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SOME CONSIDERATIONS OF THE ROLE OF THEORY IN NEW ZEALAND ARCHAEOLOGY

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The archaeologist, in his major role, is the historian of pre- and non-literate societies. Because of the nature of the evidence that survives to him, he is denied the intimate and many-sided knowledge which the social anthropologist derives from the study of such societies at first hand, while in contrast to the historian he starts with a lack of information as to the age, authorship and relationships of the material with which he is dealing.

An inordinate amount of archaeological time is spent in establishing the facts of prehistory, which includes the winning of the basic data from the ground: much less on seeing what the archaeologist is actually doing with his material and what he thinks he is doing. This at least is a valid characterisation of much British archaeology, whose orientation is in the main strictly empirical. Questions of what we are doing and why are likely to be relegated to the sphere of philosophy and questions of how answered in terms of techniques (cf. Wheeler 1956). American archaeologists have been much more conscious of the role of theory in their subject, possibly because of the intimate connection between American Indian archaeology and ethnography, which has called for the validation of archaeological procedures in broader cultural terms.

In areas where the cultural record is long and varied, where the archaeological sites are numerous and diversified, and where some element of material culture like pottery is a constant associate of human activity, questions of theory can be avoided in the detailed processes of excavation and record. In New Zealand, where few of these conditions apply, they are inescapable if any sense is to be made of the material at all.

The archaeological situation in New Zealand presents a number of categories of portable artefact and a number of categories of site. The archaeologist's task is to expose the connections between all these categories in terms of the associations into which they fall at different points in time and the relationships between such associated groups along the time scale.

A few years ago the material had been organised into two prehistoric phases largely defined in terms of artefacts and separated by a transitional phase that remained undescribed, though all the crucial changes must by default have taken place there (Golson 1959). Some sites could not be incorporated in the scheme because they lacked the types of artefact that defined it. The information they possessed about the people responsible for them was unavailable since the limited perspective within which the evidence was viewed made it impossible for it to be handled. Little success had been achieved with the analysis of the portable artefacts themselves beyond the broad segregation into two contrasted but overlarge assemblages. Nor did the known character of Polynesian settlement promise the existence of stratified sites of long occupation where the course of

artefactual change would be laid out on the spot, to the elucidation of other sites where portable artefacts did occur in quantity.

In 1962, at the Christchurch Conference of the Archaeological Association, Green gave a review of the course of New Zealand prehistory the like of which had not been heard before. In place of the scheme defined above, he presented a sequence of five prehistoric phases, all reasonably well-defined and with the sites that examplified them listed. These five prehistoric phases formed a connected and coherent story, told not in terms of artefacts whose typology was, except for a few cases of correlation between one site and another, almost incidental to the theme, but vividly and comprehensively in terms of interlocking changes in ecology, subsistence and settlement. Almost every site could be assigned at least a provisional place in the scheme, whether it produced any of the standard types of artefact or not.

Now this remarkable change in the look of New Zealand prehistory did not spring from any dramatic discoveries in the ground in the years immediately preceding 1962, but from a particular way of looking at all the evidence that had accrued from archaeological activities over the years. It is true that certain important sorts of information were available in 1962 that were absent or insufficient in 1959: for example about semi-or fully subterranean structures or pits. It is equally true, however, that some of the new information would never have become available at all without the new attitude that perceived its potential significance. I am thinking here particularly of the work on shell midden analysis and on obsidian, which has achieved important results and promises more.

My aim now is to analyse the approach that Green adopted to the data of New Zealand prehistory and to discuss its validity. I shall do so in terms of the theoretical framework that Green offers in the publication that emerged, well worked over and polished, from the discussions of the Christchurch Conference and after (Green 1963b). It is not my intention to review the details of the New Zealand prehistoric evidence in terms of Green's, or any other, formulation. My concern is with the models, the hypothetical mechanisms, which Green adopts to relate the disparate facts which have resulted from the activities of prehistoric men in New Zealand.

What Green does, though this is not made altogether explicit in his theoretical discussions, is to employ the concepts of regional aspect and chronological phase (Golson 1959: 30-3; Green 1963b:90) as the vehicle of three separate models for the organisation and interpretation of the prehistoric data. These models are: the effect of man's entry into the untouched New Zealand environment; Yen's introductory, experimental and systematic stages of New Zealand's agriculture; and a rather complex model modified from the American original and relating amongst other things subsistence activities and settlement type.

