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**ABSTRACTS FROM THESES,
DEPARTMENT OF ANTHROPOLOGY, UNIVERSITY OF OTAGO, 1989-1990.**

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Abstracts from all Ph.D., MA, and BA (Hons) theses in archaeology completed in the period 1989-1990 are given below. Copies are held in the Department of Anthropology, University of Otago, where they may be consulted in the Departmental Library. Xerox copies may be obtained through the Librarian, Department of Anthropology at cost, plus GST and postage. These are subject to the usual restriction applying to theses, namely the understanding that their use is for private research and not publication.

Rachannie Bannanurag, Khok Phanom Di and its Socio-Cultural Implications. Ph.D. thesis. 1989. Department of Anthropology, University of Otago. 1 page abstract; (xxi) 377 pp., 209 figures, 59 tables.

Khok Phanom Di is a prehistoric site many features of which are, at present, unique in Southeast Asia. It was occupied between 2000 and 1500 BC, when the sea level was 2 m higher than at present. According to the geomorphological and biological studies which have been undertaken following excavations in 1985, the site was located in a sheltered estuarine location giving access to mangal, freshwater swamps and open mudflats. It attained a maximum area of 5 ha. and height above the natural land surface of 12 m.

Within a 10 by 10 m excavated area, 152 burials were encountered, involving 153 individuals. These burials, which were found within a depth of 5.5 m, are the subject of this dissertation. The objective is to offer several alternative interpretations of the social structure which these burials represent. As a necessary first step, the site's environment, the subsistence economy of the inhabitants, their place in a regional settlement pattern, the degree to which they engaged in an exchange network involving exotic goods and the status of the site contributing to such a network are reviewed. It is found that there was a marine diet in association with rice consumption. The site probably occupied a nodal position at the head of a major estuary, and the women were skilled in making technically outstanding pottery vessels. All stone, however, and much of the shell used to make ornaments was imported.

Chronologically, the burials may be divided into seven mortuary phases. Culturally, we can recognise a series of burial clusters, laid out on a grid pattern. Many burials are superimposed over earlier ones, and it is possible to define stages within each cluster. Some clusters were enduring, others were short-lived. All contain adult males and females, infants and children. Having described each burial and its contents, the sample is then subjected to a number of statistical analyses to determine the basic variables in the mortuary tradition. Thus, some infants were well endowed with grave goods, some adults were not. Only women

were buried with anvils used for shaping pots, but turtle carapace ornaments were restricted to men.

Having defined the basic variables underlying the mortuary tradition, the clusters are then redefined as lineages and a series of genealogies are reconstructed. These reveal oscillating wealth between lineages consistent with a big-women social form. Such a finding harmonises with the clear role of women in pottery making. Some aspects of the genealogies reveal also that, with time, there was an increasing matrilineal bias. The implications of this are then reviewed within a regional framework. It is found that no site, either in Southeast Asia or China, has produced comparable data combining information on subsistence, mortuary and technological characteristics of a prehistoric society.

M. Dianne Hall, The Decorated Ceramics of Khok Phanom Di and the Social Implications. MA thesis. 1989. Department of Anthropology, University of Otago. 1 page abstract; (xi) 235 pp., 104 figures, 78 tables, 8 appendices.

This thesis is concerned with the role of decorated pottery in the ritual of death at the site of Khok Phanom Di. Recent studies, in particular in Europe, have considered the possibility that fine pottery played a significant role in mortuary practices. The site of Khok Phanom Di has provided a sophisticated set of data for assessing social, technological and cultural behaviour. This has provided an opportunity to examine the role of decoration in the burial ritual.

The non-mortuary ceramics were examined to provide a comparison with mortuary ware in order to ascertain if highly decorated pots utilising similar motifs were present in the non-mortuary area. A classification of motifs was undertaken by mode of decoration. The level of decorated ware in the mortuary and non-mortuary context and the degree to which decoration showed chronological continuity or change was documented. Motif affiliation by gender, age, and cluster was analysed. The correlation between form, zone and motif placement was also undertaken.

The detailed skeletal and social data at Khok Phanom Di has allowed ceramic decoration to be examined in order to elicit social information. The pottery vessel was the commonest grave good present and it is clear that pottery decoration was a ritual preference in the mortuary practices at Khok Phanom Di.

Carolyn A. McGill, The Identity of Defecators in Prehistoric Coprolite Studies: Towards a Solution by Biochemical Research. MA thesis. 1989. Department of Anthropology, University of Otago. 2 page abstract; (x) 152 pp., 4 plates, 7 figures, 5 tables, 5 appendices.

