

Skeletal Remains from San Clemente Island

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In this paper we describe human skeletal remains recovered on San Clemente Island in 1983 and 1984 during field work conducted by the University of California, Los Angeles. These skeletons provide important new information on the diet, activity patterns, and genetic affinities of the island's prehistoric inhabitants. Morphological differences between crania from Eel Point (SCLI-43) and Nursery (SCLI-1215) Sites indicate that two genetically distinct groups of people lived on the island. The Eel Point and Nursery burials also contrast in the incidence of auditory exostoses, dental caries, and traumatic injuries. These data suggest differences between the two populations in diet and patterns of interpersonal violence.

Chronology

Although most of the material considered here came from the Eel Point and Nursery Sites, scattered remains from sites at Knotts Pier, Mail Point, Xantusia Cave, and a small shelter near Eel Point are also discussed. A radiocarbon date of 5362 ± 80 BP has been obtained on a skeleton from Eel Point B, and obsidian from the cemetery of Eel Point C produced a hydration date of approximately 2000 BP. Although a radiocarbon date of nearly 8000 BP has been obtained from sea grass associated with a burial at the Nursery Site, its accuracy is in doubt due to possible contamination of the sample with ancient carbon from upwelling, which may have become incorporated into

the growing sea grass. This date is inconsistent with other evidence which indicates that the Nursery Site was occupied about 1500 YBP and it contains no cultural remains as old as 8000 YBP. Problems with these dates, as well as other dating determinations, are discussed by Goldberg et al. (2000).

There is little evidence for dating the remains from the other sites, with the exception of Xantusia Cave, where Burial 1 yielded a corrected radiocarbon date (on collagen) of 5770-5940 years BP, in conformity with other dating evidence placing the site at about 6000 years ago. Most of the skeletal material from the other sites was collected from the surface after site disturbances of various kinds and there are no associated artifacts which could be diagnostic of time.

Cranial Morphology

Measurements of recent California Indians and skeletal remains from archaeological sites indicate that at least three morphologically distinct groups of Indians lived in California during the late prehistoric period (Gifford 1926a, 1926b). People of the Yuki physical type were confined to the Mendocino County area of northern California. These Indians are short in stature, with narrow heads, broad noses, and low faces. A second widely distributed "California" physical type consists of people with high faces and broad heads. Areas occupied by Indians with this cranial morphology include the northern Channel

Islands and the adjacent mainland coast. A third narrow-headed, broad-nosed group called the “Western Mono” physical type occupied a much more restricted area that included the Monache territory in the Sierra Nevada near the headwaters of the San Joaquin River and the territory of the Gabrielino on the southern California mainland, including the Los Angeles basin and southern Channel Islands (all of the

“Western Mono” type occupied territory inhabited by Shoshonean speakers in historic times).

Marked contrasts in cranial morphology between the Nursery and Eel Point skeletal collections indicate that two different groups of people lived on San Clemente Island during the prehistoric period (Figs. 18.1 and 18.2). The Eel Point crania are short from front to



Fig. 18.1. Crania from Eel Point C (SCLI-43C) (left) and Nursery (SCLI-1215) (right) in profile.



Fig. 18.2. Crania from SCLI-43C (left) and SCLI-1215 (right), posterior views.

back and in this respect are morphologically very similar to those of the Chumash who lived on the northern Channel Islands during the Late Prehistoric Period. The Nursery Site skulls, in contrast, have the long, narrow cranial vaults of the Western Mono type. In this respect they differ markedly from those of the northern Channel Islanders.

Skeletal remains from sites on San Nicolas Island (north of San Clemente) show a similar mixture of cranial morphologies (Rootenberg 1960:117). Crania from SNI-15 and SNI-18 are long and narrow and similar to those from the Nursery Site. Crania from SNI-16 and SNI-56, in contrast, are short from front to back and resemble skeletal remains from Eel Point. A radiocarbon date of 3300 ± 100 YBP from SNI-16 indicates that this site was occupied much earlier than SNI-18, which has a radiocarbon date of 300 ± 60 YBP (Breschini et al 1984:34). These dates are consistent with the hypothesis that people of the Californian physical type were living on both the northern and southern Channel Islands during the Early Prehistoric Period and that later there was an intrusion of long-headed Uto-Aztecan (Shoshonean) speaking people of the Western Mono physical type into the southern Channel Islands.

