

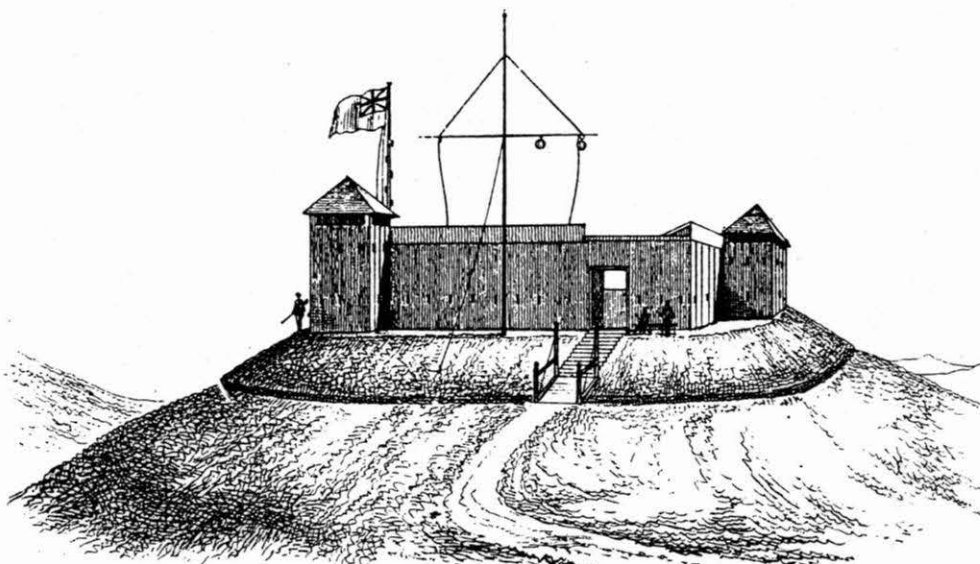


NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION MONOGRAPH 20:
Nigel Prickett, *Archaeological Excavations at the Omata stockade and Warea Redoubt,*
Taranaki



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J.E.A. From a Sketch by T. Good, Ens. T.M.

PERSPECTIVE VIEW OF THE OMATA STOCKADE, TARANAKI, N. Z.

ARCHAEOLOGICAL EXCAVATIONS AT THE OMATA STOCKADE AND WAREA REDOUBT, TARANAKI

Nigel Prickett

20

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION
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CHAPTER 1. INTRODUCTION

The New Zealand Wars arose out of a fundamental conflict between two peoples, one indigenous and the other intrusive, over who should have the land and what law and government should prevail. There was a small Pakeha presence in New Zealand from the start of the 19th century, but in 1840 with the signing of the Treaty of Waitangi, European people, almost all of British descent, began flooding into the country. By 1860 there were more Pakeha in New Zealand than Maori (1).

During the 1840s there were a number of minor military conflicts which were the result of Maori fears over the expanding European presence. These early campaigns did not result directly in the territorial expansion of European settlement. In the 1860s, however, a series of major campaigns resulted in much of the most coveted land in the North Island being taken from tribes previously in possession. Effective Maori opposition to European settlement and law was extinguished. The most important of these campaigns took place in Taranaki, Waikato, the Wanganui-Patea region, Bay of Plenty and the East Coast (Fig. 1.1).

European prosecution of the New Zealand Wars traditionally has been described in terms of military movements and engagements (2). A different approach, however, makes more sense of the process and its results. It was in fact the systematic taking of Maori land which secured victory. The campaigns in Taranaki and Waikato, and northward of Wanganui, may be seen as bringing about a much desired and deliberate expansion of the Pakeha settlements of New Plymouth, Auckland and Wanganui respectively. The political ambition of more land was achieved by the military process of an advancing frontier.

It was this strategy, more than any tactical or battlefield requirements, which resulted the construction of more than 200 field fortifications by the British army and colonial forces. The remains of these are now important elements of the historic landscape in many parts of the North Island. They tell the story of what actually happened during the New Zealand Wars.

THE NEW ZEALAND WARS

When systematic European settlement began in New Zealand in the 1840s, small forts were thrown up in times of alarm or military activity. The French at Akaroa built three blockhouses in response to the Wairau affair of 1843 and subsequent ill-humour among southern Maori (3). These were completed upon news of the sacking of Kororareka in 1845. Contemporary sketches show they were of the typical 'New England' style with two loopholed storeys, the upper overhanging the lower (4).

At Nelson, more closely affected by the so-called 'Wairau massacre', settler response included construction of a massive earthwork fortification on Church Hill, known as 'Fort Arthur', the south-east bastion of which survives today (5). Within the earthworks a stockade provided a second strong defensive line.

The first major conflict between British troops and Maori was the war of 1845-46 in the Bay of Islands district. European forces made little use of fortifications in this campaign. Colonel Despard who commanded the troops did not believe they were necessary.

After the July 1845 defeat at Ohaeawai the troops retired to Waimate where Major Bridge remained in command while Despard went to Auckland. Bridge ordered the construction of an earthwork defence for the dispirited force. Despard on his return ordered it removed.

"I could never admit that a European force of between 300 and 400 men well supplied with arms and ammunition and four pieces of cannon, required any rampart to defend them in open country against a barbarian enemy." (6)

The most remarkable European fortification of this period, and indeed the whole of the New Zealand Wars, was the Albert Barracks in Auckland (7). A loop-holed stone wall 3-3.5 m high enclosed an area of 23 acres (9.3 ha). The fort was completely flanked and accommodated a large body of men, as well as giving space to a parade ground, magazine, stores and other

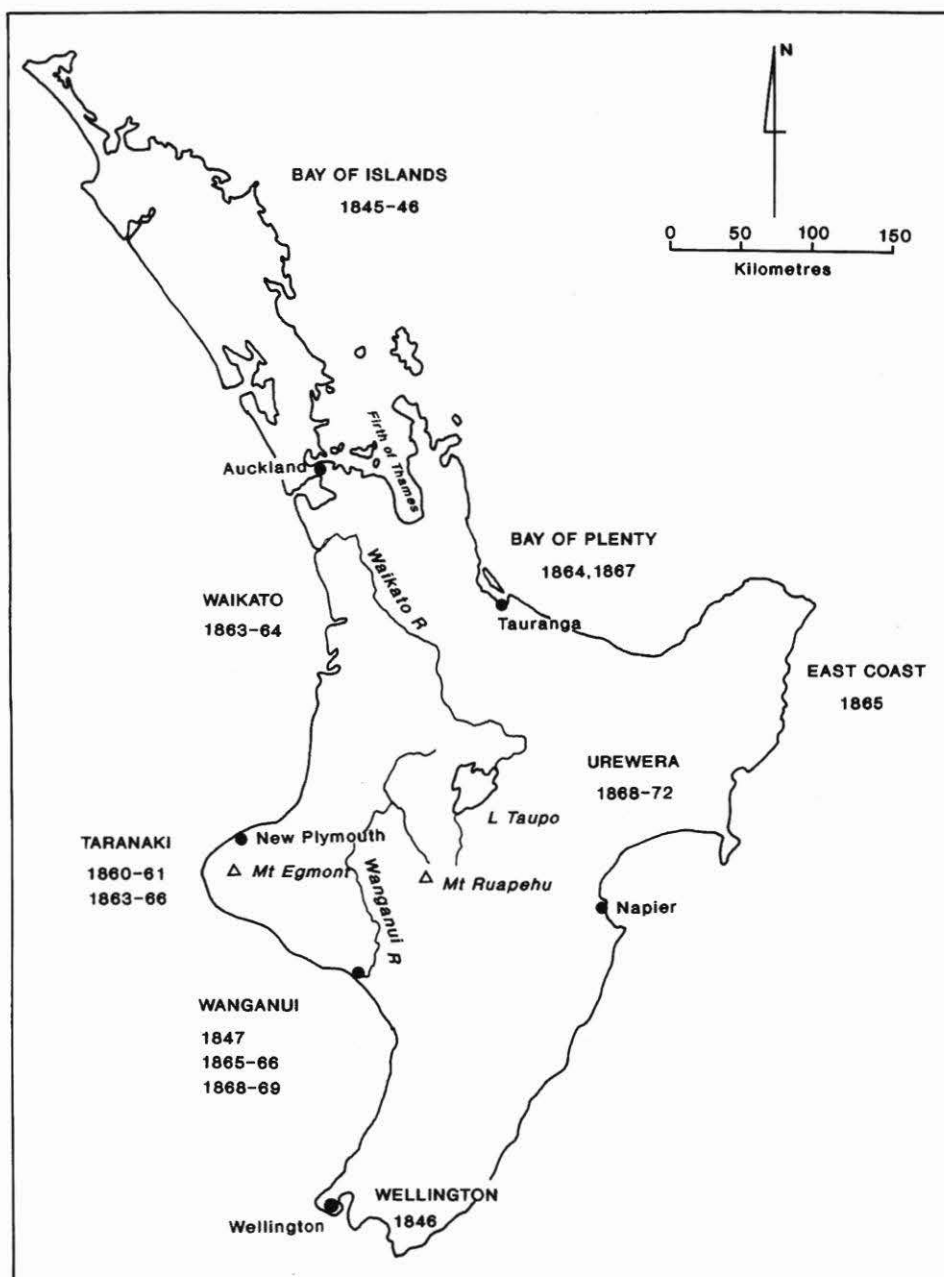


FIGURE 1.1. The North Island showing location of major campaigns of the New Zealand Wars.

buildings. A short length of wall survives in the University of Auckland grounds.

More use was made of fortifications during the campaign of 1846 in the Wellington region. Upwards of half a dozen small stockades were scattered through the bush, serving as refuges for isolated farming districts and as way stations for military movements along the Porirua Road (8). In Wellington earth-

work forts were built at Thorndon and Te Aro.

The most notable fort of this campaign was the Paremata Barracks, a two-storeyed stone building 60 x 44 feet (18 x 13 m), with flanking towers at two opposite angles (9). The building was rendered unsafe by the earthquakes of 1848 and 1855. Its ruins may be seen at the junction of Porirua Harbour and the Pauatahanui Arm, north of Wellington.

The third military campaign of the 1840s took place in 1847 in the Wanganui district. Rutland Stockade, which enclosed two blockhouses, and York Stockade on an adjacent hill, defended the infant town and provided accommodation for the troops (10).

In the 1860s fighting began with the First Taranaki War of 1860-61. This was like the campaigns of the 1840s, in the desire of British commanders for victory in the field and the limited European strategic objectives. Fortifications were widely used, mostly for the protection of communications or tactical advantage on the battlefield. Only a ring of blockhouses around the town of New Plymouth can be seen as having a frontier role (11). The campaign was fought, initially at least, over disputed land at Waitara. At the war's end the fundamental conflict between Pakeha and Maori was not resolved.

Two years after the ceasefire of March 1861 a more general conflict began. Campaigns were fought over much of the North Island, importantly in the Waikato, Bay of Plenty, Taranaki, Wanganui and East Coast districts.

The New Zealand Settlements Act of November 1863 paved the way for the wholesale taking of Maori land, and brought military strategy into line with political objectives. By this legislation of the settler parliament the government was enabled to confiscate the whole of any district where a "considerable number" of Maori were in rebellion against the Crown. To win the war, the Pakeha were to systematically dispossess Maori of their land. The European military frontier now coincided with the farming frontier where military settlers took up confiscated land protected by frontier forts.

The final phase of armed struggle took place in the late 1860s and early 1870s when Te Kooti's guerilla force, in the Urewera and central North Island, defied the result of the previous decade's fighting. Here a more fluid campaign developed. Field fortifications were again used by European forces, but generally as rear depots or located to restrict enemy movements, and not as forward positions (12).

TARANAKI

Taranaki was the northernmost of six systematic colonies in New Zealand, established along lines proposed by Edward Gibbon Wakefield (13; see Fig. 1.2). Organised settlement began in 1841 with arrival of the first of six Plymouth Company vessels, which brought settlers mostly from the counties of Devon and Cornwall in England.

New Plymouth (14) was for long the smallest and most isolated of European settlements in New Zealand. It was isolated by virtue of its open roadstead and difficult landing place on a coast exposed to prevailing westerly winds. It remained small for lack of land.

Early in the history of the New Plymouth settlement the land question became an obsessive interest of European colonists. The New Zealand Company claimed to have purchased 70,000 acres in Taranaki from the Te Atiawa tribe which had fled the area in the early 1830s following raids by Waikato tribes. Following the arrival of the European settlers the Te Atiawa began to return to their former homes.

In 1844 Commissioner Spain investigated New Zealand Company claims and recommended that the New Plymouth settlement be awarded 60,000 acres extending northwards beyond the Waitara River (15). But Spain's award was overturned by Governor FitzRoy who wished to avoid conflict with Te Atiawa. The New Plymouth settlement was left with only 3,500 acres immediately surrounding the straggling town on the banks of the Huatoki Stream (16).

In the years following several blocks of land were purchased from the Te Atiawa and Taranaki tribes (17). Much of this was heavily forested country inland to the slopes of Mt Egmont, however, and European settlers still looked towards Waitara with its open country and fertile soils, and the promise of a sheltered harbour in the river mouth. In 1848 an important Te Atiawa chief, Wiremu Kingi te Rangitake, returned to Taranaki with his people from Otaki, north of Wellington. Many of those returning settled with Kingi on the south bank of the Waitara River.

