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ACKNOWLEDGMENTS

This synthesis of the excavations at Tairua was undertaken in the course of research into stone flaking technology and usage in the Archaic period. It is based on published articles, conversation with, and unpublished documentation (site plan and the data on activities) made available by the principal excavator, Roger Green. The readiness with which Green made this material available is greatly appreciated.

TOKOROA MOA-HUNTER SITE, N 75/1

Garry Law

Summary

The excavation of a small site used for hunting moa is reported. The site contains some structural evidence, obsidian artefacts, and Archaic adzes while faunal remains are restricted to one species of moa. Soils evidence suggests the site was formerly forested and occupation took place before a later soil formed under scrub. The function of the site is discussed.

INTRODUCTION

The site, situated on a small stream flat, within a bend in the stream, is about half a mile west of the outskirts of Tokoroa (Figs. 1 and 2). The stream has a strong perennial flow and runs through gently rolling farm land about 300m above sea level. A little above the site the stream has been dammed to a height of about 2m and flows over a concrete weir. The farmer, Mr Davey, found the site over 30 years ago while ploughing, when he found a number of adzes and observed many obsidian flakes.

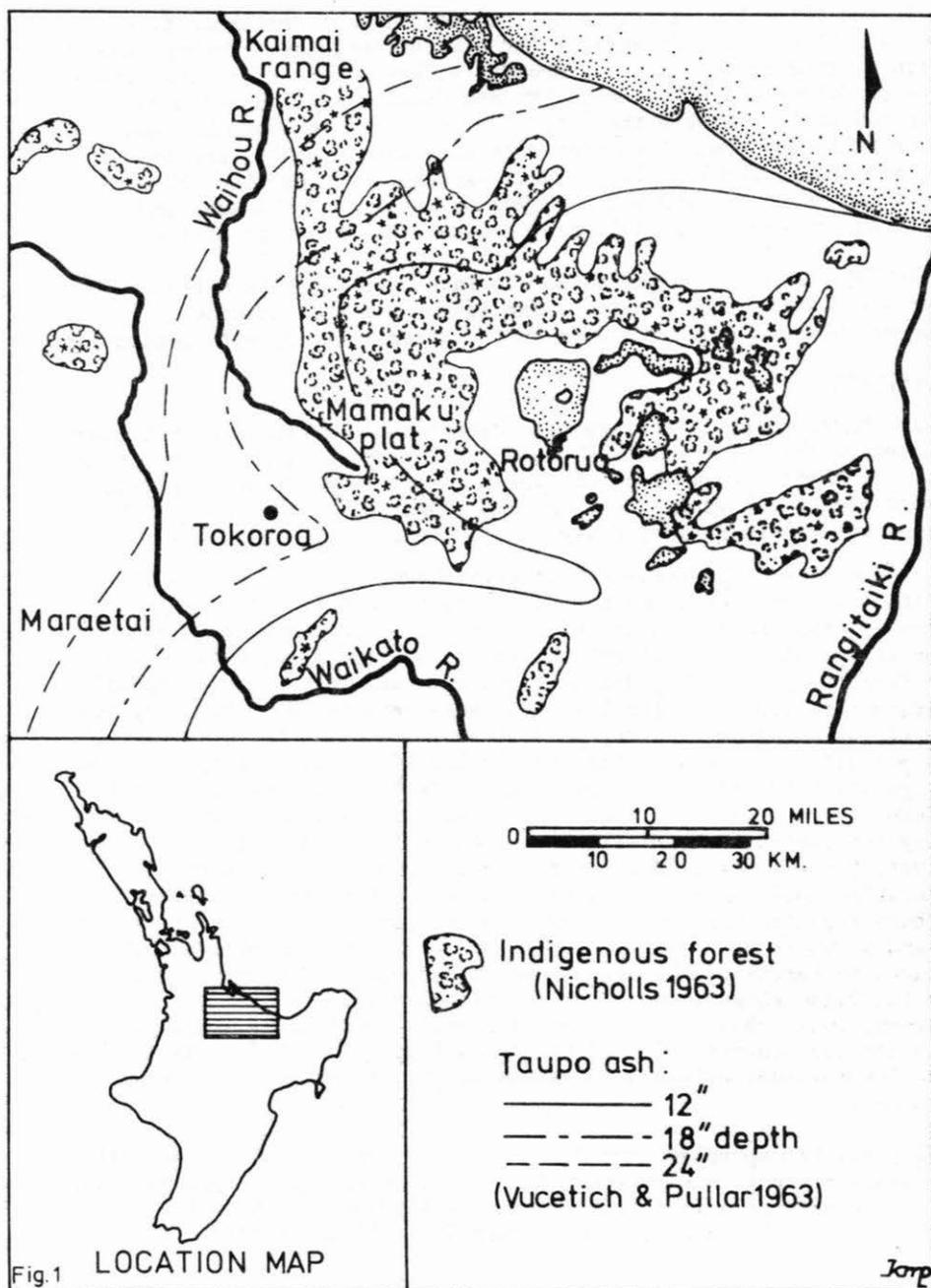


Fig. 1. Location Map, Forest and Ash Shower Boundaries.

