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# University of Auckland Field School Excavations at Waiwhau, 1987

Caroline Phillips

Anthropology Department, University of Auckland

## ABSTRACT

An archaeological field school run by Auckland University continued excavations at Waiwhau. Questions raised included: the extent of the site; the nature of the occupation; whether or not the site was defended; and the date of the occupation. Waiwhau is interpreted as a small undefended settlement situated near the river junction, with outlying habitations and gardening. The occupation is thought to date to the late prehistoric and early protohistoric.

*Keywords:* WAIWHAU, RAUPA, PROTOHISTORIC, OPEN SETTLEMENT, GARDENING, OBSIDIAN, FIELD SCHOOL.

## INTRODUCTION

In February 1987, Waiwhau was chosen as the venue for the University of Auckland's annual field school teaching excavation. Waiwhau, N53/198 (T13/756), is located in the Hauraki Plains, near Paeroa (Fig. 1). The field school was headed by Professor Roger Green, with assistance from Rod Wallace, Keren Lilburn and myself. At the time the field school was in progress, Nigel Prickett, of the Auckland Institute and Museum, was undertaking further investigations at the neighbouring site of Raupa Pa, N53/37 (T13/13). The two excavations were run concurrently so that the field school might avail itself of some of the facilities that were already in operation for the other, bigger, excavation.

## THE SETTING

The landform has been described in detail previously (Phillips 1985, 1986). Briefly, the site was situated at the junction of the Ohinemuri and the Waihou, which are the two main rivers that drain the east side of the Hauraki Plains. These rivers formed the eastern and northern boundaries of the site. An old meander of the Ohinemuri River provided an area of low-lying, wet land to the south of the site. This wet land can be seen on the old land map of the Waihou Block originally drawn in 1903 (Fig. 2). This map also shows some of the vegetation and fencelines that were present in the block at this time, as well as a rectangle surrounding an area, marked as a "Native burial ground" in 1903 and subsequently named "Waiwhau Pa" in 1932. It should be added here that the area was not known to be a burial ground before excavation, and the local Maori elders also seemed unaware of this designation.

Gold mining at Waihi in the late 1800s resulted in a large amount of rock flour being dumped in the Ohinemuri River, inundating low-lying land near Paeroa and lapping the edges of Waiwhau. Attempts this century to prevent the flooding of farmland and residential areas have involved stopbank construction and the re-channelling of the Waihou River, so that it now joins the Ohinemuri north of the town. The current work by the Hauraki Catchment Board is a continuation of these attempts. Waiwhau now lies between the stopbank and the Ohinemuri River and will be destroyed by the construction of a berm.

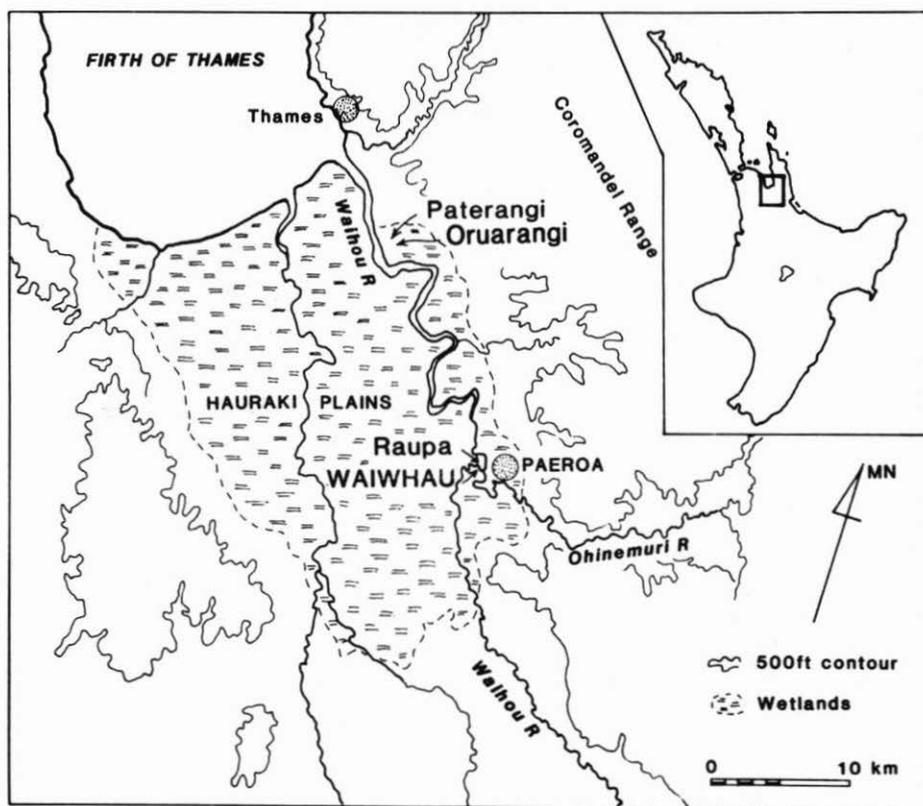


Figure 1: Location map showing the position of Waiwhau at the junction of the Ohinemuri and Waihou Rivers before re-channelling.

## PREVIOUS INVESTIGATIONS

Waiwhau first came to the attention of archaeologists when the Hauraki Catchment Board noticed that a block of land in the path of their development project was named "Waiwhau Pa". Initial observation showed nothing of interest. However, a trench cut through the site by a mechanical digger (Fig. 3: Trench B), revealed many layers of shell, postholes, and firescoops. A preliminary investigation, involving the excavation of another trench (Trench F) and a small square (Area 1), was undertaken in January 1984 in order to ascertain the type and extent of occupation at Waiwhau. The results of this excavation and investigations at the neighbouring Raupa Pa were reported in this Journal (Phillips 1986).

These preliminary excavations established that there was a range of occupational evidence at the site, including midden, firescoops, postholes, a possible obsidian flaking floor and charcoal-stained soil. This evidence mainly occurred over an area of some  $100 \times 60$  m, but there were concentrations of evidence at the eastern end of the site and at the northern end of Trench F, where Area 1 was placed. It seemed likely that the site was prehistoric in age, as the only artefact of European origin found was a shotgun cartridge case. The site was interpreted as a large open settlement, since no evidence of fortification could be discovered in the sections. It was suggested that

