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ABSTRACTS FROM THESES.DEPARTMENT OF ANTHROPOLOGY, UNIVERSITY OF OTAGO, 1987-88

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1987

Brian A. Vincent, The Prehistoric Ceramics of Northeast Thailand, with special reference to Ban Na Di. Ph.D. Thesis, 2 page abstract, ix, 314 pp., 110 figures, 48 tables, 3 appendices.

This thesis considers the prehistory of Northeast Thailand through a technological analysis of ceramics and potting clays. The material composition and forms of wares are used to explore cultural relationships and temporal changes. Petrological and geological data are used to characterise potting clays and a wide variety of ceramic fabrics. This information allows sources to be suggested for prehistoric wares, where appropriate. Mortuary, occupation wares, and other ceramic artefacts from Ban Na Di are detailed and compared with an extensive corpus of ceramics from both within and beyond the Khorat Plateau.

Earlier Southeast Asian studies have concentrated on pottery style. These emphasize form and design characteristics, features susceptible to transient influences. Reliance on such evidence risks misleading results. Ceramic fabrics, however, encapsulate technological and mineralogical information potentially useful in explaining cultural relationships and changes in the potter's craft. Such information is essential if prehistoric wares are to be used for chronological frameworks, and as markers of social organisation, exchange networks and cultural changes.

Khorat Plateau geology, geomorphology and palaeoclimate are each outlined and related to Sakon Nakhon Basin potting clays. The geology is relatively homogeneous, due to its principally

sedimentary composition. Materials derived from sedimentary areas can present technical problems for potters because they often require special manufacturing methods. The resultant fabrics are often distinctive. Thus both mineralogical and technological information can be identified in wares produced under these conditions. A new analytical method, which combines these data, is presented. Many prehistoric manufactories are likely to have been located in sedimentary terrain for two important reasons. Firstly, it is estimated to form up to 80% of the earth's crust. Second, prehistoric settlements tend to be concentrated in such terrain for socio-economic reasons unrelated to pottery factors.

The role production centres played in the distribution of ceramics is considered critical. Production is constrained by the need for reliable supplies of suitable clays and other ceramic ingredients. Quality potting clays are often restricted to small localised deposits. Pottery was often a prominent exchange item. This was partly because consumer populations were often net importers. Thus the mere presence of pottery in archaeological contexts does not guarantee *in situ* manufacture. These factors must be taken into consideration, therefore, when pottery is used to construct archaeological frameworks such as relative local or regional chronologies, if reliable conclusions are to result. Further, geographically explicit labels, such as "Ban Chiang Painted" or "Om Kaeo Ware", should only be used if they genuinely define a ware's origin. Evidence is presented which contradicts previous assumptions regarding the origin of these latter wares. Alternative explanations are given in their place.

Particular attention is paid to temper species because they are important ingredients in pottery manufacture. Since potters display marked conservatism in technological matters, tempers help to identify different ceramic traditions. One Ban Na Di mortuary ware fabric, however, contained a technologically superfluous additive. This is considered to represent symbolic expression. It correlates strongly with a mortuary vessel form which is also considered ritually significant for independent reasons. Such correlations demonstrate the need to combine technological and stylistic evidence.

Two temporally separated Ban Na Di ceramic traditions are detailed through analyses of potting clays, ceramic artefacts, tools associated with pottery manufacture, and the accoutrements of metallurgy. Each distinctive tradition employed different clays and fabrication techniques, and displayed different pottery styles. The local changes are considered to reflect broadscale developments of some magnitude. Theoretical models are suggested to account for these changes. They draw on material from sites within and

beyond the Khorat Plateau. This evidence is used to suggest exchange networks, the presence of itinerant metallurgists, and to index the movement of pottery made under the rubric of the later ceramic tradition into an area previously lacking its associated distinctive technology. It is argued the implications of such changes are important because they heralded significant socio-economic events which markedly widened the external relationships of early Sakon Nakhon Basin communities. In addition they are thought to index the arrival of immigrant practitioners familiar with the new ceramic technology. It is postulated that this technology originated far to the south, ultimately beyond the margins of the Khorat Plateau. The coincidence of these new ceramics and exotic artefacts suggests that Sakon Nakhon Basin communities subsequently took part in a much expanded and more dynamic exchange network than they previously knew.