In the 1950s the site came to the attention of Professor K. B. Cumberland of Auckland University through the fortunate circumstance of his son working on the farm. Through Professor Cumberland and (then) Messrs J. Golson and R. C. Green, Mr Rod Cook, a local amateur, was encouraged to investigate the site. This he did in September and October 1961, and these investigations have been reported previously (Cook and Green, 1962). The squares excavated on the site (Fig. 3) were worked on in May and October 1962 by members of the Auckland Society and members of a field school under the direction of Green.

In 1971 Green asked the author to take over the site notes and analyses and write this report. The author visited the site in September 1972 and added the data on the adzes in Mr Davey's possession.

SURROUNDINGS

The basal rocks in the area are Pleistocene ignimbrites, but these have been mantled by the late Pleistocene and Recent ash showers of the area. Some picturesque tors of ignimbrite still protrude in places. The most recent ash is of the Taupo ash shower suite of 1819 ± 17 BP (Radiocarbon determination, Healy *et al.*, 1964: 34).

At the site it is evident that this shower fell hot enough to burn the existing vegetation as the ash contains charcoal fragments. Tokoroa is near the limits at which it has been suggested this ash shower killed all forest (Vucetich and Pullar, 1963: 66, 67). It is clear from the generally podsolised soils formed on the Taupo deposits that forest returned to almost all the area devastated by the eruption. The earliest European records, in contrast, indicate that only part of these podsolised soils were forested in the 19th century (Fig. 1), and the vegetation in the area at European contact would have been scrub and fern. The clearing of these post-Taupo forests is therefore usually attributed to Maori-lit fires (Nicholls, 1963: 58; McKelvey, 1953: 444-5; Vucetich and Pullar, 1963: 71). Forest regeneration could occur only where repeated firing was inhibited. Elsewhere repeated burning retained the vegetation of the colonising fern and scrub sere. Although there has been some suggestion that podocarps in forest nearby are not as active colonisers now as shortly after the Taupo shower, due to disadvantageous climate change (McKelvey, 1953: 446), other types of forest associations are still viable and the non-retention of forest must be attributed to man, aided by the low moisture retention of these soils, rendering the vegetation fire prone.

Tokoroa is separated from Rotorua by the Mamaku Plateau, and from the Waikato River in the west by rolling country. It is approximately at the mid-point of a line from Arapuni to Atiamuri, both on the Waikato River, but the river itself runs 20 km to the west.

Fig. 2. Site location and Square positions.