The Colonisation Model

For this model Green utilises a number of well known or generally accepted features of the Polynesian settlement of New Zealand, of which we may note the assumed small size of the initial colonising group, the large size of the country in

which they made landfall, and its radically new, but also internally diversified, conditions and resources. The mechanism is rapid population expansion in conditions where there was no competition for food and a considerable impact upon the ecology.

The most important, for our present discussion, of the results of man's entry into New Zealand, and certainly the best known, was the impoverishment of the native bird population, and particularly the extinction of the moas. Modern New Zealand archaeology can be said to have begun with Duff's use of the fact of moa extinction to organise the prehistoric data into two different types of cultural assemblage, the one earlier than the other by virtue of its association with moa bones.

Now at one stage, as we know, the opinion was strongly canvassed that only a few moa species had survived into the era of human occupation and that this survival was more typical of the South Island than the North (Duff 1956: xi-xii). This opinion was based on the adjudged unreliability of the evidence to the contrary and on the positive indications at the Wairau Bar that only Euryapteryx gravis (in quantity) and possibly Emeus crassus (in small numbers) were represented. The case appeared to be supported by the varied moa fauna present in the natural deposit at Pyramid Valley, older than Wairau Bar but not far distant from it.

These were the circumstances which, ten years ago, had us all intent on proving the validity of our moa associations - Lockerbie in South Otago his full range of moas at Pounawea, ourselves in the North Island any moa at any site.

As history records, we succeeded: we now know that man was the contemporary of a full range of moas in both islands. But we snatched the shadow for the substance for in our eagerness to prove one point, the fact of the association of moas with man, we overlooked another and more important one, the differences in the types of moa in human association from site to site.

Now there are a number of possible explanations for the presence of a particular range of moas at one site and a different range at another, as Smart and Green discuss in their Tairua report (Smart and Green 1962:244). Thus certain species may be absent due to ecological factors from the natural moa population of a particular region, and consequently unavailable for hunting. Or preference for particular types of moa may be exhibited by different groups of hunters. Or certain species may under certain conditions be difficult to catch. Or for reasons connected with one or more of the foregoing some species may have been reduced to complete or virtual extinction by previous hunting.

Because of lack of information on these points, one may be tempted to avoid a judgement, thus missing the opportunity of putting any hypothesis to the test of other data. Green, however, took the so simple step which avoided all these complications: he assumed that in general the wider the range of species at a site. the earlier that site in the settlement history of its region.

This hypothesis, which resulted from looking at the same body of evidence as the rest of us but adding insight, afforded the first real means in New Zealand prehistory of ordering in time the moa-hunting sites of the same region. By so doing, of course,

the hypothesis should supply information about its own reliability as a criterion of differentiation. Thus if in a particular region we order a number of sites chronologically by the criterion of their moa associations, the order should be reflected also in other aspects of the data, including features of the portable artefacts themselves.

Some of the associated changes may be expectable in terms of the original model and their occurrence will help to confirm belief in its approximation to reality. Thus excavations at the stratified site at Tairua by Smart and Green allowed the description of a change in shellfish diet over time, the formulation of possible reasons for it, and a suggestion that such a change might be an aid in dating (Smart and Green 1962: 254-6). Observations at other sites showed that Tairua was part of a fairly general pattern in certain parts of the Auckland province, whereby the exploitation of shellfish of the rocky shore was characteristic of early sites and shellfish of sand and mudflat of later ones. This situation was perfectly consistent with the original model, since it could be proposed that the initial group of settlers would utilise shells of a type familiar to them in their homeland (Green 1963b: 46), while the growth of population, if no other circumstance, would in course of time dictate the exploitation of the more abundant sand and mudflat species. The observation that change had taken place in shellfish diet over time on New Zealand archaeological sites had been made at least once before in print, by Leslie Adkin (Adkin 1948: 38-43), and more generally there was an unsystematic recognition of the differences between the faunal composition of different middens. In other words, what Green did with shellfish, as with the moa, was to extract significance out of observations theoretically in the possession of us all.

He did this by looking for a pattern in the individual occurrences that would allow a choice within the range of possible explanations. For others each individual case remained unique and therefore inexplicable. As a result of his insight a valuable tool has been added to the New Zealand archaeologist's kit, whereby, at least in parts of the Auckland province, early sites may be recognised by shell content, with other faunal evidence as an independent check, the shift in the direction of the late type of midden can be followed, and vital correlations made between neighbouring sites - for example the Sarah's Gully beach midden and Skipper's Ridge Settlement (Green 1963a: 61) - with little other material than shell in common.

