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Archaeology at Opita

Three Hundred Years of Continuity and Change

Part One

Caroline Phillips
Harry Allen

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makarau

"The boundary of the Opita pa on the ground is a ditch."
Rapata Te Pokiha (Tareranui and Pokiha 1878:328)

It was Rapata Te Pokiha's statement in the Maori Land Court records that prompted the authors, plus students of the 1991 University of Auckland Anthropology Department Archaeological Field School, to investigate the location of Opita pa in a river bend at the junction of the Ohinemuri and Waihou Rivers near Paeroa.

The pa (Maori fortification) proved elusive, but in the search, evidence of a series of nine small kainga (Maori villages) and the pa were uncovered. The main focus of the investigations was on a riverside terrace that contained four overlapping occupations separated by layers of flood silt and sand. Distinctive artefacts and features on this terrace allowed the linking of all the other sites in a chronology spanning 300 years.

These kainga represented intermittent occupation of the Opita area, in which changes and continuities over time were evident. Some of the changes were due to the influence of the new European materials, foods and ideas. Nonetheless, it was clear that Maori often incorporated these new materials into an essentially Maori world. Our understanding of the processes was enriched by information from both Maori accounts and the observations of early European visitors. In the later phases of occupation, this combined information allowed the distinction between foodstuffs cultivated, gathered, hunted, raised and traded; and between goods consumed on the site, prepared and exchanged for external materials; as well as items brought in by outsiders. In other words: the evidence presented a much more complex mix of activities, production and consumption than could have been achieved by archaeological information alone.

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Caroline was a student at the University of Auckland, and her PhD research on Maori settlement along the Waihou River was the reason for the investigation of Opita. Her thesis was later published in 2000 as, *Waihou Journeys: The Archaeology of 400 Years of Maori Settlement*, published by Auckland University Press. She has lectured in archaeology at The University of Auckland and Te Whare Wananga o Awanuiarangi, published academic articles and presented conference papers and seminars, both locally and internationally. Her research questions include how to identify dynamic settlement systems, continuity and change, small-scale cultural changes, and issues of ethnicity and identity using landscape approaches, contextual archaeology and multiple causality.

Recently Caroline Phillips and Harry Allen jointly edited B*ridging the Divide: Indigenous Communities and Archaeology into the 21st Century* (2010) published by Left Coast Press. They are part of a research team studying "The Cultural Significance of Wetlands in Taranaki"; and they previously worked together along the Waihou River on an indigenous training scheme that resulted in the publication *Taskforce Green/University of Auckland Archaeological Project, Waihou River* (1993), published by the Department of Anthropology, University of Auckland.

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Harry is an Australian trained archaeologist, who has conducted archaeological research in New Zealand, Australia and Southeast Asia. Harry Allen recently retired from the Department of Anthropology at Auckland after forty years of teaching, research and research supervision. He is a past Trustee of the New Zealand Historic Places Trust, a past member of its Maori Heritage Council and an Honorary Life Member of the Trust. He has published numerous articles on New Zealand archaeology and the protection of cultural and archaeological heritage. Harry Allen was awarded an ONZM in the 2008 New Year's Honours for his services to archaeology in New Zealand.

The University of Auckland acknowledges the contributions of all authors. This publication has been peer reviewed, and all reasonable efforts have been made to ensure the accuracy of the materials published herein.

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Cover Photograph: The team excavating Squares F and H, Trench C is out of shot to the left, the line of white spoil behind is Trench B and the stopbank and Coromandel Ranges are in the distance. Photograph taken by Harry Allen around mid-February, 1991.

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Three Hundred Years of Continuity and Change

Part 1

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1. Introduction

"The boundary of the Opita pa on the ground is a ditch."

Rapata Te Pokiha (Tareranui and Pokiha 1878:328)

It was Rapata Te Pokiha's statement in the Maori Land Court records that prompted the authors, plus students of the 1991 University of Auckland Anthropology Department Archaeological Field School, to archaeologically investigate the location of Opita pa in an old river bend at the junction of the Ohinemuri and Waihou Rivers near Paeroa (Figures 1 and 2).

Archaeological work in the area began eight years earlier in 1983, when, as part of flood protection works by the Hauraki Catchment Board, a strip of ground up to 120 m wide either side of the rivers was cut down to form a floodway, behind which a larger stopbank was to be built. In order to assess the impact of this development, Simon Best visited the location of Raupa, which at this time was the only site recorded in the vicinity (Best 1983). Best observed site damage caused by the start of the floodway excavations and test excavated two sections which revealed the extent of the archaeological deposits and led to the identification of Waiwhau pa, adjacent to Raupa (recorded in Maingay 1983).

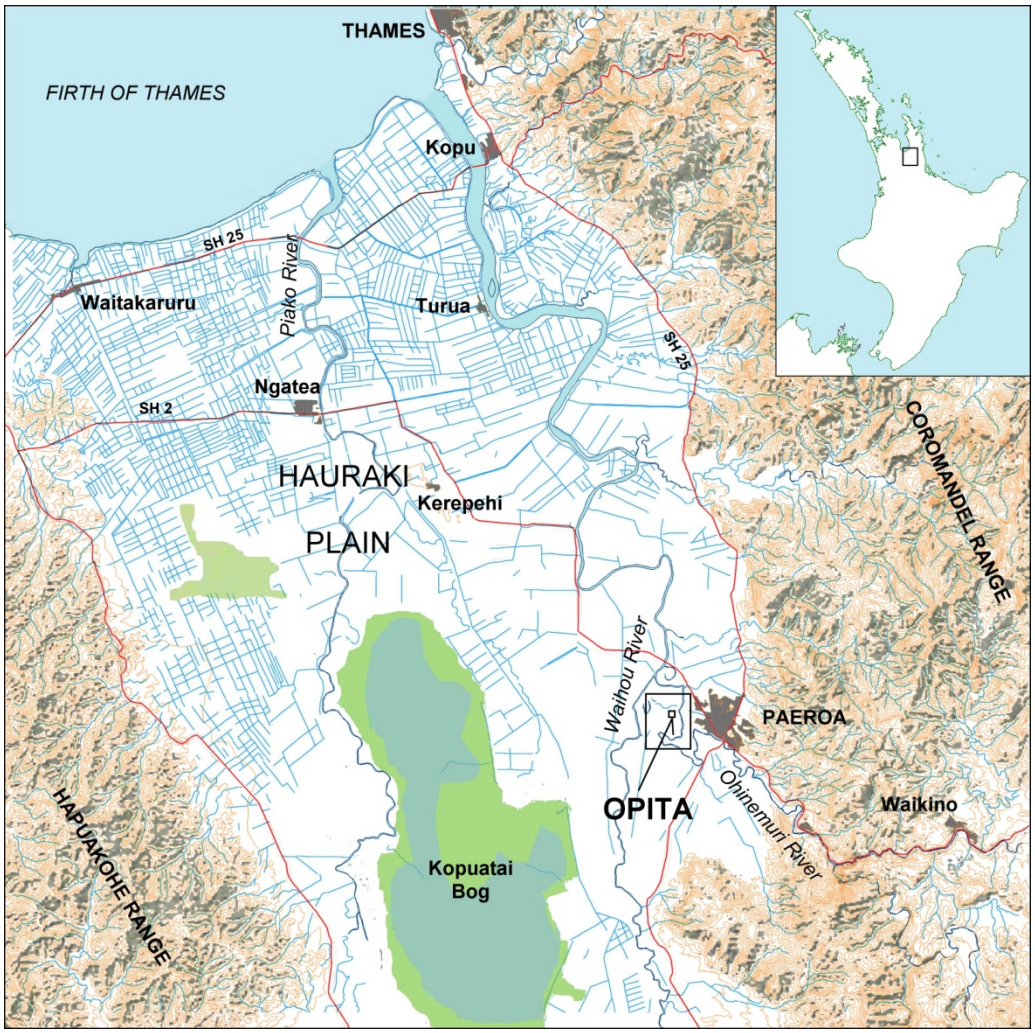

Figure 1. Location of Opita on the Hauraki Plains, showing current drainage and the steep ranges on either side.

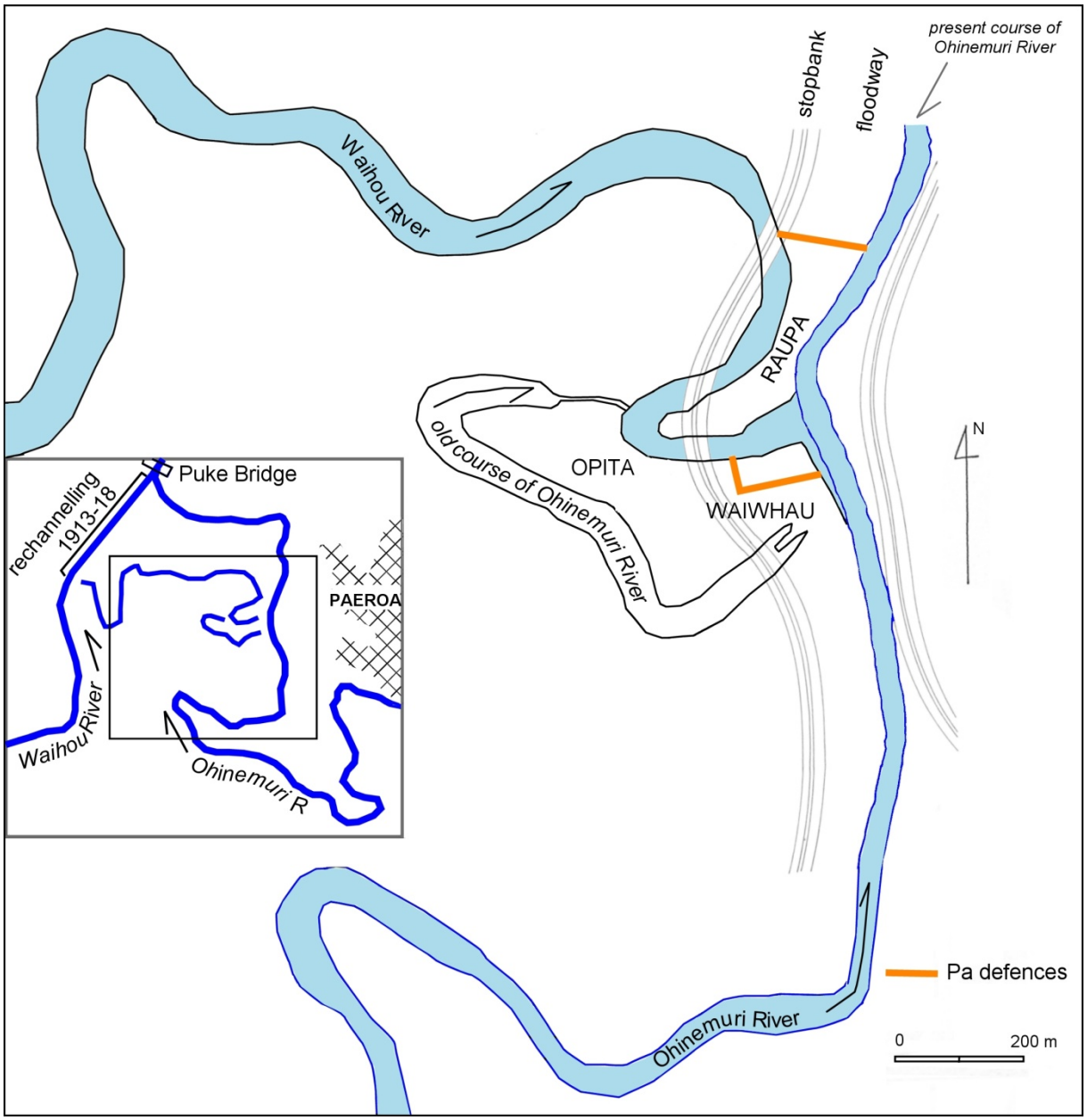

Figure 2. Changing courses of the Ohinemuri and Waihou Rivers with the three pa and the former junction of the rivers. The inset shows the current junction at the Puke Bridge after the cut to move the junction of the rivers northwards was made in 1913-18 (see location Figure 1).

The lead author and a group of volunteers followed this with a preliminary excavation on the parts of both pa (Raupa and Waiwhau) that were to be destroyed in the 1984 season of planned earthworks (Phillips 1986). In researching the background of these sites, Phillips discovered the rich evidence presented in the Maori Land Court Records (MLC). This led to the discovery of the quote above, revealing the existence and location of Opita pa.

In 1987 and 1988, Raupa was further investigated by teams led by Nigel Prickett of Auckland Museum (Prickett 1990, 1992), while University of Auckland (AU) Archaeological Field Schools led by the late Professor Roger Green excavated the neighbouring pa of Waiwhau (Phillips 1988; Phillips and Green 1991). Finally in 1991, following the archival discovery of Opita, Allen directed the AU field school investigations at Opita with the assistance of Phillips and Rod Wallace.

This report details the findings of the Opita investigations and compares them to the results of the neighbouring Raupa and Waiwhau excavations, together with the information from similar sites of the same time period further afield.

This monograph firstly presents the physical and historical information relating to Opita. This is followed by a description of the excavation methods and presentation of the findings. The materials collected, both artefacts and samples, are then described on the basis of analyses carried out by the AU Department of Anthropology students, which have been supplemented by further research: the amended student reports are included in the Appendices attached to this volume. Finally, key themes are discussed, which bring together the locational, traditional, historical and archaeological findings of this project.

1.1 Definitions

Throughout this document a consistent terminology is used when referring to Maori settlements and chronological phases. Maori words are glossed in English in the text the first time they are used and are included in the Glossary at the end. Macrons and italics are not used.

1.1.1 Site, kainga and pa

A site-based approach is adopted here without denying that over time Maori occupation of Hauraki resulted in a continuous archaeological landscape where non-site approaches could also be employed (Dunnell 1992). Defined locations with concentrations of features and artefacts are termed sites. The name Opita refers to an area where a number of individual archaeological sites have been identified, one of which was the location of Opita pa named in the MLC records. These individual concentrations have been recorded as three archaeological sites in the New Zealand Archaeological Association Site Recording Scheme (T13/324, 788 and 789). The landscape at Opita represents a remnant pattern of settlements where, as will be seen below, the methods available allowed some of the many archaeological features of this landscape to be identified (Dewar and McBride 1992).

In this monograph the Maori terms kainga (village or habitation, generally without substantial fencing) and pa (stockade, fortified place) are used. We have used the term kainga as it parallels the term pa and is shorter than saying ‘undefended settlement’ as was the case previously (Green 1994). Not all kainga are the same, just as not all pa are the same (Green 1975:633). At Opita, kainga may have been temporary collections of one or more dwellings and cooking areas, with or without storage, that were occupied only once, or intermittently on several occasions. The Opita area was also used for gardening and other subsistence activities. Maori use of the landscape often involved a high degree of mobility together with occupations of short duration.

1.1.2 Prehistoric or pre-contact times, post-contact, historic or colonial

The term prehistoric has been used to refer to Maori settlement prior to European discovery of Aotearoa. This term is not meant to imply that Maori had no history prior to the European arrival, but is used to complement the term historic, with the turning point between the two being the first appearance of references to Maori in European literature. Maori oral traditions and archaeology document Maori settlement of New Zealand and continued development for more than 500 years before Captain Cook first visited these shores. Although the term historic implies an accuracy and completeness of information after the advent of writing, archaeology commonly finds this is not the case and that multiple sources of information are required to build a useful picture of the past.

Similarly, the terms pre-contact and post-contact refer to the moment of the first encounters between Maori and Europeans in any particular area of New Zealand. Such contact initiated interaction and

adjustment between the two peoples. The term ‘contact’ has been challenged as it suggests a violent interaction, which was not always the case (Torrence and Clarke 2000). Rather than marking any significant turning point, contact represents the beginning of new processes, as well as the continuation of old ones under the new circumstances of colonial interaction.

After 1769, and along the Waihou certainly after 1830, the terms Maori and Pakeha or European become problematic terms as they imply the existence of cultures or polities that were entirely separate. From this time onwards multiple agencies were operating in Aotearoa/New Zealand (Allen and Phillips 2013). In this context, it is more appropriate to talk in terms of institutions and associations: the iwi (tribe) or hapu (clan) someone might belong to, or which organisation someone, such as government minister, missionary or trader, might be operating within. This allows alliances to cross boundaries and also avoids the necessity to define people according to their ethnicity. In a similar vein, there is the danger of trying to divide the archaeological record into Maori and European objects: they are just things located in particular circumstances. Neither the origin of such materials, whether in Europe or New Zealand, nor their raw material (such as glass, iron or obsidian), predicts their place or use within Maori technology. As a result, the authors question whether measuring such things as the changing percentages of obsidian, absences of stone tools or the presence of metal can provide unambiguous evidence of economic and cultural change.

1.1.3 Technical terms

Several archaeological terms are used in this report.

Features and deposits: a feature is a general term for any observed structure, whereas a deposit can be a layer of shell, lens of charcoal or layer of soil.

Hangi scoops (referred to as hangi or scoops in the text): an earth oven, specifically small hollows formed in the ground, in which a fire was made for the purposes of heating stones and/or cooking food. Scoops generally have evidence of fires, but may not always contain hangi stones, as they may have been removed for re-use. Hangi stones are the heat-retaining stones, often found as fire-cracked fragments, used in the cooking process.

Kumara storage pits: semi-subterranean stores, rectangular shaped and dug into the ground (generally 2.5-5.0 m long, 1.5-2.5 m wide and 0.5-1.0 m deep), lined with ferns or other vegetation, and roofed with an A-frame roof. Alternative methods of food storage were above-ground pataka (store houses) or whata (raised stages).

Postholes and stakeholes: small circular areas filled with different soil to the parent material, they are presumed to be where either a hole was dug to place a post in the ground, or a stake was thrust into the soil. The assumption is that postholes related to larger structures, such as palisades and houses, while stakeholes were evidence of small fences, temporary structures or shelters.

Midden: food waste, which in Maori settlements is often visible due to the presence of large amounts of discarded shells from shellfish. Fish, bird and other bones, together with charcoal and small fire-cracked hangi stones, are often associated with the shells.

Artefacts: manufactured portable objects, waste and raw materials. In an archaeological setting the waste material from making an object is valuable in determining the method and place of manufacture, and may be the only evidence left. Raw materials brought to a site, but not used, indicate the intentions of the inhabitants.

Dates: dates in this volume are given as years A.D., as in 1769. Where approximate calendrical dates are calculated from genealogical calculations or radiocarbon dates, the original source reference is provided.

2.Background

The physical and historical context of Opita has changed dramatically over the years. Evidence for these changes can be detected through the study of maps, survey plans, photographs, sketches, diaries, official accounts and evidence presented in the MLC records in the Hauraki Minute Books. Together with comparative materials from other excavations along the Waihou River, these provided the background for the detailed investigations undertaken at Opita and the subsequent analyses.

2.1 Location

Opita, the neighbouring pa Raupa and Waiwhau, and other undefended settlements were located at the junction of the Ohinemuri and Waihou Rivers, and on the land surrounded by an earlier bend of the Ohinemuri River (Figure 2).

A study of archival plans, the evidence in the Hauraki Minute Books with the associated survey plans, and early European encounters gives an idea of what the landscape was like prior to the impact of gold mining, deforestation, farming and flood protection works, all of which have radically altered the topography.

Survey plans of the land blocks at the junction of the Ohinemuri and Waihou Rivers from 1856 show the vegetation and water courses. The vegetation and the old cut-off channel of the Ohinemuri River was most clearly marked on an 1883 plan (SO 3421) of the roads throughout these and other land blocks to the south (Figure 3). At that time, the river banks were cleared, some being "open land", while others had briars[1] and regrowth species. In between were areas of kahikatea[2] bush and swamp. This mature bush probably reflected the extent of Maori clearances. The cut-off meander of the Ohinemuri was described as being part swampy and part lagoon, suggesting that there was standing water, and a small outlet fed into the Waihou at the northern end. This cut-off would have received water during floods from both the Ohinemuri and Waihou Rivers.

The river banks, shown as cleared areas, were natural levees (slightly elevated but discontinuous strips parallel to the river) where coarser flood material was deposited, while finer clays and silts were laid down over a wider area of land (Flint & Skinner 1977:136; Philippa Black pers. comm. 1992). The passage of intense cyclones, when the soil had already been saturated by previous rainfall, caused flooding. Under these conditions the steep streams that rise in the Coromandel and Kaimai Ranges are capable of producing floods which inundate the plains alongside the Waihou River. The archaeological investigations detailed some of the floods and different sediments on which the pa and undefended kainga had been built.

It was this environment in which Maori had established settlements and gardens, and used the natural resources. The rich accounts in the minutes of the MLC together with early European accounts yielded a history of the three pa and settlements in the area.

2.2 Historical Setting of Opita

This history has been compiled from five main sources that overlap the approximately three hundred years of Maori occupation found at Opita, i.e. 1600-1900. Firstly, the MLC records and associated survey plans pertaining to the land blocks in the vicinity of Opita (the genealogies linking the main

1 It is not certain if these were briar roses that had escaped from a garden, or native thorny shrubs and climbers.
2 Scientific names for wood, bone and shell are included in the relevant Appendices.

witnesses are shown in Figure 4, the location of blocks and other place names are in Figure 5, with all plans in Appendix 17). Secondly, the findings of the Waitangi Tribunal for the Hauraki claim, which reviewed not only the MLC accounts, but oral histories presented at the Tribunal and much other historical material (Waitangi Tribunal 2006). Thirdly, Maori place name traditions by Taimoana Turoa and Te Ahukaramu Royal (2000) and regional history by Paul Monin (2001), which contains other information specific to particular places and events in the Opita locality. Fourthly, there are European eye-witness accounts which date from 1769 onwards, including diaries, books, maps and newspaper reports. Finally, there is archaeological research as described in *Waihou Journeys* (Phillips 2000a).

The Waitangi Tribunal claim by Hauraki peoples identify three phases of Maori occupation:

(a) the canoe migrations,

(b) Marutuahu occupation, and,

(c) post-Marutuahu Maori occupations, to which can be added several post-European contact phases.

Figure 3. Detail of part of SO 3421, dating to 1883, showing vegetation, river channels and surveyed Maori land blocks in the vicinity of Opita (same area as Figure 2).

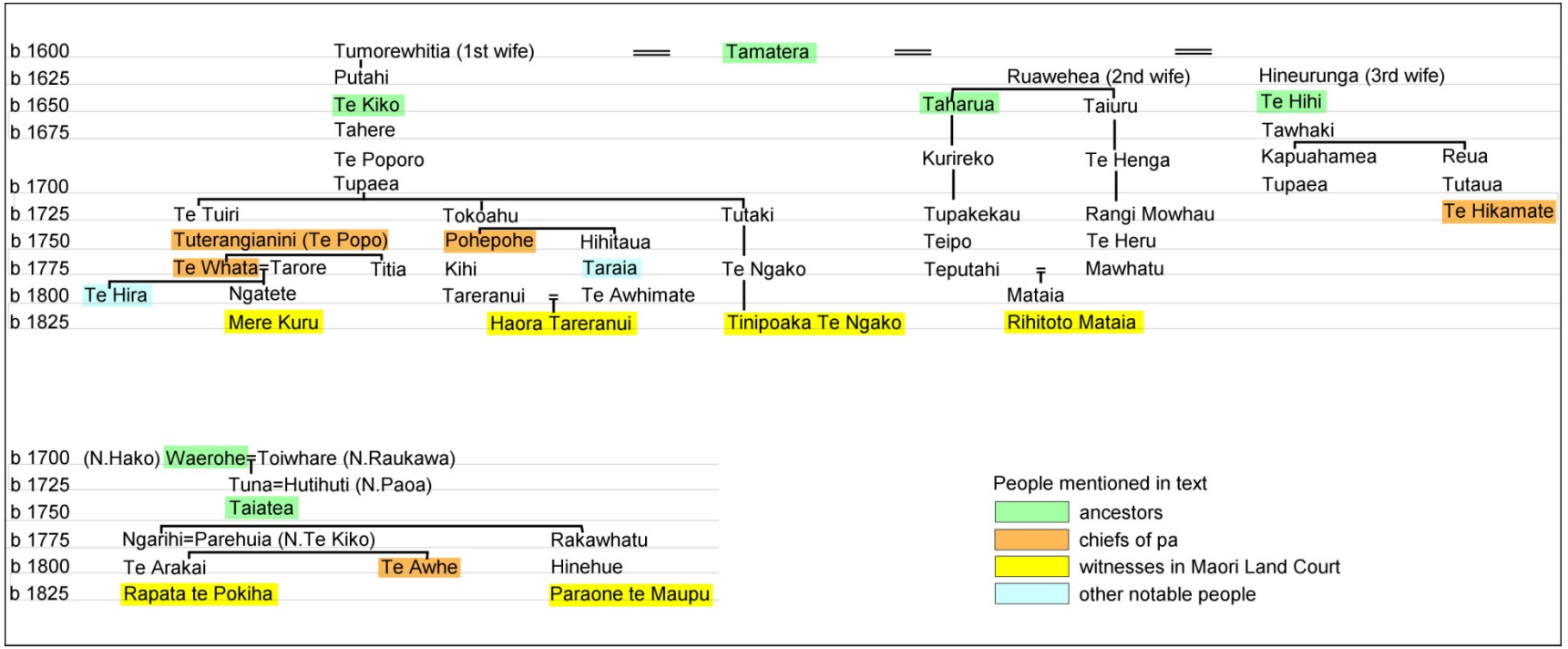

Figure 4. Genealogies linking the main witnesses in the hearings near Opita (from Turoa and Royal 2000; MLC records). Taraia married Titia and Te Poporo married Kapuahamea. Dates are approximate based on 25 years per generation.

2.2.1 Earliest occupants – c.1450

Within Maori traditions, Ngati Hako are acknowledged to have been the first peoples in the vicinity of Opita, the descendants of Toi-te-Huatahi who voyaged on the founding waka Te Paepae-ki-Rarotonga (Evans 1997:111-2). Hako the eponymous ancestor of Ngati Hako lived around 1450 (according to genealogical depth)[3], although it is not known whether he and his people lived inland, or only in the more coastal areas of their rohe (tribal area). Archaeological dates for sites along the Waihou River indicate that Maori were occupying this landscape from at least 1450.[4]

The earliest recorded tradition for the Opita area is one relating to c.1600 when Te Kahureremoa, who lived on the west side of Hauraki, stayed a night at Raupa on her way to visit her husband in the Bay of Plenty (Kelly 1945:210). Another early tradition relates to the naming of the Ohinemuri River – more properly known as Te Waitangi-o-Hinemuri, or the weeping waters of Hinemuri who was the daughter of a local tribe (Turoa and Royal 2000).

Archaeological information suggests that while the first settlements may have been undefended, fortified pa were being constructed by at least 1600 (Phillips 2000a:161-3, Schmidt 1996). Traditional accounts suggest that at least seven pa were built by Ngati Hako and Ngati Huarere along the Waihou River, and the dates for Whetukura, closer to the mouth of the Waihou, indicate there may have been more (Phillips 2000a:109). In this period the pa were located principally at the mouth of the Waihou and in the vicinity of the Ohinemuri junction, suggesting that these were the areas where threats were coming from at that time (Phillips 2000a:61-2; 1994:215).

Many of the earlier stories have been overlaid by traditions associated with the Marutuahu arrivals in 1650-1700. As a consequence of these incursions, Ngati Hako lands were reduced to an area about the junction of Ohinemuri and Waihou Rivers, known as Ruawehea,[5] further up the Waihou and along parts of the Piako River, but they were never totally subjugated (Waitangi Tribunal 2006:35).

2.2.2 Marutuahu – c.1650-1700

The Marutuahu confederation of tribes (Rongo-U, Maru, Whangaunga, Tamatera and Paoa) derived from the sons and grandchildren of Marutuahu, a descendant of Hoturoa, who 12 generations previously had captained the voyaging canoe Tainui that arrived in Aotearoa around 1350 (Turoa and Royal 2000; Waitangi Tribunal 2006). Hotunui, Marutuahu's father, left the Kawhia area on the west coast and journeyed to Hauraki. Seeking his father, Marutuahu followed in his father's footsteps from Kawhia to settle in Hauraki. As is common in many Maori conquest stories, Marutuahu married into the Hauraki tribes and it was only later that conflict broke out (Te Taniwha 1941).

The Marutuahu incursions into the Hauraki Plains are often referred to as three conquests, with the final conquest around 1675 at Te Mataii, 7 km north of Opita. However, it was the second marriage of Tamatera (one of Marutuahu's sons), approximately 25 years earlier, to Ruawehea of Ngati Hako that first brought Marutuahu peoples to the Ohinemuri River junction.

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3 Hako is shown as being seven generations prior to Tamatera. If Tamatera was born around 1600 then Hako was born around 1425 (if 25 year generation length is assumed), but was active around 1450-1475.

4 Dates of 1390 have been obtained from Totara at the mouth of the Waihou, forest clearance dating some time prior to 1520 has been recorded at Hurumoimoi about 4 km upstream, and 1450 is the earliest date from Oruarangi 6 km upstream (Best 1980; Phillips 2000a; 2008).

5 The name Ruawehea possibly refers to the parting of the two rivers and two routes, one following the Ohinemuri River across the Coromandel Ranges into the Bay of Plenty, and the other following the Waihou River inland to Matamata.

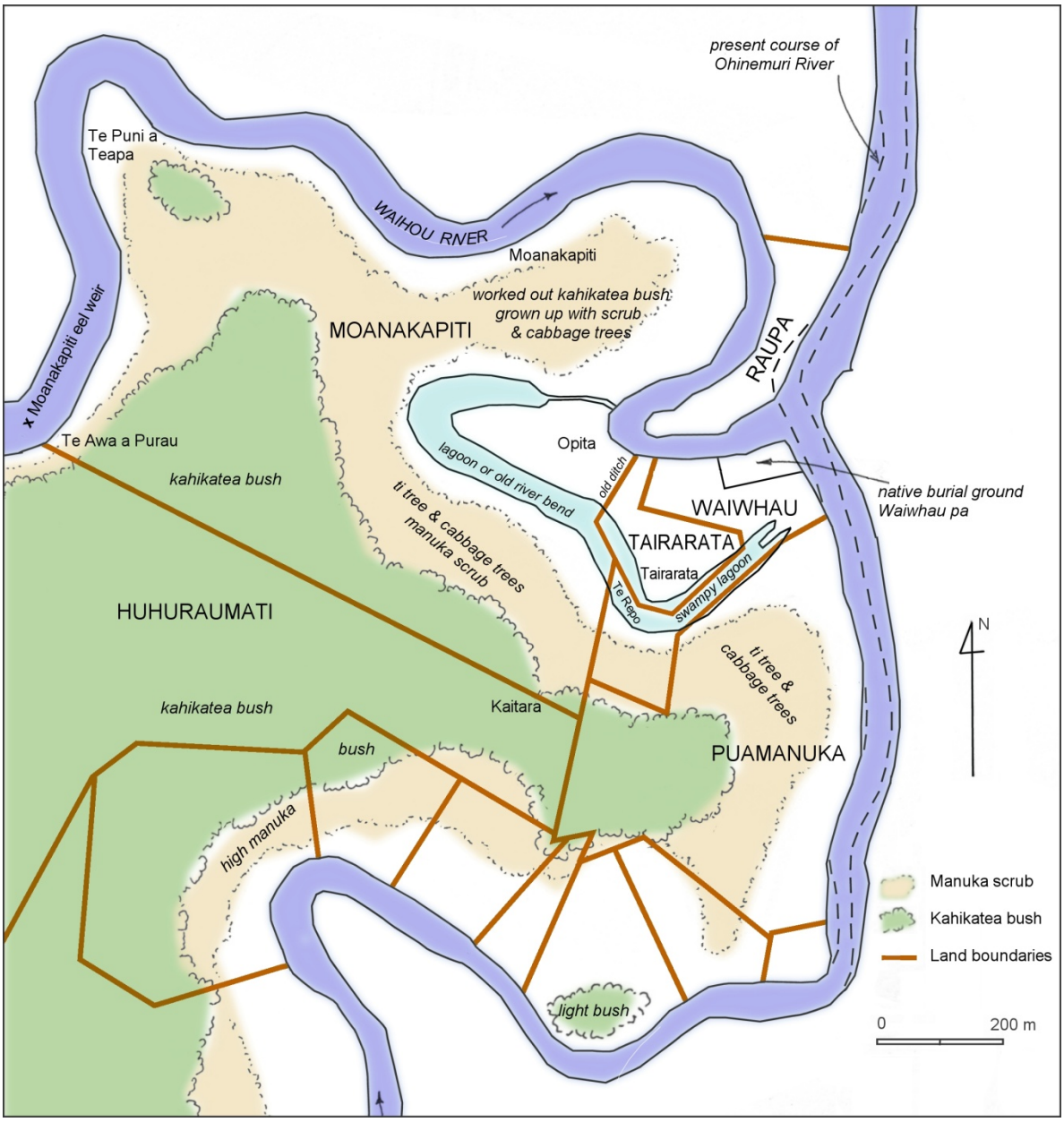

Figure 5. River courses, vegetation, Maori Land blocks and place names in the vicinity of Opita, as surveyed between 1878 and 1919 (same area as Figures 2 and 3).

2.2.3 Post- Marutuahu – c. 1700-1790

Shortly after the last Marutuahu conquests, four noted chiefs and their people also moved into the Ohinemuri area. These were Te Kiko (progenitor of Ngati Te Kiko and a grandson of Tamatera), Toiwhare (progenitor of Te Uriwha, of Ngati Raukawa descent), Tara (progenitor of Ngati Koi, also of Ngati Raukawa descent) and Tokanui (progenitor of Ngati Tokanui, who was from Nga Marama). These iwi and hapu claimed land and intermarried with each other, as well as with Ngati Hako and Ngati Tamatera, forming a complex web of alliances (see Figure 4). One result was the emergence of the hapu Te Uriwha with strong connections to both Ngati Te Kiko of Ngati Tamatera and Ngati Hako, although at times they argued in the MLC that one iwi rather than the other held mana whenua (political and spiritual authority in the land).

In the Tairarata hearing, Rapata Te Arakai asserted:

> My mana over all these lands is through Wairohe wife of Toiwhare. Lands all about here were never taken in conquest from N.hako.[6] The descendants of Toiwhare formerly lived on this land (Tareranui and Te Pokiha 1878:326).

Regarding the adjacent Moanakapiti block, Haora Tareranui, said his ancestor Te Kiko conquered and lived in the land which included the Opita peninsula (Tareranui et al. 1898:95).

These internal battles to establish mana whenua (sovereignty) resulted in pa being constructed the whole length of the Waihou from the Ohinemuri junction to the river mouth. This is reflected in the earliest date from Raupa excavations of c.1690 (Phillips 2000a:129-139; Prickett 1990, 1992). Towards the end of this phase several burials were interred in the centre of Raupa.

Around 1775 peace was finally established in the Ohinemuri area by Tuterangianini Te Popo[7] of Ngati Tamatera (Phillips 2000a:61-2). However, disputes with other tribes continued, including battles with Ngati Haua from Waikato, Ngaiterangi from the Bay of Plenty and Ngati Paoa from the Firth of Thames, and again pa were built around the Waihou River mouth and Ohinemuri junction. Raupa pa was refortified during this time, and numerous cooking areas, houses (including one large house with a porch) and defences have been recorded (Phillips 2000a:129-139; Prickett 1990, 1992).

Gardens were mentioned in many of the MLC hearings. The actual crops were not frequently described, however, kumara were mentioned for the blocks around Opita. Gardens were generally only used for between two and three years before being left to fallow for a period of possibly 10-40 years (Phillips 2000a:163).

2.2.4 Explorers and timber millers – 1769-1820

The first detailed European accounts of the lower Waihou River were from the journals by Captain James Cook and Joseph Banks in the 1769 voyage of the *Endeavour*. The effect of this visit was probably not directly significant for Hauraki Maori. However, Cook's comments about the excellent timber growing along the river banks heralded the initial phase of European contact by vessels intent on acquiring timber for sale in Australia and China. During the 1790s and the first decades of the 1800s, several such vessels visited the northern parts of the Waihou (Beaglehole 1955; McNab 1914; Phillips 2000a:80-1). Maori at Hikutaia, Kopu and other places along the northern part of the Waihou traded timber, food, water and other goods, as well as labour, in exchange for a range of iron tools.

In April 1801, a group of London Missionary Society missionaries on their way to Tahiti arrived in the Firth of Thames on board the *Royal Admiral* captained by William Wilson (Anon 1801). While Wilson and his men were occupied cutting timber, the missionaries travelled around the district and recorded their experiences. They arrived in a time of conflict between Hauraki and Waikato, and described some of the intense arrangements for war during May and June of that year, involving the gathering of several thousand defenders at Oruarangi. The *Royal Admiral* left before the results of all these preparations could be witnessed.

The last phase of construction at Raupa may have been in response to these events. Oruarangi may have been abandoned by 1820 but Raupa was strengthened with multiple lines of defences enclosing an area of over two hectares, expanding it to the same size as Oruarangi had been (Phillips 2000a:40-3). Raupa was very much a traditional pa that was re-occupied on a number of occasions and inhabited

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6 In many of the MLC minutes the tribal Ngati is written as N, and on occasions the tribal name is given in lower case, such as here with Ngati Hako.

7 Tuterangianini was a chief of Ngati Tamatera of Ngati Matewaru hapu who was a great war leader 1790-1840 and uncle of Taraia. He had contracted an infection which resulted in painful ulcers, these were never cured and resulted in him adopting the name Te Popo, or rotting flesh (Turoa and Royal 2000:90-1, 236).

for several decades: possibly 20-30 years every 60-100 years. Raupa may have been first an undefended kainga that was fortified for some event, and enduring political factors ensured that its prominence was enhanced over time. Such fortifications were very different to the small, temporary pa constructed once for a particular event and not re-inhabited afterwards (Phillips 2000a:157,163). In this period, more than 20 different pa were in use along the Waihou River, although as each needed substantial work after only a few years to replenish the palisade bindings (Dante Bonica pers. comm. 1999), only a few would have been occupied at any one time (Phillips 2000a:60-2).

In 1820, the Rev. Samuel Marsden, travelling on the timber ship the *Coromandel*, was the first to record coming as far as the Ohinemuri and provided a fairly full account, despite the brevity of his visit. Marsden stopped at Raupa pa, which he described:

> On a point of high land where the two streams meet, and by which it is surrounded, stands the hippah [pa] of the head chief .... The hippah was very full of people, who welcomed us on shore .... The natives' houses here were much larger and better built than any I had seen in New Zealand. The areekee [ariki – paramount chief] appropriated one for us, which afforded lodging to us and the fifty natives who had attended the launch up the river (Elder 1932:255).

The large number of people Marsden noted at Raupa may have been due to the threat of attack, as he was informed by Te Puhi (a Ngati Maru chief who accompanied him) that there had been a raid by a combined Waikato and Ngati Paoa force on Te Totara, near the mouth of the Waihou River. Kelly states that Te Hikamate was the chief Marsden met at Raupa in 1820 (Kelly 1945). However, it might have been Te Pohepohe or his cousin Te Popo, who with his son Te Whata, are mentioned in the MLC records.

Haora Tareranui stated that Te Pohepohe and Te Popo were chiefs of Waiwhau: “Te Popo had a house built at Waiwhau in which to make peace with Ngaiterangi” (Tareranui and Te Pokiha 1878:334). This has been estimated to have been around 1790 (Phillips 2000a). Waiwhau was typical of those pa built once for a particular event and had very light defences (Phillips and Green 1991:168-9). Tareranui continued: “Te Popo lived on the Waiwhau until Tarore's death when it became a tapu” (Tareranui and Te Pokiha 1878:334). Te Whata, Te Popo’s eldest son, was said by Mere Kuru to have been the chief of Raupa (Kuru 1893) and it was his wife, Tarore, who was the first to be buried at Waiwhau, which must have been around 1815. Others may have also been buried at Raupa soon after this time (Prickett 1992:87-90). One way of enhancing the significance of a place was to use it as a burial ground and many pa along the Waihou River banks were re-used as burial places (Phillips 2000a:62).

2.2.5 Ngapuhi raids and abandonment – 1821-1830

The events recorded above occurred just before the Ngapuhi incursions that were to have a major effect on the Hauraki people and beyond. Fear of Ngapuhi guns, especially after the loss of Te Totara pa at the mouth of the Waihou River, drove many to hide in the forests or hills. Rihitoto Mataia details that some gathered at Opita:

> After this the threat of another Ngapuhi invasion came. N. Taharua & N. Taiuru went to Opita where N. Hako were living …. Some of N. Koi and N. Tokanui also went there. The Ngapuhi came up the Waihou River and the approach was seen from Raupa pa. A fight took place there. Maeaea and Toea chiefs of Ngapuhi were killed. Ngapuhi fled (Mataia & Tareranui 1893:111).

She continued that although that particular skirmish was won by the defenders, the Hauraki tribes fled south to the Waikato. As Paraone Te Maupu stated:

> The land was deserted at the time of the Ngapuhi invasion. N.hako remained about this district when the other tribes fled inland. Ngapuhi fought with N.hako on two occasions (Tareranui & Te Pokiha 1878:329).

2.2.6 Pare Hauraki return – 1830-1840

Most of the Hauraki people retreated into the Waikato where, by overstaying their welcome, they engendered new conflicts culminating in the battle of Taumatawiwi in 1830. After this, the Waihou people returned to their former homes. Many, including some Ngati Tamatera, did not remain there long, but moved north to other Marutuahu lands, such as Te Puru, Colville, Waiau and Moehau along the Coromandel coast, as well as Whakatiwai and Waiheke Island. It was near Colville (Te Umangawha-o-nga-waka) that the meeting house Te Pai o Hauraki was first constructed about 1838 (Turoa and Royal 2000-167-8). However, some did stay along the Waihou River. Paraone Te Maupu who was born at Opita around 1820 (McCaskill et al. 1879:129), said:

> After the return of the tribes from inland Te Uriwha lived at Opita - the land on that map and the land opposite the Opita stream was all under cultivation by N.hako, N.koi and Te Uriwha. No one else cultivated there (Tareranui and Te Pokiha 1878:329).

This redistribution of population had an effect on the numbers and sizes of the settlements along the Waihou River between the Ohinemuri junction and river mouth near Te Totara, which is particularly evident in the pa. Of the 49 pa reported in this area, only four date to the period after the Ngapuhi raid: Kopu, Turua, Te Kari and Opita. These were built when the population had declined to a fifth or less than it had been, due to a combination of an overall decline in population due to the newly introduced infectious diseases and outward migration (Phillips 2000a:61-4).

At this time there was also a significant change in economic practices, in which timber, flax and a few blocks of land were traded for imported items. Witnesses in the MLC for the blocks around Opita reported that flax was the most common fibre gathered. Although the majority of the references to flax date to the mid-19th century trade with Europeans, it was a significant resource prior to that.

Traders were welcomed by Maori as an opportunity to purchase guns, tobacco, metal tools and blankets. Some were short-term residents, who travelled around the neighbouring Maori settlements and transported their goods to the central markets of Thames, Tauranga and Auckland. Other trader-settlers, such as William Webster and Albert Nicholas were more permanent. Webster stayed at Coromandel for over ten years, finally leaving New Zealand in 1847 (Adams 1990:578-9), while Nicholas lived at Waiharakeke (further up the Waihou River near Te Aroha) from 1846 for seven years and then moved to Hikutaia (18 km downstream from Opita), where he remained until he died in 1888 (Fenton 1879:124; Te Pamahue et al. 1872:70-78; Vennell 1976:52). Trader-settlers often married the daughter of the chief on whose land they were residing. In this way, the chiefs attempted to incorporate the traders into their kin group and thereby maintain control over them (Derby 2011).

As a result of his visit in 1820, Rev. Samuel Marsden proposed that a mission station be set up along the Waihou (Elder 1932). A Church Missionary Society (CMS) mission station was established alongside the Puriri Stream (27 km downstream from Opita) in 1833 by William Fairburn, James Preece and John Wilson, together with their families. However, they discovered that Puriri was not the best location and strongly suggested moving closer to the large Maori population resident at Kauaeranga (near what was to become the township of Thames). In 1837, the station was finally transferred to Kauaeranga, where it was staffed by Preece alone for a further ten years (Phillips 2000a:90).

In 1839, fear that direct government rule in New Zealand might herald the end of cheap property prices sent many speculators into the Hauraki Plains (Vennell 1976:37-46). Lachlan and Allan McCaskill and Samuel Martin attempted to buy the land on which the Opita settlements are situated from Te Awhe and others. This land comprised two large blocks on the true right bank of the Waihou, one to the north of the Ohinemuri junction at Opukeko and the other to the south where Opita is

located [8] (Figure 5). However, the transactions broke down as Te Awhe believed he was to receive further goods including guns.

According to Karaitiana Kihau, Te Awhe received the following:

> I stated that 100 guns 100 casks of powder 50 casks of tobacco and 10 articles of clothing were agreed to be given in final payment. Gowns, pur--, tomahawks, blankets, calico, shirts, needles & etc were some of the articles to be given. Money was not given (McCaskill et al. 1879:134).

This was in addition to the goods given at the signing of the agreement of sale. However, McCaskill did not give any further goods and said that he had made it known that the goods given at the sale were the full and final payment for the land, being "clothing, ironmongery, tobacco, soft goods, muskets and powder" to the value of £496 or £4 per acre [9] (McCaskill et al. 1879:20,135-6).

McCaskill built a house and employed two Pakeha sawyers to cut timber from these lands, but was driven off after a year (McCaskill et al. 1879:19-20). These structures were probably built at Opukeko proper, next to Joshua Thorp's land as the plan accompanying the sale (OLC 120 see Appendix 17) shows a house and grass paddocks surrounded by a series of hedges there.

2.2.7 Opita pa and outside influences – 1840-1860

Joshua Thorp is commonly regarded as being the first European to settle along the lower Waihou. In 1839, he bought 354 acres (143 ha) at Opukeko for £70 worth of trade goods: mainly guns, gunpowder, tobacco and blankets (Vennell 1976:43) and in 1842 he and his family moved onto the property to begin farming (Thorp 1967). This settlement known as Belmont was painted in glowing terms by George Cooper, who visited in 1849 (see Figure 8). Cooper described the spacious orchard and garden, splendid herd of cattle, 30-40 acres sown in potatoes, wheat and meadow grass, as well as 50 hives of bees and rose hedges in bloom (1851:18-20). This was an English farm transplanted into a Maori setting. He also remarked that:

> Thorpe [*sic*] employs no servants, all the work being done by his own sons with the occasional assistance of some natives in the planting and harvest seasons (G. Cooper 1851:18).

In the 1840s, there was a change in the pattern of trading. As European towns developed, Maori took their produce directly to Auckland rather than selling to local traders. Ernst Dieffenbach records this change on his trip down the Piako in 1843:

> Some European traders had formerly lived at this place, but they have now quitted it, as the natives prefer bringing their pigs themselves to Auckland, where they know they shall obtain the market-price (Dieffenbach 1843 Vol I:416).

Significant tonnages of cultivated wheat, maize and potatoes were imported into the town of Auckland during the heyday of Maori agriculture, between 1845 and 1860 (Hargreaves 1959; Williamson 1865). The *Daily Southern Cross* in 1853 and 1854 listed cargoes arriving at Auckland from Hauraki: these included pork, kauri gum, potatoes, onions, wheat, maize, cherries, live pigs and poultry (30/12/1853, 10/1/1854). Taraia, a Ngati Tamatera chief owned and operated a schooner sailing from Hauraki to Auckland between 1858 and 1866 (Allen and Phillips 2013). However, it is not known how much of this produce originated along the lower Waihou River.

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8 Rather confusingly, both large blocks were referred to as Opukeko, and in 1870 evidence concerning a much smaller block that contained Opukeko pa, which was excluded from the earlier Opukeko Blocks, was heard in the Maori Land Court (Mataia & Te Moananui 1870). It was also known as the Opukeko Block.

9 This indicates he purchased 124 acres or 50.2 hectares, but the OLC plan records it as 899 acres or 363.8 ha.

Although some trading patterns changed, political agendas continued as before. One event affected the people living at Opita. Paraone Te Maupu stated:

> At the time Taraia went to fight with Ngaiterangi, these three tribes continued to reside on this land, and they did not run away. On the return of Taraia, Te Awhe proposed that these three people should live as one for the protection of each other and told them to build a pa in case of Ngaiterangi invasion. The pa was made but Ngaiterangi never came to attack it. They came on a subsequent occasion to make peace. We had grown a great quantity of crops and caught many eels for this occasion. Te Tuihi (Te Hira) told us to do this so that the Ngaiterangi might be brought over here to make peace.
>
> Christianity had been introduced the time this pa was built. We did not go with Taraia's war party to Tauranga because of Christianity. Those who accepted Christianity did not engage in wars (Tareranui and Te Pokiha 1878:329-331).

Tinipoaka Te Ngako added that when "Opita pa was inhabited the burying place was Waiwhau" (Tareranui and Te Pokiha 1878:335), and it seems that Te Uriwha buried many of their ancestors within the former pa site over a number of years.

These events can be more closely dated as they were reported by European observers and officials. Taraia's battles with Ngaiterangi took place in 1842 and when he killed Te Whanake of Ngaiterangi retribution was seriously threatened. Peace was eventually made in 1846 (Williams Journals, entry 1/9/1847, Allen and Phillips 2013).

Edward Shortland, sub-protector of aborigines for the Eastern District, visited Opita pa in October 1842, soon after it was built. He mentioned seeing 50 people present and he observed that it "was newly fenced for fear of the Tauranga natives", and the old chief, Te Awhe, accompanied them "in his canoe to his cultivation, where they were busy planting potatoes" (Shortland ms. Diaries & journals).

A year later, Bishop Selwyn was the first missionary to record visiting Opita pa, where he "went into a large house formerly built for an Englishman engaged in the pig trade" (Wilson 1889:12; Selwyn 1847:24). A drawing by Joseph Merrett showed Opita pa and village as they were only two years later (Figure 6). Merrett's painting shows storehouses both inside and outside the defences. No defensive ditch can be seen and it may be that this was a gunfighter pa with an internal ditch. A European-style house outside the palisade may be the pig trader's house.

As regards the location of the pa, in the Tairarata hearing Rapata Te Pokiha stated:

> I have not seen the survey myself. The boundary of the Opita pa on the land is a ditch (Tareranui and Te Pokiha 1878:328).

Possibly at this time the Moanakapiti eel weir or tarawa was made by Pakitahi of Ngati Te Kiko and Te Uriwha, a contemporary and relation of Te Awhe (Te Pokiha and Tareranui 1882:174). Tinipoaka stated that he had seen Haora Tareranui and others repairing it, and Haora's cattle dragging the timber for it (Te Pokiha and Tareranui 1882:176). However Rapata Te Pokiha said that Te Awhe built the eel weir and that Pakitahi derived his mana from Te Awhe. Moreover, he stated that the right to do so was derived from Ngati Hako and that he, Rapata, had kept it in repair (Te Pokiha and Tareranui 1882:177). Apart from gardening, eeling was the most frequently mentioned economic activity. Eels were caught either in weirs (tarawa or pa tuna) set across the rivers or in eel baskets (hinaki) placed in deliberately cut channels. The eel weir at Moanakapiti may be the one sketched by Rhodes Cooper in 1850 (Figure 7).

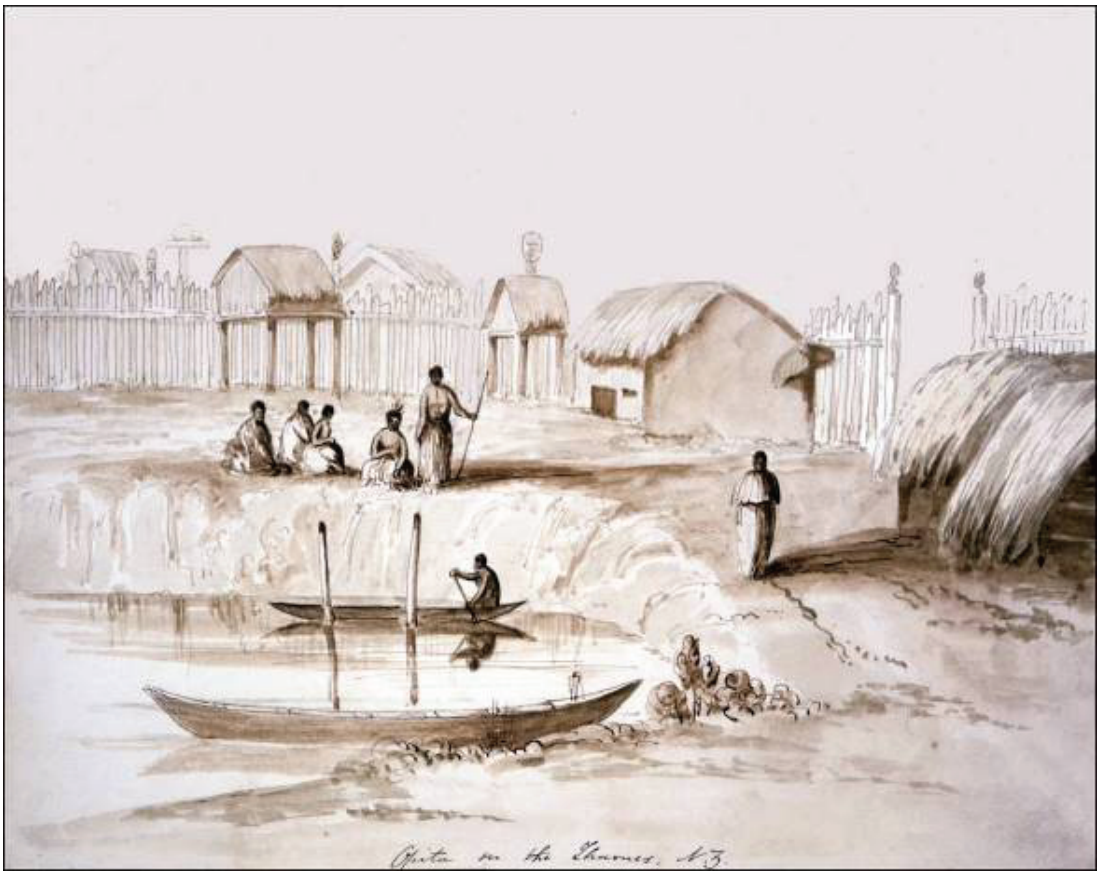

Figure 6. "Opita on the Thames, NZ" by Joseph Merrett (1848), showing the pa defences, storage structures, houses and canoes on the Waihou River, with the junction of the old Ohinemuri channel to the right . The seated group are where the principal riverside excavations took place.