Finally, the role pottery plays in archaeological method and theory is briefly considered. As ceramic materials are rock-like in composition they are usually durable. Such durability affords pottery a degree of importance to archaeologists which may often exceed that given it by prehistoric societies. It is fortunate, however, that pottery is durable because it provides insight into cultural activities which would otherwise be unobtainable.

Jennifer A. Evans, Comparative Dental Conditions in several Prehistoric Oceanic Groups. M.A. Thesis, 1 page abstract, ix, 142 pp., 13 figures, 42 tables, Appendix.

This study sets out to examine three basic factors causing changes to the teeth in prehistoric people in the Pacific region. These are attrition, periodontal disease and caries. The incidence of calculus and enamel hypoplasia was also noted. Ten prehistoric groups were studied, comprising 400 individuals and 5351 teeth. These ten groups are Nebira, Eriama (both in Papua New Guinea), Watom (New Britain), Namu (Solomon Islands), Taplins (Vanuatu), Wairau Bar, Castlepoint (both New Zealand), Lakeba (Fiji), the Chatham Islands and Tonga. Diet is considered to be the most important factor in determining the dental condition, and inferences are sought from these conditions.

The various methods used in this study are based on those used by other researchers in the field of dental anthropology. These methods are considered to be replicable by other researchers in order that valid comparisons between studies can be made.

This thesis includes a discussion on the background literature pertaining to the study of teeth and dietary

reconstruction, and also a discussion of the archaeological evidence of economic debris for each of the study groups. A brief summary is made about the past diet of each group, and expectations of dental conditions are formulated. The validity of dietary reconstruction is also examined.

In interpreting the information gained, the archaeological evidence is combined with the data from dental conditions to attempt a reconstruction of the prehistoric diet from these two sources. It was found that in many cases, the expected values for attrition, periodontal disease and caries matched the observed values. Some of those which did not are explained as anomalous, due to the small sizes of the samples involved. The highest values for the degree of wear were exhibited by the New Zealand groups Wairau Bar, Castlepoint and Chatham Islands. The lowest values for the degree of wear were exhibited by Pacific groups defined as horticulturalists. Generally the groups with heavier wear showed a low incidence of caries compared with the groups with lighter wear. This observed difference in dental conditions is explained by dietary differences between these areas. An interesting exception to this was the Namu population, with a slightly higher than expected degree of wear, and a lower incidence of caries, both of which are explained by the habit of chewing betel nut, which these people practiced.

For the economies of the groups from Watom and Labeka, two opposing hypotheses are formulated, either horticultural or 'strandlooper'. The results showed that the dental conditions from the Watom population best fitted with the strandlooper interpretation. The results from the study of dental conditions of the Labeka group best fitted with the hypothesis of a horticultural economy. In both cases, small sample sizes limit interpretation.

The importance to the study of dietary reconstruction of information from the study of dental conditions is stressed. This is only possible with access to skeletal material, which contains direct information on what was being eaten.

To'aiga I. Sua, Polynesian Pudding Processes in West and East Polynesia: an ethnographic, linguistic and archaeological synthesis to study the antiquity of elaborate culinary concoctions in Polynesia. M.A. Thesis, 1 page abstract, xviii, 518 pp., 26 plates, 7 figures, 36 tables, 3 appendices.

Food preparations, culinary-related Proto-Polynesian and Proto-Nuclear-Polynesian words and material culture associated with cookery processes from West and East Polynesia provided the data base. This study looks at the Polynesian pudding from an interdisciplinary point of view using ethnography,

linguistics and archaeology.

The specific recipes from individual Polynesian island groups were standardised. The data indicates that several key processing techniques occur that have a widespread distribution during prehistory. The distribution of the individual standardised recipes, coupled with the archaeological and linguistic information, relate the culinary utensils to the main processing steps thus providing definitive evidence for the Polynesian pudding as a culinary practice during prehistory.

Two main issues under investigation in this study were: To define and determine the antiquity of the Polynesian pudding preparation. From the Samoan case study, what elaborate culinary processes continue to the present day and why do they persist?

