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EXCAVATIONS AT BALD HILL, N.46-7/22, SOUTH AUCKLAND, 1968

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Abstract

A restricted excavation of a section of a complex of pits near Pukekohe, New Zealand, yielded data indicative of a storage rather than a habitation function. There was evidence that substantial storage racks had been constructed within a large subterranean structure. The relevance of this data to the problem of pre-European Maori agriculture in general, and kumara agriculture in particular, is briefly discussed, as is the relationship of this site to others previously published. There was evidence for the use of adzes in the digging of the pits.

INTRODUCTION

In April 1968, it was reported to the University of Auckland Anthropology Department that a complex of pits at this site some five miles south-west of Pukekohe (Fig. 1) was threatened by a proposal to develop a metal quarry on the hill on which they were situated. Mr L. M. Groube suggested to the present writers, at that time M.A. students of the university, that they should direct a small-scale salvage excavation of a limited number of the reported structures. The permission of the owner, Mr A. Hyland of Glenbrook having been obtained, a small group of members of the University of Auckland Archaeological Society participated in the excavation which was carried out in May 1968.

THE SITE

Rising 482 feet above sea level, Bald Hill is situated four miles from the Waiuku River arm of the Manukau Harbour from which water-way canoes are known to have been portaged to the Waikato River. Over these water-ways the site commands an unobstructed view. Geologically, the hill belongs to the late Pliocene Bombay basalts which are characterized by deeply weathered, well-eroded cones, with areas of poorly preserved coarse tuffs from explosion craters (Schofield 1967). The banded tuffs at the excavation site are well weathered, and while it is in no sense a

'soft' rock it is not so hard that it would have presented a very difficult task to the original excavators of the pits. The contours of the hill are well-rounded, although on three sides there are steep slopes to the flat land below. The spur running to the north however is less steep, and some 100 yards from the pit complex it is cut off by a ditch and bank fortification which then extends in a general rectangular pattern to enclose a relatively large area of evenly contoured land on which there are some surface indications of further pits. These however are indistinct as the area has been extensively ploughed.

A total of 11 pits were discernable on the northern side of the crown of Bald Hill itself, although two of them were rather indistinct (Fig. 2). All had been partly filled by natural erosion processes, and some had been utilized as convenient rubbish pits by later European occupants and farmers of the site. Pits 1, 2 and 3 were approximately 10 feet square; pits 5 and 8 were 18 by 12 feet; pits 4 and 6 were 24 by 18 feet; while pit 9 was a massive 27 by 24 feet. In addition, it was noted that pit 9 was drained by a deep ditch to the steep gully at its side, and that pit 4 seemed to have a similar feature, showing only as a small depression on the surface of the ground. It should be noted that in this report 'pit' is used to mean a depression of presumed cultural origin showing on the surface of the ground, while 'structure' is used to mean archaeologically defined evidence of sub-soil cultural activity. Because of limited resources of time and personnel, it was decided to excavate the set of pits 1-4 inclusive as these seemed to form a discrete unit within the larger complex. In addition, it was felt that they might provide some data as to the relationship and function of pits which were so obviously differentiated in terms of size.

THE EXCAVATION

A grid of four metre squares arranged so that the largest pit (No. 4) could be excavated by the quadrant method on this larger grid was laid out over the set of pits, and by quartering excavation squares B-6 and B-7 it was possible to include the investigation of pits 1 and 3 (Figs 2 and 3). Because of restrictions imposed by the factors of time and labour it was decided to determine the limits of the structures by trowelling, then to remove the bulk of the fill by spading, with trowels again being used for the final stages of the excavation. This approach was also facilitated by the structural simplicity of the infilling processes.

