

Preliminary Report on the Human Skeletal Remains from
the Gognga-Gun Beach Project, Tumon Bay, Guam.

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ABSTRACT

This paper reflects work in progress on the preliminary analysis of a large sample of human skeletal remains from the prehistoric Chamorro site at Gognga-Gun Beach on Tumon Bay, Guam. Of the approximately one-hundred discrete burial pits that were recognized in the field, many have yielded multiple inhumations. Combined with the additional human remains excavated from an area within and around a set of Latte stones, the total number of individuals recovered may reach one-hundred fifty. While a minimal number of these skeletons are essentially complete and in a good state of preservation, most of the remains are poorly preserved. However, many individuals have been reconstructed to a suitable state of study. Completeness of each skeleton varies greatly, with vertebral bodies and the articular ends of long bones being common sites of poor preservation. Early data suggested that adult males were drastically under represented, with females of all ages and immature individuals comprising the vast majority of the processed remains. Adult males were eventually found in greater numbers, but remain outnumbered by adult females on the order of 2:1. Given the great degree of sexual dimorphism, these initial assessments of gender appear sound. Preliminary analysis shows that ages range from late foetal development to well over forty years. Estimation of stature in adults (based on Houghton, et al., 1975) has yielded a range of about 152 to 162 cm. (60 to 64 inches) in females, and a range of approximately 173 to 178 cm. (68 to 70 inches) in males. Various pathological and anomalous conditions of both the dentition and skeleton are present in this collection, and are described.

INTRODUCTION

The purpose of this paper is to report on the findings from the preliminary analysis of the human skeletal material from Gognga-Gun Beach, Tumon Bay, Guam. This prehistoric Chamorro site, which is dated at about A.D. 950 to A.D. 1450, possessed over 100 discrete burial pits, many of which contained multiple individuals. In addition, an area within and around a set of Latte stones yielded many other skeletal remains, thus bringing the total number of individuals represented to perhaps one hundred fifty. Because the analysis has yet to be finished, this number can only serve as an estimate. It should be noted that this report is based on laboratory work performed between February and December, 1990, and thus contains more information than did the oral presentation delivered in Kyoto during the Symposium in September of 1990.

Although the numbers of individuals represented at this site may be high, the state of preservation and completeness are generally poor. The poor quality of preservation is exemplified by the tendency for any skeletal element that consists of high amounts of cancellous bone, in the presence of a thin cortical component, to be totally (or at least partially) deteriorated. Thus, vertebral bodies, ilia, and the articular ends of long bones are many times absent. Infant remains, by virtue of having smaller sites of cancellous bone, are generally well preserved. As for the variable state of completeness of these skeletons, more than simple deterioration appears to be responsible. As mentioned above, many of the burial pits contained more than one individual, with intrusionary additions being frequent. It apparently was a cultural practice to add corpses to existing graves, although there is no doubt that some of

these intrusions were accidental. Thus, a portion of the missing bone can be accounted for as being a result of disturbances to existing skeletal material when intrusionary corpses were added. There is also the possibility that certain skeletal elements were deliberately removed for use in either tool making (long bones) or ceremonial activities (skulls).

DEMOGRAPHICS

In all but the most fragmentary of remains, extensive reconstruction has been performed to maximize the potential for thorough skeletal analysis. Of the 65 or so burial pits that had been analyzed prior to completion of this report, approximately ninety-five individuals are recognized. Of this number, thirty-three are under the age of 15 years, thirty-one are adult females, and about fifteen are adult males. Of the immature remains, the following age cohorts are constructed: five individuals are aged at about 9 foetal months, fourteen are between 3 months and 2 years, eight are between 2 years and 6 years, and six have been aged between 6 and 15 years. Most of the adults are aged in the third, fourth, and fifth decade, although given the fragmentary nature of these remains, not all skeletal indicators of age were always available. Thus, a few individuals may be much older, especially in light of some possessing advanced degrees of osteoporosis. The remaining 15 or so individuals are too fragmentary to ascertain much beyond gross age estimates.

