ANIMAL SUBSISTENCE IN THE CHALCOLITHIC CULTURE OF WESTERN INDIA (WITH SPECIAL REFERENCE TO BALATHAL)

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ABSTRACT

The early farming communities which flourished in western India in the third-second millennia BC include the Ahar culture of Rajasthan, the Prabhas culture of Gujarat and the Savalda, Malwa and Jorwe cultures of Maharashtra. Although almost all excavated sites have yielded biological material crucial for understanding the environment and subsistence systems, very few bone assemblages have been analysed scientifically. However, the excavations at Inamgaon, Walki and Kaothe in Maharashtra, Prabhas Patan in Gujarat and the recent excavation at Balathal in Rajasthan have provided a fairly good picture of the man-animal relationships of this period. The early farming communities of western India subsisted on stock-raising, farming and hunting-fishing. They reared cattle, sheep, goat, buffalo and pig, and also hunted a variety of terrestrial, avian and aquatic animals for food. Nevertheless, a distinction has been noticed in the exploitation of certain habitat-specific wild animals due to geographical variations.

At Balathal the abundance of faunal material is unparalleled compared to other Chalcolithic settlements of the region. The faunal assemblage has revealed more than 38 species of animals comprising mammals, reptiles, birds, fish and mollusks. Both domestic and wild animals contributed to the subsistence system although the frequency of wild animals was comparatively high in the Chalcolithic period. The scanty representation of wild animal bones in the upper layers at Balathal may indicate environmental degradation during the Early Historic period. Cattle are the most predominant animal followed by sheep and goat. Probably cattle and sheep/goat pastoralism was the main occupation of the inhabitants in both the periods. When one looks at the present day topography of the region, which is not congenial for agriculture because of the erratic monsoon and the lack of irrigation facilities, such a subsistence pattern becomes understandable. Also noticed are a large number of finished and unfinished bone tools probably used in hide preparation and wood working.

INTRODUCTION

The third-second millennia BC witnessed the emergence of early farming communities in western India in the form of the Ahar culture of Rajasthan, the Prabhas and Rangpur (or Lustrous Red Ware) culture of Gujarat, and the Savalda, Malwa and Jorwe cultures of Maharashtra. These cultures share many common features such as blades made of semi-precious stones, wheel-made pottery, tools and ornaments of copper, terracotta objects including animal and human figurines, beads of various kinds, huts with wooden posts (Maharashtra) and unbaked and baked bricks (Gujarat and Rajasthan). This semi-arid region has an annual precipitation ranging from 400-1000 mm. The Mesolithic hunter-gatherers who formerly occupied this area became food producers in the first half of the third millennium BC in Gujarat and Rajasthan. The Mesolithic site of Bagor in Rajasthan, dating back to 4600 BC, has yielded the earliest evidence for animal domestication in India (Misra 1973; Thomas 1975). In Maharashtra, incipient agriculture in the Tapi valley is reported in the later half of the third millennium BC (Sali 1963). The relatively wet phase in the third millennium may have aided the emergence of the early farming communities in this region.

A large number of Chalcolithic sites have been reported and excavated in western India. But out of the 14 reported sites from Maharashtra only three – Inamgaon, Walki and Kaothe – have detailed faunal reports (Thomas and Joglekar 1994). The excavations at Inamgaon, District Pune, Maharashtra, have been conducted for more than twelve field seasons in a multi-disciplinary way (Dhavalikar *et al.* 1988). Likewise, the recent excavation at Balathal, District Udaipur, Rajasthan, being conducted jointly by Deccan College and the

Rajasthan Vidhyapeeth under the guidance of V.N. Misra, has bridged an important gap in the Chalcolithic sequence in the extreme northwestern part of India (see paper by Shinde this volume). At present we have fairly a good idea about human-animal relationships during this period in western India.

ANIMAL EXPLOITATION IN CHALCOLITHIC SITES

Maharashtra – Inamgaon

The Chalcolithic culture in the state of Maharashtra dates to about 2000 to 700 BC, with most sites found in western Maharashtra. There are four cultural phases; Savalda (2200-1800 BC), Late Harappan (1800-1600 BC), Malwa (1600-1400 BC) and Jorwe (1400-700 BC), all based on distinguishable and typical forms of pottery (Dhavalikar 1989). Major sites include Prakash, Bahal, Kaothe and Tekwada in the Tapi valley; Nasik, Jorwe, Daimabad, Nevasa and Apegaon in the Godavari valley; and Chandoli, Walki, Inamgaon and Songaon in the Bhima valley. In western Maharashtra, of the total fourteen Chalcolithic sites, only Inamgaon, Walki and Kaothe have faunal reports (for details see Thomas 1984, Thomas 1988; Joglekar 1991; Thomas and Joglekar 1994; Pawankar 1995). Other sites such as Nevasa (Eapen 1960), Apegaon (Badam 1979), Daimabad (Badam 1986) and Nasik (George 1955) have only brief reports of animal species.

The habitation at Inamgaon (Pune District) is continuous from Malwa to Late Jorwe without no break in the cultural deposit. About 100,000 animal bones were analyzed, representing more than 35 species of mammals, birds, reptiles, fish, mollusks and crustaceans (Thomas 1988; Pawankar 1995). A gradual increase in the cattle population is evident from the earlier to the late phase of the Malwa culture. In the transitional phase between Malwa and Early Jorwe, dated to about 1400 BC, meat consumption increased more than two-fold. The large-scale slaughter of both domesticated and wild animals at this time probably suggests a decline in arable farming, marked by a decline in the quantities of remains of wheat and barley (Kajale 1988).

