



NEW ZEALAND
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER



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SETTLEMENT AND SUBSISTENCE IN NORTHLAND, NEW ZEALAND

Revised version of a paper read at the NZAA Biennial Conference, Dunedin, May 1969.

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Many of the assumptions underlying our current views on the prehistory of New Zealand are not derived from archaeological evidence. From the time that Europeans first encountered the Maori people, observations of Maori culture have been recorded, and our recognition of the prehistoric period in New Zealand is very much influenced by the fact that there is continuity between what we as archaeologists study, the recorded observations of the early historic period, and the Maori people of today. New Zealand archaeology is not truly prehistoric, therefore, and it is very much to our advantage that we are studying a period of the culture of a living people about whom a great deal is known.

Nonetheless, the advantage is offset by certain difficulties. Archaeology cannot proceed without maintaining a certain integrity in terms of its evidence and interpretations. While understanding of the past and present of the Maori can only arise from the conjunction of results of studies in many disciplines, understanding of the prehistoric period in New Zealand must rest primarily on the techniques of archaeology. Non-archaeological data, such as documents and tradition, can serve as aids to archaeology only if verification is possible through the techniques of the archaeologist. Such extraneous evidence may provide a basis for the framing of hypotheses within archaeology itself, which, if verified, will have significance in archaeological terms. However, much of the New Zealand documentary and traditional evidence is beyond the reach of archaeological verification, and is thus not immediately relevant to archaeology.

Of the cherished assumptions underlying current understanding of the New Zealand prehistoric period, almost none stands unchallenged: we have already heard at this conference the questioning of some of the most basic. This, of course, is an indication of the health of the discipline.

It is assumed that the Maori of the late prehistoric period was a cultivator, culturally related to the people of tropical Polynesia. The chief crop grown was kumara. At the same time, we have to recognise

that cultivation may never have been possible in the south of the South Island, and that the range of resources in New Zealand is sufficiently variable to suggest considerable regional variation in subsistence activities, which might be reflected in other aspects of culture, in particular in the nature of settlement. The activities of the Maori as a cultivator are known from the ethnographic record: studies of agriculture such as that made by Best (1925) represent some kind of orthodoxy. Maori cultivation of kumara differed in several respects from kumara-growing in tropical Polynesia. Though primarily a tropical root crop, kumara has a wide geographical range. It has been suggested by Yen (1961) that the kumara plant in New Zealand, an area marginal to its tropical distribution, was maintained by techniques that were not introduced with the plant, but had to be developed in New Zealand. These innovations coped with the annual growing cycle imposed by climatic conditions by introducing a storage phase to maintain at least a seed crop, and by a change to propagation by tubers rather than by vegetative stem cutting. Both these new techniques seem well attested in the ethnographic record, and contrast with those supposed to have been in practice in tropical Polynesia. Yen (ibid.) argued that these innovations must have taken some time to develop.

The nature of settlement of northerly parts of New Zealand in the late period is a question which has troubled archaeologists, for the orthodoxies of the ethnographic record, represented by Best (1927) and Firth (1959), do not obviously accord with the available archaeological evidence. In particular, the nature of habitation of the pa site in prehistory is yet to be established. The question of settlement patterns, the spatial organisation of a human group, which is held to reflect economy, social organisation and the resources of the physical environment, has been examined by Groube (1964, 1965). His conclusions about late prehistoric settlement of New Zealand are based on a projection back in time of the documentary accounts of the earliest explorers. The pa site he thought was not necessarily a stable fortified town, but was the hub of a fairly mobile population dispersed in less substantial temporary habitations connected with the various subsistence activities engaged in by small groups of people.

However, he saw the Bay of Islands as an exception, the pa site being a much more stable permanently occupied settlement. This he explained in terms of very productive kumara cultivation, enabling the subsistence activities of groups to be contained within a limited area, with probably frequent warfare between the fortified villages (Groube, 1965: 52).

My own assessment of Bay of Islands documentary evidence, the de Fresne documents, which refer specifically to the south-east Bay of

Islands in the winter of 1772, is that settlement of the area was in fact very similar to that suggested by Groube as generally applicable to coastal areas in the late prehistoric period (Kennedy, 1969). There is little to suggest that the villages of the area were politically as well as economically independent. On the contrary, the documents suggest that, while there was rivalry between the villages, there were also strong political ties between them. Among the fighting force that met the French attack on Paeroa Pa there were men from at least five villages. The French did encounter scattered huts, both occupied and abandoned. If there actually were fewer of these in the Bay of Islands in May and June 1772 than in other areas described by other explorers, for example Doubtless Bay, this could be a reflection merely of the seasonal economic cycle.