By 1859 the European population of the New Plymouth settlement was still only 2,700 (18), and was falling behind that of Auckland and the developing southern provinces. In addition to the lack of land, Taranaki shared with Nelson and other smaller settlements the generally difficult economic times of the 1840s and 1850s. Only the Victorian gold rushes of the early 1850s gave settlers - and Maori - a market for their agricultural produce. By the end of the decade Maori and Pakeha were again thrown back on their own resources. The newcomers, however, fixed upon the shortage of land as the basic problem behind their settlement's lack of progress.

In the 1850s a feud arose within the Te Atiawa which spread rapidly to draw in Maori tribes over a wide area of the North Island west coast. While there were a number of aspects to this feud, and old scores settled, a major element was disagreement among factions on the question of selling land to the Pakeha. There was at the time a wide-spread European fear of a 'land league', which supposedly represented a deliberate combination of Maori tribes resolved not to sell more land. Taranaki settlers saw Wiremu Kingi as a key figure behind this resolve.

In March 1859 a chief named Teira offered land at Waitara to Governor Browne who was visiting New Plymouth (19). Europeans in Taranaki saw this as providing an immediate opportunity to expand their settlement in a long-desired direction, and also the long-term prospect of breaking up opposition

to land sales among Te Atiawa. Early in 1860 an attempt to survey the Pekapeka Block at Waitara was resisted by people living there and troops were sent to protect the survey. This resulted in the opening clash of the First Taranaki war at Te Kohia, near the present Brixton Hall, on 17 March 1860.

War spread rapidly to engulf the extended and unprepared European settlement, and troops campaigned north and south of New Plymouth (20). The First Taranaki War was brought to an end by a ceasefire in March 1861. Neither side gained a victory - and the underlying issues were unresolved.

In the autumn of 1863 war again broke out in Taranaki. The Second Taranaki War may be regarded as lasting from 1863 to 1866 (21). Other crucial campaigns of the New Zealand Wars were fought at the same time elsewhere in the North Island, most notably in the Waikato, Bay of Plenty and Wanganui districts. By the close of the Second Taranaki War the most ardent ambitions of the New Plymouth colonists were realised, with Pakeha farmers settled on confiscated land from Stoney

River (Hangatahuta) to north of the Waitara River, and discontinuously as far north as Pukearuhe.

In the north, however, European settlement was too scattered, and the extended military frontier too exposed, for security to be assured. A March 1869 Maori raid on the frontier post at White Cliffs provoked further European military activity north of the Waitara. During what may be termed the 'White Cliffs Scare' a number of new military posts were thrown up in the area (22). The lowland area north of Waitara River was thus secured for Pakeha settlement.

The final period of military expansion of the Taranaki settlement was the Parihaka Campaign of 1880-81. Armed Constabulary and volunteer units, accompanied by road builders, advanced over the Stoney River frontier to dispossess Taranaki and Nga Ruahinerangi people of confiscated land which the Pakeha had until then lacked the resources effectively to occupy (23).

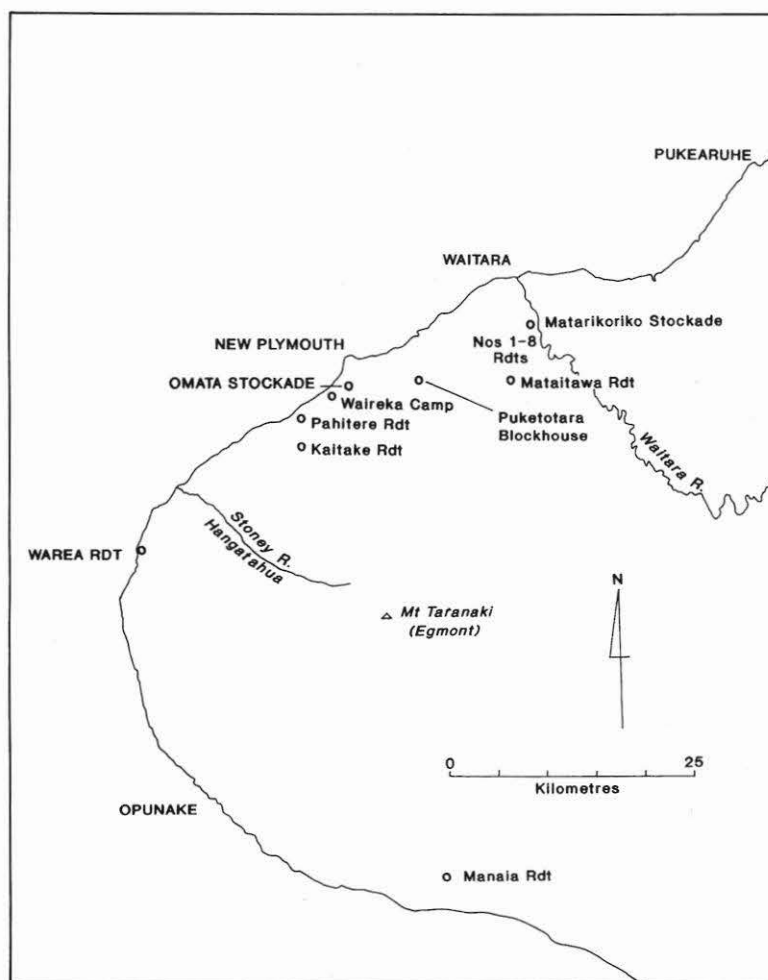


FIGURE 1.2. Taranaki showing location of the Omata Stockade and Warea Redoubt, also other military posts and localities mentioned in text.

THE FORTIFICATIONS

New Zealand was not the only Pacific territory in which Europeans built fortifications. A well known early example was Cook's 'Fort Venus' at Matavai Bay, Tahiti (24). In the early 19th century the Russian-American Company built a timber blockhouse at Honolulu and an earthwork redoubt on Kauai (25). The first European fort known to have been built in New Zealand was a 7 foot (2 m) high stockade thrown up in 1801 on the banks of the Waihou River (Thames), to defend a timber cutting gang from the *Royal Admiral* (26).

Historical antecedents for European fieldworks in New Zealand are to be found in other parts of the world subject to the expansion of Europe since about the 16th century. At first massive fortifications were built, not so much for protection against indigenous populations, but for defence against rival European powers. An example is the astonishing Portuguese fortress of Fort Jesus at Mombasa on the East African coast, which dates from the late 16th century and has been cited as the culminating point of Italianate Renaissance military architecture (27).

Following the adventurers and merchants of the first phase of European expansion were farmers and tradesmen anxious to settle permanently in the new worlds. These people did not need massive fortresses at key strategic points so much as small local forts to act as refuges and deter local threats. It was this second phase of expansion, especially in North America, which saw the development of fieldworks suited to small scale frontier warfare of a kind very similar to those used later in New Zealand (28).

North American precursors can be found for the three fortification types later used in New Zealand. In 1970s excavations at Wolstenholme Towne, Virginia, the plan of an early 17th century stockade was uncovered, this being the oldest known English fortification in the New World (29). The fort was of a four-sided trapezoidal plan, 25 x 40 m in size, with flanking defence at two adjacent corners covering all but one side. A century later at the southern frontier of Georgia an earthwork redoubt was built with four bastions in 'star form' (30). Excluding the bastions the dimensions are *ca* 20 x 40 m, which falls nicely within the New Zealand range.

An example of the third fortification type comes from northern New England where a mid-18th century frontier blockhouse survives at Fort Halifax in Maine (31). The building is square with a shingled roof, upper storey overhanging the lower, and is made of squared logs dovetailed at the corners. In New Zealand this type of blockhouse was described as the 'New England' style.

Detached fieldworks can serve two general purposes: tactical and strategic. On the battlefield they are tactical and give a

temporary advantage in disposition of men and weapons to one side, while preventing the enemy from using his resources to best advantage. Strategic works on the other hand have a long-term frontier or garrison role and are designed to deter attack. Such posts must be strong enough to withstand attack, but the measure of their success is not that an attack is repelled but that no attack is made.

Redoubts

'Redoubts' in New Zealand were earthwork fortifications, defended by a ditch generally dug to 6 ft depth (1.8 m), with the spoil thrown up to form an 8 ft (2.4 m) parapet on the interior side. Thus the combined ditch and bank presents a 14 ft (4.2 m) obstacle to an attacker. Behind the parapet a raised 'tread' provided a firing platform (Fig. 1.3). Redoubts were usually located on level or near-level ground to allow a good field of fire for the defending garrison.

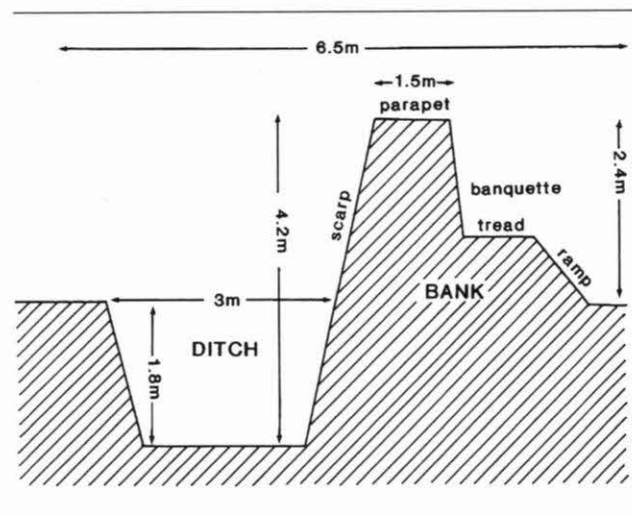


FIGURE 1.3. Cross-section of redoubt defences.

Redoubts could be thrown up quickly in battlefield situations where they might be used for only a few days or weeks, or they could serve a long term security or frontier role, often being enlarged or otherwise altered to suit changing circumstances. In Taranaki, Nos 1 to 8 Redoubts, thrown up south of the Waitara River in the summer of 1860-61, were tactical battlefield works. At the same time, Camp Waitara at the mouth of the river had a strategic purpose, as the British army's headquarters redoubt for the area.

Depending on particular needs redoubts could vary greatly in size. In the First Taranaki War, No 4 Redoubt near Waitara was only 13 1/2 yards (12.3 m) square enclosing 152 m². The garrison was 50 men (32). Smaller earthwork redoubts, as little as 9 m in diameter, acted as guard posts for otherwise unde-



FIGURE 1.4. Waireka Camp, 1975. A classical redoubt form, square with two bastions covering all four sides, dating from winter 1860.

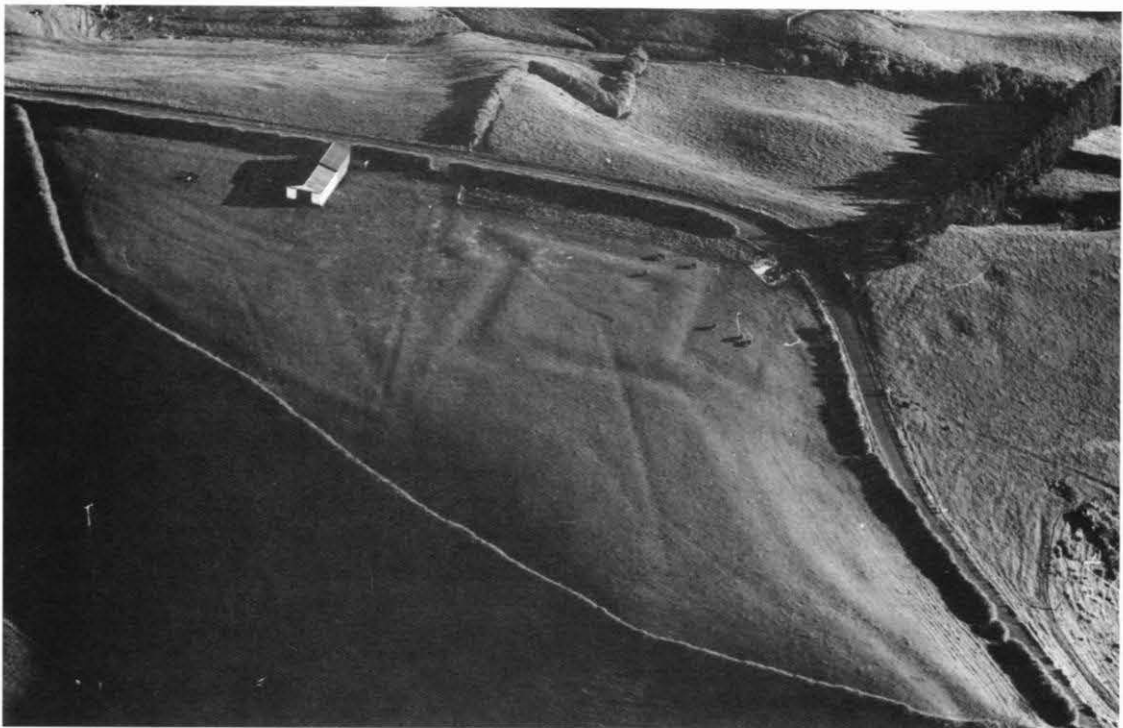


FIGURE 1.5. Mataitawa Redoubt, 1975. An October 1864 earthwork of the so-called 'New Zealand redoubt' form - that is, with bastions at all four sides, each covering one side only. Other lines in the paddock are the result of ploughing.

fended camps in the 1880-81 Parihaka Campaign (33). At the other end of the scale was Queen's Redoubt, Pokeno (South Auckland), 100 yards (91.5 m) square and enclosing some 8360 m² of ground. Four hundred and fifty men made up the garrison (34).