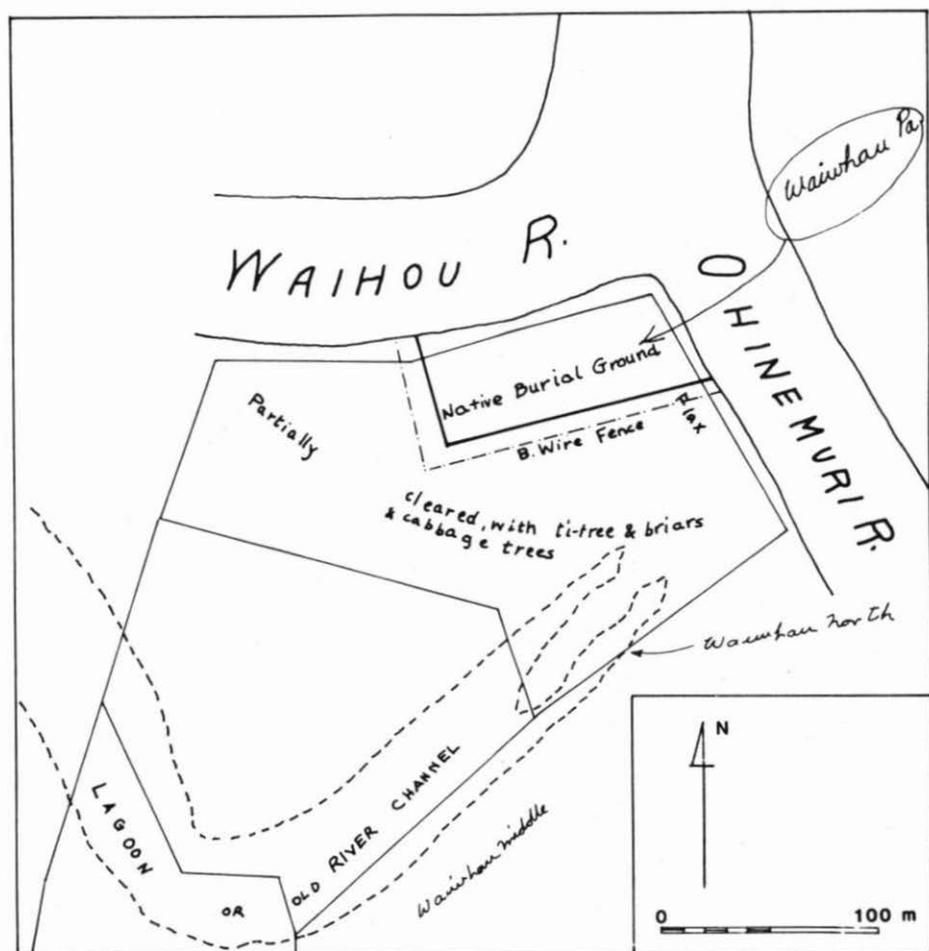


Figure 2: Environment of Waiwhau in 1903, showing the original course of the Waihou and Ohinemuri Rivers, the old course of the Ohinemuri, vegetation, and property boundaries. (Based on ML6966 Plan of Waiwhau S.D. 1903, with additions from 1932.)

Raupa and Waiwhau might parallel the large pa and satellite pa complexes further down river, such as Oruarangi and Paterangi. The location of the sites at the junction of what must have been the major highways of the region supported this argument.

Post-occupational disturbance included ploughing, which unfortunately penetrated to a depth of 40 cm, destroying much of the stratigraphical evidence. More recent destruction included the beginnings of the creation of a berm in a 50 m wide strip parallel to the stop-bank, and the entire river bank south of Trench F (shown as "bulldozed edge" in Figure 3). The berm construction had lowered the land by between 0.5 and 1.2 m, thereby destroying any occupational evidence in that region. The stopbank appeared to have covered some material, since a shell lens was seen on the western side, the rest of the site being to the east of the stopbank.

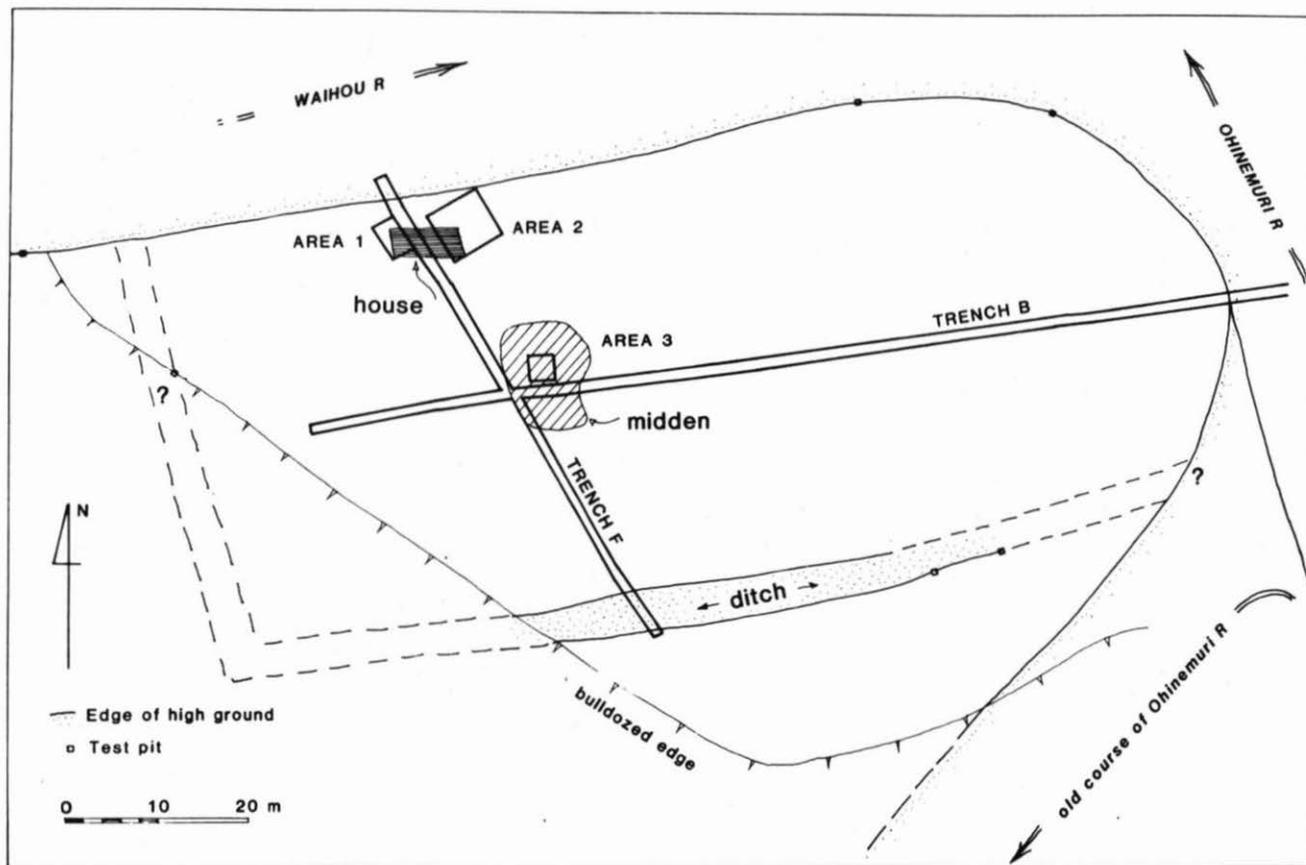


Figure 3: Plan of Waiwhau showing excavations, the extent of the site, and the main features located.

## THE EXCAVATION

Further excavation at Waiwhau was thought to be worthwhile, because of the many questions posed by the preliminary work. The continuation of excavations at Raupa Pa also meant that it became necessary to understand the local settlement pattern of which Waiwhau was a part.

## THE AIMS

The aim of the excavation in 1987 was to try to establish what type of occupation had occurred at the site. In order to achieve this, various specific aims were identified. These included: dating the occupation, confirming the prehistoric nature of the site and determining the length of occupation; relating the occupation to Raupa if possible by artefactual material; opening up one or more areas to ascertain the type of housing and cooking occupation present; continuing the excavation of a structure in Area 1, which had been partly exposed in 1984, but not completed because of lack of time; establishing the boundaries of the site; and confirming that it was undefended. These aims were arranged in order of priority, taking into account the fact that the field school was primarily a teaching project. More detailed accounts of the 1984 excavation and the 1987 field school with subsequent laboratory work are in preparation.

## THE PERIMETER AND DEFENCES

The problem of the extent of the site and whether it was defended was tackled in three ways. Initially, the "bulldozed edge" was investigated to trace evidence of occupation and anything that might indicate a defensive structure. The second stage involved the clearance of part of the bulldozed edge which showed a shallow ditch and its parallel section at the southern end of Trench F (Fig. 4). The third stage involved test excavations at various places to determine the extent of the ditch and the boundary of the site at the river edges. The latter were obscured by the recent deposition of rock flour.

Investigation around the bulldozed edge showed that an underlying soil/charcoal mixed layer extended over the entire area. In some places there were scatters of shell. The charcoal and shell deposits were both presumed to relate to cultural activity at the site. Ploughing was evident over most of the area, and in some places this had extended below the level of the cultural deposits. The only structures noted were small drains (possibly field drains dating to the farming period), and the ditch. It seems that although part of the area was defined by the ditch, the actual occupation extended beyond its boundary.