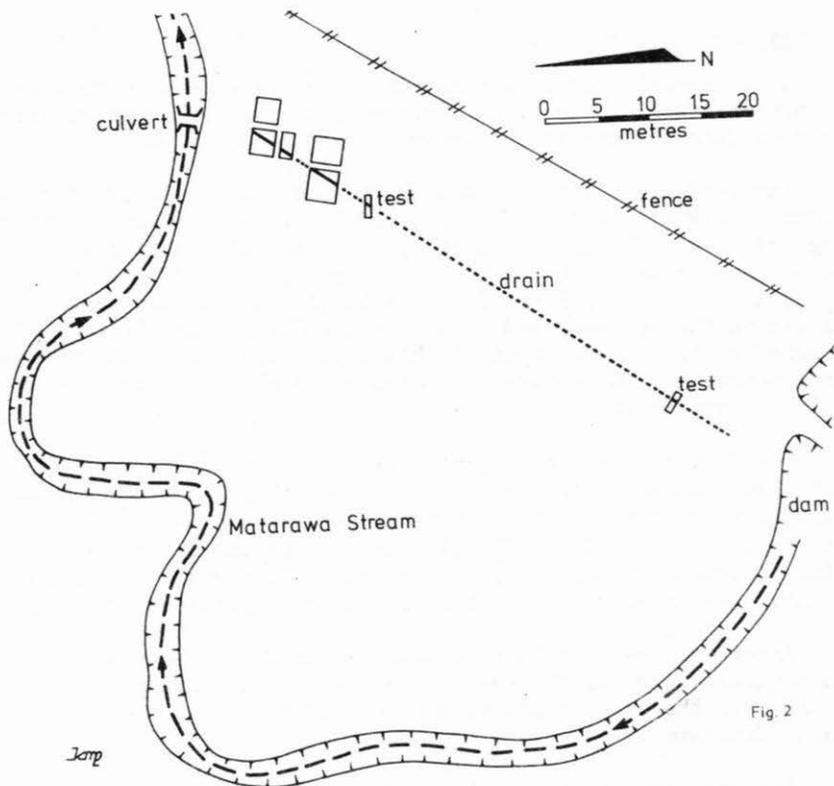


Fig 2

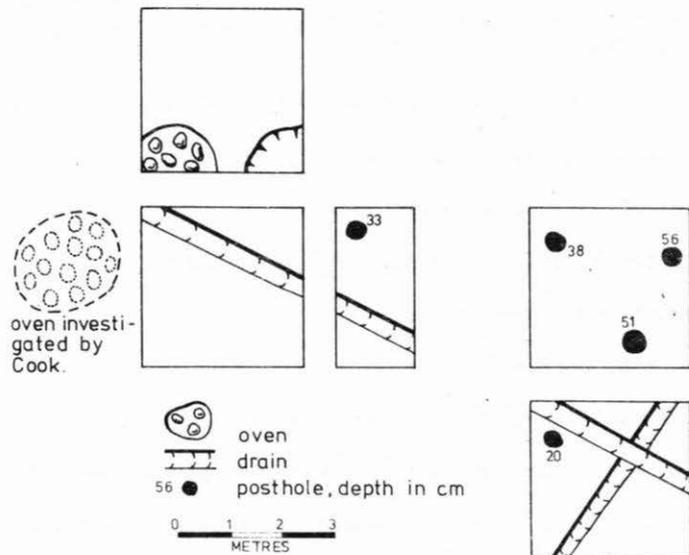


Fig 3

Fig. 3. Site plan.

EXCAVATIONS

Cook concentrated on the margins of a track leading down to a culvert crossing of the stream, clearing an oven and straightening and recording the section on the west side of the track.

The 1962 excavations consisted of four and a half 10 ft squares (3.05m), excavated within a 12 ft grid to the south side of this track (Fig. 3). The cultural stratigraphy of the site is simple with all the cultural material being found in a ploughed topsoil of about 100mm depth, with the exceptions of the fills of the two oven depressions, one within the squares, and a further shallow pit at the base of this ploughed soil. At the base of this layer, apart from the oven and the other depression, were five postholes and a shallow drain with a deeper drain cut across it.

The deeper drain was about 400mm across and 600mm deep and had a flat floor and near vertical sides. Following the line of this drain, two test pits were dug, both of which intersected it and demonstrated its linearity (Fig. 2). The site did not continue into these test pits. From its form, and possible association with the dam on the stream, it is felt this is a European drain predating the ploughing.

Artefacts and bone were recovered both from Cook's excavation and the squares. Ignembrite oven stones were noted but not further studied. The fill of the oven excavated by Cook had the oven stones still in place (diagrammatic section, Fig. 4b).

The section recorded in the underlying layers indicated the history of the site prior to occupation. The stratigraphy was as follows (Fig. 4a):

1. Disturbed topsoil with ignembrite oven stones and lapilli inclusions.
- 2a. Fill of hangi (see Fig. 4b).
- 2b. Pocket of Taupo ash, bright yellow.
- 2c. Disturbed lens of mixed yellow Taupo ash and black topsoil.
3. Fine soil and lapilli, grey.
4. Taupo ash, deep yellow.
5. Coarse lapilli with few fines, stream deposited.
6. Ditto, more fines and cemented with feruginous deposit.
7. Fine sand derived from Taupo ash and stream deposited.
8. Taupo ash, subaerial deposit.