Figure 7. **'**Eel fishers near Opita' by I. Rhodes Cooper (1850:40). This sketch appears to show Karangahake hill in the background, which is to the south-east. The eel weir could be Moanakapiti or another next to Waiwhau where the houses are shown.

By 1849, Opita was recorded by George Cooper as being run down and he stated:

> Opita is a wretched place, containing about a dozen miserable raupo houses all tumbling to pieces. We found the natives in a very poor condition, not a living animal had they, save four geese, a hen with a brood of young chickens, and a few skeleton-looking dogs; they had neither potatoes nor kumeras, but were living on fern root and a few eels which they catch now and then (G. Cooper 1851:18).

After the abandonment of the pa, Opita continued to be used as a meeting place by the missionaries until at least 1857 (Appendix 18). A chapel may have been built there during this period, however this would probably have been a raupo whare (Maori house) as weatherboard chapels were not built in Hauraki until 1851 and then only in more major centres such as Manaia and Kauaeranga (Monin 2001:163). Occupation at Opita may have been intermittent or seasonal. It was said to be deserted in August 1855 when the crew of the *H.M.S. Pandora*, who were conducting a series of hydrographic surveys and plans around the coastline, came up the Waihou River as far as the Ohinemuri junction (Ancestry.com 2011, Figure 8). This plan also shows Belmont farm belonging to Thorp, the nearby pa of Opukeko, and that the Ohinemuri River was too tapu for them to survey it.

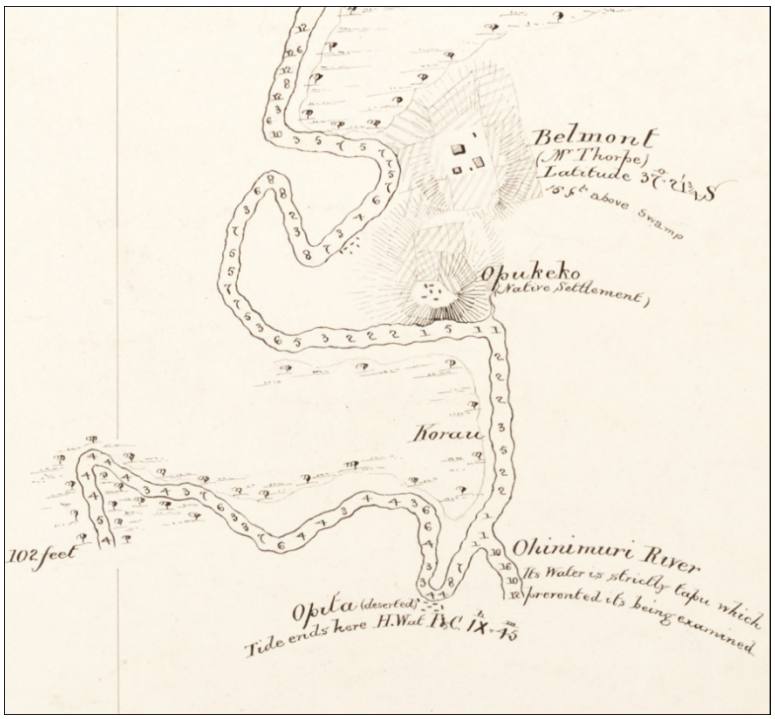

Figure 8. Part of the plan of the Waihou River by *H.M.S. Pandora*, showing the soundings of the rivers in feet (Drury 1855): the vertical line on the left marks True North. Opita is said to be deserted, the Ohinemuri River "its water is strictly tapu which prevented its being examined". Opukeko native settlement and Mr Thorpe's Belmont is also shown.

There was a rapid decline of the Maori population along the Waihou River after European contact. In part this echoed the overall drop in the numbers of Maori which Pool (1991) and earlier writers (Dieffenbach 1843 Vol II:274; Fenton 1859) suggested was largely due to a high mortality rate. In particular, this was due to infectious diseases to which Maori had little resistance. There are many personal stories of deaths, as well as instances of epidemics during the period 1820-1860, that caused the Maori population to drop by half. The population reached an all-time low of 44,000 in the 1886 census.

Wikiriwhi Hautonga describes two episodes at Te Komata, just north of Opukeko, prior to 1820:

> They lived on Te Komata the time of 'te rewharewha',[10] before the Pakehas came. A number of N.hinewai died from that disease on the block .... All the N.hinewai did not die off of rewharewha. Another the same called Kingi Hori appeared and others died. Whanaunga [his grandfather's brother] died of it at Te Tapi near Te Tutu pa. Tohi [his grandfather] also died and many others of my ancestors. They who died of the disease were not buried. The house in which they died was closed up and the body left (Hautonga & Te Ngako 1870:318-9).

In 1847, Joshua Thorp (1847) described Maori from the neighbouring village, presumably Opukeko, as being "subject to both acute and chronic diseases, and few of their children survive the second year".

Another reason for the local decline was that at this time more of Ngati Tamatera left the Ohinemuri area for other places. Opita was less prominent by the end of this phase. While it had regularly appeared on sketch maps of the 1840s (Phillips 2000a:93,97), the *Pandora*'s map of 1855 is the last time it is shown. However, the land continued to be occupied by Te Uriwha. During the occupation of Opita pa and for some time afterwards, members of Te Uriwha were buried at Waiwhau, while Ngati Tamatera were buried at Kopuarahi, further south along the Ohinemuri River. As Tinipoaka Te Ngako stated:

> Formerly when N.tamatera were living on seaward only the Uriwha dead were buried at Waiwhau. Since the return of the tribe inland Kopuarahi has been the common burying place (Tareranui and Te Pokiha 1878:335).

As part of his continuing residence in the area Rapata Te Pokiha introduced new plants, including cherry trees brought from Matamata, peach trees and willows (Tareranui and Te Pokiha 1878:337). Presumably the fruit were for sale as well as eating. Around the same time, timber was cut and floated down to McCaskill's mill and sold for goods (Rapata Te Pokiha in McCaskill et al. 1879:118).

2.2.8 Wars over land and gold – 1860-1875

In the late 1850s fear of being swamped by Pakeha began to be felt by Hauraki Maori and major inland tribes. Te Wherowhero was enthroned as the first Maori king in 1858, as part of an attempt to save the land. Disputes over land between Maori and the settler government increased and war erupted in Taranaki in 1860; this spread to Waikato and Tauranga in 1863. The goldfield at Coromandel was reopened in 1862 and Hauraki chiefs had to determine whether they would collaborate or rebel against Pakeha government. This was no simple decision as some hapu had become indebted due to investment in schooners, flour mills,[11] new foodstuffs (including tobacco) and by the use of raihana (ration notes)[12] especially during tangi. Much of this had not directly affected those Maori living at Ohinemuri, but gold had been found at Waihi in 1868 and pressure increased to allow the development of mining there as well. Eventually Te Hira Tuiri, and those with him who had been resisting further incursions into their lands, had to relent (Monin 2001).

Prior to the opening up of the Ohinemuri Goldfield in 1875, a survey was undertaken of the area in 1870 (ML 1879). This showed access routes and several Maori settlements (Figure 9).

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10 Various epidemics in the early 19th century were called 'Te rewharewha' or rewarewa, including dysentery and influenza (Pool 1977:118).

11 Taraia employed two Pakeha to construct a flour mill on the Kuoiti Stream at Ohinemuri between 1864 and 1866 (see Figure 9), wheat was grown but the mill ceased to operate some time before 1875 (Monin 2001:207-8). Two flax mills were also built nearby (Waitangi Tribunal 2006:1142-4).

12 Raihana could be redeemed at local stores to a set value, and were often provided against the equity of interests in land (Monin 2001:235-8).

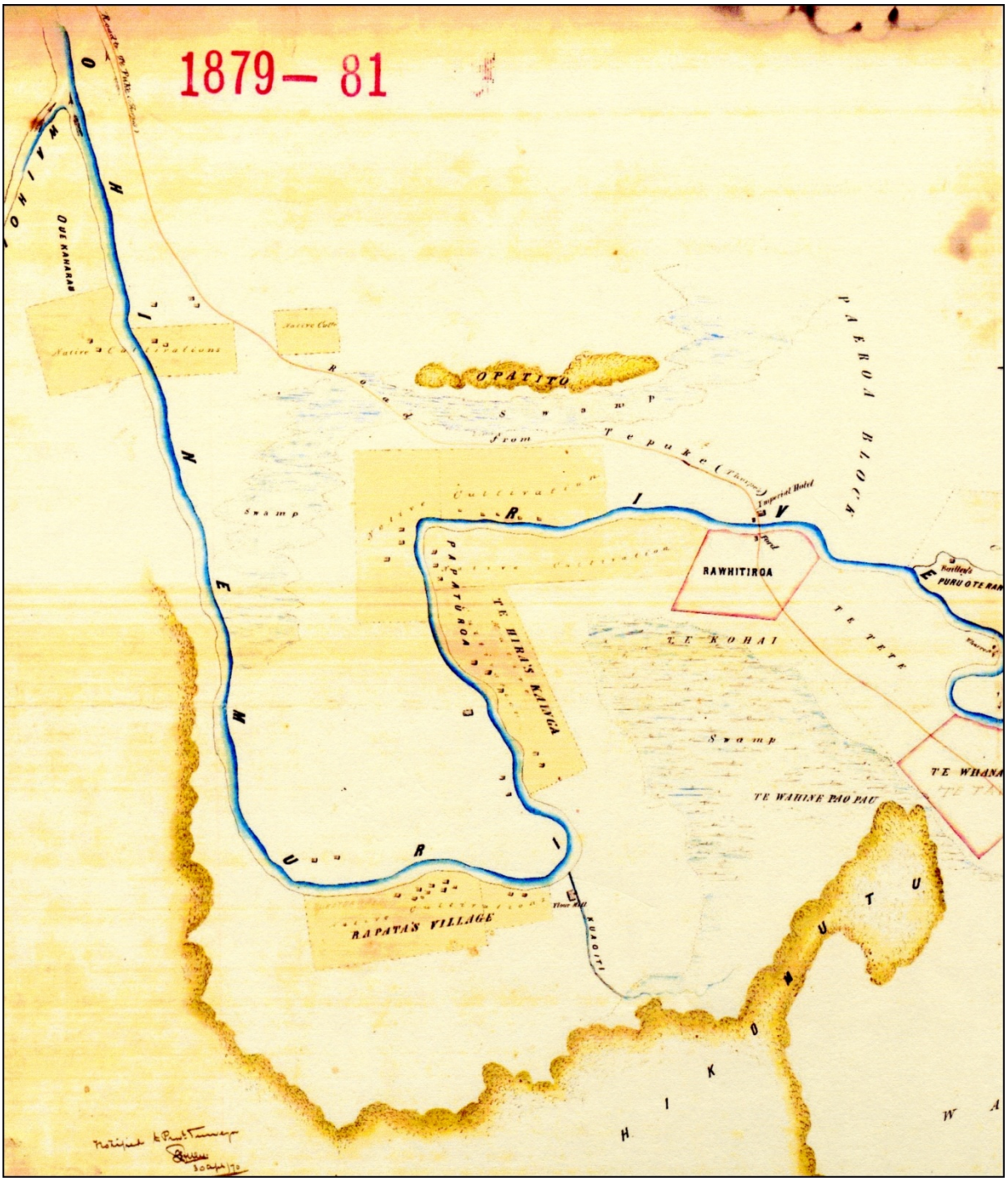

Figure 9. Part of a plan drawn in 1870 (ML 1879) showing Maori villages and gardens along the Ohinemuri River (note a major bend to the west has been omitted), the Paeroa Block that became part of the present township and the flour mill near Rapata's village. The square on the opposite side of the river from Te Hira's village is possibly Te Pai-o-Hauraki marae. The first European buildings – Imperial Hotel and Bailey's house are also marked.

At this time no occupation is indicated at the junction of the rivers, rather the main focus of Maori settlement appears to be along the Ohinemuri and around the crossing at what is near the present Criterion Bridge in Paeroa. Kainga of Te Hira and Rapata are both marked, and in 1878 Tinipoaka Te Ngako, Haora Tareranui, Rapata Te Pokiha and Paraone Te Maupu were all living at Ohinemuri. A

pataka on the banks of the Ohinemuri sketched in the 1860s may have belonged to one of them (Figure 10).[13] As Turoa and Royal observed:

> Following the cessation of the land wars in 1864, much pressure was applied by the Crown to acquire the O-Hinemuri tribal lands for gold-mining purposes. The Native Land Court was established in 1865 to facilitate alienation. Because of their isolated situation, the tribes decided to vacate their Moehau homes and return to the more active centres of Thames and Paeroa where these land transactions were being carried out. In 1868 their house [the meeting house Te Pai o Hauraki] was once again uplifted and barged in sections up the Hauraki Gulf and the Waihou and Te Waitangi-o-Hinemuri (O-Hinemuri River) and resited on the opposite bank from where it now stands (Turoa and Royal 2000:168; see Figure 9).

Figure 10. Raised storehouse drawn by James Richmond in the 1860s, showing a sloping path down to the ford across the Ohinemuri River, the flax bushes on the river banks, patchy trees growing on the flats and partially cleared hill slopes behind.

Around 1872, members of the Ngati Kahungungu tribe were invited by Rapata Te Pokiha to stay on the land as a form of ahi ka (retaining rights to land through regular reoccupation), to prevent McCaskill from running his cattle on the block (Tareranui and Te Pokiha 1878:327). Wini Kerei of Ngati Kahungungu said:

> I know this land Tairarata. I worked there up to last year [i.e., 1877]. I left there because Puamanuka has gone into the hands of Europeans and their cows trespassed on our land …. Our cultivation was just outside the pa. When we first went there we saw a great quantity of peaches and grapes growing there. I hear they were the Uriwha's property. The peach trees were planted the same time Opita pa was built. There are also willow trees growing there (Tareranui and Te Pokiha 1878:333).

13 In the 1870 plan shown in Figure 9 the Imperial Hotel is marked on this spot.

Ngati Kahungungu were joined in 1874 briefly by John Guilding[14] who married a daughter of Rapata Te Pokiha. He stated that he lived near the eastern boundary of the Tairarata Block (Tareranui and Te Pokiha 1878:338). Te Reiti Paraone said that she had been born across the Opita Stream at Te Nganginga and as a consequence Te Awhe was laid out there after his death in 1866 (Tareranui et al. 1898:109). According to this account other Te Uriwha and Kahungungu were then buried there (marked as 9 on Figure 11).

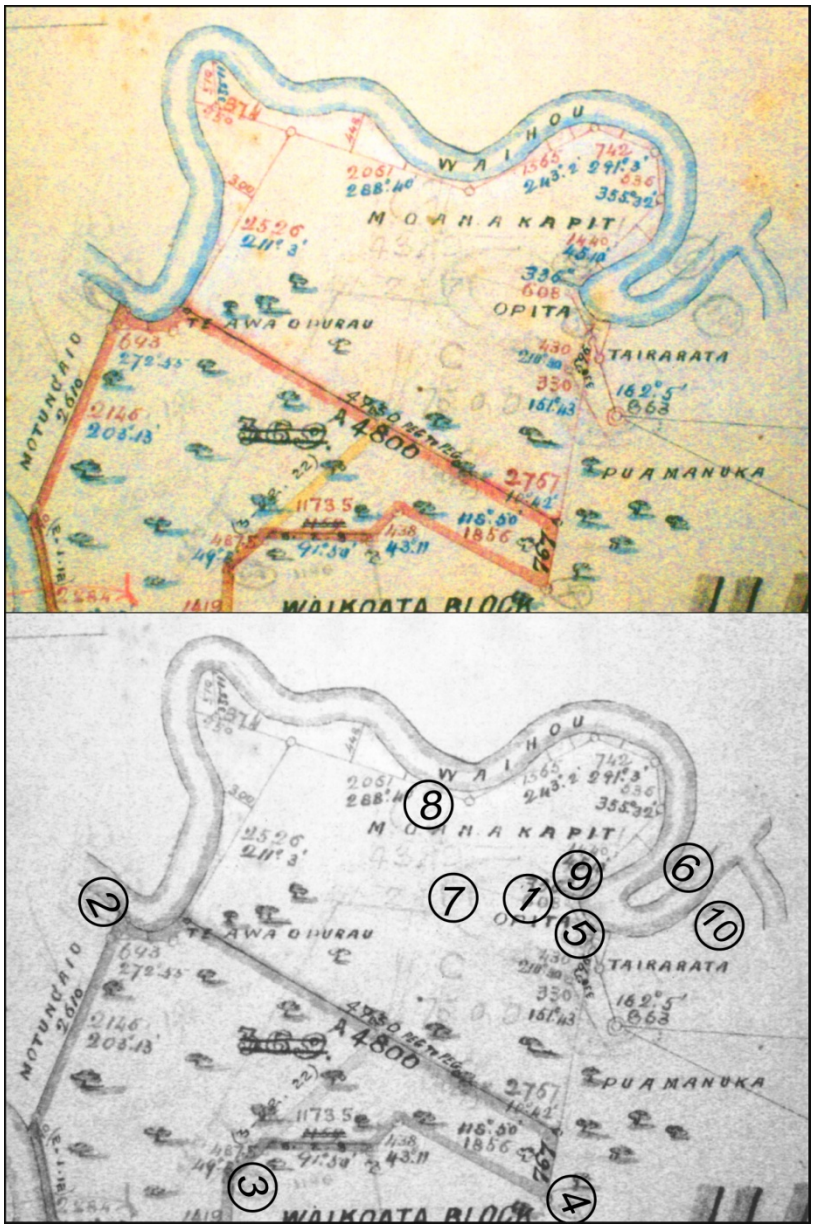

Figure 11. Above: detail of Huhuraumati Block (ML 4382) originally drafted in 1879, showing the position of Opita in the old river bend with numbers pencilled in 1898. Below: numbers mentioned in the hearing and text below are highlighted. Point 1 was marked on the Moanakapiti plan.

14 John Guilding was a trader who appears several times in the newspapers prior to living at Opita. In April 1863 he entered the Port of Auckland with 15 pigs, ½ ton gum and 1 ton of potatoes from the Thames (*Daily Southern Cross* 16/4/1863). Three months later, he had stock on a farm on the Piako River (*Daily Southern Cross* 31/7/1863). In April 1865, he and his partner Frederick Summerfield claimed for losses due to not being able to occupy their houses, and loss of goods, furniture and stock (*Daily Southern Cross* 13/4/1865). He clearly returned to the Piako, as the following year he was sworn in as a special constable, charged to search vessels coming up the Piako with guns for sale to Maori (*Daily Southern Cross* 24/9/1866). In 1867, he was reported to have a store at Thames (*Daily Southern Cross* 30/7/1867).

2.2.9 Gold mining, Paeroa township established – 1875-1900

Less than twenty years after gold mining began much of the land around Paeroa had been sold into European hands. However, the land around Opita remained in Maori ownership until the end of the 19th century and the beginning of the 20th century.[15]

This period marked a change in land use, gardening and eeling appeared to have ceased and most of the land was used for grazing. In the Opukeko hearing of 1879 Rapata Te Pokiha said he had:

> Left off cultivating the land in 1877 …. My horses and pigs [were] running on the land (McCaskill et al. 1879:118).

Haora Tareranui said:

> We have an eel weir at Moanakapiti and go there to catch eels where there is a fish in the river. Ngatikiko worked there three years ago but not since …. My horses and cattle are running there at present. I mean all over the land. We have fences outside the land and make this a run for our cattle and horses (McCaskill et al. 1879:124).

Wini Kerei and his whanau stayed on the land until his death in the early 1890s. According to Haora Tareranui, the houses were still there in 1898 but were rotten (Tareranui et al. 1898:96).

Haora Tareranui said that the first European house at Opita was built in 1894 by Tu Paaka, a descendant of Te Awhe, and that about 1895 Witika Taupo built another one close by (Tareranui et al. 1898:90-91). Te Paea Taupoki stated that he had put up a fence (shown as 1 in Figure 11) to protect trees from being felled, as he had not received money for those that had been cut (Tareranui et al. 1898:91). Morehu Te Putu (Tareranui et al. 1898:96) also put up a fence (shown as from (7) to (8) in Figure 11), possibly for the same reason as Te Paea, as he was annoyed by Witika Taupo's actions. He said that Taupo had sold some thousands of feet of kahikatea from the Huhuraumati block. However, Taupo objected saying he was not the only person who had cut or sold timber from the land (Tareranui et al 1898:102).

A number of timber and flax mills were established in the Paeroa area. From 1875 the growth of the Auckland population and trade with Australia increased the pressure for timber and a number of timber agreements were entered into between saw-millers and Maori land owners. A timber mill operated in Paeroa, and McCaskill continued his operation on the Hikutaia River during this time. In the 1890s flax mills were established on the Waihou River and elsewhere in Hauraki (Waitangi Tribunal 2006:609, 1111-2, 1142). Mill Road, shown in Figure 12, became so named due to the number of different mills that were situated along the river banks (Hall 1970).

Five censuses taken between 1874 and 1891 show the number of Maori living between Thames (Parawai) and Ohinemuri increased from 450 to 1350 (*AJHR* 1874, 1878, 1881, 1886, 1891). Of these about 200-500 were living in the Ohinemuri district. The Pakeha population in the same area increased dramatically, especially in the townships, from a mere handful in 1830 to about 5,000 in 1900 (Te Ara 2010).

Around Waihi, gold mining practices involved crushing rock to extract the ore: this resulted in large amounts of rock flour. In 1895 the Ohinemuri was designated by the government by Proclamation as a sludge channel. The tons of sediment dumped in the river, especially in times of heavy rain, caused widespread damaging floods at Waikino and Mackaytown in the Karangahake Gorge and at Paeroa where the waters spread out over the plains (Figure 12). The first of a series of devastating floods occurred in 1896 to be followed by others in 1903, 1905 and worst of these floods was in 1910 (*AJHR* 1910 C-14; Watton 1995:81).

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15 A small part of the land between the Waihou and Ohinemuri Rivers is still in Maori ownership.

2.2.10 Afterwards – 1900-present

After the turn of the century, leasing of grazing and land sales resulted in Opita becoming a Pakeha domain. Tinipoaka Te Ngako must have felt the devastation of the people and the land, when he related the tradition about Kaitara, a tree on the southern boundary of the Moanakapiti block:

> Kaitara was a kahikatea tree, it is now rotten. It was a --- tree. When a chief died, a branch would fall off. When the last chief died the tree itself fell (Te Pokiha and Tareranui 1882:176).

In 1910 the government established a Commission of Inquiry to seek a remedy for the regular flood damage in the Paeroa district (Watton 1995:81). The result was a plan involving stopbank creation along the river banks and the cutting of a major bend in the Waihou, forming its junction with the Ohinemuri further downstream at Puke where it currently is located (Figure 12).

This flood protection work meant that at the former junction, the original Waihou course became a swamp and lagoon like the old Ohinemuri channel, but with each new flood the old channels filled with silt until in places they are barely visible today.

The first stopbank was low and narrow; material to construct it came from adjacent high ground. Flooding was not prevented as the Ohinemuri had become clogged with silt 45 feet (15 m) deep at the Criterion Bridge (*Ohinemuri Gazette* 22/8/1921). Continual work during the twentieth century included higher stopbanks, toe drains behind the stopbanks, floodgates and after 1984, the creation of a broad floodway between the river and the stopbank. As our earlier research observed:

> [Prior to flood protection measures] The Waihou River flows through a narrower channel, varying between 70-150 m wide. It is bordered by natural levees averaging 100 m wide, which are slightly elevated above the surrounding swampland.
>
> The Maori settlements are generally located on these sandy levees. Considerably less shell was used in the construction of the sites in this reach, making them much harder to locate archaeologically. The previous flood protection work utilised much of the silt from the levees to construct the stopbank and in doing so destroyed, or severely damaged many of these river banks sites. Therefore, the main source of information for settlements in this area has had to come from the Maori Land Court Records.
>
> The current flood protection scheme in this reach has involved creating a graded berm or floodway between the river and the stopbanks, new higher stopbanks, and toe drains. These developments have effectively removed a 150 m wide strip to a depth of 2 m along the river bank (compared to the previous 50 m, or narrower, strip), thereby destroying most of the sites located along the natural levees. The results of this activity were seen in all the excavations, and had a major impact on the preservation of the sites (Phillips and Allen 2006:86).

Farming too had its impact. The land on which Opita was located was subdivided during the first decades of the twentieth century, being part of the Moanakapiti-Huhuraumati, Tairarata and Waiwhau Maori Land Blocks, and was registered as a number of freehold titles. Initially, these blocks remained in Maori ownership, but gradually were sold to Pakeha farmers. By the end of 1920, Tairarata No. 1 and Moanakapiti-Huhuraumati D1A, D1B and D2, which contained most of Opita, were sold to William Keys (Appendix 19). Rudolf Rasmussen purchased Tairarata from Keys, possibly to gain access to the Waihou River, as the river was the main way that goods and stock were transported at the time. The Rasmussens gradually acquired other property in the area, and in 1939 purchased the Moanakapiti-Huhuraumati sections from the Keys. The remainder of the area investigated lay in the Waiwhau North Block, which also contained Waiwhau Pa. The pa and urupa had been fenced off, and the surrounding land was probably farmed by Keys, Rasmussen, or other adjacent farmers. Waiwhau North did not pass into freehold title until the 1984 flood protection works when it was acquired under River Control Purposes. It is now farmed by the Rasmussen family.

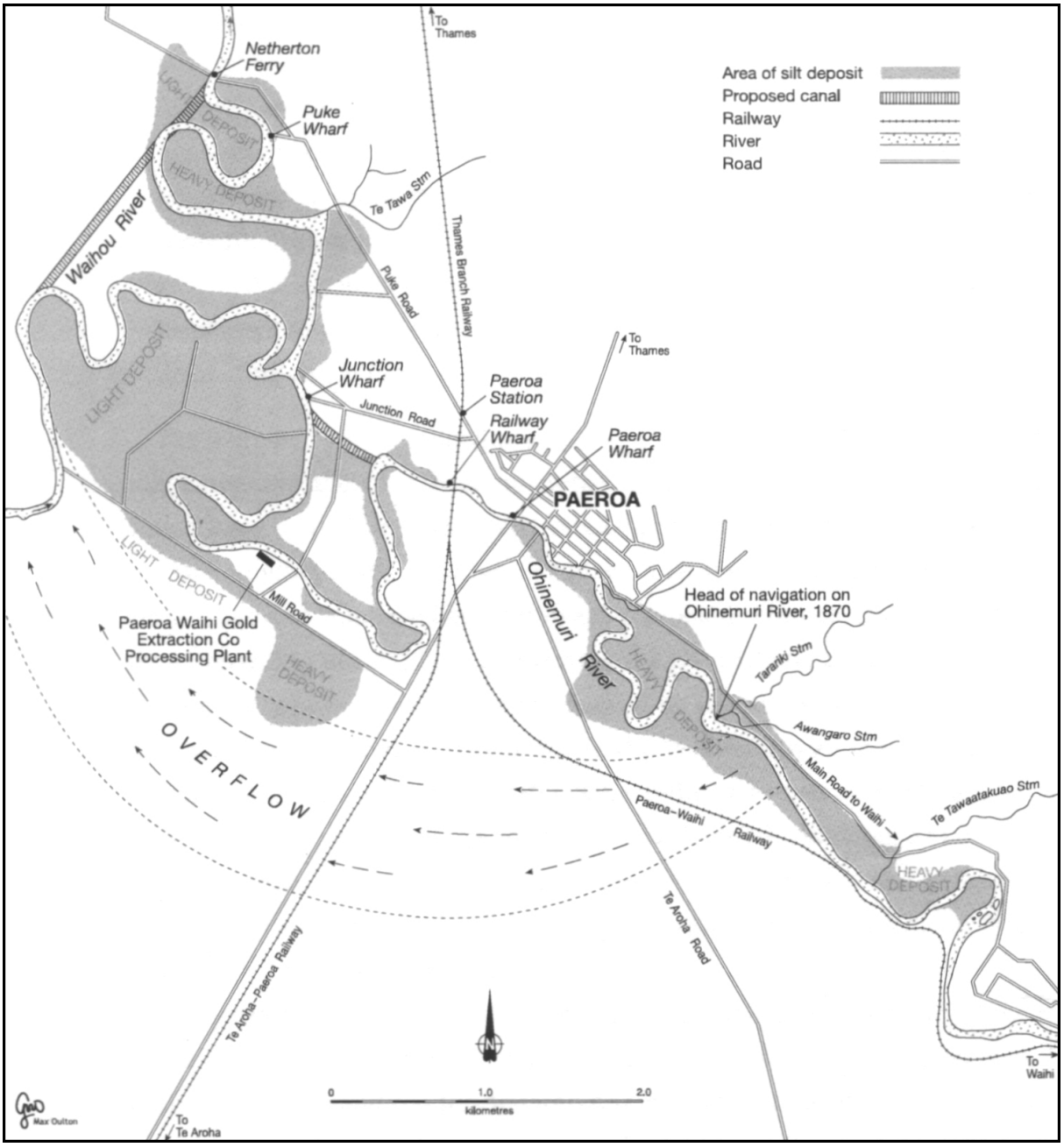

Figure 12. Plan of flooding and silt deposit in 1910 (Waitangi Tribunal 2006:1129 from *AJHR* 1910). The proposed canal designed to move the junction of the rivers northwards, the location of the Paeroa Waihi Gold Extraction plant and nearby Mill Road are also marked.

Over time the farmers constructed a number of drains, and more recently undertook mole ploughing. In the 1970s or early 1980s pipelines were laid to enable the spraying of whey from the dairy factory and finally, a roadway through the Opita settlements was formed as part of the 1984 flood protection works (Phillips and Allen 2006).

These flood protection works and farming activities affected the preservation of the archaeological evidence at Opita to varying degrees. The particular impacts are discussed later in the "3.4 Post-occupational disturbance" section.

3. Excavation

Between 29 January and 16 February 1991, the authors and a team of 15 students (Heather Adams, Stuart Bedford, Bev Butler, Gerard Carter, Elaine Cooper, Hilary Graham, Eleanor Herd, Maurice Hoban, Simon Holroyd, Martin Jones, Helen McCracken, Jacky McDonald, Jeff Mosen, Amanda Young and Jeff Young), plus Rod Wallace, senior technician at Department of Anthropology at University of Auckland and Dominic Wilson, investigated the old meander of the Ohinemuri. The team stayed at Te Pai o Hauraki marae in Paeroa and were looked after by Winnie Hutchinson and others of Ngati Tamatera (Figure 13).

Figure 13. The team at Te Pai o Hauraki marae, where we stayed during the excavation.

A survey plan of the Tairarata block showed an 'old ditch' crossing the old Ohinemuri bend (shown as a green line in Figure 14). This, together with the account by Te Pokiha led us to think that the whole bend had been fortified, making Opita a very large pa totalling some 25,000 m^2 in area, five times the size of Waiwhau at 5,000 m^2, and larger than the greatest extent of Raupa at 20,000 m^2. A major object of the investigation was to test this assumption.

This section of the report firstly outlines the methods employed in this investigation, secondly, describes the excavation findings, then records the extent of post-occupation disturbance and, lastly, presents the results of the geophysical surveys.

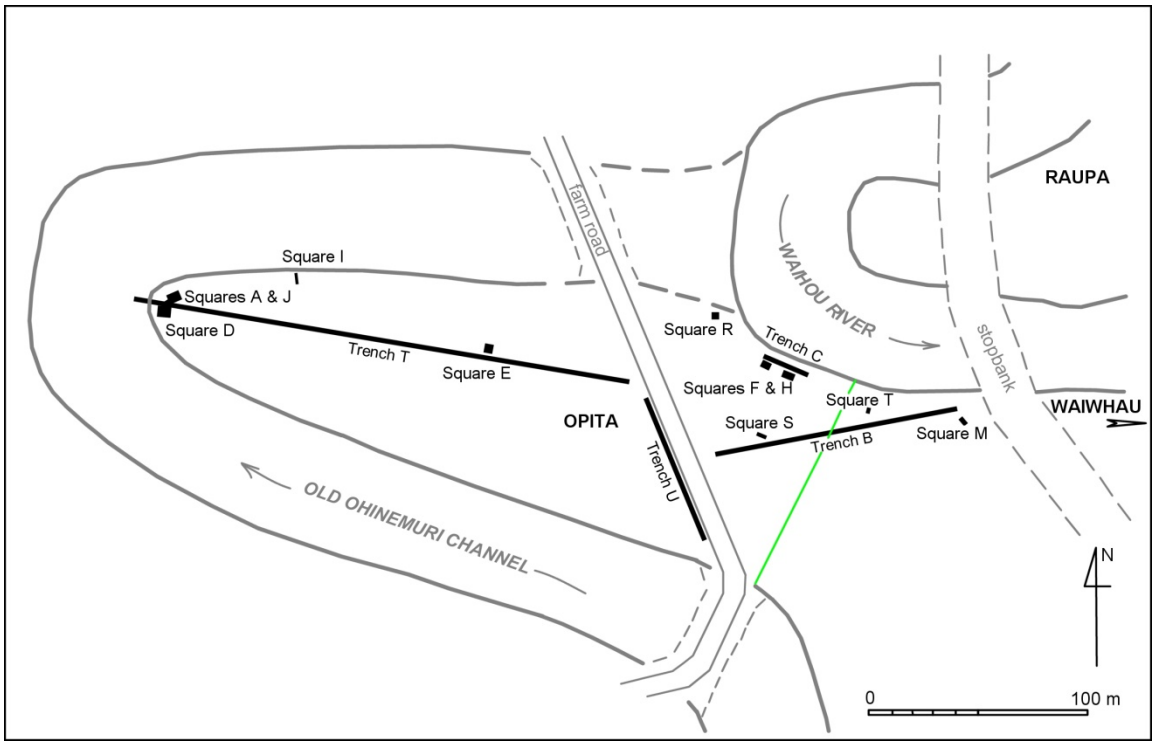

Figure 14. Plan of excavations within the bend of the old Ohinemuri channel, showing line of 'old ditch' in green.

3.1 Methodology

The large area under investigation consisted of three flat paddocks, separated by fences and a road, and bounded by the old Ohinemuri channel (Figure 15). The only surface features, apart from some midden exposed on the former Waihou River bank, were those caused by recent farming activities.

In order to investigate the site within the constraints of a field school and the time and labour available, a series of three trenches were excavated by machine to try and ascertain the extent and type of occupation. These were to become farm drains after we had finished our work (Figure 16). The trenches were named, from west to east: T, U and B. Midden observed on the old Waihou River bank was cut back and this formed a fourth named Trench C. The trenches were examined and any archaeological evidence revealed in them was recorded, artefacts were recovered and several samples were taken. As these trenches were longitudinal entities, location description was achieved through marking distances from their start point, e.g., 0, 25, 120 or 200 metres.

A series of squares (Squares A, D, E, F, H, J, M and S) were opened up by hand alongside these trenches where there were visible concentrations of features (cover). Three other squares investigated particular questions (Squares I, R and T). These were all fully excavated, sections and plans were drawn, photographs taken, artefacts and samples recovered.

Later, bore holes were dug across the old Ohinemuri channel to determine its environmental history, a grid of test pits was dug in one paddock to determine the extent of various soils and deposits, a series of test pits were dug parallel to the Waihou River channel and others excavated in the vicinity of a midden at the eastern side of the project area.

Figure 15. Looking west along cut-off channel of the Ohinemuri River prior to fieldwork commencing, with tape marking alignment of Trench T.

Figure 16. Mechanical excavator commencing work at western end of Trench T.

The river side excavations (Trench C, Squares F and H), provided the majority of the finds and features in the Opita investigations, and demonstrated a more complex stratigraphy. Consequently, the findings from this area are discussed separately from the other excavations.

All the various excavations were plotted by electronic alidade and plane table (Figure 17). Topographic features, farm features and a series of spot heights were also plotted. Two areas were geophysically surveyed: one during the field school and one two years later.

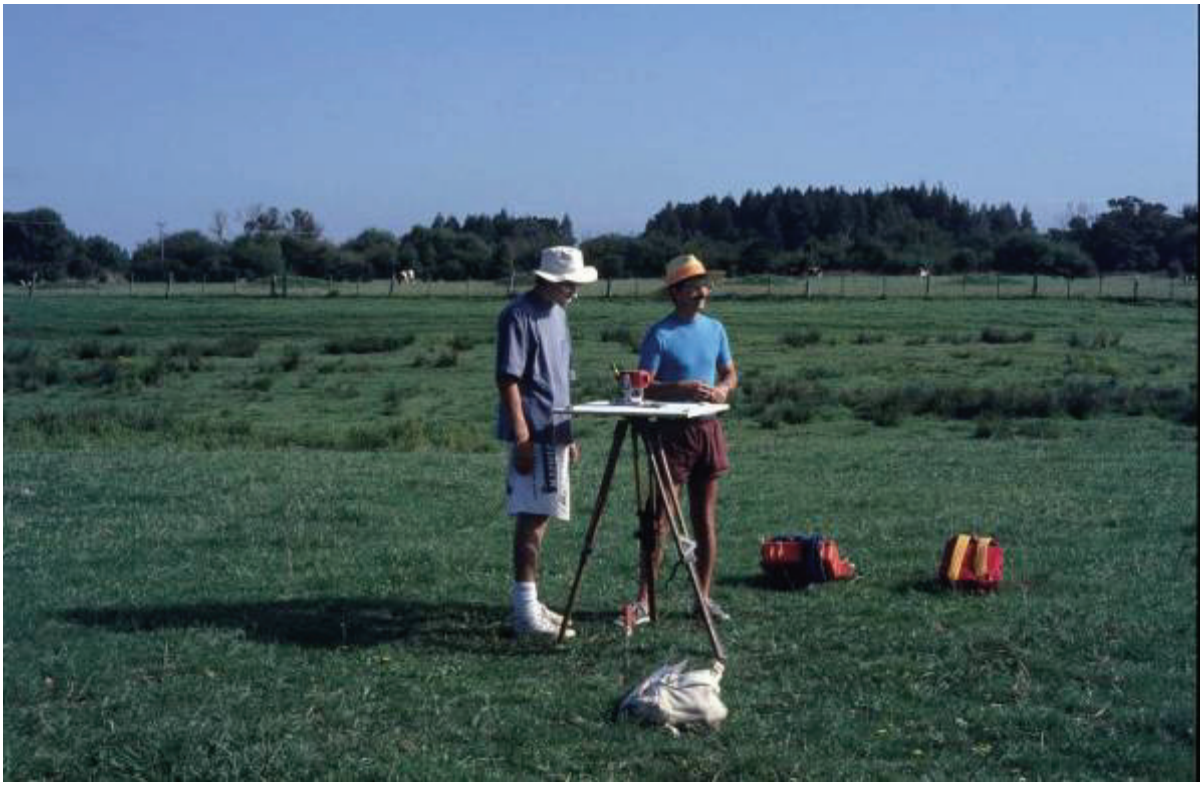

Figure 17. Rod Wallace directed students in recording the site on the plane table.

3.2 Excavated areas

The investigations are described below, from west to east (see locations Figure 14).

3.2.1 Trench T

Trench T ran across the old Ohinemuri River bend from the far west to the farm track in the east. The 221.6 m long trench showed three basic layers above the subsoil totalling 25-50 cm thick. These included a layer with cultural remains overtopped by rock flour with topsoil at the top (Figure 18, Figure 19). At times these layers were indistinct having been mixed by ploughing. The cultural layer comprised charcoal and pumice sand in the brown silt matrix and may have been the result of gardening activities. Notably, no midden was visible in Trench T. Features included postholes, stakeholes and a possible kumara storage pit. A few artefacts were found in the section: obsidian and chert flakes, an adze fragment, hangi stones, bones, a clay pipe, a horseshoe, writing slate, a brick fragment and a broken bottle (in Figure 19 these items are colour-coded according to their probable chronology).

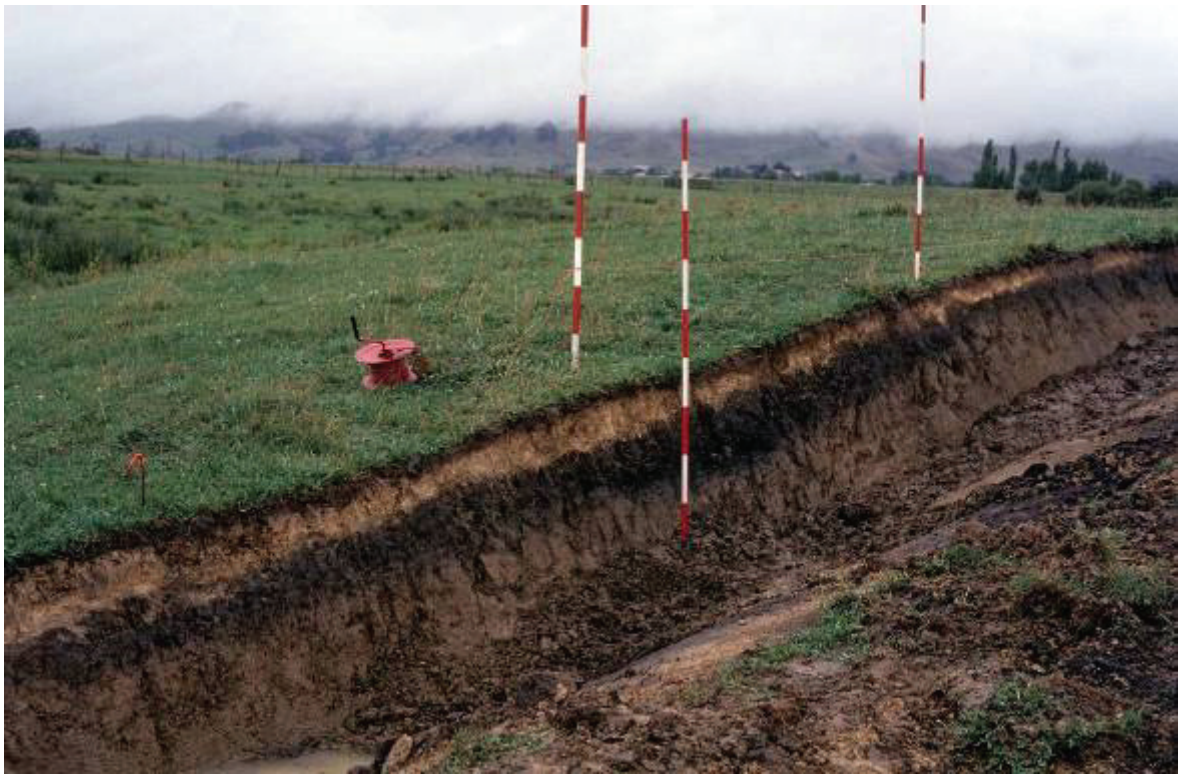

Figure 18. Trench T, showing topsoil on yellow rock flour overlying dark brown cultural layer visible after machine excavation.

Concentrations of features and artefacts were observed in the section (marked kainga and ?kainga in Figure 19). Two of these concentrations were investigated further by laying out excavation squares adjacent to the trench. As it was assumed that Opita pa extended to the western end of the old river bend, Squares A, D and J were opened up in the anticipation of finding palisades, in addition to internal structures. Later, Square I was opened up north of the trench to confirm the lack of palisades seen in the other areas. Square E was opened up near the centre adjacent to a cluster of postholes observed in Trench T.

3.2.2 Squares A, J and D

Three squares were laid out adjacent to possible palisade postholes located at the western end of the old river bend (Figure 20). Square A measured 4 x 3 m, Square D was 6 x 2.5 m, and Square J was a maximum of 4 x 2.5 m set between Square A and Trench T.

Firstly, the overlying layers and the dark cultural layer had to be removed in order to define the postholes; hence the original depths of these features were hard to determine. The result was a mass of postholes (more than 12 cm diameter and 30 cm depth) and smaller stakeholes, some of which were possibly in a circular arrangement and others in a longitudinal arrangement (see Figures 20-21).

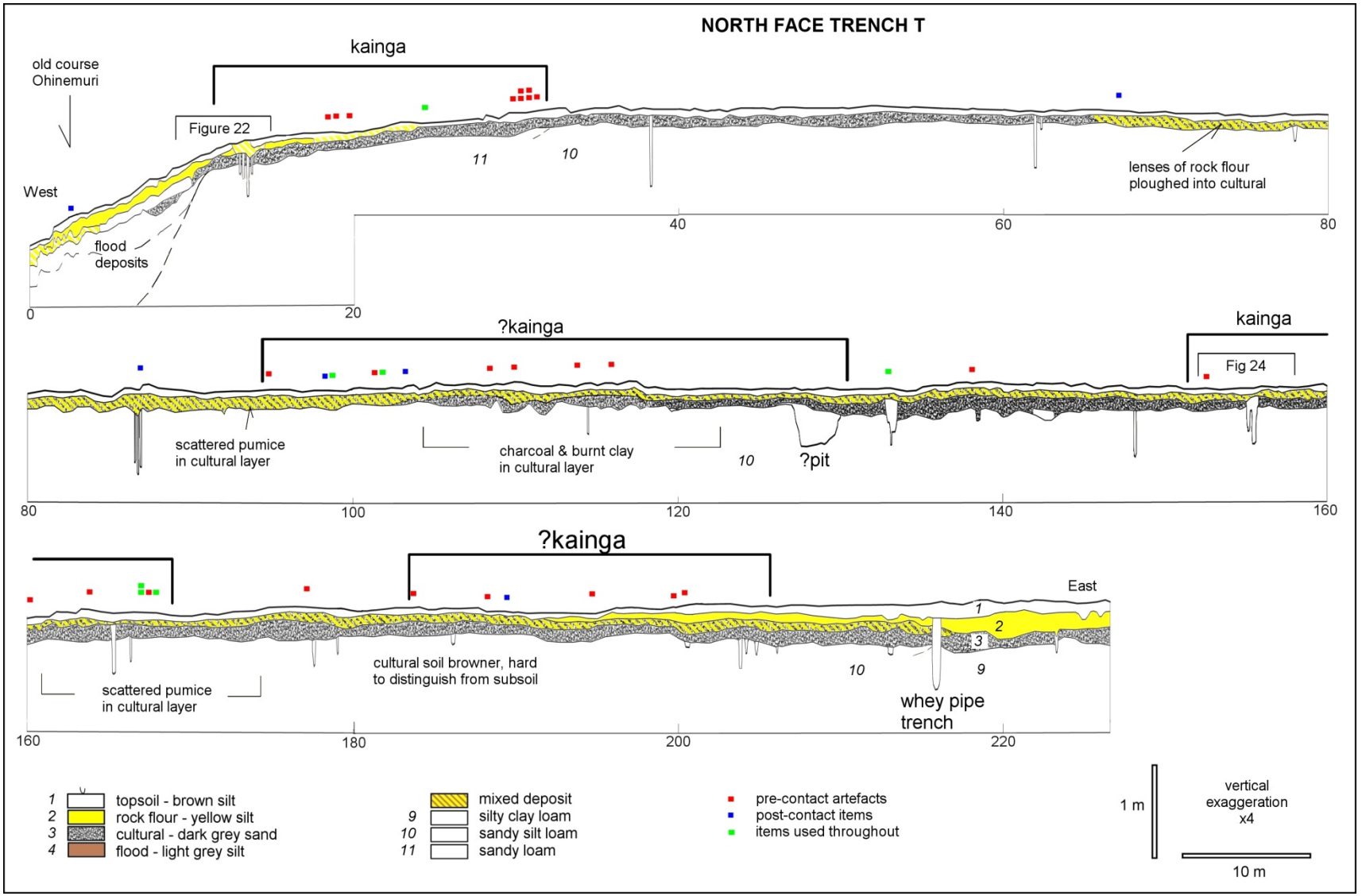

Figure 19. Section drawing of Trench T with location of artefacts recovered (colour-coded according to their probable chronology) and possible extent of kainga (see detailed sections in Figures 22 & 24, and full section & feature details in Appendix 1).

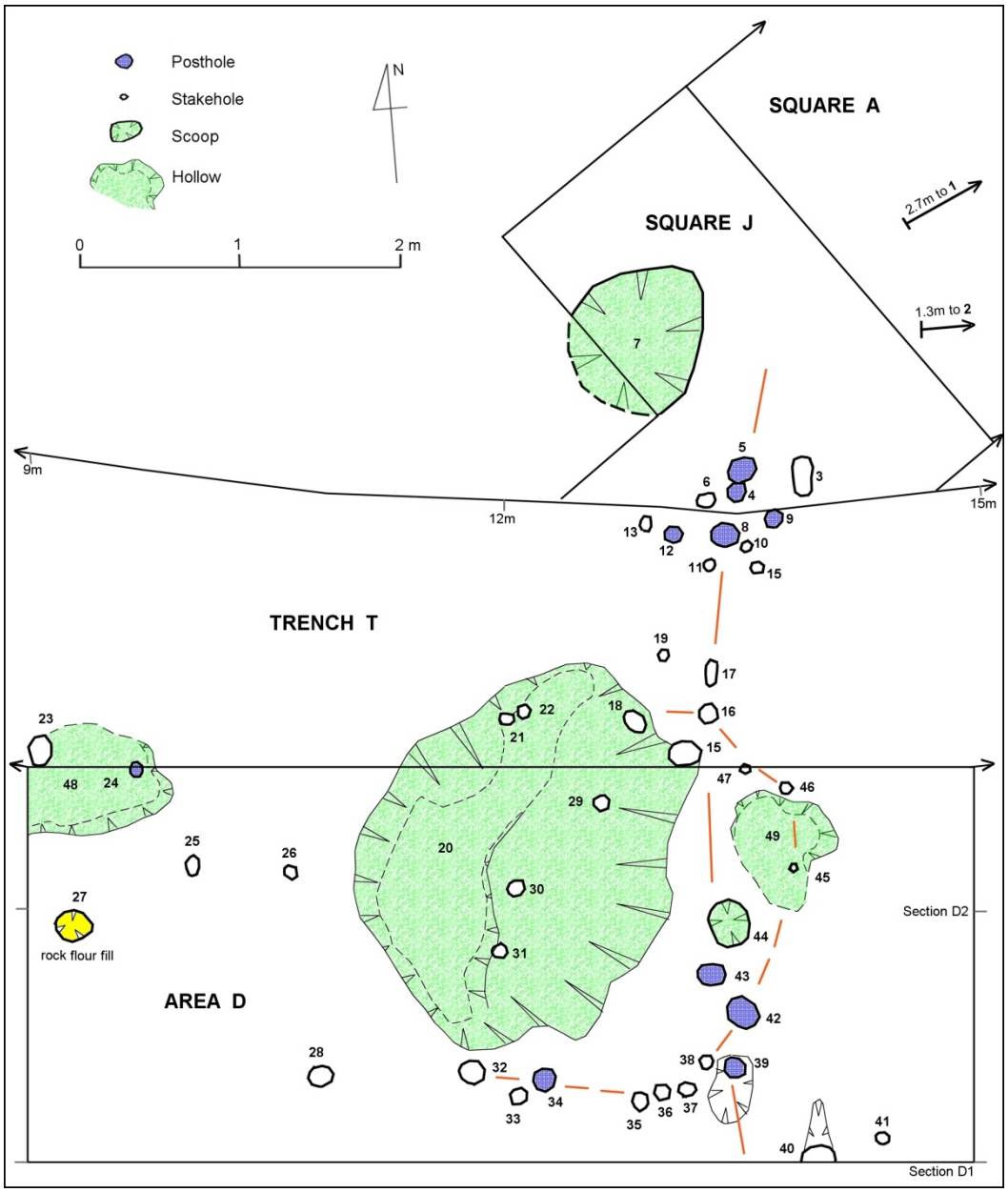

Figure 20. Plan of Squares A, J and D, and part of Trench T, showing features and possible alignments.

It was the latter alignment that first made the excavators suspect that these features represented a light palisade line: an assumption based on the idea that this site was thought to contain a large pa and should therefore have been defended by a palisade around the circumference. The inability to find the line of postholes continuing to the north of the Trench T (in Square A) led to the excavation of Square J, an extension of Square A, which proved that the postholes did not in fact extend further north.

Two of the postholes were half-filled with rock flour (features 1 & 27), as if they had been open up to the time just prior to that episode of flooding, whereas others were filled with a sandy mix. It is probable that the sand-filled postholes were an early event, whereas the rock flour-filled postholes were more recent, dating from the gold mining period. Some of the postholes cut through the earlier fill of the hangi scoops, while for the majority it was uncertain as to whether they were prior to or subsequent to the filling of these scoops.

Figure 21. Layout of postholes and hollow in Square D (see Figure 20).

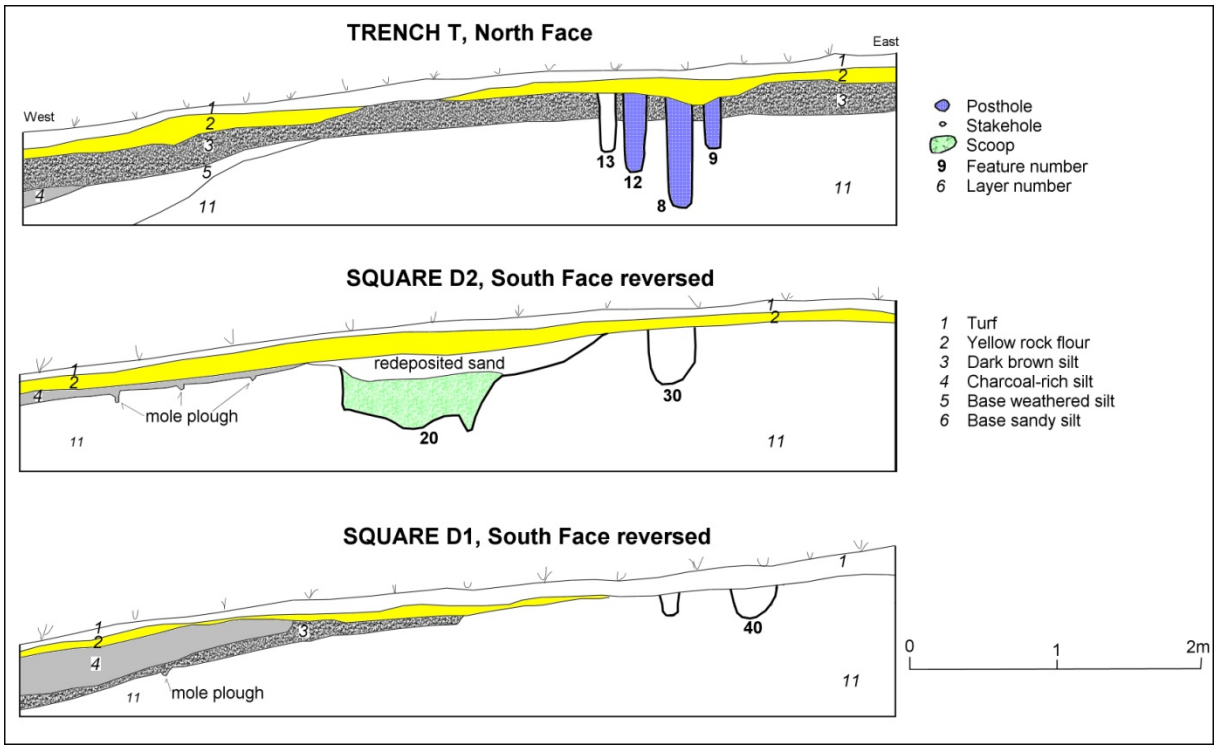

Figure 22. Sections across Square D and Trench T.