The faunal assemblage procured from each excavated house of the Malwa period was studied independently. A significant and unique observation was that meat was shared between two different houses. The right half of the body of a three year old bull was found in House No. 83 and bones of the left part in House No. 79 (Thomas 1984, 1988, 1989). The bones identified from both the houses had the same degree of charring, and the metrical analysis revealed that these bones belong to one and the same animal.This animal may have been killed or sacrificed on some special occasion and the meat was shared among the people of these two houses.

The Malwa phase is followed by the Early Jorwe phase at Inamgaon. Economically this was the most affluent phase in the Chalcolithic culture at Inamgaon. The inhabitants further increased the cattle population and hunting was of lesser importance. As in the Malwa period layer 8, there was also a three-fold increase in the total number of animals killed or butchered, suggesting that the inhabitants may have had to depend more on animal food.

During the Late Jorwe period at Inamgaon the economy appears to be different. The horse was introduced; a few horse bones have been found with cut marks and charring and the finds are similar to those found in the Iron Age culture of this region, where horse sacrifice was practiced by the megalith builders (Thomas 1992b). Whereas cattle were dominant in the Malwa and Early Jorwe periods, in the Late Jorwe period emphasis switched to hunting and sheep and goat domestication (Pawankar 1996). Evidence suggests that dog meat was also eaten. Blackbuck (*Antilope cervicapra*) were profusely hunted but deer species decreased considerably (Pawankar and Thomas 1997). Aquatic and avian resources were also exploited. Farming seems to have been in decline, with intensity of cultivation of wheat, barley, horse grain, hyacinth bean and common pea lowered by more than 80% (Kajale 1988).

Trace element studies carried out on the human skeletal remains have shown some very interesting dietary habits in the Inamgaon population (Gogte and Kshirsagar 1988). The Early Jorwe people consumed relatively more agricultural products than their counterparts in the Late Jorwe culture. The Late Jorwe people had a diet rich in meat, fish and locally gathered plant species. A possible rise in the weaning age in the Late Jorwe period may be associated with a gradual shift from an agricultural sedentary life to a semi-nomadic one. This drastic change around 1000 BC at Inamgaon may have been due to environmental degradation caused by prolonged human interference with nature.

A similar picture of human-animal relationships can be presumed for almost all the Chalcolithic sites of Maharashtra, though the Late Jorwe phase is not represented in many other sites. Variation has been noticed in the species of wild animals at sites close to Gujarat (Kaothe: Thomas and Joglekar 1990), and to the east towards Madhya Pradesh (Tuljapur Garhi: Thomas 1992a, 1996; and Adam: Thomas *et al.* in press) where species belonging to more sub-humid environmental conditions are reported. These differences are mainly attributable to the different environmental settings of these regions.

Gujarat – Prabhas Patan

Prabhas Patan was first excavated in 1956 jointly by the Gujarat State Department of Archaeology and the M.S. University of Baroda (Nanavati *et al.* 1971). The site was re-excavated in 1972 by Deccan College and the Gujarat

State Department of Archaeology. Four main cultural periods (Period I Harappan, Periods II and III Chalcolithic, Period IV Early Historic) were identified. The Chalcolithic period can be dated to about 2000-1200 B.C. The faunal remains excavated from Periods I-III in 1972 have been studied in detail (Thomas 1974, 1977, 1979).

Cattle were the predominant animals in the food economy throughout the cultural history at Prabhas Patan, the bones of which accounted for more than 50% in the total faunal assemblage. Buffalo constituted the second most important animal, with a bone frequency of 31.48% of the bone assemblage in Period I, 13.45% in Period II and 10.51% in Period III. This decline in the frequency of buffalo bones from Periods I to III is interesting. Small herds of sheep, goat and pigs were also maintained. There is an increase in the frequencies of sheep/goat in Period II and pigs in Period III. The inhabitants also hunted wild animals such as barasingha (*Cervus duvauceli*), chital (*Axis axis*), gazella/ chinkara (*Gazella bennetti*) and turtle/tortoise, fish, crab and mollusks. However, the exploitation of the wild fauna, especially deer, was more common in Period I.

Thus, in period I at Prabhas Patan a mixed economy of agriculture, stock-raising and hunting was practised. The frequency of wild animal bones in Period I was higher than in succeeding periods. In Periods II and III the Chalcolithic population at Prabhas Patan relied more on stock-raising and also probably agriculture. Large scale hunting might not have been possible in these periods because of the deforestation of the region caused by agriculture.

Rajasthan – Balathal

More than 90 Chalcolithic sites have been reported from southeast Rajasthan (Misra 1995). Prior to Balathal, only Ahar (Sankalia *et al.* 1969) and Gilund (IAR 1959-60:41-46) had been excavated. However, these two excavations were conducted on a small scale almost four decades ago. Therefore, the decision to investigate Balathal by Prof. V.N. Misra, who had discovered the site in 1963 (Misra 1967:151), was very significant (see paper by Shinde this volume). The village of Balathal is located about 40 km northeast of Udaipur city and has a habitation deposit 7 m thick. The excavation has revealed mainly two cultural periods – the Chalcolithic (Ahar culture) and the Early Historic. Based on radiocarbon dates (Misra 1997b), the Chalcolithic period dates to 2600-1500 BC, and the Early Historic to 340 BC-AD 130 (Mauryan to Kushana eras). Thus, Balathal was one of the oldest early farming communities outside the domain of the Indus civilization (Misra 1997, Misra *et al.* 1997).