The ditch section that appeared in the bulldozed edge was cleared down and drawn. In the adjacent section of Trench F, the face was also cleaned and the ditch located (Fig. 4). The ditch measured 3 m wide and 1 m deep. The spoil appeared to have been thrown up internally, creating a bank 1.5 m wide, and possibly externally as well. The section suggested that the ditch filled in quite rapidly leaving only a shallow depression. The section of Trench F could not be viewed properly in the 1984 season, since the higher water table at that time prevented the base of the ditch from being excavated and drawn. In contrast, the lowered water table and increased vegetation cover over the site in 1987 revealed a low-lying strip covered in "willow-weed" (*Polygonum* sp.). This strip, which extended east from the two ditch sections drawn, proved to delineate the path of the ditch. Various test pits placed beyond the extent of the willow-weed showed that the ditch continued eastwards

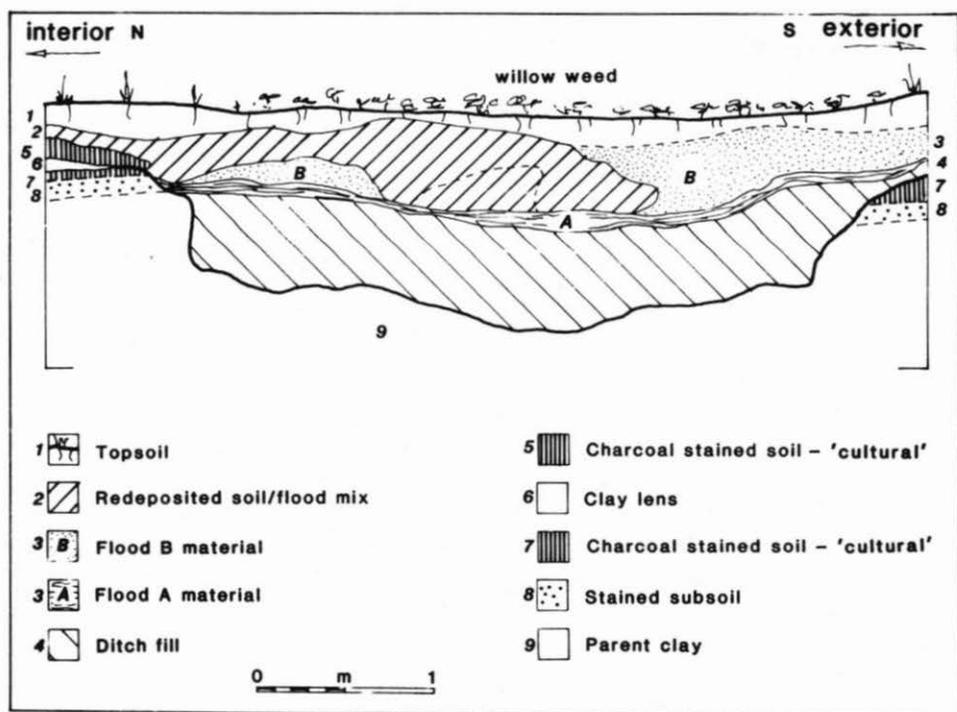


Figure 4: Section through the ditch at the southern end of Trench F.

towards the Ohinemuri River. A further investigation of the bulldozed edge at the western side, near the stopbank, showed a trace of the ditch cutting north (Fig. 3). It was therefore assumed that the ditch formed a right-angle.

As mentioned previously, the original river boundaries of the site had been obscured by the sediments, largely composed of rock flour, that had come down the Ohinemuri River during the gold-mining era. In order to establish the northern and eastern extent of the site, a series of test pits were dug. These demonstrated that the junction of the rivers was further south than at first thought. The results were plotted on the overall plan of the site (Fig. 3).

Investigations of the site perimeter showed that Waiwhau was smaller than originally thought. The ditch enclosed an area some 80 × 50 m. This area, when overlaid on the 1903 survey map, conformed to the rectangle surrounding the "Waiwhau Pa" (Fig. 5). Cultural deposits were visible in all exposed sections, extending beyond the confines of the ditch and cut by the bulldozed edge. The southern and western perimeters could therefore have continued for a further 50 m or more beyond the ditch.

#### THE OCCUPATION

Two areas were opened up in order to investigate the type and extent of occupation (Fig. 3). Area 2 was placed adjacent to Area 1, on the eastern side of Trench F. The square overlay an area of charcoal-stained soil and post-holes, which was thought to be the eastern half of a structure partially uncovered in Area 1. Area 3 was placed near the intersection of Trenches B and F, where a thick layer of shell midden had been observed. It was hoped to

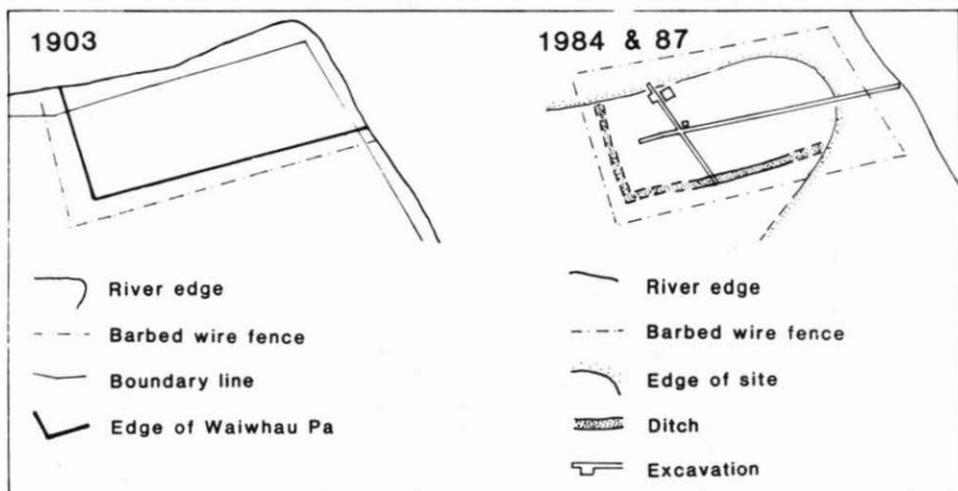


Figure 5: The position of the site boundary, ditch and fencelines located in 1984 and 1987, compared with the features shown on the 1903 land map.

detect evidence of cooking and associated structures.

#### Area 2

A square measuring 6 × 6 m was laid out over the possible house floor. A range of features was located, including postholes, stakeholes, a bedding trench, small hangi pits, a drain and four burial pits (Fig. 6).

The section across the southern baulk of Area 2 (b–d in Figure 7) illustrates the basic stratigraphy within the square. It appeared that the area had been levelled, as the subsoil seemed to have been scraped clear at the western side and redeposited on the east. The exposed parent clay was covered by the layer of charcoal-stained soil. Overlying the entire square was a dark brown soil, termed “cultural” because of the presence of charcoal, shell, and artefacts.

The section (a–b in Figure 7) along the face of Trench F was essentially similar. The subsoil was not evident here, except at the riverbank where it was mixed with the “cultural” soil. At the southern end, the charcoal-stained soil overlay the parent clay. Other smaller charcoal lenses could be seen sloping down to the river. Again the “cultural” soil covered all the lower layers. It and the other upper layers had been turned over by ploughing, making interpretation of the stratigraphy difficult. The plough zone was graphically clear at the north end, as the bright yellow rock flour had been turned into the dark “cultural” soil. The sections showed that at least three distinct flood layers of rock flour could be identified, the last of which post-dated the plough zone.

