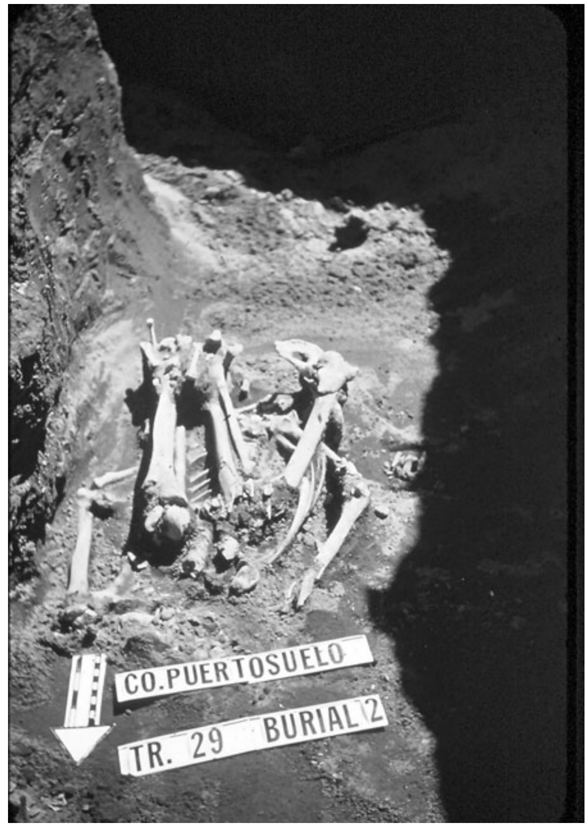

Figure 7. Burial T29-2, cranium removed. UCLA photograph CPZ A204.tr29b2.

However, neither of the individuals represented in that collection are the same as the 204-28 person, so it will be dealt with separately (see below).

The T29-2 collection (accession number 204-28) is in poor condition, but most parts of the body are represented. Several characteristics of the innominate indicate that T29-2 is a female (Phenice 1969). An age in the 45–65 year range seems likely (Lovejoy et al. 1985; Suchey and Katz 1998).

Abscesses are absent in the recovered segments of the maxilla and mandible, but most of the left sides of both are too fragmented for observation. The only dental decay is a small cavity in the buccal pit of the mandibular right second molar. There is no hypoplasia.

Accession number 204-29 is said in Nicholson's catalog to be Field 3 of Trench 29, so in Clune's record it is Trench 29, Burial 3. But three individuals are represented in the 204-29 collection. Most of the bones are from a large adult, here designated T29-3:1. A small number are from a second adult (T29-3:2), distinguishable from T29-3:1 by size (T29-3:1 is considerably larger), the color of the bones, and the fit among the elements. T29-3:3 is a child, represented by only a few elements.

Most of the T29-3:1 skeleton is represented in the collection, but the cranium, mandible, and teeth are completely absent. Although this would seem to raise the possibility that this is the missing postcranial skeleton of T29-1, both T29-1 and T29-3:1 include the first cervical vertebra. The characteristics of the innominates indicate that T29-3:1 is a male about 25–29 years old (Phenice 1969; Lovejoy et al. 1985).

T29-3:2 is represented only by the second cervical vertebra, both fibulae, and the left ulna. This person is smaller than T29-3:1 but is

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also an adult. Sex and a more precise age for T29-3:2 cannot be determined. The different coloring of the bones of these two adults suggests that they may have been from different graves, but this cannot be verified with the available data, so we are following the catalog numbering, albeit again with reservations.

T29-3:3, the child, is represented by a partial humerus, a manubrium, and a fragment of parietal bone. The size of these elements suggests that T29-3:3 is about 6–10 years old.

Another Trench 29 collection is accessioned as 204-36. Nicholson's catalog says it is from Pit 29 Field 2, so Clune identifies it as Pit 29 Burial 2. It includes the very poorly preserved remains of two individuals, an adult and a child. Skeletal element duplications show that the adult is not the same person as T29-1, T29-2, T29-3:1, or T29-3:2. It may be Burial 4 of Trench 29, but there is no evidence to support this. Given this uncertainty, we have designated this adult as T29-x:1 and the child as T29-x:2.

T29-x:1 is represented by numerous small fragments of poorly preserved bone. Identifiable material includes innominate, vertebra (the right side of the first cervical, the second cervical, and some thoracic vertebrae were recognizable), sacrum, humerus, ulna, and several hand and foot elements. The fusion of the iliac crest and the full development of the rib facets indicate an adult, but sex cannot be determined from the available material. There is no trace of the cranium, mandible, or teeth. The absence of cranial and mandibular material is not just the result of poor preservation, as these elements were apparently not included in the collection.