Stature

Analysis of long bone dimensions indicates that the inhabitants of San Clemente were about the same stature as the Indians who lived on the northern Channel Islands. Measurements of San Clemente Island skeletal remains made by Earnest Hooton give an average stature of 157.2 cm for males, 152.6 cm for females, and a male/female height ratio of 1.03 (Gifford 1926a; Rogers 1977). The dimensions of skeletal remains from San Nicolas Island measured by Rogers (1977) indicate that the average stature on this island was 160.2 for males, and 152.6 for females, with the male/female height ratio being 1.05.

Non-metric Traits

Non-metric traits, such as the presence or absence of accessory foramina for the passage of blood vessels and sutural bones in the cranial vault, provide information on the genetic affinities of the San Clemente Island population as well as some of the environmental influences to which it was exposed. As with metric traits, such as the dimensions of the cranial vault, there is still considerable debate concerning the relative contribution made by genetic and environmental factors to the expression of specific discrete traits (Suchey 1975:30-36).

The small size of the San Clemente collection makes statistically valid comparisons with collections from the other Channel Islands impossible. The high incidence of auditory exostoses in the Eel Point burials and their absence in the Nursery Site burials is, nevertheless, worth comment (Fig. 18.3). The growths of bone in the ear canal are common among people who swim in cold water (DiBartolomeo 1979; Kennedy 1985). This difference between the two sites perhaps indicates that diving in cold water, during shellfish collecting or some other subsistence activity, was more common among the people who lived at Eel Point than it was for the inhabitants of the Nursery Site.

Demography

Age and sex determinations were made using standard osteological criteria (see Krogman 1962; Acsádi and Nemeskéri 1970; Bass 1971). Eleven of the 33 recorded burials were infants under six months of age at the time of death, two were young adults (15-20 years old), and the remaining 20 burials were mature adults.

Problems of differential preservation and deposition make extrapolation of demographic characteristics from these mortality statistics difficult. In archaeologi-



Fig. 18.3. Traumatic injuries and auditory exostoses on burials from Eel Point C (SCLI-43C).

cal sites where conditions are unfavorable for the preservation of bone, the incompletely calcified skeletons of infants and children disintegrate much more rapidly than those of adults. As a result, the remains of these immature individuals tend to be under-represented in skeletal collections (Walker and Sneathkamp 1984:61; Walker and Johnson n.d.). Since the preservation of our skeletal sample is quite good, however, differential preservation of this kind has probably not greatly biased the collection.

The practice of burying men, women, and children in different areas of a cemetery is another possible source of sample bias. The Indians who lived on Santa Rosa Island, for example, are said to have used separate burial plots for men and women (Heizer 1955). Because the San Clemente Island excavations involved only small portions of each cemetery (with the exception of Eel Point C where all of one cemetery area was excavated), the separation of graves by sex and age could have significantly distorted the demo-

graphic characteristics of our sample. This problem is exacerbated by the custom of burying individuals in isolated graves not part of any cemetery area; something observed in several of our sites.

Taken at face value, the skeletal data indicate that about 32 percent of the individuals in the San Clemente Island population died before reaching adulthood. Although high, an infant and juvenile mortality rate of this kind is not unusual for hunters and gatherers. Acsádi and Nemeskéri (1970), for instance, found that about 38 per cent of the Neanderthal and Upper Paleolithic skeletons studied by Vallois came from individuals who were under 11 years old at the time of death.

All the primary inhumations in the Eel Point C cemetery were males. Because of the small number of individuals involved, it is unclear whether this is a sampling error or a result of the intentional burial of males in one area. The latter is more likely since the margins of the burial area were extensively dug in 1984 without encountering additional human remains. The inclusion of paraphernalia associated with shamans in the graves of these men suggests the possibility that this area was reserved for religious leaders of high status (see Hardy 2000).