It seems likely that the series of scoops (some were ill-defined hollows, whose purpose was uncertain), postholes and stakeholes represented one or more occupations on the same spot. The first was the construction of hangi scoops (features 7, 20, 44, 48 and 49) and subsequent throw-out of material down the slope into the old Ohinemuri channel (Figure 22). These scoops were then filled by levelling off the sandy soil to the east and at least one, or probably several, structures were built: these may have been shelters and fences rather than formal houses. No topsoil had formed between these occupations, suggesting that these events occurred around the same time.

Several artefacts were recovered in Squares A, D and adjacent sections of Trench T. These included eight chert and 18 obsidian flakes, a fragment of bone and a fruit stone, 25 hangi stones and, in the topsoil, three shotgun cartridges and a nail. The lack of historic material within the cultural layer suggests that it may be either pre-European contact or early post-contact.

3.2.3 Square I

Just to be certain that there was no fortification surrounding the entire river bend a small test excavation was dug further around the circumference. This also yielded no signs of a palisade. Only one obsidian flake was found in this area.

3.2.4 Square E

In order to test for the presence of a structure, Square E, measuring 4 x 4 m, was opened up 1 m north of a series of postholes seen in the section of Trench T (Figures 23 and 24). Seven postholes and stakeholes were located in total, but they did not form any particular pattern. Two postholes in the section were partly filled with rock flour, which suggests they dated from around the gold-mining period or during the part of early twentieth century.

Figure 23. Postholes exposed in base of Trench T, Square E was placed to the north of the trench.

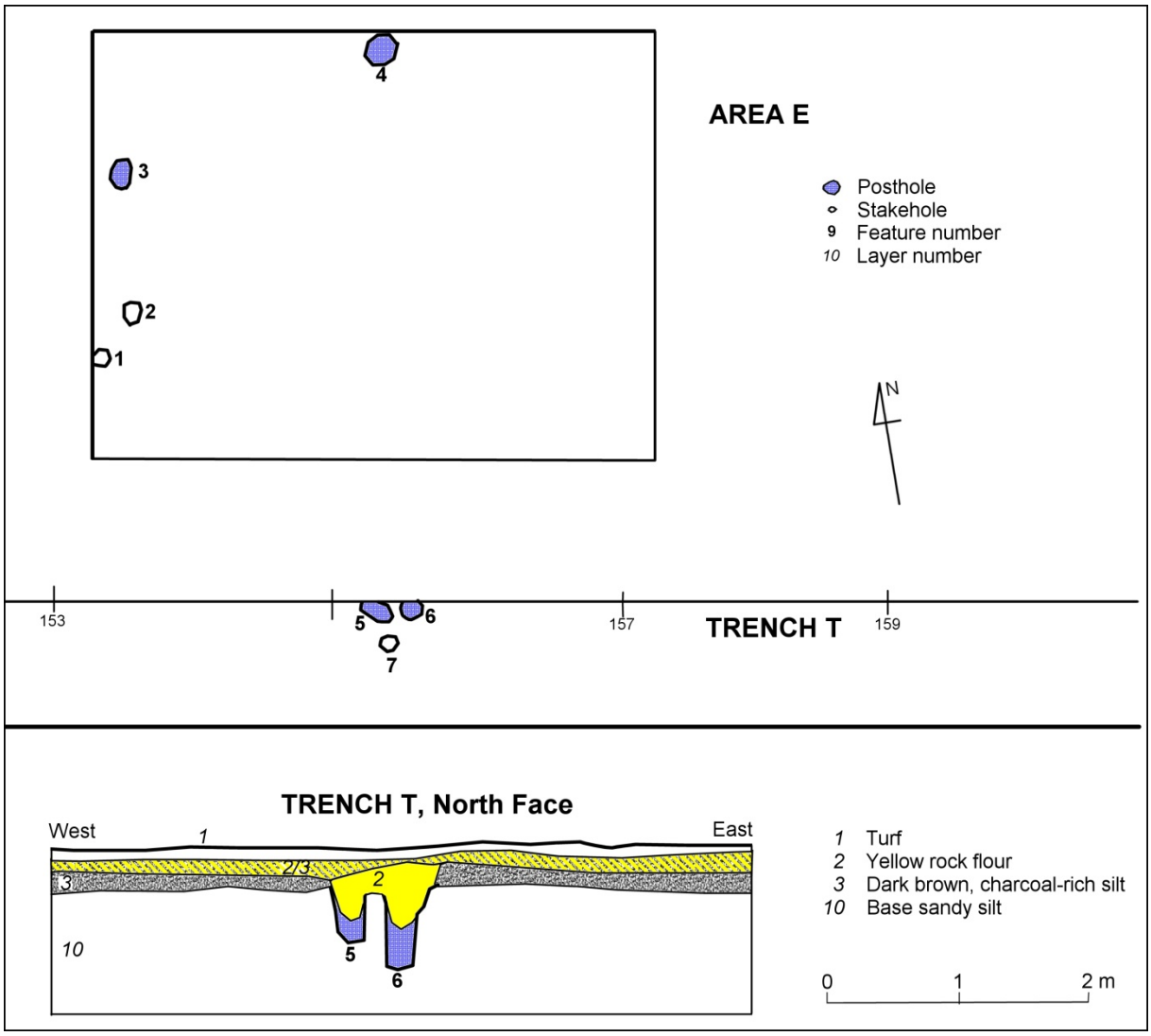

Figure 24. Plan of features in Square E and the adjacent part of Trench T, and section of Trench T.

Excavation confirmed that ploughing had probably destroyed any cultural floors that had been associated in this area, as they would have been only 15-20 cm below the current surface.

No artefacts were found in the square, but a group of items was found in Trench T, including one obsidian flake, three chert flakes and three hangi stones. Although some of the postholes may have been more recent, the artefacts suggest that some activity took place nearby, possibly dating to the pre-European contact or early post-contact.

3.2.5 Trench U

On the eastern side of the paddock another trench 68 m long was excavated, running approximately north-south parallel to the farm road, excavated 12 -80 m from the end of Trench T (Figure 25).

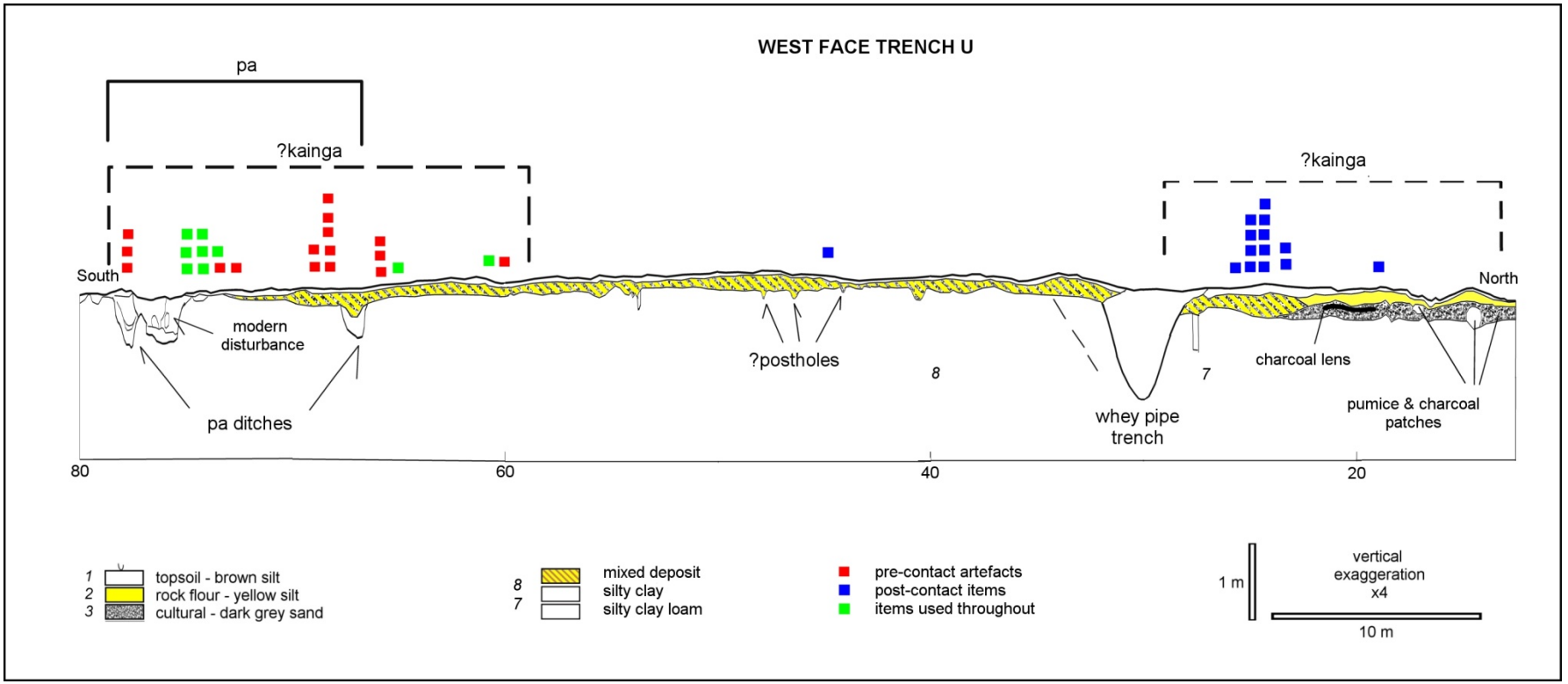

Figure 25. Section drawing of Trench U with location of artefacts recovered (colour-coded according to their probable chronology) and possible extent of kainga and pa (see full section & feature details in Appendix 1)

On the northern end the layers were a total of 25-30 cm thick overlying the silty clay loam. Here there were three layers: turf, rock flour and a cultural layer with charcoal lenses, patches of pumice and charcoal. The pumice presumably was the result of flooding by the Waihou River at some time, as this point was close to the Waihou.

In the centre and south of the section the deposits were much shallower being only 5-10 cm deep on the silty clay base. This thin deposit of mixed rock flour and cultural deposits appeared to have been disturbed and much of the cultural layers and subsoil had been removed, probably as a result of the flood protection works. A line of very shallow postholes ran parallel to the current fence, and may be an indicator of the amount of material that had been removed.

Three major features were evident. To the north was the whey pipe trench with signs of recent disturbance around it. In the south there was one clear ditch at 67 m, measuring 1.1 m wide and 0.4 m deep (Figure 26). It had been partially filled before a flood of rock flour, which left small patches and lenses. There was a complicated feature or features between 75-78 m. The southernmost part of this feature appeared to be another ditch 1.2 m wide and 0.5 m deep that was filled with lenses of charcoal and clay. The two ditches were interpreted as part of the Opita pa defences. Immediately to the north of this second ditch was a depression that had standing water in it for some time before it was filled with large blocks of clay. This was thought to be a recent machine-dug feature.

Figure 26. Base of defence ditch exposed in south end of Trench U, with interior of pa to right.

Two groups of artefacts were found in the section. At the northern end were pieces of glass, iron, kauri gum and a fragment of ceramic, while at the southern end there were 14 obsidian and two chert flakes, and nine hangi stones (in Figure 25 these items are colour coded according to their probable chronology).

The features, stratigraphy and artefacts suggest that possibly two kainga may have existed in the vicinity: one at the northern end of the trench dating to the historic period and the other towards the southern end, possibly dating to pre-European contact or early post-contact. If the ditches do relate to the pa, the historic information indicates a date for that site around the 1840s.

3.2.6 Trench B

East of the farm road a trench 118 m long was excavated, running to the stopbank fence line at the far east of the project area. This intersected the line of the "old ditch" which was thought to mark the pa site of Opita (Figure 28).

As in Trench U, the deposits were generally very thin, being only 15-30 cm of turf and cultural deposits over the silty clay base. Between 48 and 50 m along the trench the clay rose to the surface and there was no cultural deposit or subsoil present; furthermore, east of 60 m until about 100 m the cultural layers appeared to have been largely scraped away, with only a few remnant scoops, stakeholes and postholes present. At the west end the ground was boggy in a low spot beside the causeway for the farm track, and elsewhere there were lower areas where the trench intersected old farm drains visible on the surface. Clearly this area had been considerably modified since the period of Maori occupation.

Despite the damage, a number of features were observed in the section. Several postholes and stakeholes and lenses of charcoal were present throughout the trench, and between 112-118.5 m a layer of concentrated shell midden was recorded (Figure 27). Five ditches and drains were observed at 10, 46, 51, 57 and 104 m (Figures 28-29). Those at 10 and 51 m, thought to be traces of the Opita Pa defensive ditch, were 1.2-1.8 m wide and 40 cm deep. The drain at 57 m was the "old ditch" surveyed on the original land plan of the Tairarata Block, which was the extension of the pa defences. The other drains were part of the twentieth century farm drainage system.

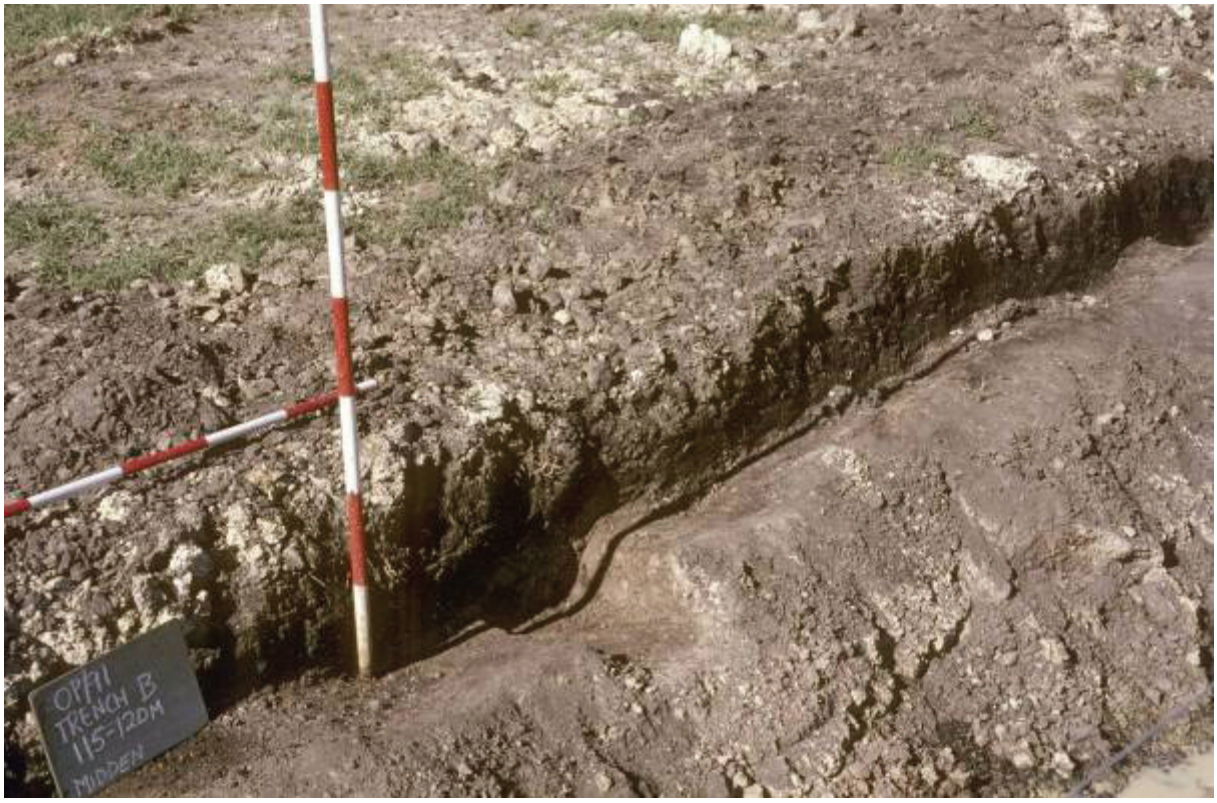

Figure 27. Midden exposed in Trench B. Square M was opened up to the south to examine the midden.

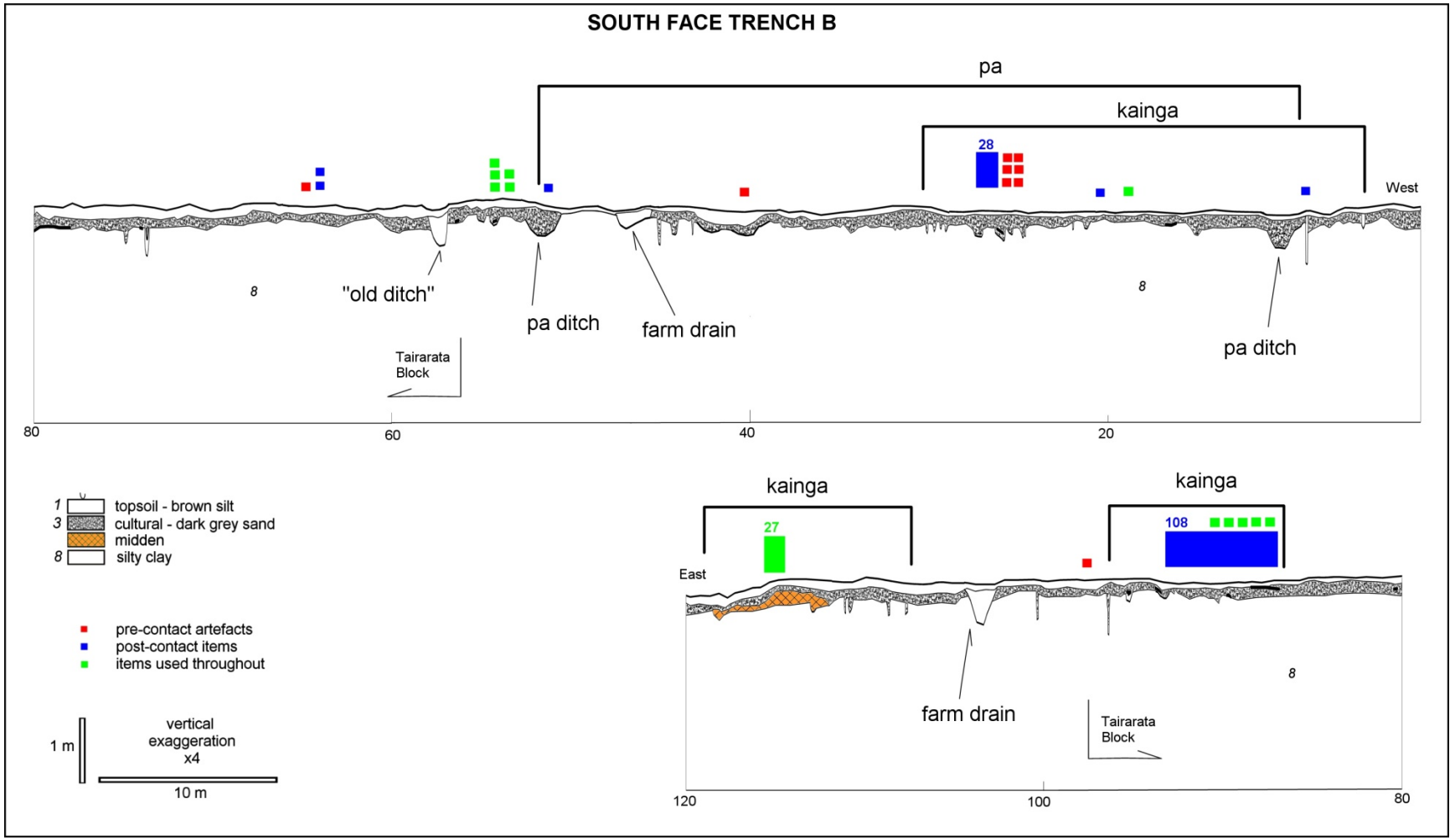

Figure 28. Section drawing of Trench B with locations of artefacts recovered (colour-coded according to their probable chronology with large groups shown by number) and possible extent of kainga and pa (see full sections in Appendix 1).

Figure 29. Farm drain cutting across line of Trench B.

Three clusters of artefacts were found, while elsewhere along this trench only a small scatter of objects occurred (in Figure 28 these items are colour coded according to their probable chronology). At 26 m there were five obsidian flakes and 28 historic items, including writing slates, glass items, a pig tooth, a piece of kauri gum, bricks, ceramics and clay pipes. Between 90-93.4 m there were ceramic and glass fragments, some of which had been burnt and melted, and hangi stones. Finally, between 113-117 m along the section, associated with a layer of shell midden, three groups of hangi stones were recovered.

Two squares were opened up adjacent to Trench B. Square M was excavated to examine the midden seen at the eastern end of Trench B. Square S was excavated in order to investigate the drain visible on the surface extending to the north in Square H and Trench C.

3.2.7 Square M

This 1 x 2 m square located 2.7 m south of Trench B focussed on the midden seen at the eastern end of the trench (Figures 27 and 30). The midden was visible 7 m along Trench B and test pits (A and G, see Figure 47) showed it to extend at least 20 m from the river bank to the south-east of Square M.

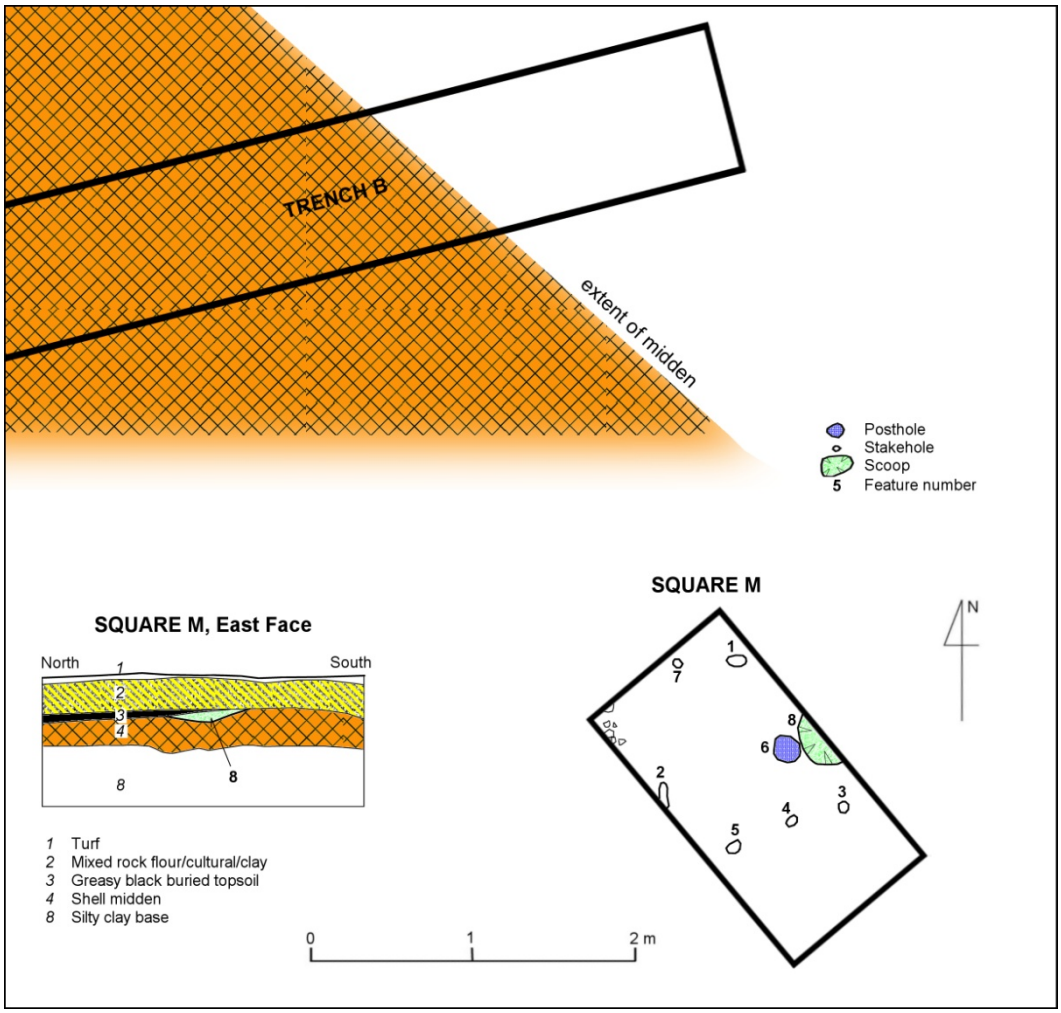

Figure 30. Plan and section drawing of Square M, showing position in relation to Trench B.

The aim of the excavation was to obtain a series of samples as a comparison with the midden found in Square F. Four layers overlaid the base clay. Beneath the turf was a highly-disturbed soil of mixed rock flour, cultural soil and clay. This overlaid greasy black topsoil, which increased in depth towards the north. Below was a shell midden 17 cm deep, of mainly pipi and cockle shells with some dog, fish and bird bones, lying on the uneven surface of the basal silty clay.

A scoop filled with hangi stones was found at the interface of the midden, while other stakeholes were found in and below the shell. The midden was removed in four spits (3-5 cm thick) and samples of the upper three spits were taken, wet-sieved and bagged.

Three obsidian flakes were recovered from the upper disturbed layers, but 27 flakes were recovered from within the midden. There was a decrease in the quantity of obsidian recovered from each spit, with 14 flakes being in spit 1, six in spit 2 and five in spit 3, and none were found in spit 4. Two chert flakes and five hangi stones were also recovered. Given that the midden in Square M appears to be relatively homogenous, the decrease in the number of obsidian flakes with depth may be accidental: a function of chance.

3.2.8 Square S

Square S was excavated in order to investigate the drain visible on the surface extending to the north in Square H and Trench C (Figure 31).

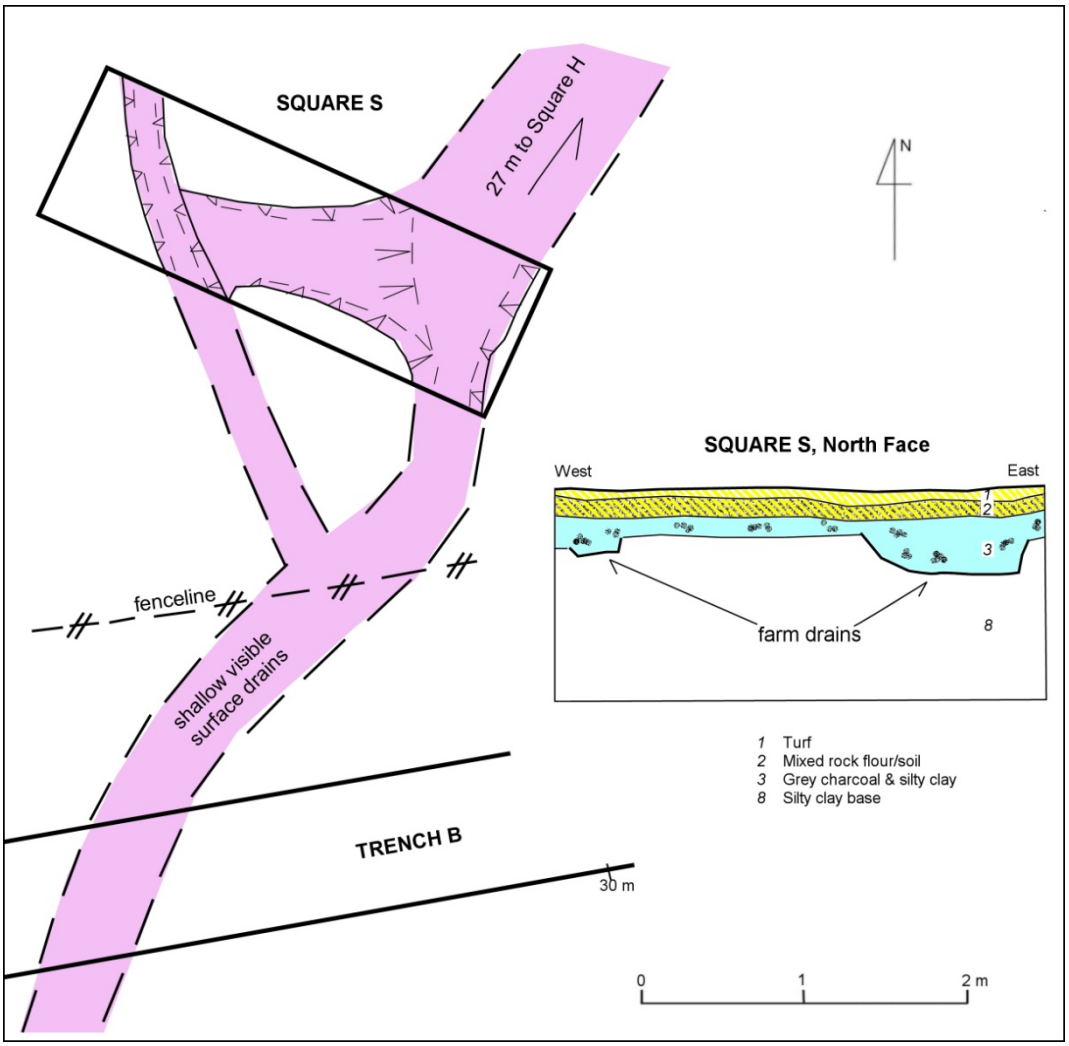

Figure 31. Plan and section of Square S, showing location in relation to Trench B and position of Square H.

The 3 x 1 m square had a very thin turf layer mixed with rock flour, below which was a disturbed rock flour and topsoil layer, over a grey silty clay deposit with charcoal, on the silty clay base. At the base were two farm drains, a narrow one (30 cm wide and 5 cm deep) on the west and a wider one (80 cm wide and 30 cm deep) on the east. These appeared to have joined immediately to the south. A small channel connected the two. The western one was visible on the surface and connected to the one excavated in Square H and Trench C where it was much deeper and wider (0.80 m deep, 1.2 m wide). However, it was not visible in the Trench B section to the south, having been much shallower at that point.

Several historic items were found in the rock flour mixed layer (presumably a ploughed deposit), including hangi stones, ceramics, glass, cattle bone and a fragment of a leather boot. In the drain fill layer kauri gum, metal fragments and glass were recovered.

3.3 Trench C, Squares F and H

Midden was visible eroding from the bank of the Waihou River. Initially, a string line was set up along this bank, extending to the eastern fence line beside the stopbank: a distance of 94 m. The first 20 m was cleaned down and the face was recorded as Trench C. This proved to be a deep complex section 0.8-1.0 m thick, with more than one episode of drain digging and midden deposit (Figure 32).

Figure 32. Layers of midden and soils, topped by yellow rock flour in face of Trench C.

In order to obtain further information on these features, two squares (Squares F and H) were opened up adjacent to Trench C. Square F, measuring 4 x 3 m, was opened up 1 m south of Trench C from 3-7 m along Trench C baseline (see cover). Later, Square H, measuring 5 x 3 m was opened up parallel to Trench C from 13-18 m along the Trench C baseline.

3.3.1 Stratigraphy

The stratigraphic sequence observed in Trench C was the same as for the adjacent Squares F and H (Table 1). Analysis of soil samples taken from Trench C and Square H clarified some of the field interpretations. The matrix of each layer is described separately below, while the artefacts and features are discussed under the headings of the three excavation units (Trench C, Squares F and H). The layers are then grouped according to Phases, which join the entire project area in broad temporal and behavioural units (these will be discussed further in 5.3 "History of Settlement").

Table 1. Descriptions of soils in Trench C, Squares F and H (see full soil analysis in Appendix 14).

Phase	*Layer*	*Thickness*	*Colour*	*Contents*	*Texture*	*Formation*
	1	5-10 cm	Grey brown	High organic	Sandy-silt loam	Topsoil
IV	2	10-30 cm	Yellow brown	Metal, no organic	Silt loam	Rock flour
IV	3	10-30 cm	Black brown	Organic	Sandy loam	Flood deposit
III	4	5-15 cm	Black brown	Organic	Sandy-silt loam	Midden
III	5	5-30 cm	Dark brown	Organic	Sandy loam	Flood deposit
II	6	5-10 cm	Dark brown	Organic	Sandy loam	Midden
II	7	5-15 cm	Black brown	Organic, pumice	Sandy-silt loam	Flood deposit
	10		Grey white	Organic	Loamy sand	Base

Layer 1 consisted of a shallow turf and topsoil, which had only recently developed since the last flood episode of rock flour deposition. Layer 2 comprised flood deposits of rock flour originating from the gold-mining waste dumped in the upper Ohinemuri River. In places this material filled features that had been open at the time of the floods. At least four flood episodes were observed, interspersed by narrow bands of topsoil.

During the excavation layer 3 was thought to consist of a mixture of rock flour and cultural deposits. However soil analysis showed it did not contain any of the metallic elements that were a clear signature of the rock flour. Layer 3 was more likely to relate to one or more inundations from the Ohinemuri that predated 1895 when the first flooding due to the gold mining occurred. A lens of charcoal within this layer suggest that burn-offs were occurring during the time it was deposited.

Layer 4 was the upper midden shell, charcoal and soil mix seen in the western end of Trench C from 1-8 m and extending into the western side of Square F. It was part of layer 5, a cultural layer comprised of a flood deposit interspersed with charcoal flecks.

The lower shell midden, layer 6, was also present in the western end of Trench C and the western half of Square F. It was part of layer 7, another cultural layer, which was difficult to distinguish from layer 5 without the intervening shell midden as they were the same colour, although of different texture. In places, Layer 7 was only present as the fill of features cut into the base material.

Layer 8 was the base deposit, the top of which became infused with charcoal from layer 7 above, hence the presence of organic material observed by the soil analysis.

3.3.2 Trench C

This 20 m long section revealed a series of hangi scoops, postholes and drains, as well as the complex stratigraphy described above (Figures 33 and 34).

Figure 33. Farm drain filled with layers of rock flour, exposed in face of Trench C, this continued through Square H.

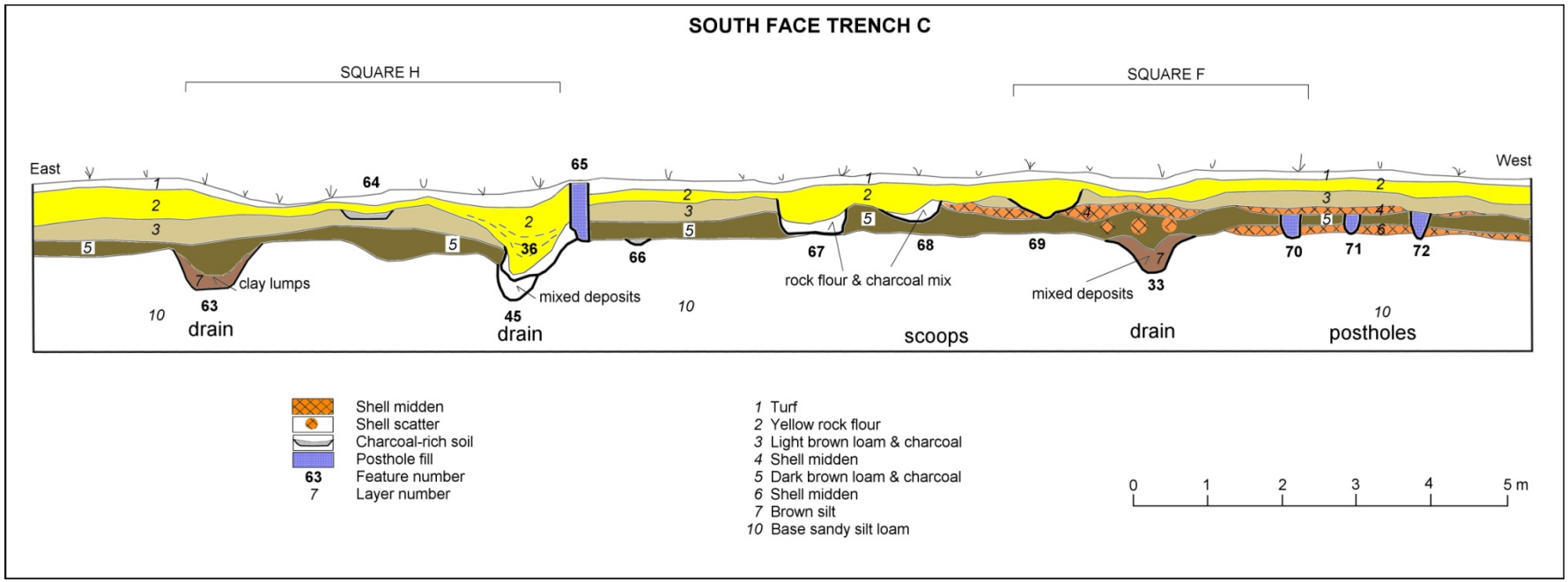

Figure 34. Section drawing of Trench C, showing the stratigraphy (see Table 1) and the position of Squares F and H that were opened up 1.5 m to the south.

Many of the features were at the western end, including three postholes 30-35 cm deep from layer 5 (features 70-72). The lower shell midden was possibly associated with a drain or deep scoop feature (feature 33) which was cut into the natural by about 50-60 cm and ran from 4.5-5.8 m. The bottom of the drain had a mixed primary fill of clay and charcoal, sealed by layer 5. Higher up in the sequence was a series of three shallow scoops 75-100 cm wide and 25-45 cm deep cut into layer 3 (features 67-69).

A few fragments of European material were found in layers 3 and 4, including wire, nails, ceramics, clay pipe and glass. In the lower layers only obsidian and hangi stones were recovered.

In the eastern half of the section was a large recent posthole (feature 65), which cut through the rock flour and was filled with a mixed rock flour, silt and sand material. Adjacent to this was a large drain feature 80 cm deep running from 12.8-14.0 m (features 36, 45, Figure 33). It appeared to have been cut twice. The later drain digging episode was filled with rock flour, with fragments of brick and ceramics included in the fill. In contrast, at 17-18.2 m was another drain feature (feature 63), 0.7 m deep and filled with layer 7 material, which like feature 33 related to the beginning of the sequence.

3.3.3 Square F

This square was opened up to examine the shell midden deposits observed in Trench C. The square was excavated by hand. First the turf, topsoil and rock flour (layers 1 and 2) were removed by spade. It was found that the lower part of the rock flour layer and the upper part of layer 3 were disturbed by tree roots and mole ploughing. Two postholes (probably both spade dug) were found (features 1, 2). Feature 1 had been dug through an earlier hangi scoop (Figures 35 and 36).

In layer 3 European artefacts were recovered, including ceramics, window glass, metal and clay pipes, and peach stones. At the base of layer 3 and the top of layer 4 a number of pieces of clay pipes were found, as well as some ceramics, pig bone, kauri gum and nails or bolts.

Midden layer 4 found on the western side of the square was mainly comprised of pipi and cockle shells, with mussel, oyster, and bone including pig (Figure 37). The shell was concentrated and less broken in the west and there were scatters of shells in the soil elsewhere. A charcoal-rich area which was the fill of a large scoop over 130 cm in diameter and 25 cm deep (feature 5) was in the north-east corner. This hangi scoop was also filled with many large pieces of charcoal, shell, shattered and whole hangi stones, clay pipe fragments and a gun flint. The midden also contained ceramics, window and bottle glass, glass beads, nails, slate pencil, clay pipes, peach stones, and kauri gum as well as traditionally available items such as obsidian and chert flakes, and hangi stones. Near the base of the layer there were scoops (features 3-4) 10 cm deep (Figure 38).

As the midden was removed a number of features were revealed cut into layer 5, including a patch of burnt earth that might have been a hearth (feature 6), seven postholes averaging 25 cm wide and 45 cm deep (features 7-13) which might have been part of a house that, if it was of the common proportions for Maori whare, might have measured 3.4 m wide and 5-6 m long. Three of the postholes had a squarish top with rounded extension at the bottom (features 7, 12-13). Another similar posthole was in the northern baulk (feature 14). All the postholes were filled with midden shell. This layer had very few artefacts with only two pieces of obsidian, a ceramic fragment and a piece of metal being recovered.

The lower midden layer 6 contained noticeably smaller cockle and pipi shell, with little bone or charcoal. The shell petered out in the south-east corner, but was concentrated across the western third and in the centre where it filled a scoop below (feature 25). No European material was found, and the artefacts present consisted of 33 pieces of obsidian and a few chert flakes.

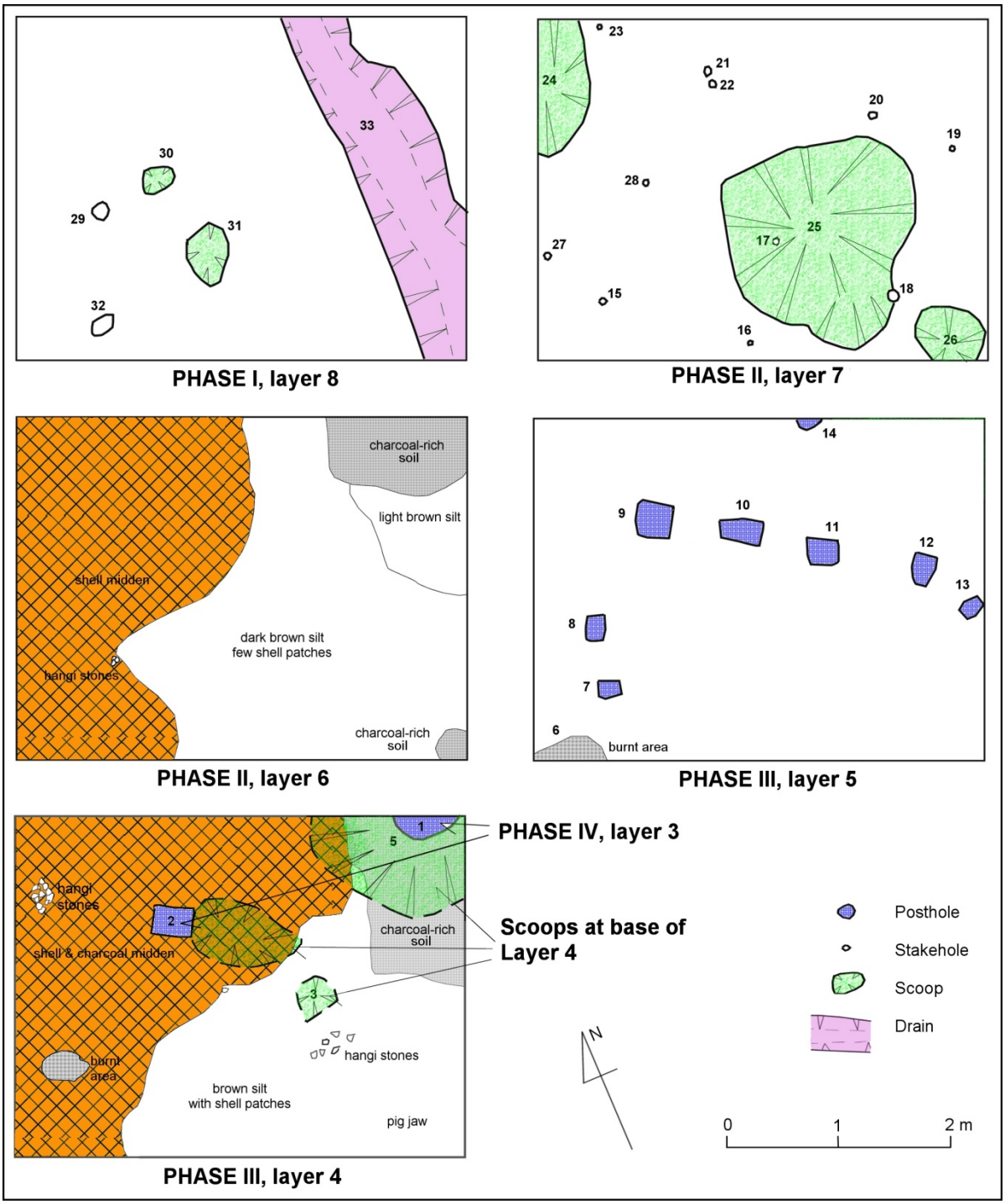

Figure 35. Plan of the features in the different layers in Square F.

Features cut into layer 7 were filled with shell from layer 6 (Figure 39). There were eleven stakeholes averaging 7 cm wide and 12 cm deep and three hangi scoops ranging from 60-180 cm wide and 5-20 cm deep (features 15-28). The principal artefacts were 36 obsidian flakes, with only a single chert flake. The contained some sizeable pieces of pumice, and had charcoal scattered through it.

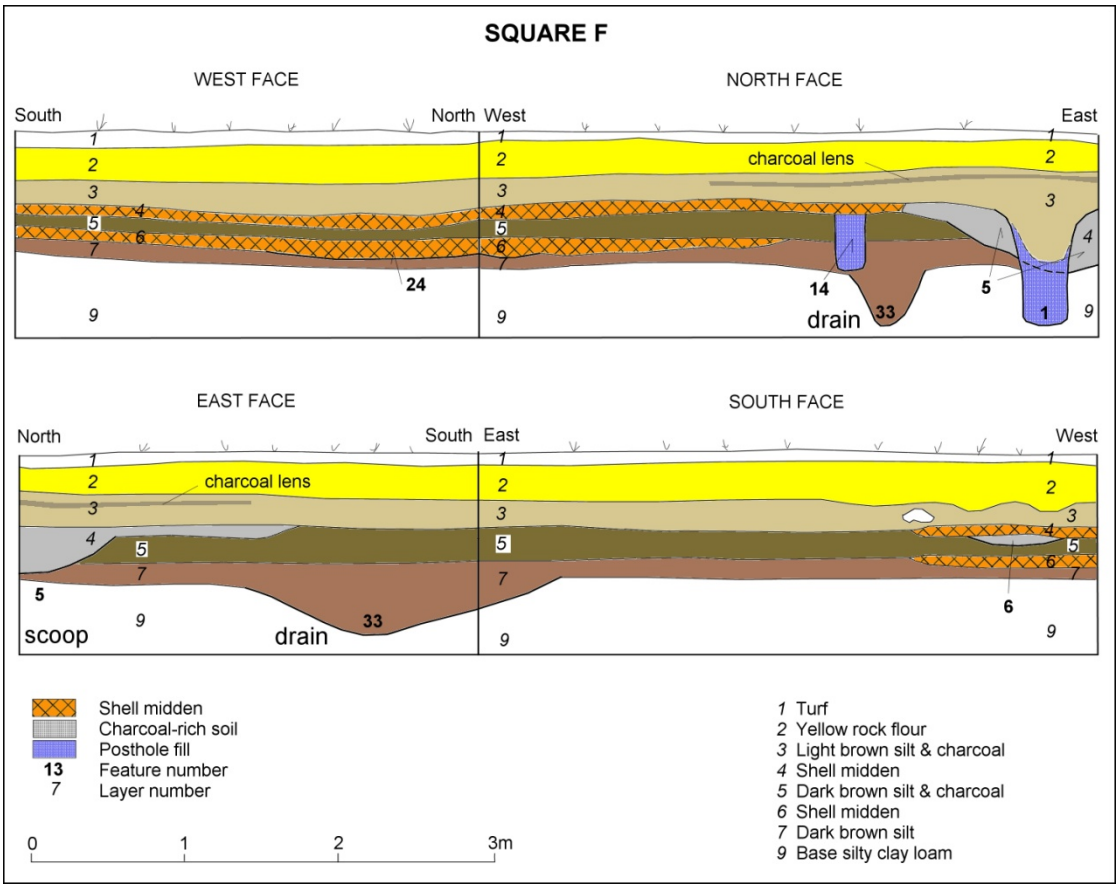

Figure 36. Sections showing all baulk faces of Square F.

Figure 37. Surface of layer 4 midden in Square F, facing west.

Figure 38. Base of layer 4 showing the hangi pits dug into the surface of layer 5 in Square F, facing west.

Figure 39. Base of layer 6 and top of layer 7 in Square F, facing east.

Figure 40. Postholes and drain in layer 8 in Square F, facing east.

After layer 7 was removed layer 8 proved to be the base of the cultural material in the area (Figure 40). Further postholes averaging 18 cm wide and 12 cm deep (features 29, 32) filled with layer 7 were revealed cut into layer 8. Two hangi scoops 28 and 55 cm wide and 7-10 cm deep (features 30, 31) were filled with silty soil with occasional charcoal. On the eastern side of the square a large drain 80 cm wide and 32 cm deep (feature 33) running north-south had been cut: this was also recorded in Trench C. The drain was probably dug to keep a house or living area dry. The bottom of the drain feature contained layer 7 silt with patches of clay. In the south-east corner of the drain hangi stones, fragments of charcoal and obsidian flakes were found, while at the northern end was a small 2B adze, a chert flake and a small piece of worked nephrite.[16]

3.3.4 Square H

Square H was opened up to examine the two drains seen in Trench C (Figures 41-43). The turf and topsoil layer 1 was removed by spade, followed by the rock flour layer 2.

The rock flour layer varied in depth where it filled the drain (feature 36). At the northernmost end the drain was 100 cm deep and at the south it was only 50 cm deep, showing that the drain originally sloped steeply down towards the Waihou River, where it was recorded in Trench C. The various stages of flooding caused the side to slump in places, mixing the deposits. At the northernmost end the drain was 130 cm wide, while at the southern end it was 120 cm.

Layer 3 was up to 50 cm deep in places and was removed in 5 cm spits. On the west was a farm drain (feature 36) 1.2 m wide and 0.8 m deep that ran north-south through the square towards the river, where it was visible in Trench C. Three hangi scoops (features 34-35, 37) up to 14 cm deep and 79 cm

16 Nephrite (pounamu) and bowenite (tangiwai) are commonly both referred to as greenstone (see Reed 1957).

wide were found filled largely with rock flour, with some charcoal and hangi stones (Figure 41). An assortment of European artefacts were found in this layer including ceramics, bottle glass, peach stones, clay pipes, glass beads, a leather shoe, a pig's jaw, a metal file, metal fragments and a silver earring. More artefacts near the base of the drain included tin cans, bottle glass, a shoe and pieces of metal.

Figure 41. Farm drain (left) and hangi (right) after rock flour has been removed from Square H, facing north.

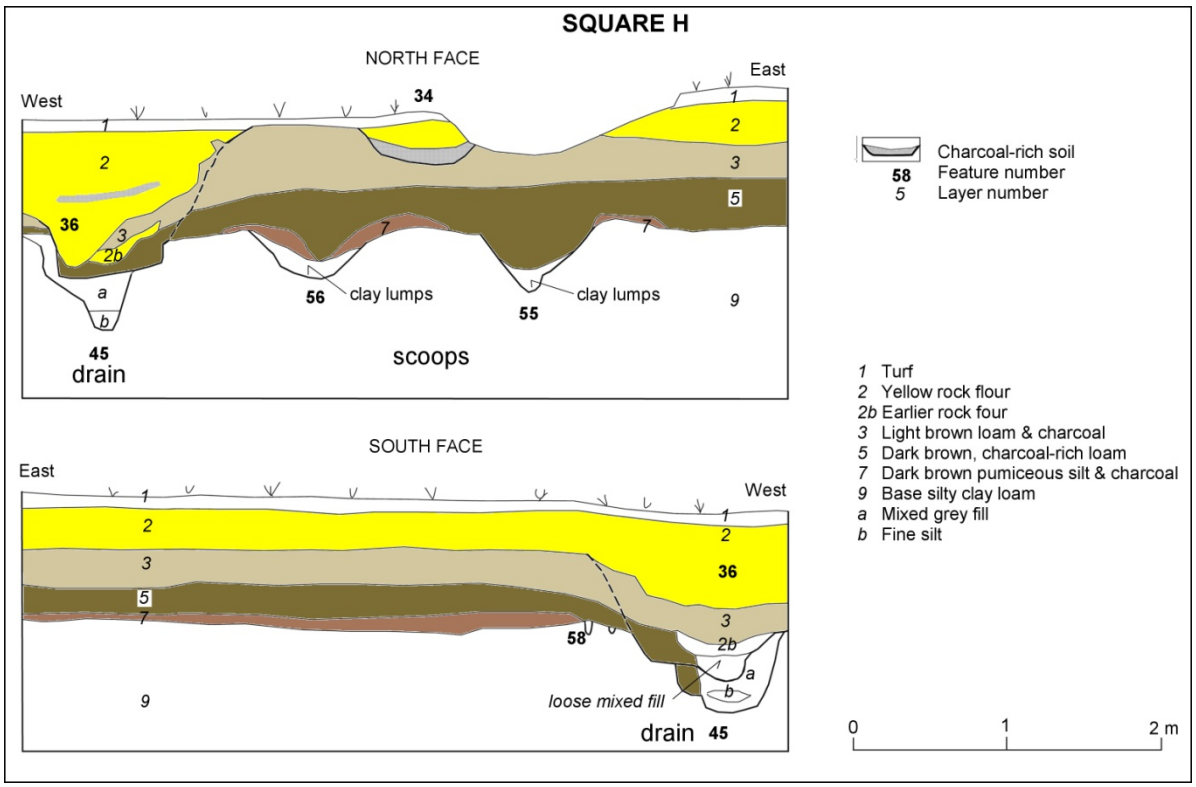

Figure 42. Sections of two baulk faces in Square H.