In making the Polynesian pudding, a deliberate set of processing techniques were undertaken requiring certain cooking utensils, the antiquity of the preparation stretching back more than 3000 years. The Samoan case study demonstrates that continuity or conservatism far out-weighs change in this aspect of Polynesian culinary history.

Michele N. Moore, The Burnishing Pebbles from Khok Phanom Di. B.A.(Hons) dissertation, 64 pp., 55 figures, 1 table, 2 appendices.

This dissertation looks at a sample of small, modified river pebbles found during the excavation of Khok Phanom Di, Central Thailand. The majority were quartz, and probably came from the stony-bottomed streams which issue from Khao Kirirom, the highest hill on the margins of Bang Pakong flood plain, about 7 km southeast of Khok Phanom Di. They appear to have been used for the burnishing of pottery, and were either collected or exchanged from some distance.

Unlike the shaping of the vessel, which appears to have been the exclusive domain of women at Khok Phanom Di, the finishing of the surface seems to have been an activity which was performed by all age and gender groups. There was no differentiation of labour between groups, as evidenced by the Burial Clusters, however within specific clusters some gender differentiation may have been present.

Helen J. Pollock, Biological Coherence at Khok Phanom Di. B.A.(Hons) dissertation, 75 pp., 58 figures, 3 tables.

The objective of this study is to analyse the relationship between burials within the clusters of each mortuary phase of

Khok Phanom Di, with a view to being able to establish possible biological affinities between these individuals. In order to determine this, pregnancy scarring was examined for each of the adult female pelvises and this information related to other spatially close burials.

The estimates of parity for all suitable female samples, when analysed within the context of the excavation, enable reasonably reliable interpretations of some fertility and demographic patterns within this population. Firstly, an analysis of the stages within the 8 burial clusters suggests there is a distinct possibility of close biological affinity between these people. It is probable that this close relationship was the basis for the pattern of interment - a tradition that continues through time although the actual spatial patterning of burials changes after Mortuary Phase 4.

To a lesser degree changes in fertility and demography can be ascertained. Based on a small sample such as this, it would seem likely that there is little difference between clusters for the average number of estimated childbirths per woman. There is, however, a distinct drop in infant mortality between Zone A and Zone B based on the number of infants interred. This suggests after an initial period of instability the population stabilised and began to increase.

1988

Michiko Intoh, Changing Prehistoric Yapese Pottery Technology: a case study of Adaptive Transformation. Ph.D. Thesis, 1 page abstract, xi, 192 pp., 52 figures, 22 tables, 10 appendices.

This study describes the processes of cultural adaptation to environmental conditions through an examination of ceramic technology. The case study involved eight months fieldwork in the Yap Islands, Western Caroline Islands, Micronesia, to obtain archaeological, ethnographic and environmental information.

Analyses of the mineral and chemical composition and physical characteristics of Yapese clays showed that two types exist on the island: very plastic metamorphic clay and non-plastic sedimentary clay. Analysis of sand samples from beach and river locations showed varying amount of calcareous sand grains.

Three types of pottery were distinguished in the archaeological deposits on the basis of temper and physical characteristics of vessel walls. Calcareous Sand Tempered (CST) and Plain potteries were made between 2000 and 6000 years B.P. whereas Laminated pottery was made after 600 years B.P. Technological change between the three pottery types was shown

by reconstructing the technology used and the physical properties of the products, using information about the mineral composition of the clays, tempering, forming, surface finish, vessel form, thickness, firing, strength and porosity.

Metamorphic plastic clay was used for making all three types of pottery. The major contrasting characteristic of the different potteries is differences in tempering behaviour. A steady improvement in firing technique over 2000 years was identified as the major causes for the changes observed.

CST pottery was tempered with fine calcareous beach sand. The clay tempered in this way was very workable but had a disadvantage of being easily damaged if fired at higher temperatures.

Plain pottery was tempered with a range of materials, such as burnt coral lime and coarse sand but not with calcareous sand. This variation with alternative tempers is interpreted as attempts to avoid the deleterious effects of heating calcareous sand. The quality of Plain pottery was not very high (weak, thick and straighter vessel wall), and the experiments did not result in an effective solution to the problems of CST pottery because technological replacement did not occur.