T29-x:2, the child, is represented by both scapulae and part of a radius. The scapula dimensions suggest an age of about 9–12 years (Scheuer and Black 2000). The age ranges assigned to T29-3:3 (6–10 years) and T29-x:2 (9–12 years) overlap. There is no duplication of elements, which is not surprising since both are so sparsely represented. It is possible that these are the same individual, but they will be treated here as two distinct people in the absence of any clear evidence to the contrary.

The Trench 29 situation was evidently more complex than the field notes indicate. If we assume that the five adults and one or two children are indeed all from Trench 29 (an assumption made with some hesitation in view of the cataloging and accessioning problems), then there are several possibilities: Burials 3 and/or 4 may have contained more than one person, there may have been additional but entirely unrecorded burials in Trench 29, or some displaced skeletal material from fill contexts may have been included in the collection—or some combination of these.

The Trench 35 sector of Complex D uncovered a residential area and some features of the Early and Late Postclassic periods. In Nicholson's catalog, 204-38 is identified as a human burial from "Cache pit 35." Clune has chosen to interpret this as "Cache in pit 35," describing the material as "a fetal burial with skull fragments and one pelvic bone." He added that associated material included a canid jaw and other animal bones. No bag with a 204-38 designation was found in the UCLA collection. However, a small collection labeled "Trench 35, Cache 1" was found. It consists of the mandible and some other bones of a juvenile dog (Wendy Teeter, personal communication 2010). This is probably part of the missing 204-38 material. It did not include any human infant skeletal material. An infant ilium and cranial bones were found in an unprovenienced collection with accession number 204-31 (see below) and may be the missing infant elements. Unfortunately, there is no surviving field record for Cache 1 of Trench 35, and a photo said to be of Burial 1, Trench 35 is actually of Burial 1, Trench 43. Compounding the problem, there is also a small collection labeled "Cache in pit 35" but with no accession number. It consists of seven infant long bones from three individuals.

It is impossible to fully resolve this confusion. We can assume that the dog remains labeled Cache 1 are part of Clune's 204-38 "Cache in pit 35," but we cannot safely assume that the infant bones of unprovenienced 204-31 are the rest of that feature's contents. In any case, we have no precise context or date for the material. The infant long bones of "Cache in pit 35" must have come from a different feature in Trench 35, but, again, the records leave us no information on its number, context, or date. We have subsequently identified it simply as T35-x.

There are further problems with this small collection of infant bones. Individual T35-x:1 is represented by a femur, tibia, fibula, radius, and ulna. Their dimensions indicate that T35-x:1 is a perinatal infant (Scheuer and Black 2000). T35-x:2, represented only by a femur, is a fetus of about 32 weeks *in utero*. T35-x:3, with only a tibia, is two months to one year old. It seems unlikely that three such incomplete infants came from the same context, so we will take T35-x:1 to be the individual from the feature and not deal further with the other two infants, which may be accidental inclusions in the collection.

Unprovenienced Burials

There are some more complete individuals that cannot be assigned to any particular complex or trench. These have been placed in an unprovenienced (U) category. Their chronological placements, like their contexts, are unknown.

Accession number 204-31 is given no provenience in either Nicholson's or Clune's list. However, the collection is sizable and includes elements from three people. One of these is an older child or small adult, represented by only a partial right tibia. It is not as well cleaned as the other bones and may have been an accidental inclusion in this collection, so it will not be considered further. An infant (U-1:2) is represented by an ilium and fragments of the frontal and parietal bones. This is the material mentioned above as possibly part of the Trench 35 Cache 1 collection, accession number 204-38. It too might be misplaced in the 204-31 collection. Nevertheless, it was sampled for isotopic analysis. Most of the bones in 204-31 are from an adolescent, U-1:1, who is represented by teeth and poorly preserved bones from most of the skeleton. Epiphyseal fusion indicates an age of about 13–15 years.

One box in the UCLA collection held much of a subadult skeleton (U-2) with no accession number or other data to indicate its provenience. Most of the unfused long bone epiphyses are in the collection, but the diaphyses are represented by only four small pieces, probably two of femur and two of fibula. The bone is in good condition, so these absences cannot be attributed to preservation. The presence of some distal hand phalanges indicates that this was originally a primary and complete burial. At some point after its excavation, some of the major skeletal elements must have been removed from the collection. Dental and skeletal development indicates an age of 12–14 years. There are no caries, abscesses, or antemortem loss. A single hypoplasia line at 2.55 mm above the cementum-enamel junction on a maxillary second molar suggests a stress episode in the seventh year (Wright 1997). There is no cribra orbitalia, and the cranium has not been modified.

U-3 is another subadult. The original paper bags in which U-3 was stored were too damaged for the UCLA staff to salvage any provenience data, which was typically recorded on the bags themselves.

Most of the skeleton is present. Dental data and the lengths of some long bones suggest an age of 1–1.5 years (Moorrees et al. 1963a; Scheuer and Black 2000). Caries and abscesses are absent. There is no cribra orbitalia, and the cranium shows no evidence of modification.