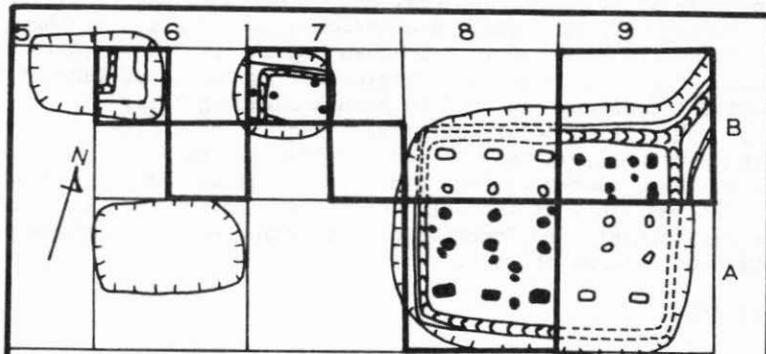
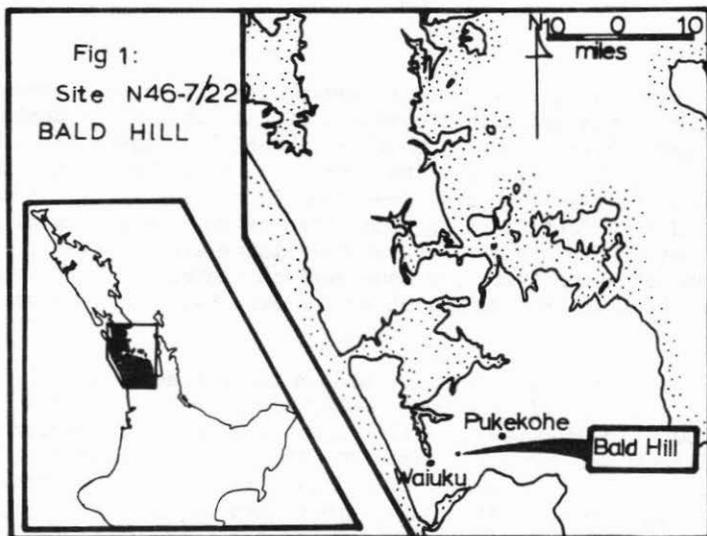
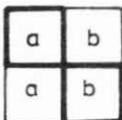


Fig 3:

Site N46-7/22 : BALD HILL

Excavated Area & Structural Features

0 1 2 3 4 5 6 feet



a: excavated area

b: non-excavated area

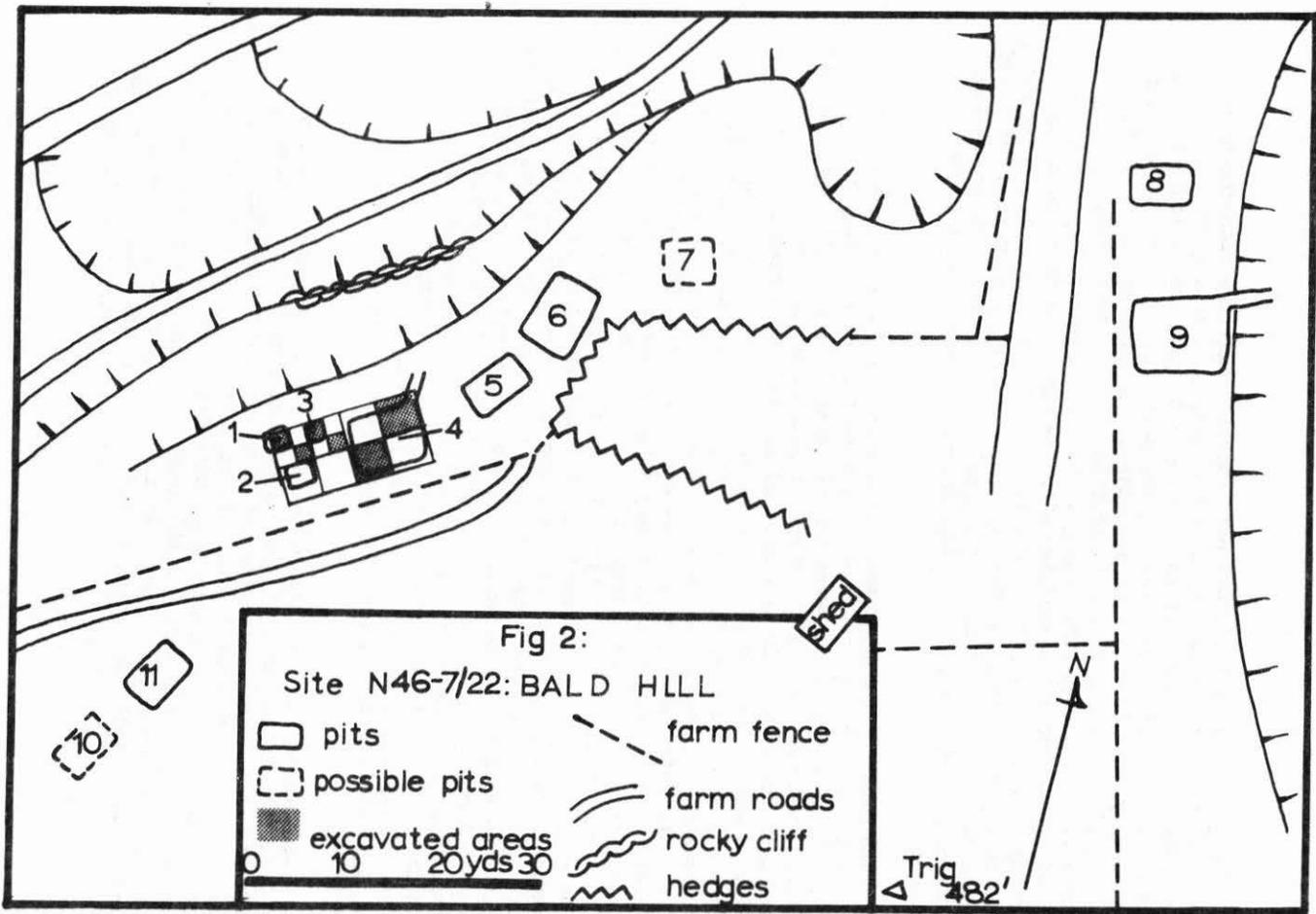
● posthole: excavated

○ posthole: postulated

▨ drains

⋯ surface pits

— structural feature



Pit 4: The fill of this pit indicated that the abandonment of the structure was followed by a period during which a quantity of earthy material eroded into the structure to give the typical sag-line profile of such processes, filling the post-holes and the corners and, less deeply, the floor of the structure. A later period of infilling associated with a fairly substantial fire left a dense layer of charcoal. It was at first thought that this may have represented a period of burning off associated with the commencement of European farming but, as the layer was not found in the infill of the other pits, it probably represents the burning off of combustible rubbish deposited in the pit at a later time. The final layer of infill of brown-black earth contained much metallic debris from the more recent European occupation.

The floor of the structure which consisted of a hard yellow clay-like material was easy to define, as were the features dug into it. Post-holes, some of which were almost three feet in depth, were clearly defined, and many showed the marks of pointed digging sticks. The holes, if the pattern in extrapolated to the unexcavated quadrants (Fig. 3) make a pattern of five rows of five holes each, although there are some holes extra to this set, and these may indicate some replacement or alterations during the period of use. A shallow drain of 10 centimetre cross-section had been dug around the perimeter of the structure, and then taken by a deep ditch at the north-east corner through the bank to the nearby gully. In the base of this drain the bite marks of the adze with which it had been dug could be seen. Particularly in the south-west quadrant of the structure were small discoidal depressions made in the floor by the pointed digging sticks with which the structure seems to have been dug. These marks indicate that this area of the structure had never been walked upon, either because the spacing of the posts did not allow for the passage of a human body, or because the use being made of the structure did not require the passage of persons over this area. Digging stick marks were clearly preserved in the back wall of the structure. There were no signs of fireplaces, nor of living debris on the floor of the structure.

As there would have been no need to employ 25 posts to support a roof for this structure, it would seem that some of the post-holes indicate an internal rack-like construction within the main structure. This differentiation of function is supported by the fact that the two outer lines of holes running longitudinally along the structure are somewhat larger than those of the inner lines and are generally rectangular in shape as opposed to the more circular profile of the inner rows. This would seem to indicate that the outer rows housed the roof support posts, while the inner rows supported the internal

construction. There were no holes indicative of posts to support a roof ridgepole, but these may have been placed outside the structure and therefore were not discovered, or, had the roof been flat or rounded, no ridgepole would have been necessary. As there was no living debris in the structure and, indeed, the forest of posts would seemingly preclude its utilization for habitation, it would seem to be a reasonable inference that the function of the structure was for storage, and that the postulated rack-like construction was to provide some form of shelving which would serve to increase the storage capacity of the structure, and also allow for a more efficient ventilation of the product being stored.

Mention must be made of a narrow slot, only two centimetres wide, which ran in a straight line through the whole length of the floor of the structure, and indeed continued through to the floor of the structure in pit 3. Where it bisected a post-hole it could be seen to extend to a greater depth than the hole itself. Because of this it was decided that the feature had geological rather than cultural origins.

Pit 3: This structure, which contained a mass of homogeneous brown earth indicative of a one-stage deliberate fill, had also been dug into the natural material of the hill. Again, the hard yellow clay floor, which measured approximately 6 by 7.5 feet, was easily defined, and in it were four holes and a shallow perimeter drain. Two of the holes were much deeper than the others, and were placed on the longitudinal axis of the structure, indicating ridge-pole supports. Of the others, one was also placed on the same axis and may have indicated an extra support or a replacement post, but the fourth hole was much more shallow and was placed closer to the side of the structure. Its function is enigmatic, although it may have been a sump hole, for there was no drain to carry water away from the structure. Again there was no fireplace, nor any cultural debris.

Pit 1: This structure, the precise dimensions of which were not obtained, was cut into a terrace which seemed to have been built up from debris excavated from other pits of this unit. Beneath the brown topsoil was a thick layer of yellow clay rubble, and it was into this material that the excavation had been dug. Showing at the side of the pit, but not present in the pit itself, was a dark buried soil horizon. On the north side, the floor of the structure was covered by a thin layer of yellow clay, apparently a second floor. If this is so, then it belonged to the same structure, or to one of identical orientation, as there was only one set of post-holes. Alternatively, the clay overlay may have served the function of providing a smooth surface over the original rubbly floor of the structure. As with structures 3 and 4,

there was a shallow perimeter drain. There was also a small irregular buttress on the east side of the structure. Because of the limitations of time, the excavation of this structure was not completed.