Laminated pottery was shown to be identical to the historically manufactured pottery, and was made with a unique technology. No temper was added to the highly plastic clay, and the techniques of forming, drying and firing were adapted to the low workability of the clay. The combination of these techniques produced a strong and durable layered vessel wall.

The thesis includes a published bulletin describing the excavations and a computer disk with a full catalogue of all pot sherds and scientific data.

Praphid Choosiri, An Analysis of Human Remains from Khok Phanom Di. M.A. Thesis, 1 page abstract, viii, 122 pp., 11 plates, 42 figures, 38 tables.

Inhumation burials recovered by archaeological excavation from the prehistoric site of Khok Phanom Di, east Thailand, excavated in 1985, dating from 2000 BC-1500 BC, are described. The primary aim of this thesis was to try & reconstruct the biological relationships of individuals within and between the clusters. To achieve this the basic parameters of age, sex & stature for the 154 individuals had initially to be assessed. The human remains are aged from new-born infants (0-5yrs) to old age (over 40 years old). Life expectancy is 28.2yrs for both sexes. There are 67 mature and 87 immature individuals.

Adult males range in stature from 162.31-166.95 cm, and adult females from 152.65-154.42 cm. Observations of non-metric and metric features of the cranial and infracranial skeleton and dentition were then made to assess the biological relationships. Observations of pathology are not included in this present study. Limited comparisons of these observations are drawn between the Khok Phanom Di population and earlier Thai prehistoric sites.

Warren Grumley, A Comparative Study of the Material Culture of Murihiku. M.A. Thesis, 1 page abstract, xi, 177 pp., 112 figures, 45 tables.

This thesis is an attempt to assess the degree of differentiation between two regions, Otago and Southland, to be found in the styles of four types of artefact; Bird-spear points, One-piece fish-hooks, Composite hook points, Adzes. In order to assess the significance of these differences the comparison has been made not only between the two regions mentioned above but also with a set of samples from the northern North Island as a bench-mark.

The data has been collected in the form of non-metrical (presence/absence) and metrical (continuous or ratio type) variables specific to each artefact type. The method of analysis of data is concerned with the study of the relative frequencies of these range of variables. This is supported by Chi^2 and Student's T tests.

As well as seeking to establish the degree of differentiation between the material cultures of the regions the interpretation also seeks to distinguish between causal factors for these differences (for example, variations in functional requirements, differing or limited access to material types, etc.).

Michelle Horwood, Trace Elements and Prehistoric Diet in the Pacific: a study of six human groups from bone strontium, zinc and magnesium concentrations. M.A. Thesis, 1 page abstract, viii, 191 pp., 9 figures, 39 tables, 5 appendices.

Prehistoric human and faunal bone from six Pacific populations was examined for strontium, zinc and magnesium content by atomic absorption analysis. As strontium is known to be environmentally variable, a method of normalizing the human values was developed by using an herbivorous faunal standard to enable meaningful comparisons to be made between the six populations examined.

Four main problems were addressed in this research. Did

some prehistoric Pacific communities rely on vegetable foods far more than others? Were there populations in the Pacific which relied on meat foods more than others? Did the diet of an Oceanic community vary significantly within it, and are observed variations correlated with demographic or cultural factors such as age, sex or status? Finally, is there evidence that some prehistoric Pacific groups relied on marine foods far more than others? Despite some methodological and interpretative problems the results indicate that this method is capable of providing information to resolve these issues.

Prehistoric populations who relied upon vegetable foods as the primary focus of the economy can be differentiated by their bone trace element content from those whose economy focussed upon exploitation of meat resources. In some cases the consumption of marine versus terrestrial foods can be isolated.

Trace element data suggests that the economy of the Namu population from the Solomon islands and the group from Watom near New Britain placed more emphasis on the collection and consumption of vegetable foods than meat foods. This study tends to confirm the view that the Moriori inhabitants from the southwest corner of Chatham Island ate few plant foods, with marine foods forming the basis of the economy. They ate comparatively few filter feeding shellfish. The trace element results from the 100 individuals examined from Namu suggest little variation in diet within the population, with age related variation being the only significant correlation observed. The results for the populations from Nebira and Eriama in Papua New Guinea suggest they were consuming a mixed terrestrial/marine diet. The consumption of freshwater filter feeding shellfish by the New Zealand Rotoiti population produced high concentrations of bone strontium and zinc, thereby making it difficult to identify relative vegetable and meat consumption. Groups inhabiting temperate regions (New Zealand and Chatham Islands) showed greater variation in trace element levels than those from tropical Oceania.