Dental Pathology

In the Santa Barbara Channel area, rates of dental wear decreased significantly through time (Walker 1978). It seems likely that this decrease was the result of a shift from a diet that included large quantities of gritty, pit-roasted roots and tubers to one mainly composed of fish (Walker and Erlandson 1984; Walker and DeNiro 1986. See also Goldberg 1993b).

The number of burials from the Eel Point and Nursery cemeteries is too small to determine whether they show a statistically significant difference in dental attrition rates. The burials from both sites have heavily

worn teeth with exposed pulp cavities, indicative of high rates of dental wear. From this it appears that both groups consumed heavily grit-laden food.

Exposure of pulp chambers through rapid attrition contributed to a high incidence of periapical abscesses and pre-mortem tooth loss in both the Eel Point and Nursery populations. These dental infections were a significant health problem. Burial 2 from Eel Point, for example, has an abscess in the bone surrounding the second molar that has perforated the maxillary sinus. Infections of this kind can be disabling and may even lead to death.

Dental caries are present in the dentitions of the Nursery Site burials but not in those from Eel Point. Since high dental caries rates are generally associated with carbohydrate-rich diets, this suggests a possible dietary difference between the people who lived at the two sites. On the northern Channel Islands, high dental caries rates are found among the early islanders whose diets appear to have contained large quantities of carbohydrate-rich plant foods. The late prehistoric inhabitants of the northern Channel Islands, in contrast, had low caries rates. This seems to be explained by a high protein, fluoride-rich diet of fish and marine animals (Walker and Erlandson 1984). This implication for the San Clemente material is that the people who lived at Eel Point consumed more marine resources than those who lived at the Nursery Site. This hypothesis could easily be tested through analysis of stable-isotope ratios in collagen samples from the Eel Point and Nursery Site burials (Walker and DeNiro 1986).

A hypoplastic area indicative of disrupted dental development is present near the cemento-enamel junction on one tooth of Burial 5a at Eel Point. The location of the lesion shows that this person suffered some kind of acute stress that disrupted normal development.

Traumatic Injuries

These skeletons exhibit a remarkable number of traumatic injuries for such a small collection. Several of the Eel Point burials have healed cranial vault fractures that appear from their size, shape, and location to have been made by a blunt weapon such as a club. Burial 5b has a depressed fracture of the right parietal. Burial 2 from Eel Point has depressed fractures of both temporal bones (Fig. 18.4), and Burial 3 has a fracture of the left nasal bone. Burial 2 also has several healed rib fractures. A radius, ulna, and coccyx from Burial 5a have healed fractures. Traumatic injuries are also evident at the Nursery Site. Two burials had poorly healed fractures.

The early prehistoric period inhabitants of the northern Channel Islands had a high incidence of depressed cranial vault fractures like those found in the Eel Point

material. During the Late Prehistoric Period, the incidence of cranial trauma decreased significantly on the northern Channel Islands. It seems likely that this decrease reflects the suppression of intervillage warfare to facilitate trade, as well as changes in warfare technology associated with the introduction of the bow and arrow (Walker 1981). It may be significant in this regard that no cranial vault injuries are present in the Nursery Site burials. This is consistent with the hypothesis that these are the remains of Uto-Aztecs who colonized the southern Channel Islands late in the prehistoric period, after the development of new patterns of warfare associated with the use of the bow and arrow.

The post-cranial fractures evident in the Eel Point and Nursery Site burials could have been sustained during warfare or some other kind of interpersonal violence. They could just as easily be from accidental falls



Fig. 18.4. Cranial injury, Burial 2 (depressed fracture of temporal bone).

suffered while climbing on the island's rugged and precipitous coastal terrain.

Osteoarthritis

Osteoarthritis develops in response to wear and tear sustained by the joints during everyday activities. Its distribution in the skeleton can thus be used to make inferences about a person's habitual patterns of physical activity. Osteoarthritis is quite common in the San Clemente Island material. These people evidently led an active life of strenuous physical activity. The distribution of osteoarthritis in Burial 3 suggests that paddling canoes was one of these activities (Figure 18.5). This individual has moderate to severe arthritic lipping on the articular surfaces of the shoulders, elbows, and wrists the areas stressed during the forceful flexion, extension, and rotation of the arms during paddling (Merbs 1983:151).