Much more, however, is involved than change in the shellfish population of the middens. Over time the middens become more shelly, less sandy, with fewer bones (other perhaps than fish), fewer artefacts and less artefactual waste. Precisely the same observations were made some time ago by Adkin for middens of different age on the Horowhenua coast (Adkin 1948: 38-43). In the present case such observations have been systematised and given a great deal of precision by Miss Davidson's work (Davidson 1964 a, b, c), while explanations have been offered in terms of the total settlement pattern of the various midden building groups, which will claim our attention at a later stage.

One prediction made by Green on the basis of his model about the early stages of settlement deserves attention. This is the suggestion (Green 1963b:32) that on early campsites the 'materials for tools will generally be of local origin or from a restricted number of the possible sources, as regional trading patterns will not be well established'. A case pertinent to this latter point is Mayor Island obsidian which is more abundant than other obsidians on early sites, even when a local source is close

at hand (Green 1963b:45). The inference is legitimately that the Bay of Plenty was the original landfall of the small colonising group and that the other obsidian sources, few and scattered, were not found until a later stage of internal colonisation.

It may well be discovered that other rock types besides Mayor Island obsidian attained their widest distribution in the early phases of New Zealand settlement: one thinks of 'baked argillite' from D'Urville Island and the Nelson mineral belt in this regard. Rock type distributions depend on a complex of factors; the desirability of a particular material, the existence and discovery of satisfactory substitutes, and accessibility to supplies. It is highly probable that in certain areas of New Zealand, for example South Taranaki where imported 'baked argillite' is typical of early sites (cf Buist 1962: 234-6), exploitation of local resources is more typical of the later period when the growth of population had territorialised the country's resources. Green (1964) and Mason (1963) show how the identification of obsidians and other utilised rocks may contribute to this type of investigation.

We may note incidentally how valuable a tool obsidian has been made in New Zealand archaeology, with the emphasis on the creative act involved. It is true that without certain properties aiding identification of source (refractive index) and relative dating (hydration layer) obsidian would not have proved as valuable as it has, no matter how ubiquitous on archaeological sites. Yet, as Green has said, this very ubiquity should have encouraged a long hard look at any potential the material, and the way it was utilised (cf. Shawcross 1964), might possess as evidence.

The colonisation of New Zealand model has proved an extraordinarily fruitful one in Green's hands. We have all long been aware of its major elements: the entry of a small group of tropical islanders into a large temperate landmass with untapped resources. We failed to formulate the procedures to cope with the ecological effects of this event, some at least of which we recognised, and instead were all seduced by the abundance and variety of the artefacts. Drawing on the accumulated anthropological experience of man in relation to his environment, Green held expections of the archaeological evidence in respect of ecological change in the particular circumstance of New Zealand settlement. These were very directly fulfilled by the differential rate of moa extinction and more fortuitously but still accountably expressed in the shellfish middens. The exploitation of these discoveries has aided the recognition of phases (Settlement, Developmental) in the earlier part of New Zealand prehistory that studies of the artefacts had not achieved, and enabled the writing of that prehistory in terms of real events in an actual world from which the static categories of material culture have held us remote.

I conclude this section ona cautionary note. The revolutionary change effected in New Zealand prehistoric studies has been wrought by means of the hitherto least regarded of archaeological materials. The lesson that all archaeologists are taught has thus been dramatically exemplified: never throw anything away and if there is too much of it, sample.

The Agricultural Model

Yen's model for agriculture in New Zealand is simple but highly important (Yen 1961). In the North Island at European arrival the Maori economy was based on

systematic cultivation of the kumara. The agricultural procedures differed from those practised in the tropical areas from which the plant had come and are ascribed to its inability to overwinter in the ground in the New Zealand climate. Maori cultivation of the kumara was seasonal, the tubers being used for propagation and stored out of season in special structures. These innovations are looked upon as having been developed in New Zealand in response to a deteriorating climate, and the original introduction of the plant is thought of as beloning to a climatic phase where cultivation according to the procedures of the tropical islands was still possible. Yen therefore postulates three stages of agricultural development - Introductory, with the growing methods of the tropics, Experimental, the development of techniques to cope with a deteriorating climate, Systematic, with agricultural methods well-established.

