

Bioarchaeology in Guam: Current Trends and Conditions

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Abstract—In the coming years, increasing government and private construction projects will result in more opportunities for archaeological projects than in the past. Currently, human skeletal elements from archaeological sites are reburied or left in place to comply with Executive Orders 89-24 and 89-9, and therefore our time to collect data is necessarily short. With this in mind, it is important to determine what information collected from human skeletal remains will benefit future question-oriented bioarchaeological research. An informed decision on what data to prioritize requires knowledge of past studies of Guam and a vision of how bioarchaeology can benefit our understanding of Guam's past. In this study, I compiled publications employing methods from bioarchaeology and physical anthropology and analyzed thematic trends pertaining to Guam's past. Based on the results, I then suggest several potential avenues for future bioarchaeological studies and explore the plausibility of a database that would include Chamorro mortuary and skeletal information.

Introduction

Excavations of *latte* sets almost always result in the discovery of associated burials (Graves 1986). Human burials are therefore a common concern for excavators in Guam. Current protocol in Guam calls for a reburial of the remains giving researchers a limited time in which to collect data. It is therefore important to collect data in a flexible manner that allows future researchers to use the burial in their analyses without ever directly examining the remains. An understanding of what research has been done and what could be done in the future can lead to more informed decisions on how skeletal and mortuary data is collected and recorded. In this literature review, trends in the bioarchaeological literature of Guam are examined by decade to discern productive new avenues for research.

Materials and Methods

One hundred and seventeen publications were included in the following literature review. The majority of the sources are from on-line searches and bibliographies, but sources from the University of Guam's Micronesian Area

Research Center (MARC) as well as Guam's State Historic Preservation Office (SHPO) are also included. Studies of populations from a broader geographic region than Guam were considered outside the scope of this study. At SHPO, Guamanian site reports from 1990–1991 and 2003–2007 were reviewed to record the number of site reports with data on excavated skeletal remains.

Time would not allow for a systematic study of site reports published in a broader time span. Instead, site reports from other years were included if found in bibliographies of other publications. This indirect method runs the risk of omitting relevant site reports that are not commonly cited. In an attempt to correct for this potential error, bibliographies of collected sources were examined until only previously recorded site reports were being found in every bibliography. With this method, the survey may not include all site reports with osteological information, but those that have been the most relevant to studies of the ancient Chamorro. Most site reports were from the 1990s (57%) which may be a product of this sampling method. Alternatively, the trend could reflect the overall increase in publication during the 1990s and the likelihood that researchers will use data from recent site reports.

The publications were surveyed and assigned to one of eleven categories in which they best fit (Table 1). Categories were constructed after most articles had been collected and I had an understanding of general patterns within the literature. The category of site reports with skeletal analysis is removed from consideration at times due to its large size when compared to other categories.

Results

The history of examining skeletal remains from Guam begins in 1924 with Hornbostel's unpublished notes and catalogs (Hornbostel 1924–25). These notes were later published by Laura Thompson (1932) in *Archaeology of the Mariana Islands*, and the Hornbostel skeletal collection continued to be studied by various researchers. The first major study on the dentition in the collection was published in by Leigh (1929). In the decades to follow, a low number of publications appear each decade leading to a gradual increase in the seventies and eighties before a major increase in the nineties when about 57% of the publications are published (Table 2). Two events in Chamorro research occurred that are mostly responsible for this spike. First, the Micronesian Archaeology Conference in 1987 held a session on physical anthropology encouraging publication (Pietrusewsky 1990). Then, in 1995, the American Association of Physical Anthropologists Conference in Oakland hosted a symposium on bioarchaeology in the Mariana Islands resulting in a 1997 *American Journal of Physical Anthropology* issue dedicated to the Mariana Islands (Vol. 104, Issue 3).

Not unexpectedly, descriptive skeletal analysis in site reports is by far the most common type of publication throughout the years (Figure 1). In fact, 52% of the publications are site reports. The second most common type of publication concerns paleopathology composing 16% of the publications (34% of publica-

Table 1. Publication categories and basic definitions.

Category	Description of Category
Paleopathology	A study of ancient disease and health
Social Complexity/Organization	Tests hypotheses on social structure and relationships between people and groups using the mortuary context
Line of Evidence	Skeletal/mortuary analysis used in conjunction with other lines of evidence from archaeology, ethnohistory, etc. to test a hypothesis
Literature Review	Reviews literature on the physical anthropology of bioarchaeology in Guam
Biodistance	A study of the genetic distance between or within human populations
Diet	A study of what people were eating and differences in diet between individuals
Paleodemographics	A study of population composition
Musculoskeletal Markers (MSM)	Impressions on bones from compensating for the overall size of muscles
Catalog	Lists and describes skeletal remains available to study
Osteobiography	Overview of life and death of one individual from skeletal remains
Site Reports	Archaeological site reports that include skeletal analysis

Table 2. Number of publications per decade.