Summary

In sum, about 19 individuals have been identified here as burials. But there is considerable uncertainty about several of these—about whether they really represent burials or are just fill material that had been displaced from burials, about which features they come from, and about whether multiple individuals were from a single feature or had just been lumped together at some point after their excavation. Only one burial (T24-1) can be unequivocally assigned to a single phase.

These problems stem in part from the inadequacy of the field data. Also, however, Nicholson and Clune apparently had limited knowledge of the human skeleton when they undertook the cataloging and accessioning, did not know much about the 1954 and 1955 fieldwork, and had little access to the field records and personnel. This failure of continuity can probably be attributed largely to Brainerd's death.

THE OXYGEN-ISOTOPE ANALYSIS

Methodology

The oxygen-isotope composition ($\delta^{18}O$) of bones and teeth is largely a product of the oxygen-isotope composition of the water that we drink, which varies with climatic and environmental variables (Yurtsever and Gat 1981), and is incorporated into bones and teeth during the process of mineralization (Longinelli 1984; Luz et al. 1984). Consequently, the oxygen-isotope composition of these tissues reflects the geographic location in which they were formed. Because enamel does not remodel, teeth contain a permanent record of the location in which individuals lived during childhood. The oxygen-isotope composition of bone, by comparison, changes when a person moves to a new environment, gradually adopting the oxygen-isotope composition of the ground water in the new locality (re-equilibration) through the process of remodeling. In adults this process can take a decade or more to complete (Parfitt 1983), but in children it can occur much more quickly because they are growing and therefore remodeling their bone at a faster rate. Because remodeling is a continual process, the chemical composition of bone reflects the environmental experience of the last several years of life. The occurrence and timing of individual relocations can, therefore, be identified by comparing tooth enamel with bone, or one tooth with another.

Intrasite variability among control samples in Mesoamerica is about 2‰ (White et al. 2007) and can be caused by use of different local water sources, consumption of imported foods with high water content, seasonal climate, and breastfeeding children, who are enriched in ^{18}O because their water source is mother's milk (White et al. 2000; Wright and Schwarcz 1998). Previously documented variability among sites (see, for example, White et al. 2007:Figure 1) is most noticeable between highland and lowland locations and between the Atlantic and Pacific coasts. Different locations that have similar environments will, however, have $\delta^{18}O$ values that overlap, so the usefulness of oxygen-isotope analysis for reconstructing mobility can be limited.

We obtained phosphate oxygen-isotope ratios ($\delta^{18}O_p$) on bone for four unprovenienced individuals and 12 individuals who were excavated from Complexes A, C, and D. Enamel was available for seven individuals, for a total of 23 samples from 17 individuals. Phosphate was chosen because it is generally better preserved than carbonate (McArthur and Herczeg 1990), and preservation in Mesoamerican soils is often poor, as at Cerro Portezuelo. Samples were analyzed using an adaptation of Firsching's (1961) volatilization method to isolate and precipitate silver orthophosphate (Ag_3PO_4) (Stuart-Williams and Schwarcz 1995), from which oxygen was extracted and converted to CO_2 using the techniques of Clayton and Mayeda (1963) and Crowson et al. (1991). An Optima dual-inlet, triple-collecting, gas-source stable isotope mass spectrometer was used to measure the oxygen-isotope ratios of the CO_2. Reproducibility of the procedure was better than +.3‰.

Crystallinity indices were measured as a test for postmortem alteration (diagenesis). The mean crystallinity indices (CI) were identical (2.8 + 0.1) for bone and enamel. No correlations were found between $\delta^{18}O_p$ values and the CI values of bone and enamel combined (Pearson's $r = 0.209$, $df = 15$). We, therefore, infer that recrystallization did not adversely affect the $\delta^{18}O_p$ values. A lack of correlation between $\delta^{18}O_p$ values and phosphate yield (Pearson's $r_{bone} = –.170$, n = 13; Pearson's $r_{enamel} = –.560$, n = 4) also indicates that one isotope was not preferentially recovered over the other during phosphate precipitation.

Evidence of Migration

The primary issue to be addressed with the oxygen-isotope analysis is whether the changes that occurred at Cerro Portezuelo after the collapse of Teotihuacan were a consequence of local processes, or the result of incursions of new people. The history of Cerro Portezuelo's relationship with Teotihuacan and other regional centers in the Basin of Mexico is outlined by Nichols (2013) and Clayton (2009) and is only briefly reviewed below to provide a general context for interpretation of the isotopic results. Cerro Portezuelo probably developed as a village during the Terminal Formative period. The Basin of Mexico was politically unified by Teotihuacan during the Classic period, but the economic relationships between Teotihuacan and its regional centers are yet to be clearly defined, as are economic relationships among the regional centers (Clayton 2009). After the decline of Teotihuacan, during the Epiclassic period, Cerro Portezuelo grew within a context of economic and political decentralization (Crider et al. 2007; Parsons 1971; Sanders et al. 1979). Whether or not its growth was the result of immigrants from Teotihuacan is debatable. During the following Early Postclassic period (A.D. 900–1150), Toltec influence originating in Tula, Hidalgo, just north of the Basin of Mexico, spread throughout the region, but again the economic and political relationships between the hegemonic Toltec state and the regional centers of the basin are unclear.