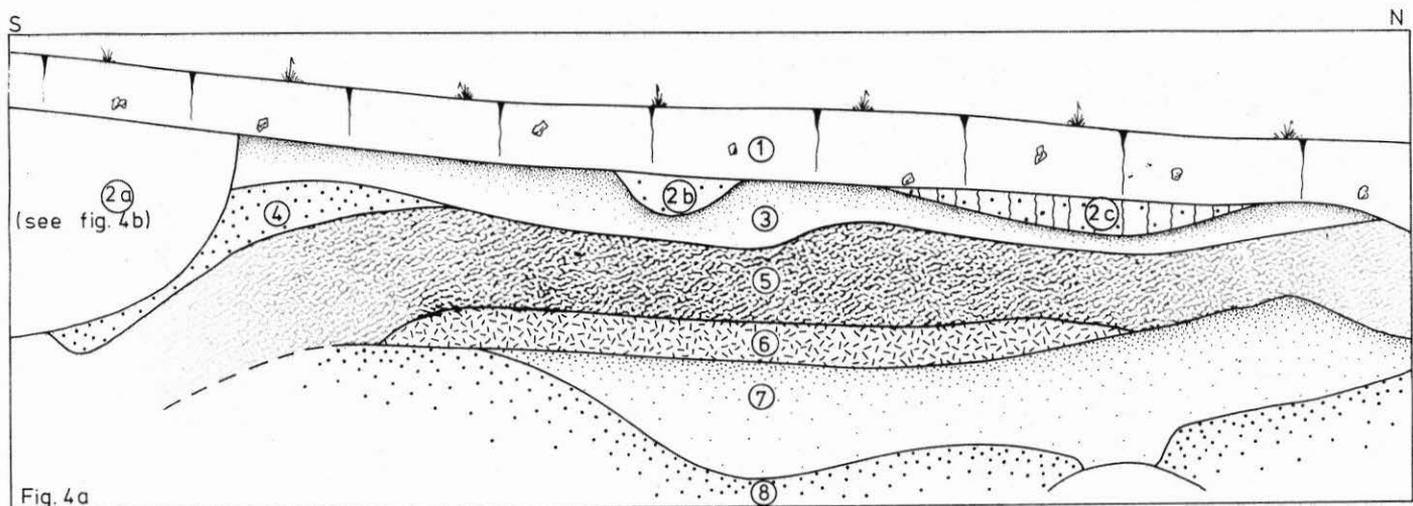


Fig. 4a

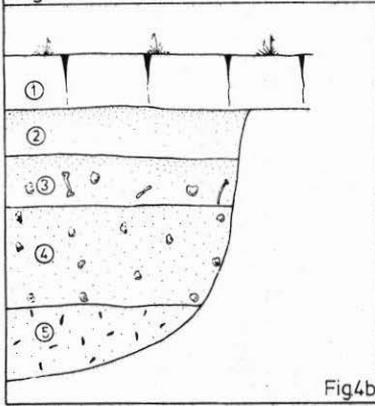


Fig. 4b

SECTION LOOKING WEST

Jump



- | | | | |
|--|--|--|--------------------------------------|
| | Topsoil ① | | Disturbed topsoil with oven stones ① |
| | Ash ② | | Fill of haangi ②a |
| | Ash with bone & stone ③ | | Taupo ash ②b |
| | Ash and stone ④ | | Disturbed Taupo ash & topsoil ②c |
| | Ash and charcoal ⑤ | | Grey soil & lapilli ③ |
| | fig. 4 b | | Taupo ash deep yellow ④ |
| | Same, cemented with feruginous deposit ⑥ | | Coarse lapilli stream deposited ⑤ |
| | Fine sand stream deposited ⑦ | | Taupo ash subaerial deposit. ⑧ |

Figs 4a and 4b. Sections.

The interpretation of this section was made with the help of Mr R. McQueen of N.Z. Forest Products, Tokoroa. Layer 1 is clearly a plough-disturbed topsoil, while layers 2a to 2c are cultural disturbances dating from the site's occupation. Layer 3 is a leached zone of the underlying Taupo layers, 4 and 5, while layer 6 is a lens formed by the deposition of materials leached from above. It is evident from the manner of the cultural disturbances cut into layer 3 that it was formed prior to the site's occupation rather than as a result of a soil development after occupation. The modification of the series from 3 down is believed to be a podsol soil formed under forest, most likely rimu (Dacrydium cupressinum) forest typical of the area and a strong podsoliser of soils.

Away from the site where ploughing has not taken place the soil shows a profile indicating the addition of a dark topsoil typical of bracken fern or scrub, but still with the underlying podsol features preserved, indicating the sort of vegetation which replaced the forest.