Redoubts took a variety of forms. A classical shape comprised a rectangular ground plan with bastions at two opposite corners covering all four sides. Waireka Camp on a hilltop 2 km west of the Omata Stockade in Taranaki is a good example (35; Fig. 1.4). A variation, the so-called 'New Zealand Redoubt', employed bastions at all four corners, each covering just one side (36). Again, an example is given from Taranaki (Fig. 1.5). Others could be simple unflanked squares, five-sided redoubts, or works of a very wide variety of unique ground plans.

Figure 1.6 shows something of what these forts looked like. At Kaitake Redoubt, inland of Oakura, there is a building inside and tents and low huts outside. A signal mast carries canvas-covered wicker balls. The photograph dates from December 1864.

In a sketchbook held in the Hocken Library, Dunedin, Colonel H.J. Warre depicts ground plans of one and two hundred man redoubts in campaigning conditions, that is, with all men accommodated under canvas inside the work (37). Colonel Warre, 57th Regiment, was officer commanding in Taranaki for some years in the 1860s (Fig. 1.7). It was he who gave the order for the advance south of New Plymouth and the establishment of Warea Redoubt, the excavation of which is described in Chapter 3.

Colonel Warre's 100 man work has flanking defence at two angles covering all four sides (Fig. 1.8). The sides (internal) are 35 yards (32 m) and 28 yards (25.6 m) respectively. Inside are 20 tents: nine, accommodating 12 men each, for the soldiers, also two officers' and two commissariat tents, and one tent each for the commanding officer, orderly room, doctor, hospital, magazine, guard and drivers.

The internal measurements of Colonel Warre's 200 man redoubt are 42 yards (38.4 m) and 35 yards (32 m), and here he also gives the external size at 48 x 40 yards. Thirty tents are



FIGURE 1.6. Kaitake Redoubt, 1864, showing earth and fern construction of redoubt wall, a barrack building ('blockhouse') inside, and outside, a signal mast, bell tents and thatched hut dug into the hill slope. (Alexander Turnbull Library, Wellington.)

listed, although Warre is not sure of the value of some open space in the centre, showing only 28 tents in the plan. There are 17 tents for the men, three each for officers and commissariat, and one for the commanding officer, doctor, orderly room, hospital, magazine, guard and drivers. Like the smaller work it has classic flanking defence at two angles to cover all four sides.

At the end of the 1860s Captain H.W. Young, 18th Royal Irish Regiment, writing for a New Zealand audience, states the principle that redoubts should have a garrison of two men per yard (0.9 m) of parapet, or 15 square feet (ca 1.3 m) of internal space per man (38). The first rule applies to large works, and the second to small. He adds that where soldiers armed with breech-loading rifles are defending a redoubt against an enemy without artillery, one man per four feet (1.2 m) of parapet is sufficient.

Stockades

Stockades were made of whole or split logs set against each other to a height of 10-12 ft (3.05-3.66 m). Defenders did not fire over the top as in redoubts but through narrow loop-holes in, or between, the stockade timbers. Within the stockade were barrack and guard buildings which sometimes enclosed a small central yard, or there might be tents for accommodation.

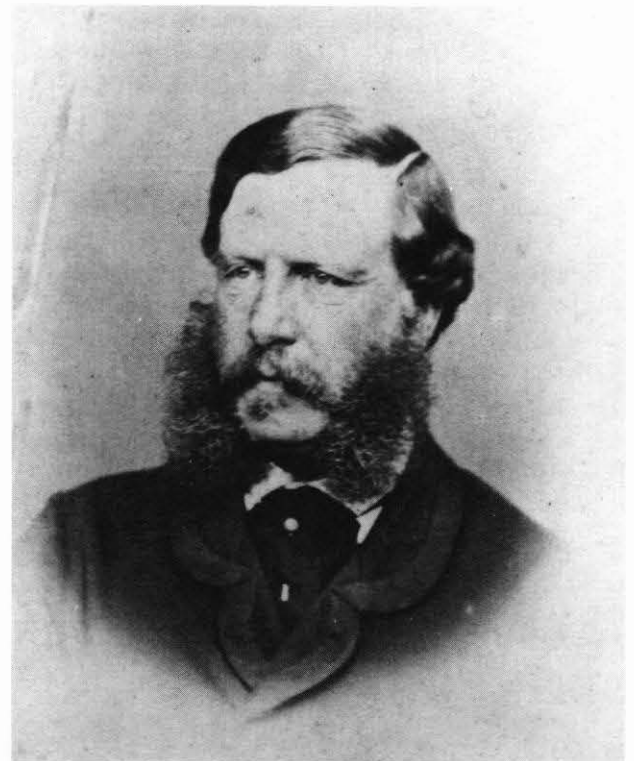


FIGURE 1.7. Colonel H.J. Warre, 57th (The West Middlesex) Regiment of Foot. (Alexander Turnbull Library, Wellington.)

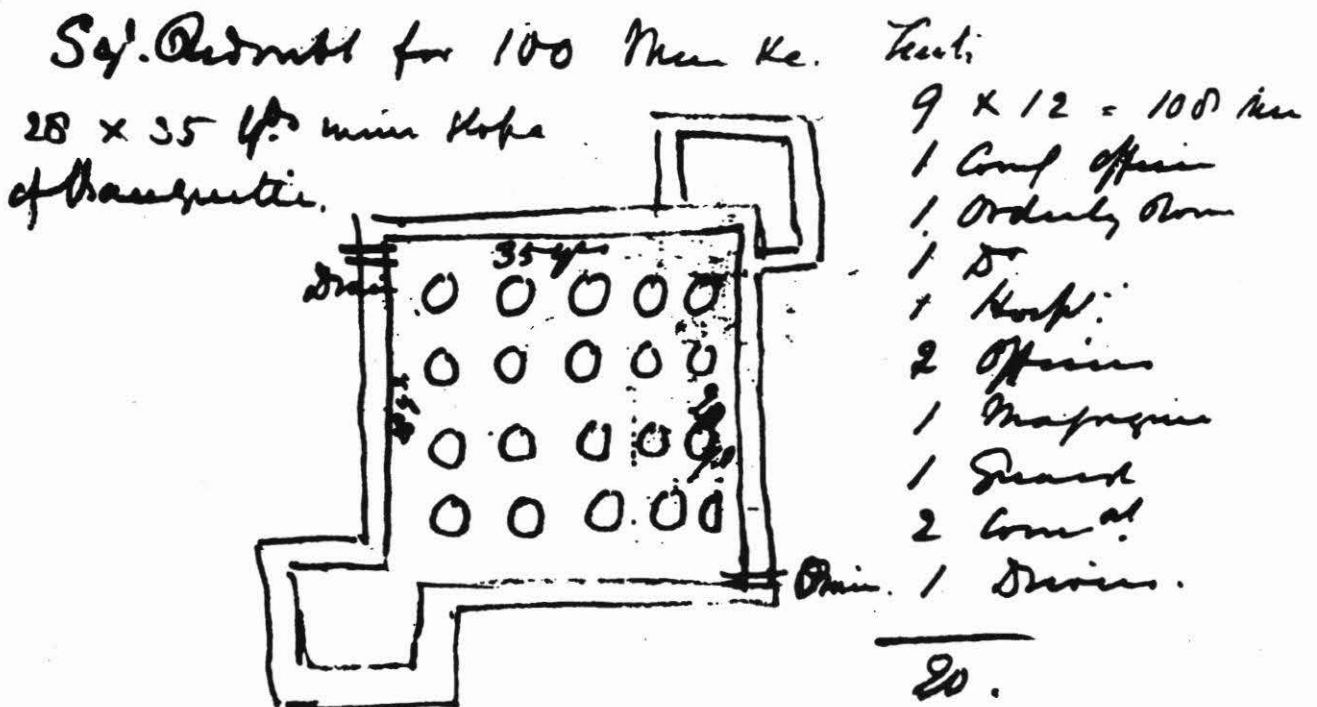


FIGURE 1.8. Colonel Warre's plan of a 100-man redoubt. (H.J. Warre Sketchbook, p. 131, Hocken Library, Dunedin.)

Stockades could be of formal plan, sometimes even bastioned like redoubts, or they could follow the shape of available ground on a hilltop or spur. The Omata Stockade is an example of the former. Measuring 19 x 12.5 m with two 2.3 x 3.2 m bastions at opposite corners to cover all four sides, the stockade enclosed an area of 250 m² (see Fig. 2.5).

Stockades differed from earthwork redoubts in that they were usually placed on top of steep hills or knolls, the naturally difficult approaches adding to defence. Since defenders fired through the loopholed stockade wall they were not dangerously exposed when firing down, as they would be over a redoubt parapet.

Blockhouses

The term 'blockhouse' was used during the New Zealand Wars to refer to barrack buildings within or attached to redoubts or stockades, or to independently defensible fortified buildings. Among the former, many were prefabricated in kauri at Onehunga, and from there shipped to the various military frontiers in the North Island. The building depicted at Kaitake Redoubt (Fig. 1.6) is an example. One of these historically important buildings survives near the Koru Road corner at Oakura, only slightly altered from the original. It was shifted

many years ago from nearby Pahitere Redoubt for use as a farm cottage (39).

Independently defensible blockhouses took time to build out of milled timber. Thus they were not employed in tactical or short term situations, but only where a long term strategic or garrison role was envisaged. They were commonly used when campaigning troops had moved on and a limited military presence was needed to reassure Pakeha settlers moving on to confiscated land. Military settlers were available when needed to reinforce the small garrisons.

Blockhouses could take several forms. The so-called 'New England' style was of two-storeys, the upper overhanging the lower. Both levels were loop-holed for defence, sometimes with hatches in the overhanging floor to prevent an enemy getting in against the wall beneath. Often they had additional defence in the form of an encircling ditch or bank. Taranaki examples of the New England style include Puketotara Blockhouse (Fig. 1.9), one of several erected near New Plymouth in 1864.

Single storey blockhouses were of rectangular plan, again loop-holed for defence, and with the walls filled with sand or gravel. Examples survive at Marangai near Wanganui (40), and as corner bastions of the redoubt at Manaia in south Taranaki (Fig. 1.10).



FIGURE 1.9. Puketotara Blockhouse, 1864. A Taranaki example of the 'New England' style of blockhouse; one of three put up behind New Plymouth to encourage Pakeha farmers to return to their land. (H.J. Warre sketchbook, Alexander Turnbull Library, Wellington.)



FIGURE 1.10. Manaia Redoubt, 1880. Two loop-holed single storey blockhouses at opposite corners serve as bastions for an earthwork redoubt. Excavation was to reveal a similar blockhouse at the north-west angle of the second (1867) redoubt at Warea.

Learning from experience

Towards the end of the 1860s in New Zealand there was some attempt to formalise experience in fortification design from the previous decade. In December 1868 a circular letter from Colonel Haultain, Minister for Colonial Defence, gave advice on the construction of a redoubt for 100 men (41). A plan of the recommended work shows it to have been 65 x 65 feet (19.8 x 19.8 m), entirely flanked from two angles, with a large earthwork bastion 28 x 28 feet (8.5 x 8.5 m) at one angle and an 18 feet (5.5 m) square blockhouse opposite.

Haultain gives detailed specifications of the blockhouse, which was regarded as important because it would enable a small body of men to defend themselves even if the main part of the redoubt was taken by the enemy - as had occurred at Turuturumokai near Hawera in July 1868 (42).

In 1869 Captain Young's *Hints on House Defence, Blockhouses and Redoubts* was published, giving detailed instructions on the design and building of blockhouses and redoubts of many forms, and outlining the principles involved (43). As well, there was advice on the defence of isolated houses, groups of houses and even town blocks.

In Taranaki a wide variety of fortifications dating from 1860 to the early 1880s illustrate changing military needs as the struggle for this part of New Zealand moved through its various phases.

THE RESEARCH

The fieldwork and University of Auckland thesis of which the following excavation reports were a part examined the archaeology of the several Pakeha military campaigns which originated in New Plymouth in the years 1860-1881. In that part of Taranaki which lies between Opunake and Parinihi (White Cliffs), European forces threw up no less than 65 small fieldworks, most of them frontier forts designed to win and hold the land. More works were thrown up in south Taranaki in the Wanganui Campaigns of the 1860s.

The most common fortification in the region was the earthwork redoubt, more than 40 of which were thrown up of a variety of different shapes and sizes according to the needs of different tactical and frontier situations. Nine stockades and 13 independently defensible blockhouses were generally used in defensive roles or as frontier posts.

In 1977 and 1978 archaeological excavations directed by the writer were carried out at the Omata Stockade and Warea Redoubt. The two excavated sites were chosen for their different histories and forms. Most importantly one was a wooden stockade and the other an earthwork redoubt. The Omata Stockade was established in 1860 at the beginning of the First Taranaki War; Warea Redoubt was thrown up in April 1865, near the end of the Second Taranaki War. At Omata the fort was designed, built and manned by local forces, with the aim of

protecting homes and farms; at Warea the redoubt was thrown up and manned by British troops in carrying the war to the Maori. The Omata Stockade was close to New Plymouth; Warea Redoubt was remote from town and port.