In Area 2, there were four main stratigraphic layers. The first layer was the subsoil which had been redeposited both on the north and east sides of the square. The charcoal-stained soil was the second layer deposited. The third layer was the development of the “cultural” soil and the last layer deposited was the flood material.

The features from Area 1 and Area 2 excavations and those seen in the Trench F section faces are combined in Figure 6. All the features, except the burial pits, post-dated the

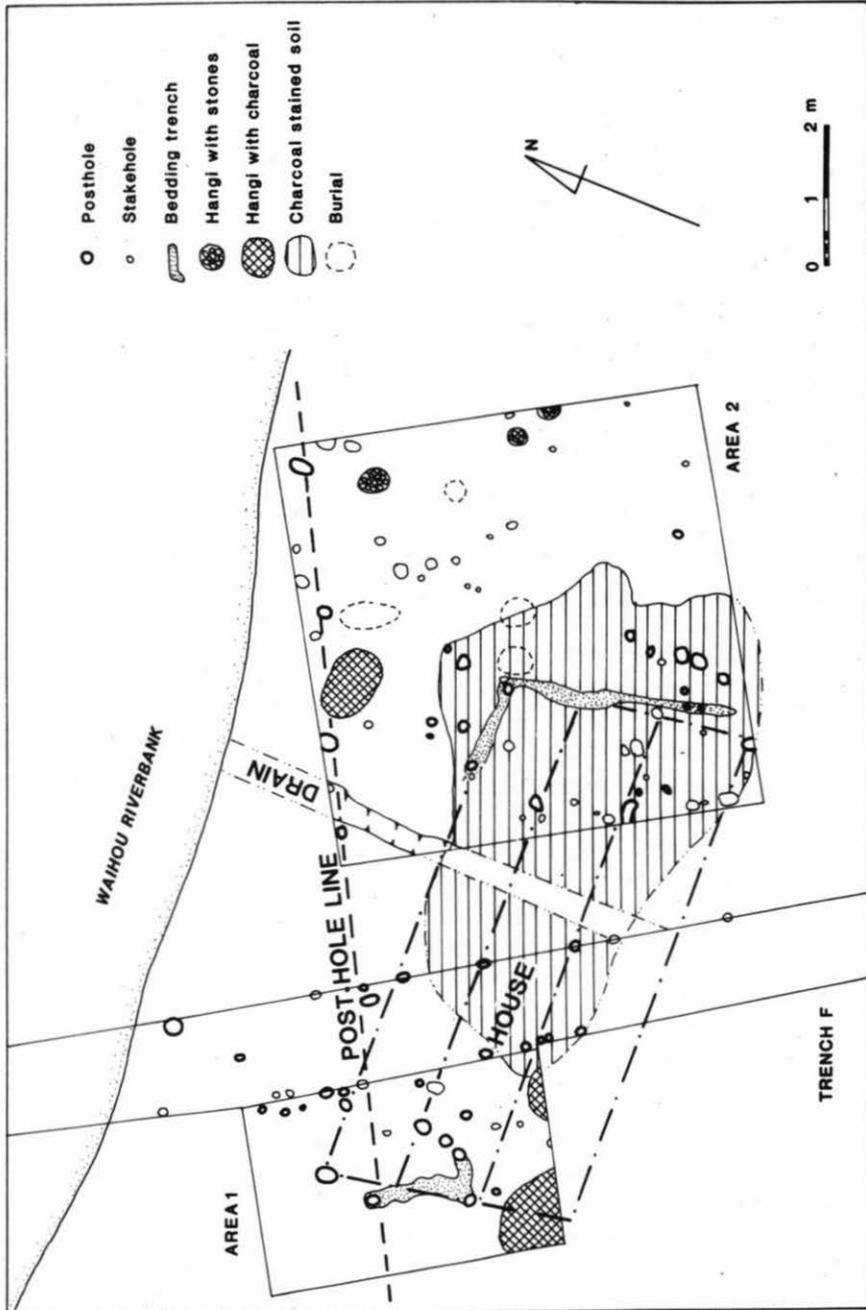


Figure 6: Plan of features in Areas 1 and 2.

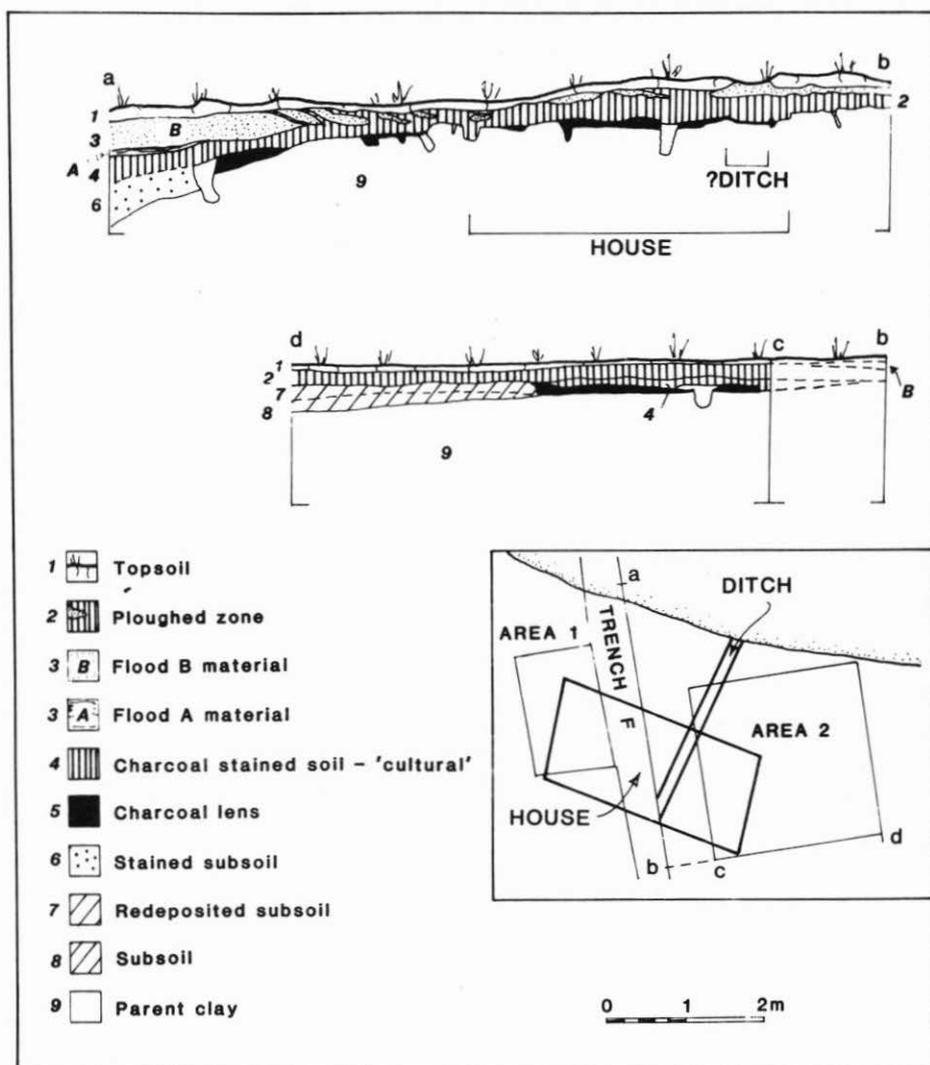


Figure 7: Section along east face of Trench F and south face of Area 2. The feature shown as a ditch is better interpreted as a drain.

levelling of the square. The burials consisted of four small pits (approximately 50–80 cm in diameter) and three contained the remains, or parts of the skeletons of children. All the bones were very degraded. The ages of two of the infants were estimated at six months to one year and two to five years on the basis of teeth development, but the age of the third could not be determined. The remains were reinterred by the local Maori elders.