About the timing of this process of adaptation, Yen makes two points: first that the agricultural innovations 'could not have been arrived at by a sudden and inspired agricultural deduction immediately on the plant's introduction'; second that the stimulus and time for the innovations would be provided by a climatic deterioration after it was introduced. Such a deterioration has been proposed for the period round about 1200, though we do not know the exact date or the speed or degree of the climatic change involved. Yen comments in this respect that 'there was probably a short period, even with a 14th century introduction, when the climate was considerably more suited to the growth of tropical plants than now'.

Green adopts Yen's model without modification and it becomes an important element in his scheme. For purposes of the subsequent discussion I do the same.

The major mechanism of kumara adaptation in New Zealand was the development of storage devices, especially semi-or fully subterranean pits, to carry the tubers for seed and food over the winter season. In the present state of our knowledge it is only with the recognition of kumara storage pits in the archaeological record that we begin to recognise kumara cultivation.

This means that in theory Yen's introductory stage of kumara agriculture could belong to any part of the archaeological sequence before the first appearance of storage pits. The same would be true of the other less important plants like taro, yam and gourd whose presence probably escaped materialisation in the archaeological record and yet whose introduction must have taken place in similar climatic conditions to that of the kumara.

Green's reading of the situation goes as follows: 'Initial introductions of tropical Polynesian plants may have failed' but there were 'plentiful food resources ... without need of recourse to agriculture' at the beginning of settlement (Green 1963b: 32). From the Development Phase there is 'some evidence from storage units ... that successful introductions of some Polynesian food plants had occurred' (Green 1963b: 34). This is 'the Introductory stage of agriculture (initially perhaps without kumara)' (Green 1963b: 101) and the range of foods represented in contemporary middens show that 'agriculture, where it existed, was a supplementary source of

food, not a mainstay in the diet' (Green 1963b: 35). It is only with the next phase, when middens record the modification of the environment by prolonged occupation, that an increased dependence on agricultural products is postulated. This occurs at a time of deteriorating climate which demands the development of the new agricultural techniques described by Yen. Yen's term for the agricultural stage - Experimental - is thus applied to the archaeological phase (Green 1963b: 35-6). The kumara is now present and by virtue of its adaptability becomes the one plant able to provide the agricultural basis for larger populations and the cultural revolution that the development of Classic Maori society constituted. The 14th century date set for the beginning of the Experimental Phase by the dates for the climatic deterioration and for early storage pits, though imprecise, is not too far removed from the date suggested by tradition for the introduction of food plants (Green 1963b: 35, 57). Finally it should be remembered that the sweet potato, having a South American origin, will have a different history in the Pacific from the other cultivated plants used by the Maori (Green 1963b:57). These could have been introduced into New Zealand at any time in the last two thousand years: the sweet potato, in Green's reading of the slender evidence for Eastern Polynesia, probably had no time to reach the Central Pacific before the first New Zealand colonists left there and may therefore have been a later introduction.

We need to look at the strands of this complex argument a little more closely.

The presence of agriculture is discounted for the Settlement Phase because of the lack of evidence for it. What evidence we might expect is not made clear. If this is the Introductory Stage of agriculture, storage pits should not be present. Evidence for agriculture anyway, as Green has stressed, is not likely to turn up in middens (Green 1963b:58).

The Introductory Stage of agriculture is assigned to the next phase of the sequence, because of the correlation of the Opito beach midden, possessing many of the characteristics of the Settlement Phase middens but a narrower avifaunal range, with the Skipper's Ridge settlement of housepits and associated pits interpreted as food stores (Green 1963b:51).

The stratigraphically later level at Skipper's Ridge, possessing a different shellfish fauna associated with shallow house pits and separate bin-like pits presumed to be for storage, becomes a component of a distinct Experimental Phase to which the later middens and the ridge top pits at Sarah's Gully belong by virtue of structural and faunal (shellfish) similarities (Green 1963a: 60-1, 65-6).

This marked and consistent faunal and structural change at sites in the same immediate area encourages the recognition of two phases within the region. What bearing it has on the general history of agriculture in New Zealand is, however, less certain.

Green makes two points in this connection. The first is that 'separate' storage pits as in the later levels at Skipper's Ridge and Sarah's Gully (Experimental Phase) marks a more fully developed agricultural community than 'attached' storage pits as in the early level at Skipper's Ridge (Developmental Phase) (Green 1963b: 34).