The aim of the excavations was to study the defensive and internal arrangements of the two sites and to recover artefacts which might tell of the economy, technology and way of life of their garrisons. Similar work had not been carried out in New Zealand before, so the investigations were also to form something of a baseline for further excavations of war sites.

The detailed report on excavations at the Omata Stockade and Warea Redoubt was completed in 1981, when it formed part of a Ph.D. thesis submitted to the Anthropology Department, University of Auckland, under the title, "The Archaeology of a Military Frontier: Taranaki, New Zealand, 1860-1881".

Subsequent work

Recent work on the archaeology of the New Zealand Wars and other 19th century sites has added a great deal to knowledge of the sites, as well as of artefacts and other remains. The later results are not included here, however, at least partly because the considerable revision involved may have resulted in this report never being published at all.

Valuable archaeological work to follow the excavations at Omata and Warea has included university research projects and salvage exercises. Among the former has been the investigations carried out by Wynne Spring-Rice at Fort Galatea in the Bay of Plenty (44). John Mitchell's work on Armed Constabulary sites along the Napier-Taupo Road included excavations at the Rununga Stockade (45). The Fort Galatea work in particular has resulted in a useful comparative collection being recovered.

Salvage work carried out under the provisions of the Historic Places Act has included Ian Smith's excavations at Fort Ligar, an 1840s earthwork redoubt in what is now Auckland's central business district (46). Department of Conservation archaeologist Neville Ritchie carried out excavations at the 40th Regiment redoubt at Te Awamutu in 1991 (47). Both sites are now in urban situations where artefacts recovered mostly date from dumping episodes after the military occupation.

An important collection of militaria was recovered by salvage work at the Albert Barracks, Auckland, undertaken by Reg Nichol in 1979; but while there is an account of the excavations (48), the artefacts are as yet unpublished. The most recent excavation at a military site has been February 1992 work carried out by the present writer at Queen's Redoubt, South Auckland.

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CHAPTER 2. ARCHAEOLOGICAL EXCAVATIONS AT THE OMATA STOCKADE

Archaeological excavations were carried out at the Omata Stockade from 3 January to 13 February 1977. The site has the New Zealand Archaeological Association site record number P19/35 (formerly N108/39), and NZMS260 map reference 988350. The work was financed by the University Grants Committee and the Anthropology Department of the University of Auckland, under permit 1976/27 from the New Zealand Historic Places Trust.

The Omata Stockade was situated above Herekawe Stream next to South Road on the present outskirts of New Plymouth

(Fig. 1.2). The site crowns a knoll which commands a deeply dissected terrace at the seaward margin of the Mt Egmont ring plain. It consists of a 15 x 25 m platform surrounded by a steep scarp to a now shallow ditch (Fig. 2.1). Beyond the ditch the hill falls away all around to the extensive terrace some 10 m below the hill top.

The chief aim of work at Omata was to recover examples of material remains - the artefacts - left by Taranaki settlers turned soldiers who manned the post in the early 1860s. Other aims included examination of the stockade and ditch defences and



FIGURE 2.1. The Omata Stockade, 1975.

internal buildings, and study of the distribution of material within the site to see if this related to different activity areas.

Examination of the objects found at Omata has led to the development of several major themes which will emerge in this chapter where discussion of particular classes of artefacts allows. These themes will be followed up in Chapter 4.

The first concerns the colonial nature of the Taranaki economy. In the 1860s dependence upon imports was increased by the influx of economically unproductive troops and by the settlers' abandonment of their farms in a war situation. The Taranaki settlement was a remote appendage of the rapidly growing northern hemisphere economies.

A second theme centres on the 19th century industrial revolution. In many industries it was the 19th century which saw craft based production replaced by use of machine tools. The crucial development of machinery for the manufacture of earthenware and glass bottles, to name two very abundant artefacts found at Omata, occurred in the first half of the 19th century. In the footwear and small arms industries, machines replaced craft production methods about the middle of the century. Many items found at Omata reflect the radical changes in manufacturing technology which occurred in previous decades.

A third major theme arises from items found at the Omata Stockade. The site was, of course, a military fortification - one of many which mark the course of the New Zealand Wars. The chief advantage held by Pakeha over Maori throughout the wars was their access to technology. This was true not just in weapons, but also in transport, preserved food and many other manufactured items as well, all of which made easier and more efficient the waging of war.

HISTORY OF THE OMATA STOCKADE

The Omata Stockade was built on the site of an old pa, Ngaturi, on the property of Mr Richard Julian (1). The work was designed and built by Omata settlers - Thomas Good (Fig. 2.2) initially planning the stockade and supervising construction. Captain George Burton, for long in command at the post, was responsible for fitting it out internally (2). A signal mast was erected in April (3). On 12 June 1860 the stockade was reported finished (4).

The expense was at first met by the local settlers with costs later covered by the government. Eighteen settlers were paid for a total of 84 days carting with bullock waggons and six were paid as carpenters for 241 days work (5). Preparation of the hill and ditch, cutting and splitting stockade logs, preparing shingles and all other work not done by carpenters was carried out by the Omata settlers themselves on militia pay and rations (6).

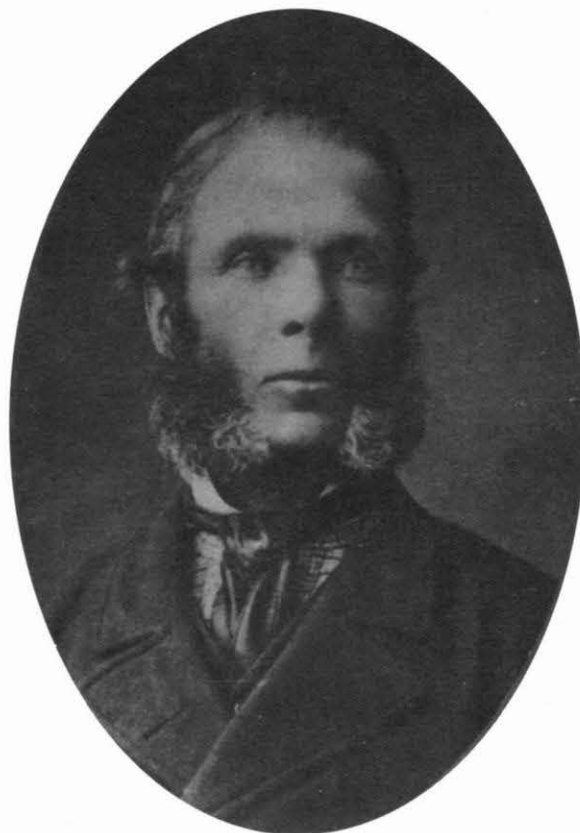


FIGURE 2.2. Thomas Good. (Taranaki Museum.)

The post was garrisoned almost exclusively by local forces - Taranaki Militia and Volunteers, and later, Taranaki Military Settlers. The Taranaki Militia was a civilian force first sworn in on 11 August 1855. In 1858 the Taranaki Volunteer Rifles was formed from the ranks of the Militia. Military Settlers were recruited on the goldfields of Otago and Victoria in the early months of the Second Taranaki War on the promise of confiscated land in return for three years service and a good conduct discharge.

During the First Taranaki War (1860-61) the number of Militia at the post varied from 54 to 73 (7). For a few weeks after the defeat at Puketakauere in June 1860 and the consequent abandonment of Tataraimaka to the south, 12 Royal Artillery with two guns were added to the Omata garrison (8). Captain Burton was the commanding officer throughout the First Taranaki War.

By the end of March 1860 most Omata settlers had left their homes for the security of New Plymouth. There were, however, some who were reluctant to leave, these settlers mostly living on Hurford Road close to the southern boundary of Pakeha

land. In March a large force of Taranaki and Ngati Ruanui arrived in the district and built a pa, Kaipopo, on Waireka Hill immediately above the old Omata cemetery.

On 28 March a combined force of troops and Taranaki Militia and Volunteers marched out of New Plymouth to secure the safety of the remaining Omata settlers. Late in the day the Militia were hard pressed at Jury's farmhouse on the sea cliff south of Waireka Stream. The troops, under orders to be in town by nightfall, retired from the field. It was almost dark when a small naval force, passing the troops on their way back to town, took the old main road (now Waireka Road) and rushed the pa, so relieving the local force and allowing their withdrawal (9).

The Omata Stockade occasionally came under fire from Maori forces which remained in the district until the ceasefire of March 1861 (10). On 23 February 1861 a party of British troops and local forces which had arrived with provisions for the post were fired on from the old Maori earthworks of Te Ngahoro, 700 m north-west. A skirmish took place in which European forces took possession of the hill and the Maori force retired south (11).

A garrison was maintained at Omata between the wars and throughout the Second Taranaki War of 1863-66. On 2 March 1864 the post was held by 80 militia under Captain McKellar (12). By 31 March 1865, as fighting moved away from New Plymouth, the garrison was down to one captain and four militiamen (13). On 30 June that year the remaining militia were struck off pay and replaced by three Taranaki Military Settlers (14), reduced in May 1866 to one man (15). It is not known when the last man was withdrawn.

At the end of its life part of the stockade was used as a school (16). In late 1867 a report was received that the stockade was being demolished by local farmers for firewood (17). Orders were then given that the remaining materials be sold by public auction (18).

There are several contemporary pictures of the Omata Stockade including the sketches by New Plymouth settler and artist F.H. Arden and Taranaki commanding officer Colonel H.J. Warre, 57th Regiment, which are reproduced here (Figs 2.3 and 2.4). These give the usual view of the post from the north-west with the Kaitake Ranges behind. The signal mast

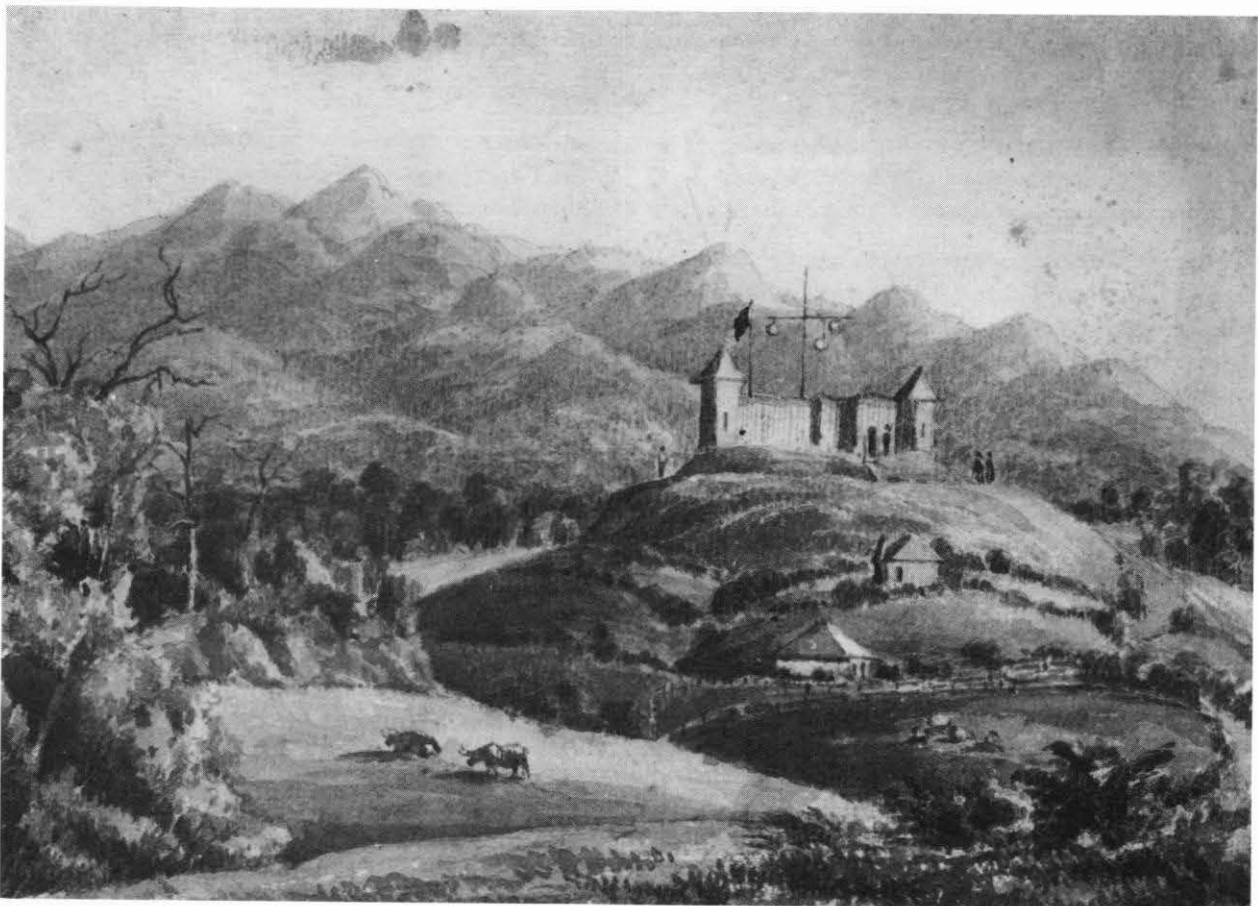


FIGURE 2.3. The Omata Stockade, with signal mast still in place. (F.H. Arden, watercolour, Alexander Turnbull Library, Wellington.)