The redeposition of the subsoil resulted in a levelling of the southern half of Area 2. This horizon, or floor, can also be seen in Trench F in the southern part of section a–b, and continues in most of Area 1. To the north, the land dropped towards the riverbank, while to the south it rose slightly. It was on this floor that a series of postholes and bedding trenches

were found. These features were interpreted as belonging to a house measuring approximately 3.5 m wide and 7.5 m long (extending from Area 2 into Area 1). It is possible that more than one structure was erected here, or that the structure was rebuilt. The consistent nature of the floor suggests that the latter is more likely. The floor was generally overlain by the charcoal-stained soil, and it is suggested that the structure had burnt down.

There were several hangi pits, of two forms. Three large pits (two in Area 1 and one in Area 2) contained a lot of large lumps of charcoal and little stone, while others were smaller and contained a lot of stone. It is suggested that the stones might have been heated in the larger pits and then transferred to the smaller pits where the cooking actually took place. The pits post-dated the creation of the house floor and pre-dated the "cultural" soil in Area 2. Those located in Area 1, however, were disturbed by the ploughing and their relationship to the house could not be determined.

The shallow drain, which crossed Area 2 north-south and dropped towards the old Waihou riverbank, is thought to have been a field drain. It was overlain by the rock flour but cut through the "cultural" soil.

A line of postholes, consisting of one deep hole (25-30 cm deep) followed by two or three shallower holes (15 cm deep) spaced approximately 1.2 m apart, was interpreted as an old fenceline, built in the pre-batten style. These postholes were beneath the second flood material and the alignment conformed to the boundary fence shown on the 1903 map but not to the modern fenceline, which was 16 m further north and set at a slightly different angle (Fig. 5).

In the area excavations and Trench F there were several other postholes, the functions of which could not be determined. At the riverbank (north end of section a-b) there was a large posthole, 54 cm deep, which could have been part of either a palisade or a retaining wall.

Portable artefacts recovered included obsidian and sinter flakes, some showing signs of use-wear, as well as hangi stones, grinding stones, ochre, a hammerstone and a sinker (Fig. 8). Historic items included fragments of old barbed wire fence, parts of a coloured glass vase, a marble and a fragment of flat glass (Fig. 9). Midden consisted of very fragmentary cockle (*Chione stutchburyi*). Charcoal from the charcoal-rich hangi pits included the forest species of tawa (*Beilschmiedia tawa*), matai (*Prumnopitys taxifolia*) and *Pittosporum* sp.

### Area 3

A square 3 x 3 m was laid out over the midden. Test-pitting showed that the midden extended over an area of 10 x 10 m (Fig. 3). The midden had been ploughed, and in the east baulk gave the appearance of two layers, since they were split by the ploughing (Fig. 10). Immediately beneath the midden was a floor level through which a series of postholes and stakeholes had been cut. The area uncovered was not, however, large enough to make any sense of these features.

The midden was composed of charcoal, shell, and hangi stones, as well as small amounts of fish, bird, pig and dog bone. The charcoal was identified as mainly scrub species including ramarama (*Myrtus dacrydioides*), matai, manuka (*Leptospermum scoparium*) and *Hebe* sp. with some kahikatea (*Dacrycarpus dacrydioides*) and beech (*Nothofagus* sp.). No exotics were recorded. The beech is unexpected, given the low-lying nature of the immediate area, and probably indicates the use of driftwood. The surprising scarcity of kahikatea

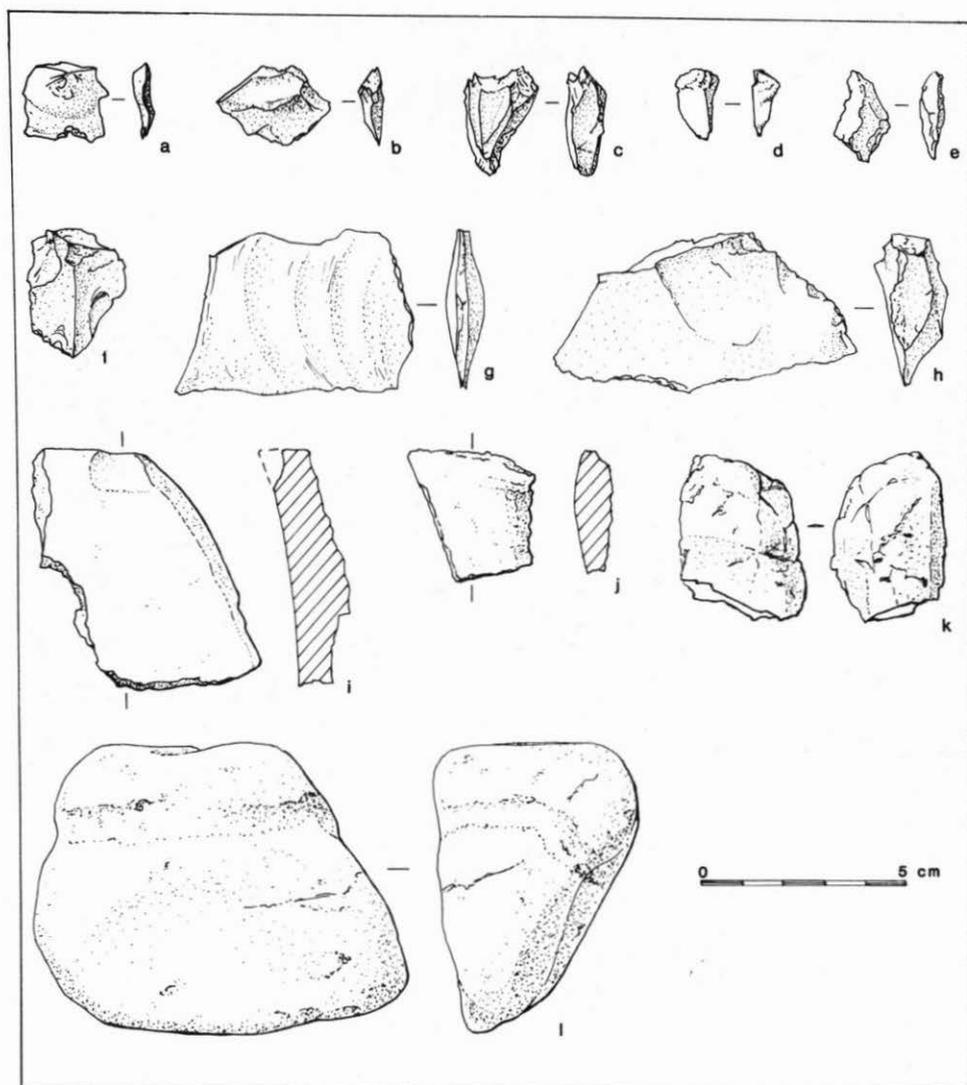
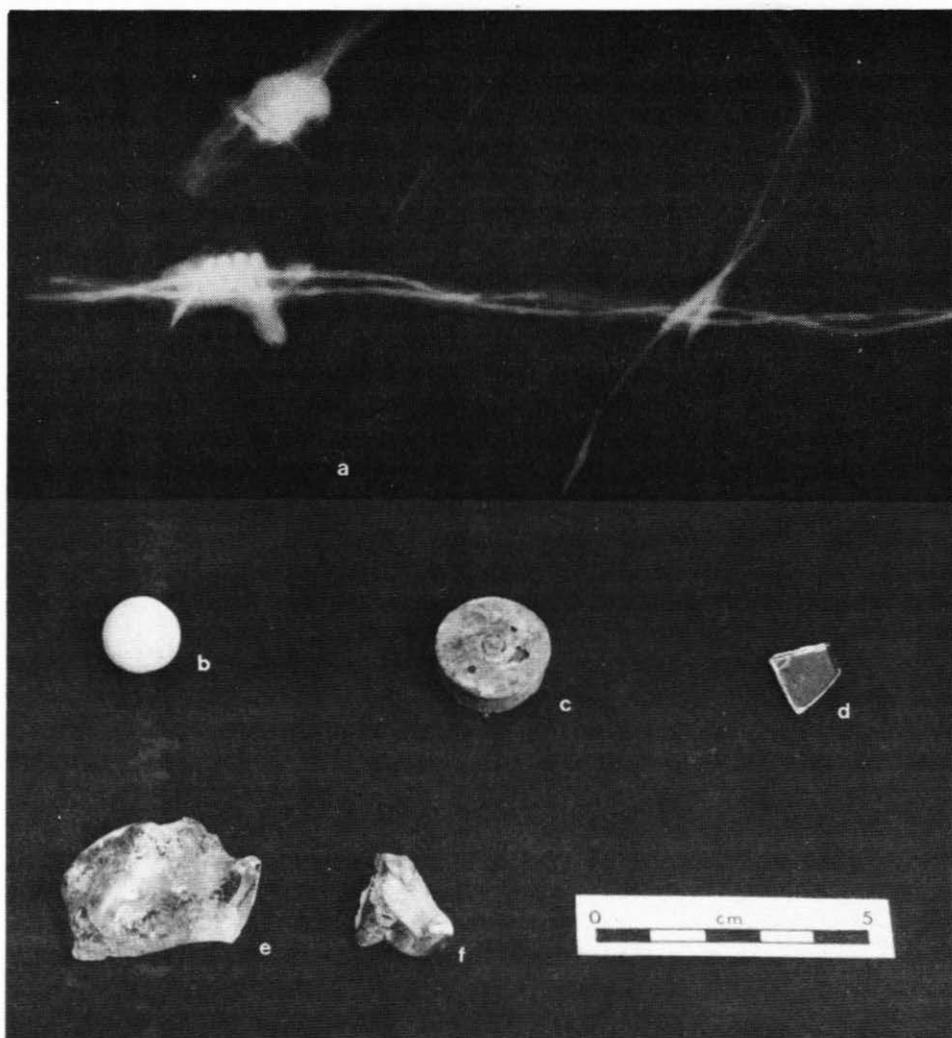