Whatever the support for this as a general principle, I should hesitate to say whether the New Zealand evidence exemplifies it, particularly the evidence from the sites now under discussion. And we have an intriguing situation at Kumara - Kaiamo where the structural sequence of Skipper's Ridge is reported as being reversed (Parker 1962).

The second point is that on the evidence of the 'attached' storage pits of the earliest level at Skipper's Ridge the 'introductory stage in Polynesian New Zealand agriculture as defined by Yen had begun 'by the later portion of this (i.e. the Developmental) phase' (Green 1963b: 34). In terms of Yen's model, however, the Skipper's Ridge pits must by definition belong to his Experimental Stage, while the implication that they date to a later part of the phase to which they are attributed is without any substantiation. One can only suggest that considerations drawn from tradition and the hypothetical history of the sweet potato in the Central Pacific have prompted this latter judgement, which in any case is only necessary if the absolute dates assigned to the archaeological phases are considered sacrosanct (and of course they are not).

I have begged above the very large question of the identification of pits as house pits and storage, specifically kumara storage, pits, because I have been primarily concerned with Green's statement of the facts of New Zealand prehistory as he accepts them. The interpretation of the 'attached' underground pits at Skipper's Ridge and the 'separate' bin-type pits at Skipper's Ridge and Sarah's Gully as food storage pits is reasonable. Indeed I should go further than Green is apparently willing to do and accept as kumara pits the underground structures of the earliest level at Skipper's Ridge on the grounds of their virtual identity with the rua-type storage pits for kumara of later times.

The Settlement Pattern Model

Green views the operation of the processes described in the two models discussed above as complementary. As the growth of population led to fuller and at times over-exploitation of natural resources, and to competition for those resources, so agriculture, if it had been present from the beginning, became more important, or, if not, arrived on the scene when there was real need for it. The critical period is seen as coinciding with a climatic deterioration which called forth those innovations in kumara agriculture which laid the basis for and were essential to the development of Classic Maori culture. The process is segmented into three phases: Settlement, a small population established in an unmodified environment. Developmental, adjustment to and modification of that environment by an expanding population. Experimental, agriculture adaptations to a changing climate in conditions of impoverished natural resources.

At the record thus interpreted Green now proceeds to look in the light of a complex model modified from an American original (Beardsley 1956). This latter presents the development of human society in general, from its primitive beginnings to the complex civilisations at the recent end of the archaeological scale, as a series of stages of evolutionary development relating settlement pattern and type, subsistence activities, population, and social organisation in terms of criteria that should be discoverable in

the archaeological record. Though modified by Green, the model is nevertheless applied in some detail to the New Zealand situation. He uses it to characterise in terms of settlement pattern the three early phases of his cultural sequence (Settlement, Developmental, Experimental) and to propose, in the same terms, two later ones. (Proto - and Classic Maori).

Green suggests that the arrival of the first colonists on the New Zealand scene would put a small number of people in a situation where on the one hand group size restricted the type of social unit that could be formed, on the other hand there would be initially few restrictions to movement in the course of exploiting the rich resources of the new land. He suggests therefore that the Settlement Phase in New Zealand prehistory might be characterised by camp type settlement in which all the activities of the group should be represented. Substantial houses are not under the circumstances likely (Green 1963b: 32, 102).

With population expansion, modification of the environment and competition for its resources, the free-wandering phase might be expected to give place to centrally based wandering where there is movement within a defined territory for part of the year, settlement at a centre for the rest, especially when agriculture starts. Evidence for more substantial housing is to be anticipated, as well as layering in refuse deposits (Developmental and Experimental Phases) (Green 1963b: 34, 36, 100, 101).

The growing importance of agriculture with the need to support an increasing population at a time when other resources are depleted leads to a certain measure of stability of settlement within an area. Because of the shifting nature of kumara cultivation, settlement is of the semi-permanent sedentary type, that is, villages are established in successive locations, occupying each for a period of years. Specialised types of sites are to be expected, away from the village, (e.g. agricultural, fishing), and residential patterning within it (Proto - Maori Phase) (Green 1963b: 37-8, 99-100).

With agriculture well-established settlement of the differentiated, simple nuclear type might be expected to emerge in favourable localities. This means that permanent settlement is possible in villages in which internal differentiation is to be anticipated and to which satellite communities are linked (Classic Maori Phase) (Green 1963b: 39, 99).