Few of these individuals are complete, and many consist of a minimal number of skeletal elements. Great variability exists in what regions of the skeleton may actually be represented. Although few innominates are preserved to the extent of making sex assessment straightforward, the marked degree of sexual dimorphism in adults enables one to be rather confident in the assessment of gender. This is exemplified in the robustness of adult male long bones and clavicles, although it should be stated that many adult females exhibit lower limb bones that are anything but gracile. Another area of the skeleton that appears to be a reliable indicator of sex is the external surface of the occipital, with adult males possessing marked sites of muscle attachment. Thus, the above contention that adult females outnumber adult males two to one at this point appears sound. It was reported in the oral version of this paper that adult males were vastly under represented in the first fifty or so individuals to be analyzed. However, this was apparently due to sampling phenomena and not an indication that adult males were lacking. A cursory examination of the remaining skeletal material indicates that adult males are present, but probably at the same 1:2 ratio to adult females.

Estimation of stature has been performed on thirteen adult females and six adult males. Utilizing Houghton, *et. al.*, (1975), the females exhibit a range of 152 to 162 cm. (60 to 64 inches), with all but a single individual being either 63 or 64 inches in height. All six males were significantly taller than any of the thirteen adult females, with the range being between 173 to 178 cm. (68 to 70 inches). The majority of these stature estimations are based on long bones of the upper limb, which is due to upper limb bones (particularly antebrachial) being more likely to be complete than those bones of the lower limb. In any event, this fact should be considered in determining the reliability of these estimations. In addition, the use of Houghton's formulae may also be questioned given that they were derived from New Zealand Polynesians, and not Micronesians, of which Chamorros are members. However, it is noted

that no differences in the estimation of stature for the adult males are experienced in utilizing either Houghton *et. al.* or Trotter and Glessner's (1958) upper arm formulae for Mongoloids.

SKELETAL VARIANTS

The single most striking skeletal variant present in this series are what may be referred to as "peri-asterionic tubercles". These can occur slightly anterior to asterion and incorporate both the temporal and parietal bones. The tubercle is full blown in at least two specimens in the collection, with three others exhibiting "swellings" in this parietal notch area of the cranial vault. Bilateral expression occurs on all specimens which have both left and right portions of the cranium, with one specimen consisting of a single side only. However, I have seen this anomaly as a unilateral trait in a specimen from the Bishop Museum's Hornbostel Collection, another Tumon Bay skeletal series. The meaning of these tubercles is unclear at the present, although several different hypotheses are currently under consideration. It does appear that the tubercles and the slight to moderate swelling of the already thickened parietal notch area are simply different manifestations of the same etiology, perhaps better thought of as grades of expression. It should be said that these tubercles do not appear to be the result of enthesal hypertrophy, as do other tubercles that are present on the occiput and which are not uncommon to prehistoric Chamorros. Suffice it to say that these peri-asterionic tubercles are different and may provide a means of comparison between other populations.

The only other skeletal variants that I wish to mention are supra-clavicular foramina and spondylolysis. These foramina of the clavicle, which apparently transmit the supra-clavicular nerves, appear in no less than 10% of this skeletal series. This frequency is higher than what appears in many other populations, and is of further interest given that a rather high frequency has been reported by Collins (in Han, *et. al.*, 1986) on prehistoric Polynesians from Hawaii. Data from the Gognga-Gun Beach collection demonstrates that the largest clavicles tend not to exhibit these foramina, and that a child aged at about two years shows a bilateral condition. As for spondylolytic lumbar vertebrae, perhaps 15% of the population possesses this trait. Because of the fragmentary nature of the vertebrae, the assessment of which particular lumbar exhibits this condition is not always possible. However, in all cases in which the posterior part of the neural arch is present, L-5 appears to be the vertebra involved. Notable is that some burial pits that contained multiple inhumations (*e. g.*, S-40) yield this trait in more than one individual in the pit.