FAUNAL MATERIAL

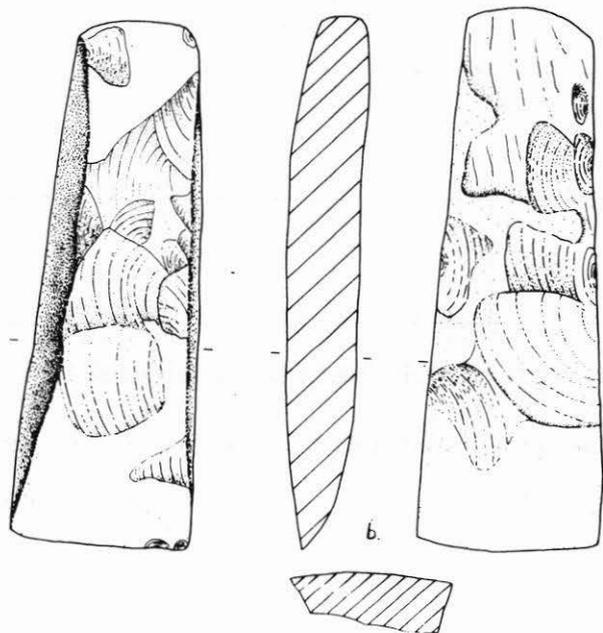
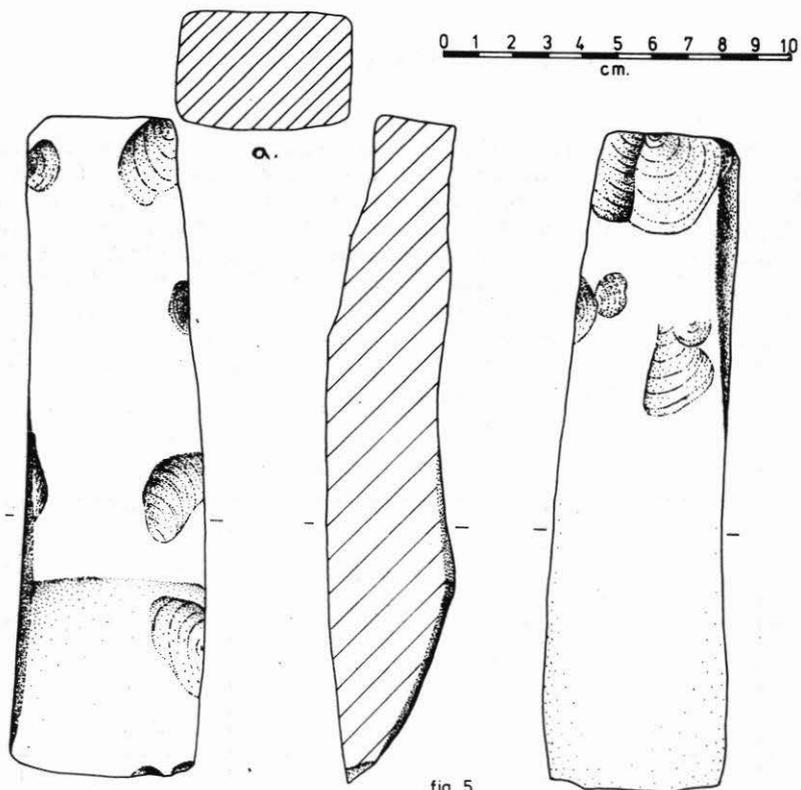
Apart from two sheep bones from near the surface of the ploughed layer, the only faunal material from the site was moa bone, some from the second layer of the oven fill, but most from elsewhere in the excavated squares. The latter was much broken, undoubtedly helped by the ploughing. The bone was identified by R. J. Scarlett of Canterbury Museum as Euryapteryx exilis, a relatively small moa. He thought the bone from the oven was not quite mature. There was one repeated bone (right tibio-tarsus, proximal part) in the bone from the squares. This would indicate a minimum of at least two birds were present and possibly three, if the bird bone from the oven was immature.

The identified bone material was dominated by leg bones but the presence of fragments of pelvis and two phalanx (toe bones) as well as the presence of bone in the oven makes it highly unlikely that the bone was industrial.

ARTEFACTS

The farmer, when he ploughed the site, found a number of adzes, (he believes six) but all except two have been dispersed. The two still in his possession (Fig. 5) are both made of a fairly light-coloured, fine-grained metamorphic rock and finished by hammer dressing and partial polishing. Both can be fitted within Duff's classification as types 1a (Fig. 5a) and 2a (Fig. 5b), (Duff, 1956: 146-163).

Also in the farmer's possession was a large core of Mayor Island obsidian, of largest dimension about 120mm and irregularly worked.



Figs 5a and 5b. Adzes from N75/1.

From the excavation the only artefacts are obsidian flakes, and flaked pieces. A total of 510 pieces were recovered, of which 479 or 94% were green in transmitted light, a feature which usually corrolates highly with obsidian of Mayor Island origin. The origin of the remaining pieces has yet to be determined. A cumulative percentage weight graph for this material is shown in Figure 6. Twenty-nine cores were recognised in the obsidian, all of Mayor Island obsidian. The absence of cores of the other obsidian is not statistically significant (Binomial theorem). This material is available for more sophisticated study by any interested student.