Figure 8: Stone artefacts from Waiwhau. a, b, f, g. obsidian flake tools. c. obsidian drill. d, e. sinter drills. h. sinter flake tool. i, j. fragments of abraders. k. chert hammerstone. l. andesite sinker.

suggests that much of the surrounding area was clear of major forest (Rod Wallace, pers. comm.). The shell was identified as over 80 percent pipi (*Paphies australis*), with the rest being other estuarine species, presumably from the Firth of Thames. Fish were identified as snapper (*Chrysophrys auratus*) and trevally (*Caranx lutescens*). The pig bone only occurred in the disturbed midden layer and may have been a later introduction. At least two individuals were represented: one pig was about two years old and the other was considerably older, judging from the tusk development (Reg Nichol, pers. comm.). Portable artefacts found in the midden included a few obsidian and sinter flakes.



*Figure 9:* Historic items from Waiwhau. a. x-ray of rusted barbed wire. b. marble. c. shotgun case. d. flat glass. e, f. fragments of coloured glass ornament.

#### SITE STRATIGRAPHY

Observation of the faces of both trenches and the surrounding bulldozed scarp enabled a reasonable understanding of the stratigraphy to be obtained. All the stratigraphy had been truncated by the ploughing episode.

#### *Trench F*

Along the face of Trench F and the adjacent area excavations, three sequences could be studied and the events compared (Table 1). The result is a series of floating chronologies, of which the only common feature is the ploughing. The only other layer which may be the

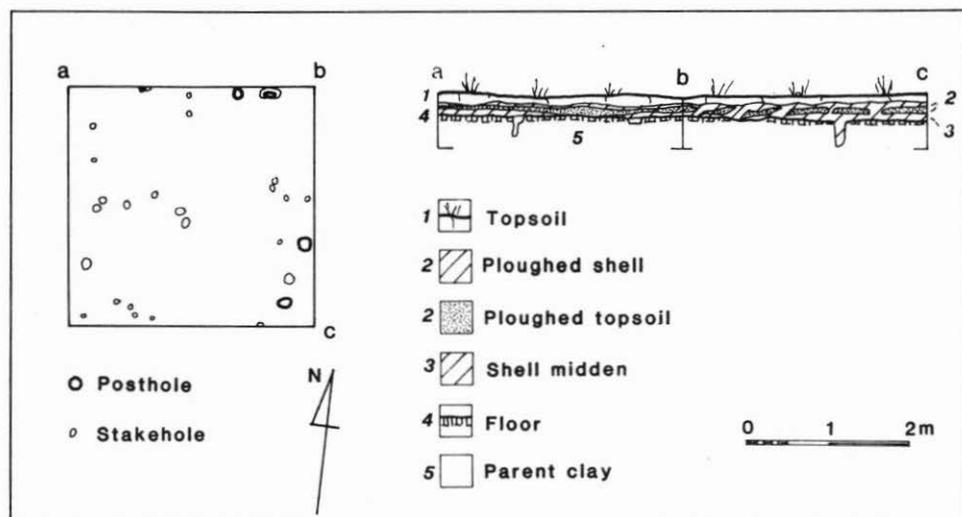


Figure 10: Plan and section of Area 3.

same throughout the site is the "cultural" soil. This soil appears to be the result of mixing of topsoil and subsoil and in some cases cultural material such as charcoal and shell. It is commonly 10–20 cm deep, although over the house floor it is up to 25 cm deep. It has been turned over by the plough so its original nature is unknown. It is suggested that it may have been formed by gardening activities.

TABLE 1  
STRATIGRAPHY ALONG TRENCH F AND THE ASSOCIATED EXCAVATIONS

LEVEL	NORTH	CENTRAL	SOUTH
1	topsoil	topsoil	turf
2	flood C		
3	ploughing	ploughing	ploughing
4		midden	bank pushed in
5	flood A & B	postholes	flood A & B
6	drain/fence	floor/postholes	bank erosion
7	vegetation		ditch/bank
8	cultural soil	cultural soil	cultural soil
9	house/hangi		postholes/hangi
10	house levelling		
11	burial		

(Tentative dates for these levels are: 1 = 1950–present, 2 = 1950, 3 = c. 1910, 4 = 1900–1910, 5 = 1870 flood A and 1900 flood B, 6 = 1870–1900, 7 = 1825–1870, 8–11 = before 1825)

In the northern section of Trench F and Areas 1 and 2 it appears that the burials were the first events, followed by the house construction and other cooking activities. Subsequently, the area was gardened and then became overgrown, as various root holes were discovered. The drain was dug and became filled, and the land was fenced. Flood deposits from the gold mining era lapped part of the site and then ploughing took place. Material from more recent floods covered the earlier deposits and the present topsoil formed.

The central area of Trench F and Area 3 was simpler, with most of the occupation post-dating the "cultural soil", and the deposition of the midden was the last event before the ploughing. The higher core of the site was unaffected by the flood material, so the midden cannot be correlated with events occurring in the lower areas to the north and south.

In the southern section of Trench F there were some features that pre-dated the "cultural soil". Here it can be seen that the construction of the ditch was a relatively late event. The material from the ditch appears to have been pushed back into it, together with material from the initial floods. This backfilling probably results from the introduction of modern farming into the area. The ditch itself, however, appears to have slumped before the flooding; the nature of the clay soil would make this very easy. Again there is evidence of ploughing but there is little topsoil development on the flood deposits.

### *Trench B*

This trench section was drawn during the initial investigation of the site by members of the Auckland Office of the New Zealand Historic Places Trust (Maingay 1983). A restudy of this section in the light of the other investigations confirms the uniformity of the stratigraphy outlined above. Evidence from the trench face suggests that there was little occupation at the western side of the site, but that the easternmost 15 m showed a greater depth and may have been the main centre of any occupation.