Pirapon Pisnupong, Aspects of Stone Working at Khok Phanom Di. M.A. Thesis, vii, 147 pp., 50 figures, 30 tables, 2 appendices.

This dissertation is concerned with four of the stone artefact types recovered from the 1985 excavation of Khok Phanom Di, Central Thailand. These are the adzes, the chisels, the hoes and the sandstone abraders. These form a coherent group, since the chisels may well have been converted from adzes and the sandstone abraders were used, at least in part, to resharpen and modify both the adzes and chisels. The hoes evidence an aspect of the activities at the site, forest clearance and soil working, which relied upon the adzes and the hoes used in conjunction.

The study of polished stone artefacts in Southeast Asia over the past fifty years has, in the main, emphasized the typology and development of adzes to support the notion of widespread prehistoric migrations and the diffusion of lithic technology. The objective of this thesis is to study the development of polished stone artefacts at a particular site, Khok Phanom Di, within a circumscribed area, the Bangkok Plain and its environing uplands. This is a particularly intriguing situation, because Khok Phanom Di was located on low-lying land which, while rich in food resources and good soil, was remote from outcrops of high-quality stone suitable for making cutting implements. It is, therefore, possible to examine the nature of exchange patterns as well as technological aspects of the prehistoric community at Khok Phanom Di.

Thomas F.G. Higham, The Shell Knives from Khok Phanom Di.
B.A. (Hons) dissertation, 1 page abstract, 44 pp., 27 figures,
5 tables

Excavations in 1985 at Khok Phanom Di, Central Thailand, revealed a cultural sequence dated between 2000 and 1500 B.C. In addition to the lengthy mortuary sequence encompassing about 20 generations, a rich material culture was recovered. Among the most numerous types of artefact, apart from ceramic items, was a shell knife made from one valve of the freshwater species *Pseudodon inoscularis*.

The range of possible uses to which these knives were put was examined through an analysis of the wear on the cutting surface. Initially, an experimental programme was followed, in which modern replicas were used for a range of tasks, each evidenced or considered likely uses at the prehistoric site itself. These included processing fish, cutting bark cloth, harvesting rice, peeling taro, cutting hair, decorating pottery and fashioning a bamboo point. The resultant wear patterns, as well as the wear resulting from the initial fashioning of the knife and resharpening the cutting edge on a sandstone abraded, were noted and described.

A series of differences in wear patterns, each reflecting a particular activity, were identified. As a check on the utility of the method, a further series of blind tests were undertaken. These indicated a reasonable, but not a universal, likelihood that the various types of use could be distinguished one from the other.

The next stage was to prepare and examine the prehistoric knives themselves. These revealed two distinct types of wear. The first comprised coarse striations which are held to result either from an initial fashioning of the cutting surface, or subsequent re-sharpening with a sandstone abraded. Several

such abraders were found at the site. The second includes a distinct sheen or gloss, together with much smaller striations running back from the cutting edge and across the blade of the knife.

When this recurrent pattern on the 400 or so prehistoric shell knives was compared with the modern experimental set, it was found possible to eliminate most of the latter from serious contention as analogues. The most consistent resemblance was found between the prehistoric shells and those used in harvesting grasses, including rice from the vicinity of the prehistoric site.

It is therefore concluded that the most likely use to which the knives were put in prehistory was in harvesting rice, or perhaps in removing the seed-heads from rice. In this context, the finding that the species of shell employed was from a fresh-water environment in a site which was located on a major river estuary is seen as supportive evidence that rice processing was involved. If this is indeed the case, then the harvesting knives are part of a group of artefacts which were associated with rice exploitation at the site. The others comprise leucogranite hoes and grinding stones. Much rice was found.

A consideration of the prehistoric and ethnographic evidence for rice harvesting in East and Southeast Asia reveals a widespread adoption of knives rather than sickles in harvesting, although the latter are not unknown. Technological, botanical and spiritual factors in favour of small hand-held knives rather than sickles are noted and discussed.