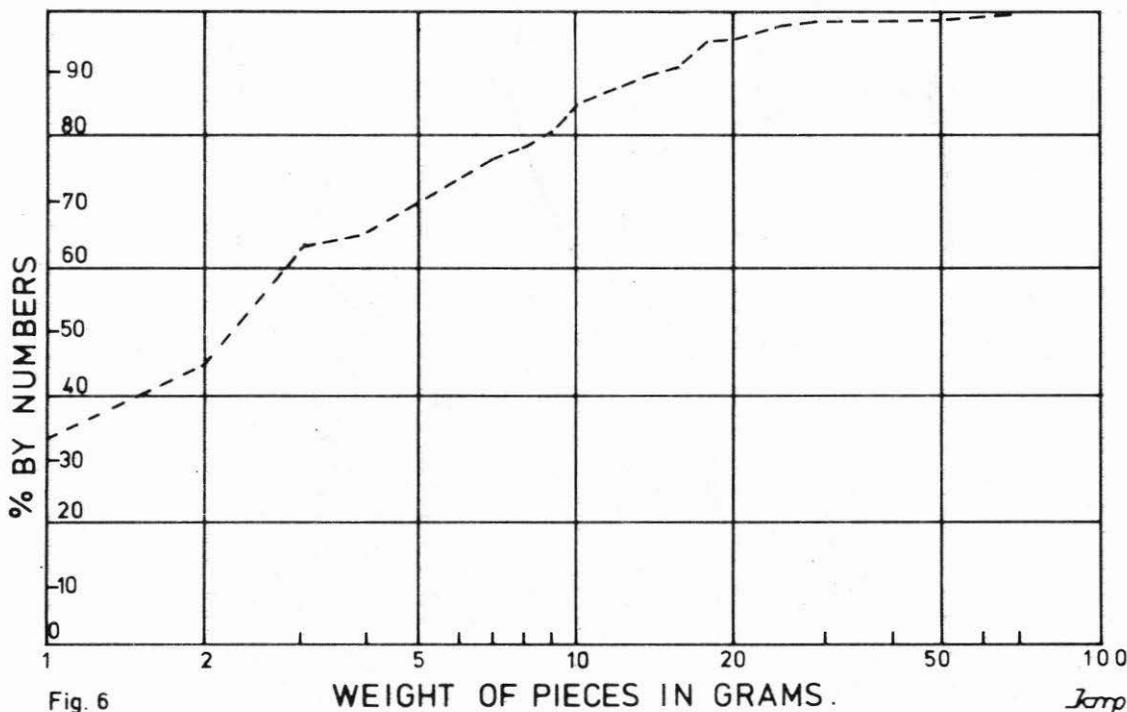


Fig. 6

WEIGHT OF PIECES IN GRAMS.

Jmp

Fig. 6. Cumulative percentage distribution of weights of obsidian pieces.

Hydration rims have been measured on one flake from this site (A.U. Catalogue 513/3), (Green, 1964: 135). The readings were taken on a section showing five surfaces. The average of 26 readings spread over these surfaces was 1.268 ± 0.024 microns. The error is the standard error of the mean. However, two adjacent surfaces, opposite the surface which formed the bulb of the flake, had higher readings than the others, statistically significant at a "probably significant" level. These may have been formed earlier than the use of the obsidian on this site, or possibly are oblique readings.

Rejecting these, the remaining 19 readings average 1.220 ± 0.021 microns. These are on average thinner, suggesting a more recent age than those from Opito (N40/3), Tairua (N44/2), Sunde Site (N38/24) and the western midden at Harataonga Bay (N30/5) which are all Archaic midden sites. The growth rate of the rim is dependent on temperature, and as all these sites are at sea level and in sand, and as soil temperatures at Tokoroa may be lower, this site may be nearer to equivalent in age to those above.

DISCUSSION

The structures found in the excavation clearly mark the site off from a mere "kill" site. The substantial postholes and the drain indicate some reasonably permanent structures stood on the site. The quantity of obsidian flaked on the site suggests that whatever economic activity it was used for, it was fairly prolonged. Finally, the loss or discarding of adzes is not an event one would imagine occurred commonly, although there is the possibility that the adzes had been "cached" and were thus only one act of dispossession.

Against these indications of some length of occupation, we must place the lack of evidence for any widely-based food-gathering, and hunting for only one food species, that of moa, is represented in the site.

It is clear from the soil evidence that the occupants of the site arrived after the Taupo ash soils had been colonised by forest and if they arrived after that forest had been converted by fire to scrub, then they could not have been long after. Indeed, one must suspect that the occupiers of the site were among those to start the reversion to scrub. This suspicion, however, must rest on the presumed early dating of the site. The presence of moa in a site must demand a reasonably early date, although here, near the middle of the North Island, not as early a date as we would require elsewhere in the Auckland Province. The two recorded adzes are clearly Archaic. While the late persistence of some Archaic traits is being demonstrated in some areas of the North Island

(see Green, 1972: 27-29 for discussion), these give the appearance of being in isolated groups. The possibility from these two lines of arguments, then, is that the site was used by a late, culturally backward group, living isolated in the area. This interpretation, however, is difficult to reconcile with the lack of any evidence for a broad economic base, and particularly difficult to reconcile with the obsidian evidence. Two sources used in prehistoric times occur closer than Mayor Island, those at Maraetai and Taupo (Green et al, 1967).