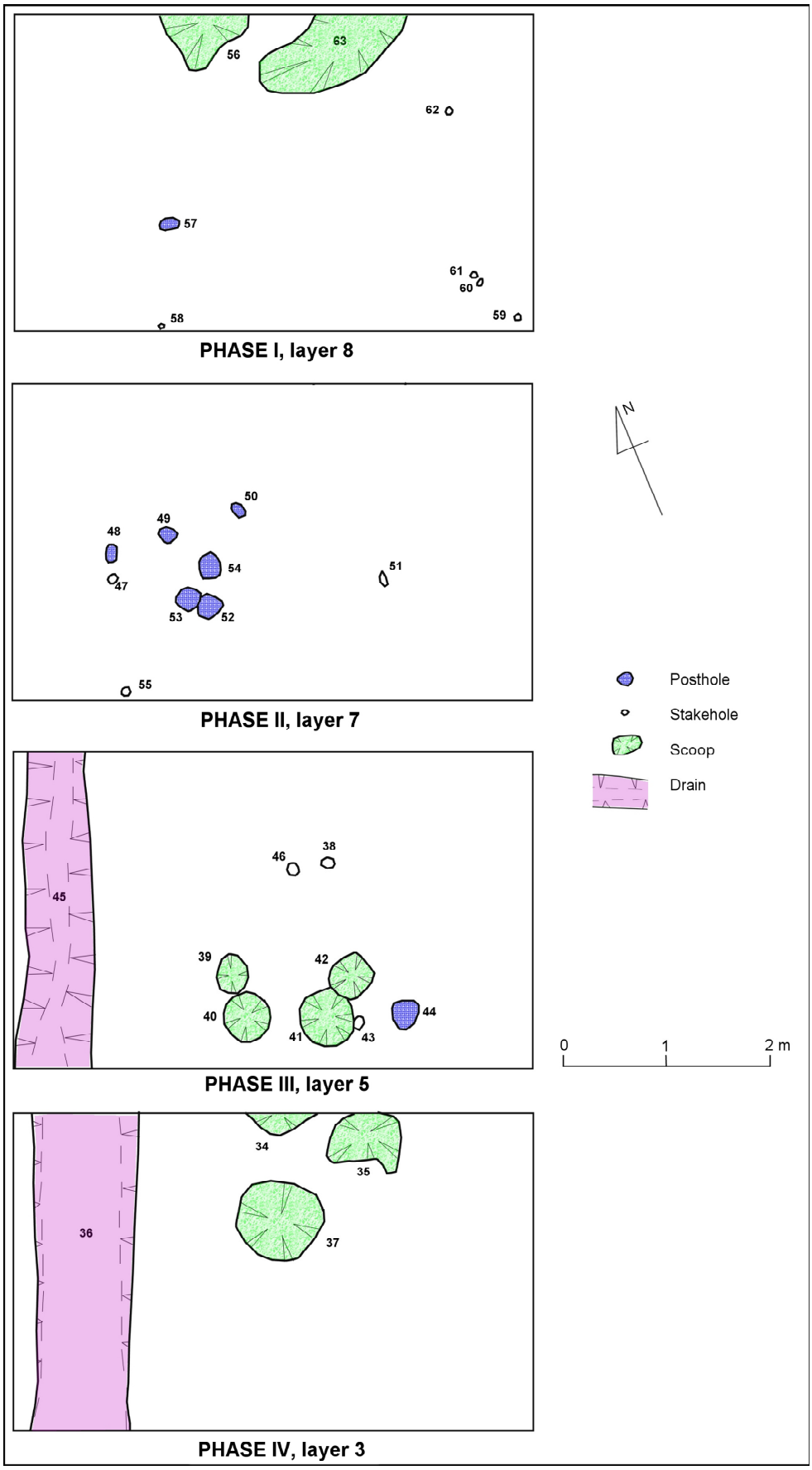

Figure 43. Plan of features in the different layers of Square H.

Layer 5 was not easy to distinguish from layer 3 in places, and contained charcoal fragments mixed throughout. At the time of excavation it was thought that this mixing might have been due to gardening. Nearer the base it contained pumice, which would have come from a Waihou River flood. Part way through the layer four scoops ranging from 37-58 cm wide and 5-20 cm deep (features 39-42), three stakeholes averaging 10 cm wide and 15 cm deep (features 38, 43, 46) and a posthole (feature 44) were found. At this time the drain (feature 45) was narrower and sometimes deeper, being 80 cm wide and 80-90 cm deep, than when it was redug in layer 3. Clay pipes, obsidian and chert flakes were found in this layer.

Figure 44. Postholes in layer 7 with farm drain to left in Square H, facing north.

Below layer 5 was the pumice-rich silt of layer 7 (Figure 44). A series of nine post and stakeholes were uncovered ranging from 8-25 cm in diameter and 4-29 cm deep (features 47-55). Very little cultural material was found in this layer, apart from four obsidian flakes, and a piece of metal which might have been derived from a higher posthole.

Five small stakeholes 6 cm wide and 9 cm deep (features 58-62), a 28 cm deep posthole (feature 57), a scoop and a drain were found cut into the base material (layer 8). The 84 cm wide and 30 cm deep scoop (feature 56) contained burnt punga, while the 60 cm wide and 32 cm deep drain (feature 63), which was possibly another around a house or living area, connected to the early drain feature seen in Trench C (Figure 45). No artefacts were found in these features.

Figure 45. Scoops and postholes in layer 8 in Square H, showing south-west corner.

3.3.5 Square R

A 2 x 3 m square was located near where the Opita defences might have existed around the edge of the old Ohinemuri channel and the Waihou River (Figure 46). This was 28 m north-west of Square F and 5 m east of the soil transect across the old Ohinemuri channel (Figure 47).

Below the turf was a rock flour layer, which showed many flooding episodes within it. Under this was a grey sandy-silt loam. In the top of the loam there was a burnt patch of ground 90 cm in diameter and 5 cm deep, with another similar patch at the base.

A few historic artefacts were found in the top of the grey loam, including three fragments of a slate pencil, a piece of kauri gum and two sherds of ceramic. Hangi stones associated with the lower burning event were observed.

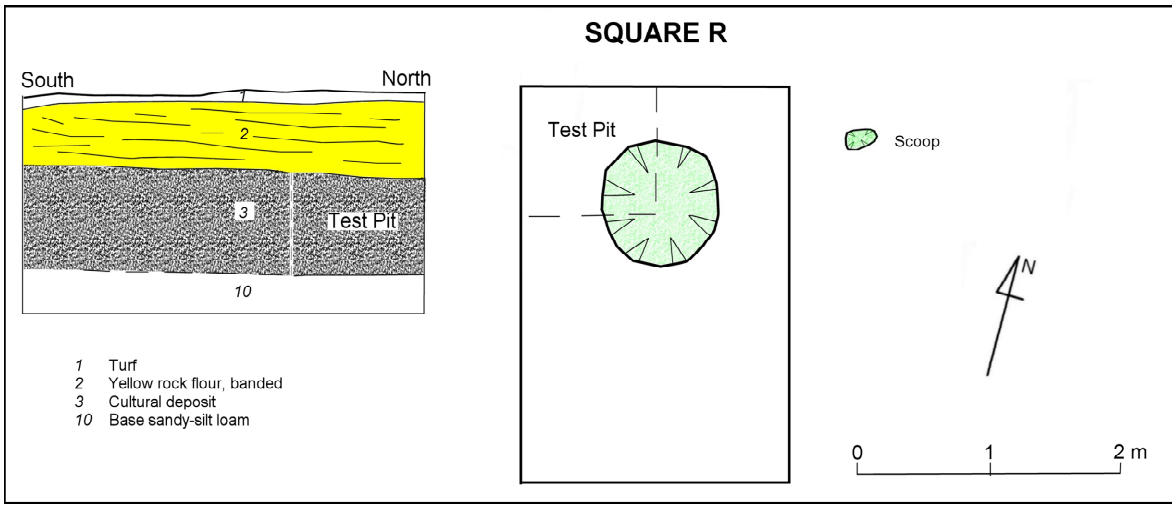

Figure 46. Plan and section of Square R (see location in Figure 47).

3.3.6 Test Pits

A series of test pits (including Square T) were dug east of Squares F and H to determine the extent of the densest occupation evidence and the different substrates observed in the river-side squares (see test pits shown in green, Figure 47). To the north and east along the former Waihou River more test pits were dug in order to locate the extent of the midden and historic deposits found in Trenches C and U, and Square M (see test pits shown in blue, Figure 47). Finally, a set of bore holes were dug in a transect across the former Ohinemuri River course, to obtain soil samples (see soil transect shown in orange, Figure 47; see details of the soils in section 4.2 "Soil Analysis").

Two sections were compiled from these test pits: one along the former bank of the Waihou River, and the other at an approximate right angle connecting Trench C to Trench U (see locations Figure 47 and sections Figure 48).

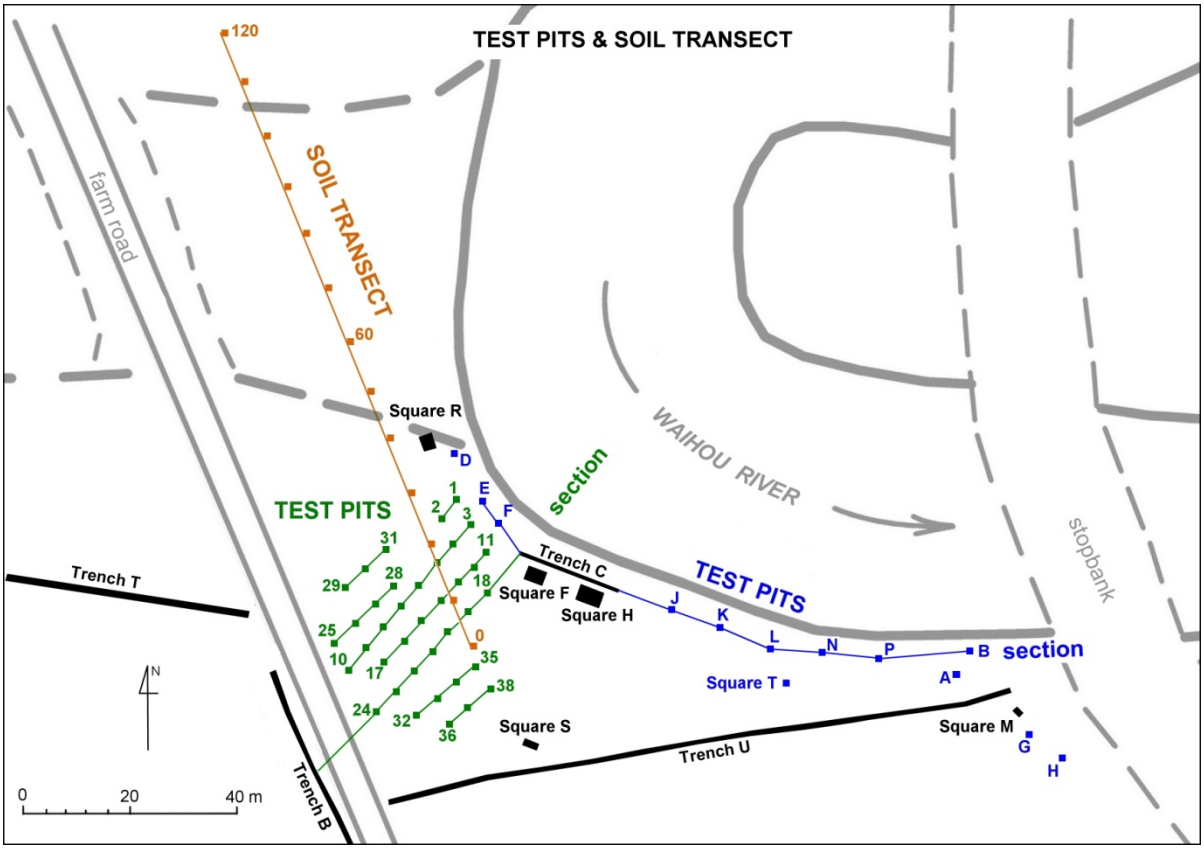

Figure 47. Plan of test pits (green and blue squares) and soil transect (orange squares), with the location of south-west face of Trench C extension and north-west face Trench U to Trench C (see Figure 48).

The sections appear to show that there were one or two natural river terraces present here (see north-west face Trench U-Trench C Figure 48). The lowest one, on which Squares F and H were located, may have been 75 m long and 25 m wide (see Figure 49). These terraces were overlain by a series of flood deposits (layers 7, 5, 3) and rock flour (layer 2). The rock flour layer itself comprised a number of different flood events, which were evident in the deeper areas. Generally these deposits were consistent across this part of the site, except where ploughing had mixed the rock flour into the topsoil or into the light brown loam immediately beneath.

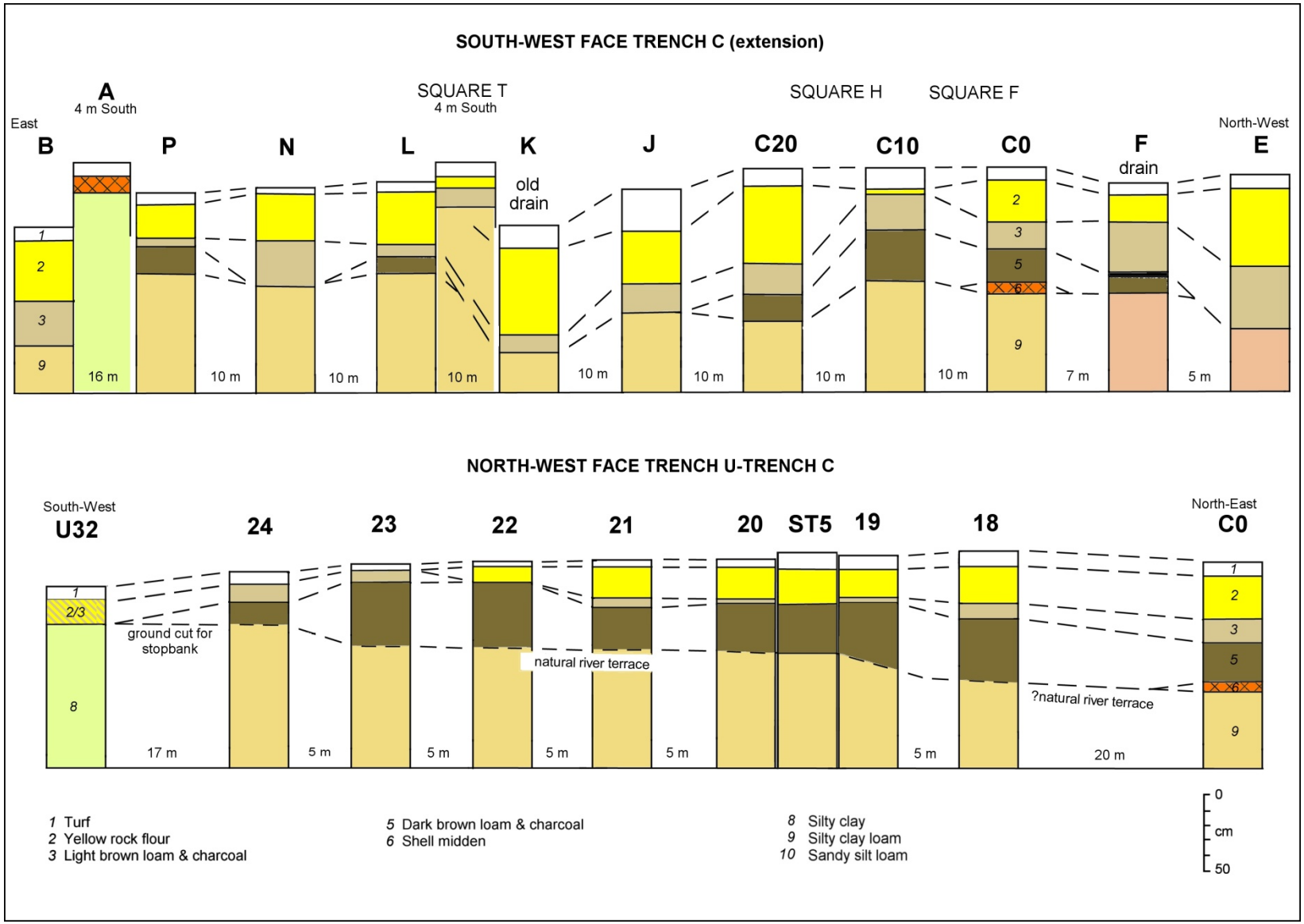

Figure 48. South-west face of Trench C extension along the bank of the former Waihou River, and north-west face Trench U to Trench C (see locations in Figure 47) showing the substrates (layers 8-10, river flood deposits (layers 2, 3 & 5) and midden (layer 6). Note: layers 4 and 7 did not occur in the points measured – see the detailed section of the western end of Trench C in Figure 34.

In the higher parts of the site, as seen in Trenches B and U, the food deposits 7, 5, and 3 were missing and there is only a thin topsoil on the silt clay. Here it is also likely that in the twentieth century material was removed from what was the higher ground to construct the nearby stopbank (Trench U and test pit A in Figure 48), so the deposits are not now as deep as they probably were originally in those locations (see Figure 50).

The section along the river bank is less easy to interpret, because the test pits were further apart, the layers were disrupted by drains and the river bank was naturally irregular.

3.4 Substrates and Post-occupational disturbance

The different substrates influenced the locations of settlements and gardens, whereas the post-occupational disturbance had differential effects on the survival of the archaeological evidence.

3.4.1 Substrates

One of the first observations revealed by the trenches (and followed up by the test pit excavations) was that different substrates underlaid the occupation surfaces (Figures 49 and 50).

To the west was a small area of sandy loams (20 m long) – this lapped on to the end of the peninsula formed by the old meander. Beneath this was a layer of sandy silt loams, which were over one metre thick at the western end, but lensed out to the east, where they merged into the silty clay loam also found on the Waihou River bank. Finally, underlying this was the white basal silty clay, which correspondingly rose to the east. This clay continued rising eastwards forming a clay mound that was also the underlying substrate of the Waiwhau pa site, although possibly half a metre of this clay had been removed at Opita to construct the first stopbank (Figure 50).

As has been observed at Waiwhau (Phillips & Green 1991), the silty clays and silty clay loams were subject to waterlogging, and thus would not provide a very suitable surface for occupation or gardening. It has been surmised that the Waiwhau area could probably only have been gardened after the introduction of European potatoes, which are tolerant of heavy soils. In contrast to Waiwhau, the site of Raupa is underlain by sandy loams and sandy silt loams, which provide much better drainage. It seems that much of the Opita peninsula was like Raupa and traditional crops, such as kumara or gourd, could have been cultivated there in the past.

3.4.2 Post-occupational disturbance

Mention has already been made of a number of different forms of post-depositional disturbance – these were a major characteristic at Opita that has affected the survival of the archaeological evidence. This disturbance could be mapped in reasonable detail in the eastern side of the site (Figure 51).

As with Raupa and Waiwhau there was evidence of ploughing and drainage. Disturbance at Opita began in the late 19th century with the excavation of drains, presumably for farming. It appears that most of these features were aimed at draining wet areas in the clay mound, as they radiated down towards the Waihou River. Material found in some of the drains dates to the 1890s. It is possible that some ploughing was also undertaken at this time; this has continued to the present.

From 1895, the dumping of vast amounts of mine tailings into the Ohinemuri River caused the first of many floods which resulted in the deposition of layers of rock flour on the site. The 1910 flood totally covered the earlier settlements at Opita.

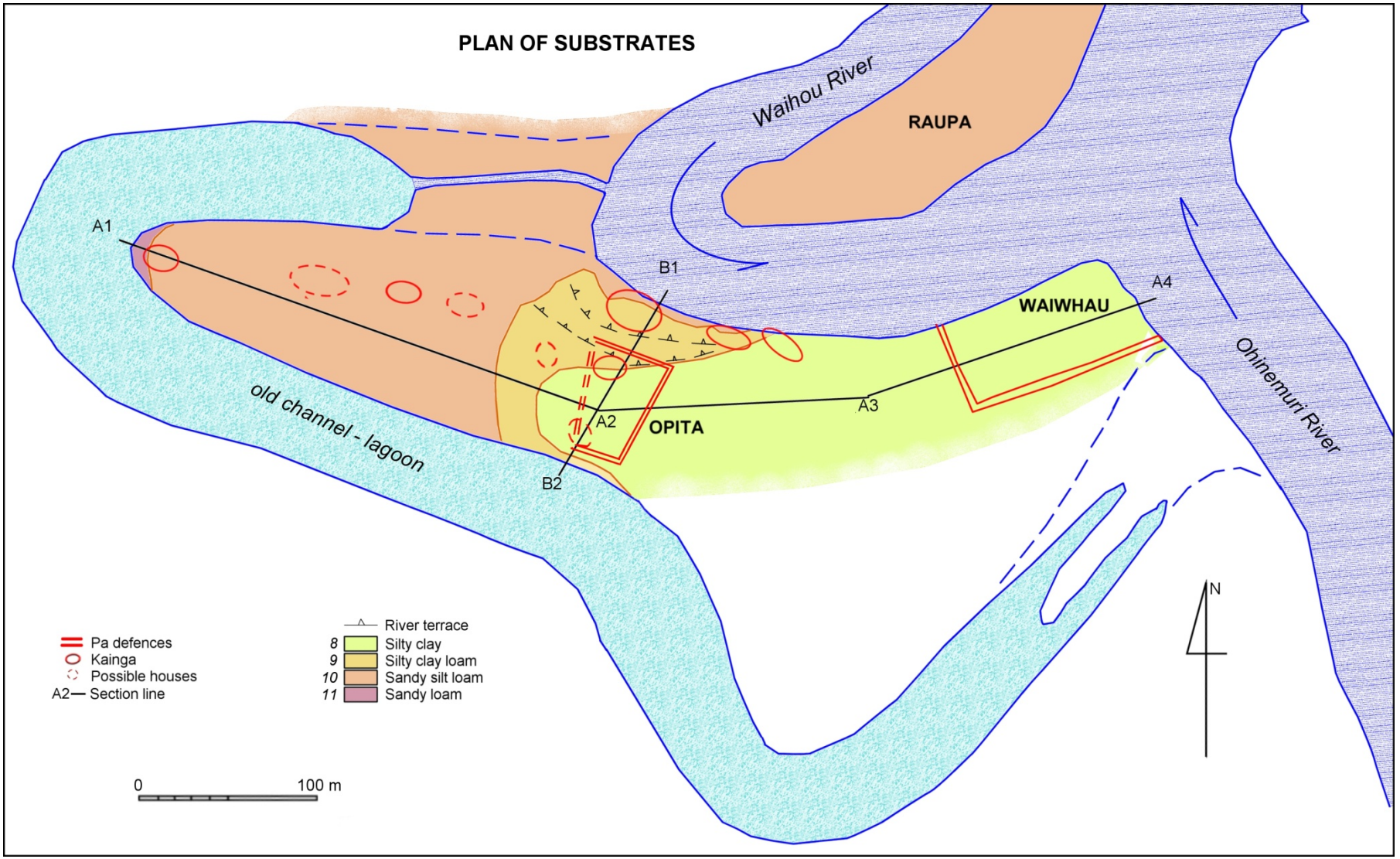

Figure 49. Different substrates across Opita, Waiwhau and Raupa (see sections Figure 50).

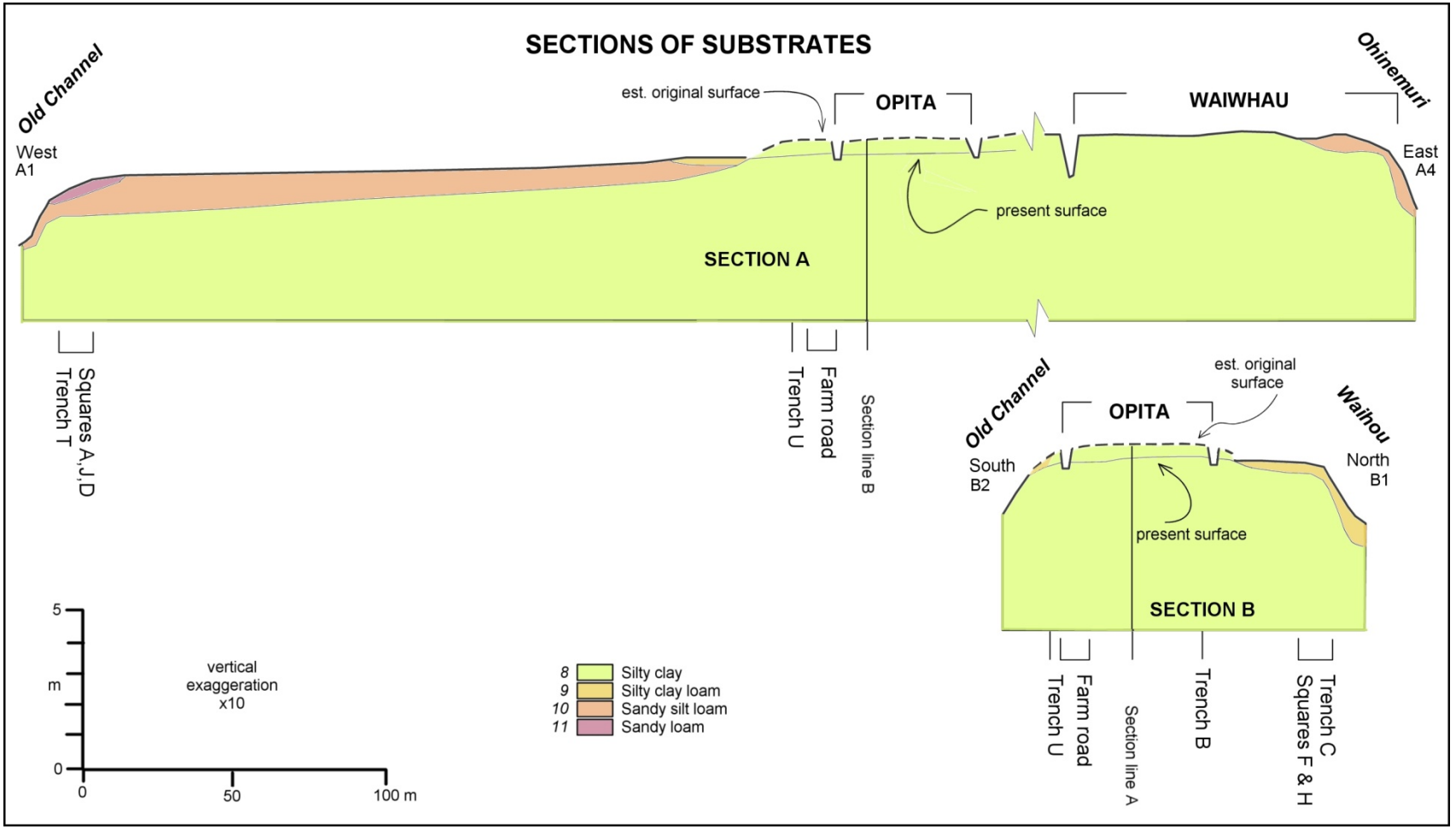

Figure 50. Sections A1-4 and B1-2 across Opita and Waiwhau, showing the substrates and estimated depth of soil removed by flood protection works.

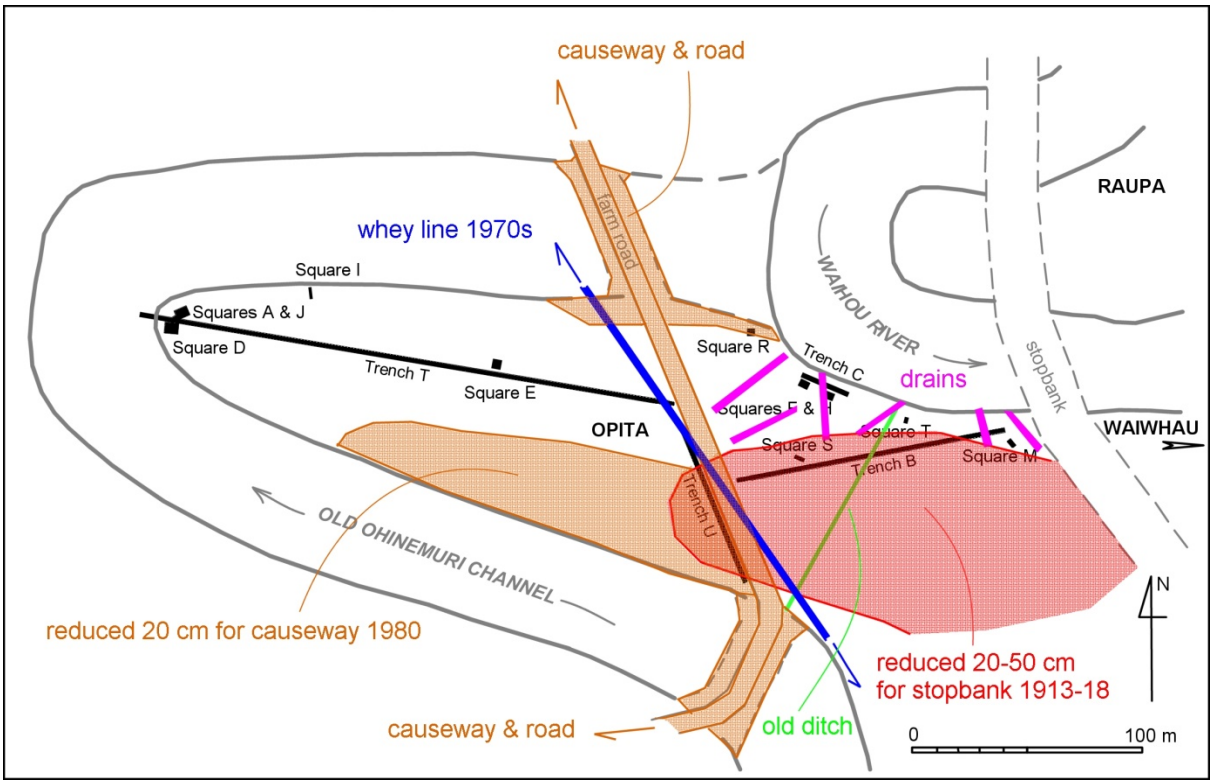

Figure 51. Plan showing post-occupational disturbance at Opita (see text for descriptions).

In 1913-18 the first stopbank was built along the banks of the Ohinemuri River in order to prevent the worst effects of flooding caused by the dumping of rock flour. Soil was probably quarried from the adjacent clay mound at Opita to build the stopbank. Some postholes thought to be the remains of an old fence line were only 15-20 cm deep, and drains in this area were of a similar depth. These investigations suggested that at least 20-50 cm, of soil was excavated from this area; this was a major contributor in our inability to clearly define the pa site.

The land in the old river bend was subdivided in the first few decades of the twentieth century and was sold to European farmers from 1920 (Appendix 19). Eventually most was owned by the Rasmussen family, and they were the owners when this excavation took place.

In the 1970s or early 1980s whey pipes were laid out across the farmland and the whey (the result of using milk fat for butter production) from the dairy factory was sprayed onto the land to fertilise pasture. One of these pipes bisects this area of the site.

Further work on the stopbank in the early 1980s necessitated the creation of an access road. This crosses through the site and soil in the south was excavated for fill to make a causeway over the old Ohinemuri channel.

Ongoing efforts to drain the low-lying land involved mole ploughing[17] amongst other things, although this did not greatly affect the archaeological deposits. After these investigations, sometime between 2004 and 2007, hump and hollow ploughing was undertaken in the paddocks south of Trench B (compare GoogleEarth 2004 and 2007 aerial photographs).

17 The mole is a pipe set at the base of a blade which cuts through the soil at a greater depth than normal ploughing and encourages water to descend to the level of the hole created by the pipe, thereby keeping the paddock surface dry.

Thus, some 40% (or 10,000 m^2) of the archaeological evidence on the Opita peninsula has been severely damaged or destroyed by the flood control, drainage and whey pipe excavations and the remaining 15,000 m^2 has been affected by ploughing, to a lesser or greater extent, depending on the depths of the deposits. The AU Field School excavations revealed that the soils were deeper and occupational surfaces had survived on the former river terraces.

3.5 Geophysical Surveys

At the time of the AU Field School Dr Peter Sheppard conducted a proton magnetometer and resistivity survey of an area 79 x 15.5 m between Trenches C and B, with the assistance of the students and Paul Vodanovich (Figure 52).

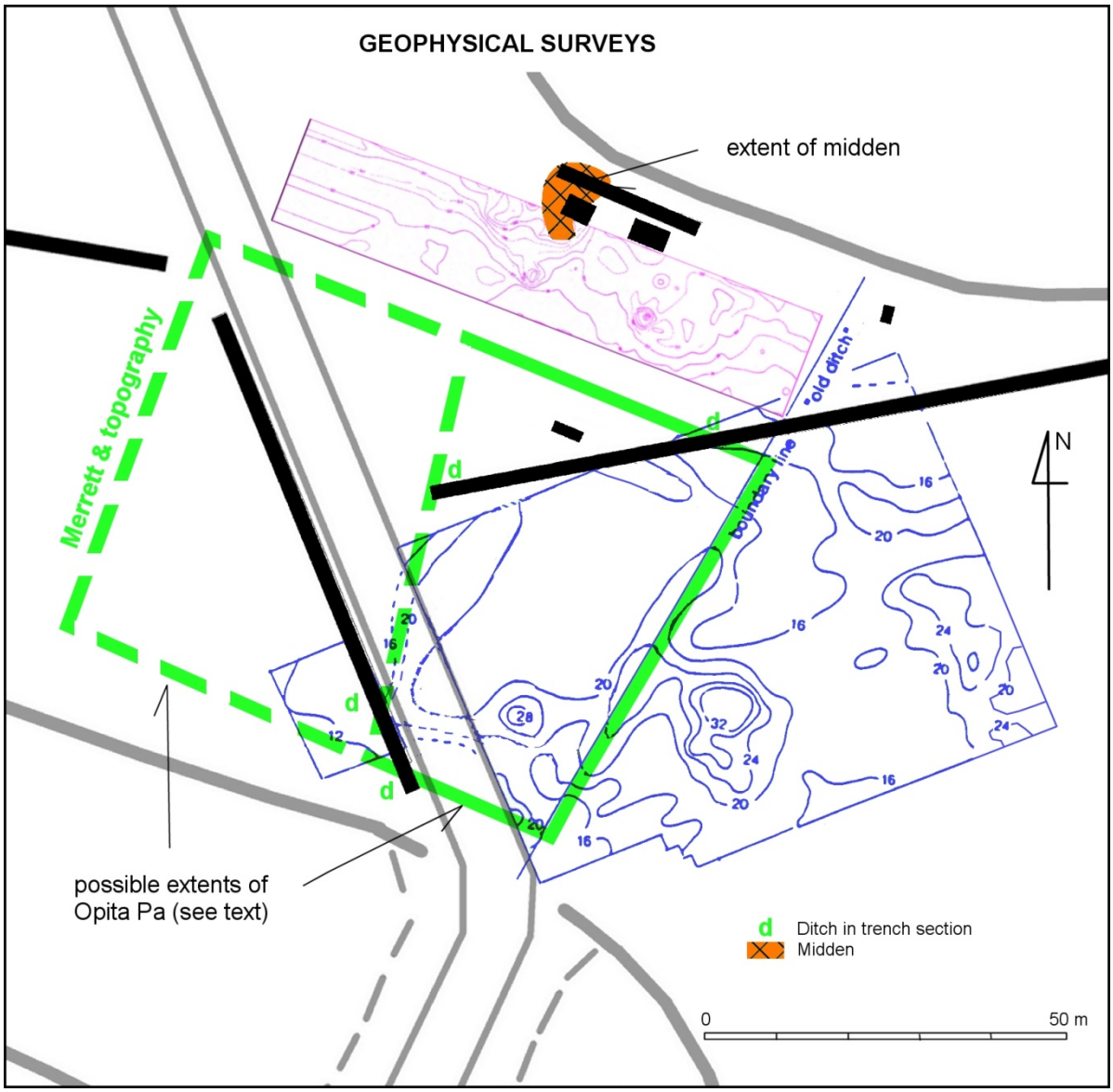

Figure 52. Conductivity (blue lines) and resistivity (purple lines) surveys at Opita. The possible outline of Opita pa is shown in bright green, with the intercepted ditches marked.

The results of the resistivity suggested that the midden seen in Trench C extended in a small fan spreading south towards Trench B. However, the lack of midden found in the test pits dug between the farm track and Square F showed that it did not spread far to the west. In total, the midden measured approximately 11 x 8 m.

Two years later, Sheppard came back to Opita to undertake a conductivity survey of the area where the defensive ditch was thought to be, in order to identify the alignment of the ditch and determine the size of the pa. This was part of a joint Taskforce Green[18] and University of Auckland project along the Waihou River, conducted by the authors with the assistance of four tangata whenua who were the field trainees (Allen et al. 1994).

This survey gave some indication of the route of the defensive ditch, which could be joined up with the ditches found in the trenches. This suggested that the pa was a very small irregular rectangle measuring some 60 x 36 m. However, Merrett's illustration (Figure 6) portrayed it extending further to the west, before an entrance and a change of angle to the south (see Figure 52). This might make it in the order of 80 m long and 60 m wide, the same size as Te Kari pa, which is the only other pa along the Waihou River built in the musket period for which there is a detailed plan (Crosby & Loughlin 1991).

18 Taskforce Green is a training scheme that allows people to participate in project-based work and is subsidised by Work and Income New Zealand (Work and Income New Zealand 2012).

4. Analysis

Materials found at Opita can be classed either as artefacts or deposits (Table 2). The artefacts included stone, ceramic, glass and metal objects, all of which were collected. The excavated deposits were sieved and samples of midden deposit were recovered, which contained not only shell, stone and charcoal, but sometimes bone and small artefacts. Groups or individual hangi stones and samples of soils were also gathered. Features were sampled for either charcoal or, in rare instances, wood identification.

These various materials were initially analysed by the AU Field School students and submitted as reports as part of the requirements for the course. These original reports have been reviewed and updated in light of more recent standards, findings from other sites, and other methods not available to the students at the time (see Appendices for the different analyses). A summary of the analysis of each artefact type or material is described separately below (Table 2).

Table 2. List of materials found at the Opita investigations and the type of analysis undertaken. The numbers of identified specimens present (NISP) and numbers of samples are shown.

Material	*Analysis*	*Samples*	*NISP*	*Appendix*
Lithic	obsidian		168	2
	hangi stones		692	3
	chert		24	4
	other lithics		20	4
	writing slate		25	5
Ceramic	ceramic		170	6
	clay pipes		108	7
	bricks		5	8
Glass	glass		74	9
Metal	metal		110	10
Bone	bird		32	11
	fish		114	11
	mammal		685	11
Wood	charcoal	22		12
	fruit stones		13	12
	kauri gum		24	12
Shell	shell	24		13
Soil	soil	49		14
Miscellaneous	clay, coprolite, leather		16	15

All analyses addressed a range of questions about the local environment, the source of the material, the use to which the material was put or activity that took place, the variation between the different areas of Opita that were examined, and change over time within the project area as a whole. This evidence was also compared to that from the neighbouring sites of Raupa and Waiwhau, as well as excavations along the Puriri Stream situated 24 km further north along the Waihou River.

4.1 Hangi Stones

Of the 48 bags of hangi stones recovered from the excavated localities at Opita, those in 39 bags were subjected to further analysis (see details in Appendix 3). These totalled 692 stones of which a few (21)[19] occurred in the deposits as single stones, some (202) were found in clusters, while the majority (472) were within the shell midden layers, often as fire-cracked discards. Research questions for this material addressed their source, their use and any chronological variation within the site and layers. Comparisons with other analyses of hangi stones were also made.

4.1.1 Sourcing the hangi stones

Of the 202 stones found in groups, 152 were identified according to rock type. Samples of stones from the Ohinemuri River were also identified, and it was found that most of the stones used in hangi were represented in the sample of rocks collected from the first rapid, which is 11 km upstream from Opita. In addition, nine indurated tuff cobbles found in one group of hangi stones could have come from the river bed, but were not found in the river stones sample.

Given that canoe transport on the rivers was an important way of moving materials around the Hauraki Plains, the cost in terms of distance may have been slight. It is possible, however, that at the time of occupation the source of stones could have been closer to Opita than the first rapid, as there has been a substantial amount of silt brought down the river since the time of the Opita occupations. This may have altered the morphology of the river and covered up a nearer source.[20]

The rock types used for hangi stones do appear to have been selected. Basaltic and pyroxitic andesite (types A, B1 and B2) seem to have been the most preferred stone, while highly altered basaltic and pyroxitic andesite (types F and G) that are very common in the river were almost incidental within the samples collected on site (see Figure 53). Scoria-like andesite and highly altered B1 (types D and E) were also incidental on site and not present in the river.

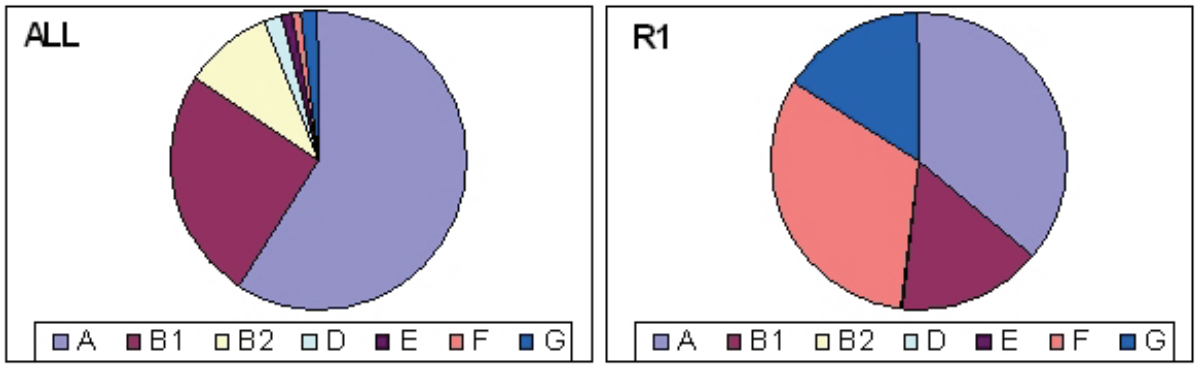

Figure 53. Left: All identified stones collected from groups and individual finds n=151 by type, omitting the indurated tuff (see definition of rock types in text). Right: identified river stones from the first rapid, n=25 (a single quartz rock has not been included, as none appeared in the site and it may have been present due to the gold mining).

19 Three other stones included in "other lithics' were later reassigned as hangi stones. No analysis was undertaken on them, but they are included in this total.

20 In 1875 the Waihi goldfield was opened up for mining and in 1895 the Ohinemuri was designated a sludge canal (Moore and Ritchie 1996; Watton 1995). As noted previously, this resulted in huge amounts of mine tailings being dumped in the river, much of which was brought down to Paeroa during floods: 45 feet (14 m) of silt was measured opposite the Criterion Hotel (Ohinemuri Gazette 22/8/1921). Consequently the Ohinemuri has become very silted up below the Karangahake Gorge where the rapids are located.

The size range of stones in the river is also within the range of the stones found together in groups, (e.g. within a hangi scoop), ranging from 1 to 460 grams (Figure 54). It should be noted that some of those found at Opita had been fractured in the fire and were not the original size brought to the site.

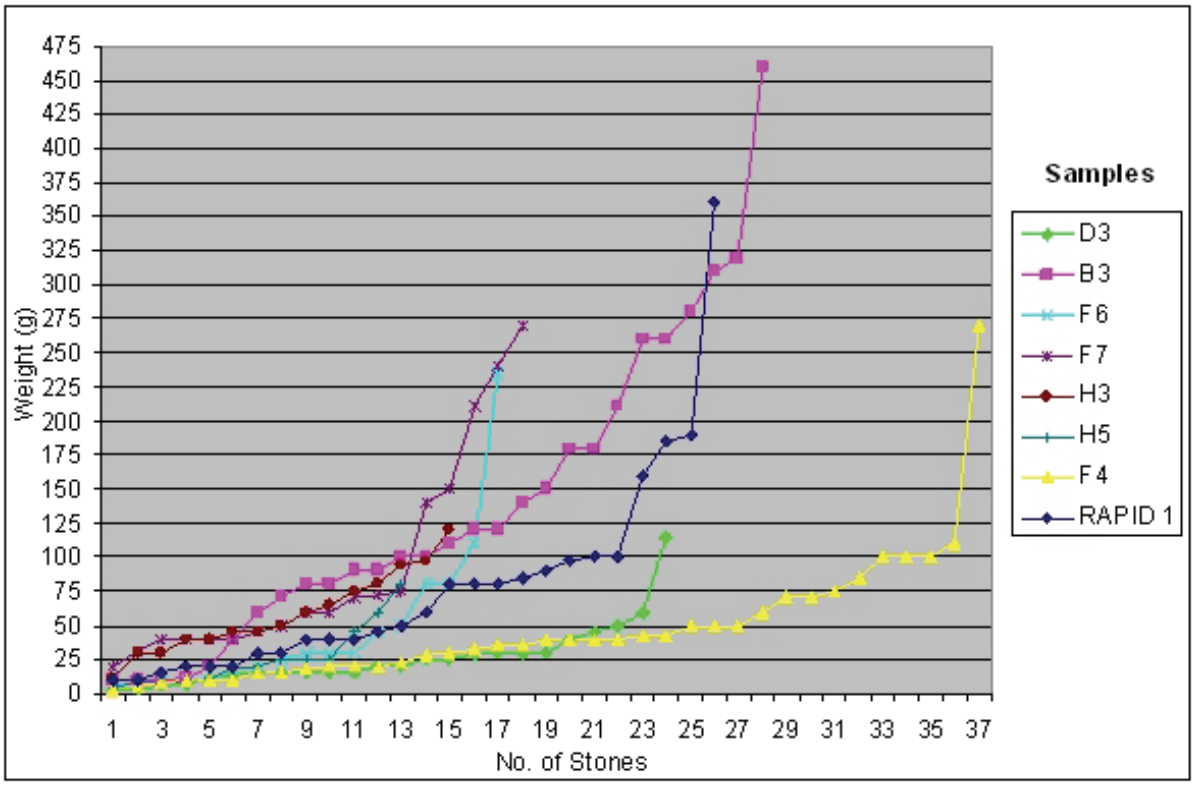

Figure 54. Stone size by weight in grams found in groups in the investigations (D3=Square D layer 3 etc.,) compared with the range found at Rapid 1 in the Ohinemuri River.

4.1.2 Use of stones

Although it was assumed that stones not found in the middens were also used as heat retainers in earth ovens, a small number (43) were examined to see if there were any signs of heating. The results of this part of the analysis are uncertain, partly because it is not clear whether all stones would show signs of heating even if they had been through a hangi once or twice. The visual descriptions of half the stones (119 of 203) found in clusters showed that there was charcoal residue on most, which is possibly a stronger indication that they had been used as heat retainers.

Clearly the stones were discarded when they were too small to handle or retain enough heat to use as cooking stones. Although there was a range of stone sizes found in the midden, the majority were less than 25 grams (Figure 55). It may have been that a few larger ones were overlooked, or that the rake-out process had not been very thorough: the Square F layer 4 midden (F4 in Figure 55) shows a number of large stones within the much smaller shatter. This contrasts to the generally larger stones and wider range of stone sizes found in the groups (Figure 54), where at least three-quarters of the stones are more than 25 grams in weight.

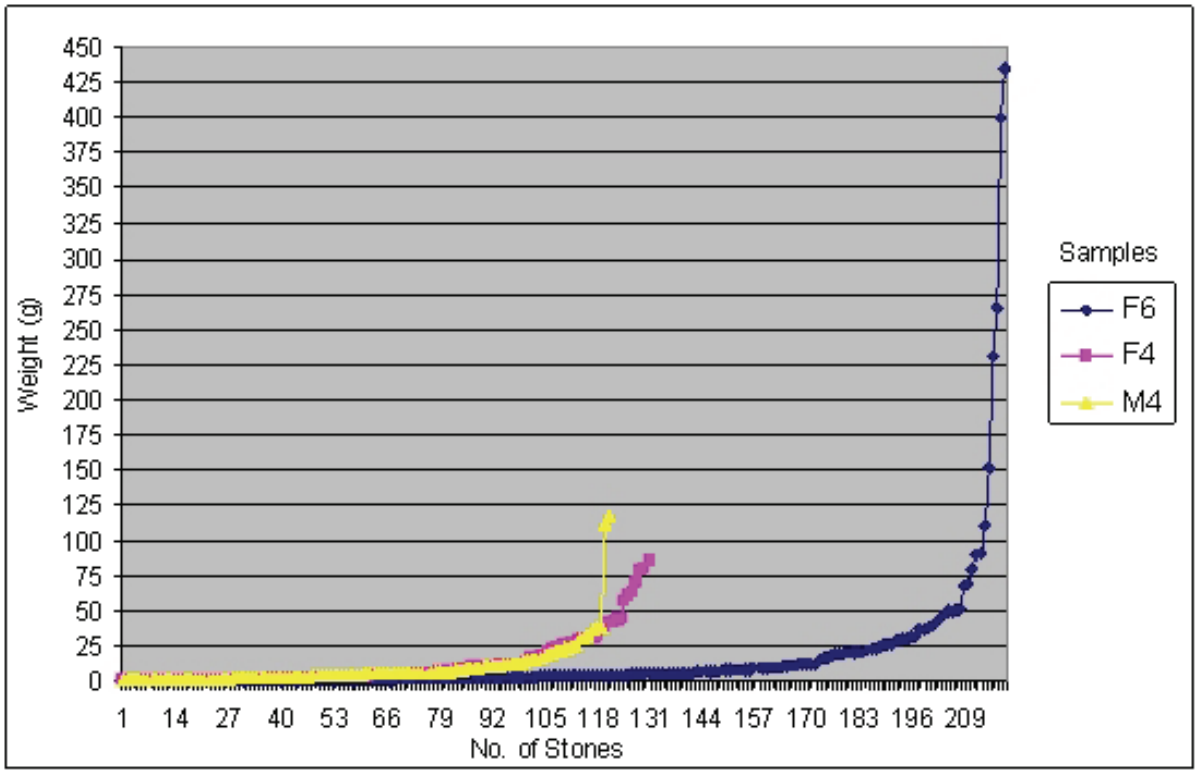

Figure 55. Graph of weights of hangi stones found in the middens (compare the weights to the groups of hangi stones and river stones in Figure 54).

4.1.3 Variation between the Opita settlements and change through time

There were three archaeological areas where most (93%) of the groups and individual hangi stones were discovered (Figure 56):

- Squares A and D and the west end of Trench T: 23 hangi stones were found in Square D, but no midden or cooking area was located.
- Square M and the east end of Trench B: 33 hangi stones were found associated with the midden in Square M and Trench B nearby.
- Trench C, Squares F and H: 145 stones were recovered from five different layers, though principally in the two associated with midden.

Comparison of the different rock types present in these three areas and two layers in Square F provide some idea of selection preferences changing over time. In this analysis Type B was subdivided according to the glassy appearance of B2 as opposed to B1.

In Square D, half [21] the stone was type A, more than a quarter was type B1 and the remainder were made up of B2, E and G (see Figure 57). In Square M and Trench B types A, B1 and B2 formed nearly a third each. In Squares F and H, and Trench C in layer 4, half were type A, less than a quarter type B1 and nearly a fifth were other types. This contrasts to the lower midden in Square F where the majority are type A with less than a fifth being type B1.

21 In Square D, the rock type of 19 hangi stones was identified from a total of 23: in Square M/Trench B, 32 were identified from a total of 33; and in Squares F/H/Trench C, 99 were identified from 145.

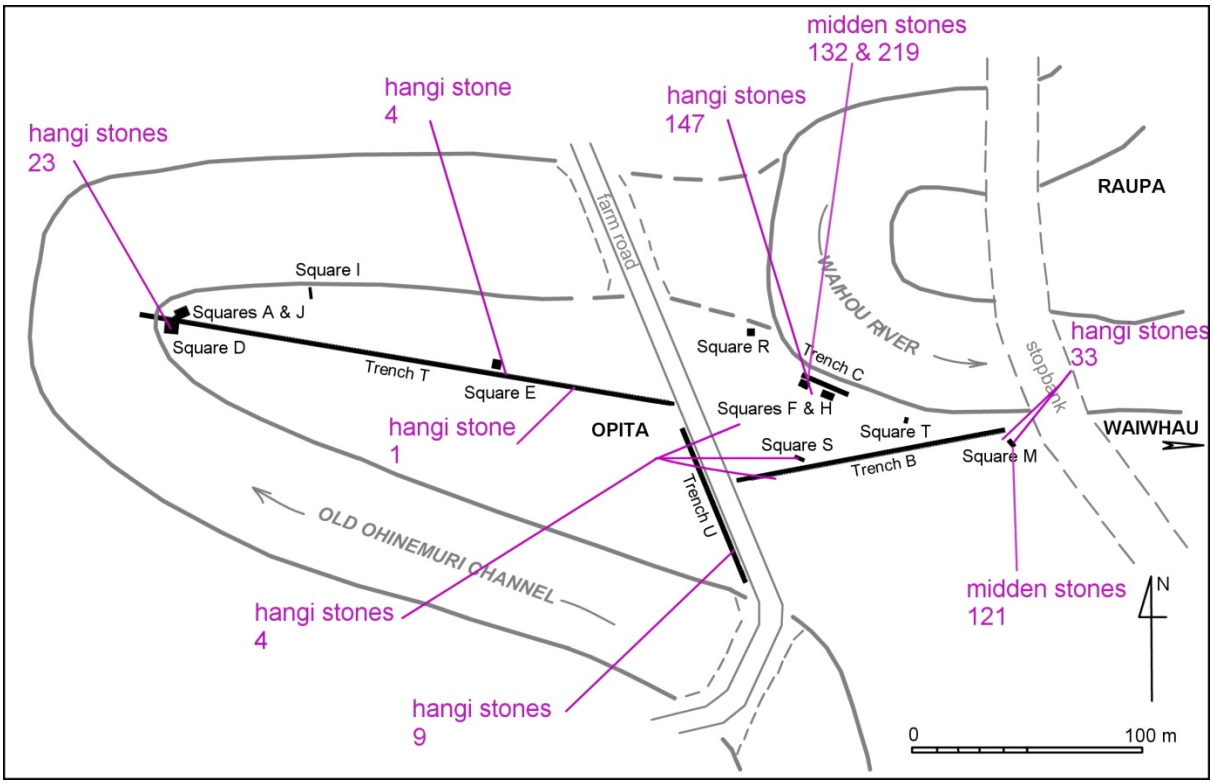

Figure 56. Distribution of hangi stones that were analysed from the Opita investigations, including the three stones from the "other lithic" category.