FIGURE 2.4. "Omata Stockade Nov 15 1864". (H.J. Warre, pencil, Alexander Turnbull Library, Wellington.)

and balls show the Arden picture to date from before the end of 1864 when these were removed. The houses depicted were used by the Omata garrison as messes during the day (19).

An excellent description of the fortification, along with the illustration given here in Figure 2.5, is given by Colonel J.E. Alexander, who commanded the 2nd Battalion, 14th Regiment, in New Zealand from 1860 to 1862 (20). Alexander visited the stockade after the ceasefire of 1861.

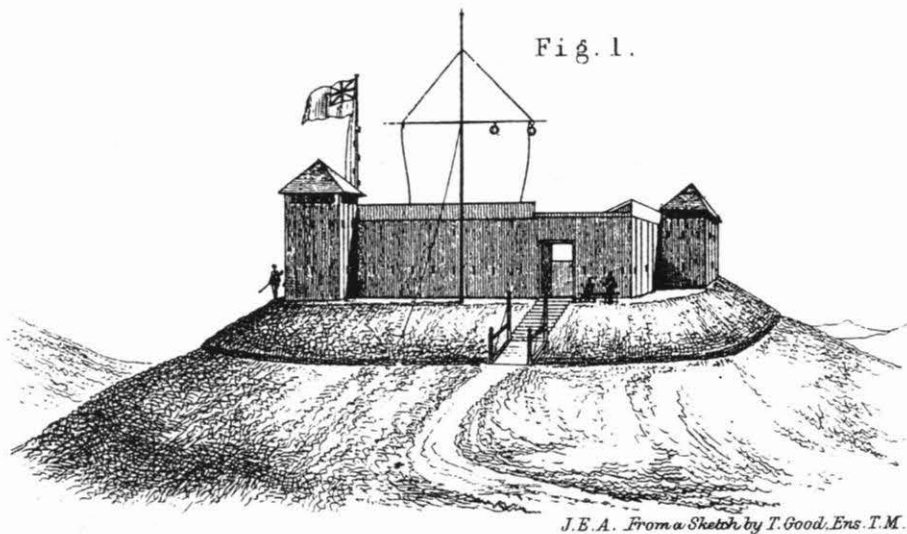
"I found at the Omata stockade, on a conical hill four miles south of New Plymouth, an intelligent and active militia officer, Captain George Rutt Burton; he had constructed his place of strength as "a city of refuge" for the neighbouring settlers, and from whence the enemy's foraying parties could be assailed as opportunities offered. I was much pleased with what I saw at Omata, and I obtained from Captain Burton the particulars of the construction of his stockade (he being his own engineer); and, as these may be of service to officers in other fields of strife, I now give them in detail, accompanied with a sketch:

Fig. 1 shows a view of the outside of the stockade, taken from the foot of the slope on the north side of the building. - The ditch, as shown here, surrounds the stockade, the outer edge or counterscarp being distant on an average about thirty-two feet from the outside of the stockade. Its form is

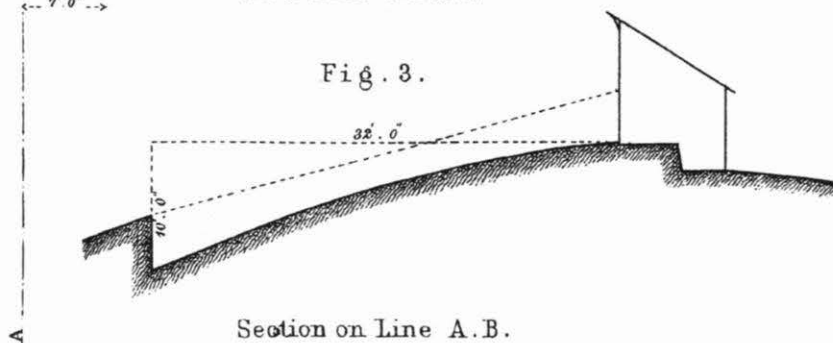
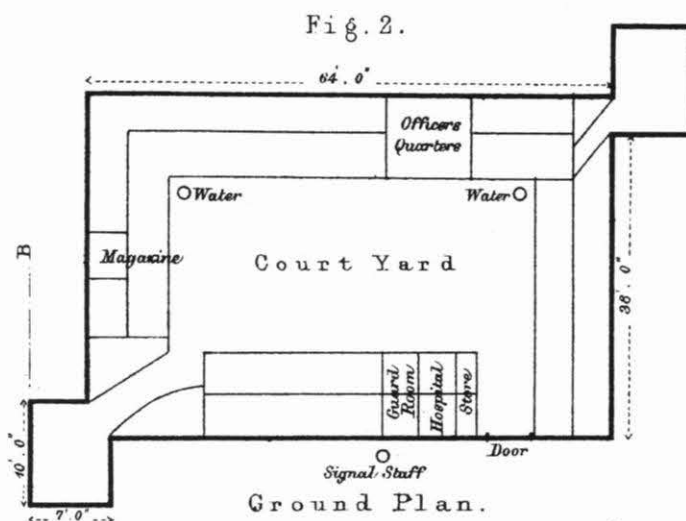
an oblong. A section of it is shown in fig. 3. Rough wooden steps lead from the drawbridge to the entrance gate. The drawbridge has a span of ten feet, and works upon strong hinges at the end nearest the gateway. It is constructed so as to be as light as possible, consistent with the requisite strength for bearing the ordinary traffic and the provisions, &c. which had to be taken across it. By ropes fastened to its front edge, and running through blocks on the top of the inner posts, it is elevated at night to a perpendicular position, thus serving to prevent ingress or egress. A light moveable handrail on each side (withdrawn at night) prevents accident in crossing the bridge.

It will be seen that the bastions are of two stories each, being loopholed on all four sides of both stories. The lower part of each is a sleeping apartment. The upper is the post for the sentries at night and in bad weather.

The roof of the bastion is raised clear of the wall plate, and is made to project a foot, or rather more, beyond the wall of the building. This arrangement admits of the sentries keeping a good look-out all round, yet protects them, to a great extent, from the weather; and further, allows of firing through the space between the roof and the wall-plate, when more convenient to do so (as was often found at long ranges) than through the loopholes. The other parts of the building



PERSPECTIVE VIEW OF THE OMATA STOCKADE, TARANAKI, N. Z.



Shewing Slope in front of outside of Stockade.

FIGURE 2.5. Perspective sketch, plan and section of the Omata Stockade. (From J.E. Alexander, 'Description of a serviceable field work - the Omata Stockade, Taranaki, New Zealand', *Journal of the Royal United Service Institution*, (1863), Vol. 6.)

have a single row of loopholes only. The roof of the sides and ends of the building is made to project about a foot beyond the outside, so as to make it extremely difficult to scale.

The entrance-gate is made of two thicknesses of "heart of pine" timber, each 2 1/2 inches thick, the outer running up and down, the inner diagonally, and strongly nailed together with spike nails, rivetted. It forms a solid door five inches thick. The jambs and sills, of heart of pine, are 12 inches by 9 inches. The jambs are sunk 5 feet into the ground; the whole framed together and well fastened to the building on each side. The hinges form, at the same time, the fastening to the gate; they are stout iron bands, extending across the door, and fitting over a staple with an eye (driven into the door-jamb), and are there secured by dropping an iron pin through the eye.

The signal staff is erected outside, but worked from within the building. It is one single young tree 60 feet long, sunk 6 feet in the ground, and properly secured by stays, guys, &c. The yard is 24 feet long. The signal balls are of wicker covered with canvass. There is an easy code for using them.

The small staff is quite unconnected with signals, and is for a British flag.

Fig. 2 shows *Ground-plan*. - The stockade is on the site of an old native war pah, called Nga-ture, or "the knees." The situation being that best fitted to any in the district for a post, it was necessary to adapt the building, both as to dimensions, mode of construction, and other matters, to the local circumstances.

The outer part is constructed either of trunks of small trees entire, or split portions of large ones, mostly the former. These piles are sunk into the ground about 3 feet 6 inches, and stand 10 feet out perpendicularly. The piles were roughly trimmed down with the axe, so as to bring them together as closely as practicable, and any knots or excrescences removed from the outside, which otherwise might facilitate scaling.

The slight apertures unavoidably left between the logs were filled by placing an inner row of stout slabs perpendicularly, covering the gaps and leaving no openings.

The logs were all sawn off straight in the bush, to bring them to a tolerable level at top. To bind the whole together and make it firm, sawn battens, 6 inches broad by 3 inches thick, were laid along the top, and a 7-inch spike nail driven through into the head of each pile. The thickness of the piles varied a little, but the average thickness might be taken at 12 inches.

The whole was proof against musket balls, and nearly so against rifle balls, except at a very short range.

The soil was removed from that portion which is marked in the ground-plan as "Court Yard" to the depth of 3 feet, as to admit of sufficient fall for the roof, which slopes inwards from the top, as shown in a section on the margin of the ground plan. The roof is framed in the ordinary manner, of sawn timber, covered with roof-boards and shingled.

That portion of the interior where the magazine is situated has solid natural earth, extending inwards six feet from the piles of the stockade. Round the remainder of the building the earth was removed to within three feet of the piles, thus leaving a vacant space of three feet under the sleeping-places for accommodation for the men's clothes, for fuel in the guard-room, &c. The floor on which the men's bedding was laid at night was laid upon joists, and boarded six feet inwards from the piles, leaving a vacant space of four feet at the foot of the respective beds (and of course about two feet six inches lower, being, in fact, only a few inches above the level of the courtyard), for passage and access to the sleeping-places. The loopholes were cut at such an elevation as enabled the rifles to be worked clear of the roof, and also that the men standing on the boarded floor covered any object down to the bottom of the ditch, down the glacis and everywhere round the stockade. Whatever the weather, the men of course were firing under cover. No man could approach the stockade under cover, even though on his hands and knees.

Doors admit from the yard to the different portions of the building, and small windows looking into the yard (and made to fasten open for ventilation in summer) afford the requisite light."

THE EXCAVATION

The site was laid out square with the length of the top platform, 3 x 3 m and 3 x 6 m areas being given Roman numerals in the order of their being opened up (Fig. 2.6). In addition each metre square had a unique letter/number reference, letters referring to the east-west axis and numbers north-south.

Two datums were established. Datum A was used for taking excavation levels on the top (stockade) platform, and Datum B for the ditch area. The height of Datum A was established by Mr G.J. Matterson of the then Lands and Survey Department, New Plymouth, as 80.5 m above sea level. Datum B is therefore 77.6 m above sea level.

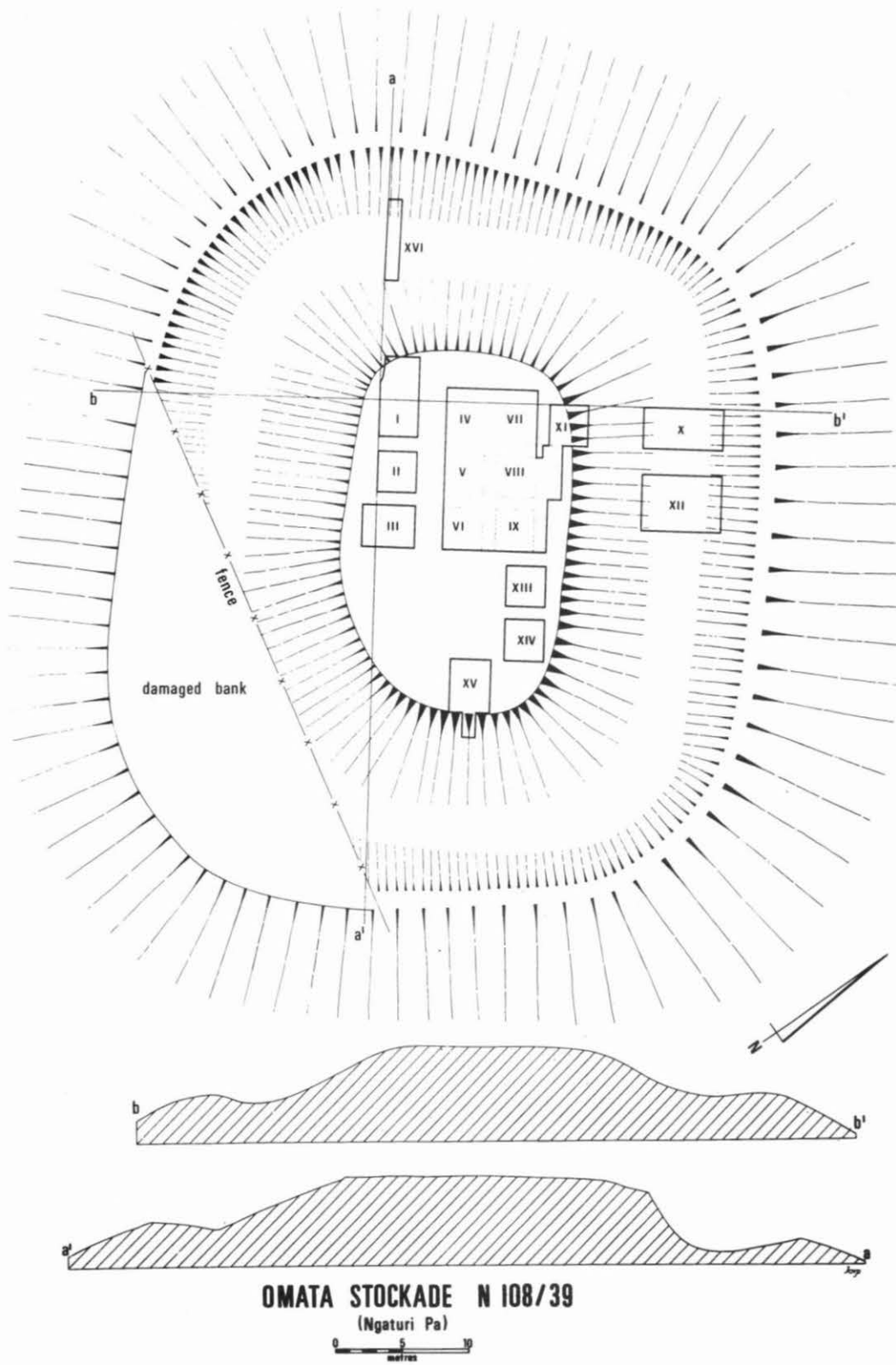


FIGURE 2.6. Omata Stockade: site plan and sections.