In order to interpret the residential experiences of the Cerro Portezuelo inhabitants, it is necessary to compare their isotopic compositions with those of other populations and regions that are possibly related. Figure 8 illustrates the results of analyses done on human enamel and bone from Teotihuacan and regions of Hidalgo, Guanajuato, and Michoacan, which can be used as baselines for comparison. The Teotihuacan baseline is drawn from the apartment compound of Tlajinga 33 as used in previous publications (White et al. 2004). The Hidalgo sample comes from the Epiclassic site of La Mesa, near Tula (Spence et al. 2006). The

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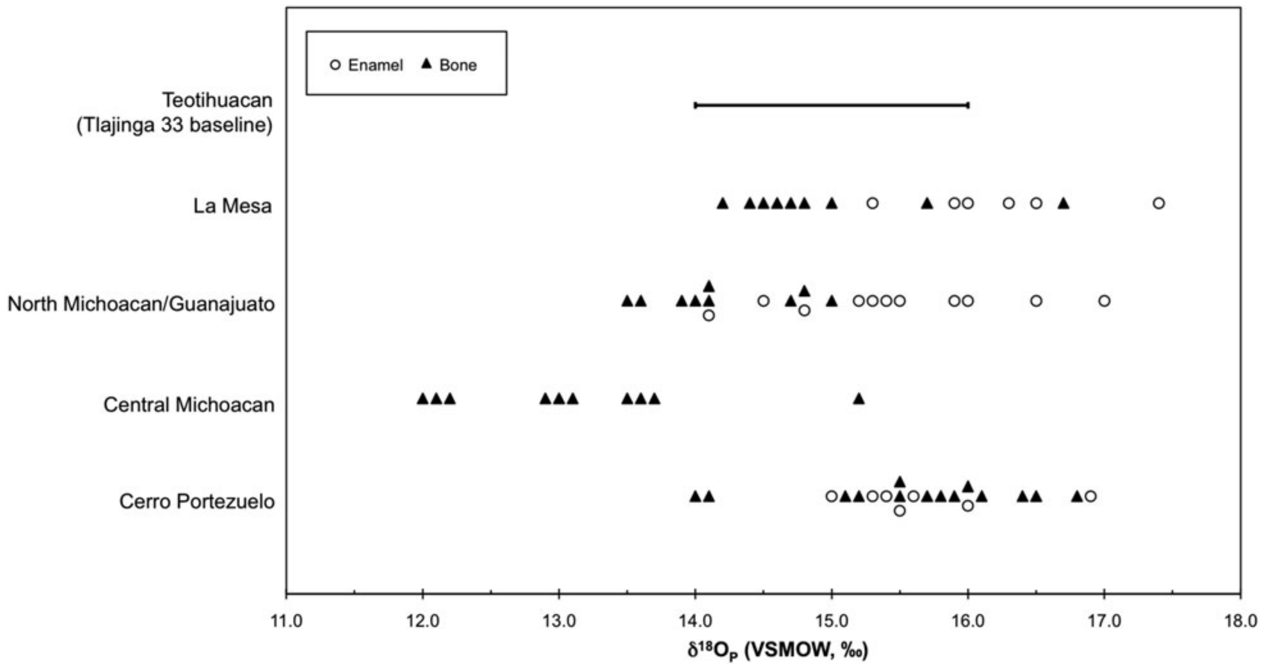

Figure 8. Oxygen-isotope values from selected sites and areas.

north Michoacan/Guanajuato sample comes from several locations and time periods including: the Formative site of Portales, the Middle Classic site of Guadalupe, the Epiclassic sites of Los Nogales and Guadalupe, the Early Postclassic site of Palacio, and the Middle/Late Postclassic sites of Milpillas and San Antonio Carupo. The central Michoacan sample is from the Lake Patzcuaro area but also comes from several locations and time periods including the Classic/Epiclassic and Late Postclassic components at the site of Urichu and the Late Postclassic sites of Tzintzuntzan, Tocuaro, Atoyac, and Teremendo. Although the data from some of these regions span more than one time period, there are no obvious temporal trends within the data sets. Intrasite variability is, however, created by the presence of some immigrants, as determined primarily by differences in the $\delta^{18}O_p$ values between enamel and bone (Figure 8). The most notable isotopic differentiation among these samples is found in the central Michoacan sites, which have lower $\delta^{18}O_p$ values and minimal overlap with the other regions.