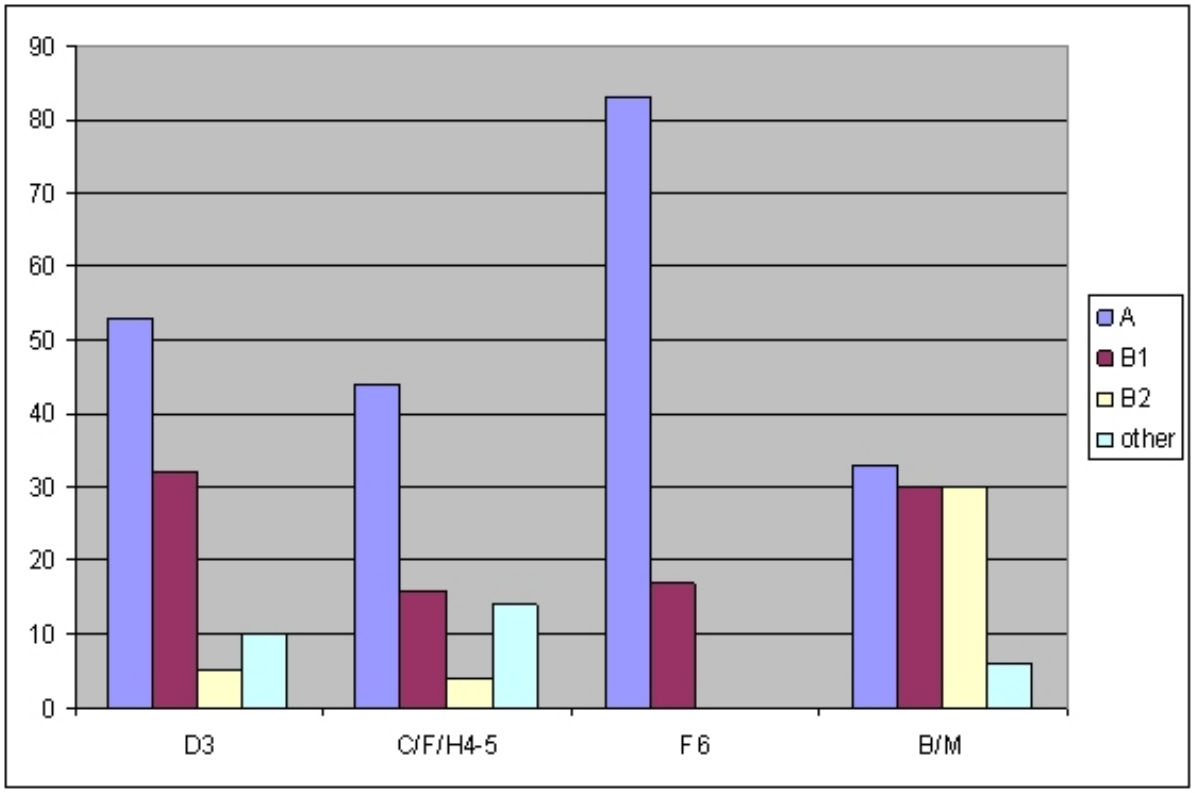

Figure 57. Graph showing proportions of main types of hangi stone in four locations and layers (Square D layer 3; Trench C, Square F and H layer 4 and 5; Square F layer 6; and Trench B and Square M). A = basaltic andesite, B1 = pyroxitic andesite, B2 = glassy pyroxitic andesite.

These variations suggest different selections were made by people at different times, although they were not identical, at any time or place, to the range of stones found in the river. The graph suggests that layer 3 in D and layer 4 in C/F/H were collected at the same time by the same people. However as will be seen below, variations in the types of obsidian suggest that Square D was the earliest occupation at Opita. The proportions from layer 6 in Square F [22] and the B/M deposits represent a somewhat different collection, either from a different time or place, or in the case of layer 6 in Square F, greater selectivity in favour of basaltic rocks. As will be seen below, there are indications that middens from Square M layer 4 and Square F layer 6 both relate to a relatively early period in the history of occupation of this area.

4.1.4 Comparison with other sites

Hangi stones are found at most archaeological sites, yet few are studied. At the neighbouring sites of Raupa and Waiwhau, hangi stones were found associated with ovens and midden, but they were not identified or measured.

A recent analysis by Phil Moore (2007) looked at a series of sites in the western Bay of Plenty and compared them with other recorded samples. In particular he looked at the choice of stone type and size.

In summary he commented that there was "some evidence that stones of a particular size range were preferred for cooking purposes" (Moore 2007:52). The sizes of hangi stones measured in the fifteen sites that he reviewed ranged from 35-200 mm in diameter, although most were in the 36-95 mm size range. Moore cited an earlier experimental study by Gillies (1983), who suggested stones averaging 100 mm would have a greater life expectancy, being less prone to breakage. In two sites, Moore (2007:45) noted that the stones from particular features were measured, including a hangi scoop at Paengaroa U15/501 and a cache at Anatere pa U13/46. The former were mainly pebbles (25-64 mm diameter), whereas the latter were predominantly cobbles (64-165 mm, or 100-500 g).

When it came to selection of particular stone types, Moore (2007:52) observed that:

> The overall impression is that quality was not a particular concern, and that wherever stones were available within a reasonable distance of the site – say a radius of 5-10 km they were generally utilised, but where there was a choice of rock types within the same area, it seems that harder, denser stone was usually preferred … .

As Moore states, political boundaries and relationships may have affected access to suitable sources, and in addition, particular stone size or composition might reflect modes of cooking, or even prestige (with larger stones reflecting on the ability of a group to produce food for their guests).

The sizes of the stones found at Opita were principally in the 25-150 g range, but this to a large extent reflected the range of sizes found in the river. So selection by size does not seem to have been a major factor. However, it seems that the inhabitants of Opita chose three of the stone types found in the river, but not two others. It may be that these stones have different thermal qualities. Clearly the inhabitants at all times had ready access to the river stones for cooking and they continued to use a similar range of stones throughout the period of occupancy documented at Opita.

22 This is a small collection of only 12 identified stones, containing fewer than the other samples which number 20 from D, 78 from C/F/H and 33 from B/M.

4.2 Soil Analysis

Soil samples were taken from four of the excavation areas and from a transect across the old Ohinemuri River channel (see details in Appendix 14 and location Figures 58 and 59). The 49 samples (39 recovered during the excavation and 10 when midden samples were being analysed later in the laboratory), were taken from cultural deposits, features and natural soil layers.

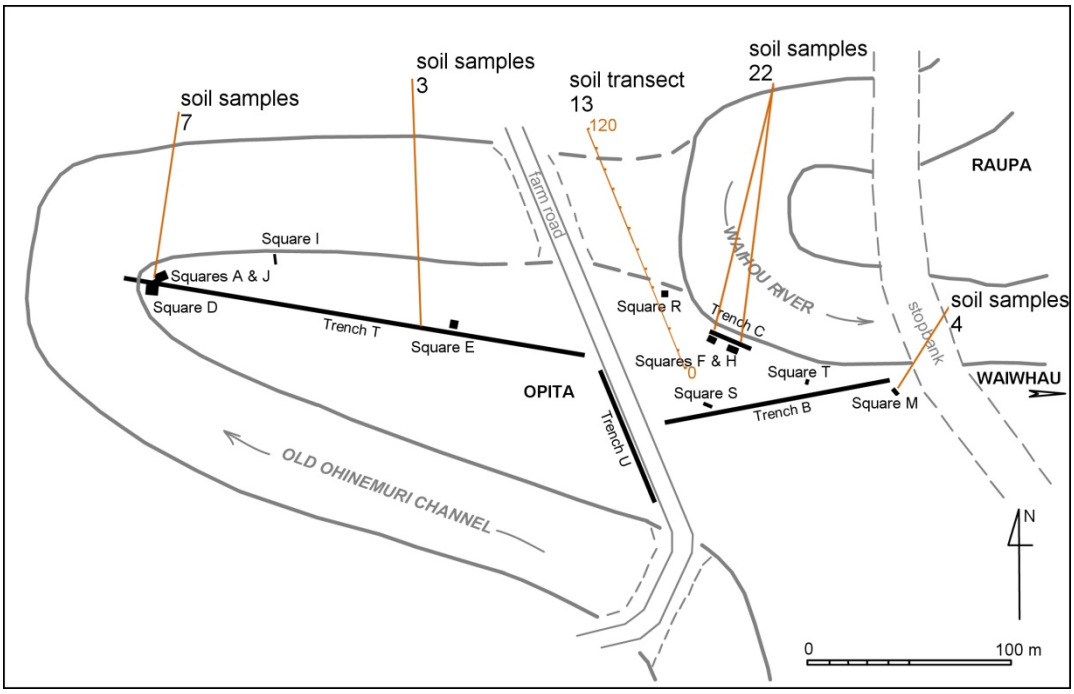

Figure 58. Location of soil samples recovered from the excavations and the 120 m long soil transect at Opita.

Figure 59. Maurice Hoban and Simon Holroyd taking soil sample from across the old Ohinemuri River channel.

The soil samples were subjected to a number of analyses, including:

- visual description, classification and colour;
- soil moisture;
- pH;
- organic matter and carbon;
- particle size analysis; and
- mineralogical examination.

These aimed to: understand the process of in-filling the former Ohinemuri channel and develop a chronological sequence of deposits that could be related to those found in the occupations; determine if there were signatures for sediment types that would assist in site interpretation; link feature fill to the established sequence; and compare the flood deposits in the Opita cultural sequence to those of neighbouring Raupa and Waiwhau.

4.2.1 In-filling the Ohinemuri

The transect samples showed that the full width of old Ohinemuri River channel had been about 50 m wide, and was filled at the base with sandy loam (Figure 60, layer G). At some point the river had broken through a bend south of Waiwhau and formed a new junction with the Waihou River, leaving the old channel as a cut-off bend.

The old channel became an overflow for the Waihou River, and over time became filled with three layers of sandy-silt loam (layers D-F). By the mid-19th century,[23] if not much earlier, there was only a 5-10 m wide channel (possibly man-made – see 5.1 Discussion), which would have emptied the cut-off bend after floods.

Finally, the narrow channel and the area defined by older river terraces was filled by the rock flour (quartz), a by-product of mining in the Ohinemuri headwaters, which was flushed down the river after it was gazetted a sludge canal in 1895. This raised the base level of the river and caused significant flooding in the Paeroa area in 1896, 1903, 1905 and 1910. Despite the efforts at flood protection throughout the twentieth century, floods have continued every time there is a major storm event. In 1954 and again in 1981 the land in the Paeroa area was covered in a layer of yellow-brown silt, the legacy of the mining era.

4.2.2 Sediment signatures

The 49 different samples could be grouped as midden and other cultural layers (18 samples),[24] flood deposits including feature fill layers (12 samples), rock flour (13 samples), and subsoils or base deposits (4 samples). Of the different soil analyses undertaken, the most useful were the grain size, pH, percentage of organic matter, and mineralogy. These analyses identified a signature for some of the soils. Grain size can be shown as a sediment triangle (Figure 61) or in frequency curves which are chiefly pictorial (no statistical parameters can be read from them), but give a better representation when comparing samples and constructing conclusions (Figure 62).

23 The painting by Merrett in 1848 suggests a small low-lying channel, and the survey plan drawn in 1879 clearly defines it. Both are prior to any significant forest clearance or gold mining and indicate the scene during occupation at Opita.

24 Particle size analysis and mineralogy was not undertaken on the 12 midden samples.

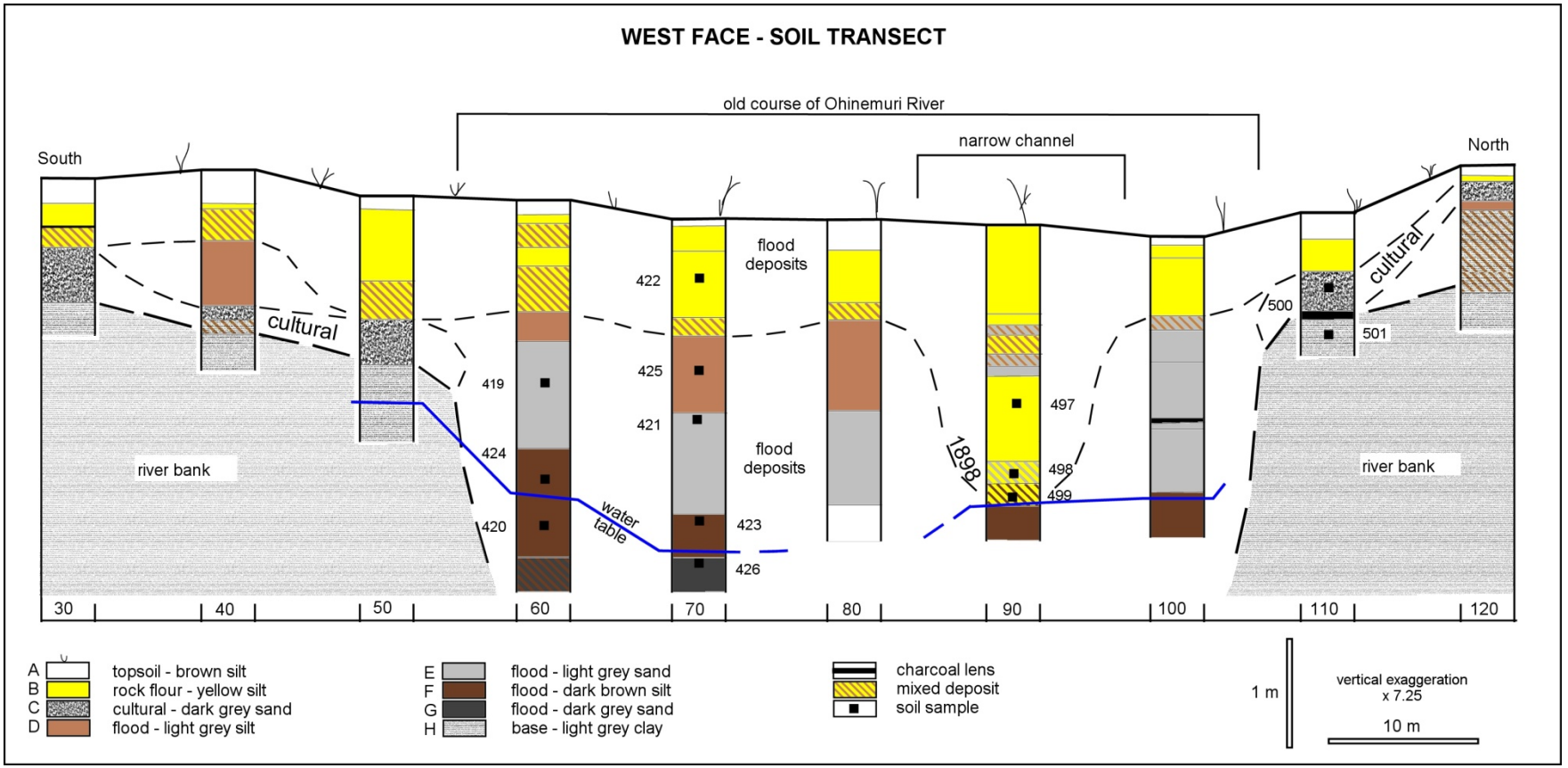

Figure 60. Soil transect across the former Ohinemuri River channel (compare transect layers to archaeological layers in Figure 62).

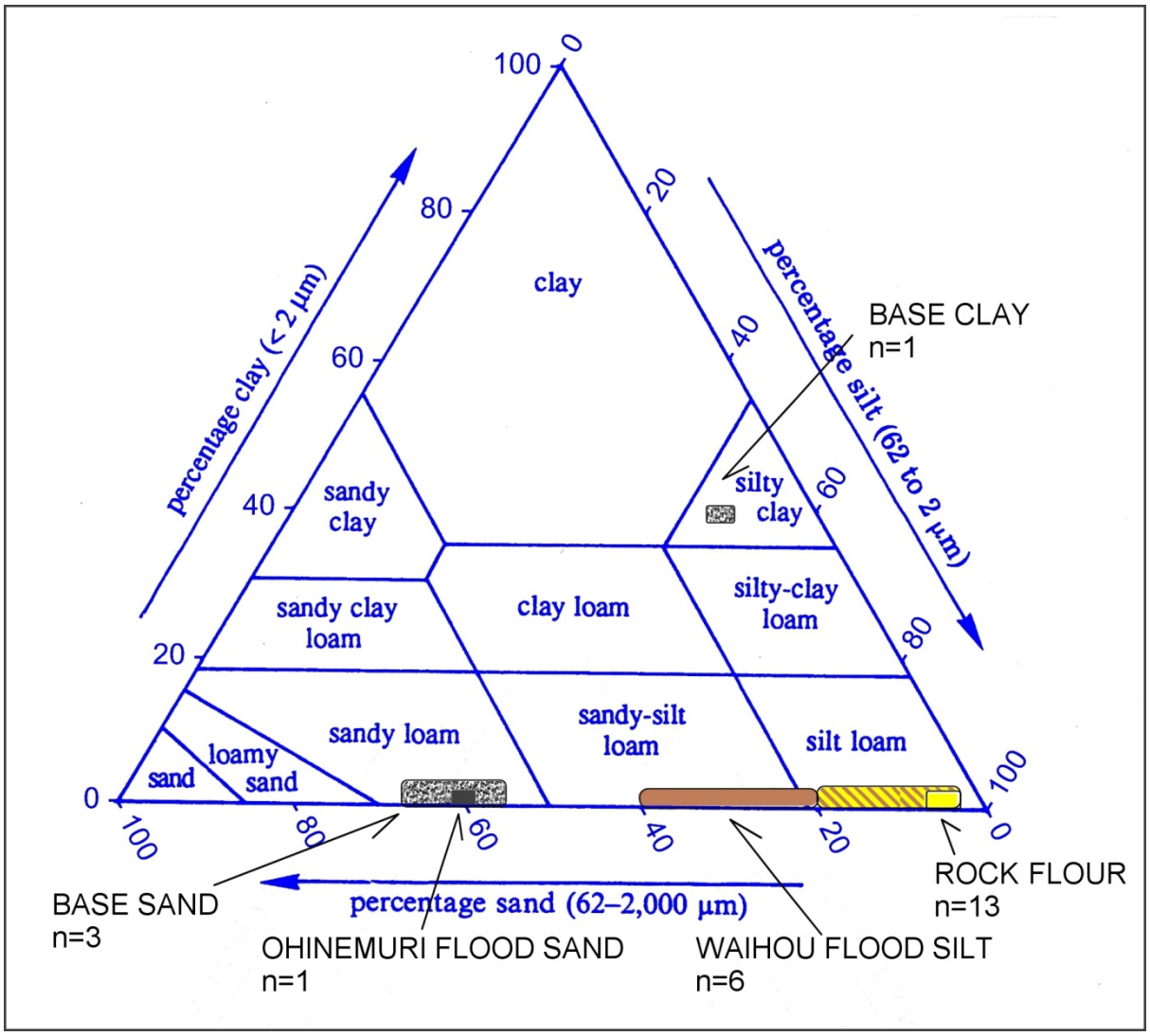

Figure 61. Sediment triangle (from Courty et al. 1989) showing the location of the natural soils in Opita. Several of the rock flour layers were extremely uniform while others appeared to have been mixed, shown as a hatched area. The base deposits beneath the cultural layers are very close to the single Ohinemuri flood deposit and distinct from the Waihou sediments. The cultural and feature fill layers are sandy-silt and silt loams.

Rock flour deposits were notable by a uniform soil frequency curve in the silt size range, they were strongly acid with a pH 4.4-5.4, had a very low organic content, generally 3-4%, and contained traces of metals, including gold and silver.

In contrast, the midden and other cultural soils have a broader soil frequency curve often with peaks in silt and fine sands – generally all in the sandy-silt loam and silt loam categories. They tended to be neutral to slightly alkaline (pH 6.8-7.7), have a higher organic content ranging from 11-39%, and no metals.

The flood deposits have also have a broader soil frequency curve, but tend to have more silt than the cultural soils, like the rock flour they are strongly acid with a pH 4.3-5.3, with intermediate readings for organic content at 9-13%, and also have no metals.

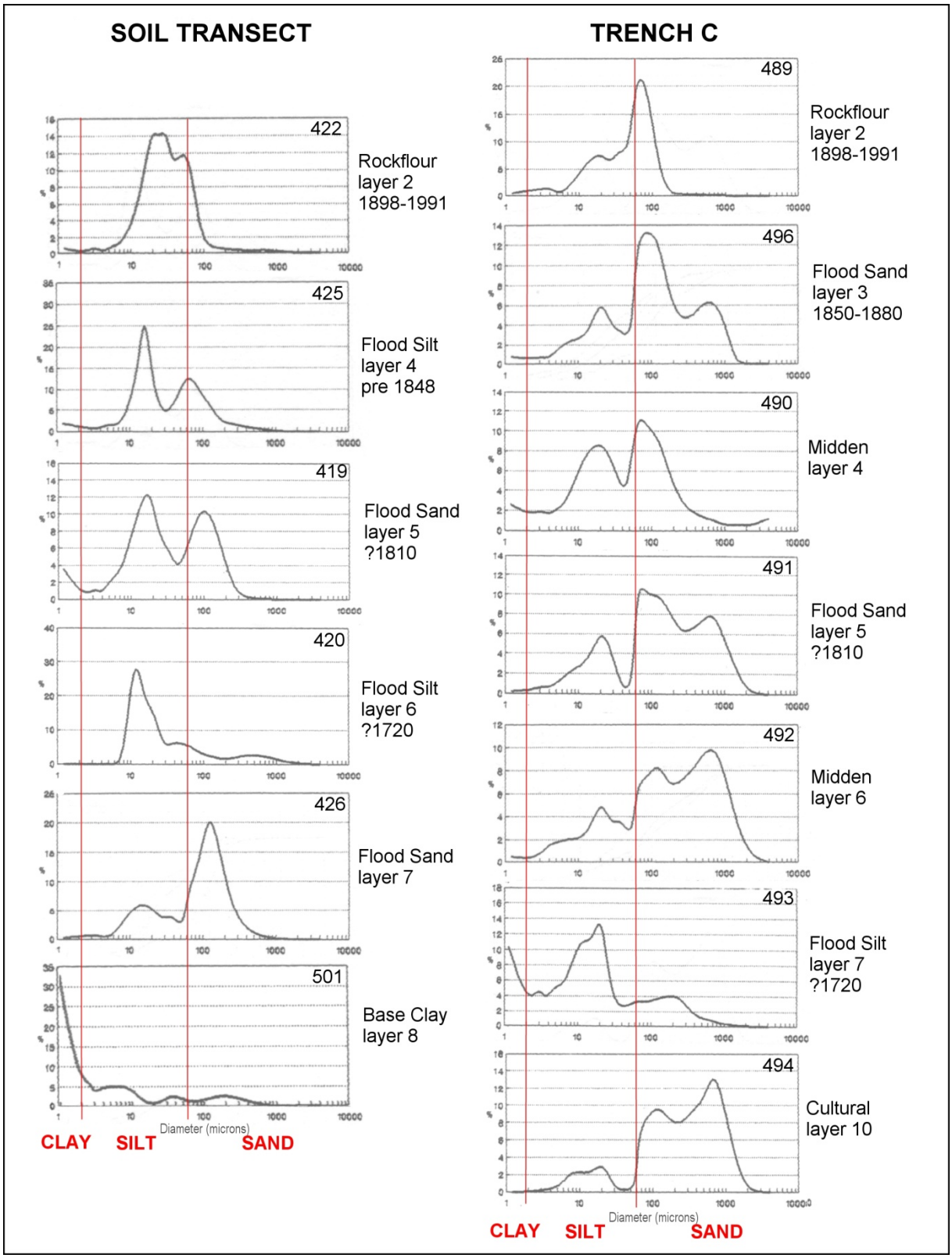

Figure 62. Grain size analysis frequency curves of numbered samples for the soil transect (see Figure 60) and Trench C (see section drawing Figure 34), with approximate dates.

The base soils or lowest cultural deposits (i.e. Trench C layer 8 in Figure 62) all fall into the sandy loam categories and suggest that the inhabitants chose the areas covered by the Ohinemuri flood deposits to live, being better drained than the underlying clays or silts from the Waihou River. These signatures enabled the identification of some soils where the aspects visible in the field were not distinct. Two samples (496 and 468) were labelled rock flour in the field on the basis of colour but did not have the other signature elements, so were reallocated, whereas another two (498 and 499) were not labelled rock flour in the field on the basis of colour, but did contain metal. On reviewing the soil transect these latter were found to be at the base of the narrow channel and probably included organic and other mixed sediments, being part of the initial flooding caused by the gold mining. The earliest rock flour contained high levels of gold and silver, and at the turn of the century when extraction methods had improved, dredges were working in the Ohinemuri River to recover and re-mine the rock flour (NZ Historic Places Trust 2006, see Figure 12).

4.2.3 Feature fill

Questions arose about the dating of features in Trench C, including two drains that extended into Squares F and H. The western drain (feature 33, see Figure 34) was filled with a sandy-silt loam (sample 493) most similar in its grain size frequency curve to layer 6 (sample 420) in the transect. Its similarity to a deposit at Raupa suggests an 18th century date or earlier (see Figure 62).

The eastern drain (feature 36/45) however was partially filled with rock flour, so was thought to relate to the 19th century. The two layers of silt loam (samples 461, 464 and 467) in the base of the drain were most similar to layer 4 (sample 425) in the transect, which was consistent with the drain being filled by sediment from the Waihou immediately before sandy silt layer 3 in Trench C, Square F and H.

4.2.4 Comparing flood deposits

In the neighbouring sites of Raupa and Waiwhau different flood deposits were observed, and the characteristics were compared to the three flood sediments recorded at Opita, in Trench C and the adjacent Squares F and H (Phillips 2000a:134,140,144) (see Figures 61 and 62).

These comparisons provide approximate dates for the flood sand layer and lower flood silt layer, while the date for the upper flood silt is based on Merrett's 1848 painting of Opita and the dates for the rock flour flood deposits are from historical accounts.

- Layer 7 in Trench C and the adjacent Squares F and H was a 10 cm thick pumiceous silt loam (493) that filled many of the lowest features. This is similar to the c.1720 silt loam seen at Raupa, which probably came from the Waihou River.[25]
- Layer 5 was a 20 cm thick sandy loam (491), and could be the same as 1810 flood deposit sand from Ohinemuri which lapped both Waiwhau and Raupa around that time.
- Layer a/b found at the base of the drain (feature 45, Figure 43) may be the flood material (Figure 60, layer D) prior to layer 3, dating some time between c.1810 and 1848.
- Layer 3 was a 15 cm sandy loam (496), and was probably deposited around 1880 due to forest clearance along the Ohinemuri River.[26]

These dates will be tested against the analysis of the artefacts found within these layers at Opita.

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25 This sediment was found at Raupa between Phases 1 & II, which were dated c.1690 & 1750 respectively.

26 This flood occurred some time between 1810 and 189826 when the rock four deposits started coming down the Ohinemuri River, but artefacts present in this and the preceding layers, together with the known bush clearances from the mid 1870s can probably define this event at around 1880.

4.3 Obsidian

Obsidian flakes were used for a variety of cutting tasks where razor sharpness was required. Identifying the sources of obsidian found at a site can trace systems of trade, exchange or gifting. The use of different sources may indicate changing relationships, and can also be used to distinguish various layers within a site or between sites, as different sources changed in frequency of use over time. After European contact, Maori began to substitute new materials for those previously available, such as iron in place of stone. Changing frequencies of obsidian artefacts can inform us about the degree of substitution taking place through time and may have some local chronological implications. In addition, the actual location and size of flakes can say something about the activities that were undertaken at the site, or at least spatial differences. These differences can also be compared to sites elsewhere.

Holroyd's initial study of obsidian sources used Phil Moore's visual recognition table (1988): the same technique that was used in the previous excavations at Raupa and Waiwhau to identify the sources of the obsidian (Appendix 2). Subsequently, Holroyd joined with others (Neve et al. 1994) to re-analyse 46% of the artefacts using the non-destructive method known as PIXE (Appendix 2, Attachment 2).

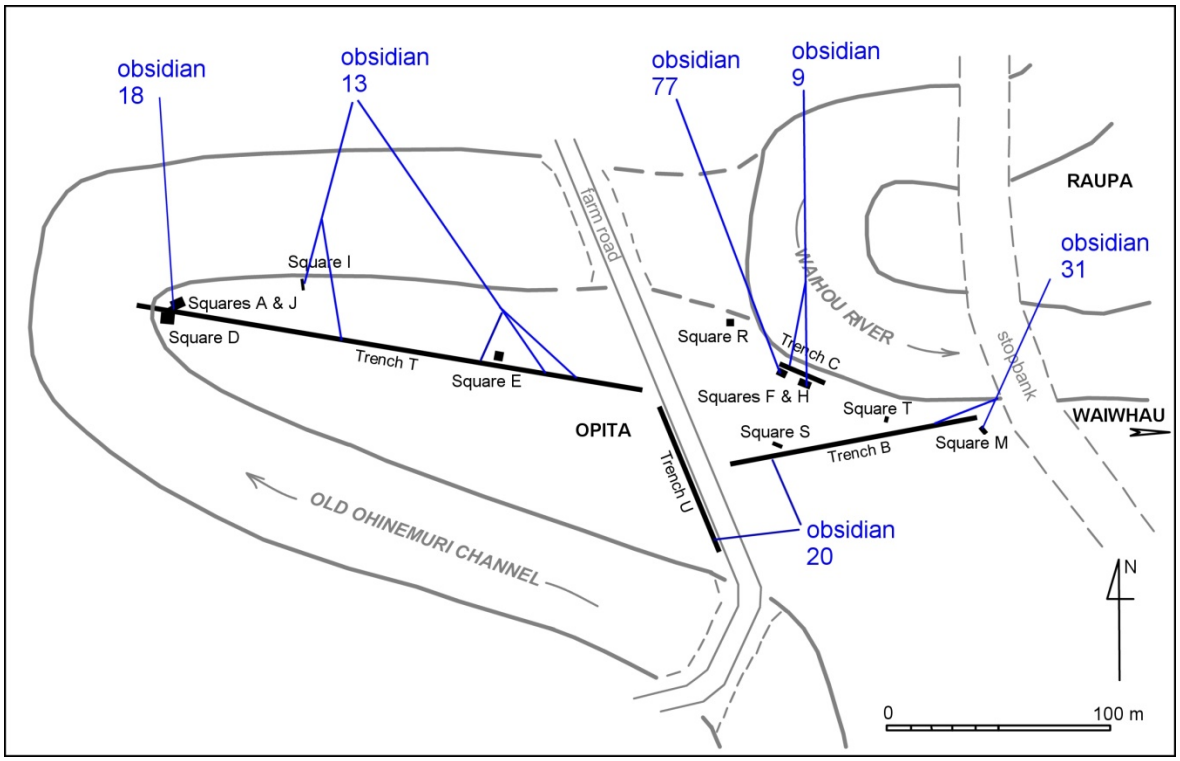

Figure 63. Distribution of obsidian flakes found in Opita.

4.3.1 Changing sources

The most prolific area for obsidian in Opita was Square F, where 77 flakes were recovered, or 46% of the total of 168 flakes found in the investigations (Figures 64-65). A further nine flakes were found in the adjacent Square H and Trench C. To the east, in Square M there were 30, while to the west, in Square A, D, J and Trench T there were 18 flakes. In Trench U and another part of Trench B, which might be related to the former pa site, there were a further 20 obsidian flakes. The remaining flakes were scattered along Trenches T and B, with one in Square I. This section will focus on changes within Square F, and make comparisons with those recovered from the eastern and western localities and the possible pa assemblages.

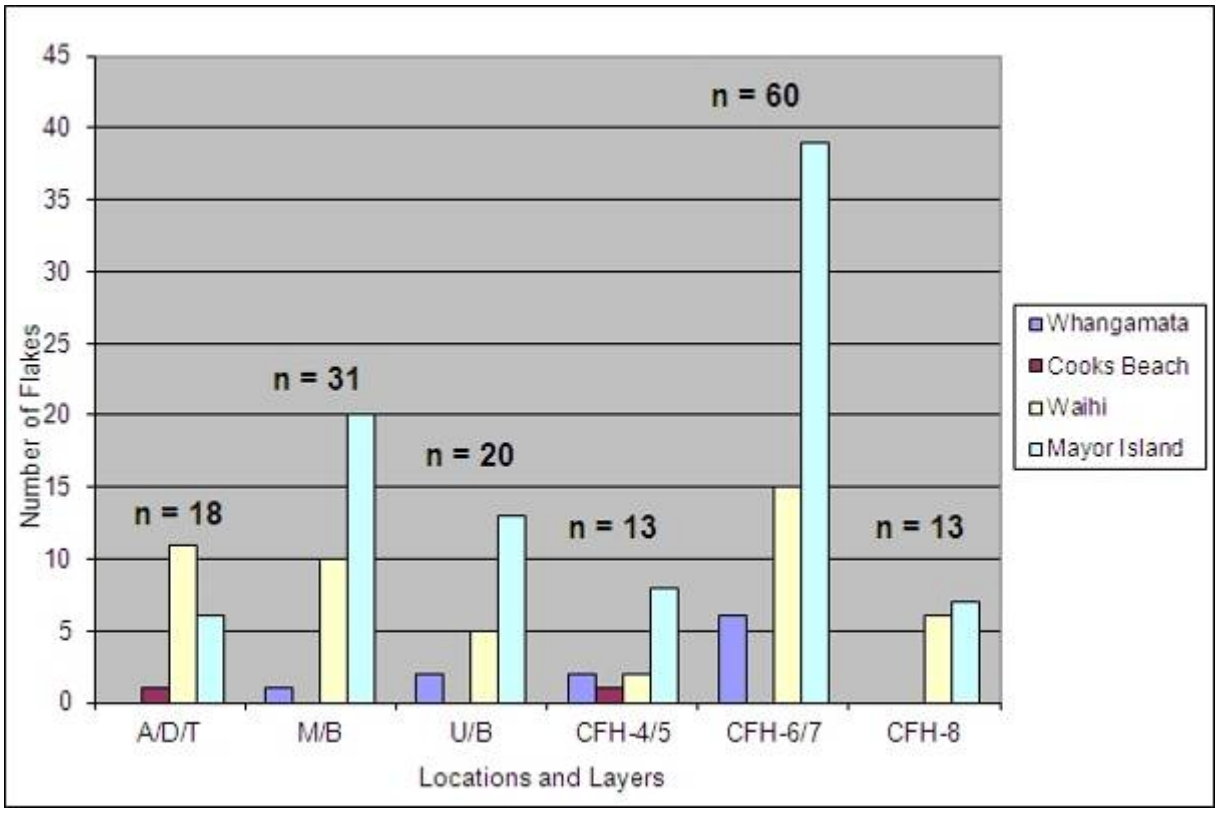

Figure 64. Differing obsidian sources present in Trench C and Squares F and H compared to other areas of Opita.

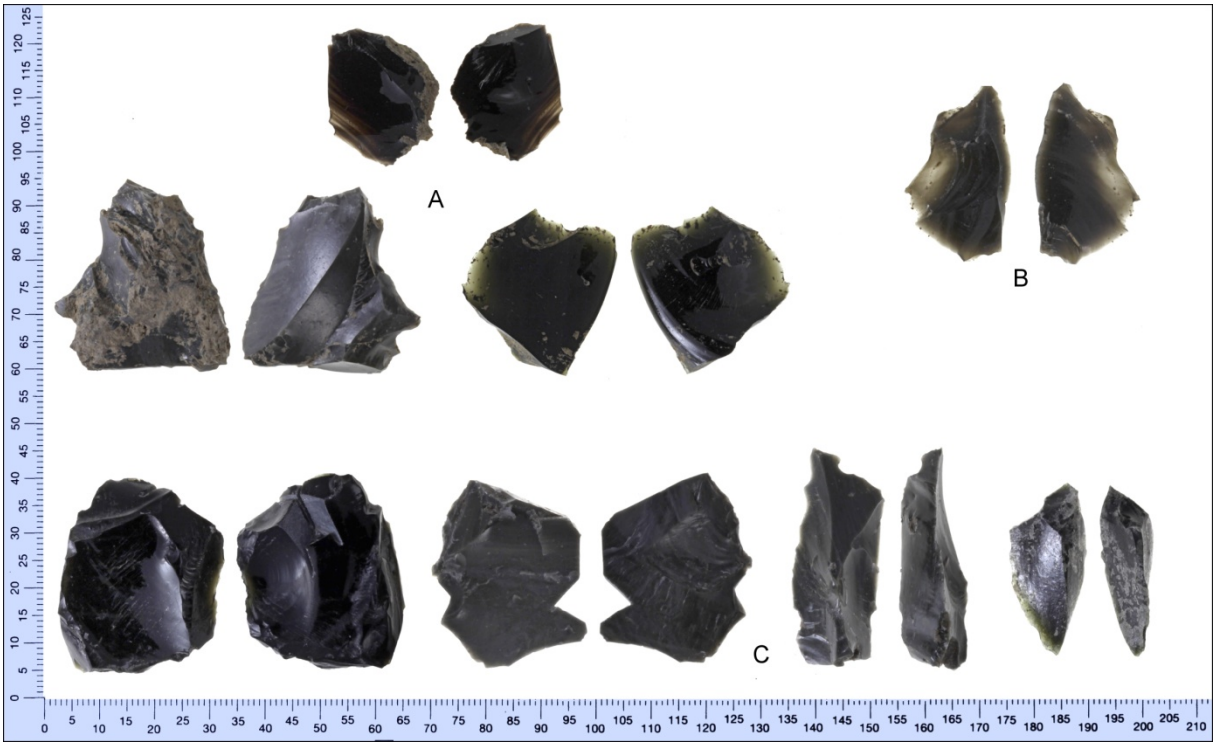

Figure 65. Obsidian found at Opita: A = flakes of Waihi (left), Whangamata (above) and Mayor Island (right) from Square F layer 7, B = flake of Waihi obsidian from Square H layer 7, C = from right to left flakes of Mayor Island, Waihi, Waihi and Mayor Island from Square M layer 4.

In Square F obsidian was found in layers 4-8 (see Figure 64 where the layers are grouped into three occupation phases). The lowest layer contained a high proportion of Waihi obsidian, whereas those in layers 6 and 7 were predominantly Mayor Island obsidian with Waihi and Whangamata. The low numbers in layers 4 and 5 are not sufficient to say anything definite, but layer 4 contained one of the only two items sourced to Cooks Bay.

The far eastern side of the site (Square M) and the possible pa (Trenches U/B) contained similar proportions of Whangamata, Waihi and Mayor Island obsidian to that found in layers 6 and 7 in Square F. However, the far west of Opita (Squares A/D and part of Trench T) had a greater amount of Waihi obsidian, and the only other Cooks Bay piece.

4.3.2 Changing quantities over time

The plans of the occupation levels in Square F also clearly show a decline in the use of obsidian over the period of occupation (Table 3). This data will be included with the other finds to examine more closely the changing nature of the evidence at the location and the possible implications it might have for our understanding of the Maori economy during the 19th century.

Table 3. Numbers and percentages of used (edge damaged) and waste obsidian flakes: by Area (top) and by layer (bottom) within Trench C, Squares F and H.

Location		*Not used*		*Used*		*Total No.*
Area	*Trench*	*No.*	*%*	*No.*	*%*	
A,D	T	9	58	9	42	18
I	T/B	10	71	4	29	14
	U/B	10	50	10	50	20
M		20	67	10	33	30
F,H	C	54	63	32	37	86
Total		**103**	**61**	**65**	**39**	**168**

Location		*Not used*		*Used*		*Total No.*
Area	*Layer*	*No.*	*%*	*No.*	*%*	
CFH	4/5	6	46	7	54	13
CFH	6/7	40	67	20	33	60
CFH	8	8	62	5	38	13
Total		**54**	**64**	**32**	**36**	**86**

The presence of obsidian in the far eastern part of the site (M/B) and the area of the pa site (U/B) links these areas with the obsidian evidence found in layers 6 and 7 in Square F. However, the western part of the site (A/D/T) may belong to a different episode: one where Waihi was the primary source and possibly where the inhabitants had direct access to Waihi, rather than through secondary exchange networks.

4.3.3 Activity areas

The plan of Square F (Figure 66) shows that obsidian flakes are differentially distributed with a diminished number of flakes present in the upper, more recent, layers. In layers 6 and 7, they are located around the two large scoops and midden, and may indicate preparation of food or materials used in cooking, whereas in layer 4 they are scattered within the midden.

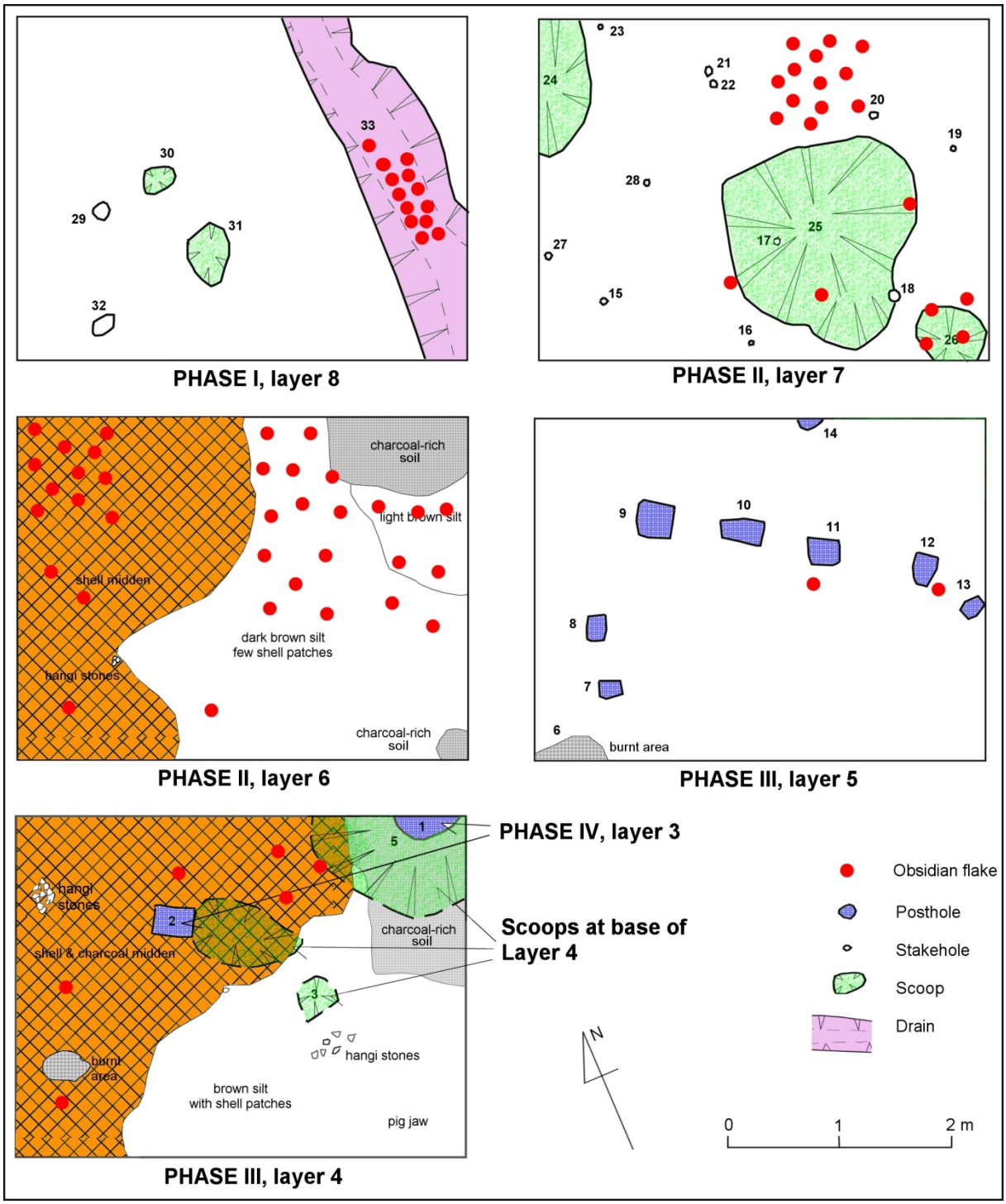

Figure 66. Distribution of obsidian shown by red dots in Square F (note the positions were recorded in terms of excavated metre squares).

Signs of usewear and the size of flakes can indicate the presence of working areas or dumping of waste (Figure 66). At Opita, the majority of areas and layers within them contained too few flakes to deduce anything definite. However the Square M midden yielded 30 flakes, a third of which showed signs of use. Similar percentages of usewear occurred in layers 6-8 of Trench C and Squares F/H, which might indicate they were waste from activities nearby. In contrast, in layer 4 above, almost half the flakes had been used as tools.

The sizes of the flakes from the four places where there were significant numbers show that, apart from a few large flakes and cores (found principally in Trench B, with one each in Squares F and M) weighing between 14 and 247 grams, most were small flakes below 3 grams (Figure 67). The proportions of smaller flakes throughout Opita, particularly in the pa and eastern area, also suggest that many were the residue of manufacture, rather than being working tools (Table 4).

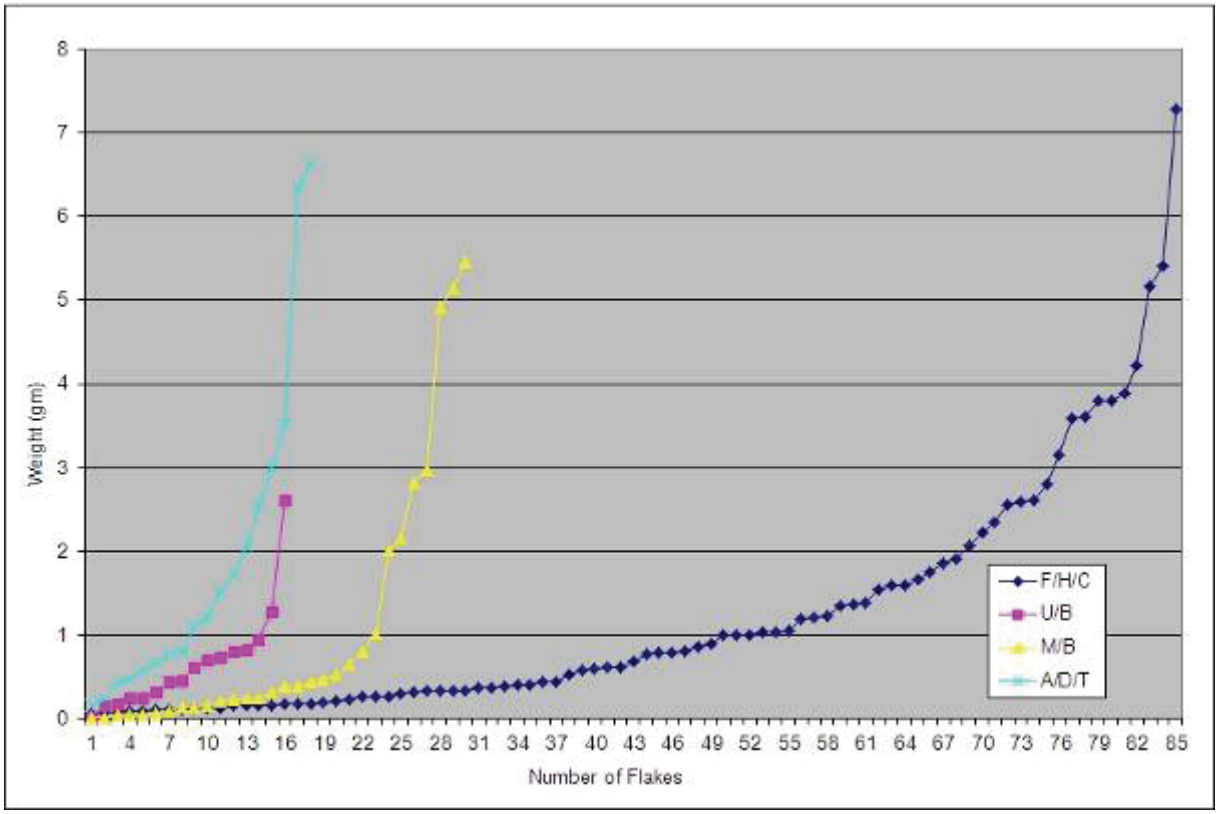

Figure 67. Weights of obsidian flakes (minus the six large cores) from the main areas of excavation.

Table 4. Proportion of different weights of obsidian flakes and cores found in Opita and at Raupa.

Weight	*Opita*					*Raupa*
	West A/D/T	*C/F/H*	*pa*	*East M/B*	*total*	
<1 g	44%	59%	70%	71%	60%	42%
1-5 g	44%	36%	10%	19%	33%	34%
5-10 g	11%	3%		6%	4%	10%
10-20 g		1%		3%	1%	8%
>20 g			20%		2%	6%

4.3.4 Comparison with other sites

The adjacent pa of Raupa and Waiwhau also contained obsidian. Although obsidian was found throughout most areas investigated, there were particular areas with very dense concentrations, up to

50-80 flakes in certain square metres at both sites.[27] This was quite different to the areas of Opita investigated where the most prolific square metre only contained 13 flakes (see Figure 66).

The sizes of the Raupa obsidian flakes were generally much larger than those at Opita (Table 4), and as many were found in a working floor, it may suggest that they were actual tools that were left when the site was abandoned.

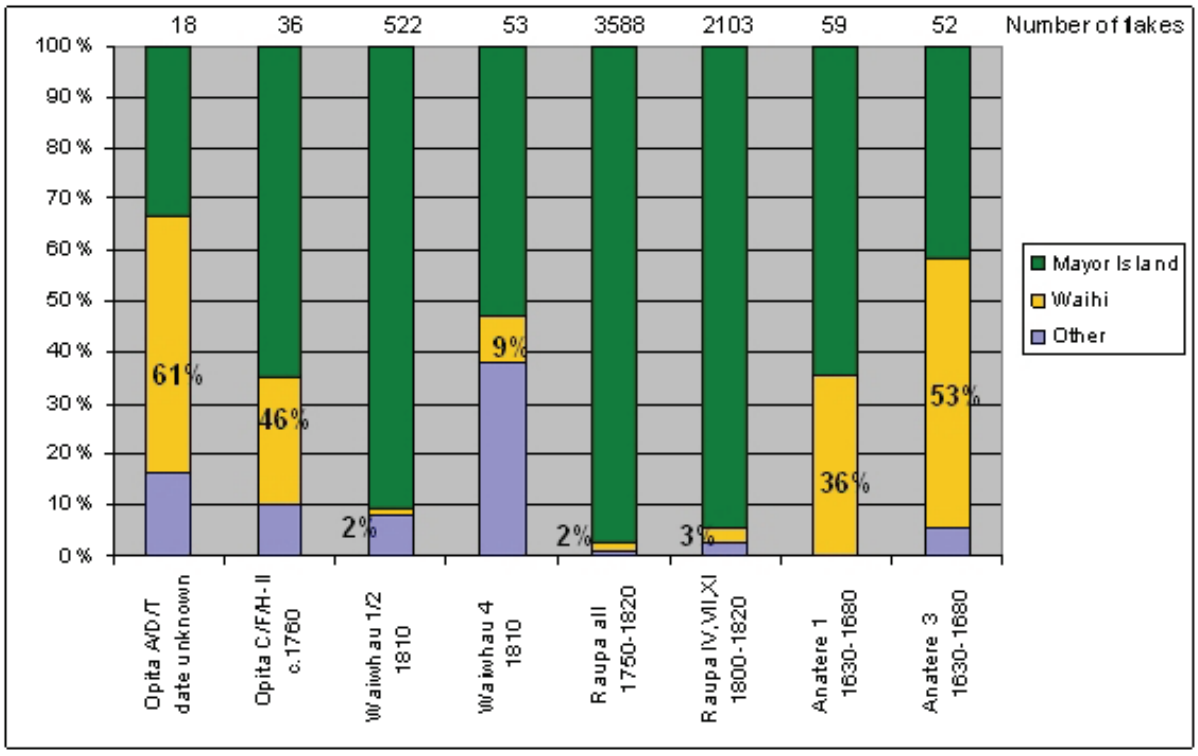

Figure 68. Percentages of Mayor Island, Waihi and other obsidian sources found at: two parts of Opita, two parts of Waiwhau, all Raupa (mainly from the upper two levels) and a large flaking floor at Raupa, and two parts of Anatere Pa at Athenree (Prickett 1990, 1992; Phillips and Allen 1996).[28]

These sites at the junction of the Waihou and Ohinemuri Rivers are some of the few that contain Waihi obsidian (Figure 68). A study by Phil Moore (2005) on the distribution of the obsidian from this source shows that Paeroa and Athenree appear to be the main places where Waihi obsidian was used.

Of the Bay of Plenty sites discussed by Moore, Waihi obsidian comprised up to 30% of the obsidian assemblage at three sites dating around 1500-1700, but was apparently rare or non-existent in later sites (Moore 2005).

The spread suggests trade, exchange and gifting routes along the Waihou and Ohinemuri Rivers, over the Kaimai Ranges to Waihi Beach, Athenree and Bowentown and beyond (Figure 69). Traditional evidence links the Ohinemuri, Waihi and Athenree areas together (see Allen and Phillips 2013).

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27 In Raupa part of Area IV and VII had a density of 36 flakes per m^2, Area IV had 26 flakes per m2, and in Waiwhau, Area 1 contained 25 flakes per m2 (Prickett 1992, 1990; Phillips 1988 respectively).

28 Total numbers of obsidian flakes: Opita A/D/T = 18, C/F/H layer 6 & 7 = 60 (the other two phases only had 13 flakes so are not included in this diagram), Waiwhau areas 1 & 2 = 522, Waiwhau area 4 = 53, Raupa all = 3588, Raupa IV, VII & XI = 2103, Anatere 1 = 59, Anatere 3 = 55.

At Paeroa, in the sites of Raupa[29] and Waiwhau the Waihi material comprised only 2-3% of the obsidian found. One exception was a single area of Waiwhau, which was associated with occupation dated to around 1800-1820, where the percentage of Waihi material rose to 9%. By comparison, one of the lower levels in Trench C and Squares F/H at Opita, thought to date around 1760, the percentage of Waihi obsidian is 46%, with Squares A/D and Trench T being the exception in containing 61% from the Waihi source (although the small number of flakes in some of these assemblages means this should be read with caution).

These findings support the idea that the Waihi source was mainly used by the inhabitants of settlements along a trading route that extended both east and west of the source, particularly during the 17th and 18th century, and that its use subsequently was much more limited.[30] The presence of a greater proportion of high quality Mayor Island obsidian at Raupa and Waiwhau 1/2 may have chronological implications (Figure 68) or else have to do with the importance of these places in the beginning of the 19th century, just prior to the Nga Puhi attacks (see Marsden description of Raupa in section 2.2.4 above).