Groube's assumption of highly productive kumara cultivation in the south-east Bay of Islands is of particular interest (Groube, 1965: 52). The adoption by archaeologists of Yen's suggested development of kumara cultivation in New Zealand is in some ways rather illogical, and often involves assumptions that Yen himself did not make. He supposed that the technical innovations of storage and planting practices had been made by the seventeenth century. Both Green (1963) and Groube (1965) seem to have assumed that once these innovations were established, kumara cultivation went on developing, reaching a peak of efficiency at about the time that European crops began to be introduced. Both assume that this development was accompanied by changes in settlement form and ecological orientation.

If Yen is correct in supposing that propagation and storage techniques were innovations in New Zealand, and were necessary for the survival of kumara in the New Zealand climate, there is no apparent reason to argue that there was increasing dependence on kumara once these innovations were made. It is perhaps premature to propose technical innovations when we do not have the slightest idea of the time of the introduction of the kumara into New Zealand. Presuming that it was introduced from Polynesia by Polynesians, it is yet to be shown that both propagation by tubers and a storage phase were not in practice there at the time the kumara was introduced to New Zealand. Though kumara is marginal in New Zealand, there is as yet little evidence to show that new techniques were necessary in all areas.

Shawcross (1967) has discussed the question of food production in Maori agricultural areas, basing her case on evidence for the Bay of Islands at large, drawn from written records. She argues that in the eighteenth century cultivated root crops, especially kumara, did not form 'the major constituent of the Bay of Islands Maoris' diet, and that the primary economic importance of fernroot in agricultural areas has been overlooked' (ibid. : 333).

Two arguments in favour of this conclusion are presented by Shawcross, as follows. The eighteenth century records cover the growing season and the time immediately after the harvest. Therefore, if

'root crops were not commonly seen on the Bay of Islanders' "tables" in May and June, were scarce between October and November (the planting and early growing season), and were not harvested in number until March and April, they can only have been eaten with any frequency in these two harvest months, if then.'

'This points to the conclusion that, with the exception of gourds in the summer months, cultivated foods were strict "occasionals" in the late eighteenth century Maori diet for at least ten months of the year.' (ibid. : 334)

Secondly, Shawcross argues that the crops could not be produced in sufficient quantity to support the population, even in areas with good soil and climatic conditions.

The south-east Bay of Islands soils did support root crop cultivation, but their fertility for this kind of crop is difficult to assess. Leached steep-land yellow-brown earths, which are most common in the area, would have required careful control of texture, and perhaps the addition of burnt plant material (cf. Rigg and Bruce, 1923). Such field evidence as there is in the area suggests utilisation of small scattered cultivation plots on slopes, which accords with the descriptions of the French explorers (Kennedy, 1969: 67; 145).

Kumara tubers for both seed and food are sensitive to dampness and excessive changes of temperature. The temperature range for storage quoted by Groube, 55-60°F. (1965: 94, citing Farmers' Bulletin) may not be applicable to the varieties grown by the pre-European Maori, but temperature control may have been important in storing these varieties also. The south-east Bay of Islands does have occasional ground frosts, and it is reasonably likely that the air temperature in winter falls well below the minimum for safe storage of Maori kumara varieties. If this were so, sealed pits could provide ideal storage conditions, allowing control of temperature and humidity. The apparent absence of pits in the Bay of Islands led Groube to suggest that the climate allowed the storage of kumara above ground (ibid. : 86). However, rectangular pits have since been excavated on Paeroa Pa, and on the west end of Te Kuri's village (Groube 1965b, 1966). On Paeroa, rectangular pits were sealed by the layer attributed to the 1772 occupation, and others were stratigraphically ambiguous (Groube 1965b: 6). Rectangular pits are

probably common in the area. If those on Te Kuri's village are the remains of the 1772 occupation (Groube 1966: 111), they may be stores, as the French make no reference to sunken houses, though houses, domestic and communal, are discussed. Storage would seem to be the most likely alternative for these pits.