The $\delta^{18}O_p$ ratios of most of the Cerro Portezuelo individuals are clustered between 15 and 16.5‰ with a mean of 15.6 $\pm$ 0.7 for all the values (Table 2). This range is shifted upward by 1‰ relative to the Teotihuacan range (White et al. 2004). There are two obvious outliers (T93-18:1 and T93-18:2), who have $\delta^{18}O_p$ bone values of 14 and 14.1‰, falling in the range of northern Michoacan-Guanajuato values (Figure 8). T93-18:1 is a middle-aged woman from Complex C who had a healed rib fracture and whose right leg was badly infected at the time of her death. She would have moved to Cerro Portezuelo as an adult and died there, possibly from the leg infection, before the re-equilibration of her bone isotope values. Her dental value, 15.4‰, could indicate her birth in Michoacan, the Tula region, or the Valley of Mexico. She could even have been a former resident of Cerro Portezuelo returning home. T93-18:2 is a child who had probably been placed as a secondary burial with T93-18:1. Given the close similarity of their bone values and the likelihood that they were in the same burial feature, this may well have been the burial of a mother and the child who had predeceased her. The child might have either died in the region of birth and then been carried to Cerro Portezuelo by the woman or died in Cerro Portezuelo shortly after arrival there.

Another individual (T29-1) from Complex D, whose permanent first molar (formed between the ages of birth and three years) has the highest value in the sample (16.9‰), appears to have spent his childhood elsewhere but must have lived at the site for 10 to 15 years prior to his death. If we treat the difference between the enamel and bone values as evidence for movement, this individual is probably also an immigrant. The perinate T35-x:1 (or rather the mother of T35-x:1) may also have come to the site from elsewhere. The bone value of 16.8‰ may indicate an origin in the same region as T29-1.

Because of the small sample size, it is not possible to identify any differences in residential behavior between men and women or among different age groups. However, the fact that both men (T29-1) and women (T93-18:1; T35-x:1's mother) moved to the site from afar, perhaps with children in tow (T93-18:2), suggests that what long-distance movement occurred was by families. William T. Sanders (2001) has suggested elsewhere that much of the mobility in Epiclassic and Early Postclassic central Mexico was in the form of individual families and small groups.

If we assume that the relative uniformity of the Cerro Portezuelo $\delta^{18}O_p$ values indicates a local range, this population does not seem to have been highly mobile, or at least it does not contain a number of people who were coming to the site from very different environments. If this is the case, then the residential behavior at Epiclassic/Early Postclassic Cerro Portezuelo is quite different from that observed in Classic period Teotihuacan where immigrants from quite different environments comprised one-quarter to one-third of a community previously assumed to have been stationary (Tlajinga 33) (White et al. 2004). The difference in pattern could simply be a matter of scale because men, women, and children

Table 2. Phosphate oxygen-isotope ratios for Cerro Portezuelo by burial, time period, sex, age, and tissue type*

Burial/Date #	Sex	Age (yrs)	Tooth $\delta^{18}O_p$ (‰)	CI	YLD[1] CO_2	YLD[2] Ag_3PO_4	Bone $\delta^{18}O_p$ (‰)	CI	YLD[1] CO_2	YLD[2] Ag_3PO_4
Classic/Epiclassic										
T93-18:1	F	40–44	15.4 (PM1)	2.8	4.9	1.4	**14.0**	2.7	4.9	1.4
T93-18:2	?	1–3					**14.1**	2.7	4.8	0.9
Epiclassic										
T24-1	?	4.5–6	15.5 (dM1)	2.8	5.6	1.4	16.1	2.6	5.0	1.1
Epiclassic/Early Postclassic										
T43-1	?	1–1.5					16.5	2.7	5.1	0.7
T27-1	?	10–11					15.5	2.8	4.8	1.4
T27-2	?	12–15	15.3 (PM1)	2.9	4.9	1.2				
T27-3	M	16–18					15.2	3.1	5.0	1.4
Early/Late Postclassic										
T29-1	M	25–40	**16.9** (pM1)	2.9	5.2	1.0	15.7	2.8	5.1	1.3
T29-2	F	45–65	15.6 (PM2)	2.9	5.3	1.5	15.1	2.7	5.1	1.2
T29-3:1	M	25–29					16.0	2.8	5.1	1.4
T29-3:2	?	Adult					15.8	2.8	5.0	1.4
T29-x:1	?	Adult					15.5	2.8	5.0	1.6
T35-x:1	?	Perinate					**16.8**	2.8	4.9	0.8
Unprovenienced										
U-1:1	?	13–15	16.0 (pM1)	2.9	5.1	1.2	16.4	2.9	5.0	1.5
U-1:2	?	Infant					15.1	2.6	5.5	0.9
U-2	?	12–14	15.0 (pM3)	2.7	5.1	1.2	15.8	2.7	4.8	1.4
U-3	?	1–1.5					15.9	2.7	5.0	0.5