Pit 2: This pit was not excavated.

DISCUSSION AND CONCLUSIONS

While this excavation was too limited in scope to yield as much as might have been hoped of the data contained within the site, it has provided data bearing on some aspects of New Zealand prehistory. Initially there was the question of the temporal, spatial and functional relationships of the two forms of structure investigated. While it was not possible to show whether or not the structures formed an integrated and interdependent contemporaneous unit, it was felt that this must have been so. The fact that structure 1 had been dug into an artificial terrace composed of debris from the other structures does not necessarily place it in any great temporal isolation. In fact, it may well have been contemporary, the terrace having been constructed specifically to accommodate this structure. However, as a soil horizon appeared to have developed at Pit 1, and as that structure had been deliberately filled, in contrast to structure 4 which initially had only natural infilling, it may be that these smaller pits are in fact earlier than Pit 4, and that the rubble into which Pit 1 had been dug was derived from the building of structure 2. If this is so, then structure 2 would be the earliest of the elements in this unit, and structure 4 would be the latest.

It is clear that each of the structures had been roofed and that some pains had been taken to ensure that the floors were kept free of rainwater. However, there is no evidence to suggest that any of the structures were utilized for habitation, in which case their alternative use as storage facilities must be considered. Structure 3 may be little more than a bin storage pit, although Green (1963) has argued that such structures should not be too hastily so categorized merely on grounds of size alone. Groube (1964: 28) however cautions against this view on the grounds that as the dwelling unit is the key to all studies of settlement patterns, such units must be defined with extreme care. He holds that it is more dangerous to elevate structures to the status of dwellings on inadequate grounds than it is to consider them all as storage units. In the present instance, in view of the cramped accommodation the structure would have provided, and because of the total absence of living debris, we are inclined to consider that the function of this structure was that of storage. But structure 4 is

obviously a much more complex unit. As it is clear that the large number of internal posts indicated by the evidence would preclude any general freedom of movement within the structure, and as there was evidence that parts of the floor were seldom if ever walked upon, the suggestion made above that there was some form of internal rack system must be seriously considered. This would then clearly indicate a storage function for the structure. Law (1969: 225) in his study of the relationship of such structures (pits) to agriculture, points out that it would be necessary to demonstrate the (storage) function of the structures before they could be admitted as evidence of agriculture.

If, then, on the evidence presented, structure 4 is accepted as a storage structure, then we may attempt to answer the question of what was being stored. The literature in recent years (e.g. Green 1963: 68; Law 1968: 74; Bellwood 1970: 8, 14; Groube 1969: 33) records many statements of belief that the product being stored in such pits was in fact kumara, and most of these writers follow with the corollary that is indicative of gardening, specifically, kumara gardening. If this proposition is in fact valid, and we are cognizant of the contrary arguments put forward by Shawcross (1967: 330-352), then it would seem that at Bald Hill we have demonstrated this relationship of pit, storage facility, and by extension, kumara and agriculture.

This does not however answer the question of precisely why kumara needed such elaborate storage facilities. Groube (1969: 33) points out the need to protect the seed kumara from winter frosts, and the structures being discussed might very well serve this purpose, the warmer northwards-facing aspect of the hill having been selected purposely. Yen (1961: 339, 343) also discusses the need for relatively warm storage and high humidity conditions in the storage of kumara. In addition, it would seem that storage racks arranged on the rows of internal posts while serving to maximize the storage capacity of such a structure would also provide adequate ventilation so as to protect the crop against possible fungoid infection.

The recent excavation of a small complex of pits at Parnell (Law 1970: 93-103) has also demonstrated an association of pits devoid of all evidence of former habitation, from which it was concluded that the function of the pits was for storage of kumara. Further, the absence of habitation evidence both at Bald Hill and at Parnell contrasts markedly with the evidence obtained by Davidson (1970: 43-54 and 1970: 108-120) for her sites at Motutapu Island and Hamlin's Hill, and Leahy (1970: 65-80) for her Motutapu Island site. At all of these sites a variety of occupation debris was an integral part of the evidence obtained from the excavation of complexes of pits. This

points to an obvious differentiation of function not only for pits but also for sites, and this problem is obviously worthy of continued investigation.

A further point to note from Bald Hill is the evidence that the use of the adze in former times was not restricted to woodworking. The cutting edge marks noted in the drain in structure 4 add a further use category to those suggested by Taylor (1970: 86), and give support to Leahy's (1970: 74) suggestion of the use of adzes to excavate sub-surface structures.

ACKNOWLEDGMENTS

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