### PLOUGHING

The ploughing had a major impact on the survival of the evidence on the site, so it was carefully studied. The manner in which the furrows lay indicated that the paddock had been ploughed in "lands" (blocks that were ploughed in strips), with each individual furrow being approximately 55 cm wide, cutting 20–40 cm deep. The lands were an average of 12 m apart (ranging from 10–14 m), indicative of hand ploughing rather than modern machinery (Fig. 11). The ploughing had the effect of turning over the soil which disturbed the stratigraphy and displaced the artefacts diagonally. The clear nature of the plough marks indicated that it had only occurred once, presumably after clearance of the area for pasture. It post-dated the fenceline shown in the 1903 map, but pre-dated the use of modern machinery. A date of about 1910 is suggested.

### ARTEFACTS

#### *Obsidian*

The most common artefacts found in the site were obsidian flakes. These were especially common in Area 1, where up to 51 flakes were recovered in 1984 in one square metre. The displacing effect of the ploughing is overlaid on the distribution map of the flakes in Areas 1 and 2, and suggests that originally the main concentration was slightly to the north-west (Fig. 12). Far fewer flakes were recovered from Areas 2 and 3 (Table 2). As with most collections of obsidian, the majority represented small waste flakes; however, up to 14 percent showed signs of use-wear that were obvious to the naked eye. Some of these have been illustrated (Fig. 8a–c, f, g). The most common source for the obsidian was Mayor Island. The next most frequent type is a "grey" obsidian thought to be from Whangamata (P. R. Moore, pers. comm.). It is interesting that this obsidian is confined to the areas of densest Mayor Island obsidian. Strangely, the least common is probably

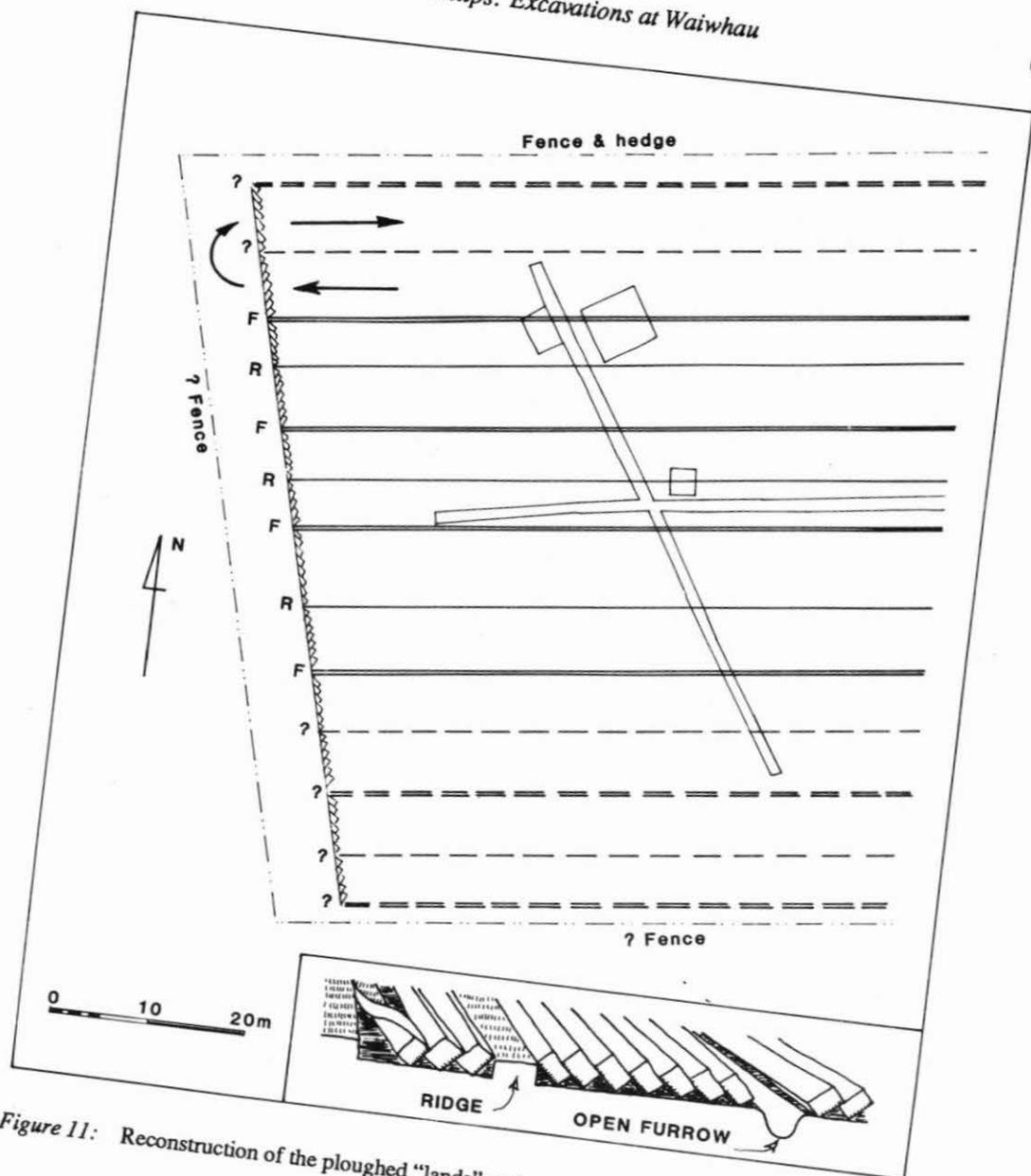


Figure 11: Reconstruction of the ploughed "lands" at the western side of Waiwhau.

from Waihi, which is the nearest source to the site. This obsidian was randomly distributed throughout the areas excavated.

#### Other artefacts

Most of the rest of the stone material recovered from the site could have come from the Ohinemuri River or neighbouring hills in the Coromandel Range. Sinter, some of it used for flaking (Fig. 8d, e, h), and volcanic rock, used for hangi stones, could have come from these sources (Richard Ruddock, pers. comm.). Other rock included greywacke and chert