Faunal assemblages have been collected from both cultural periods. As the excavation at Balathal is still in progress and the amount of faunal material is unparalleled compared to the other Chalcolithic sites of the region, only the material from one trench (HX2) has so far been studied (Thomas and Joglekar 1996). This reveals the presence of more than 38 species of animals, comprising 23 species of mammals, three reptiles, two birds, fish (species not identified) and nine species of mollusks. Among the domestic animals, humped cattle (*Bos indicus*), buffalo (*Bubalus bubalis*), sheep (*Ovis aries*), goat (*Capra hircus)*, pig (*Sus domesticus*), horse (*Equus caballus*; found only in the Early Historic period), domestic cat (*Felis domesticus*) and dog (*Canis familiaris*) are represented. The wild fauna is represented by elephant (*Elephas maximus*; found only in the Early Historic period), gaur (*Bos gaurus*), nilgai (*Boselaphus tragocamelus*), blackbuck (*Antilope cervicapra*), four-horned antelope (*Tetracerus quadricornis*), chital (*Axis axis*), sambar (*Cervus unicolor*), wild pig (*Sus scrofa*), fox (*Vulpes bengalensis*), jackal (*Canis aureus*), porcupine (*Hystrix indica*), hare (*Lepus nigricollis*), mongoose (*Herpestes edwardsi*), rats (*Rattus rattus*), bandicoot (*Bandicota indica*), pea fowl (*Pavo cristatus*), fowl (*Gallus gallus*), monitor lizard (*Varanus monitor*), tortoise (*Lissemys punctata*), fresh water fish and nine species of mollusks, including two species of marine cowry shells.

A majority of the bones of these animals had cut marks and charring suggesting their use as food. However, a few bones of animals like horse, dog and elephant do not show cut marks. Bones of larger animals like elephant may have been brought to the site for industrial use. A large number of finished and unfinished bone tools consisting of points, scrapers and chisels, probably used in hide preparation and wood working, were identified.

Since cattle bones formed more than 65% of the collection, it can be presumed that beef was important in both cultural phases. Buffalo bones were more common in the Chalcolithic. Domestic and wild pigs were also more important in the Chalcolithic. Sheep and goat bones were also abundant, and cattle and sheep/goat pastoralism may have been the main occupation of the inhabitants. A large number of terracotta bull figurines from both the Chalcolithic and Early Historic periods and a couple of sealings depicting bulls in the Early Historic period suggest the significance of cattle in the economy. On one of the seals, double-humped bulls are depicted pulling a cart. On another, the driver of a cart is shown with a whip in his hand.

The bones of wild animals are more common in the Chalcolithic, and their rarity in the upper layers may indicate environmental degradation during the Early Historic period. Here the bones of nilgai, blackbuck, and four-horned antelope were more common than those of deer, suggesting semi-arid conditions during the Early Historic period.

Intentional burials of cattle skulls have been found in several layers of the Chalcolithic and Early Historic deposits.

Other animals also have been found deliberately buried at Balathal. In trench H4, at a depth of about 1.77 m from the surface, the complete skeleton of a blackbuck was found. There were no associated materials with this burial. Likewise, in a pit in trenches D3 and E3, layer (9), a complete skeleton of cat in a highly disturbed condition was noticed. A large number of small stones were found with these burials. Interestingly, from almost the same level in trench E3, a human skeleton was found which was not very far from the cat burial. Pet animals have been reported buried along with human skeletons in a number of protohistoric sites in India (Thomas 1989). Another interesting burial from the lower level (layer 19, depth 5.48m) of trench HX2 is that of a massive horn core (circumference at the base is 35.5 cm) and a few cervical vertebrae of a gaur (*Bos gaurus*). The horn core was found in an almost upright position.

Bones were also used for other purposes at Balathal. In trench A1 (Lot No. 6108, layer 15, depth 3.88m) the diaphysis of an unfused proximal humerus of *Capra/Ovis*? was found with a well-executed shell bead inside its medullary cavity, which was closed with a quartz chip serving as a lid. The mid-shaft of this bone is slightly charred and worked.

From the foregoing discussion it can be suggested that the economy at Balathal was a combination of arable farming, large scale animal husbandry, hunting and fishing. However, when one looks at the present day topography of the region, which is not congenial for agriculture because of the erratic monsoon and the lack of irrigation facilities, cattle pastoralism may have been more successful than agriculture, even during the Chalcolithic.

CONCLUSION

During the Protohistoric and Early Historic periods cattle were killed profusely for meat and were a major source of protein for the early populations. The economic outlook of the inhabitants and the manifold utility of cattle could be the reasons for their abundance. Cattle by-products such as milk and hide may have been significant in the economy, although direct evidence for their utilization is lacking in Indian archaeological contexts. However, cow dung was used for plastering the floors and walls of the early settlements. Even today, cattle dung is the source of domestic cooking fuel (Thomas 1989).