Though the French do not mention such storage, climatic factors, especially temperature, may have necessitated the storage of kumara seed stock in special separate structures in the south-east Bay of Islands, because of the possibility of ground frosts, if only for a short period of the year. It is at least possible that storage was in isolated, inconspicuous sealed pits. If special storage had to be provided for the seed stock, there is no apparent reason why the food crop should not also have been stored during the few months of winter, enabling a limited availability of kumara all the year round.

Kumara was not being eaten in large quantities at the beginning of winter, as the French accounts make clear, but neither would the season's crop necessarily have been consumed before this time. The relative unimportance of kumara in the diet in May and June, and the absence of mention of storage pits in 1772 might thus suggest that the bulk of the crop was in storage.

Fernroot was certainly eaten in quantity by the south-east Bay of Islanders during the period of the French visit, and was probably much more important than kumara at this time of the year at least. The French accounts suggest that bracken (*Pteridium esculentum*) was very common in the area, close to the coasts, and on the islands. Shawcross (1967) has argued that fernroot provided the everyday carbohydrate of the eighteenth century Maori diet in agricultural areas. She states that *Pteridium* grew best under roughly the same conditions as kumara, but was much more productive, requiring less labour than kumara, and was not subject to failure or loss from storage. These conclusions on the importance of fernroot in the diet are very probably correct for the south-east Bay of Islands at all times of the year.

Nevertheless, the Maori certainly cultivated root crops such as kumara. Shawcross has shown that a great deal of effort in growing kumara probably produced a very small return. This is significant in consideration of diet: overall less kumara than fernroot was eaten. However, the conclusion that the 'Maori living in areas favourable to agriculture ... had an economy based overwhelmingly on fernroot' (Shawcross 1967: 344, *my emphasis*) is misleading. The very fact that crops were cultivated, requiring a major effort not only in cultivation, but also probably in storage, while fernroot was productive, kept well

and was available all the year round, indicates that cultivation was an extremely important activity, involving the combined efforts of a labour force larger than would be necessary if the population had subsisted on fernroot alone. Thus, in a sense, the economy was based on cultivation, even though fernroot provided the major source of carbohydrate in the diet.

Settlement in the south-east Bay of Islands in 1772 cannot be explained by the efficiency of kumara cultivation. The importance of fernroot to the late Maori, as yet archaeologically unknown, may have important implications for preceding periods. Bracken may have become important as a source of food through an association with kumara as a weed of cultivation in the early phase of agriculture in New Zealand. If both fernroot and kumara became important in the diet, permanent agricultural plots would be rather less likely than some sort of shifting cultivation, producing alternately kumara and fernroot. Whether settlement of an area was permanent or not, there would be competition between groups to maintain their rights in land actually under cultivation, but also in cleared land with a potential crop of fernroot. Such competition would be increased by population growth. At a certain point population pressure might have caused a considerable decrease in the mobility of groups, arising from the need to maintain rights in land by continuous occupation of it. Decreased mobility could have reduced the efficiency of kumara cultivation quite considerably, by reducing the available areas of suitable cultivable land, and by containing populations within a small well-defined territory. In the south-east Bay of Islands, good cultivable land is limited to small isolated pockets of coastal alluvial soils, but the area has other advantages in terms of excellent conditions for fishing at all times of the year, close proximity of the resources of podocarp and hardwood forest, and plenty of land that supports bracken, but would require a considerable amount of effort to support root crops. The population of the south-east Bay of Islands in 1772 does appear to have been in permanent occupation of the area, with little mobility outside it, and under constant pressure from groups further west, to which they succumbed shortly after 1772 (Kennedy 1969: 166H). Their very limited dependence on cultivated foods may have been brought about by population pressure at an earlier period, necessitating decreased mobility and permanent settlement with only limited dispersal around small fortified settlement sites.

Thus the Maori of this area may have been well past their peak as efficient cultivators dependent on agricultural produce, if indeed there ever was such a peak. Kumara was not important in their diet in 1772, but nonetheless was most important economically, because it required considerable effort, and communal organisation. There is obviously a

very pressing need for the archaeological study of some of the assumptions about the late Maori as a cultivator. This will be very difficult, but we must proceed beyond the stage of making assumptions for which there is no evidence. The best that can be done at present, in the absence of detailed techniques for documenting vegetable foods archaeologically, is the careful casting of hypotheses in terms that are at least potentially verifiable.

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