Type of publications	1920s	30s	40s	50s	60s	70s	80s	90s	2000s	Total
Including Site Reports	2	2	0	2	2	6	23	67	13	117
Excluding Site Reports	1	2	0	2	2	3	8	33	6	57

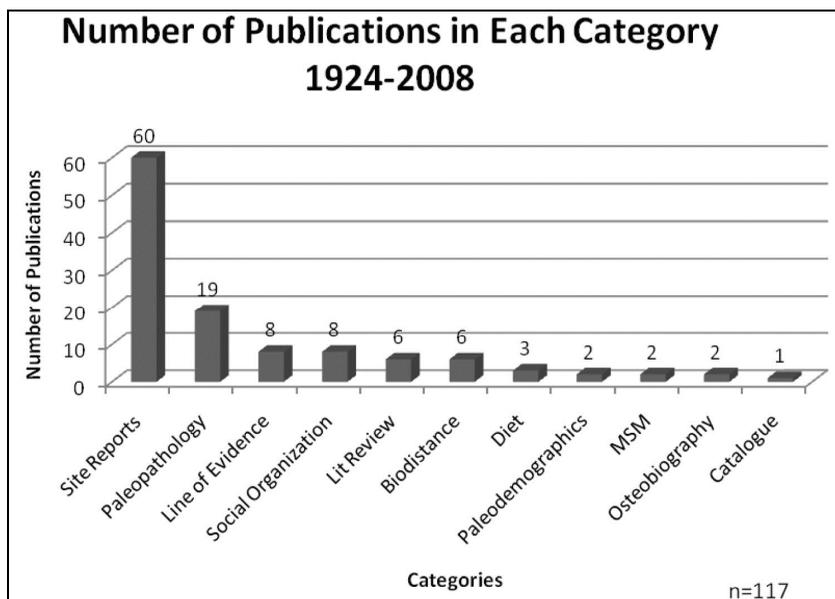


Figure 1. Number of publications in each category, 1924–2008. Publications are, for the most part, evenly distributed excepting for the higher number of publications in the “Site Reports” and “Paleopathology” categories.

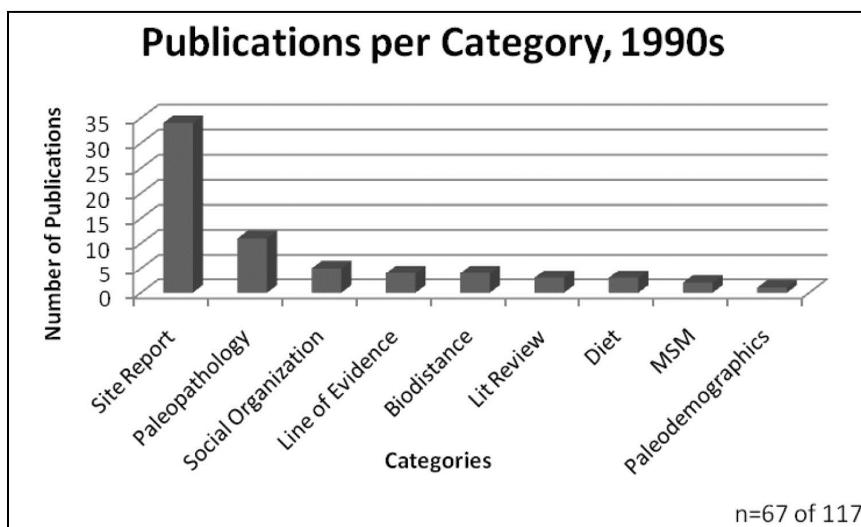


Figure 2. Publications per category during 1990s. Publications from the 1990s are distributed in categories in a pattern very similar to the distribution of publications in categories over the 84 year time period (1924–2008).

tions excluding site reports). Publications are more evenly distributed between categories otherwise. Subject matter did not change significantly during the increase in publications of the 1990s (Figure 2). Still, several categories are only found during this decade (Diet, Musculoskeletal Markers) and over half of the publications in some categories are from the 1990s (Biodistance, Social Organization).

Conclusions

Sampling methods for this survey favor the collection of well cited sources which allows for the analysis of general trends in the bioarchaeology of Guam. A more detailed survey may reveal sources that are often neglected but potentially beneficial to the study of the ancient Chamorro. Future reviews after the increase in government and private construction projects could document how these current cultural changes might increase the number of data sets available as well as shift the focus of research.

Publication types most common in the 1990s suggest a movement toward research beyond the description of skeletal remains and the first level of analysis (sex, age, etc.). Still, future studies of skeletal remains that consider cultural context on a regional scale would greatly further bioarchaeology's contribution to the study of the ancient Chamorro. A dearth in bioarchaeological research exploring temporal variation limits our understanding of the longevity of cultural phenomena and also places an undue emphasis on how Chamorro society operated when Europeans first made contact by relying on ethnohistoric texts to interpret ancient practices. Studies of variation in skeletal and mortuary data between different archaeological sites on Guam will improve our understanding of relationships and continuity throughout the island. No single site was isolated during occupation, and therefore studies of single sites may overlook major patterns by ignoring surrounding sites. Additionally, by performing skeletal analyses and considering mortuary context, one is able to address prehistory on an individual level. Therefore, bioarchaeology is well suited to address issues of identity. The potential for understanding how individuals operated within ancient Chamorro society using bioarchaeological data is under-studied and warrants further analysis.

In order to consider these approaches in the future, a database of ancient Chamorro skeletal remains and their local and regional mortuary contexts would be crucial. Before embarking on such a project, one must consider if enough information has been recorded in reports of the excavation of skeletal remains for the project to be both plausible and sufficiently useful. In two days of reading through site reports at Guam's State Historic Preservation Office, two people were able to read through seven years of reports and found 50 burials to catalog

in a database prototype. The level of description available varied from reports that only mention a burial to reports that recorded a wide variety of characteristics including skeletal and mortuary data. This suggests that constructing a database would be both plausible and beneficial to our field.

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