*Bold = probable foreign values. CI = crystallinity index. Yld_1 in mol/mg Ag_3PO_4. Yld_2 in mg produced/mg starting material. dM1 = deciduous first molar, pM1/pM3 = permanent first/third molar, and PM1/PM2 = first/second premolar. The $\delta^{18}O_p$ values have been adjusted downward by 0.7‰ for pM1s and 0.35‰ for PMs to account for nursing effect. The dM1 would likely have formed mainly before nursing occurred. The pM3 would have formed after weaning.

from distant origins have also been identified at the Classic period Teotihuacan sites of Tlailotlacan and the Merchants' Barrio (White et al. 2004, 2010). It may just reflect the difference between a huge urban center with a broad territory and a smaller center in a politically fragmented landscape (see Crider et al. 2007).

Several other interpretations of residential behavior are, however, possible when these data are considered in the context of Teotihuacan and the groups of sites from Hidalgo, Michoacan, and Guanajuato. The lack of secure dating for the Cerro Portezuelo individuals is certainly a potential source of error for these interpretations. If there is a significant Epiclassic component in the series, it is possible that most of those individuals came from Teotihuacan during or after its collapse because during this time Cerro Portezuelo was expanding. The overlap in the ranges of oxygen-isotope composition for Teotihuacan and Cerro Portezuelo makes it difficult to identify any such migrants. Although it is possible that strontium isotopes might eventually help to clarify interpretation, better baselines will be needed because of the large range of values that exist among the major geological formations involved (Sierra Madre Occidental: .7030–.7140; Sierra Madre Oriental: .7040–.7100; Altiplano: .7030–.7040) (White et al. 2007).

If much of the sample is Early Postclassic, the possibility of a Toltec migration from Hidalgo must be considered. Many of the enamel $\delta^{18}O_p$ values from La Mesa are higher than those of bone, which suggests that this population contains a large number of immigrants (Spence et al. 2006). The bone samples from La Mesa have a mean $\delta^{18}O_p$ of 14.9‰ and a range of 14.2–16.7‰, which is similar to but somewhat higher than that of Teotihuacan. Unfortunately, the degree of overlap among Teotihuacan, Cerro Portezuelo, and the Tula area in $\delta^{18}O_p$ values—combined with insufficient numbers of bone-enamel pairs and problematic baselines—do not allow us to clearly reconstruct patterns of mobility for the majority of individuals in the Cerro Portezuelo sample. Although it is likely that they lived locally for most of their lives, the possibility that they were either Hidalgo Toltec or Basin of Mexico Teotihuacan colonists cannot be eliminated with the available isotope data. Additional analysis of strontium-isotope ratios might help to provide finer resolution on the residential histories of these individuals (see Manzanilla 2005:265–267).

DISCUSSION

Identity and Practice

None of the excavators of Cerro Portezuelo were osteologists, so their field comments on the age and sex of the burials cannot be taken as reliable identifications. At best, an adult-subadult dichotomy can be constructed from them (Hicks 2005). The subset of 19 individuals analyzed here has a more reliable demographic profile, but we are hampered in moving beyond the biological data and into questions of gender and identity by the lack of contextual information for most of them and by a strong suspicion that they are a biased selection of the site population.

Sex identification is possible for only five individuals, and only two of these have contextual data. T29-1, a male, was flexed on the right side, head to the west, while the contemporaneous T29-2 was flexed on her back (probably wrapped), head to the north (Table 3). Neither had grave goods. Without a larger sample of identified sex, it is impossible to say whether either treatment is gender related.

The lack of context also constrains what we can say about age categories. The only four individuals with grave goods were all

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Table 3. Cultural practices

Number	Grave Goods	Position	Orientation	Cranial Modification
T24-1	Jadeite and shell beads, ladle, miniature jar	Flexed on back	Head to S	Absent
T43-1	Shell beads and pendant	Seated	Facing N	Unknown
T27-1	Two sherds	Flexed on back	Head to W	Unknown
T27-2	Ladle censer, plate, two bowls	Flexed on L side	Head to N	Present
T27-3	Unknown			Absent
T29-1	Absent	Flexed on R side	Head to W	Absent
T29-2	Absent	Flexed on back	Head to N	Absent
U-2				Absent
U-3				Absent

subadults while the two adults for whom we have data had nothing (Table 3). Other data from the site show that adults often had grave goods and subadults often had none (Hicks 2005). One observation, though, may be more broadly applicable. The only individuals in the UCLA collection with beads, T24-1 and T43-1, are both young children. The only other occurrence of beads on the site was with Burial 17 in Trench 96, an Early Postclassic child with a necklace of small shell beads.