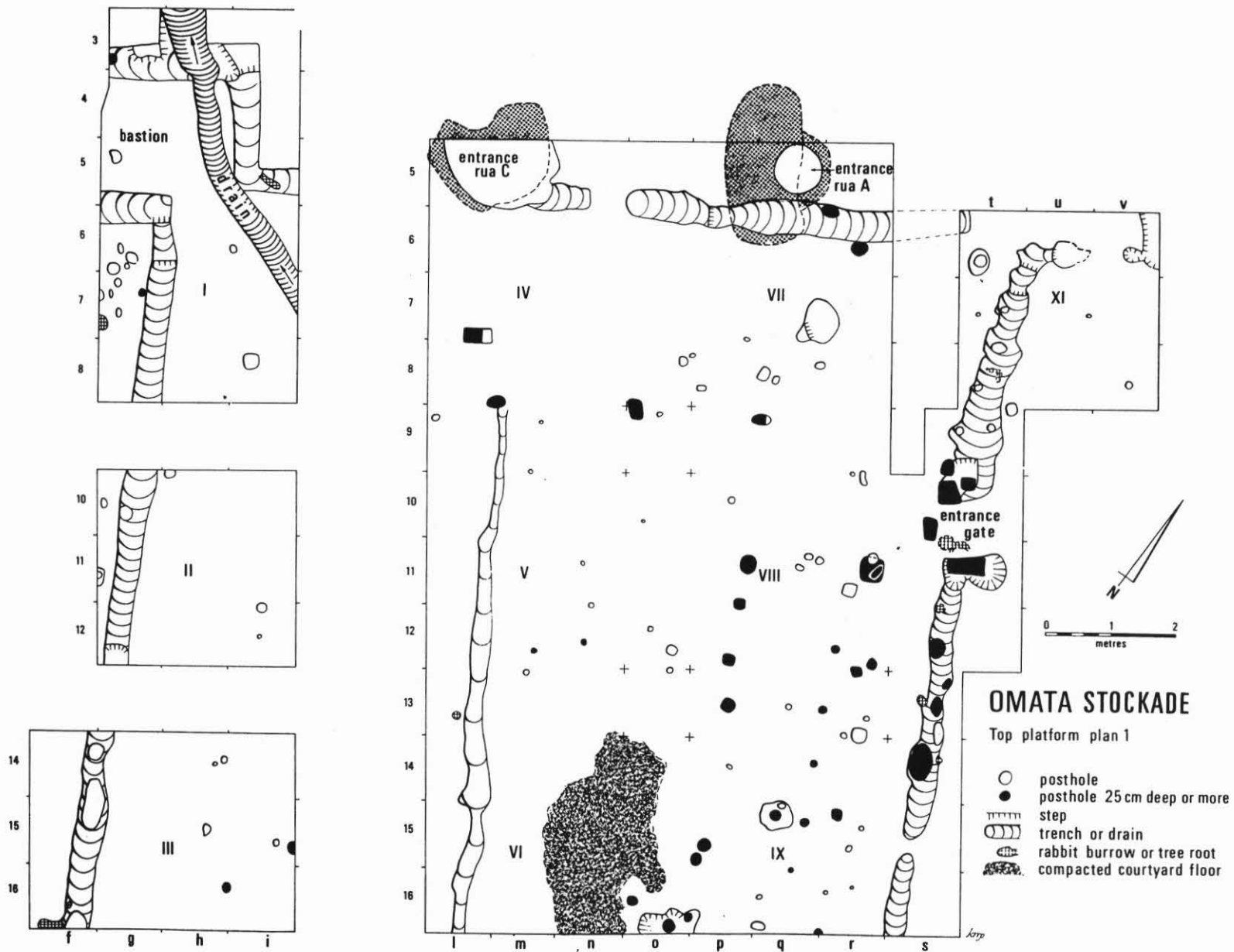


FIGURE 2.7. Top platform (north end) plan.

The top platform

Excavations were begun on the top platform. Nine 3 x 3 m squares together with intervening baulks covered the northern half of the platform. With the removal of many of the baulks and the extension of squares to locate or follow structural features the excavated area of the northern half of the platform finally totalled 143.5 m², this including an additional square (XI) dipping over the edge of the scarp at the north-east corner (see Fig. 2.7).

On 29 January most excavations at the north end of the top platform were filled in and three 3 x 3 m squares were opened up at the southern end (Squares XIII, XIV and XV). Later extensions to one of these squares resulted in an excavated area of 33 m² in this part of the site (Fig. 2.8), making a total of 176.5 m² excavated on the top platform.

This part of the site proved shallow. Alexander's description has the perimeter of the platform with stockade walls and barrack and other rooms three feet above the central courtyard. He also says that the stockade posts were sunk three feet six inches into the ground. Archaeologically, however, the deepest part of the stockade wall trench proved less than 300 mm (1 ft), and in places the trench was so shallow it had almost disappeared. Further, the courtyard floor, very apparent in places, proved only 200-300 mm and less below the surrounding area. It is clear that when the stockade was demolished most of the higher perimeter of the platform was thrown into the ditch.

Parts of all four walls of the stockade were uncovered. Postholes include prominent lines parallel to the stockade wall, representing structures built around the yard which used the stockade as their outer wall (Figs 2.7-2.10). Excavations show the stockade to have been 12.8 x 19.3 m in external measurements. In addition, the north-west bastion was excavated and a deep drain underlying it was revealed (Fig. 2.11). The stockade was set at an angle to the top of the hill in order to fit the two corner bastions on the prepared platform.

The north-west bastion was 2.3 x 3.2 m in

plan size (Fig. 2.11, and see Fig. 2.7). Despite damage by stock the size was determined from evidence in the eroding scarp below the stockade platform. The gap into the bastion from the main fortification rectangle was approximately a metre wide.

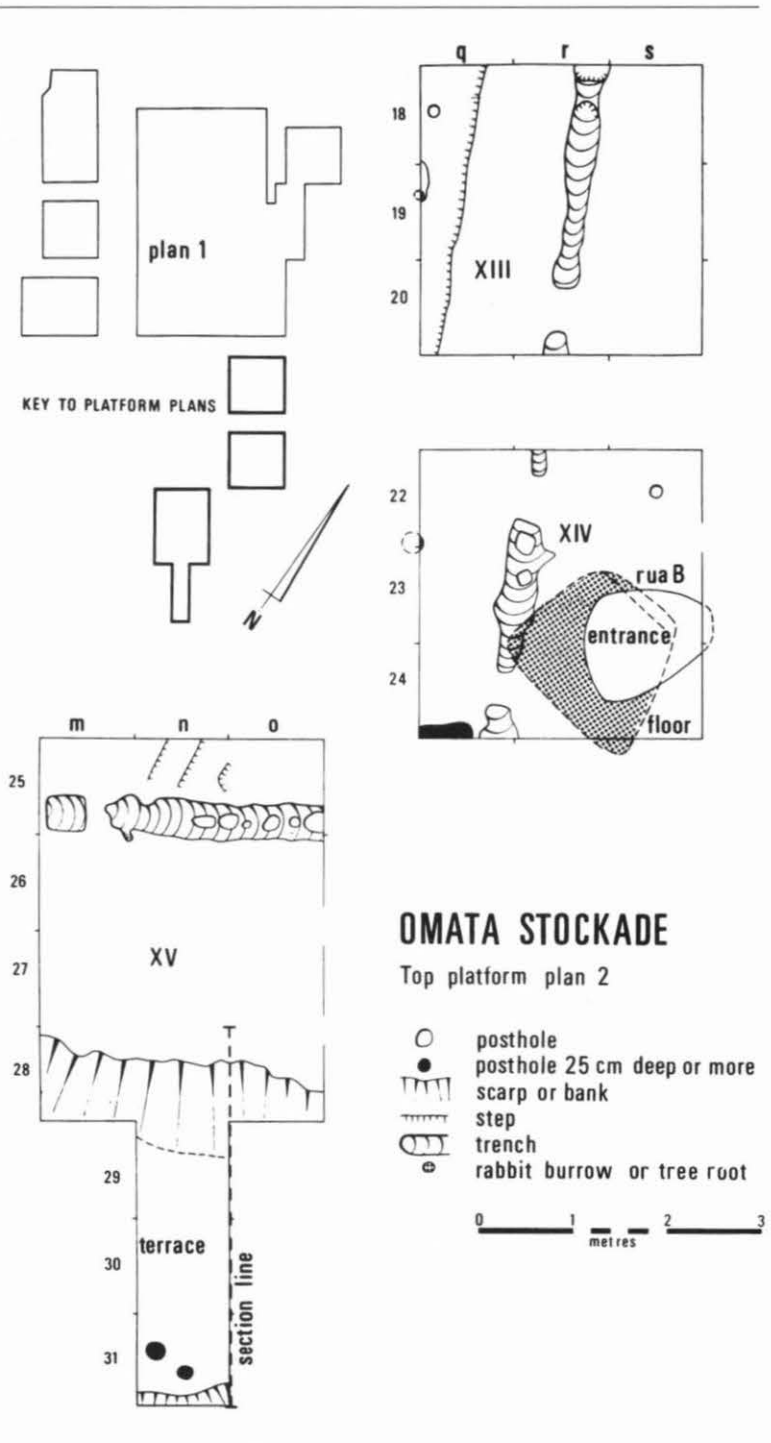


FIGURE 2.8. Top platform (south end) plan.

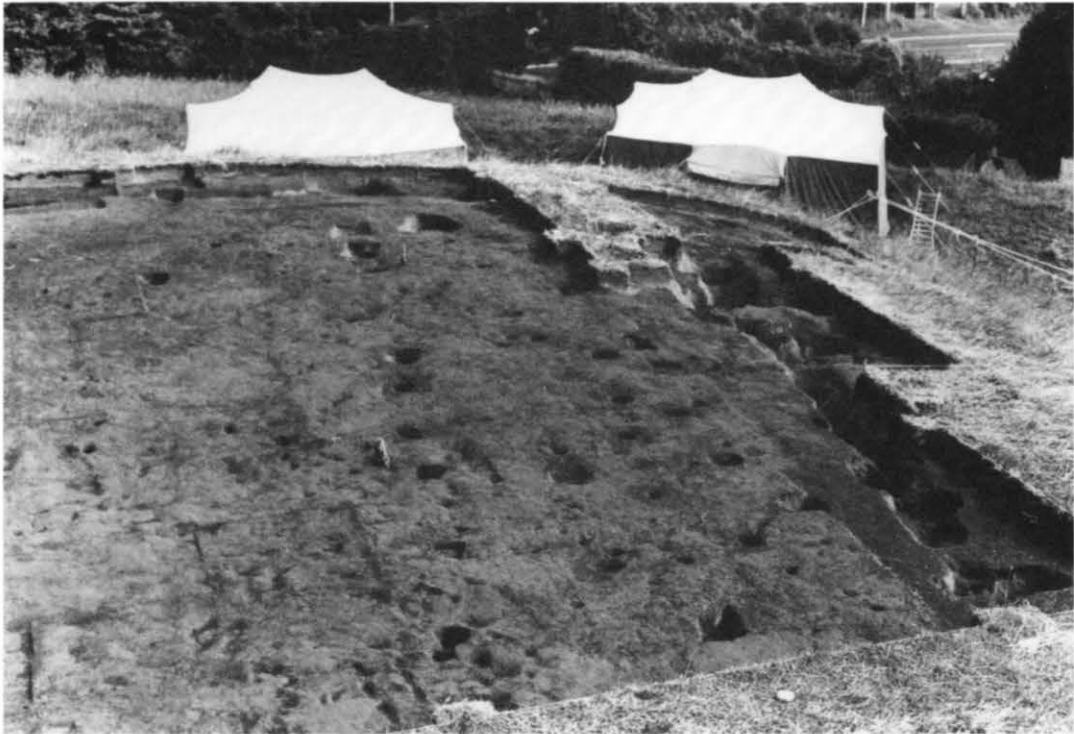


FIGURE 2.9. Top platform: looking north, to show the parallel lines of postholes which mark the eastern side barrack building. At right is the stockade line.