Coprolite analysis may contribute to many areas of archaeological research. In the past it has contributed to knowledge of the diet, health and disease, environment, food technology and aspects of behaviour of prehistoric individuals. The value of this information mostly depends on the positive knowledge of the species which was the defecator of the coprolite. However, it is believed that methods of identifying the final defecator of a coprolite are very subjective and may lead to erroneous conclusions.

Many of the methods used to identify the species of defecator depend, in some way, upon differences in diet of the different species. In New Zealand the two main species likely to have defecated the coprolites are humans and dogs and it is considered that there may not always have been differences in diet between these two species.

Identifying the species of the defecator of coprolites was therefore seen as a major problem concerning coprolite analysis and one that had not, as yet, been sufficiently solved. It was thought that identification of specific secretions from the gut would be a much more objective way of identifying the species.

It was proposed to test for the protein, serum albumin, antibodies of which are specific for each species. Amino acid analysis was undertaken to detect the presence of proteins in modern faecal and coprolite samples. Then sodium dodecylsulphate polyacrylamide gel electrophoresis (SDS-PAGE) was used to identify the specific protein, serum albumin, in modern faecal and coprolite samples. Once the presence of this protein was established the protein was extracted from the modern faeces and coprolite sample by mixing it with a saline solution and tested on an Ouchterlony two dimensional double diffusion gel for a reaction with either anti-human or anti-dog serum. Although amino acid analysis and SDS-PAGE were able to identify positively the presence of the protein serum albumin, the method of Ouchterlony two dimensional double diffusion was found to be too insensitive to reveal a reaction between the serum albumin protein and the anti-serum.

Other methods were outlined that may be more sensitive tests to use in the future to identify the species of defecator. One method in particular, the technique of 'immunoblotting', appears to be the logical direction to proceed in further attempts to identify the defecating species of coprolites.

It was concluded that after a flourish in the 1960s and 1970s, coprolite research has tended to centre around dietary, palynological and parasitological analysis. Modern methods of scientific analysis are becoming increasingly more sophisticated so that now, and in the future, the field of coprolite analysis may expand to include the biochemical analysis of coprolites. Biochemical analysis seems the likely path to take in order to solve the problem of the defecating species. This study has been one step along this path.

Katherine J. Roy, A Study of the Early Marianas Islanders - The Skeletons Under Their Skins. MA thesis. 1989. Department of Anthropology, University of Otago. 3 page abstract; (xx) 372 pp., 25 plates, 2 figures, 45 tables.

It is only in the last decade that much archaeological research has been carried out in Micronesia and that studies of prehistoric human remains have emerged in any quantity. In this study human skeletal material from eight sites in the Marianas Islands is analysed with particular reference to the health of the individuals. Research on the health of the inhabitants of a site can provide an archaeologist with direct information on how well these people adapted to their environment. The remains from seven of these sites had been previously analysed, but it is felt that there is still much to be gained from a re-analysis.

Several variables are employed in the investigation of the health of these people. They include sex, age at death, stature, pregnancy markings, Harris lines,

cortical thickness and Nordin's score, as well as an examination of degeneration, pathology and any evidence of frequently performed activities. The dentitions are analysed for tooth wear, alveolar resorption, caries, enamel hypoplasia, staining, calculus and any other dental pathology. Evidence is sought of cultural modification of teeth or other parts of the body. It is felt that the inclusion of this many variables is the best research strategy for these fragmentary and sometimes comingled remains.

A discussion of previous physical anthropological research on the health of Marianas islanders is included in this thesis. Within the present analysis, information from this previous research is incorporated to provide a synthesis which in turn will hopefully provide direction for future research.

It was found that these Marianas islanders generally enjoyed good health. Those who survived to adulthood died between 20 and 40 years of age and achieved a relatively tall stature. Their bone cortex was comparable to modern well fed populations. Menarche may not have begun until 17-18 years with a maximum of three to four children being born to each woman by her thirties. A few individuals had episodes of poor health during their childhood. A physical examination for both sexes resulted in a slight degree of degenerative change by the fourth decade of life (30-40 years). A squatting position was consistently adopted, and a strong downward motion of the arms was frequently performed. Evidence of cribra orbitalia possibly due to a childhood episode of iron deficiency anaemia was discovered in one individual. There were only a few instances of trauma. Individuals at three sites had bony evidence of a treponemal infection, probably yaws.