The evidence of the toy cart drawn by a pair of bullocks at Mohenjodaro (Mackay 1973), a miniature bronze chariot with bulls found at Daimabad (Sali 1986), the engraving of a cart drawn by bullocks on a storage jar at Inamgaon (Sankalia 1974; Dhavalikar 1977) and the seals depicting humped bulls pulling carts from early Historic Balathal clearly point to the use of this animal for draught purposes from early times. Terracotta figurines of humped cattle are reported from many protohistoric sites, and depicted on pottery and rockshelter walls. Misra (1997) feels that a Bull cult shrine may have existed at Balathal because of the large number of bull figurines. At present, however, it may not be appropriate to suggests that these animals were worshipped because of the profuse killing of them in the protohistoric and early historic periods.

Considering the semi-arid climatic conditions, the erratic monsoon rains, the lack of irrigation facilities, the threat from crop robbing animals and the primitive cultivation that prevailed in western India during the third-second millennia BC, one can postulate that animal pastoralism may have been more successful than agriculture during the Chalcolithic period. This hypothesis is further substantiated by the abundance of faunal remains, especially of humped cattle, and also the close emotional affinity bestowed on them by the early farming communities of western India.

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MID-SEQUENCE ISOLATION IN FIJI 2500-1000 BP

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ABSTRACT

The reduction in imported materials found in the Lakeban sequence between 2500 and 1000 BP has been thought to represent diminishing areal contact within the Fiji archipelago. Declining interaction appeared to fit an isolation-by-density model where increasing population and settlement densities led to deepening community isolation. Analysis of ceramic attributes and a review of the interarchipelago transfer of materials 3000-1000 BP indicates that there is little evidence for isolation during the mid-sequence. In fact, continued contact is attested for the period ca. 2000-1000 BP. The finding suggests that the socio-cultural variation found in Fijian society at European contact was not solely caused by the radiation of isolated communities and that social diversification in an environment of continued archipelago interaction is a viable alternative to the isolation-by-density model.

INTRODUCTION

Establishing the amount of interaction taking place within and between Oceanic islands during prehistory is important for understanding the development and transformations of societies in the region. Patterns of interaction are particularly useful in informing prehistorians about the frequency of voyaging, episodes of gene flow between islands, and as a factor affecting rates of material culture and socio-linguistic change.

In Near Oceania (New Guinea to the Solomon Islands) the transfer of animals and other items has a considerable antiquity, reflecting the age of human occupation there and the relatively small distances between islands. The development of the Lapita cultural complex around 3200 BP in Near Oceania was marked by a significant increase in the movement of items, the most visible being ceramics and obsidian, over longer distances and in greater quantity than had occurred previously (Kirch 1997). East of the Solomon Islands, in Remote Oceania, the Lapita culture marks the first human settlement of islands in the area from Vanuatu to Tonga. In both Near and Remote Oceania longitudinal studies of interaction have demonstrated a decline in communication-exchange networks following Lapita settlement (Green and Kirch 1997). This paper is concerned with evidence for a post-Lapita communication decline in Fiji.

For the Fijian archipelago, Best's extensive study of Lakeban prehistory (Lau Group) showed temporal fluctuations in the island's communication network (1984). The work showed that Lapita-age sites contained the greatest number of imported items, including volcanic glass, basalt and other kinds of stone, along with non-local ceramic tempers. Post-Lapita, the number and quantity of imported items declined, as did the distance over which the imports travelled.

The Lakeba data were used as a proxy for the Fijian archipelago by other researchers, who summarised Fijian interaction as beginning with a set of wide-ranging and frequent interactions during the first 300-500 years, marked by Lapita assemblages. This was followed by 1500 years of deepening community isolation, that was then succeeded by large-scale and frequent interactions during the past 1000 years. From 2500 to 1000 BP the Lakeba data have been interpreted as fitting an isolation-by-density model (Hunt 1987; Rechtman 1992). The model predicts that as a population grows isolation within a system increases as the density of separate places multiplies. The development of communication boundaries leads to areal diminution in interaction and socio-cultural divergence. These processes correlate archaeologically with the cessation or reduction of imported items in the prehistoric record.

A 1500-year period of isolation in Fiji constitutes a useful hypothesis about the kinds of physical evidence that should be found in the Fijian landscape, including site-age densities, diversity in material-culture sets and the range and frequency

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imported, while percentages drop to under 10% in the mid-sequence. An important point here is the longevity of the Lapita cultural complex. A lengthy Lapita tenure, marked by long-distance interaction, stresses the role of communication in maintaining cultural homogeneity, with declining imports symptomatic of cultural breakdown and diversification. A Lapita chronology spanning one or two centuries has recently been suggested for Fiji (Anderson and Clark 1999.). Evidence for the greater quantity of imported materials during the Lapita phase on Lakeba could therefore be the result of direct procurement during the colonisation phase instead of long-term communication networks that declined during the mid-sequence (see also Sheppard *et al.* 1997).

A decline in inter-archipelago contact during the mid-sequence is difficult to establish. At least half of the Fijian import-exports attributed to the Lapita phase are poorly provenanced and some of these may record post-Lapita transfers. Vanuatu volcanic glass continues in the Lakeban sequence for around 400 to 600 years during the mid-sequence. As Best (1984: 493) notes, it is likely that the obsidian arrived on Viti Levu before being moved to the Lau Group. This glass may have arrived in Fiji via Tikopia rather than from the Banks Islands in northern Vanuatu. On Tikopia there is Vanuatu volcanic glass through the sequence and a Fijian sherd in layers dated from 2000 to 1000 BP. Whether the obsidian was obtained from Tikopia or Vanuatu, voyages of around 1000 km in length were made during the Fijian mid-sequence.