FIGURE 2.10. Top platform: looking south, the shallow trench across the foreground marks the base of the stockade. At left is the entrance to Rua A, and at right, the entrance to Rua C.

A drain runs from the interior of the stockade through the bastion and out beneath the north wall. This drain is 500 mm deep where it enters the excavated area, and almost 1 m deep where it exits beneath the bastion wall 550 mm deeper than the bastion wall trench. The actual fall is slightly greater than 500 mm because of the general fall in the ground level. It seems likely the drain was designed to carry off excess water from the butt shown in the north-west corner of the yard in Alexander's plan. In Square XIV a hole 560 mm deep which was only partly excavated suggests a matching drain through the south-east bastion (see Fig. 2.8).

Archaeological evidence for the stockade entrance gave different picture to that shown in Alexander's plan. In the plan the gateway is ten feet (3 m) from the north-east corner of the stockade and in line with the inner wall of the internal building on the north side of the yard. Archaeological evidence puts the gateway 4.4 m from the corner of the work and *ca* 1 m from the wall of the internal barrack building (see Fig. 2.7).

The gateway is marked off by two large postholes, now 500-600 mm deep, which are 850 mm apart. At the centre of the gateway, just within the stockade, is a single posthole now 330 mm deep which probably held an upright post against the back

of the door across which there was in all likelihood a horizontal bracing timber. A passageway extends from the entrance gate between the buildings and into the yard.

The buildings which surround the yard are marked by lines of postholes (see Figs 2.7 and 2.9). At the north and east sides, postholes 3 m from the stockade mark the inner wall of the buildings. Most of these are now 300-500 mm deep, but they would have been deeper before demolition of the stockade. The posthole in the centre of the shallow pit in metre square 016, which appears to belong to this series, proved unusually deep at 830 mm.

Postholes between the inner wall and the stockade on the east side of the yard fall into two close set lines. The better defined is 1.5 m from the stockade wall and presumably indicates the piles on which the floor was laid to six feet from the stockade wall according to Alexander's account. Approximately 500 mm from these postholes is another line which is continued in Square XIII by a shallow scarp only 50 mm high (Fig. 2.8). Approximately 1 m from the stockade wall, this line suggests the edge of the area to which, "... the earth was removed to within three feet of the piles". Flooring extended out another three feet with the space beneath used for storage.

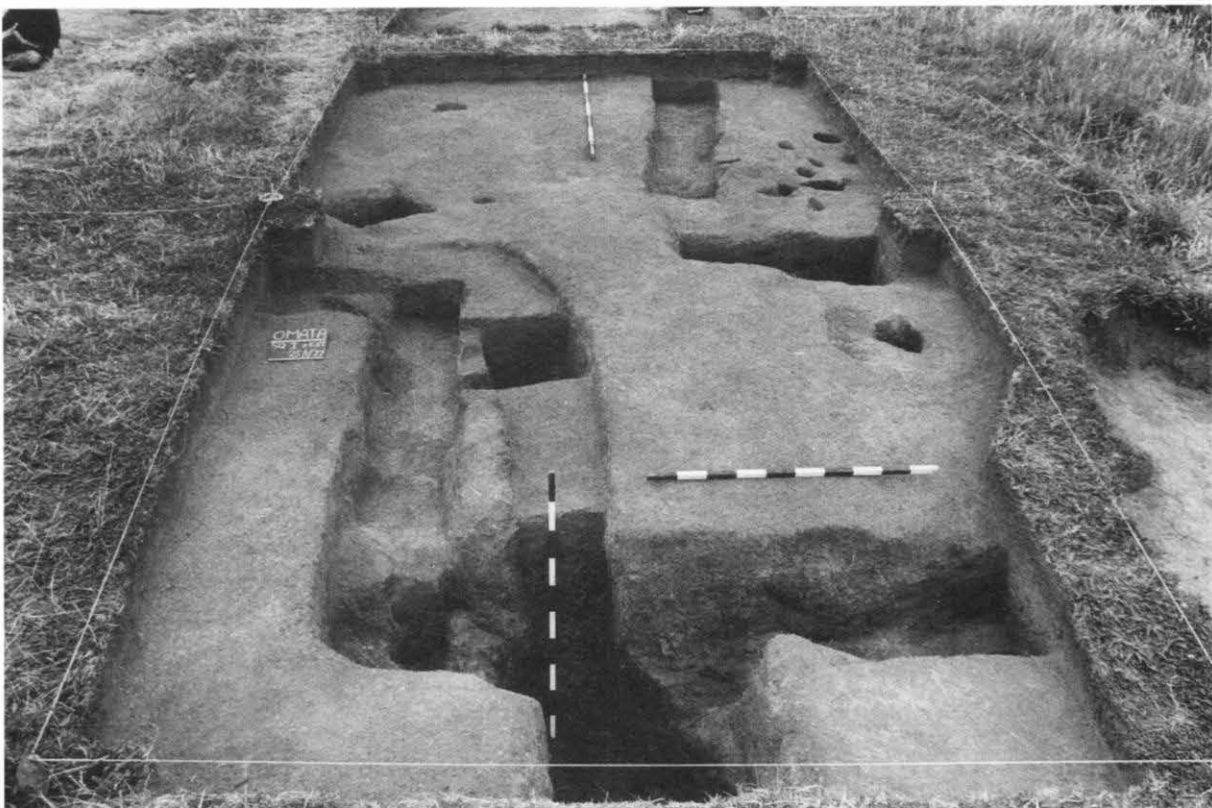


FIGURE 2.11. Top platform: the north-west bastion, looking south. The vertical scale (100 mm intervals) is in the drain from the central yard which exits beneath the bastion. At the centre rear a shallow trench marks the line of the west side stockade.

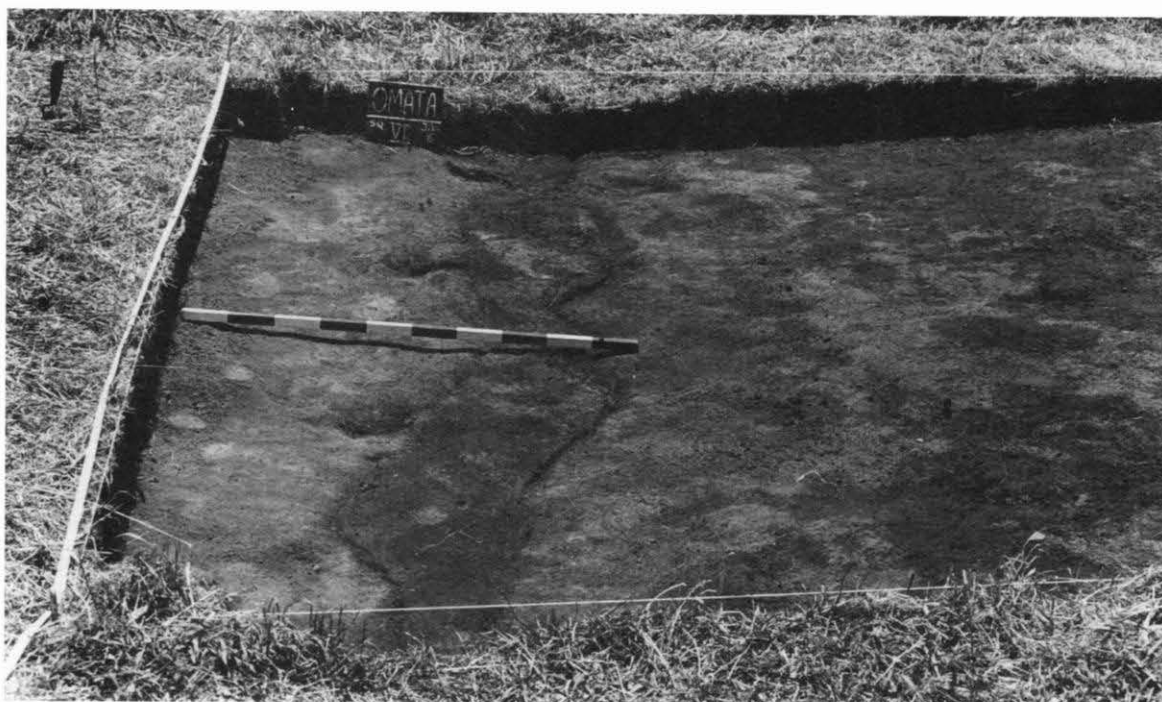


FIGURE 2.12. Top platform, Square VI: showing the slope of the yard to the (unexcavated) shallow central drain. Scale intervals are 100 mm.



FIGURE 2.13. Top platform, Square XV: the signs of demolition work by horse-drawn scoop are to the right of the dark soil which now fills the remains of the stockade trench.

Hard-packed courtyard floor was found over only a small part of the excavated area, showing that this area too suffered during demolition of the stockade (see Fig. 2.7). The courtyard surface was made up of compacted ash and sand which tended when dry to break up into irregularly shaped slabs. The courtyard floor slopes from the sides into a shallow central drain, which falls slightly to the south (Fig. 2.12, and see Fig. 2.7). As the plan indicates, it is somewhat closer to the west wall than the east wall of the stockade and is not quite parallel with the surrounding structures. The courtyard drained out beneath the south-east bastion as has already been described.

In Square XV three small parallel scarps about 200 mm apart suggested to the then landowner, Mr Bill Reardon, the use of a horse-drawn scoop (Fig. 2.13). Such scoops were allowed to enter the earth at a slight angle, to make entry easier than if the whole length of the leading edge was drawn into the ground at once. Thus a horse scoop may have been used to pull earth from the platform rim into the ditch when the stockade was demolished, or subsequently.

Evidence of the earlier, Maori, occupation of the hill is given by three bell-shaped rua or storage pits (Figs 2.7 and 2.8) found at the northern and south-east margins of the platform, and by a terrace at the southern end. Also found was a small fragment of chert (Fig. 2.50F) and a polished sliver of greenstone (Fig. 2.50E). A flat water-worn pebble, heavily reduced along one margin by hammering and with a slight scoop in one of the flat sides, is identified as a tattooing pigment pot (Fig. 2.50G).

The rua are of two kinds (see Fig. 2.14). Rua A has a vertical entrance, a broad step, and a kidney-shaped floor area 2.35 m in length and 1.13 m from the step to the wall opposite (see Figs 2.14 and 2.15). Rua B has a vertical entrance, a narrow step and a four-sided floor plan, with upright rather than overhanging

walls (Figs 2.14 and 2.16). Rua C was in poor condition but appeared similar in arrangement to B. Unlike Rua A and B which were *ca* 1.6 m in depth, Rua C was only 1.2 m deep showing that the Maori platform or terrace was cut down more severely here for the settlers' stockade.

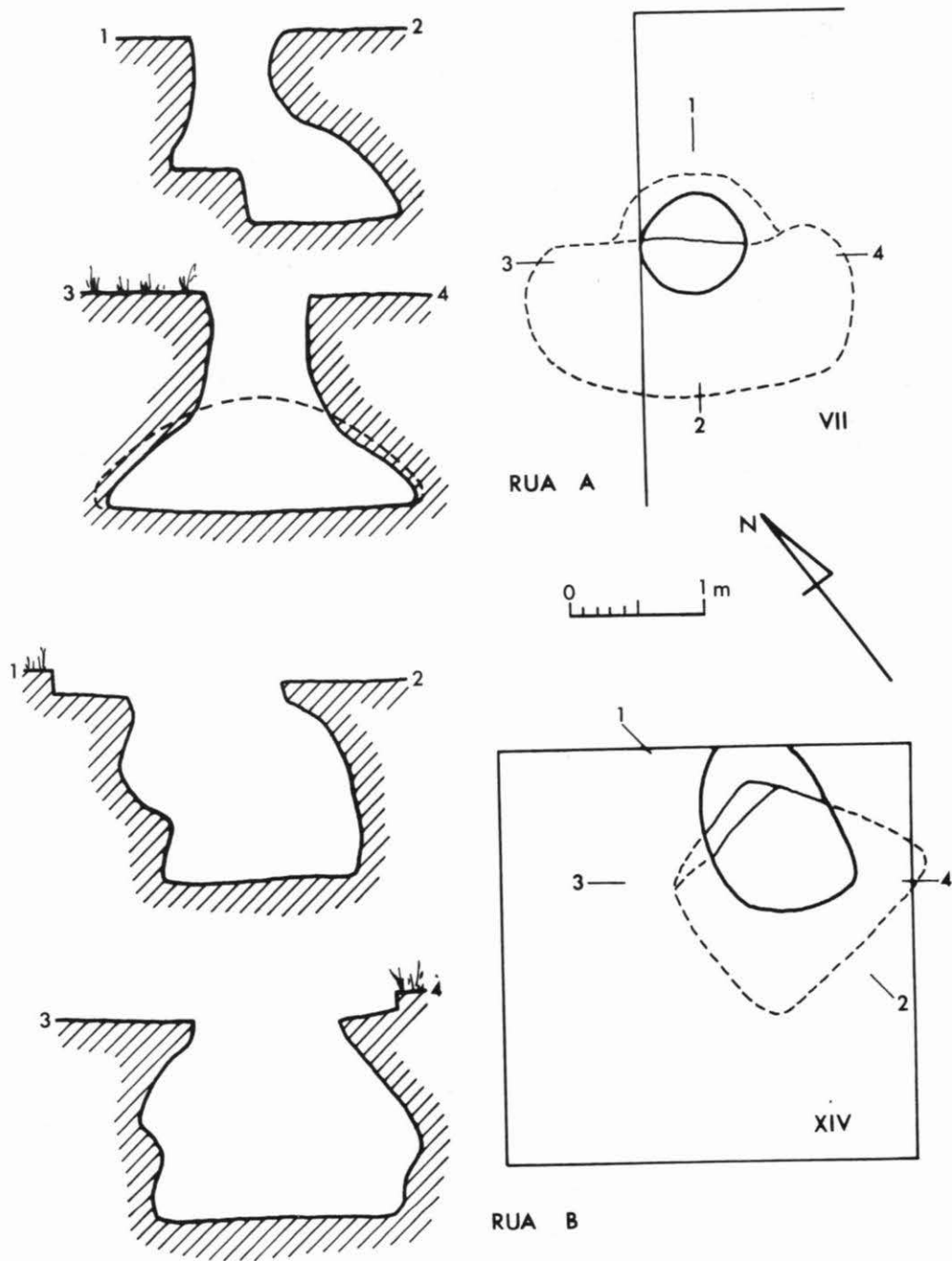


FIGURE 2.14. Kumara storage pits (rua) relating to the Maori occupation of Ngaturi. For location of the rua see Figs 2.7 and 2.8.