T29-2, an adult, was flexed on her back with her legs pulled back over her torso, but T24-1 and T27-1, both children, were also in that position, as were other adult and subadult burials on the site (Hicks 2005). The child of T43-1 was in the seated flexed position, but the adult of Trench 96, Burial 32 was also seated (Hicks 2005). There are no extended burials in the UCLA collection—at least among those for whom there is some documentation of position—but the larger Cerro Portezuelo series included two Early Postclassic extended adults in Trench 96, one with an offering of several ceramic items and the other with only a broken obsidian point (Hicks 2005). Extended burials, usually adults and often with extensive offerings, form a minority of the Early Postclassic burials in the Teotihuacan area and at Tula (Elson and Mowbray 2005; Gómez Serafín et al. 1994; Linné 2003:80). The position may have been reserved for those of high rank.

Although there are no examples of dental decoration in the UCLA collection, only two individuals (T29-1 and T29-2) are old enough and retain the appropriate teeth to show such modification. One individual (T27-2) has a post-coronal sulcus, a depressed band running across the parietals just posterior to the coronal suture. This feature is usually the result of the modification of cranial shape by the application of some sort of device (Tiesler Blos 1998: 145–146, 173). Six others, however, show no evidence of modification (Table 3). This is a rather low incidence for a Mesoamerican series (Spence and White 2009:234). There are also some field observations by the excavators of cranial modification, but, given the often subtle effects of cranial shaping and the haphazard nature of these comments, they cannot be converted into reliable frequencies.

Demography and Health

None of the children or adolescents for whom we have data suffered from dental caries or antemortem loss, and there is only one instance each of cribra orbitalia and porotic hyperostosis (Table 4). Of nine observable individuals, only three have hypoplasia defects, one with two lines and the others with one line each, all on permanent teeth. These indicate episodes of stress during the fourth and later years of life. While some of these episodes may reflect weaning difficulties, others (in T24-1 and U-2) seem too late for that.The demographic structure of the sample is unusual. There are two infants (birth–12 months), three young children (1–4 years), four older children (5–12 years), four adolescents (13–18 years), and six adults (19+ years). This places 8 of the 19 individuals, or 42%, in an age span (5–18 years) generally thought to have low mortality, past the problems associated with infancy and weaning but not yet encountering adult hazards like childbirth and warfare (Storey 1992:130–131, Table 5-5). This may reflect a bias in the mortuary system. For example, all 17 of the Trench 93 Epiclassic cemetery burials are adults (Hicks 2005), suggesting that children in that period were placed in a separate mortuary track, perhaps buried in or near their family residences. Most of the burials in the UCLA collection seem to have been buried in domestic—not public or cemetery—contexts. There has probably been a further bias in the selection of skeletons to send to UCLA. Most of the burials in large clusters (Trenches 93 and 96) and well-provisioned with grave goods were left in Mexico, while those with fewer or no grave offerings and from more isolated contexts were sent to the university. The UCLA series, then, is hardly a random sample of the Cerro Portezuelo population.

Table 4. Health

Number	Cribra Orbitalia	Porotic Hyperostosis	Caries	Antemortem Loss	Hypoplasia
T24-1	Unknown	Absent	Absent	Absent	UC-0.8, 6.05
T43-1	Present	Unknown	Absent	Absent	Unknown
T27-2	Unknown	Absent	Absent	Absent	Absent
T27-3	Unknown	Absent	Unknown	Absent	Unknown
T93-18:1	Unknown	Absent	Absent	Present (LM2 and M3)	Absent
T29-1	Absent	Present	Present (UM1 and M2, 1 anterior)	Absent	UI1-2.85, 3.48
T29-2	Absent	Unknown	Present (LM2)	Present (UM1 and M2)	Absent
U-1:1	Unknown	Absent	Absent	Unknown	Unknown
U-2	Absent	Absent	Absent	Absent	UM2-2.55
U-3	Absent	Absent	Absent	Absent	Unknown

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The only skeletal evidence of poor health among the adults is the severe but localized osteomyelitis of individual T93-18:1. However, all three of the adults for whom there are data had dental problems (Table 4). T93-18:1 had antemortem loss of two lower molars, T29-2 had antemortem loss of two upper molars and decay in a lower molar, and T29-1 had caries in two upper molars and in an unidentifiable anterior tooth. This contrasts with the absence of caries and antemortem loss in the subadults (including three adolescents), but dental pathology is progressive with age. Among the three adults the incidence of caries is 4/50 (8.0%), and antemortem loss is 4/55 (7.3%) for all teeth. With the exception of caries in an anterior tooth of individual T29-1, all of the dental problems are concentrated in the molars. Considering these alone, the frequencies are 3/14 (21.4%) for caries and 4/18 (22.2%) for antemortem loss. Although a sample of three adults is hardly adequate, these frequencies do not seem out of line with other maize-dependent Mesoamerican populations (Seidemann and McKillop 2007: Table 2; Whittington 1999:Table 8.2).