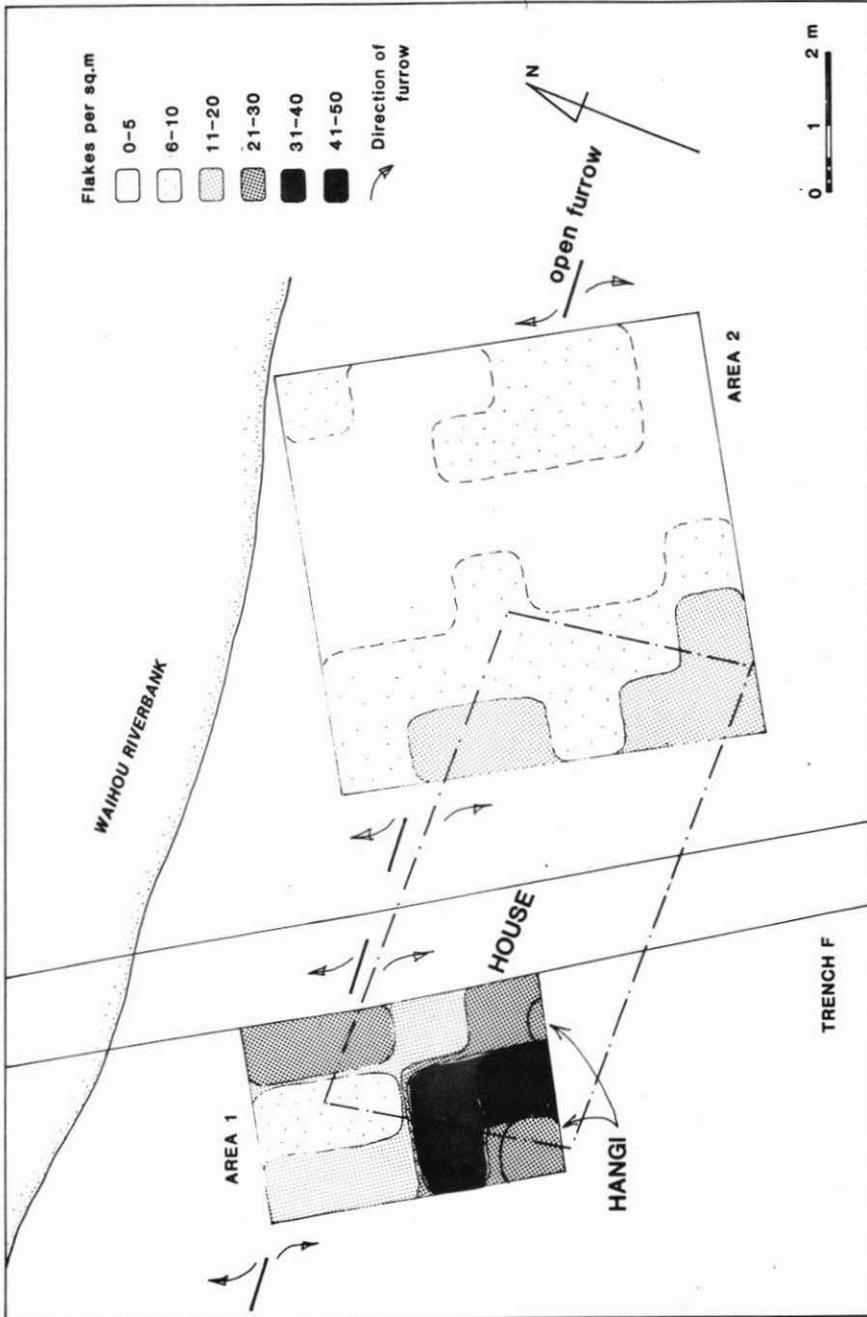


Figure 12: Distribution of obsidian in Areas 1 and 2.

TABLE 2  
DISTRIBUTION AND SOURCES OF OBSIDIAN FROM AREAS 1, 2 AND 3

	Mayor Is.	"grey"	"Waihi"	Total	No. per sq. m
Area 1 (1984)	259	41	3	303	25.3
Area 2 (1987)	214	0	5	219	6.1
Area 3 (1987)	10	2	4	16	2.0
Total	483	43	12	538	

(the latter of very poor quality), both possibly originating from an area north of Thames or the southern extent of the Hunua Range, at the west side of the Hauraki Plains. The purpose of only a few of these fragments could be determined (Fig. 8i-l).

The historic items included the glass and metal objects found in the ploughed zone of Area 2. The metal proved to be barbed wire and may have been associated with fencing. The placement of the glass objects may be fortuitous and they could have been associated with a variety of events.

## DISCUSSION

The mixture of historic and traditional portable artefacts has led some people to suggest that the site is a protohistoric pa (Roger Green and Nigel Prickett, pers. comm.), and that this possibly relates to the latest phase of occupation of the adjacent Raupa Pa. This interpretation relies on the date and purpose of the ditch, which the post-occupational disturbance with its consequent lack of stratigraphic control makes difficult to determine.

The ditch was present before the first flood, tentatively placed at 1870, and it was presumably still evident in 1903, since a thick line is shown in the same position on the plan of that date. The earlier European observers, however, did not mention the site at all when they visited Raupa (Marsden in 1820 [Elder 1932: 255], Williams in 1833 [Rogers 1961: 346] and Kenny in 1893 [Kelly 1945: 207]), which would be expected if it was a pa site. If the purpose of the ditch was defensive, one would also expect a greater density of occupation within the pa than is apparent from the exposed sections.

In fact, the densest occupation in the sections appears to be at the eastern end of Trench B and I suggest that a small undefended settlement, covering an area estimated at 25 x 15 m, existed near the junction of the rivers for some time. To the west, the burials and house in Area 2 and the postholes and hangi seen in the southern end of Trench F are the earliest signs of occupation. The density of obsidian in Area 1 suggests that this occupation is prehistoric.

The deposit of "cultural" soil which overlies much of this early evidence is puzzling. I suggest it is due to a mixing of topsoil and subsoil with some cultural debris from occasional habitation associated with gardening activities. Its widespread distribution and depth indicate that its development might have taken some time.

Historical evidence points to the site being abandoned in the 1820s along with most settlements in the area, because of the Ngapuhi raids (Kelly 1949: 368). It may have been gardened between 1830 and 1870, although in Area 2 there is evidence for regrowth during this period. Revegetation may well have occurred over the whole site, and the survey map of 1903 indicates a cover of flax, "ti-tree & briars & cabbage" (Fig. 2).

At some point before the last occupation, a ditch was dug around the site. This may have been a device demarcating the area marked on the original land map as a "Native burial ground" and known later as "Waiwhau Pa", although it may never actually have been either a fortification or a burial ground (the burials found appear to pre-date this name).

The last occupation period involves the evidence from Area 3. The midden here included much exotic faunal material. It may, therefore, have belonged to the time when the first farming began, and be associated with the surveyed fence and the levelling of the bank into the ditch.

The final evidence of activity on the site involves ploughing and grazing.

## CONCLUSIONS

The 1987 field school excavation changed the ideas about the site. The finding of the ditch challenged my view that the site was undefended, and the recovery of historic artefacts and introduced fauna suggested a protohistoric rather than a prehistoric date. The scanty habitation evidence found in Areas 2 and 3 indicated that the site was not densely occupied, and that the previous calculations of its total size were probably overestimated.

The picture that now emerges is that the main focus of occupation was near the junction of the two rivers. It was here that a small undefended settlement was situated. The higher ground of Waiwhau would have been an attraction in a region of wet, low-lying terrain. Wider use of the area could have been in the form of gardening with occasional houses and cooking areas, such as those excavated. Indeed, some of the gardeners may also have been residents of the defended site at Raupa. The site was abandoned in the early nineteenth century, because of Ngapuhi raids. A ditch was then constructed enclosing a 4000 sq. m area of unknown purpose, which subsequently became known as "Waiwhau Pa". Later use was sporadic and mainly concerned with farming operations.

As with much archaeological investigation the excavation answers some questions while posing many more. Clearly, part of this site's history lies in the nineteenth century. Although ploughing has disturbed the stratigraphic relationships, detailed scrutiny of the available historical records and maps may well shed light on problems concerning the ditch and other historical occupation. Excavation of the portion near the river junction may lead to an understanding of the open settlement which may have been established in that area back in the prehistoric period. Further information could come from a study of the soils both at the paddock margins and at the site margins. The former might uncover unploughed land and aid in an understanding of the development of the "cultural soil" layer, while the latter might give clues to the type of environment that existed when the site was occupied.

I consider that further work at Waiwhau could prove well worthwhile. The value of continuing investigations would be threefold. Firstly, Waiwhau provides a contrast to the intensely occupied and defended site of Raupa. As work is to continue at Raupa in 1988, a thorough understanding of the neighbouring site of Waiwhau would be valuable, since it is highly probable that at some periods occupation was contemporary at the two sites. Secondly, further investigation would provide information on the rather shady transition period between the late prehistoric and the early historic, shedding light on a time when European influences presumably had their greatest impact on Maori society. Finally, Waiwhau is well suited for future field schools, since it is a site with relatively simple stratigraphy; in the case of the ploughing this is very graphically displayed.

I envisage that future work would be directed towards the three fields of investigation outlined above, namely the study of historical sources, excavation of the riverside open settlement, and study of the physical environment of the site.

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