A group entirely resident in this area would be most unlikely to have left a deposit containing 94% Mayor Island obsidian. With the Western Bay of Plenty being occupied by "pa-using", and thus presumably war-like people, from at least the 15th century on (C14, Polach et al, 1968), the procurement of Mayor Island obsidian by any culturally backward group must be unlikely. The almost exclusive use of Mayor Island obsidian by any early group is, on the other hand, entirely in line with prior experience of early sites (Green, 1964). Taupo obsidian does appear in a coastal Archaic site, its having been recognised, though not with complete certainty, in a site at Palliser Bay, dating from about A.D. 1350 (C14, B. F. Leach, pers. comm.). Armitage et al (1972: 418) show it was appearing in the Waikato by 1700 A.D., but the failure of the users of this site to exploit it in preference to Mayor Island need not be lack of knowledge, rather that they were a group in transit from some direction other than the area of that source. The obsidian fringe measurements would allow a date as late as the 15th century, but as suggested, the comparability with other sites can be called to doubt and the date may be considerably earlier.

Finally, in the Whakamoenga Cave (N94/7), at Taupo, there is evidence of moa-hunting in its lowest levels and associated carbon dates, which suggest an early date (Hosking, 1962). Obsidian from the local Whangamata source was in use at this site from its first occupation.

In date, the occupation at N75/1 is limited by the development of forest on the Taupo ash at the lower end, and about 1400 A.D. at the upper, based on comparative arguments from sites dated by radiocarbon. The moa material is too fragmentary for precise identification.

It has been suggested that moas failed to recolonise the area disrupted by the Taupo ash shower (Archev, 1941: 92) and indeed that this was one of several deterministic reasons advanced for their extinction, as opposed to extinction caused directly or indirectly by

man, a belief that is now current (Fleming, 1962; Green, in press; but see also Williams, 1962).

Moas certainly occupied the area after the eruption, and no doubt before. Vaile (1939: 158) records the recovery of bones from nearby, but it is not clear if they predate or postdate the eruption. Bones of Pachyornis mappini and Dinornis sp. have been found postdating the shower near Taupo (Anon., 1963), while Hosking (pers. comm.) has found similarly positioned remains of Anomalopteryx didiformis at Tokaanu and has heard of earlier finds in the area. Clearly, then, at least four species of moa re-occupied the area devastated by the eruption.

This site and Whakamoenga provide evidence to show this recolonising extended into the period when man penetrated the area.

Finds of moa skeletal material are rare in the North Island outside dune areas and limited localities with limestone caves and calcareous swamps. Bones incorporated into human occupation sites is the other main occurrence. Caution should be used in interpreting frequency of sub-fossil remains, from other areas, for differential survival is clearly involved.

In accordance with Simmons' thesis (1968) that moa exploited predominantly a forest niche, the presence of moa in the regenerated forest would be expected. The few bones known only from two human sites hardly constitute any evidence for a substantial population of moa attracting human predation. If large numbers were involved, blame for the subsequent local extinction of moa must largely be attributed to environmental modification by man, rather than his predation. If, on the other hand, the spread of the forest reduced the extent of the environment niches capable of supporting moa, a delimited and small population of moa would be readily exterminated by direct predation, and leave little trace of that predation.

Tokoroa is one of three early sites known from the interior of the North Island. Its interpretation leads to discussion of the nature of inland occupation. In the South Island, Ambrose (1968), has argued for the economic unimportance of inland areas to the earlier inhabitants and gives evidence (Ambrose, 1970: 433-5), that sites in the Waitaki Valley were occupied briefly, and only before the local forest was destroyed, probably as a result of just that occupation.

At Oturehua (S34/1), however, Leach (1969: 71) has suggested more permanent settlement, associated with radiocarbon dates of A.D. 1053 ± 27 and 1023 ± 82 , although here a rock quarry may have acted in attracting a more permanent settlement to such a valuable resource.

In the North Island, unlike the South, parts of the interior were eventually permanently intensively settled, but on present evidence the derivation of these inhabitants from any Archaic settlement of the interior is unlikely. The few North Island inland Archaic sites can be best seen as the result of occasional visits from inhabitants of the coast, and we might suspect the Archaic economy was not viable permanently removed from the coast.