PATHOLOGICAL CONDITIONS

Several individuals in this series possess lesions that are characteristic of Treponemal infections, with Yaws being the most likely diagnosis. Sites such as the tibiae, fibulae, radii, ulnae, and manual phalanges are present. Femora and humeri have not been observed to exhibit these lesions. No cranial involvement has been observed, although cranial remains (*i.e.*, the frontal bone) are not always present with the affected long bones. One of the individuals who exhibited lesions such as described was a young female, aged in the early teens. These lesions

appear to be less remodeled than do the lesions on individuals who are much older, suggesting that the lesion itself may be indicative of the length of chronicity. Other skeletal pathologies are present as well, but will not be treated here.

Some mention must be given to the dental pathologies that are present. Principal among these is periodontal disease, which has affected many adult mouths and is a major reason for the alveolar resorption that characterizes these individuals. The shallow sockets of their anterior teeth attest to this. Missing anterior teeth, with fully resorbed sockets, is common and may in fact be partially due to cultural activities that traumatize these teeth and not simply due to periodontal disease. However, the propensity of these ancient inhabitants of Guam to chew Betel nut undoubtedly aided in the accumulation of dental calculus which could then trigger alveolar resorption. The occurrence of a severe case of hyper-cementosis in one individual may have been in response to the alveolar resorption that was present. Dental caries occur in low frequencies in adults, although many adults exhibit a great degree of dental attrition, thus potentially removing any occlusal caries that may have been present. At least one child (aged at about 6 years) possessed an extreme case of caries, which affected nearly all of the the maxillary anterior deciduous dentition.

Two additional dental observations, although not pathological, merit discussion. The first is a pronounced case of linear enamel hypoplasia on a maxillary central incisor of a child aged at 11 to 13 years. The degree of grooving in this tooth is marked to the extent that it may, at first blush, be mistaken for an incidence of mutilation. The second observation to be discussed is an actual case of dental mutilation. The teeth involved are best described as being "sculpted", with the facial surfaces of the maxillary first molars, premolars (the left second is not recovered), left canine (the right canine is not recovered), and the incisors all exhibiting some degree of abrasion. The anterior dentition is affected the most severely, with dentin being exposed on the incisors and canine. None of the eight recovered mandibular teeth show any sign of this modification.

DISPOSITION OF THE SKELETAL REMAINS

All of the human skeletal remains recovered at the Gognga-Gun Beach are to be reburied in the summer of 1991. Thus, much research lies ahead. Skeletal analyses have already been completed by Professor Kazuro Hanihara, Dr. Takao Suzuki, and Dr. Hiroko Koike. Additional research projects by Dr. Gary Heathcote and the author will be implemented in the spring and summer of 1991.

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グアム島ゴンガ＝ガン・ビーチ遺跡出土の人骨に関する予備的研究

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この論文はグアム島、タモン湾のゴンガ＝ガン・ビーチ遺跡から出土した大量の先史時代チャモロ族人骨に関する予備的研究の報告である。この遺跡では約100基の墓墳が発見され、その多くには複数の遺体が埋葬されていた。ラッテ・ストーンで囲まれた場所の内外で発見された人骨を含めると、総個体数は150に近くなる。ほぼ完全で保存の良好な個体はきわめて少なく、保存状態の悪いものが多いが、研究可能な状態にまで復元できた例も少なくない。骨の残存状態は個体によって異なり、とくに脊椎骨骨体と長骨骨端は保存の悪い部分である。現在のところ成人男性は少なく、各年齢層の女性および幼児が圧倒的多数を占めている。全体としてみると成人男性骨と成人女性骨の割合は1:2となる。骨の性差が著しいため、この推定に大きな誤りはないと思われる。予備研究の範囲では、年齢分布は胎生後期から40歳以上に及ぶ。成人の身長推定値 (Houghton et al., 1975による) は女性で152.16m、男性で173~178cmである。歯および骨に病理的ならびに先天性異常が多く存在し、それらについて報告する。

(Translated by K. Hanihara)