The postulation of a free-wandering stage in New Zealand prehistory is open to criticism on theoretical grounds: it would seem to require the reinvention of Polynesian forms of organisation by subsequent generations. It certainly requires far more evidential support than can currently be found for it. It would need an extremely depleted colonising group indeed for the residential practices of a prior existence to be completely abandoned. After all the new arrivals were sophisticated in a range of subsistence activities, especially fishing, and, even with agriculture (whose absence or unimportance cannot be taken for granted), the resources of the new country might be expected to support, and habit would surely have encouraged, a much more stable existence than postulated. In these circumstances substantial houses might well be anticipated from the beginning of the record, particularly in view of the colder climate of the new homeland.

At Tairua the failure to find evidence of substantial housing - or of agriculture - is not convincing in view of the limited excavation. The effective arguments for the character of the Settlement Phase derive partly from the single occupation which the site represents during moa-hunting times, partly from the full range of activities which it records on the spot - cooking, eating, manufacture. The contrast with the homogeneous middens of later sites, like those on Kauri Point, characterised by shell and little else, is a marked one and obviously significant.

However, other evidence gives cause to doubt whether the difference is due to camp settlement on the one hand and village settlement on the other. The Opito beach midden, which provides evidence of a range of activities similar to the Tairua site, is plausibly correlated with a settlement on Skipper's Ridge, with houses and associated storage structures interpreted as evidence of agriculture.

Skipper's Ridge is attributed (with the Opito beach midden) to the Developmental Phase by virtue mainly of its faunal associations. In terms of its settlement characteristics it might equally well be attributed to the Proto-Maori Phase (Parker 1960, 1962). It exhibits evidence of agriculture and at least three periods of occupation at the one spot. Excavation uncovered but a fraction of the settlement: Parker's initial test squares showed that even at the earliest period structures covered a considerable area (Parker 1959). Residential patterning seems to be indicated. The beach front site might be looked upon as the scene of specific activities away from the village.

The possibility of this type of confusion in attributing sites to phase by Green's criteria rests in the evolutionary assumption on which his scheme is based. This involves the view that development takes place from the simple in the direction of the more complex. The belief that this is an appropriate reading of the New Zealand situation is encouraged by the small size of the population that initiated New Zealand prehistory and the adjudged nature of its economic pursuits - agriculture absent or unimportant. The phases through which New Zealand development are then seen as passing - growth of population, competition for and territorialisation of depleted resources and, where possible, development of agriculture - recapitulate in a way stages in the evolutionary history of human society as a whole and suggest the appropriateness of a universal model of cultural evolution to New Zealand circumstances. This model defines its evolutionary stages in terms of complex and interdependent phenomena, a certain ecological situation, a certain form of subsistence activity, a certain level of population implying a certain pattern of settlement and a certain size and character to its units. Cultural characteristics are postulated for the phases of New Zealand prehistory by reference to appropriate stages of the universal model.

As we have seen, however, in our Opito-Skipper's Ridge discussion, such postulations fail to measure up to the evidence, where this exists to test them. The fact is that only the particular interpretation of the New Zealand data favoured by Green allows a reading of the New Zealand situation in terms of a general model of cultural evolution.

In illustration we may take his basic assumption that agriculture becomes important in New Zealand prehistory only as other resources become impoverished. To agree that it becomes more important in these circumstances is not to concede that it was unimportant before. The Opito sites, the beach midden rich in fauna and the ridge settlement with food storage pits, provide an apt illustration of this point: whether agriculture, with or without the kumara, was an original introduction is in this light irrelevant.

Agriculture would allow stability of settlement, village organisation and the like independently of what was happening to other food resources. The changes that are evident in midden composition might then be viewed as reflecting not a fundamental alteration in settlement type but a dramatic shift in the protein basis of the diet. By this interpretation the place of moa and sea mammal would be filled by a necessarily massive exploitation of the abundant sand and mudflat bivalves whose very disposal would create the uniform and homogeneous middens of later sites.

This argument should not be read as contesting the thesis that cultural phenomena are interdependent. Indeed Green's concern with interdependence in the data of New Zealand prehistory is another of the salutary lessons he has taught us. The danger comes when the nature of such interdependence is assumed and the assumptions are built into the definitions of basic archaeological units. Thus in Green's scheme Proto and Classic Maori are defined in terms of settlement and sociological features the evidence for which is not established and which, by the logic of evolutionary assumptions made, are considered inappropriate for any earlier stage of the sequence.