There were fluctuations in the amount of contact within Fiji and between Fiji and other islands during prehistory. There is evidence, for example, of substantial interaction taking place within the last 1000 years, especially between Fiji and Tonga-Samoa but also including islands such as Rotuma and Tuvalu. However, fluctuations do not necessarily represent isolation and the case for mid-sequence isolation appears over-extended in light of the ceramic comparison, the reconsideration of the Lakeba data and the prehistoric import-export record of Fiji. These indicate that the isolation-by-density model does not provide a good explanation for the mid-sequence archaeological record, although further work, particularly detailed studies of ceramic assemblages, should be undertaken.

An alternative model for the Fijian mid-sequence posits a degree of areal homogeneity in material culture, underpinned by a loosely integrated communication network. It is useful to contrast the ceramic record of Fiji – with its similar decorative repertoire and range of vessel forms – with ceramics from New Caledonia and Vanuatu, that display contemporaneous ceramic styles suggestive of communication boundaries or evidence of localised group affiliation. The geography of the Fiji Islands may well have contributed to the small component of areal ceramic variation. The Fijian Group has a distinctive shape, compared to the linear forms of neighbouring archipelagos, with chains of small islands to the east and west flanking the large land masses of Viti Levu and Vanua Levu. Within this amphitheatre-like space, contact rather than isolation was a factor during the Fijian mid-sequence. Irwin (1980) argued that socio-cultural divergence in Remote Oceania took place in a context of continuing communication and such a view may be applicable at least to Fiji. The dynamics of the contact need further study. The detailed analysis of ceramic attributes from mid-sequence assemblages will allow Fijian interaction to be better understood, as will the growing body of information on the movement of artefacts within the Remote Oceanic region.

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deposits (Dye 1988130; Poulsen 1987172-3, 211). Adzes made of a green metamorphic rock occur as surface finds on Tongatapu and Samoa (Green *et al.* 1988; Spennemann 1989160) and siliceous materials from Tonga and Samoa are potentially of Fijian origin (Clark 1996; Green 1996). *Rattus praetor* also appears to have been introduced into Fiji during the Lapita phase deliberately or accidentally (White *et al.* in press).

During the mid-sequence, volcanic glass from northern Vanuatu enters the Lakeba sequence of two rockshelters around 1500 BP and continues until 1100 BP. A paddle-impressed sherd with a Fijian temper from Tikopia may date to this period (Kirch and Yen 1982), as might a paddle-impressed sherd from a surface context in Ha'apai (Dye 1988:214). Sherds from northern Viti Levu dating to approximately 1000 BP have been found on Tuvalu, Tokelau, and Rotuma (Best 1988; Dickinson *et al.* 1990; Ladefoged *et al.* 1998). Adzes of Samoan origin and with a distinctive morphology have been documented in the Fijian record of Lau and Taveuni (Best *et al.* 1992; Clark and Cole 1997) and no doubt occur in other parts of Fiji. The antiquity of these imports is known to be 900-450 BP (Best 1984: 401, 411) but their absence from mid-sequence deposits contexts could be misleading, as hinted by their earlier presence in Samoa (Green 1974:265) and considering the small number of Fijian adzes recovered in contexts dating to 2000-1000 BP. A single piece of obsidian from the fortified site of Ulunikoro is sourced to Tonga or Vanuatu (Best 1984:434, 628). This piece may have been brought in as fill during fortification construction or transferred in some other manner from the Qaranipuqa-Wakea Lapita site to the nearby fort.

DISCUSSION AND CONCLUSIONS

Ceramic diversification in the mid-sequence is difficult to evaluate for the period 2500-2000 BP. Intact deposits were found on Lakeba, but in other Fijian sites such as Natunuku and Beqa the plain-ware component is mixed with earlier and later ceramics. Until further assemblages are excavated and compared with the Lakeban pottery the ceramic data must be considered neutral and of little use in identifying patterns of ceramic similarity and divergence. The interpretation of plain-ware sequences from the Fiji-West Polynesian area has also proven problematic, with both divergence and homogeneity regarded as fitting the ceramic data (Davidson 1979; Dye 1988).

From 2000 to 1000 BP, ceramics from sites representing the approximate eastern and western extents of the Fijian archipelago indicate that ceramic change took place within similar time frames. Common kinds of surface modification, like parallel rib and cross-hatch impressions, are found in all sites and even rare types (cord-wrapped relief and finger pinching/gouging) have a wide spatial distribution. Frequency comparison of three decorative types showed that parallel rib and cross-hatch impressions, the two most popular kinds of surface modification, followed similar developmental trajectories in sites, increasing from small amounts to comprise the majority of decorated sherds, before declining after 1300 BP. Little evidence for diversity in vessel form was found and specialised vessels like the double-spouted form with a stirrup handle have a Fiji-wide distribution, although leaf and mat-impressed trays may be spatially limited and have not been recorded, so far, from the Lau Group.