On a more speculative plane, reasons for their being any sites in the interior and in particular at Tokoroa can be suggested. The possessors of a culture which settled land over a vast area of ocean must be credited with an exploratory outlook. This must have led to some degree of transitory movements, even at some economic disadvantage, which continued until the settlers felt they knew the country. A group such as an extended family on foot could not travel quickly, and a protracted halt could be necessary for recuperation of the less fit members. A group which had travelled up the Waihou River by canoe and proceeded on foot down the west side of the Mamaku Ranges, could arrive at Tokoroa, as could a group striking eastwards across the southern edge of the Waikato at the foot of the ranges.

CONCLUSIONS

The Tokoroa site was one occupied for a period sufficiently long to require the construction of some substantial structures. The users of the site display Archaic traits and there are hints that they were not adapted for exploiting only the local environment but rather were in transit through the area.

When they were there, moa were available and used for food, and it can be inferred that forest was more widespread.

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REFERENCES

- Ambrose, W. 1968 "The Unimportance of the Inland Plains in South Island's Prehistory", Mankind, 6 (11): 585-593.
- 1970 "Archaeology and Rock Drawings from the Waitaki Gorge", Records of the Canterbury Museum, 8 (5): 383-437.
- Anon. 1963 "Further Moa Discoveries at Taupo", Historical Review, 11 (1): 50.
- Archev, G. 1941 The Moa. Bulletin of the Auckland Institute and Museum, No. 1, Auckland.
- Armitage, G. C.,
R. D. Reeves and
P. Bellwood 1972 "Source Identifications of Archaeological Obsidians in New Zealand", N.Z. Journal of Science, 15 (3): 408-420.
- Cook, R. and
R. C. Green 1962 "An Inland Archaic Site", N.Z. Archaeological Association Newsletter, 5 (1): 30-32.
- Duff, R. S. 1956 The Moa Hunter Period of Maori Culture. Government Printer, Wellington.
- Fleming, C. A. 1962 "The Extinction of Moas and Other Animals During the Holocene Period", Notornis, 10 (3): 113-117.
- Green, R. C. 1964 "Sources, Ages and Exploitation of New Zealand Obsidian", N.Z. Archaeological Association Newsletter, 7 (3): 134-143.
- 1972 "Moa-Hunters, Agriculture and Changing Analogies in New Zealand Prehistory", N.Z. Archaeological Association Newsletter, 15 (1): 16-39.
- in press "Adaptation and Change in Maori Culture" in G. Kuschel, ed., Biogeography and Ecology in New Zealand, Monographiae Biologicae, The Hague.

- Green, R. C.,
R. R. Brooks and
R. D. Reeves 1967 "Characterisation of New Zealand
Obsidians by Emission Spectroscopy",
N.Z. Journal of Science, 10 (3):
675-682.
- Healy, J.,
C. G. Vucetich and
W. A. Pullar 1964 Stratigraphy and Chronology of Late
Quaternary Volcanic Ash in Taupo,
Rotorua and Gisborne Districts.
N.Z. DSIR, Geological Survey,
Bulletin N.S.73, Wellington.
- Hosking, T. 1962 "Report on Excavation of Whakamoenga
Cave, Lake Taupo", N.Z. Archaeo-
logical Association Newsletter, 5
(1): 22-30.
- Leach, B. F. 1969 The Concept of Similarity in Prehistoric
Studies. Anthropology Dept,
University of Otago, Studies in
Prehistoric Anthropology, Vol. 2,
Dunedin.
- McKelvey, P. J. 1953 "Forest Colonisation after recent
Volcanicity at West Taupo",
N.Z. Journal of Forestry, 6 (5):
435-448.
- Nicholls, J. L. 1953 "Volcanicity and Indigenous Vegetation
in the Rotorua District",
N.Z. Ecological Society Proceedings,
10: 58-65.
- Polach, H. A.,
J. Golson,
J. F. Lovering and
J. J. Stipp 1968 "ANU Radiocarbon Dates, List II,
Radiocarbon, 10 (2): 196-197.
- Simmons, D. 1968 "Man, Moa and the Forest", Transactions
of the Royal Society of New Zealand,
General, 2, No. 7: 115-127.
- Vaile, E. Earle 1939 Pioneering the Pumice. Whitcombe & Tombs,
Christchurch.
- Vucetich, C. G. and
W. A. Pullar 1963 "Ash Beds and Soils in the Rotorua
District", N.Z. Ecological Society
Proceedings, 10: 65-72.
- Williams, G. R. 1962 "Extinction of Land and Freshwater
Inhabiting Birds of New Zealand",
Notornis, 10 (3): 113-117.