Burial Practices

The San Clemente islanders disposed of their dead both through primary inhumation and the secondary inhumation of cremated remains. They also disturbed and reburied earlier interments during grave digging.

Examples of primary disposal in which more or less intact bodies were buried in the ground include the Nursery Site burials and Burials 2, 3, and 5b at Eel Point. These burials are flexed or semiflexed with the arms folded on the chest. The entire skeleton of Eel Point Burial 3 was in a proper anatomical position with the exception of the cranium and cervical vertebrae, which were displaced downward onto the chest. One possible explanation is that this cranium was displaced when an adjacent grave was excavated. Disturbance during the excavation of adjacent graves may also account for the condition of Burials 2, 4, and 5a at Eel Point. Burials 2 and 4 are semi-disarticulated with skulls displaced from their anatomically correct position. Burial 5a is more heavily disturbed and

consists of the remains of several commingled individuals.

Damage probably caused by the gnawing of a dog or fox is present on the scapula and one of the vertebrae of Burial 2. This suggests that the body was exposed above ground for some time or that it was in a shallow grave accessible to carnivores.

Burial 7 from Eel Point consists of the cremated remains of a young adult between 15 and 20 years old. Although this person appears to be a female, based on the robusticity of the mandible and long bones, the remains are too fragmentary to determine sex with certainty. The cremation consists of small pieces of bone from skull, pelvis, hands, feet, vertebral column, scapula, and long bones. Most of the bones have a uniform black color indicating incineration in a "green" or defleshed state at temperatures below 800° C (Baby 1954; Buikstra and Swegle n.d.). The first and second cervical vertebrae were still articulated in their proper anatomical position at the time of excavation, showing that portions of the skeleton were still held together by ligaments at the time of cremation.

Some of the bones are less heavily burned than others. The ribs and one of the manual phalanges are tan in color, suggesting comparatively little exposure to fire. The fact that the thoracic vertebrae that articulate with the ribs were heavily burned again suggests incineration in a partly disarticulated state. Several fragments of unworked burned bird bone were found with the human remains. Although they may have been intentionally burned along with the body, it is also possible that they are food refuse from the midden surrounding the burial and are inadvertent associations.

Disposal of the dead through cremation rather than burial distinguished the Shoshonean-speaking Gabrielino on the mainland adjacent to the southern islands from the Hokan-speaking Chumash of the



Fig. 18.5. Bones illustrating osteoarthritis of the elbow.

northern Channel Islands and adjacent mainland (Kroeber 1925:824). Although the Indians who lived on San Clemente and the other southern islands during the late prehistoric period are generally believed to be more closely related (biologically and culturally) to the Gabrielino than to the Chumash, the islanders generally buried their dead instead of cremating them. One possible explanation for this inconsistency is that there is virtually no firewood on the island, making it difficult to maintain the ritual of cremation.

At SCLI-121, McKusick and Warren (1959) found cremated human remains above an unburned interment. This stratigraphic relationship supports the idea that inhumation was practiced by the early islanders and that cremation was a later innovation. The limited burial evidence from the historic sites of Ledge and Old Air Field, however, includes only inhumations and no cremations.

Conclusions

Differences in cranial morphology between the Eel Point and Nursery burials indicate that the people who

lived at these sites belonged to two genetically distinct populations. The skeletal remains also provide evidence of differences between the two groups in dietary emphasis. The high incidence of auditory exostoses in the Eel Point burials and their absence in the Nursery burials suggest that the people who lived at Eel Point obtained more of their subsistence through diving in cold water than the Nursery inhabitants. A subsistence difference is also suggested by the prevalence of dental caries in the Nursery Site burials and their absence in the Eel Point collection. This evidence supports the hypothesis that the Nursery Site population had a high-carbohydrate diet composed mainly of terrestrial resources while the Eel Point population had a diet containing a larger proportion of fish and other high-protein resources. Depressed cranial vaults are common at Eel Point and absent at the Nursery Site. This suggests a possible contrast between the two groups in patterns of warfare or interpersonal violence. To adequately test these hypotheses, it will be necessary to obtain a larger sample of skeletal remains from each site.