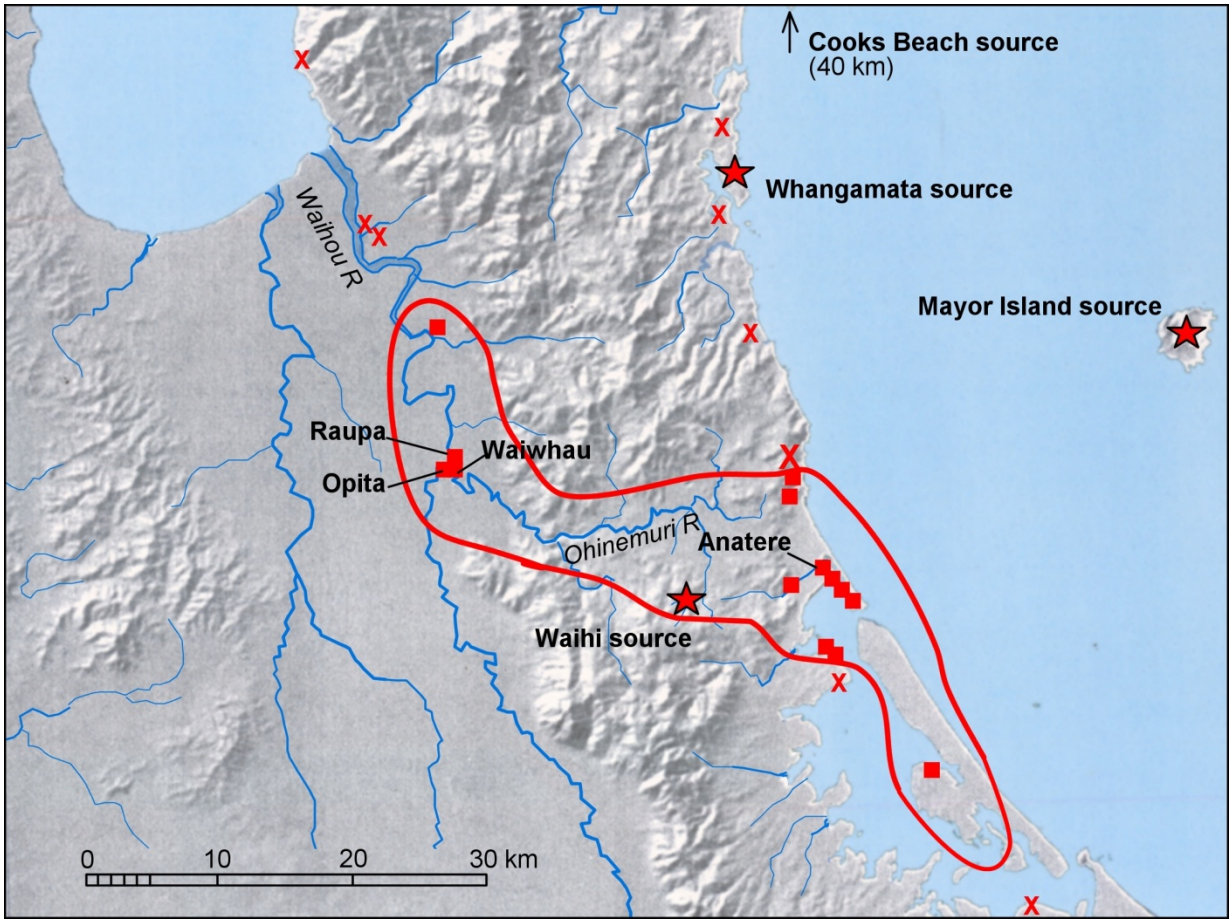

Figure 69. Distribution of Waihi obsidian, showing obsidian sources, sites containing Waihi as red squares, and those without as red crosses (after Moore 2005:71).

29 There may have been variation within Raupa both in space and time, but generally the layers were not distinguished and the summary amounts were given in percentages of weight (Prickett 1990, 1992).

30 The distance decay models of McCoy et al. 2010 fail to take into account chronology, topography, sample sizes or Maori mobility.

4.4 Charcoal, fruit stones, kauri gum

Twenty-two charcoal samples (totalling 335 identified pieces of charcoal), eight samples of fruit stones (containing 13 kernels) and 15 samples of kauri gum (with 24 fragments of gum) were analysed from the Opita excavations (Appendix 12).

The charcoal samples selected came from the four main settlements scattered across the site of Opita: Squares A/D in the west, Square M in the east, Trenches B/U being part of the pa, and Squares F/H on the river terrace (Figure 70). The fruit stones came from the east and river terrace site, while the kauri gum came from around the pa and the river terrace.

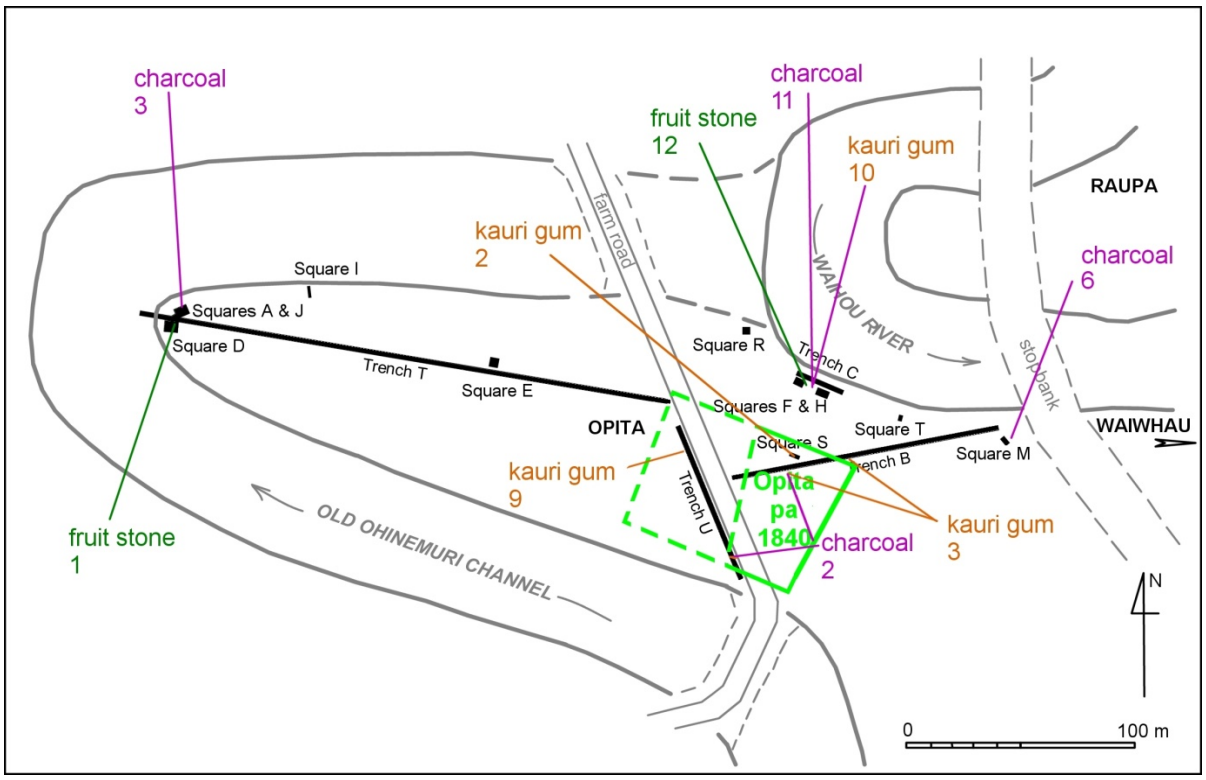

Figure 70. Plan showing location of analysed charcoal, fruit stone and kauri gum samples, with green rectangle indicating the possible outline of Opita pa.

Thirteen of the 22 charcoal samples were from hangi scoops and midden and represent remains of firewood used for cooking (Table 5). Nine samples were from a mixture of charcoal from fireplaces, and burnt buildings and vegetation.

The analysis of these materials focussed on the local environment, cultural selection and change over time. These results are also compared with those from the neighbouring sites of Raupa and Waiwhau.

4.4.1 Local environment

The whole charcoal assemblage shows very clear patterns of species abundance. There is a very limited presence of bracken, tutu, hebe, coprosma and five-finger (8%), which grow in the very early pioneering stages of vegetation successions on cleared land.[31] However, the majority (62%) of the

31 Pioneering species start the process of recolonising bare land, in 10 years the secondary species begin to dominate, and after about 100 years the forest becomes established, although it can be 1,000 years for the long-lived species to mature (Wassilieff 2012).

charcoal is from a large shrub and small tree association dominated by manuka (49% of the total charcoal). A third (30%) of the assemblage consists of broadleaf and podocarp tree species dominated by tawa, matai and kowhai (22% of the total charcoal). This data indicates the sites were located on land largely cleared of forest on which woody vegetation, primarily manuka scrub, was actively regenerating as a secondary stage of revegetation.

This picture of patches of open land and manuka scrub is similar to that recorded by the first surveyors between 1856 and 1883 (see Figure 3 above). At that time the natural levees had been cleared of forest and were under a mixture of grass and manuka scrub, while the lower land further from the rivers was in kahikatea bush.

Table 5. Identified charcoal according to vegetation types and contexts in which they were found.

Plant Type	*Species*	*Structures*	*%*	*Soil lens*	*%*	*Firewood*	*%*
Pioneer species	Bracken	1	10.4		1.5%		9.6%
	Hebe	1		1		19	
	Tutu	3					
	Coprosma					1	
	Five-finger					1	
Secondary shrubs & small trees	Manuka	8	27.1%	33	65.7%	122	68.6%
	Pittosporum					8	
	Olearia					2	
	Toro			1			
	Mapou	2		2		9	
	Mahoe	2		1		5	
	Kanuka			4		2	
	Putaputaweta	1		3		3	
Forest broadleaf & conifer trees	Titoki		62.5%		32.8%	3	21.8%
	Rewarewa	1					
	Taraire					5	
	Kohekohe					2	
	Mangeao			2			
	Puriri					1	
	Maire			1			
	Rata	1		1		7	
	Kowhai	7		1		10	
	Tawa	9		16		6	
	Totara					2	
	Matai	12		1		12	
	Totals	**48**		**67**		**220**	

4.2 Cultural selection

It is expected that the firewood would come from vegetation in the immediate vicinity of the settlements; being collected as part of the daily routine of the inhabitants. The charcoal identifications reveal the woody vegetation species in the immediate area at the times the sites were occupied. The firewood samples are dominated (78%) by shrubs and small tree species with manuka contributing 54% of the total charcoal present. Its dominance especially in the midden layers and fire scoops, suggests it was the most common species selected for firewood. The remainder of the wood used in the cooking fires came from forest trees, especially matai and kowhai.

There was a possibility that river driftwood was collected for firewood. However, a much more diverse assemblage would be expected if this were the case, including at least some of the kahikatea and pukatea that was typical of forest on the wetter areas of these plains and a wider range of conifers such as kauri, totara, rimu, and tanekaha that would have grown on the nearby hills.

Although manuka dominated the firewood, the choice made by the inhabitants would have been for dryness and quantity rather than species. However, where the charcoal was from structural features, selection was being practised. Three-quarters of the charcoal from samples where posts and pit structures are present were from only four species: manuka, kowhai, tawa and matai. So it appears that these species were deliberately selected for building material.

Of the 335 charcoal identifications, no evidence of kahikatea was found in the residue from firewood or other burnt materials, despite the fact that Opita was located in a kahikatea swamp zone and survey plans dating from 1856 to 1883 show that there were still stands of kahikatea bush within 200-250 m of the settlements. If these kahikatea stands were the location of the other forest trees burnt on site and used for structural timbers, then there appears to have been an avoidance of kahikatea. Alternatively the wetter areas, which kahikatea occupies may have been actively avoided and forest on drier land was targeted in the process of clearance for horticulture.

4.4.3 Change over time

Samples were recovered from three occupations of the river terrace in Squares F and H that ranged in date from approximately 1750-1900. Other analyses suggest that the western settlement (Squares A/D) might have been earlier, followed by the eastern Square M (similar to layer 6 in Squares F and H) and the pa in Trenches U and B (similar to layer 4 in Squares F and H).

In Figure 71, the samples from the four periods of occupation are plotted with respect to their chronological unit, type of species (pioneering, regrowth shrubs or forest trees), and the category of sample. With regard to the categories, the charcoal probably came from three sources: firewood used for cooking; burning the natural vegetation to clear ground for living and cultivation; or the burning of structural timbers of disused buildings. In some cases it was not easy to distinguish the latter two categories, so the results have been combined in the figure.[32]

32 Only one of these samples was clearly a local burn-off (133), while the others were either charcoal mixed in the soil (104, 435) or in the fill of features (105, 128, 77) and may have been a mixture of charcoal from fireplaces, old buildings and vegetation.

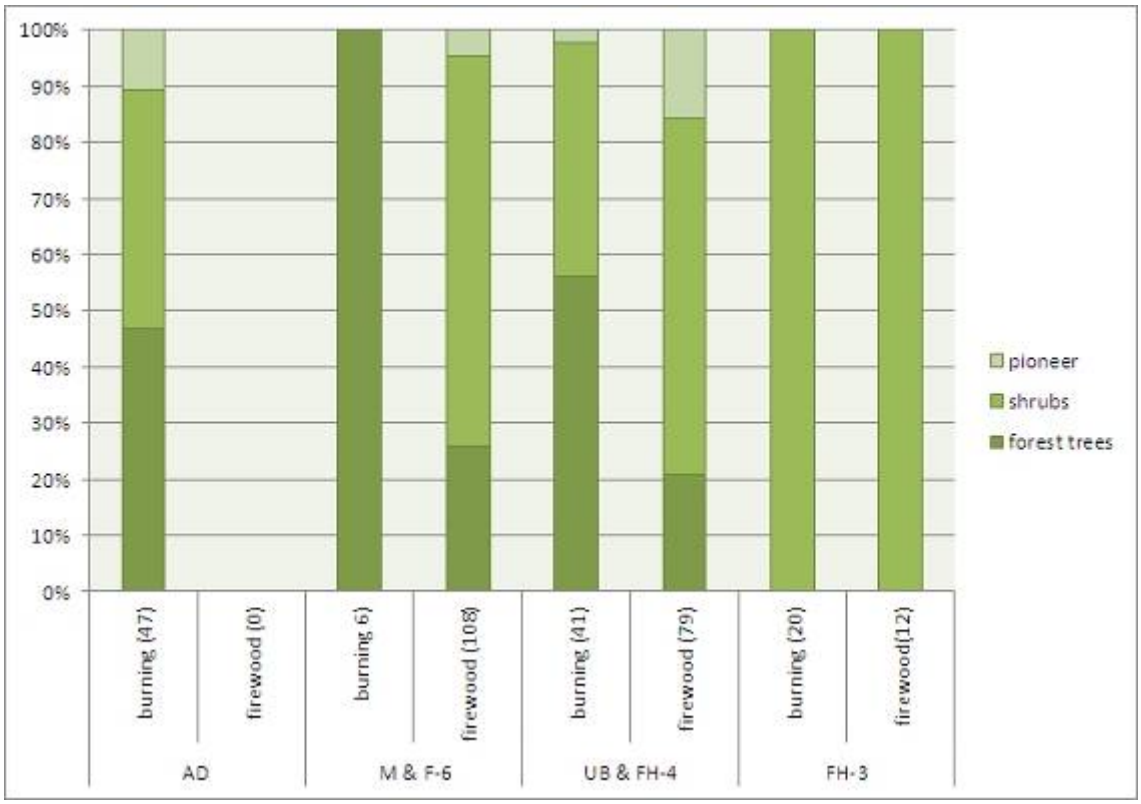

Figure 71. Proportions of forest tree, regrowth shrubs and small trees, and pioneer species from the different dated locations at the site (numbers indicate the number of identifications). Listed from the earliest occupations on left to, most recent on right.

The charcoal from the earliest occupation had more than half shrubs and pioneer species, indicating that it was not the first occupation on the site. The second occupation contained pioneering species, shrubs and a range of forest trees, which might suggest that the ground had not been fully cleared during previous occupations. The forest trees were still present locally during the time of the pa, but there were more pioneering species that might indicate a shorter interval between its construction and the preceding occupation. The latest occupation was notable for only containing manuka and could indicate the removal of most forest trees, and the lack of pioneering species could indicate that there was a longer interval between it and the time of the pa. However, the number of samples and identifications, especially for the last occupation, mean that these results should be read with caution.

Twelve peach stones were found at the river terrace at Opita (Figure 72). They all came from layer 3,[33] and indicate both a post-contact date for that layer and the cultivation of at least one peach tree in the neighbourhood. Peaches were used as a trade item with Pakeha settlers, but were obviously consumed on site by the local inhabitants.

Kauri gum found in the post-European contact occupation (layers 3 and 4), and might have been the residue from processing it for the gum trade as all except one piece was the oxidised crust, which had to be scraped off by the gum-diggers to reveal the solid gum prior to sale. Kauri gum was exported to varnish manufacturers in London and America, and from 1850-1900 it became Auckland's main export (Te Ara 2011). In Hauraki, gum-digging became a source of income for Maori from the 1860s (Monin 2001:208).

33 Peaches were said to be planted in 1842 and "a great quantity of peaches and grapes were growing there" in 1872 (Wini Kerei, evidence in Tareranui and Te Pokiha 1878:333).

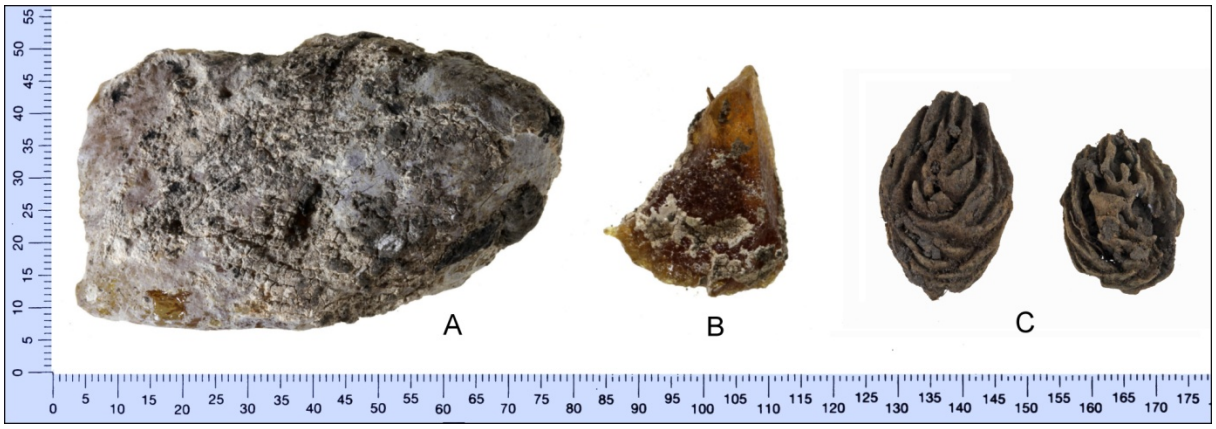

Figure 72. Kauri gum and peach stones found at Opita: A = oxidised crust of kauri gum from Square F layer 4, B = kauri gum from Square F layer 3, C = peach stones from Square F layer 3.

4.4.4 Comparison with Raupa and Waiwhau

The environmental findings from the neighbouring sites are similar to those from Opita, with charcoal from burn-offs being predominantly shrub species such as manuka and coprosma, suggesting that the excavated sites were constructed on land that had already been cleared by earlier occupants (Prickett 1990:101, 1992:86). Driftwood was thought to be the principal source of the forest trees used in cooking fires (Phillips and Green 1991:163; Prickett 1990:102).

Fruit stones were found at both Raupa and Waiwhau, but these were from native trees (Prickett 1990:95,102; Phillips and Green 1991:163). No peach stones were recorded, and as both these sites had been abandoned by 1820, this supports the conclusion that layers 3 and 4 at the riverside settlement at Opita were later than Raupa and Waiwhau.

Kauri gum was found at Raupa (Prickett 1990:94, 1992:41,75). Most pieces appeared to be similarly in a degraded state, although three pieces in good condition were also found. They came from levels of the site dating 1750-1820 and, as the export trade in Hauraki did not start until the 1860s, it was thought that they were used for tattooing pigment. Raupa was a large site with many high status objects, including several tattooing chisels, so the use of gum for this purpose was quite likely.

4.5 Clay Tobacco Pipes

Broken fragments totalling 108 pieces from at least 16 clay tobacco pipes were found at Opita (see details in Appendix 7 and locations Figure 73). The majority were made of clay and came from Square F, with a few from adjacent Trench C and Square H which also contained a few synthetic pipe stems. Single pipes were also found in Trench T and Trench B. The form of each pipe, material and makers' marks where present were identified, to determine their age and possible source. The historical context of tobacco smoking amongst Maori was also researched (Appendix 16).

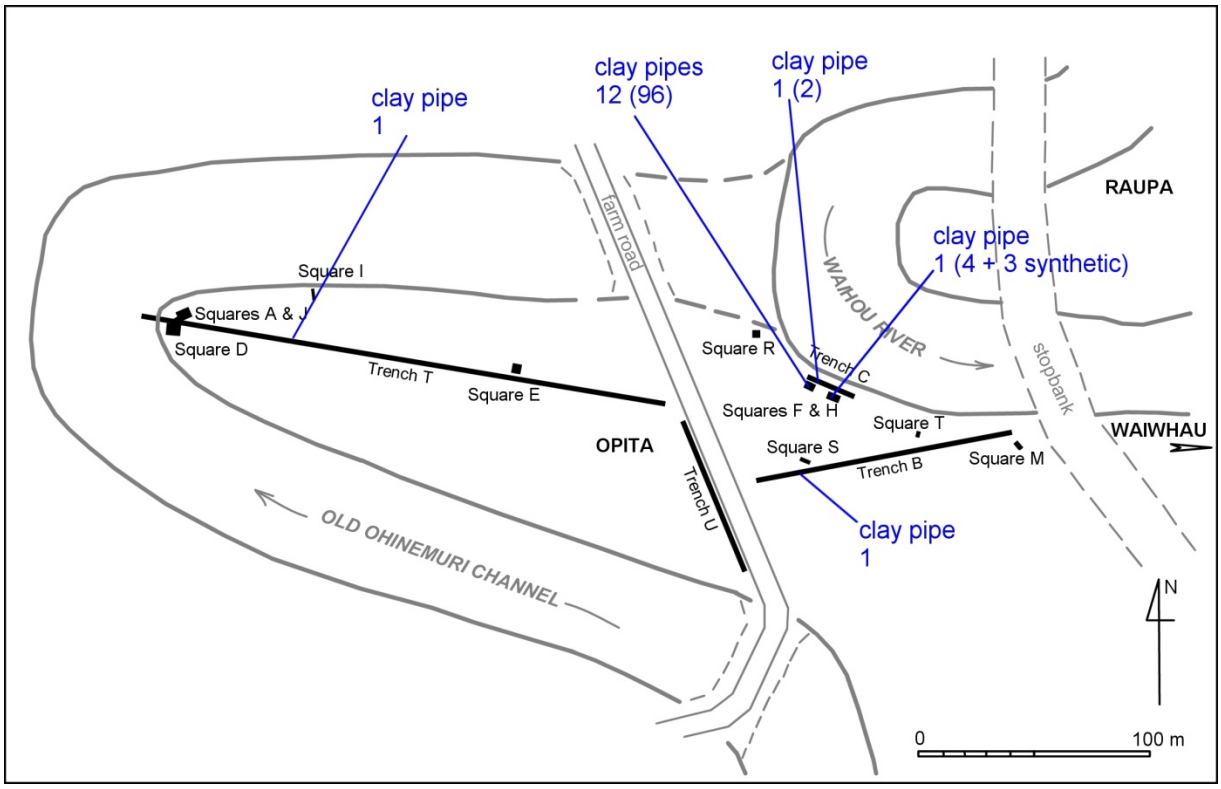

Figure 73. Distribution of clay and synthetic tobacco pipes found in the Opita excavations (numbers indicate the minimum number of individuals with the number of identified specimens in brackets).

Due to the fact that tobacco smoking was extremely popular in the 19th century, and that clay pipes were cheap, easily broken and survive well in the ground, they are a particularly useful component for dating the early historic period in archaeological sites. In this case they are used to date the layers within Opita, and compare the different areas within Opita to the neighbouring sites of Raupa and Waiwhau.

4.5.1 Historical context

Clay pipes are present in New Zealand sites throughout the 19th century. They mark a time when Maori started adopting some European materials and habits, and in the early to mid-19th century were a popular trade item. Tobacco was widely accepted as a payment for land and labour right from earliest contact. Watkins (1968 Vol.1:41), referring to land transactions in 1833-34 with the missionaries, mentions pipes and tobacco being one of the items.

European traders were present along the Waihou River from the early 1830s and missionaries established their first mission station in 1833, which may mark the introduction of pipes to the region.

4.5.2 Chronology within Opita

In the river side settlement (Squares F, H and Trench C) clay pipes and synthetic stems were found in three layers (Table 6, Figure 74).

Table 6. Location, numbers and types of tobacco pipe smoking artefacts found at Opita, with approximate dates.

Location			*Layer*	*Items*	*No: of*	*MNI*	*Date*
Area		*Distance*			*fragments*		
Trench	T	65-70	1	clay pipe	1	1	1860->
Trench	B	26	2	clay pipe	1	1	
Trench	C	11.7	5	clay pipe	2	1	
Square	H		3	amber stem vulcanite stem	2 1		1860-> 1865->
Square	H		5	clay pipe	4	1	?1830->
Square	F		3	clay pipe	23	5	1840->
Square	F		4	clay pipe	71	7	?1830->

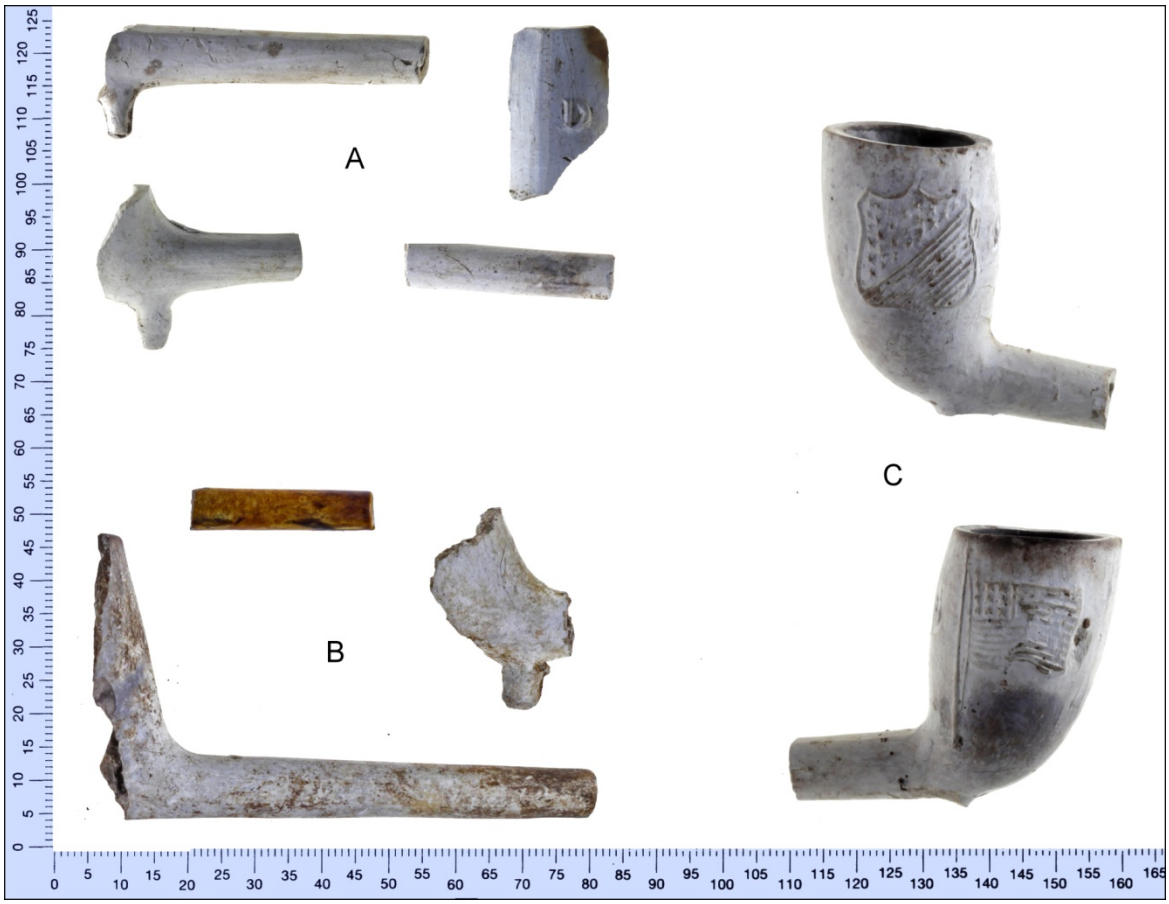

Figure 74. Clay pipes from Opita: A= stems with spurs, unmarked broken stem and bowl with part of embossed T.D. from Square F layer 3, B = stem without spur and part bowl, bowl fragment with spur and glazed mouthpiece from Square F layer 4, C = bowl with embossed shield on one side and the American flag on the other from Trench T layer 1.

In the lower occupation (layers 4 and 5 of Squares F and H, and Trench C) a minimum number of eight pipes were recovered. All the bowl fragments showed signs of use, i.e., blackened internally. None of the stem fragments have makers' marks, but three show evidence of reuse, i.e., the end was reworked after the original mouthpiece had been broken. All were relatively plain, with only three having minimal distinguishing marks.

Plain pipes were a feature of the early 19th century (Rusden 1982:8), while decorated pipes became more common from the 1840s. Clay pipes excavated from Paremata, a site dating from the mid-1840s, had several examples of highly decorated pipes and many with makers' names (Prickett 1981a). The large assemblage from the 1860s Victoria Hotel in Auckland also contains many pipes with decorations and makers' names (Brassey and Mcready 1994). This would suggest that the lower layer at Opita with plain clay pipes dates some time prior to 1840.

The upper layer (layer 3) had a minimum of five pipes and contained the three synthetic stems. Similar material has been recovered from other sites in New Zealand and suggests that this type of pipe post-dates the mid-1860s (Prickett 1981a, Ritchie 1986).

The single decorated clay pipe from the centre of Trench T also dated from the 1860s (Figure 74C), while another from part of Trench B is associated with glass material dating to the 1870s. None were recovered from the areas where the majority of the other evidence of Maori occupation was found in the west (Squares A, D and Trench T) or the east (Square M and Trench B).

4.5.3 Comparison with other sites

No clay pipes were recovered from Waiwhau, however one pipe bowl without decoration was found in a disturbed upper layer of Raupa (Prickett 1992:75) and was thought to relate to the 1820s Maori occupation of Raupa.

Clay pipes were found at Oruarangi and Te Kari, which are 18 and 31 km downstream respectively from Opita, however this material was not available for study (Green and Green 1963:33). Oruarangi, like Raupa, had been abandoned by the early 1820s, while Te Kari was abandoned sometime in the late 18th century and reoccupied for a short time in the 1830s and again in the 1850s-60s (Phillips 2000a:116,125-6).

Clay pipes were more common in the later sites along the Puriri Stream (Bedford 1994:146-9). In T12/340, the historic layer dating around 1880 contained 185 pipe fragments from a minimum of 34 pipes. Unlike those from Opita, 29 of the Puriri pipes had a makers' mark (generally McDougall or Davidson) and the place of manufacture Glasgow impressed onto the stem. Two other sites (T12/318 and 833) each contained three or four fragments of a minimum of one clay pipe.

This evidence would tend to suggest that tobacco pipes began to be introduced into the area during the early 1820s, and increased in popularity later in the 1830s or 1840s, as is shown by the Opita assemblage. It should be noted, however, that the collections from the earlier sites of Oruarangi and Te Kari were not from research excavations and there are biases in the assemblages, also the Raupa pipe was from a disturbed level, so these comments should be read with caution.

Decorated pipes may have become more common during the later 19th century after Auckland was established as a trading and importing centre. This is certainly suggested by the Puriri material which, dating to 1880, was later than Opita Square F layer 4, which was the layer that most of the Opita pipes came from.

4.6 Glass

Glass is also a useful dating tool in archaeological sites for the historic period. In this case the presence of glass has been used to date the layers within Opita, and to compare the different areas within Opita and the neighbouring sites of Raupa and Waiwhau, as well as the Puriri Stream excavations. The distribution of the different glass objects in these sites may also indicate a range of different activities.

The majority of the 74 fragments of glass artefacts from Opita consisted of fragments of bottle glass from a minimum number of 13 bottles (Figure 75). From the bottle fragments, different bottle types and products were identified and dated where possible (see details in Appendix 9). This was done through recognition of known changes in bottle manufacturing techniques, changes in shape and colour, and makers' marks. Some bottle types have a very limited period of production, some are associated with specific products and others (usually later in the 19th century) were embossed with the company's name and address.

Miscellaneous items included 4 amber glass beads, 1 dark blue glass bead and 1 multi-faceted amber bead, which may have been trade beads (Figure 76). There were also 9 fragments of flat window glass, and 7 melted fragments of an ornamental vessel (Table 7).

Table 7. Location, numbers and types of glass items found at Opita, with approximate dates.

Location			*Layer*	*Items*	*No. of*	*MNI*	*Date*
Area		*Distance*			*fragments*		
Trench	T	2.5	2	bottle	5	1	post-1880
Square	T		1	bottle	2	1	post-1900
Trench	B	26	2	bottle	7	1	1870-1890
Trench	B	62	2	bottle	2	1	
Trench	B	90-93	2	bottle ?ornamental	7 7	1 1	
Trench	U	24-45	3	bottles	3	2	?1900
Square	S		2	bottles	7	2	1860-1890
Trench	C	7	1	bottle	1	1	
Square	H		3	bottles beads	13 4	2 4	1880-1910
Square	F		3	bottle window glass	1 1	1 1	1880-1915
Square	F		4	bottle window glass beads	4 8 2	1 1 2	

4.6.1 Activities and areas

Glass material was found throughout the site, and was more regularly distributed than many of the other materials (Figure 77). In part this may reflect the different timespan of the bottles (up to the early twentieth century) and the fact that they were originally used for alcohol (gin, spirit and beer), though some may have been refilled later and used for other products.

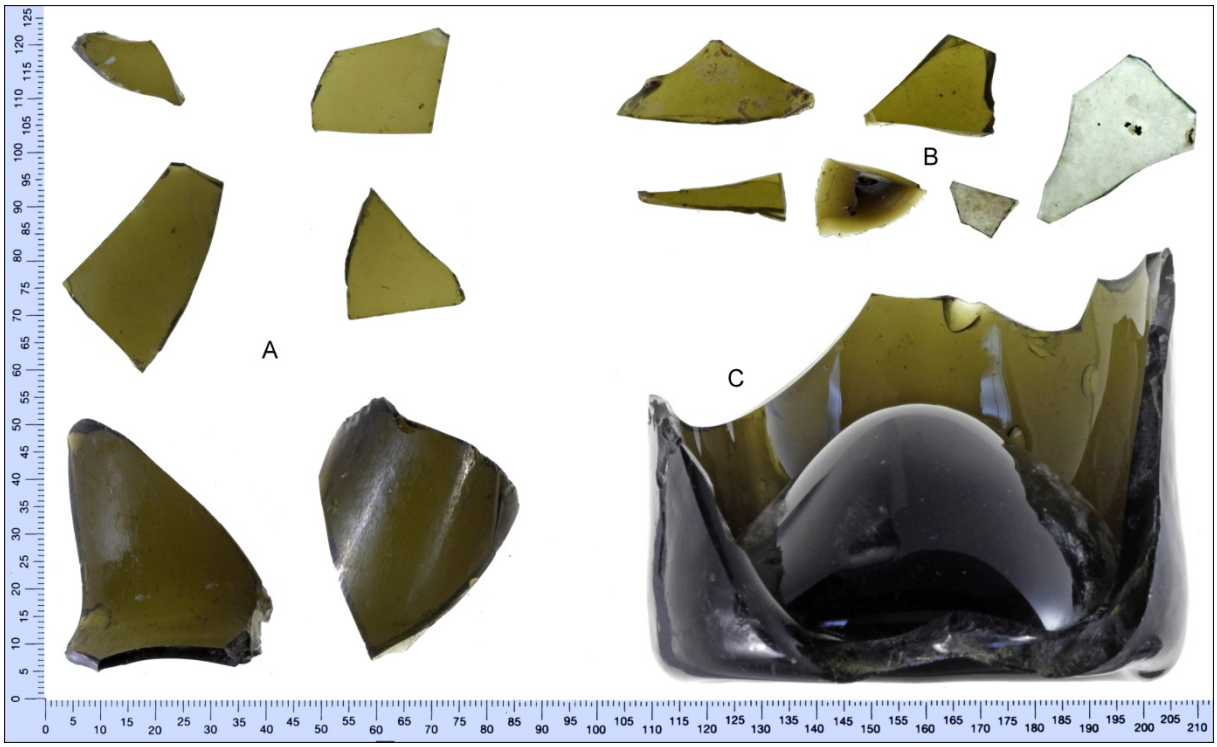

Figure 75. Bottle glass found at Opita: A = broken fragments of spirit bottle from Trench B layer 2, B = bottle fragments from Square F layer 4, C = base of beer bottle from Square H layer 3.

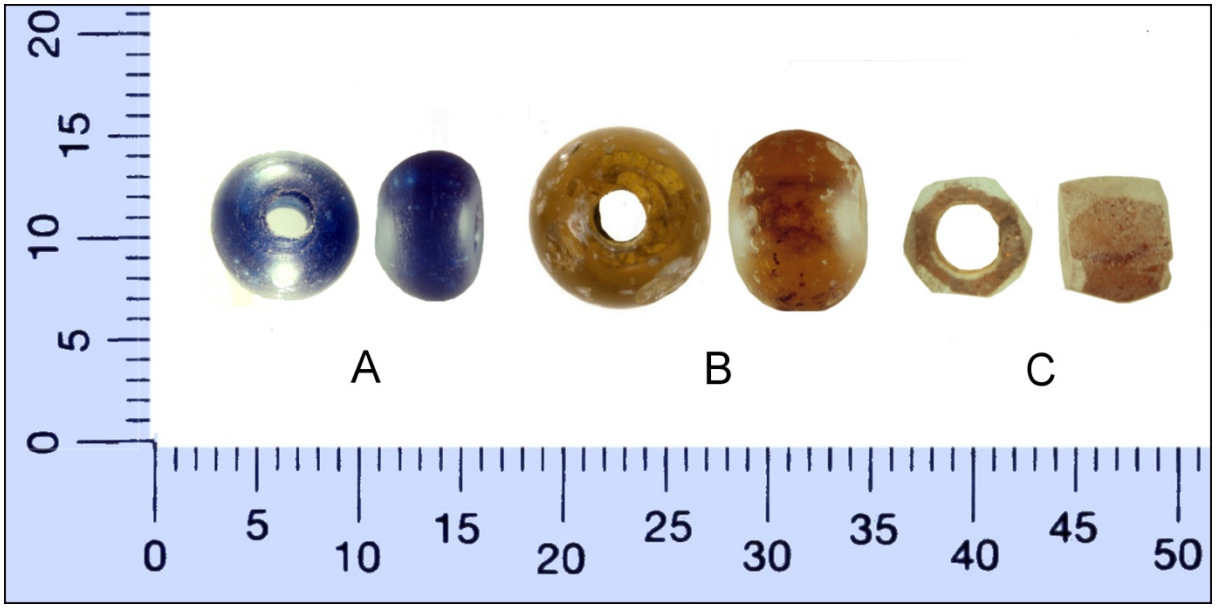

Figure 76. Glass beads from Opita: A = blue bead from Square F layer 4, B = one of three amber beads from a firepit in Square H layer 3, C = amber multi-faceted bead from Square F layer 4.

4.6.2 Chronology within Opita

Some of the bottles in particular were found in the upper deposits (layers 1 and 2) and may not reflect occupation of the settlements themselves. In the west, the single bottle was found in the rock flour layer, which probably dates after 1900 and has been ploughed on more than one occasion. In the

centre of the site (Trench U, Square S and the western end of Trench B) the glass was also in the upper more disturbed layers.

It is possible that the glass bottles and a possible ornament found further east (Trench B and Square T) had been melted in a fire of a former homestead (Figure 77).

Glass that was found associated with evidence of settlement included all the material found in Squares F and H. Layer 3 in Squares F and H, marks a time when bottled goods were more common at the site, including beer, gin and vinegar. These bottles can be dated to the period 1870-1910. Four amber glass beads were excavated from a circular scoop, which dates from the same time.

In the lower layer (layer 4) of Square F, two glass beads and fragments of window glass were recovered, and four body fragments of a bottle. These items could not in themselves be dated. European buildings were known to have existed at Opita from the mid-1830s, so the window glass may relate to one of these, although Maori along the Waihou used European-style materials from at least 1820 (Furey 1996:176). Trade beads were popular early contact trade items, especially amongst the missionaries, where such gifts were used to keep the children under control (Kendall cited in Elder 1934:130).

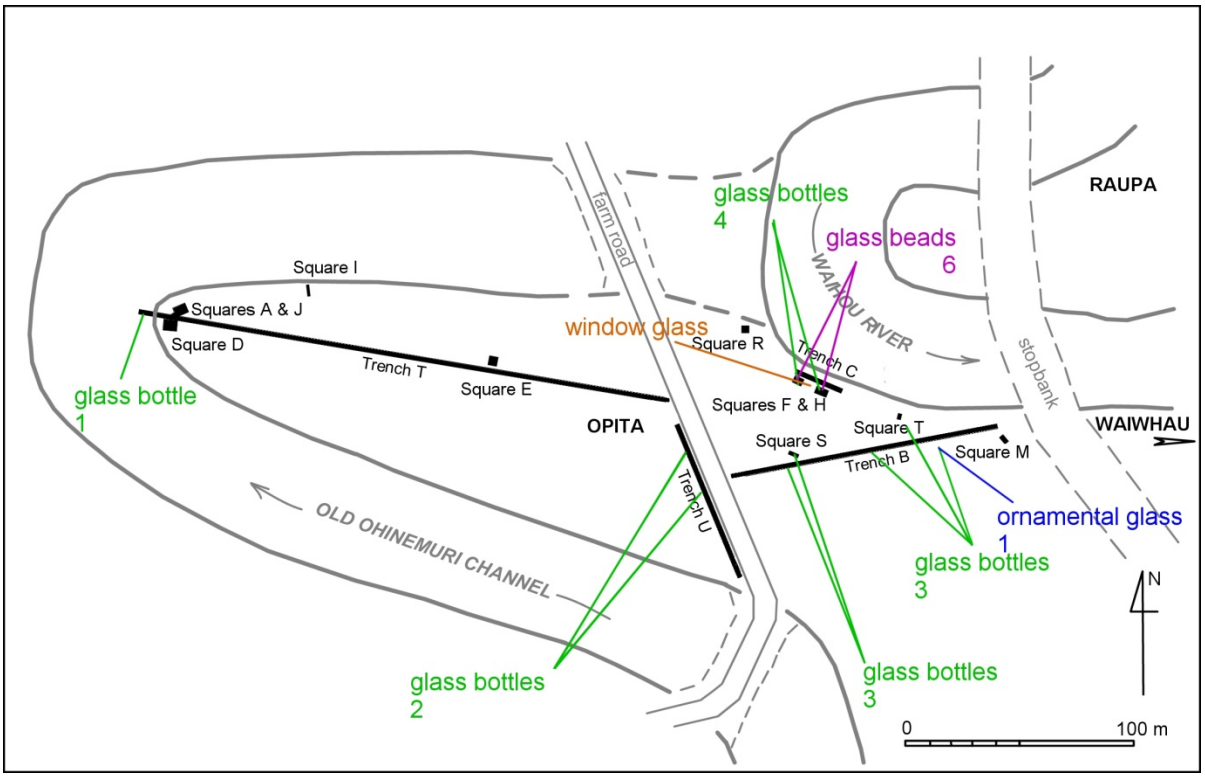

Figure 77. Distribution of glass objects found in Opita, coloured according to type (numbers indicate the minimum number of individuals).

4.6.3 Comparison with other sites

The total glass material from Waiwhau consisted of only a small fragment of window glass and 2 pieces of melted ornamental glass recovered from a disturbed area (Phillips 1988:69).

The glass material from the excavations at Raupa includes bottles and window glass from disturbed upper layers not associated with the Maori occupation (Prickett 1990, 1992). The only glass bottle remains which possibly related to the Maori occupation of Raupa were 2 tiny green glass fragments from a 19th century wine bottle (Prickett l990). From the 1984 excavations a small blue glass bead,

identical to that found in layer 4 in Square F at Opita was found, but that too was from a disturbed upper layer (Phillips 1986:99).

In contrast, the Puriri sites, in particular T12/340, yielded a large quantity of glass material, including 28 alcohol and 4 aerated water bottles, 8 pharmaceutical and 21 condiment vessels, 10 dishes, 8 assorted objects and 148 fragments of window glass (Bedford 1994). This was thought to relate mainly to a 1880s house belonging to a family with children. There were also 85 glass beads and, although some may have related to the earlier mission period (1833-37), most probably dated to the 1880s. The glass assemblage at Puriri T12/340 suggests a period when Maori domestic arrangements included the use of European pharmaceuticals, table condiments, and possibly aerated waters (though these might also be bottles that were refilled with other products).

The paucity of glass in the early sites probably reflects the date at which they were abandoned as settlements. Alcohol in particular was not common amongst Maori until the second half of the 19th century (see Appendix 16). This reinforces the conclusion that the upper layers of Opita (layers 2-4), which do contain glass material, date sometime after 1820. Most of the bottles recovered from layer 3 at Opita suggest a similar date to that of the Puriri sites, which contained abundant amounts of glass material dating to the 1880s.

4.7 Slate

Writing slate and slate pencils, representing possibly only three writing slates and two pencils were found at four places at Opita (see Appendix 5, Table 8, Figure 78). These can be used to give an indication of the date of the layers and the type of activity that was happening there at the time.

Table 8. Location, numbers and types of slate writing material at Opita.

Sample No.	*Location Trench/Square*		*Layer*	*No. pieces*	*MNI*	*Description*
34	B	26 m	3	15	1	Writing slate with parallel lines & grid on reverse
187a	F	B5	4	4 1	1 1	Writing slate Slate pencil
346a	F	C5	4	1		Slate pencil
20	T	103.3 m	2/3	1	1	Writing slate
405	R		3	3	1	Slate pencil
Total				**25**	**5**	

Writing on slates became the "the heart of children's education" from the beginning of the 19th century when Joseph Lancaster developed a method of mass education based on the use of slate (Hall 2003). Writing slate and pencils were imported from England and Wales throughout the 19th century and early twentieth century up to 1930 (Spring-Rice 1983).

The presence of slate in the Opita artefact assemblage suggests that it would have been introduced sometime after 1833 and that mission education took place at Opita. The missionaries visited the area in the 1840s and 1850s, and established a chapel there (Appendix 19). The slate in layer 4 of Square F, and possibly in Trench B, dates to this time, while the other fragments are not connected with any investigated settlement.

Figure 78. Fragments of writing slates found in Trench B layer 3, at the top both sides of the fragments are shown and have lines or grids marked on the surface, the slate pencils came from Square F layer 4 and Square R layer 3.

No similar material has been found at the other excavated sites of Raupa and Waiwhau, but these sites were abandoned prior to the establishment of the CMS station at Puriri in 1833 (Prickett, 1990, 1992; Phillips, 1988; Phillips & Green 1991). Excavated Maori sites along the Puriri Stream, close to the mission, do contain slate material, although it is not known if it belongs to the mission period or to the 1880s house from which most of the artefacts were recovered (Bedford 1994).

4.8 Brick

Like the slate material there were very few fragments of brick recovered from the Opita excavations (see Appendix 8, Table 9, Figure 79). Brick was found in three locations and might represent three different bricks, two of which were pale yellow and one orange in colour.

Table 9. Location and numbers of bricks at Opita.

Sample No.	*Location Trench/Square*		*Layer*	*No. pieces*	*MNI*	*Description*
49	B	26 m	2	1	1	One piece brick
65	B	26 m	2	1		One piece brick
58a	C	13.5 m	3	2	1	Two fragments of brick
?	H		3	1	1	One piece brick
Total				**5**	**3**	

Figure 79. Brick fragments from Trench C layer 3, showing wire cut marks.

From the stratigraphy it seems apparent that the bricks all come from late in the site's occupation. The bricks from Trench C and Square H came from layer 3, the occupational horizon in which late 19th century glass and ceramics have been found. The brick fragment from Trench B came from layer 2, the layer directly below the topsoil where ceramics post-dating 1884 were found.

The information the bricks themselves provide is minimal. The Opita samples provide no precise information about the date they were made, as they have no makers' marks. However they were made using the wire cutting process which was utilised in brick production from 1879-1930 (Eaves 1990) and indicates that the layers they were found in post-date 1880.

No comparison is available with either Raupa or Waiwhau, as no bricks were recovered from those sites. However, the late 19th century Puriri sites did contain bricks (Bedford 1994). Some 134 fragments were recovered from T12/340, with much smaller amounts from two other sites (16 fragments from T12/883 and 3 from T12/318). In T12/340 in particular, broken bricks were used as part of a causeway to gain access to a wharf from the stream. The causeway bricks were from a mixture of sources: hand- and machine-mixed, wire-cut and moulded, unglazed and partly glazed, and 11 different colours of clay. It was thought that they were reused at least once, but none had mortar on any surfaces, so they might have been from ship's ballast. The same may be true of the few brick fragments found at Opita, as no evidence of a brick structure was found.

4.9 Ceramics

A range of ceramics, totalling 169 sherds from a minimum of 29 vessels and a single button, was found at seven locations in the Opita excavations (see details in Appendix 6 and locations in Figure 80). The vessels were identified where possible to determine the type of occupation that their presence might suggest, while the designs and marks were used, along with the stratigraphy, to date the assemblages. Comparisons were made with neighbouring sites and the Puriri Stream excavations.

4.9.1 Types of vessels

A number of different vessels were identified. They can be classified within the categories of tea sets, dinner sets, storage vessels, and toiletries (Table 10). There was also a porcelain button.

The largest assemblage came from Trench B and the mixture of objects suggests that a house once stood nearby. Many burnt sherds were associated with lenses of charcoal, so it is possible that they were present in the house when it burnt down. It is possible that another house was near Square H, although there are fewer identified items from this area. Most of the ceramics (13 items) were decorated with transfer prints, including the popular willow pattern and Asiatic pheasants (Table 11). Others included hand-painted edge-banding (5) in various colours (Figures 81 and 82).

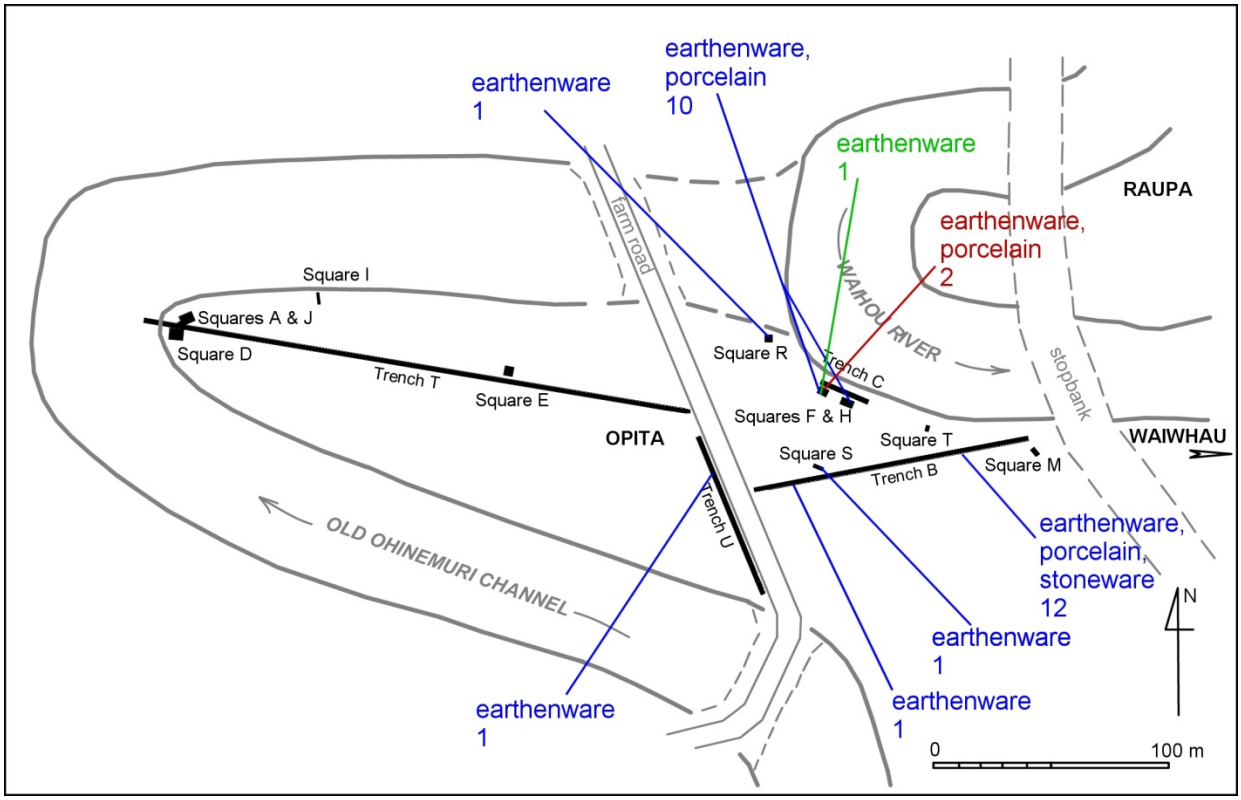

Figure 80. Plan showing the distribution and types of ceramics at Opita (numbers indicate the minimum number of individuals). Stratigraphy is indicated by colour: blue items are from layer 3, green from layer 4 and red from layer 5.

Table 10. Ceramic vessel forms and minimum number of vessels by area.