The Definition of Aspects and Phases

Green has offered a division of the prehistory of the Auckland province into five phases. If the criticisms made in the foregoing are valid, the characterisation of those phases is in need of revision. Indeed the very status of some might be called into question: thus in terms of the limited criteria offered - faunal and agricultural - there is little left in the Experimental Phase that might not be equally well attributed to the Proto-Maori.

The important thing, however, is that by directing attention particularly to faunal changes Green has not only documented a chapter of extraordinary and general importance in the Polynesian settlement of New Zealand, he has also made possible a finer sub-division of a regional sequence in terms of phases. With the framework thus provided it should be possible to begin to study changes in other items of culture including portable and non-portable artefacts. Changes in different elements of culture should not of course be expected to take place at a uniform rate: it may well be that aspects, as the expression of the regional identity of archaeological materials over a period of time within which no appreciable change takes place, will, where now defined by one set of criteria, be reformulated in terms of another.

The phase concept was introduced as an ordering of culturally similar aspects below the level of culture itself (Golson 1959: 32-3). Green has alternatively expressed it as defining an inter-regional stage in cultural development (Green 1963b: 90). Though I have queried on a number of grounds his characterisation of these stages in cultural evolutionary terms, the processes of ecological change and agricultural adaptation which he has emphasised will be sufficiently similar over a wide enough area to provide the framework for the correlation of aspects whose regional ordering will depend partly on the same criteria. Growing refinement in the definition of aspects in more specifically cultural terms like the form of houses, types of storage structure, and details of artefact typology will help to disclose the complex processes underlying the broad parallelism of regional development. Thus the settlement phase in area Y may be inaugurated by colonisation from area X by the evidence of close and specific cultural similarities. The regional aspect of the Settlement Phase in the newly colonised area will owe some of its characteristics to adaptations and innovations already accomplished in the home area. This in fact is what we might expect of the process of internal colonisation. As Green suggests, when this stage of analysis is reached, aspects will be carrying the burden of interpretation (Green 1963b: 31). The phase, useful as an operational tool at an earlier stage in research, may disappear as such; its substance will remain as one sort of generalisation about the nature of New Zealand prehistory.

Conclusion

Everyone who has ever generalised about the data of New Zealand prehistory has done so from some theoretical standpoint. Von Haast in the very early days applied the then new concepts of palaeolithic and neolithic to the limited evidence as he saw it. Skinner used the culture area model developed in studies of the American Indian to the totality of New Zealand Polynesian material culture in the absence of any information about cultural chronology. Duff showed that Skinner's Southern and Northern Cultures were in essence the two ends, Moahunter and Maori, of a sequence of cultural development, the mechanism of which was, after an essentially biological model, looked upon as adaptive and non-adaptive change in an isolated and unique environment. Golson was concerned to provide a flexible framework and unambiguous nomenclature for the ordering of the prehistoric data in time and space, without prejudice to their ultimate interpretation. Green took that framework and, as we have seen above in some detail, applied it to the entire range of the prehistoric evidence interpreted in the light of models of cultural ecology.

Each worker has used some formulation current at his time to read the significance of the cultural data before him. With time the data have increased in quantity and precision and the available formulations, with the growth of the anthropological sciences, in number and sophistication. In these circumstances new syntheses of the material are not only bound to appear: they are essential to the healthy development of the subject. They build on what has been achieved but extend the frontiers. We must expect, and hope, that this process will continue.

The soundness of any theory at any stage is to be judged by various criteria - its

compatibility with other knowledge, its fertility in testable consequences, its economy of means. By these and any other standards, what I have called Green's colonisation model is the most illuminating productive and elegant by far of any that has been applied to the New Zealand data. It has opened new areas of evidence previously unavailable and made more sense of the data employed in previous formulations.

The other elements in Green's scheme I find unsatisfactory, in the main because they do not fit the facts as we accept them. Discussion of the points at issue has emphasised the importance of studies of agriculture and settlement type. The investigation of structures, to which increasing attention is now being paid, is vital in this regard. Valid interpretation of settlement sites, however, depends on extensive and costly area excavation, which cannot be often or lightly undertaken. Herein, however, lies the key to much that at present is obscure or in dispute.

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