Similarities in mid-sequence ceramic attributes indicate that interaction was sufficient for the transfer of stylistic features and therefore that isolation was not as pronounced as suggested by the isolation-by-density model. This indicates either that ceramic attributes, as they have been recorded, are too coarse to measure socio-cultural divergence or that there are alternative explanations for the Lakeban data used as evidence for isolation. The description of Fijian ceramic assemblages does requires further development if questions relating to socio-cultural variation within the archipelago are being examined. However, there is little reason to suggest that the picture of ceramic similarity was not caused by continuing contact, even though the type of interaction, whether the transfer of potters by marriage or the movements of a mobile population, is not yet understood.

Turning to the Lakeban record of imports from 3000 to 1000 BP, there are 12 items including ceramic tempers, two sorts of adze material, a species of freshwater shellfish and siliceous coral and jasper from Lapita contexts. From 2500-1000 BP the imports consist of three or four ceramic tempers, one adze material, and siliceous coral and possibly jasper. The discrepancy in the number of items has been interpreted as reflecting a contraction in communication networks and therefore relative isolation. However, a reduction in the number of imports might be connected to sample size. Two of the exotic ceramic tempers from Lapita deposits are represented by few sherds in a collection of about 70,000. The smallest ceramic sample (under 12,000 sherds) is from the 1500 years of the mid-sequence, which also has the smallest number of imported tempers. Differences in sherd numbers are reflected in the size of the areas excavated. Excavations of over 50 square metres sampled Lapita deposits and the ceramic and artefactual items were augmented by surface collections. This compares to around 19 square metres of excavated mid-sequence deposits from the Lakeban rock shelters and in one shelter (Qaranipuqa) deposits dating to 1700-1000 BP had been removed.

Sample size might effect the number of imported materials found but does not explain why the quantity of imports decreases. Early Lakeban ceramics are over 30%

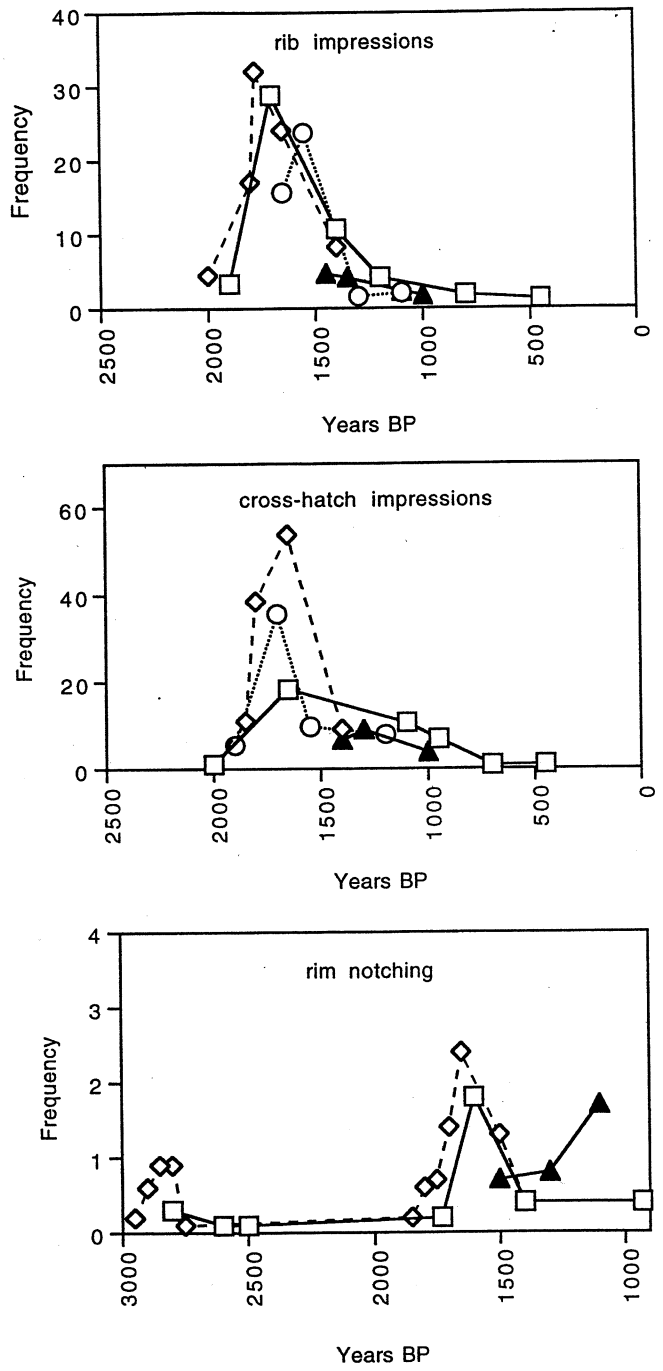

Figure 1: Decorative frequencies in Fijian ceramic assemblages. Squares = Lekeba; diamonds = Yanuca; circles = Beqa; triangles = Navatu 17A.

VESSEL FORMS

The plain-ware phase at Lakeba (2500-2000 BP) was characterised by bowls, and sub-globular jars with expanded and small collar rims with flat or rounded lips. Large vessels with inverted rims, vessels with sharp body carinations and narrow orifices were present in small numbers (Best 1984: Fig. 3.54). These rim forms and vessels occur on Beqa Island and possibly at other sites such as Natunuku and Yanuca (Hunt 1980), but there is little information on these vessel forms elsewhere in Fiji.