Their dental health as indicated by slight tooth wear, moderate alveolar resorption, the incidence of caries, calculus deposits and stained teeth was the result of a soft carbohydrate diet, poor oral hygiene and habitual betel nut chewing. Abscesses and antemortem tooth loss did not develop until their thirties. Staining, incising and filing of teeth was found at several sites and may have occurred upon betrothal, as a rite of passage or as a sign of status. The possibility that they were incidental to some other practices is also discussed. The skull of one individual was artificially flattened in the occipital region and was the only other possible example of cultural modification among these people.

The overall conclusion that the health of these Marianas islanders was good infers that they had adapted well to a favourable environment. The re-analysis of these people has led to the discovery of new aspects of their health and also points to problems for future research, thus successfully fulfilling its objectives despite the limitations of the material. Another important point which this study makes is that analysis and re-analysis of skeletal material of poor condition can establish new insights to the health of a population. In the Pacific, where skeletal remains are frequently fragmentary, it is hoped that this point will be kept in mind.

Fiona M. Kirk, Analysis of the Small-Bird Remains From Shag Mouth (S155/5): Implications in Relation to Environmental Change in Coastal Otago. BA (Hons) dissertation. 1989. Department of Anthropology, University of Otago. 1 page abstract; (viii) 66 pp., 10 figures, 3 tables, 7 appendices.

This report is concerned with the analysis of the small-bird remains

excavated from the mouth of the Shag River (S.M./C.), North Otago.

The small-bird bone was identified and the minimum numbers calculated. These data were studied in relation to their implications for a change in the local environment, during the prehistoric occupation of the site.

If environmental change involves an alteration of the ratio of different small-bird habitats, it could be expected that the small-bird populations would also be affected. Hence, a change in the proportions of species from different habitat types over time can be interpreted as indicating a change in the area of the different habitats available.

In the Shag Mouth sample, the differences in the proportions of species from different habitat types between the earlier and later layers suggest that there was extensive, but not complete, destruction of podocarp/broadleaved forest in the region, that created greater expanses of open ground, and led to the formation of the estuary at the mouth of the Shag River.

Present evidence for widespread cultural firing of eastern South Island forests from c.800-600 yr BP, supports the evidence obtained from the small-bird bones from Shag Mouth.

Angela S. Boocock, Fishing in Early New Zealand: A Study of Archaeological Fishbones. MA thesis. 1990. Department of Anthropology, University of Otago. 2 page abstract; (xiii) 429 pp., 3 figures, 165 tables, 10 appendices.

This thesis is concerned with the character of prehistoric New Zealand fish catches, their temporal and regional trends, and their comparison with prehistoric fish catches from the tropical Pacific in order to identify the nature and extent of adaptation of fishing practices when East Polynesians first settled New Zealand. The fishbone content of 63 New Zealand archaeological sites from five regions and three chronological periods was reanalysed, and MNI and percentage figures calculated for each assemblage (space-time) unit within a site, and each regional and temporal unit.

Barracouta (*Thyrsites atun*) dominates the overall fish catch of New Zealand, followed in importance by labrids (*Pseudolabrus* spp.) and red cod (*Pseudophycis bachus*).

In the northern regions of New Zealand, snapper (*Chrysophrys auratus*), generally taken with the demersal baited hook, was the most commonly caught species. The use of the net is also indicated in the north by the presence of such herbivorous species as the marblefish (*Aplodactylus arctidens*) and butterflyfish (*Odax pullus*), while pelagic species, for example kahawai (*Arripis trutta*) and trevally (*Caranx georgianus*), are also present, but in lesser proportions than in the south.

Southern fish catches consisted predominantly of the barracouta, red cod and labrids, with the use of the pelagic lure of most importance, particularly in the Archaic period. Netting was of considerably less importance in the south than in the north.

The proportion of barracouta decreased through time, with an associated increase in the catching of nearshore species. This suggests that observed chronological changes in fish catch composition, rather than being the result of changes in the material culture and fishing technology, were more a response,

arising from the increasing emphasis upon marine resources, towards an increasing need to take advantage of those species which were more readily available and easier to catch.

Significant differences were noted between New Zealand fishbone assemblages and those of the Pacific. This is most likely the result of the great environmental difference between the two regions. The nature and extent of adaptations made by the early New Zealand Polynesians are examined by considering three themes - the fish taxa and fishing practices that had to be abandoned, those that were modified, and those which were adopted.