Vessel form / *Location Trench/ Square*	*Button*	*Bowl*	*Cup*	*Toilet dish*	*Toilet dish, porcelain*	*Jug*	*Jug/Cup, porcelain*	*Necked, porcelain*	*Dinner plate*	*Tea plate/ Saucer*	*Unid.*	*Total*
B		1	1	2	1	2		1	1	1	3	13
U									1			1
F layer 3										1	2	3
F layer 4											1	1
F layer 5							1		1			2
H layer 3	1	1					1		1	1	2	7
R										1		1
S											1	1
Total	**1**	**2**	**1**	**2**	**1**	**2**	**2**	**1**	**4**	**4**	**9**	**29**

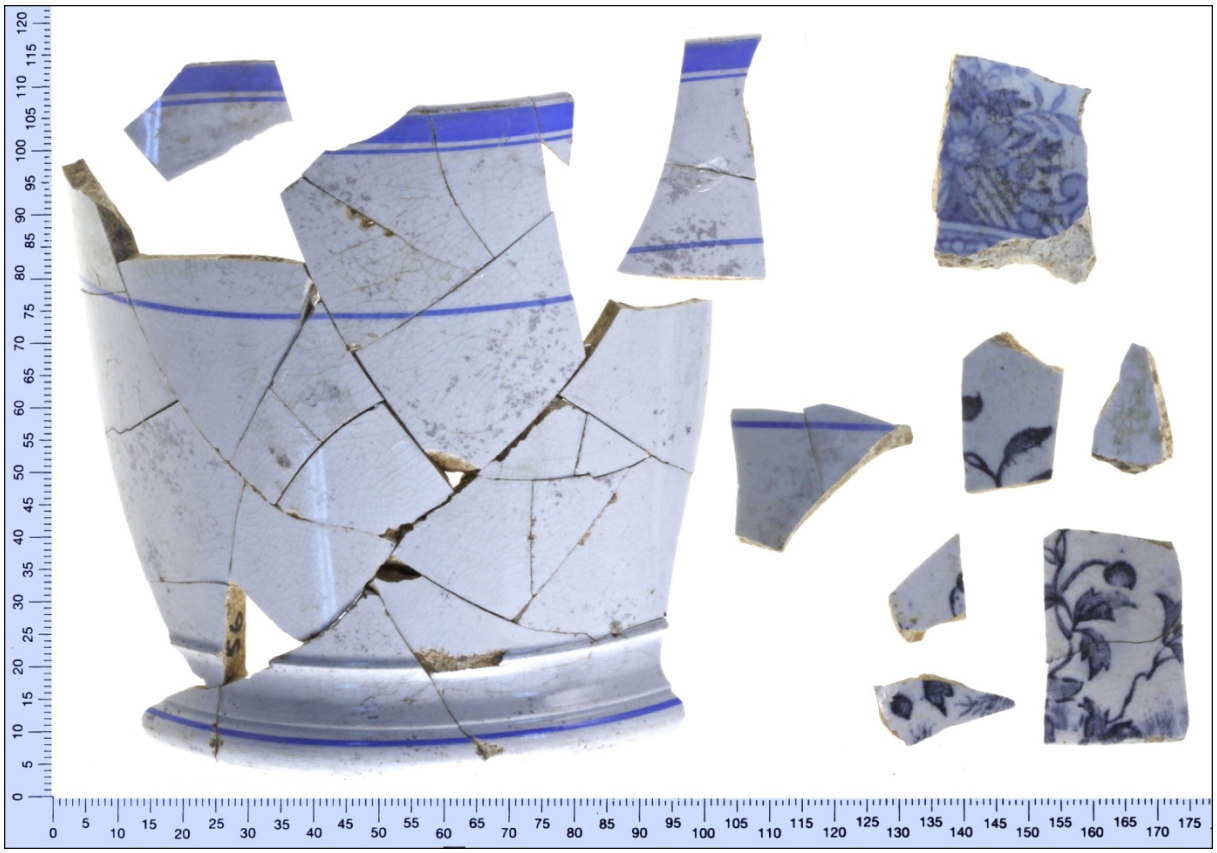

Figure 81. Ceramics from Square H layer 3, blue banded Staffordshire jug (partially reconstructed) and fragments of blue transfer print vessels.

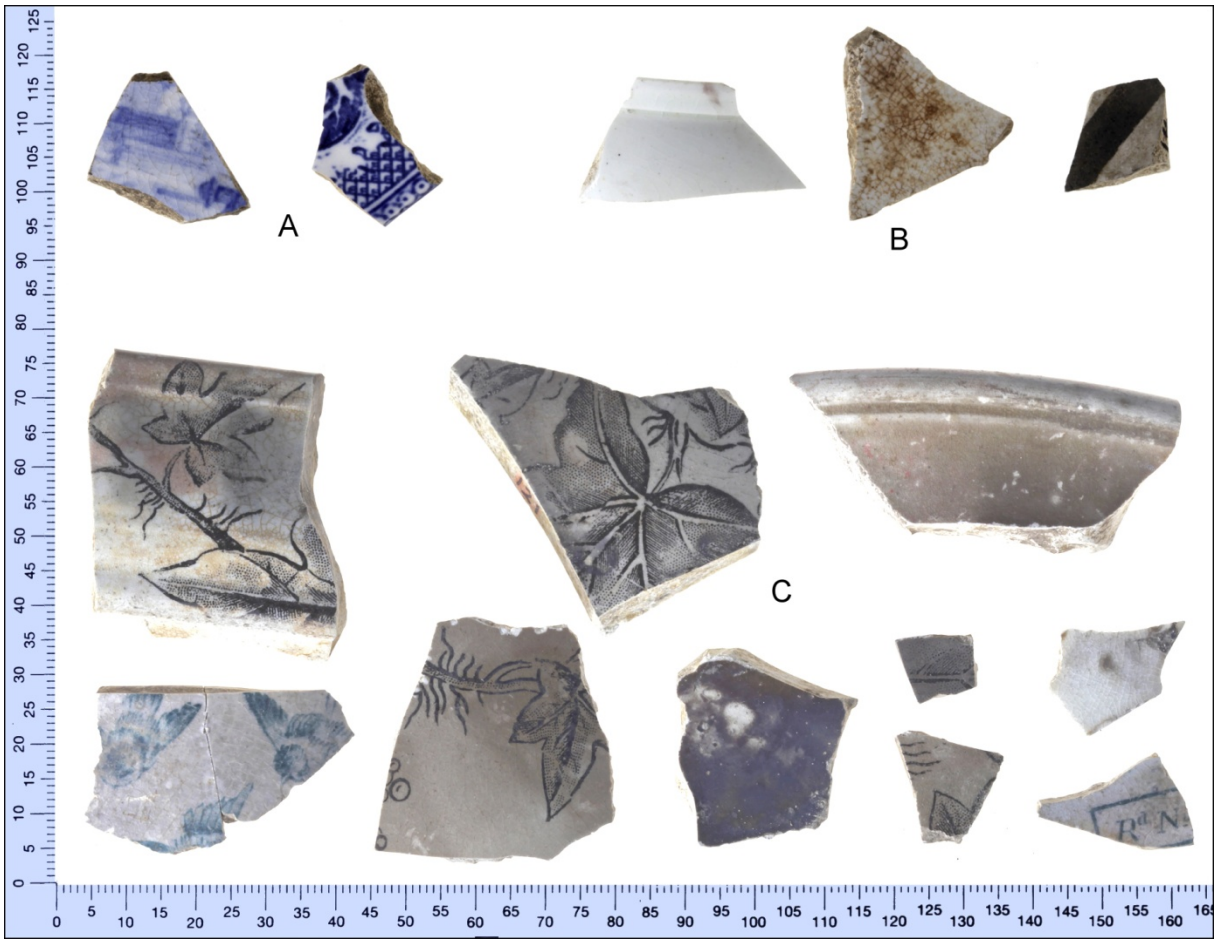

Figure 82. Ceramics from Opita: A = blue transfer prints from Square F layer 3, B = plain and banded earthenware from Square F layer 4, C = burnt ceramics from Trench B layer 2.

4.9.2 Dating of assemblages

There may be three or more periods represented by the ceramic assemblages at Opita: the earliest being layer 5 in Square F; the second being layer 4 in Square F; and the latest being layer 3 in Squares F, H, and R. Occasional ceramics at the west end of Trench B, Square S and Trench U probably also date to layers 3 or 2.

The main area containing ceramics was in Trench B (around the 90 m mark), which included a mixture of earthenware, porcelain and stoneware items (Figure 82C). There is good reason to treat the Trench B ceramics as a discrete assemblage: the designs do not overlap with the collections in other areas (apart from the ubiquitous Asiatic pheasants), the one piece of undecorated earthenware from an ink or storage vessel came from this area, as did the majority of the porcelain, also some of the vessels appeared to have been part of a toiletry set. This range in ceramic types suggests that a house stood nearby, which possibly burnt down with all its contents. A fragment of a design registration stamp was found on the base of one ceramic. Registration numbers were prefixed by 'Rd No'. As this system was introduced in January 1884 the sherd can be no older than that (Godden 1978).

Other isolated ceramics came from Trench U, the western end of Trench B and Squares S and R. All are consistent with a late 19th or early twentieth century date.

Layer 3 of Squares F and H contained a minimum number of ten items, including the button. The willow pattern bowl excavated in Square H was found to have a mark on it bearing the words Doulton and Burslem, inside an irregular mark surmounted by a coronet. Beneath this mark is the word England, and below that in larger print, Willow (Table 11). This particular mark was used by Doulton and Co. Ltd. of Burslem, Staffordshire between 1891 and 1902 (Eyles 1980).

Square F layer 4 had just two fragments from an unidentified vessel. Immediately below, in layer 5 of Square F there were three fragments of willow pattern transfer print and one small fragment of porcelain. As with the bottle glass, Square F layer 4 had only a small quantity of ceramics indicating that the inhabitants of the site continued to use traditional vessels for food preparation and serving. This is in some contrast to the economic remains, such as the presence of pig bones and the number of nails, indicating that change had occurred in the wider rather than the domestic economy.

4.9.3 Comparison with Raupa, Waiwhau and Puriri

The adjacent sites of Raupa and Waiwhau Opita allow little in the way of comparison with finds from the ceramic assemblage. No ceramics have been found at Waiwhau (Phillips, 1988, Phillips & Green 1990), and the only ceramic artefact found at Raupa is a fragment of plain white ceramic bowl dating to the late 19th or early 20th centuries (Prickett, 1992).

Table 11. Number of decorated ceramic vessels by area.

Vessel form / *Location Trench/Square*	*Banded ware*	*Black underglaze transfer*	*Blue underglaze transfer*	*Green underglaze transfer*	*Hand painted design*	*Plain white*	*Red underglaze transfer*	Total
B	1	2	1	2		7		13
U			1					1
F layer 3	1		1		1			3
F layer 4	1							1
F layer 5			1			1		2
H layer 3	2		3			2		7
R							1	1
S			1					1
Total	**5**	**2**	**8**	**2**	**1**	**10**	**1**	**29**

However, sites along the Puriri Stream do contain substantial amounts of ceramic material, especially T12/340, which was the location of a family home dating to the 1880s, and T12/883 probably another household of the same date (Bedford 1994). These contained a minimum number of 77 and 41 ceramic items respectively, which included 6 ceramic buttons in T12/340.

Not only is the amount of material greater in the Puriri sites than at Opita, but the range of objects is also greater: in particular there are a number of toys in T12/340, while none were found at Opita. Interestingly the dates appear similar, between 1880-1900, but the range of transfer print designs are different with willow pattern being the most common in Square F/H in Opita and an assortment in Trench B, but a preference for Rhine and Rouen in the Puriri site of T12/340, with Rhine and Asiatic pheasants being common in T12/883, which may indicate individual choice by the inhabitants.

4.10 Metal

The metal objects found at Opita were mainly of ferrous metal and highly corroded. Although 110 fragments were recovered they probably related to about 46 individual items originally (see Appendix 10, Table 12, Figure 83). These metal items were divided according to the areas they were recovered from and to functional categories. None were diagnostic of a particular time, but they could broadly be dated by stratigraphy to the late 19th and early twentieth centuries. Comparisons were also made with other sites.

4.10.1 Activities and areas

Metal objects were found in nine different areas in the Opita excavations (Figure 84). These were assigned to six categories (nails, tools/cutlery, household items, horse equipment, firearms, tins and miscellaneous), which in turn suggested different activities occurred in different places.

Table 12. Location, numbers and types of metal objects found at Opita.

Location Trench/Square		*Layer*	*No. pieces*	*MNI*	*Description*
Trench B	?90 m	3	1	1	nail
Trench C	10.2 m	3	2	2	wire & nail
Square D		1 2	3 1	3 1	shotgun cartridges nail
Square F		3	10	4	nails, key, ring
Square F		4	23	8	nails, wire, iron, lead sheeting
Square H		3	56	16	file, wall bracket, tins, nails, fork, ring, shotgun cartridges, lead shot, bolts etc
Square S		3	7	6	nail, handle, chain, stirrup, hinge
Square T		1	4	2	“bed frame”, nail
Trench T	30 m	1	1	1	horseshoe
Trench U	19 & 26 m	3	2	2	nails
Total			**110**	**46**	

Nails were ubiquitous and in general were so corroded that they could not be identified more precisely. A small number could be seen to have been hand forged. Therefore the nails could be parts of houses, farm buildings, fences or a number of other functions. A file and a table fork from Square H and inlay for a knife or similar object from Square S were grouped under the tools and cutlery category. Household items included a possible door key from Square F, a bracket from Square H and a hinge from Square S. Tins were found in Square H. Evidence of firearms were found in Square D and Square H, while horse equipment was found in Trench T and Square S. Highly corroded items which could not be identified were found in most locations and grouped under the miscellaneous category.

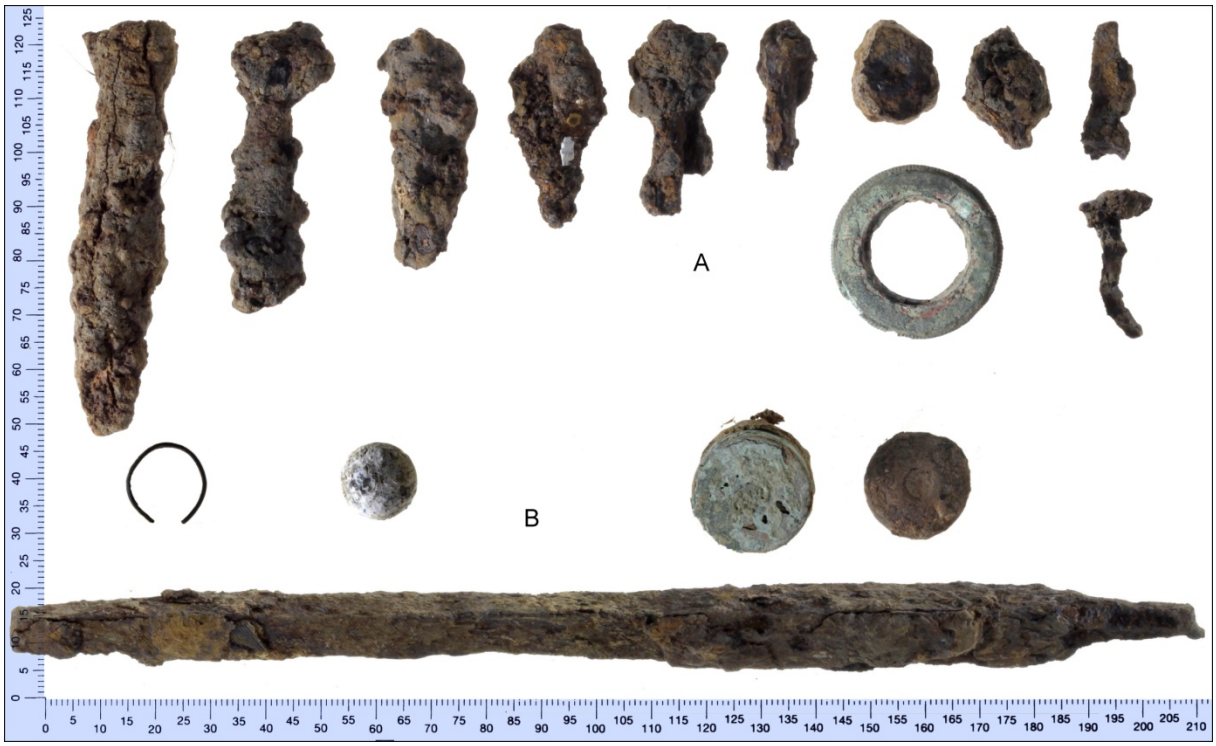

Figure 83. Metal objects from Opita: A = assorted nails and a cuprous ring from Square F layer 3, B = non-ferrous ring, lead shot, two shot-gun cartridges and a triangular file from Square H layer 3.

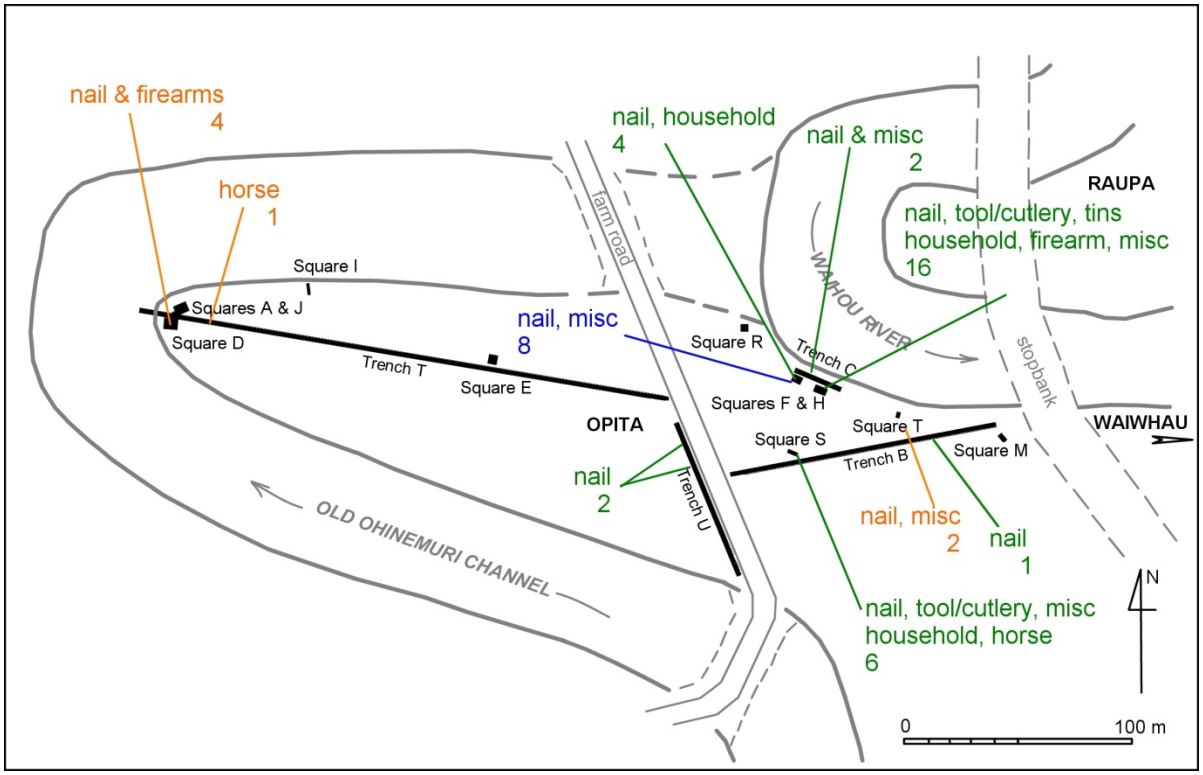

Figure 84. Distribution of categories of metal objects. The minimum number of items are coloured according to stratigraphy: orange items are from layers 1 and 2 (twentieth century), green from layer 3 and blue from layers 4 and 5 (both from the 19th century).

4.10.2 Stratigraphy and chronology

Metal items found in the topsoil and rock flour layers (layers 1 and 2) date from the twentieth century (shown in orange in Figure 84).

The majority of items came from layer 3, which is the uppermost cultural layer across Opita. This may not relate to one period, and may in fact represent mixed deposits in more disturbed areas such as Trenches B, U and Squares S and T. However, those items assigned to layer 3 in Trench C and the adjacent Squares F and H are all stratigraphically the same level.

A few items came from lower earlier layers in Square F: mainly nails in layer 4 and three small items recorded as coming from layer 5, but these may have penetrated via scoops cut in layer 4 (these items have been grouped with layer 4 material in Table 12 and Figure 84).

4.10.3 Comparison with other sites

A few metal artefacts were found at Raupa and Waiwhau. A piece of barbed wire, rusted iron, nail and shotgun casings were found in the upper ploughed layers at Waiwhau (Phillips 1988; Phillips and Green 1991), while at Raupa a copper nail in the upper layers and two pieces of rusted iron from the Maori occupation layers were found (Prickett 1990; 1992).

In contrast, the Puriri sites of T12/340 and T12/833 dating to the late 19th century (c.1870-1890) contained large numbers of metal objects, numbering 1527 and 143 items respectively (Bedford 1994). At T12/340 there were a significant number of nails and screws (1480) – many were in groups and thought to have been unused, which may mean that there was a shed or store nearby where they were kept. There were also a number of personal items, in particular buttons (ceramic buttons are discussed in the section on ceramics, but at Puriri there were also ones of wood, bone and jet, as well as the 16 one and two-piece metal types – in total 29 buttons and 3 metal buckles). It was thought that there may have been some clothing held in the store as well. The other material from T12/340 suggested that there was a house nearby, supported by the amount of household and personal ceramics found there. There were also 130 nails and screws from T12/883, which contributed the majority of the metal assemblage from that site, and 19 nails were recovered from T12/318.

The size and content of the Opita metal assemblage reflects the later occupation of layers 3 and 4 in contrast to the neighbouring sites of Raupa and Waiwhau, but while layer 3 at Opita was of similar date to the Puriri sites, the earlier layer 4 fell some time in-between the occupations of Puriri and Raupa/Waiwhau.

4.11 Bone Analysis

A total of 685 mammal bones, bone fragments and teeth, 114 fish bones and 32 bird bones was recovered from the Opita excavations (see details in Appendix 11 and locations in Figure 85). Using specimens from the comparative collections held in the AU Department of Anthropology Archaeology Laboratory, identifications were made to the lowest taxonomic level possible. Amongst the mammal bones tentative identifications have the prefix ‘cf’ but most bones could only be identified as ‘mammal’. All bones were quantified using number of identified specimen present (NISP), and minimum numbers of individuals (MNI). For pigs and dogs minimum numbers of elements (MNE) were listed, and the age of mortality was determined. Modifications such as dog gnawing, recent breakage, weathering, and butchery patterns were observed and general observations were reported. These findings are compared to those from the neighbouring Raupa and Waiwhau excavations, as well as those from the Puriri Stream excavations.

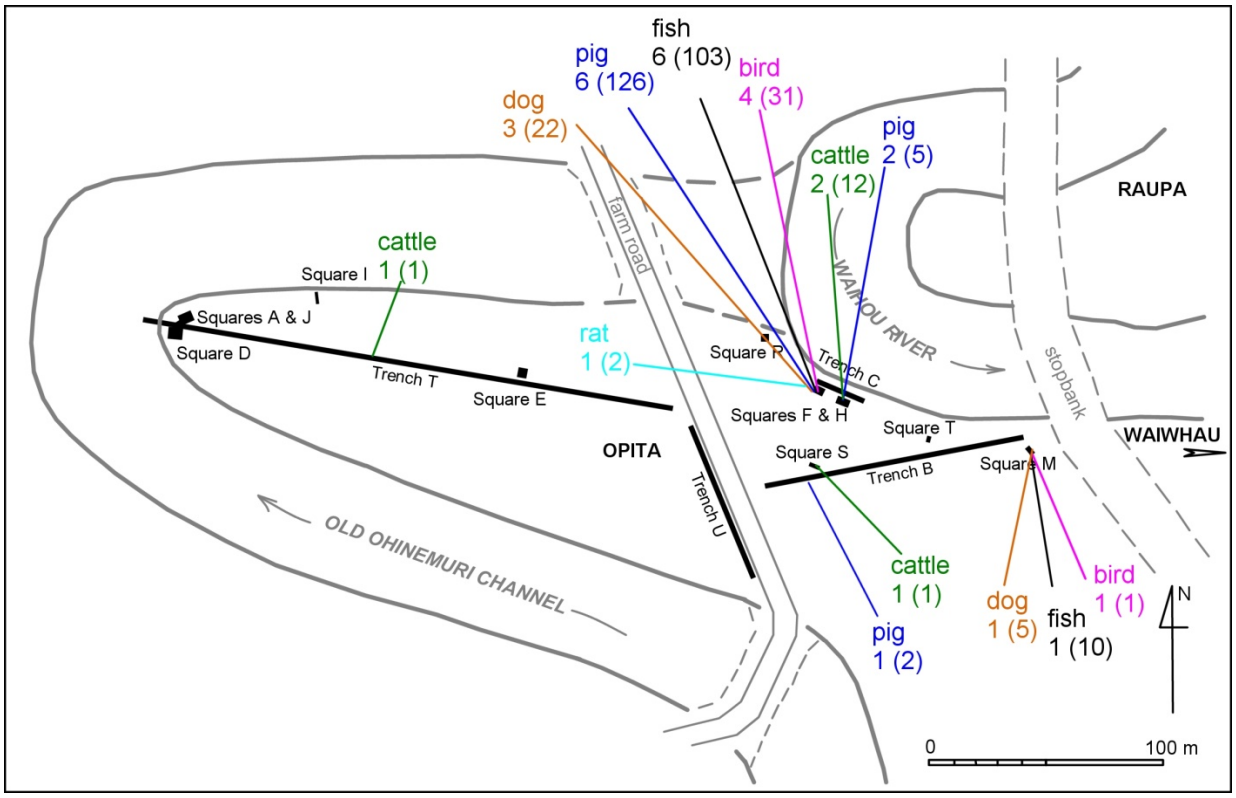

Figure 85. Distribution of faunal species found in the Opita excavations (numbers indicate the minimum number of individuals with the number of identified specimens in brackets).

It was clear that Square F had by far the largest number of bones from all species, followed by Squares H and M (Figure 85 and Table 13). Only occasional bones were found in the upper layers of Trench B, T and Square S. Moreover, within Squares F and H there was a change in the types of species present over time. Other observations such as methods of cooking and capture were also made.

4.11.1 Stratigraphic change over time

Bones were recovered from four layers of Square F (3, 4, 5 and 6) and layer 3 in the adjacent Square H. These show clear temporal trends when looking at the relative abundance of the identified specimens (Table 13 and Figure 86).

Cattle bones were mainly found in Square H layer 3. Pig bones were found in the upper layers 3 and 4 while dog bones were mostly present in the lower layers 4 to 6. In Square F small amounts of butchered, burnt and gnawed dog bones are present in the lower cultural layers 5 to 6, but declined significantly by layer 4 which coincides with a concentration of pig bones present in layer 4. Bird bones are present throughout, but fish also decline in the upper layer. Two rat bones were also recovered from layer 4.

The range of species found in Square M is closest to those from layer 6 in Square F, although the numbers are small and not too much should be read into this part of the assemblage alone.

Table 13. Table showing the number of identified faunal specimens (NISP) and minimum number of individuals (MNI) in the Opita excavations by area. The category mammal records specimens which could not be further identified.

Square/ Trench	Layer	Cattle		Pig		Dog		Rat		Mammal	Fish		Bird	
		MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	NISP	MNI	NISP	MNI	NISP
F	3			2	6					9			1	6
H	3	2	12	2	5					44				
F	4			2	119	1	2	1	2	407	2	55	1	22
F	5			1	1	1	2			5	3	3	1	1
F	6					1	18			22	1	45	1	2
M						1	5			2	1	10	1	1
B				1	2									
S		1	1											
T		1	1											

4.11.2 Methods of cooking and capture

Amongst the mammals a wide range of pig elements are represented from pigs aged 2 years and less, indicating that young adult and sub-adult pigs were killed and eaten on the site (Figure 87). A number of juvenile and adult dog bones show signs of butchery and burning. The dog skeletal element representation, based on only a small sample size, indicates most of the butchery waste was composed of foot and skull fragments, which suggests that the meat-bearing bones were taken elsewhere. Cattle bones were mainly from the feet and many were burnt, which represents butchery waste. Again the meat-bearing bones appear to have been taken elsewhere.

Most of the fish bones were from the layer 4 and 6 middens in Square F. Fish bones were also recovered from Square M layer 4. The species caught included snapper, shark/ray, stingray and eagle ray. Fishing methods were probably focused on hook and line, although rays can also be caught by spear as they come close to the shore and rest on the tidal flats. All fish species present at Opita are likely to have been obtained from the Firth of Thames, though it is possible that some fish were also obtained from the Waihi-Tauranga Harbour area where there were established cultural connections.

Only two different bird species were identified including duck (possibly a brown teal) and tui. These may have come from the local wetland and forest environments.

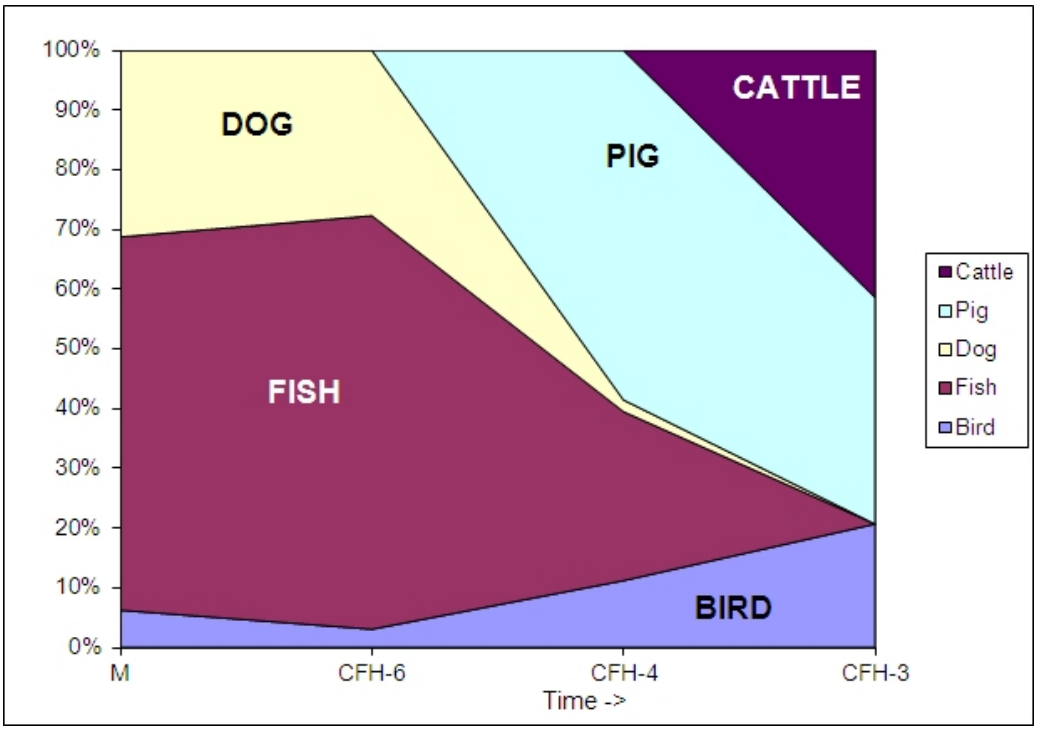

Figure 86. Number of identified faunal specimens by area and layer, showing the change over time from the upper layers of Square F and H to the lowest one of Square F, which is similar to Square M (the occasional bones found in Trenches B and T, and Square S are not included).

Figure 87. Pig tusks, teeth and part of juvenile jaw bone from north-west corner of layer 4 midden in Square F.

4.11.3 Comparison with other sites

The results, especially from the upper layers of Opita, are different to the neighbouring sites of Raupa and Waiwhau, which were both abandoned by the early 1820s. However, the potentially earlier layers at Opita (Square F layer 6 and Square M) were more similar in that they show a predominance of dog and fish.

In several areas of Raupa the middens were found to contain fish and dog bone, and occasional whale (Prickett 1990, 1992). The fish species included snapper, eagle ray, kahawai, gurnard, mullet, mackerel, trevally and eel. Dog bone was quite common and was recovered from a number of different locations. Dog bone was also formed into artefacts, and waste from that process was found in working areas. Bird bone was only identified from one midden. Four pig bones were found in three areas.

At Waiwhau very small amounts of fish, bird, pig and dog bone were found in the middens (Phillips 1988; Phillips & Green 1991). Fish species were identified as snapper, trevally and ray.

The late pre-European or early post-European contact sites along the Puriri Stream had a few fish bones scattered in the midden, with snapper in the lower level of T12/340, and snapper and shark in T12/882.

Those Puriri sites (Bedford 1994) dating to the latter part of the 19th century also contained introduced species. T12/340 had cattle bones from a minimum of two animals with butchery marks on the bones. T12/883 had some snapper and kahawai in the midden (though this might have been part of the shell midden that was used as a foundation for a house and was probably mined from an earlier site). However, the faunal assemblage in T12/883 was dominated by pig bones (44 NISP), and it was clear that pigs were being raised and butchered on the site. In addition there were a few cattle and sheep bones, but these may have been purchased butchered portions (apparently cheaper cuts) and did not represent whole animals. A few bird bones were also present, including native brown teal, as well as introduced turkey and chicken.

4.12 Midden Analysis

Twenty-four shell midden samples were collected from Opita. Most (17) midden samples came from the three deposits of shell, layers 4 and 6 in Square F, and Square M, from which 11 samples were subjected to further study (see details in Appendix 13 and locations in Figure 88). The analyses aimed to compare the shell material from the different deposits to see if they showed any changes in shell preferences, sources, gathering techniques and predation pressure. The samples were also examined to see if the undated samples could be grouped according to their similarity and whether there might have been any artefactual or structural use of the shell. This resulting data was compared to that of the neighbouring sites of Raupa and Waiwhau, as well as sites along the Puriri Stream and at Totara near the mouth of the Waihou River.

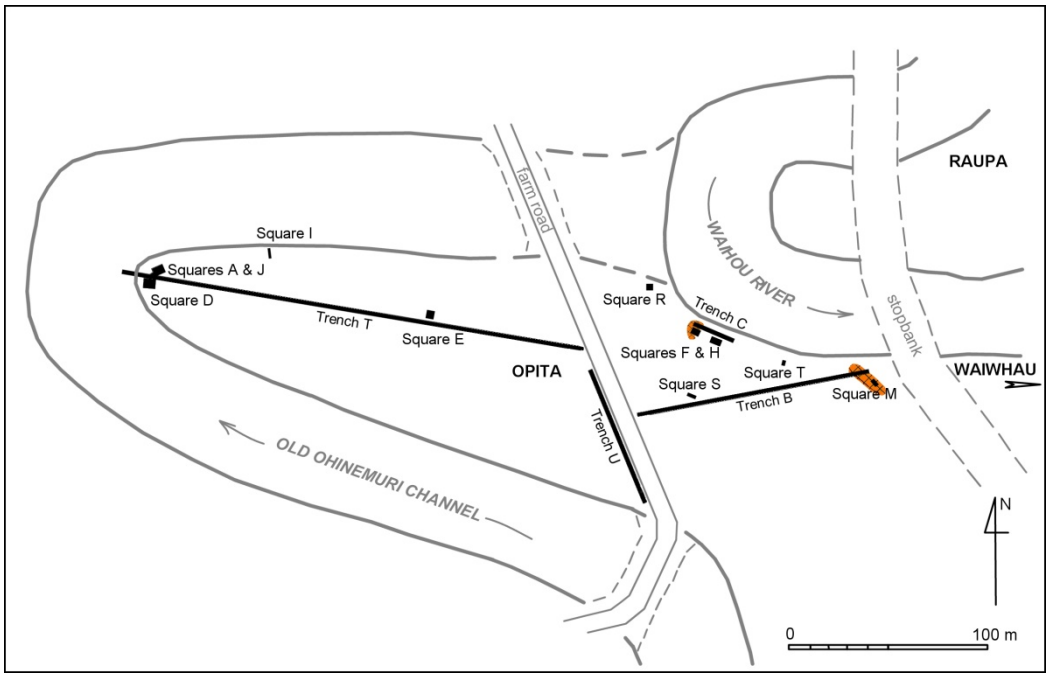

Figure 88. Location of shell midden recovered from Opita, with the extent of the deposits determined from test pits and geophysical survey.

4.12.1 Shell preferences

The majority of the species were cockle and pipi, with other species making up less than 1% (Table 14). However, there was a distinct difference between layer 4 in Square F and the other two samples (Square F layer 6 and Square M). In Square F layer 4 cockle represented an average of 65% of the identified shells, whereas in Square F layer 6 and Square M between 72-95% were pipi. In both Square F layers there was some variation in the different quads, but this was usually in the smaller samples, and the strong trend remained.

Table 14. Numbers of shell species and percentages of the main types by location.

Square/level	*Quad/spit*	*cockle*	*%*	*pipi*	*%*	*other*
Square F layer 4	B4 total	126	74	44	26	?
	B4/C4	1070	67	518	32	18
	D4	48	21	182	79	p
	B5	358	72	138	28	2
	B6	118	74	40	25	1
	Total	**1720**	**65**	**922**	**35**	**21**
Square F layer 6	C6	58	28	148	72	p
	B4	216	5	4368	95	14
	Total	**274**	**6**	**4516**	**94**	**14**
Square M	4-1	274	11	2174	89	7
	4-2	242	9	2326	90	13
	4-3	188	10	1714	90	14
	Total	**704**	**10**	**6214**	**89**	**34**

The middens from Square F layer 6 and Square M layer 4 are similar to Raupa in Squares I and II where 85-90% of the shellfish was pipi and at Waiwhau 80-90% were also pipi (Prickett 1990, 1992; Phillips 1988; Phillips and Green 1991) (Figure 89). At the Puriri Stream sites pipi ranged from 68-94% of the shell in six sites, while in two sites pipi and cockle were present in equal numbers (Bedford 1994). The greater proportion of pipi at Puriri might reflect its proximity to the Firth of Thames.

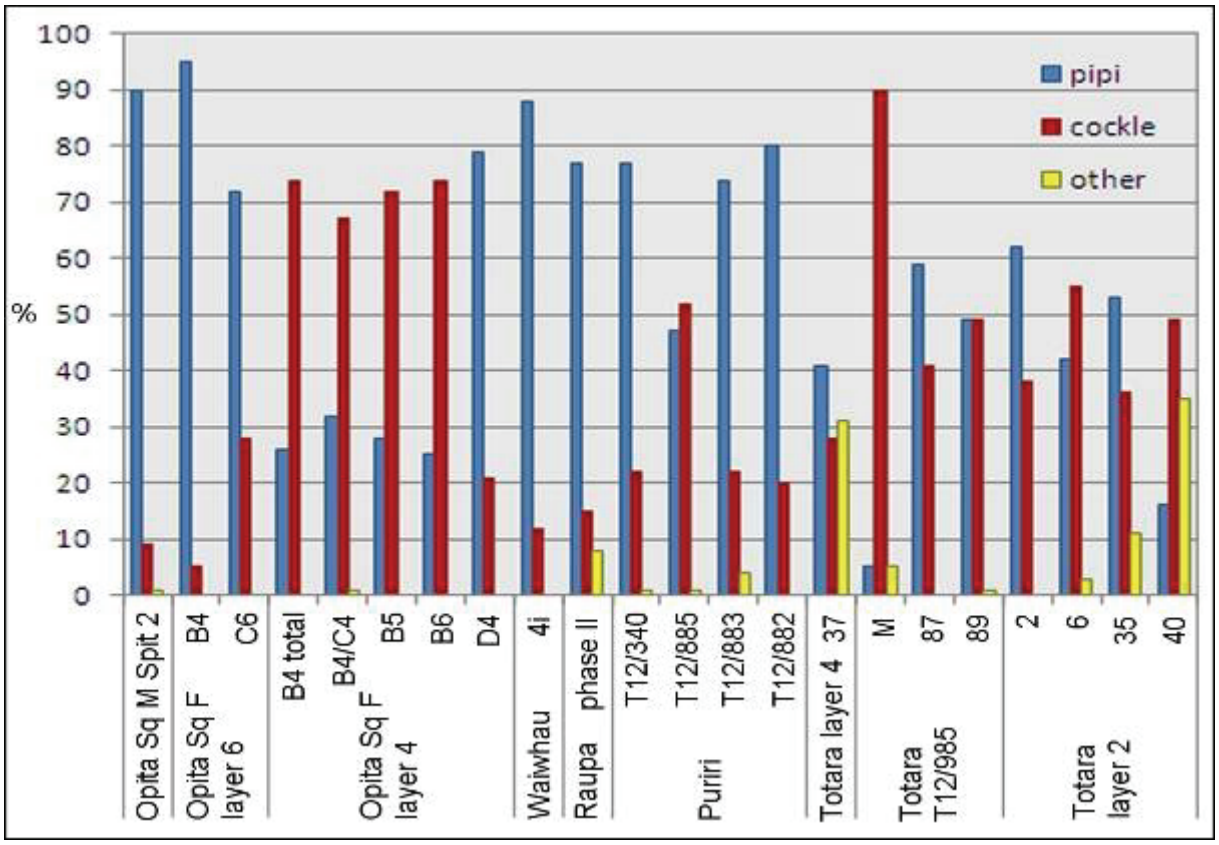

Figure 89. Proportions of different shell species in middens along the Waihou River. Opita samples are discussed in the text: Waiwhau dates c.1810; Raupa phase II c.1810; Puriri c.1620-1700; Totara T12/372 layer 4 c.1390, T12/985 c.1690, T12/372 layer 2 c.1790. Apart from the Opita samples only those with more than 100 counted shells that are from dated contexts and with different proportions are graphed.

4.12.2 Source

The source of both main species is likely to be the Waihou River and shores around the Firth of Thames, though pipi and cockles are also available from Waihi and Tauranga Harbour. Given the morphology of the Waihou River, cockles were more likely to be available further upstream than pipi, as cockle are more tolerant of tide levels and siltier substrates. Pipi would be commonest on the sandy flats at the mouth of the Waihou and around the beaches of the Firth of Thames at mid- or below-tide level; The river is tidal up to the junction of the Ohinemuri River, which is the location of Raupa, Waiwhau and Opita, so inhabitants were able to travel to the shellfish beds with relative ease utilising the tides. Alternatively they might have obtained them through exchange with coastal-dwelling neighbours.

Excavations of two sites at Totara, on the sandy banks at the mouth of the Waihou River, recovered midden samples dating to at least three distinct time periods c.1390 (layer 4 T12/372), 1640-1730 (T12/985) and 1720-1800 (layers 2 and 3 T12/372) (Phillips 2000b, 2008). Here there were three

predominant shellfish types harvested: pipi (5-71%), cockle (1-90%), and trough shell (0-34%). It should be noted that most of the 13 samples (with over 100 identified shells) came from individual scoops, which may reflect the variability of separate meals. This variability was reflected in both the 17th and 18th century sites (only one sample was obtained from a 14th century midden).

At the junction of the Ohinemuri, 37 km from the river mouth, during the late prehistoric and early historic period (c.1625-1810 at Opita, Waiwhau and Raupa) there was a distinct preference for pipi over cockle and this appears to be a local preference, as Puriri showed similar patterns of selection (although sites T12/885 and 886 were the exceptions to the rule).

In contrast, the most recent midden in Square F layer 4 at Opita, dating to the 1840s, contained 67-74% cockle, except for one small hangi that had only 21% cockle and 79% pipi.

This suggests that residents living beside the shellfish beds at Totara alternatively harvested from three different shellfish beds adjacent to their settlements, whereas those living further away were more selective.

4.12.3 Gathering techniques

Generally, the broad size range of shells in the Opita middens, together with the presence of other shells that occur naturally in cockle and pipi beds, but were not used as food, supports the conclusion that the shells were gathered up into baskets and not individually selected (Figure 90). Although there is evidence for the selection of different species, there does not seem to be selection of individual specimens within the shellfish beds in any of the samples. This similarity suggests that the gathering techniques remained the same over time.

The size distribution data obtained for pipi and cockles suggests slightly different patterns of exploitation, probably relating to the downstream ecology of the Waihou. Pipi were preferred, but were available further away and non-selective gathering was practised. Cockles were available on the river mudflats slightly closer to Opita and some size selection took place.

4.12.4 Predation pressure

The small sizes of the shellfish gathered during the late prehistoric and early historic periods (Opita Square F layer 6 and Square M layer 4) suggests considerable pressure on the beds with the result that the shellfish in the middens are quite small relative to modern populations (Figure 90).

Powell (1979:415) recorded lengths of pipi on New Zealand beaches varying between 48-83 mm, which is much larger that the Opita pipi that measured 20-60 mm (mean 32 mm) in the earlier middens (Square F layer 6 and Square M) and 25-65 mm (mean 40 mm) in Square F layer 4. At Totara the pipi measured 10-55 mm (mean 32 mm) (Phillips 2000b, 2008). This suggests the shellfish beds harvested were under predation pressure during the 17th and 18th centuries, and had only recovered slightly by the 1840s.

The slightly larger sizes of shellfish recovered from the upper midden layer (Square F layer 4) at Opita are probably the result of a reduction in shellfish gathering from 1821 onwards when, due to the Ngapuhi incursions, the region was abandoned for nearly ten years. This gave the beds time to recover slightly from the considerable pressure they were experiencing through the late prehistoric and early historic.

However, when the people returned from Waikato they no longer harvested the same proportions of shellfish. It could be due to the ecology that had also changed by this time, and which favoured cockles over pipi, or alternatively the people of Opita had less access to the more distant pipi beds. There are also indications that fewer people remained living near the junction of the Waihou and Ohinemuri Rivers, as a number of people are recorded as having moved to the Coromandel Peninsula, or further afield to the Hauraki Gulf Islands (Allen and Phillips 2013).

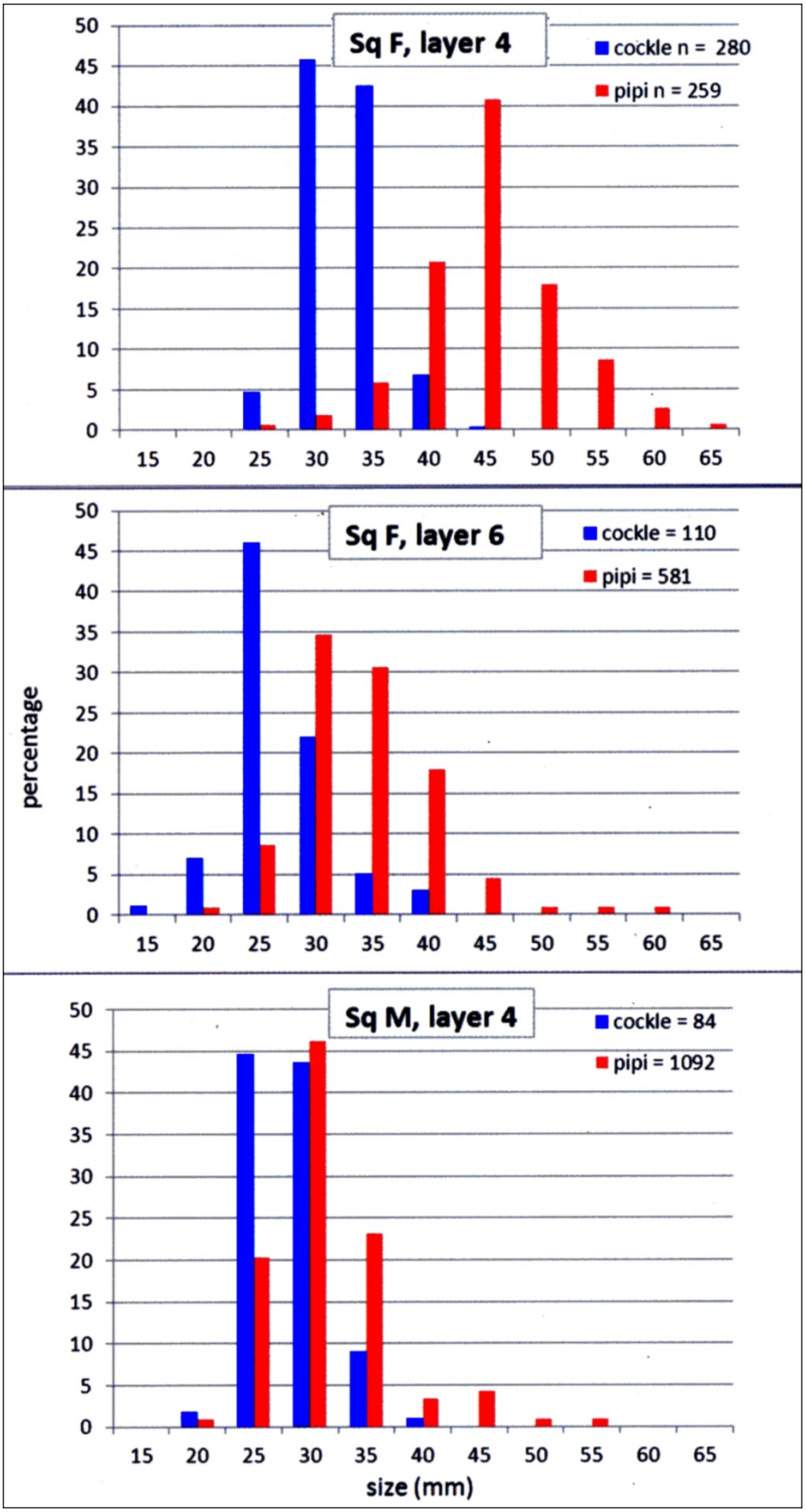

Figure 90. Cockle and pipi size percentages in samples from Square F layers 4 and 6, and Square M.

4.12.5 Dating the middens

None of the middens at Opita were subjected to radiocarbon dating, but the presence of historic material in Square F layer 4 indicates a date in the 1840s. layer 6 in Square F contained no historic material and clearly pre-dated layer 4, while flood deposits similar to that found in Raupa suggests a date c.1760 (Phillips 2000a:144).

The composition, appearance and size of the middens from Square F, layer 6 and Square M are similar. Not only were the proportions and sizes of shells very similar, but so was the shell density and degree of wear. The latter has been attributed to the acidic soils (see Appendix 14). Therefore it is assumed that Square M also dates to the mid-18th century.

4.12.6 Artefactual or structural use of shell

Along the banks of the Waihou River, many sites south of the junction with the Hikutaia River were built on a mixture of subfossil and midden shell (Phillips 2000a:47). Two of the Puriri sites used older midden as the foundation for later 19th century houses (Bedford 1994:196,199). Nearer to Opita, it is possible that Raupa had a central raised area built on midden shell (Phillips 1986:108-110). Certainly the shell midden recovered from Raupa was very fragmented indicating repeated shifting before being finally dumped (Prickett 1990:88, 105). However, these practices do not seem to have been employed at Opita and the shell there did not show any signs of crushing consistent with being used in a garden soil, or for the foundation of a house or settlement.

In a late 17th century midden at Totara by the mouth of the Waihou River, a patch of several thousand discarded pipi shell tools was found, identified from a wear pattern consistent with cutting flax and stripping the fibre to make cordage or netting (Phillips 2000b:21-24). Observation of the pipi recovered from Opita showed no sign of any distinctive wear patterns that might suggest their use as tools.

4.12.7 Environmental changes

The change in shellfish proportions dating to the 1840s (seen in layer 4 of Square F) may have been due to the changing river conditions, with increasing siltation around the mouth of the Waihou River in the early 19th century (Phillips 2000a:31). This would have favoured cockles, but not pipi.

Also, although some selectivity is evidenced in the shellfish data from the sites at the Waihou-Ohinemuri junction, during the late prehistoric and early historic periods shellfish predation from Opita indicates a reliance on regional-scale resources. The evidence post-1830 may suggest a reduction in the gathering of longer-distance resources and a greater reliance on local ones.

4.13 Special objects, chert and other lithics

As well as obsidian, hangi stones and writing slate there were a number of other lithic items found in the Opita investigations. The main group comprised chert flakes, numbering 24 pieces, of which one was classed as a special object. A further 20 items included three special objects, tools and waste material from a variety of rock types.[34] These items were scattered throughout the area investigated (see details in Appendix 4 and location in Figure 91).

34 After examination of these items, three stones that were in "other lithics" were re-assigned as hangi stones (these have been added to the hangi stones list in the text, but were not included in the analysis).

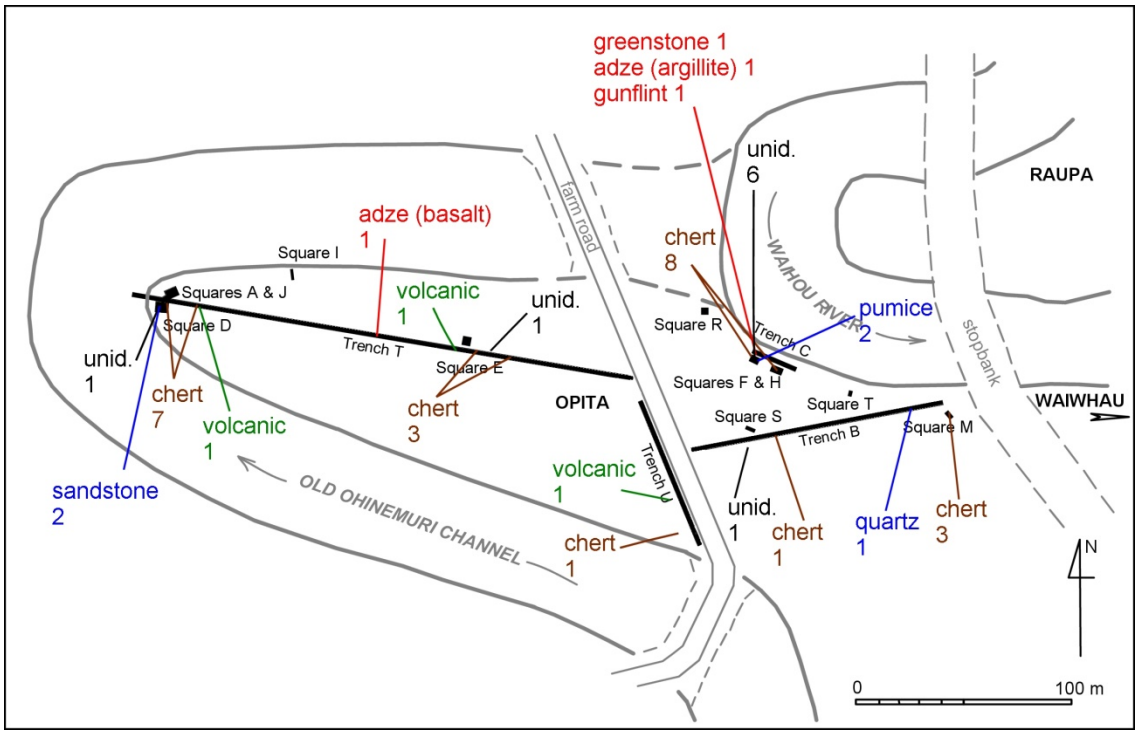

Figure 91. Distribution and numbers of special objects (red), chert flakes (brown) and other lithic items (blue, green and black). The three volcanic stones were reassigned as hangi stones (see Figure 56).

4.13.1 Special objects

Four lithic objects found at Opita were classified as special in the sense that they were of unusual materials (e.g., nephrite, argillite, basalt and gunflint), materials only available from a distance.

First, a broken, partly worked and burnt piece of nephrite that was in the process of being cut in half lengthwise into two thinner pieces to make chisels or pendants (Figure 92A). Unlike many such examples it shows no sign that it was formerly a larger artefact that was being reworked into smaller ones.