Lakeba vessels from 2000 to 1000 BP were described as cooking-pot forms with everted rims, concave or straight rim courses, and flat or flat-rounded lips. Similar vessels were recorded from Sigatoka, Yanuca, Beqa, and Navatu. Not found on Lakeba were the large flat-bottomed dishes with impressed leaf and mat impressions known from the south coast of Viti Levu (Green and Palmer 1963), or the double-spouted vessel with a stirrup handle first recorded by Gifford (1951). The absence of double-spouted vessels on the south coast of Viti Levu and of the flat-bottomed dishes from the north coast suggested the presence of two contemporaneous ceramic traditions on Viti Levu (Palmer 1965; Shaw 1967). However, double-spouted vessels have since been identified from south-coast sites (Karobo and Beqa Island) and Natunuku, in addition to Taveuni and Cikobia (Clark and Sorovi-Vunidilo 1999; Sand pers. comm.). Flat-bottomed leaf or mat-impressed vessels are certainly found in greater numbers on the south Viti Levu coast but there are records of this form from the north coast of Viti Levu and from the Yasawa Group (Palmer 1965; Lambert 1971).

INTER-ARCHIPELAGO CONTACT 3000-1000 BP

Green (1996) summarises the evidence for the movement of items, such as lithics and ceramic tempers, into and out of Fiji during the Lapita period. From Fiji, two flakes of volcanic glass found on Naigani Island originated from Talasea (the flakes probably arrived via Reef/Santa Cruz), and two of the five flakes from the Lapita component of Qaranipuqa-Wakea are from Tafahi, in northern Tonga. Found with the Mulifanua pottery was one sherd with a quartzose temper from Fiji, possibly Viti Levu. Five Fijian sherds from two sites in Ha'apai are likely to be imports from the Lau Group. However, the Lapita association is uncertain as the excavator notes that: "the stratigraphic case for the association of the exotic sherds with Lapitoid era deposits is extremely weak" (Dye 1988:246). From Poulsen's Tongatapu excavations two sherds may have a Fijian origin but one is a surface find and the other is described as dating to the late ceramic period (Key 1987: 274-275). Of probable northeast Viti Levu origin are a sandstone file and an adze made from green dacitic tuff found on Tongatapu, and an adze fragment made from a coarse-grained blue-green rock from Ha'apai (Green 1996). These specimens are, however, poorly provenanced and may not according to the excavators be associated with Lapita

Table 1. Comparison of main decorative types found in the Lakeba sequence 2500-1000 BP with other mid-sequence assemblages.

	2500-2000 BP		2000-1000 BP							
Decoration type	red slip	burnish	parallel rib imp.	cross-hatch imp.	cord imp.	wavy imp.	rim notching	finger pinching	incising	Reference
Lakeba, Qaranipuqa.	X	X	X	X	X	X	X	X	X	Best 1984
Lakeba, Laselase.	X	X	X	X	X	X	X	X	X	Best 1984
Totoya Island.	X	X	X	X	X	X	X	X	X	J. Clark & Cole 1997
Beqa Island.	X	X	X	X	X	X	?	X	X	Crosby 1988
Yanuca, Zone 2.			X	X	-	-	X	X	X	Hunt 1980
Sigatoka, Level 2.			X	X	-	X	X	X	X	Birks 1973
Navatu 17A, Layer 4.			X	X	X	X	X	X	X	Clark n.d. Gifford 1951
Taveuni Island			X	X	-	X	X	X	X	Frost 1970

with horticultural practices, have disturbed many Fijian archaeological deposits, making the comparison of low and high frequency decorative types problematic.

Frequencies of three decorative types were calculated using data from sites or levels that appear to have been minimally disturbed, or from sites where the degree of disturbance does not appear to have obscured the integrity of the ceramic sequence. The ceramic assemblages have experienced different site formation processes and were accumulated through diverse collection methodologies. These factors are likely to contribute an unquantifiable amount of inter-assemblage variation.

Best (1984:594-617) records another factor that might confound an inter-assemblage comparison of decorative traits. In the recent past, vessel forms associated with decorative types were linked to high-status areas. If this were true for the period 2000-1000 BP then variation in excavated assemblages could represent difference in social status.

Percentages of parallel rib relief were calculated for sites from Lakeba, Yanuca, Navatu and Beqa. Chronological comparison was made using radiocarbon dates from Lakeba and Navatu 17A and interpolation between determinations from stratified Beqan assemblages. The Yanuca chronology was reassessed using radiocarbon results from the Karobo site where a ceramic assemblage similar to that found at Yanuca was found. A distinctive ceramic marker in the Yanuca sequence was the flat-bottomed platters with leaf or mat impressions. This vessel was prominent in Ceramic zone 2 with a basal date of 2660 ± 90 (GaK-1227) and a mid-zone 2 determination of 2060 ± 100 (GaK-1228). However, at the nearby Sigatoka and Karobo sites these vessels are found in contexts dated to 1700-1400 BP, providing a more reliable indication for the age of the Yanuca mid-levels.

Frequencies of parallel-rib relief in Lakeban and Viti Levu assemblages display similar changes. Rising to *c.*25-33% at about 1650 BP, the quantity of relief sherds decreases to under 11% by 1300 BP before declining, in all sites, to levels below 5% or so during the last 500 years (Figure 1).