CONCLUSIONS

In the 1950s, physical anthropology did not really have a lot to offer Mesoamerican archaeologists beyond basic sex and age identification and some unsystematic observations of pathology, and even age identification methods were not that well developed (Spence and White 2009:233). For that matter, the archaeology of the 1950s was not focused on the sorts of topics that would have benefited from the input of a physical anthropologist. It comes as no surprise, then, that Brainerd and his team emphasized ceramics over bones. The skeletons that would have been of most interest to them, because of their association with offerings that often included fine ceramic vessels, were the Trench 93 and 96 burials. They were left in Mexico for further analyses that never materialized while most of the grave goods were brought back to UCLA. The skeletons that did go to UCLA were for the most part from smaller and more peripheral trenches that had less clear architectural contexts.

Nevertheless, some useful observations have been possible. Subadults show less dental pathology than one would expect given the cariogenic diet that at least the older children would have experienced, and which is evident in the adult dentitions. There are an unusual number of older children and adolescents in the collection, but their disproportionate presence is probably an artifact of differential mortuary practices, coupled with the biased selection of skeletons for curation at UCLA, rather than of an elevated mortality in that age set. The adults show the caries and antemortem loss typical of Mesoamerican populations with a maize-based subsistence system.

The overlap in oxygen-isotope compositions among the Tula area, the Valley of Teotihuacan, and the Cerro Portezuelo area make it difficult to detect any migrants moving about within that broader region. It is possible that a combination of oxygen-isotope and strontium-isotope analyses would eventually reveal movement at that level since each set of isotopes responds to different environmental factors, allowing us to triangulate the source area for a sample (Price et al. 2007; White et al. 2007).

The detection of migrants from more distant and environmentally distinct regions is somewhat easier, but there are only four possibilities at Cerro Portezuelo. T93-18:1, an adult woman, and T93-18:2, a child, have very similar $\delta^{18}O_p$ bone values (14 and 14.1‰ respectively) and may have come from Michoacan or Guanajuato not long before their deaths (Table 2; Figure 8). However, the T93-18:1 dental value (15.4‰) may indicate a childhood spent in the Basin of Mexico or, perhaps, a different part of Michoacan. Obsidian from Michoacan sources is common in Cerro Portezuelo (Glascock and Parry 2008), so some movement of people between the two regions would not be surprising. Unfortunately, without contextual information or a more specific date, we are limited in what we can say about these two individuals.

Individual T29-1 has a $\delta^{18}O_p$ bone value (15.7‰) appropriate for Cerro Portezuelo but a dental $\delta^{18}O_p$ value (16.9‰) that suggests his movement there sometime after a childhood passed elsewhere. That dental value is very similar to the bone value (16.8‰) of the T35-x:1 infant. This does not necessarily mean that they came from the same region, but it is certainly a possibility. The Tula region, as represented by the La Mesa bone values, is one possible source for these two individuals (Figure 8).

Much of what we have been describing in this article is an archaeology of the archaeology, and it has not been entirely successful. Had Brainerd lived, there would certainly have been much better continuity between field and laboratory, and we would have had more of the contextual data that are so sorely needed. A next step in the investigation of Cerro Portezuelo's osteology would be a search for the skeletons left in Mexico. If they have survived and their provenience data have been preserved, they would offer a much larger sample with more adequate contextual data. As part of their study, further oxygen-isotope analysis—perhaps coupled with the analysis of other environmentally sensitive isotopes (strontium, lead, sulfur, etc.) (Spence and White 2009:239)—is recommended.

RESUMEN

En los años 1954–1955 y 1957 los arqueólogos del proyecto de Cerro Portezuelo excavaron aproximadamente 70 entierros humanos pero actualmente hay restos de solamente 19 individuos en las colecciones de la Universidad de California, Los Ángeles (UCLA). Los otros entierros se quedaron en México, y su ubicación actual es desconocida. Además, faltan informes del campo, dibujos y fotografías de la mayoría de los entierros que aún tenemos, por lo cual no podemos determinar sus fechas o describir sus contextos. Estas dificultades limitan las conclusiones que podemos inferir de los datos osteológicos e isotópicos. Sin embargo, algunas interpretaciones son posibles. Los niños y adolescentes de Cerro Portezuelo no sufrían de problemas dentales como caries, aunque los adultos tenían una frecuencia de patología dental comparable a la de otras poblaciones mesoamericanas. Un análisis de los isótopos de oxígeno indica que no había mucha inmigración a Cerro Portezuelo de regiones lejanas. Desgraciadamente, sin datos sobre las fases de los entierros no es posible detectar cambios temporales en estos patrones.

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