The second item was a small metasomatised argillite adze, probably reworked from a much larger flaked adze (Figure 92B). Both these artefacts were recovered from Square F layer 8 in the base of a drain. Similar small adzes were recovered from Ongari Point and Oruarangi, and their small size makes it likely that they were hafted using a socket (Shawcross 1964; Shawcross and Terrell 1966).

The third item was a flake from the corner of a Tahanga basalt blade (Figure 92C). Like the argillite adze, it would originally have been a large flaked adze, and probably had several stages of reworking before this piece of the blade broke. It was found at the base of the cultural soil in Trench T.

Finally, a gunflint, part of the firing mechanism of a musket, was found in Square F layer 4 (Figure 92D). The gunflint shows a small amount of wear around its margins, but appears to have been little used. An unused gunflint, purchased from the New Zealand Historic Places Trust Stone Store at Kerikeri, is illustrated for comparison (Figure 92E).

Figure 92. Special objects recovered from Opita: A = broken burnt and partly worked piece of nephrite from Square F layer 8, B = argillite adze from Square F la yer 8, C = fragment of basalt adze blade from Trench T layer 3, D = partially used gunflint from Square F layer 4, E = unused gunflint for comparison (purchased from NZHPT Kerikeri store).

The source of the stone from these special objects came from very different locations: nephrite from Westland, argillite from Marlborough, basalt from Coromandel east coast, and flint from England. These are by far the most travelled objects found at Opita.

4.13.2 Chert

Twenty-three pieces of chert were recovered, of which, three were flake tools, one was a core with flakes removed and the remainder were waste from flaking (Figure 93C-F). Chert forms a harder cutting edge than obsidian and was used by Maori to make drill points. These pieces were associated with the main areas excavated: the three flakes came from Trench B, Square F layer 8 and Square H layer 5; the core was found in Trench U; while the waste was found in Trench T near Square D, Trench T, Square F layers 4 and 6, Square H layer 5, and Square M.

Chert is found throughout the Coromandel Ranges, and the raw material for these may have come from a location along the Ohinemuri River (pers. comm. Phil Moore 2011). Seven small waterworn chert pebbles were also found. These may have been gathered along with hangi stones in the river.

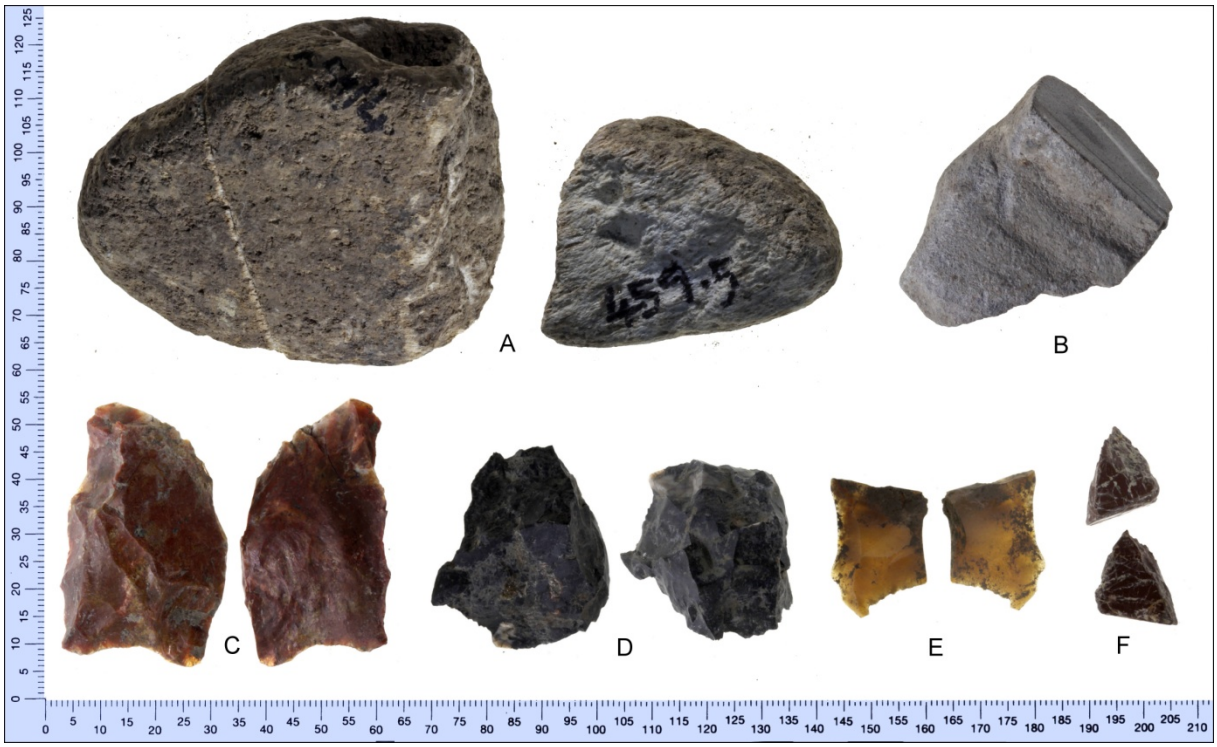

Figure 93. Chert and other lithics from Opita: A = two pumice fragments from Square F layer 7, B = sandstone file with grinding marks from Square D layer 3, C = chert flake from Square F layer 8, D = chert from Trench U layer 3, E = chert from Square H layer 5, F = chert from Trench B layer 3.

4.13.3 Other lithics

Amongst the 17 other lithics are two pieces of sandstone, one with rubbing grooves on it, two pieces of pumice that may originally have been part of a larger cobble, one small piece of quartz and three small volcanic stones that are probably silicified tuff (Figure 93). The nine remaining items in this category were small stones that could not be identified. Most of these lithics came from two areas: Square D and the adjacent Trench T, and the river-side Squares F and H.

The sources of the sandstone and pumice were from outside the immediate area, while the quartz and volcanics and the other unidentified stones, like the small chert pebbles, could all have come from the adjacent Coromandel Ranges and may have been present in the bed of the Ohinemuri River.

4.13.4 Comparison with other assemblages

The two large sites of Oruarangi and Raupa also contained nephrite items and adzes, some of which were made of Tahanga basalt and Nelson argillite, although in much greater numbers (Oruarangi had 67 nephrite items, 115 basalt and 30 argillite adzes; Raupa had nine nephrite items, one basalt adze and some argillite flakes; Furey 1996; Prickett 1990, 1992). In contrast, the smaller Waiwhau and Puriri sites did not have any of these items.

Chert was more common, with all the sites containing some chert. Notably, at Raupa only 10% of chert artefacts had signs of use-wear, with the majority being waste shatter rather than deliberate flaking (Prickett 1992:95-6).

Most sites contained a range of other lithic materials, with by far the greatest range recovered from Oruarangi, followed by Raupa. The other sites had occasional items, such as the sinker, float and

grindstone found at Waiwhau. Small flakes and cobbles of other stones were recovered from all the sites.

At Opita in Squares F and H the artefacts in layer 8 (argillite adze, nephrite piece and chert flake) are relatively rich, especially considering the small area opened up, and indicates that this was an important kainga at that time, possibly associated with an occupation at Raupa in the late pre-contact. The chert flakes and pumice items in layers 6 and 7, associated with the lower midden, suggests a range of activities taking place. In layers 4 and 5, which related to the period of Opita pa, there was a gunflint, which indicates that at least one of the inhabitants had a musket, while the waste chert may indicate they also used chert for tools on occasion. The assemblages from these areas are consistent with the range of lithic material also brought to Waiwhau and the Puriri sites, but distinctly different to the range and variety of materials and artefacts found at Raupa and, especially, Oruarangi.

4.14 Miscellaneous

A small number of miscellaneous items were also found, including burnt clay nodules, coprolites and leather items (see details in Appendix 15). The burnt clay was thought to be the accidental residue of burning, such as hearths or hangi on site, while many of the items including the leather related to the farming period. No further analysis was undertaken on these.

5. Discussion

Information recovered from these investigations concerned the local environment, the number of different settlements within the Opita area, activities of the inhabitants, changes over time, trade and exchange networks, and relationships to other sites. In particular, the four identified phases of occupation on the river terrace in Squares F, H and Trench C show changes in some economic aspects, but continuity in others. Materials from this part of the Opita excavations can be compared to the smaller assemblages to create a floating chronology. Finally, Maori and European historical information can be compared and contrasted to these findings in order to provide a richer interpretation.

5.1 Local environment

Over time, the meandering Waihou and Ohinemuri rivers wore down the underlying silty clays and in turn deposited sands and silts during times of flooding (Figure 94). Layers of river silt were recorded at Opita, Raupa and Waiwhau. The result of these inundations was a depositing of fresh soils and nutrients on the river banks, which were the natural river levees. It was these soils that were gardened, while the heavier silty clay ground could probably only be cultivated after the introduction of potatoes, which are more tolerant of such soils than kumara, as was suggested for Waiwhau (Phillips and Green 1991). Certainly at Opita, the poorer-draining silty clay and silty clay loam was drained on several occasions by both the Maori occupants and later farmers.

In a substantially flat landscape, any elevation is noticeable and important. Work at Waiwhau demonstrated that the older clay ground was about 50 cm higher than the newer river silts at Raupa. At Opita, the remnant higher area of poorer-draining clay rose to the east above the sandy silts to the west and north on the old river terraces.

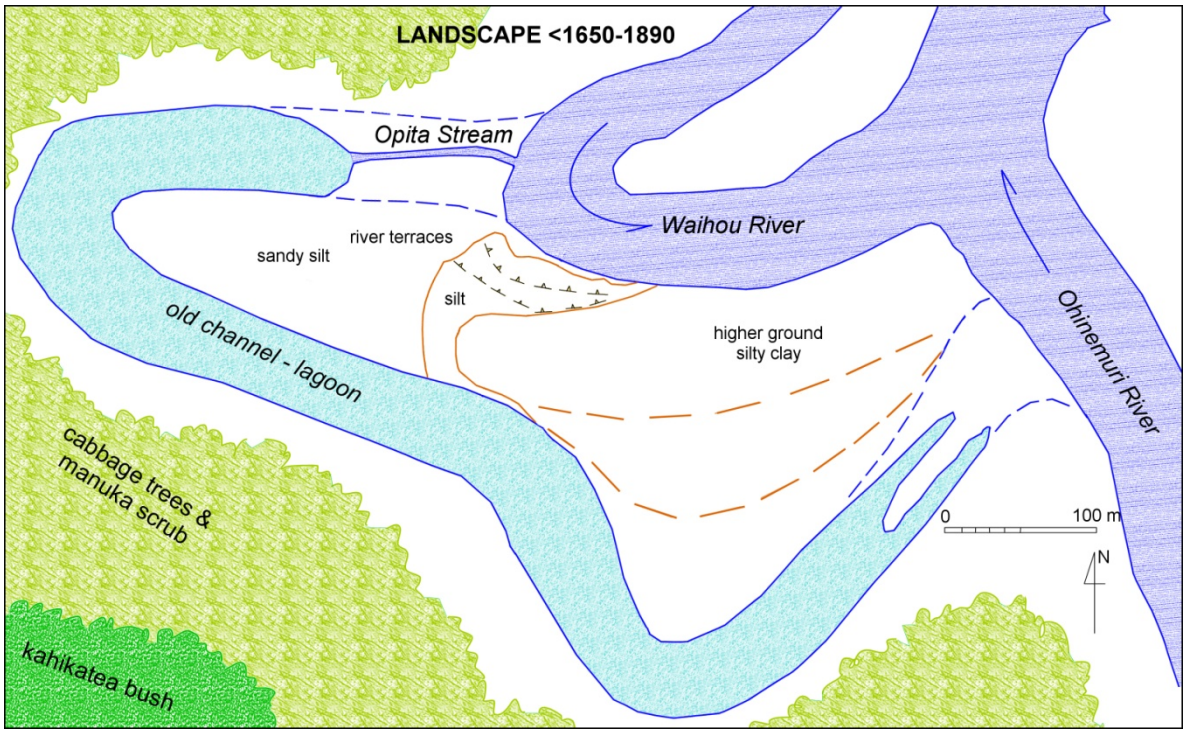

Figure 94. Environment at Opita, based on 19th century survey plans and soil analysis.

At some time in the past the Ohinemuri River had cut through a sharp bend south of Waiwhau leaving a lagoon, which almost surrounded Opita. At the northern end the channel was probably open until sediment brought down the rivers with floods during the first half of the 19th century (layers D and E, Figure 60) blocked the flow. The 1879 survey plan shows a narrow channel, called the Opita Stream in the MLC records, possibly dug for an eel pot or hinaki, which drained the lagoon water.

Sometime prior to the mid-17th century, Maori cleared this land for gardens and occupations. The charcoal recovered from cooking fires and local burn-offs suggested that the vegetation at the time of the settlements was similar to that shown in the 19th century survey plans, with a broad cleared strip along the river banks, with flax swamps and kahikatea forest set further back (Figure 94, see changes in the different plans in Appendix 17). In 1843, the naturalist Ernst Dieffenbach described the vegetation at the Ohinemuri junction as "fern, Dracaena australis [cabbage tree], Leptospermum [manuka], with some rushes; here and there also a little grass". He also commented that firewood was rather scarce (1843 Vol I:410). By 1883, when SO 3421 was drafted (Figure 3), the Maori population had declined considerably, particularly in inland areas, and consequently the areas of regrowth manuka scrub were probably more extensive than they had been formerly.

During the Maori occupation of Opita it is likely that small groves of manuka and other secondary shrubs and trees grew on abandoned gardens and along the sloping river banks. These were the sources of most of the firewood, together with timber from abandoned structures. Flax, raupo and other water plants grew in the swampy areas around the old cut-off river bend and other low-lying places, and in turn would have attracted birdlife, while the rivers would have been home to freshwater fish and especially the short-finned eel (Ayling & Cox 1987, Fleet 1986).

It was probably proximity to the two major rivers, defensible higher ground, natural river terraces, good gardening lands and low ground by the old Ohinemuri channel where canoes could be beached (until the early 19th century canoes could have been paddled round to the western end of the Opita peninsula), that made Opita a very favourable location to settle. In addition, Opita was at the junction of the routes north along the Waihou River to the Firth of Thames, east up the Karangahake Gorge to the Bay of Plenty, and south to Matamata and the Waikato. At times, Opita would have been a busy hub, while people waited for a change of tide to canoe downstream or rested before continuing their journey. However, relationships with those other districts were not always peaceful, as witnessed by the three different pa at the river junction and the historical accounts.

Living on the Hauraki Plains also had its environmental drawbacks. At times of heavy rain the rivers flooded, especially during the winter when the ground was already saturated. However, the water probably did not remain on the banks themselves, but did stay on the lower land and around the swamps, especially during the wetter winter months. Dieffenbach, travelling through the plains in 1843 described such an event (Dieffenbach 1843 Vol I:416). One result of these floods was that Waihou Maori tended to store their crops in above-ground pataka (store houses) and whata (raised stages) rather than in underground kumara storage pits, as shown in Merrett's painting and the pataka along the Ohinemuri River (Figures 6 and 7). Only the earliest levels of the investigated sites along the Waihou River had semi-subterranean storage pits (Phillips 2000a:149). This may be an indication that floods became more frequent following Maori firing of the vegetation c.1300 (McGlone and Wilmshurst 1999:11).

Modification to the environment during the twentieth century has greatly altered the topography and survival of the archaeological sites. Rock flour from gold mining in the Ohinemuri River catchment covered and protected the lower-lying settlements, but the frequent inundations also resulted in the construction of stopbanks to prevent flooding of the towns and farmland, for which any elevated ground was borrowed. This practice destroyed, or severely damaged, sites on the higher ground, including Opita pa, making its size and shape difficult to define.

5.2 The Opita settlements

The Opita excavations located ten areas with archaeological evidence that represented intermittent occupations over 300 years (Figure 95). The main settlement is represented in the materials from Squares F and H with the adjacent Trench C on the river terrace. To the far west was a settlement at Squares A, D and J and the intervening section of Trench T, while to the far east was Square M and the adjacent part of Trench B (midway between Opita and Waiwhau pa), and in the centre there was a kainga in Trench B and Square S.

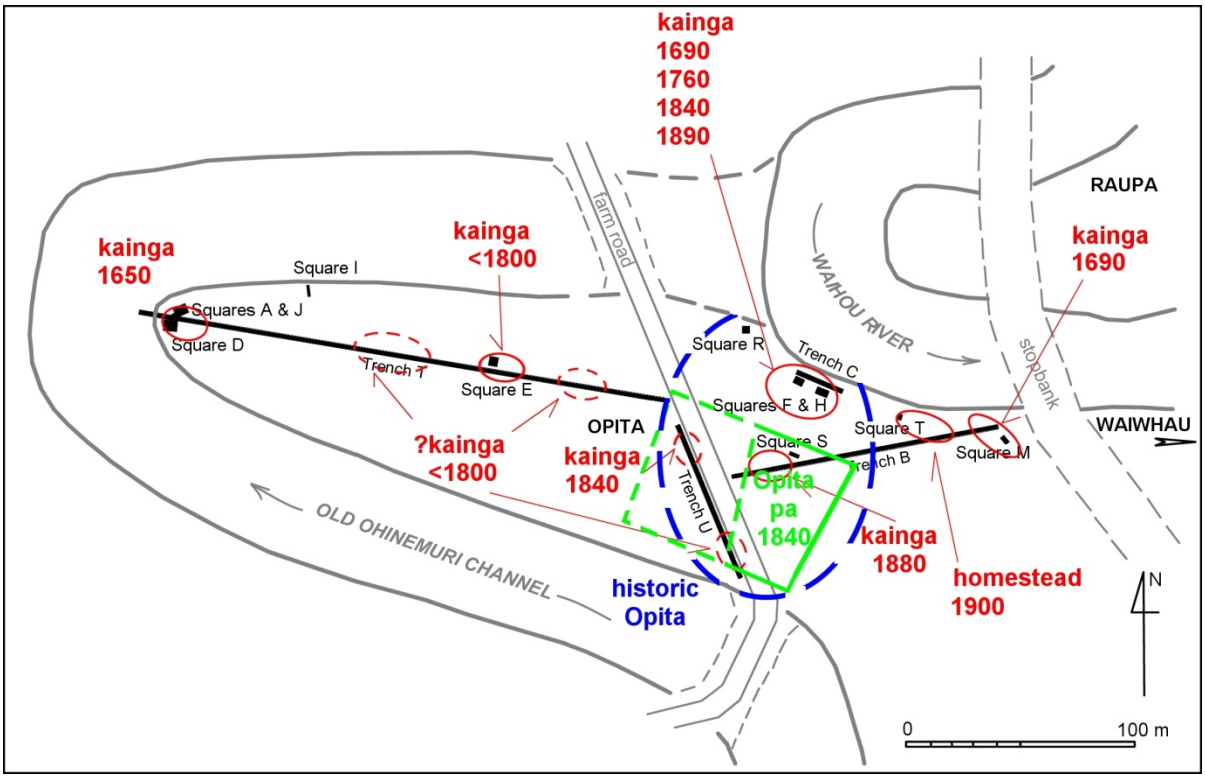

Figure 95. The Opita settlements found in the excavations, with estimated chronologies. The possible extent of Opita pa is outlined in green and the 19th century historic settlements at Opita is indicated by a dashed blue line.

In Square E and part of Trench T, also Trench B and Square T, collections of items with nearby postholes and other features observed in the sections indicated places where there may have been other small settlements (the latter might have been a farm homestead). In addition, there were possibly four other small settlements near Trenches T and U which have only been detected by a scatter of objects (shown as dashed ellipses in Figure 95).

The remnants of the pa, represented by traces of the ditch and possibly artefacts mixed with those from other later kainga, overlapped with two or three of the kainga in Trenches U and B (depending whether or not the defences extended further westward as shown by the dashed green line in Figure 95). The pa appeared to have been defended by palisades possibly 2 m high, with a ditch measuring 3-3.5 m wide and 0.8-1 m deep.[35] As this was a late, gunfighter pa, the palisades may have been erected on a low bank outside the ditch and this is suggested in Merrett's sketch, which fails to show

35 The ditch sections excavated have been deepened to compensate for the later loss of soil.

an external ditch. The small defended area was probably rectangular, extending over some 2,100 m2 if the smaller size is accepted or 4,800 m2 if the larger size is chosen. Unfortunately, the pa construction and internal layout could not be determined since the majority of the fortification has been destroyed by earthmoving, probably during the construction of the original stopbank in 1913.

5.3 History of settlement

Five of the identified kainga would appear to represent short term, possibly single period occupations, with three (in Square S/Trench B and Trench U) either pre- or post-dating the former pa. This is in contrast to the kainga identified in Squares F and H and the adjacent Trench C, which showed a complex history of occupation and reoccupation on a natural terrace beside the Waihou River. The proposed dating and the evidence used to identify the sites (except the possible kainga), are shown on Tables 15 and 16 below (see locations in Figure 95).

In relation to the pre-European times, indicators of chronology at Opita are based on the comparison of flood deposits with dated layers in neighbouring sites of Raupa and Waiwhau. In particular, two flood deposits: a silt from the Waihou River dating c.1720, and a later one of Ohinemuri sands c.1810, overlapped the river terrace settlement. These sealed the first two phases on the river terrace. A later flood could be dated by historic material above and below it to c.1880. For those areas not affected by the flood deposits the range of fauna, obsidian, hangi stones and tree species used for firewood allowed a grouping of those areas that were most like each other.

Occupations identified fall into four phases:

- Phase 1 c.1650-1690 CE
- Phase II c.1750-1800 CE
- Phase III c.1840-1850 CE
- Phase IV c 1880-1900 CE

The eight earlier settlements at Opita (Phases I and II), were scattered throughout the old river bend, and may have been outlying gardening kainga associated with occupations at Raupa pa, and possibly Waiwhau. This evidence is consistent with a time when there may have been several hundred people living in the area, especially when Raupa was being defended against incursions from the south and east. The kainga are characterised by the presence of higher proportions of Waihi obsidian, structural evidence (post, stake and slot holes, drains and hangi) and, where midden is present, a higher proportion (80-95%) of pipi relative to cockle and the presence of dog bones.

Four of the kainga, including two layers on the river terrace, could be dated by the presence of items that were manufactured after a certain date and historical references to Phases III and IV (see Tables 15 and 16). The first recorded European visit to the Opita area was in 1820, semi-permanent traders and missionaries did not arrive until the early 1830s, while settlers came in the late 1830s. However, Maori from this area had contact either indirectly with Europeans in the Bay of Islands from 1815, or were present at other locations where Europeans had visited over the previous 50 years since Captain Cook in 1769. Therefore, although it was possible that European material could date from the time of Cook, it is more likely that exotic material became part of Maori life after 1830.

After the abandonment of both neighbouring Raupa and Waiwhau and their use as urupa, Opita became the main area of settlement at the river junction and the pa was built there. This is termed Phase III. At first the pa was built for the safety of the nearly residents during Taraia's fight with Ngaiterangi. After peace had been made, the MLC accounts suggest that Ngati Tamatera left for the Coromandel, but that Te Uriwha and Ngati Hako remained. In this period Opita continued as a meeting place, where the missionaries came to preach and teach, and as a stopping point in travel up the Waihou River towards the Waikato. The locality is marked on several maps until 1855 (Figure 8) (Allen and Phillips 2013).

Table 15. Contents of four Opita kainga, homestead and pa (see location Figure 95), continued in Table16.

kainga	*Squares A, D, J Trench T 9-30 m*
obsidian	18 flakes, 61% Waihi, which is twice the lowest part of Square F
hangi stones	23 stones, 47% type A similar proportion to those from Square F, but not Square M
chert	7 chert
other lithics	2 sandstone & 2 other
charcoal	47% forest species, mainly matai & tawa, probably from burnt structural timber
fruit stone	hinau
postholes	overprinting of postholes and stakeholes made it impossible to define any particular features
hangi/midden	rakeout from a fire, no evidence of shell, one fragment of unidentified mammal in area examined
historic items	none - bottle, shotgun cartridges and nail are all in topsoil or rock flour layers
date	?1650: due to the use of Waihi obsidian
kainga	*Square E, Trench T 152-167 m*
obsidian	not in this section of Trench T but scattered in area generally
hangi stones	3 stones
chert	3 chert
other lithics	1 volcanic & 1 unidentified
postholes	group of postholes, stakeholes, slot - no clear feature defined
hangi/midden	no sign of cooking in area investigated
historic items	none
date	prior 1820: probably pre-European contact
pa & kainga	*Square S, Trenches U 60-80 m, B 9-28 m*
obsidian	20 flakes, 25% Waihi, similar to Square F
hangi stones	11 stones, mostly not identified
chert	2 chert
other lithics	1 volcanic & 1 unidentified
writing slate	1 writing slate parallel lines & grid on reverse in B
ceramic	2 earthenware in B & S, no date
clay pipe	1 pipe, no markings
bricks	1 brick in B
glass	3 - spirit bottle in B & S, condiment bottle in S
metal	collection of metal in S, nail, handle, chain, stirrup, hinge
bone	2 pig in B, 1 cattle bone in S
charcoal	54% forest species, mainly tawa possibly from burnt construction timber
kauri gum	fragments in B & S
postholes	occasional postholes and base of ditches/drains
hangi/midden	no defined midden, but areas of burning some of which may be rakeouts from cooking
date	mixed deposits from pa 1842-46, settlement at S & B c.1880 from spirit bottles 1870-1890
homestead	*Trench B 87-93 m, Square T*
hangi stones	5 stones, only 1 included in analysis
ceramic	13 burnt earthenware & porcelain items, inc., toilet dishes, jug, bowl, cup, plates in B
glass	2 melted glass objects, inc., gin bottle & ornamental glass in B, beer bottle in T
metal	1 nail in B, ?bed frame and nail in T
features	no features in B or in test pit Square ,
hangi/midden	lenses in charcoal in B, associated with burnt items
date	c.1920: ceramic mark in B dates after 1884, bottle in T post-1900, could be first farmhouse
kainga	*Square M, Trench B 111-119 m*
obsidian	30 flakes in M, 30% Waihi, same as lower levels of Square F
hangi stones	153 stone, including 121 from the midden, 33% of identified type A, different to other areas
chert	3 chert
bone	1 each bird, fish and dog, like lower level of Square F
charcoal	mostly shrubs burnt, especially manuka (61%)
postholes	some in & below midden in M & B, not large enough area to determine their function
hangi/midden	several hangi and pipi/cockle shell midden seen in M & B
historic items	none
date	?1650-1690: may be same as lower level of Square F

Table 16. Contents in the different layers of the river bank kainga, Squares F, H and Trench C (see location Figure 95) and compare contents to Table 15.

kainga	*Squares F, H & Trench C - layer 3*
hangi stones	16 stones in H, only 4 identified none type A
other lithics	1 unidentified
ceramic	10 items, including cup, dinner & tea plates, mainly blue transfer & banded earthenware
clay pipe	5 pipes plus 2 stems dating 1860s
bricks	2 fragments of different bricks
glass	1 each bottles vinegar, beer & gin
glass beads	4 amber beads
metal	22 items, including nails, key, file, bracket, tins, fork, bolts, lead shot, cartridge cases
bone	2 cattle, 4 pig, 1 bird
charcoal	all manuka firewood and burnt structural timber, 8 peach stones
kauri gum	3 small pieces
postholes	only 1 posthole & farm drains, including reworking of earlier one in H
hangi/midden	hangi scoops in H & C, but no midden in areas investigated
date	c.1890: bottle dates 1880-1915, saucer 1891-1902, layer 3 sand probably dates c.1880
kainga	*Squares F, H & Trench C - layers 4 & 5*
obsidian	16 flakes, mix of Waihi 12%, Coromandel and Mayor Island, like Waiwhau
hangi stones	78 stones, 56% type A, plus other stones also used for heat retainers
chert	5 chert, 1 gunflint
other lithics	4 unidentified
writing slate	1 writing slate and 1 pencil
ceramic	3 fragments of jug and plate
clay pipe	8 pipes date post-1830
glass	1 bottle, window glass
glass beads	1 each: blue and multifaceted amber bead
metal	8 items, nails, wire, iron & lead sheeting
bone	3 pig, 2 dog, 5 fish, 2 birds
charcoal	25% forest trees, other mainly manuka
kauri gum	7 small pieces
postholes	postholes of house in F, and possible fence in C, plus drain around cooking area in H
hangi/midden	series of hangi in H, hangi and cockle/pipi shell midden in F
date	c.1840: clay pipes date post-1830, probably same as pa 1842-46, layer 5 sand dates c.1810
kainga	*Squares F, H & Trench C - layers 6 & 7*
obsidian	60 flakes, Waihi 25% same as M, different to A/D/J/T & layers 4/5
hangi stones	48 stones, 84% type A
chert	1 chert
other lithics	2 pumice, 1 unidentified
bone	1 dog, 1 fish, 1 bird
charcoal	33% forest tree, other mainly manuka & hebe
postholes	post and stakeholes in H no clear structure, 2 windbreak fences in F
hangi/midden	hangi and pipi/cockle shell midden in F/C
historic items	none
date	c.1760: layer 7 silt dates c.1720
kainga	*Squares F, H & Trench C - layer 8*
obsidian	13 flakes, Waihi 46% between layer 6/7 and A/D/J/T
chert	2 chert
other lithics	1 argillite adze, 1 nephrite
postholes	scattered post & stakeholes, no clear structure, drains across living floor
hangi/midden	hangi but no midden in area investigated
historic items	none
date	c.1690: layer 7 silt c.1720 postdates this layer

Phase III is also characterised by the presence of ceramic tableware, glass bottles and beads, clay pipes, pig bones, metal items, kauri gum and writing slates and pencils, in addition to shell midden, hangi, and stakeholes and postholes.

During the uncertain period of the 1860s and 1870s, the main area of occupation appeared to be along the Ohinemuri River, near the intersection of the tracks leading up the Ohinemuri and inland to Matamata (Figure 9). One reason for the shift was to guard the entrance to the Ohinemuri against the gold miners. After this time, in Phase IV, Opita became essentially a place for running stock (horses, pigs and cattle), and obtaining timber for sale. This history is consistent with the spread of historic materials, probably from a handful of dwellings and related structures, which are limited to a much smaller area around the former pa and adjacent river terrace (see Table 16). In this phase there was a greater number of ceramic tableware, bottles and metal items, peach stones, kauri gum, cattle bones and pig bones.

5.4 Consumption, trade, exchange and gifting

Archival and archaeological information combined give a good idea of the changing economic pursuits practised by the residents of Opita. Over the full period of occupation of the Opita area, food procurement included gardening, arboriculture (peaches and cherries, but not karaka), birding, eeling, flax gathering, managing stock (dogs, cattle and pigs), and travelling downstream to fish and gather shellfish. Evidence is present at Opita for most of these activities, while others are highly likely due to the location and the historical accounts (Figure 96). Goods acquired and used by the inhabitants included a range of lithics, kauri gum, and a range of exotic items. Archaeological evidence is present for many of these items.

The original source for most of these items is known, although the actual route from that source to Opita and intermediary stops on the way can only be guessed for some items. Of the various materials found in the occupations, most were local, a few came from the wider region or throughout Aotearoa/New Zealand, while yet others were introduced from overseas. Some products were manufactured at Opita, many were brought there to be used, while other resources were brought there to trade for other goods.

Within 200 m of Opita, material that could have been harvested included firewood, peaches and livestock (dogs and pigs were probably reared on site). Birds may have been hunted from the nearby lagoon (a range of flax, raupo and other wetland plants would have attracted duck and tui). Fibre, fruits, firewood, timber and eels, as well as cultivated plant and tree crops, were also locally available.

Slightly further afield, but still within the rohe of the local tribes, hangi stones and possibly chert came from the Ohinemuri River bed upstream (these may have originally been available closer to the site, but nearer sources may now be covered due to siltation of the river bed). Kauri gum must have been dug from the hills and brought down to Opita, where it was prepared for trading[36].

Obsidian came from three sources to the east outside the immediate tribal rohe: Mayor Island, Waihi and east coast Coromandel. Obsidian cores or flakes could have been collected when the inhabitants travelled east up the Karangahake Gorge, or exchanged and gifted with people from those places.

36 At Raupa kauri gum was used in pre-contact times, but at Opita it was only found with 1840s or 1880s deposits.

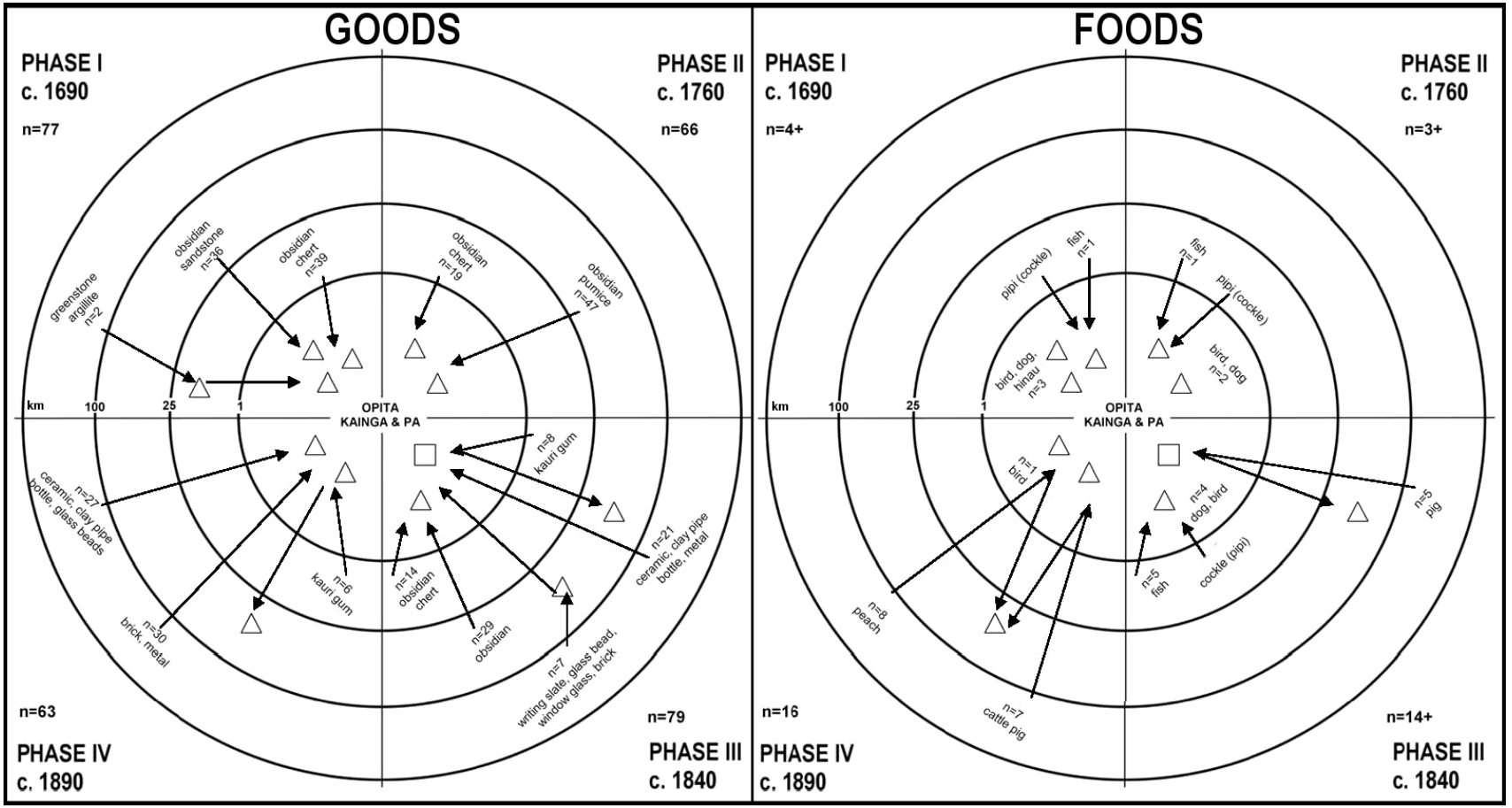

Figure 96. Model of changes in trade and exchange over time from the material found at Opita (triangle=Opita kainga in each phase, or external settlements, square=Opita pa, n= number of items except for shellfish, distances are 1, 25, 100 and greater kilometres from the site).

The types of material present on site varied over time. In the first two phases at Opita, the presence of obsidian, chert and adzes suggests wood-working, which may have been to build houses and storage structures (whata and pataka), the manufacture of hinaki and eel weirs, implements associated with gardening and food processing. Unlike Raupa and other larger pa such as Oruarangi, there is no evidence of bone working or adze manufacture at Opita. The finds of nephrite, argillite and basalt demonstrate extensive trade and exchange networks, though each of these items shows reworking, so such contacts may not have been direct. In any case, these items are very few in number compared to Raupa. Pumice, sandstone and other stone (except hangi stone) would also have had to be acquired from outside the immediate rohe.

Fish and shellfish presumably came from the mouth of the Waihou River and the shores of Tikapa Moana (Firth of Thames) to the north, or exchanged with those living downstream. Opita is near the end of the tidal flow of the Waihou River and canoes could travel with the tide, to and from the Firth in a day.[37]

In Phase III, after the Ngapuhi incursions, Maori, of necessity, became much more involved in trade with Europeans. At first this was to obtain muskets, but later other goods such as metal tools, clothes and tobacco were sought.[38]

From 1830 to 1840 in particular, much of the foreign material (ceramic tableware, metal nails and house fittings, clay pipes, tobacco, bottled alcohol and condiments) came to Opita as a result of exchanging local goods, such as potatoes, pigs, flax, timber and kauri gum, with traders who travelled up and down the Waihou River (Waitangi Tribunal 2006:61,1142).

After 1833, when the CMS missionaries established their station first at Puriri and then Herewaka in Thames, items such as writing slates and trade beads might have been acquired when the missionaries preached and taught at Opita, while other items might have been in exchange for labour such as paddling canoes and building houses. When the first lands were sold to Europeans in the late 1830s, often it was in exchange for such goods. The materials given by McCaskill for the Opukeko Block, which included Opita, are an example of the range of goods (see section 2.2.6 in "Historical Setting of Opita").

Some of these new materials were used by Maori living at Opita, while others may have been grown, raised or prepared for markets at Auckland and later Paeroa and Thames. It is quite likely that the pig bones were evidence of pigs being bred essentially for sale (though a few were clearly eaten on site). The *Daily Southern Cross* (3/11/1854) notes the arrival in Auckland of ½ ton of pork from the Thames (Waihou River) aboard Nicholas' vessel the *Nga Huia.* The kauri gum found was the scraped remains from the resin preparation that was then traded to the merchants. Peaches were also commonly sold.

From the 1870s, Phase IV at Opita, cash became a significant part of the Maori economy (Monin 2001:222) and these new items could have been bought in the nearby townships of Paeroa and Thames. At this time the Opita area was being used to run horses, cattle and pigs, while timber and flax were being cut to sell to local mills.

The diagrams in Figure 96 show the changes over time in patterns of trade, exchange and gifting derived from the materials found on the Opita kainga and pa, with the circles indicating increasing distance of the source of the goods (to left) and foods (to right) from Opita. In some cases these items

37 In 1820 Marsden and his group travelled up the Waihou River, from Kopu to Raupa, taking a day "with a fair wind and tide", but he makes no mention of whether they stopped for breaks (Elder 1932:255). Selwyn's party struggled against the tide in 1843, taking 3 hours from Herewaka to Puriri and a further 12 hours to Thorp's house (Selwyn 1847:23). Cooper wrote about a trip taken by Governor Grey and Te Heuheu and their party, in which they travelled from Kopu to Thorp's house in about 8 hours, but although the tide was apparently low when they started they made no mention of how strong it was later in the day (Cooper 1851:14, 16).

38 At this time there was a preference for tobacco over alcohol, and the latter was not taken up by Maori to any degree until later in the 19th century, and all the datable alcohol bottles found at Opita post-dated 1870, see Appendices 9 & 16.

were not consumed, or only partly consumed, at Opita with the remainder being traded off the site. Knowledge about trade in the two later periods comes from historical accounts, and it is possible that some materials were also exchanged in the earlier periods in a similar pattern to the kauri gum, pigs, cattle and peaches. However, some items that might have been exchanged at this time (such as dried eels and dressed flax) required no specialised non-organic materials to manufacture them, and are consequently invisible in the archaeological record.

Clearly there were changes in patterns of consumption, as well as those of trading and exchange. Phase I was a time of exchange and gifting with a wide circle of networks, probably due to the influence of nearby Raupa. Phase II was similar, but appeared to have fewer long-distance connections. Phase III signalled the beginning of trade relationships between Opita residents and settlers in Auckland, also education through contact with the missionaries from the Herewaka Mission (near Thames). By the end of this phase many foods were cultivated, stock was reared and goods were manufactured and taken by Maori directly to Auckland to obtain foreign goods (Hargreaves 1959). It is only in Phase IV that there is evidence for a different type of production, from the previously more intensive one based on eeling, pig-raising and horticulture, to one of less intensive grazing, flax gathering and timber milling: Opita had ceased to be a place of residence.

5.5 Continuity and change

The evidence presented above describes changes that took place at Opita, however, there were also continuities.

Some of the transformations in the lives of the inhabitants over the first half of the 19th century involved mass migration, changed settlement size and distribution, reduction of political hierarchies, new elements in economy and technology, and population decline. Although these changes appear very dramatic, these were not uncommon events in Maori life prior to European contact.

On the surface the biggest, and apparently most disruptive event, caused indirectly by the Maori response to European introductions, was the migration of the majority of the inhabitants from Hauraki to Waikato after the Ngapuhi incursions. In pre-contact times, similar events had occurred in Tamaki (Auckland), in which it was evident that processes of abandonment of a home territory, temporary residence with another group, followed by a return and subsequent reciprocity to their hosts were well worked out (Sullivan n.d.,:100-5). Therefore, the move inland was probably part of a normal cycle of pre-contact Maori economic and political life along lines of kinship and past associations. The only difference in the Hauraki case was that Ngapuhi owned the newly introduced and much-feared muskets and were arriving after successful battles against Ngati Paoa. Extreme mobility of groups and flexibility of alliances was a noted aspect of Maori society, therefore the effect of the migration was probably much less disruptive than it would have been in a sedentary population. As Allen stated:

> … the mosaic of groups scattered across the landscape not only provided access to different resource zones and thereby allowed the intensification of production but also intensified social life through exchanges between residents, visitors, landowners, guests, and commoners and chiefs (Allen 1996:670).

Many Waihou Maori spent up to 10 years in the Waikato, while a few others remained along the Waihou and the Coromandel Peninsula. After the return from Waikato, the focus of settlement changed. Large pa such as Raupa associated with ariki (paramount chiefs) no longer existed. Although Taraia, Te Hira and others were named as major chiefs in the 19th century, the hierarchy of chiefs with ariki at the apex no longer seemed to be present. This was despite the fact that ariki had lived in Hauraki in pre-contact times and existed elsewhere after contact, including Hongi Hika of Ngapuhi and Te Wherowhero of Waikato (Ballara 1990:201-2; Oliver 1990:526-8). It may be that this larger

polity was a relatively new development attempted by several tribes throughout the 18th and 19th centuries (Sullivan n.d.; Phillips 2000a:164; Sissons et. al 1987:147-50), but as it was not firmly entrenched in the existing socio-political organisational structures, it may have been inherently unstable. Certainly the Ngati Tamatera chief, Taraia, continued to maintain the power relations of previous times in fighting his people's traditional enemies up to the mid-1840s, when peace was being encouraged from all sides (Allen and Phillips 2013). However, despite the apparent lessening of inter-tribal conflict and development of permanent towns, ahi kaa was still very important in maintaining tribal lands for economic, as well as political and social purposes, as evident by Rapata Te Pokiha placing his people on Opita.

Economic relations were also very different after the Ngapuhi raid. In the Bay of Islands new crops formed the basis for an expansion in production after 1815, especially as it was:

> The great quantity of potatoes and pigs required by Europeans for each musket [which] made it imperative for Maoris who were ambitious to acquire quantities of firearms to expand their food production to a maximum (Shawcross 1966:270).[39]

Similar developments may not have occurred until the 1830s and 40s in Hauraki. At the same time as change there was continuity. Eeling was the most frequently mentioned economic activity in the MLC records, with the widening and straightening of streams in which to set weirs and pots (possibly like Opita Stream) and construction of eel weirs such as Moanakapiti near Opita, date from the mid-17th century to the mid-19th century (Phillips 2000a:57).

Clearly Maori eagerly sought European goods, not only those with obvious economic benefits (such as potatoes, pigs, iron, cloth and muskets), but also those which had acquired a high status, such as schooners and flour mills. In fact, they "... engaged in the European order, selectively and adaptively, to serve Maori purposes" (Monin 1995:197). Despite the European presence, Hauraki was still a tribal landscape, owned and used by them until the reduction in the Maori population associated with debt, land sales and gold mining in the latter half of the 19th century.

Of the locations excavated or analysed as part of the Opita project, a detailed sequence is only available for Squares F, H and Trench C on the river side terrace (Figure 97).

The evidence for continuity is found in structural remains, particularly the presence of a windbreak, a probable house, scoops and drains, postholes and stakeholes, and the presence of middens in Phases II and III. At Opita, methods of cooking in hangi, drainage around living sites and the building of kainga on the river terrace were unchanged up to the late 19th century. According to Haora Tareranui the first European-style house was not built at Opita until about 1895, although the squared postholes of the structure dating around 1840 indicated that metal spades might have been used to dig the postholes. This combination of the old and the new is also evidenced in Te Pai o Hauraki meeting house. Built near Colville around 1838 and now in Paeroa, the meeting house was carved with metal tools, but contains no nails or bolts, being joined and bound with fibre (Tuora and Royal 2000:167-168). The landscape of Opita, with its distribution of kainga over time suggests that mobility was also a continuous aspect of Maori occupation.

[39] Belich (1996:159) suggests the name 'Potato Wars' might be a more accurate description than 'Musket Wars'.

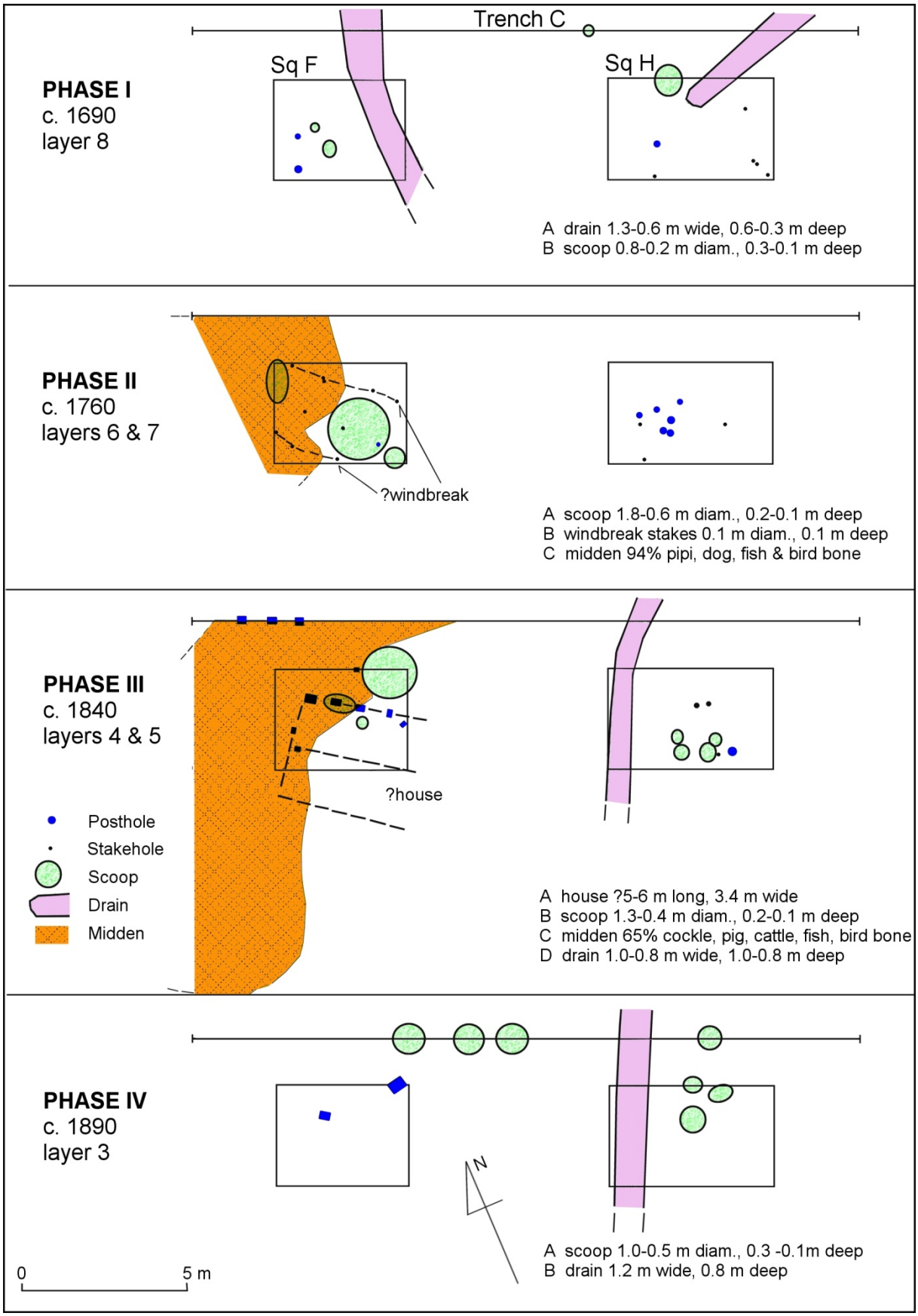

Figure 97. Changes and continuities at Opita. The various arrangements of features in Squares F, H and Trench C, in the four phases of occupation.

The evidence for change concerns the artefactual and faunal materials associated with these structures, including in the later midden an increase in cockle shells, the presence of pig, some glass and ceramics, and the decline of dog bones.

Earlier in this monograph and elsewhere (Allen and Phillips 2013), we question the extent to which the presence or absence of European-derived objects within an archaeological site might be an indication of cultural or economic change on the part of Maori. The presence of material obtained from a European source is indicative of trading relations, but once in Maori hands might be used in a Maori manner, or take on a Maori meaning and be disposed of within a Maori archaeological context. Exploring these issues brings us to the edge of essential classification and the folk-use of terms such as Maori and Pakeha during the 19th century, when Maori might be living in a Pakeha-style house in Auckland and a Pakeha in a whare on the Waihou. In terms of the measurement of change, however, the archaeological context remains significant. Here it is the manner in which a site is structured and the relationship between features and objects that offers clues as to what is going on.

At Opita, in Square F levels 4 and 5, we recovered a small number of pig bones, some ceramics, bottles, window glass, clay pipes, a gun flint, nails, wire, writing slate and glass trade beads. However the archaeological context was one which exhibited considerable continuity with earlier levels in the same Square (levels 6 and 7) in terms of the structural organisation of the remains: shell midden, postholes, a probable house structure, drains and hangi scoops, and the use of obsidian and chert. This was sufficient for us to conclude that the organisational structure of the site at the time conformed to a Maori way of life, and that the presence of trade goods and goods being traded (such as pigs and kauri gum) reflected Maori social and economic arrangements more than European ones.

We might contrast this with T12/318 and T12/883 on either side of the Puriri Stream, excavated by Bedford (1994:193,199). These sites appear to be younger than Opita Square F level 4 (i.e., c.1880 rather than c.1840), and a much greater number and range of bottles and other material obtained through trade was present. Additionally, in T12/318, people appeared to have adopted a European-style house. Nonetheless, despite a change in what might be termed ‘stage props’, the context continued to be a Maori one and the change was from Maori culture defined in one way, to Maori culture defined in another, no less authentic, manner.

6. Summary

These investigations at Opita have provided a number of rare opportunities.

Firstly, the four overlying layers at the riverside settlement seen in Squares F, H and Trench C were clearly separated by river sands and silts that retained the integrity of each individual occupation. This allowed the clear separation of the features and artefacts from each phase.

Secondly, the extensive trenching enabled the analysis of an additional eight probable kainga and one homestead across the wider Opita landscape, to add to the pa known from historical records. None of these were visible on the surface (the only evidence initially recorded was midden on the river terrace that became Trench C). Although it was found that ploughing had damaged the living surfaces of many of these kainga, an indication of their distribution could still be determined.

Thirdly, identification of the artefacts and deposits from Opita allowed a floating chronology to be created. This chronology could be dated approximately by reference to the findings from the neighbouring sites of Raupa and Waiwhau, datable historic items, plus accounts by Maori who lived there and by visiting Pakeha.

Fourthly, the artefacts and the features show both changes and continuities in Maori life over possibly three hundred years, spanning the period of early interaction with Europeans (Tables 15 and 16). Consequently, it is clear that the process of change following European settlement was complex and involved responses and adjustments on the part of both Europeans and Maori (Bedford 1996; Phillips 2000c; Torrence and Clarke 2000).

Fifthly, the additional historic accounts both by Maori and early Pakeha visitors allowed a richer interpretation of all the phases of settlement, in which the archaeology and historic data complement each other. Archaeological data relates strongly to the particular places where the investigations occurred, while the historical accounts are sometimes less specific as to place, but more precise in relation to time. The historic accounts also yield names and intentions that are not directly available or only inferred from archaeology alone. Some activities are revealed by the archaeology, whereas others are identified by the histories; neither included all that happened at Opita.

Finally, the material in the later phases includes items that were used at the site (tobacco pipe, alcohol bottles) in exchange for goods nearby (flax, timber); goods that were prepared on site for sale (pigs, peaches and kauri gum); foodstuffs that were cultivated, gathered, hunted or raised at the site for consumption by the inhabitants (dog, fish, birds, and possibly peaches and pigs); and items that were brought in for education of the inhabitants (missionary writing slates and beads). This is a complex mix of activities, production and consumption, which is a lesson for some of the interpretations of assemblages where historic accounts are not available.

To conclude, the Opita excavations have revealed broad spatial changes and continuities over an area of three hectares, as well as detailed changes and continuities in a smaller sector of the river terrace. Maori and Pakeha accounts have enriched the understanding of the material evidence and added substantially to the history of the district, complementing the previous investigations at Raupa, Waiwhau and Puriri. This work has also challenged ideas of cultural change and the interpretation of archaeological assemblages.

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Various reference collections were used, including Faunal Reference Collection, Anthropology Department, University of Auckland; Ornithology Reference Collection, Auckland War Memorial Museum; Reference Collection, Geology Department, University of Auckland. Historical references and illustrations were sourced from Alexander Turnbull Library, Wellington; Auckland City Library, including the Sir George Grey Special Collections; Land Information NZ; UK Hydrographic Office, Somerset; University of Auckland Library; and numerous digital sources (listed in the references).

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