Frequencies of cross-hatch impressions are more variable. At Lakeba a maximum of 18% of the assemblage was decorated, but on Beqa the frequencies from excavated levels range from 23% to 36%, and at Yanuca up to 56%. The Lakeba frequency distribution is more even through time than Yanuca and Beqa, both of which showed a rapid decline in the amount of decoration after 1650 BP. By 1300 BP, frequencies have fallen to 10% or less and in all sites low percentages persist after this time (Figure 1).

Low frequencies of rim notching showed a small increase between 1700 and 1450 BP at Lakeba, Yanuca and Navatu but apparently did not occur on Beqa (Figure 1).

of imported and exported items found in the archaeological record. It also provides an explanation for the social and linguistic diversity found in Fiji at European contact. Overall, though, the existence of mid-sequence isolation is not well attested and rests largely on the interpretation of the Lakeba data.

Before accepting a one and a half millennia episode of relative isolation, a period of time accounting for half of the archipelago's human history, there are two issues to address. The first is the interpretation of the imported items found during the first 2000 years of the Lakeba sequence. These underpin the case for mid-sequence decline but are they consistent with other lines of evidence, particularly with the ceramic record? Secondly, has the contrast between rates of interaction in the Lapita phase and those of the mid-sequence been exaggerated in favour of an interaction versus isolation dichotomy? If interaction rather than mid-sequence isolation is evidenced then alternative models for Fijian prehistory may need to be considered.

This paper examines the case for mid-sequence isolation in Fiji. Ceramic attributes from assemblages dated to 2500-1000 BP were analysed for evidence of divergence. Ceramics were used, as they constitute the primary material-culture resource recovered from Fijian archaeological sites. The plasticity of the medium, and the large array of potential manufacturing options open to a prehistoric potter, suggest that if Fijian society followed an isolation-by-density path then ceramic assemblages from the archipelago should vary in their form, type and frequency of surface modification. Secondly, archipelago isolation during the period 3000-1000 BP is examined by reviewing items imported into Fiji and exported from Fiji to other islands. Isolation-by-density operates at two scales; within Fiji as increasing settlement density leads to reduced contact within the archipelago, and between Fiji and other archipelagos. The decline or absence of long-distance voyaging during the mid-sequence would be consistent with a reduction in the geographic scale of interaction from the interarchipelagic to the local level. Therefore, a review of portable items transferred between 3000 and 1000 BP provides a test of the isolation-by-density model.

CERAMIC EVIDENCE FOR DIVERSIFICATION

The Lakeban sequence established by Best (1984) is used here as the basis to assess ceramic variation within Fiji. The first 2000 years of the Lakeban ceramic sequence were based on collections from two highly stratified and well-dated rockshelters (Qaranipuqa and Laselase) which have a relatively consistent set of 19 radiocarbon determinations. The only other sequences which rival Lakeba for time-depth and dating are those from Yanuca, excavated by the Birks (Hunt 1980), and Beqa (Crosby 1988). However, both of these sequences are deficient. Yanuca suffers from having potentially unreliable Gakushuin radiocarbon determinations (Spriggs 1990) and evidence of deposit mixing (Prescott *et al.* 1982). The Beqa assemblages were dated by few radiocarbon determinations from small excavations. Most Beqa ceramics were collected from surface contexts. Further, the Lakeba ceramics were described in greater attribute detail than those from other sites and tied to a stratigraphic provenance.

PRESENCE/ABSENCE OF SURFACE MODIFICATION

Nine decorative types were used by Best (1984: Fig. 3.55) to summarise ceramic change on Lakeba from 2500 to 1000 BP. These are red slip and burnishing (2500-2000 BP), followed by different types of paddle impressing (parallel rib, cross-hatch, cord, wavy), incising (asymmetric), finger pinching/gouging and rim notching (2000-1000 BP). The presence or absence of these Lakeban decorative types was recorded in assemblages from six locations; a south coast Viti Levu sample from two sites and one island (Sigatoka, Yanuca and Beqa Island); a north coast Viti Levu sample from Navatu site 17A excavated by Gifford (1951) and the author in 1996; a southern Lau sample from Totoya Island (J. Clark and Cole 1997); and the Taveuni ceramics recorded by Frost (1970).

Assemblages decorated exclusively with burnishing and a red slip are only recorded from Lakeba and little can be said about the geographic distribution of these traits except that they are present in Lapita ceramic collections and appear, on limited evidence, to continue after the demise of dentate-stamping on Lakeba (Table 1). Ceramics from ca. 2000-1000 BP are more common. Sherds marked with parallel ribs, cross-hatching, finger pinching/gouging and incision (asymmetric or symmetric) are found in all sites, with cord-impressed sherds occurring in excavations at Lakeba (Qaranipuqa and Laselase), Navatu Site 17A, Beqa (Rukua rockshelter) and as surface finds on Totoya. At Navatu and Rukua the cord-wrapped technique dates from 1700 to 1000 BP, which is in agreement with its presence on Lakeba, although the technique may persist after 1000 BP.

FREQUENCY OF SURFACE MODIFICATION

The frequency of a decorative type in ceramic collections is useful to establish as frequency similarity can indicate prehistoric contact. However, the absence of rare or low frequency decorative types cannot necessarily be taken as evidence for diverging ceramic assemblages because of unequal sample sizes. Small collections are less likely to contain low-frequency decorative types than large. Further, site disturbances through digging various types of pits and the construction of house platforms and fortifications, along