It was found that the early New Zealand Polynesians had to adapt their fishing practices to some extent when they arrived here a millennium ago. Offshore fishing was abandoned in favour of taking species caught closer inshore, but there was a continuation of the targeting of certain species. The New Zealand equivalents of two Pacific fish taxa of considerable importance (the scarid, and bonito) were caught in considerable numbers in New Zealand (labrids and barracouta, respectively), although it must be recognised that the bonito was generally caught offshore and the barracouta inshore. A number of species previously unknown to the prehistoric Polynesians were caught in New Zealand waters. Initially at least, these may have been caught during fishing activities targeted at other species.

Thomas F.G. Higham, The Seasonal Factor at Shag Mouth: An Investigation into Seasonality at Shag Mouth, Otago, using Oxygen Isotope and Growth Ring Analysis. MA thesis. 1990. Department of Anthropology, University of Otago. 1 page abstract; (xi) 169 pp., 36 figures, 18 tables, index.

This thesis addresses the issue of seasonality at the site of Shag Mouth, an important early prehistoric settlement in North Otago. In 1988, a large area of the site was excavated and the mollusc components were analysed for seasonal evidence. Two accurate techniques, oxygen isotope analysis and growth ring analysis, were used to estimate the period of occupation in prehistory. Blue mussel (*Mytilus edulis acceanus*) and cockle shells (*Chione stutchburyi*) from the site were the materials involved in this investigation. The results were integrated with information from other avenues of enquiry, including ethnographic evidence, seasonal resource availability, site taphonomy and chronology, and a model of prehistoric seasonality at the site is described.

Carolyn J. Quinn, Stable Isotopes and Diet: Indications of the Marine and Terrestrial Component in Diets of Prehistoric Populations from New Zealand and the Pacific. MA thesis. 1990. Department of Anthropology, University of Otago. 2 page abstract; (xvi) 300 pp., 12 figures, 24 tables, 4 appendices.

The importance of marine versus terrestrial foods in prehistoric Pacific and New Zealand diets, and the adaptation of the Polynesian diet to new environments, are examined through the analysis of the rations in human bone of the stable isotopes of carbon, nitrogen, and sulphur. In particular, this study seeks to obtain quantitative information which could provide answers to five main questions, relating

to the subsistence focus of the early Lapita colonists in the Pacific, the significance of sugar cane in the diets of early Pacific populations, the proportions of reef versus open ocean and terrestrial versus marine foods in these diets, and the identification of populations with pronounced marine or pronounced terrestrial diets.

One hundred and nineteen samples of human bone from 13 sites throughout the Pacific and New Zealand were processed. Nitrogen values were obtained directly from bone powder, while carbon values were determined from collagen produced by digesting bone powder in phosphoric acid. Sulphur evaluations were determined from a $BaSO_4$ precipitate, produced after combustion of the collagen samples in a Parr bomb.

Interpretation of results is approached from a comparative point of view, which enables the proportions of marine and terrestrial foods in the diets of each study group to be assessed in relation to the diets of all the other groups. Additional information on the composition of the diets is gained by comparing the stable isotope values obtained in this study with published values of other human populations, and of marine and terrestrial plants and animals.

The potential of stable isotope to identify the composition of prehistoric New Zealand and Pacific diets is confirmed. A unique marine adaptation is revealed from the analysis of the Chatham Islands Moriori, who appear to have focussed almost exclusively on marine resources. In contrast, a highly terrestrial diet is suggested for groups from Nebira in Papua New Guinea and Lake Rotoiti in New Zealand.

David J. Hood, An Exercise in Futility: Archaeology and Ideology of a Gold Mining site. BA (Hons) dissertation. 1990. Department of Anthropology, University of Otago. (iv) 66 pp., 9 plates, 4 figures.

This study sets out to show that, using an appropriate framework, the ideology of the miners of the Upper Nevis Valley, Central Otago, can be seen in the archaeological record. It also develops a method for measuring the efficiency of water races.

By using the archaeological record it could be shown that the Pactolus Company built a futile water race. It was possible to establish that they did not need to do so and, therefore, it becomes obvious that the Pactolus site is representative of the ideology of mining.

The method for measuring the efficiency of water races that was developed during this study could be developed further. In its present state it can reflect relative differences in water race efficiency, but this can be expanded.

Any structure which is inefficient from a utilitarian point of view, in relation to others of its type, must have had less material reasons for its construction. A structure which is significantly at variance with others of its type reveals that the mind(s) that planned it held views at variance with the rest of society.