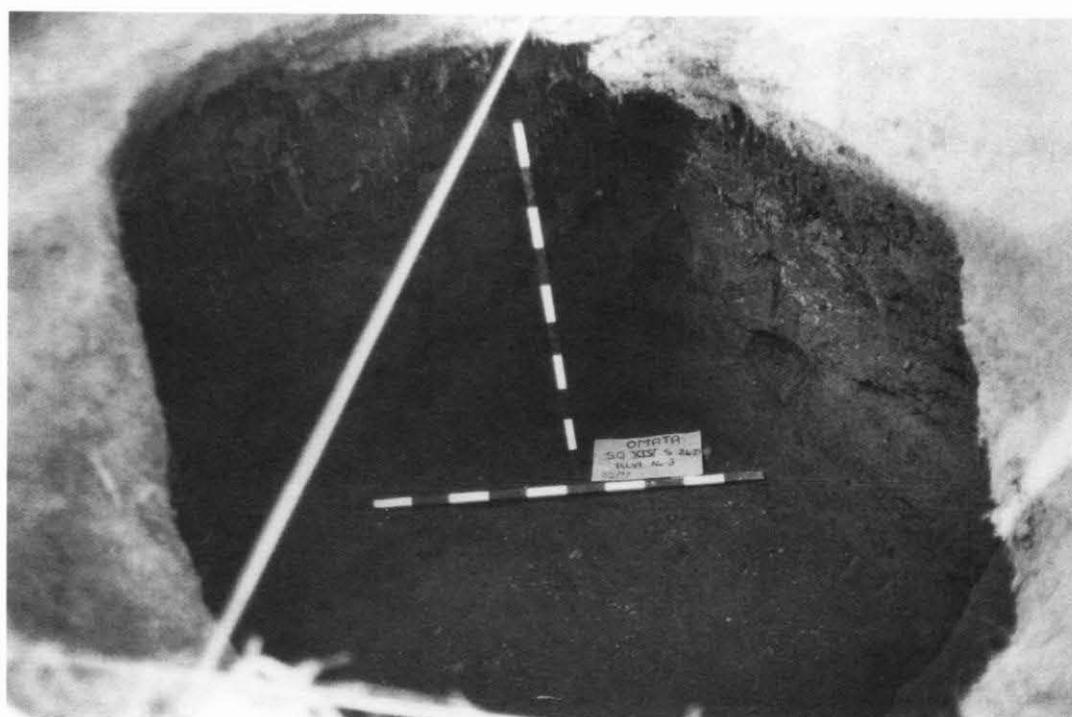
FIGURE 2.15. Top platform: excavation of Rua A, dating from the Maori occupation of Ngaturi.

At the southern end of the platform an extension to Square XV explored a Maori terrace 1 m below the stockade level (Fig. 2.17). The terrace is little more than 2 m across. The width is unknown. Occupation evidence includes a thin scatter of tiny fragments of charcoal, some pebbles and two postholes.

Artefacts recovered from the top platform are small or fragmentary. They include pieces of bottle and window glass, earthenware, clay pipes and stone bottles, some ammunition and percussion caps, fragments of iron, brick and coal, and small items of brass and copper. All items are discussed below together with artefacts from the ditch. Because the high rim of the platform has been removed, and much of the remainder has probably undergone a degree of disturbance, the distribution of material on the top platform does not tell us anything of the way in which the garrison organised itself.

Very rarely *in situ* material was found. Jammed into a posthole in metre square Q15 were six pieces of earthenware making up part of a blue and white jug (Fig. 2.44D), also a complete unmarked clay pipe bowl, some window glass and four large pieces of an aqua 'whisky' bottle. In Rua C, the fill of which dates from the stockade construction, was a considerable quantity of black bottle and other glass, some pieces of a stone bottle and fragments of clay pipe.

FIGURE 2.16 (Below). Top platform, Square XIV: Rua B, dating from the Maori occupation of Ngaturi.



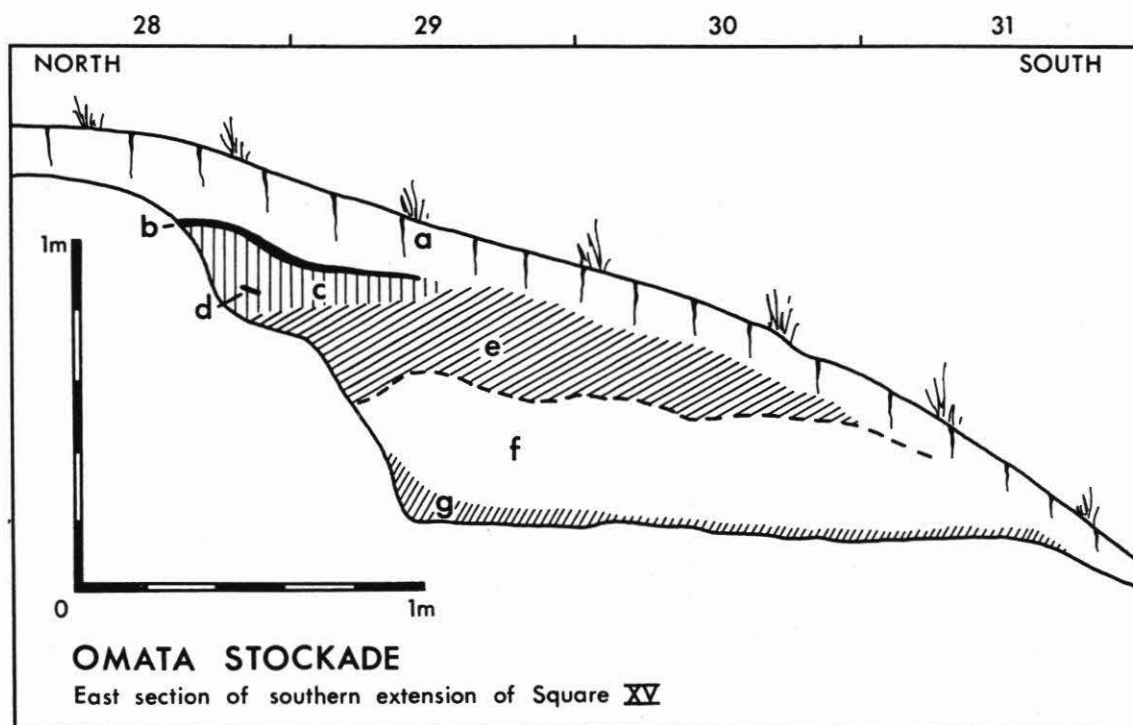


FIGURE 2.17. Top platform: east section of southern extension of Square XV, showing the artificial terrace dating from Maori occupation of Ngaturi.

- a. Turf, dark brown loam.
- b. Charcoal and ash, likely to date from demolition of the stockade.
- c. Compacted erosion layer of redeposited soil and ash.
- d. Object of rusted iron.
- e. Blocks of redeposited soil and natural ash suggest rapid infilling, probably related to stockade construction.
- f. Homogeneous redeposited natural ash and soil.
- g. Thin bands of natural ash, with some charcoal and pebbles - the Ngaturi (Maori) living floor.

The ditch

The ditch was excavated at the north-east corner of the hill (Squares X and XII) in order to look at arrangements for the crossing to the entrance of the stockade. The stockade gateway was also considered a likely area for rubbish to accumulate.

Work began on 11 January when a 6 x 3 m square (X) was opened up close to the north-east corner of the site (Fig 2.18). Another 6 x 3 m square (XII) was later excavated 2 m from Square X; this square subsequently was enlarged to 6 x 4 m. Towards the end of the season a 6 x 1 m trench (Square XVI) was dug across the defensive ditch at the north-west corner of the site to check the picture emerging in Squares X and XII. The total area excavated in the ditch was 48 m².

The ditch surrounding the stockade was found to have been 1.8-1.9 m deep in relation to the outer encircling bank. Stratigraphically it was broadly similar throughout: a large number of layers and lenses may be included in three levels (see Figs 2.19-2.22).

Level 1 ('sandy layer') at the bottom of the ditch consisted of water-laid sandy loam 800-1200 mm deep. In places this material was fairly homogeneous, but elsewhere it was made up of thin lenses of discrete material. Level 1 contained much rubbish, especially within a 'bottle lens' in Square XII and to a lesser extent in Square X. Almost certainly it was laid down during occupation of the stockade, probably in later years when the partly filled ditch would not have been a threat to security.

Level 2 ('mixed fill layer'), up to 700 mm deep, consisted of blocks of material including compacted ash and clay, black (charcoal) soil and other soils, sand and other material. Level 2 resulted from a rapid and deliberate infilling of the ditch which probably occurred when the stockade was demolished. It contained little rubbish.

Level 3 ('turf layer') consisted of the present turf and underlying compact and structured soils to about 500 mm depth. Rare rubbish items are the result of recent erosion from the top platform and intervening slope.



FIGURE 2.18. Defensive ditch: view of Squares X and XII, to north from top platform.

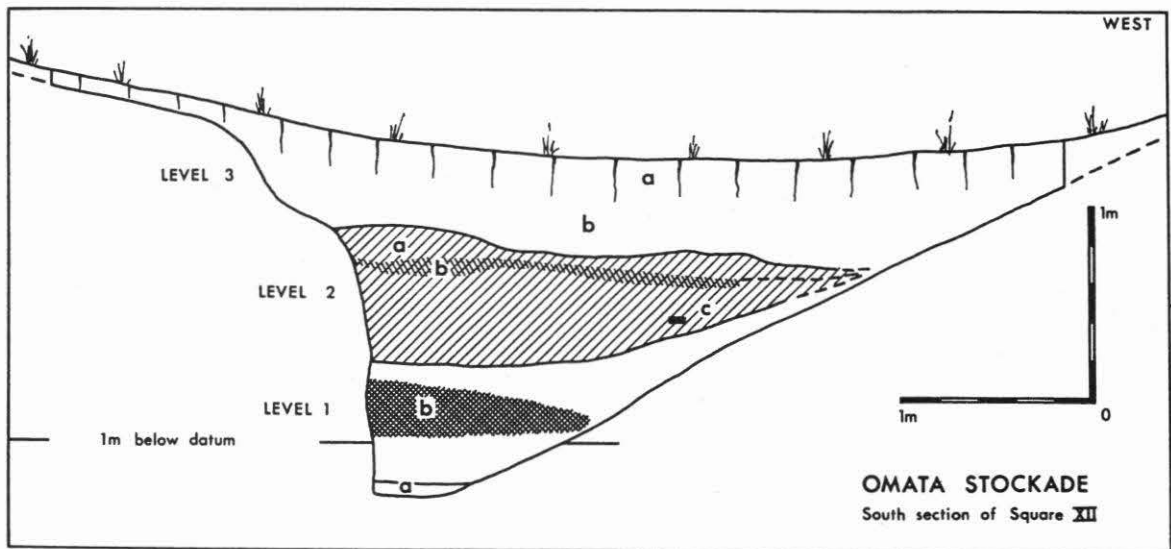


FIGURE 2.19. Defensive ditch, Square XII, south section:

Level 1. Homogeneous water-laid sandy loam. a. Finely bedded compact sandy loam, dating from stockade occupation. b. Mass of broken bottles and other material.

Level 2. Mixed fill layer. a. Yellow-brown mixed ash and soils. b. Compacted former occupation surface. c. Iron object.

Level 3. Turf. a. Dark brown loam. b. Compact loam with some charcoal, ash and clay.

Note that 1 m below Datum B is 76.6 m above sea level.

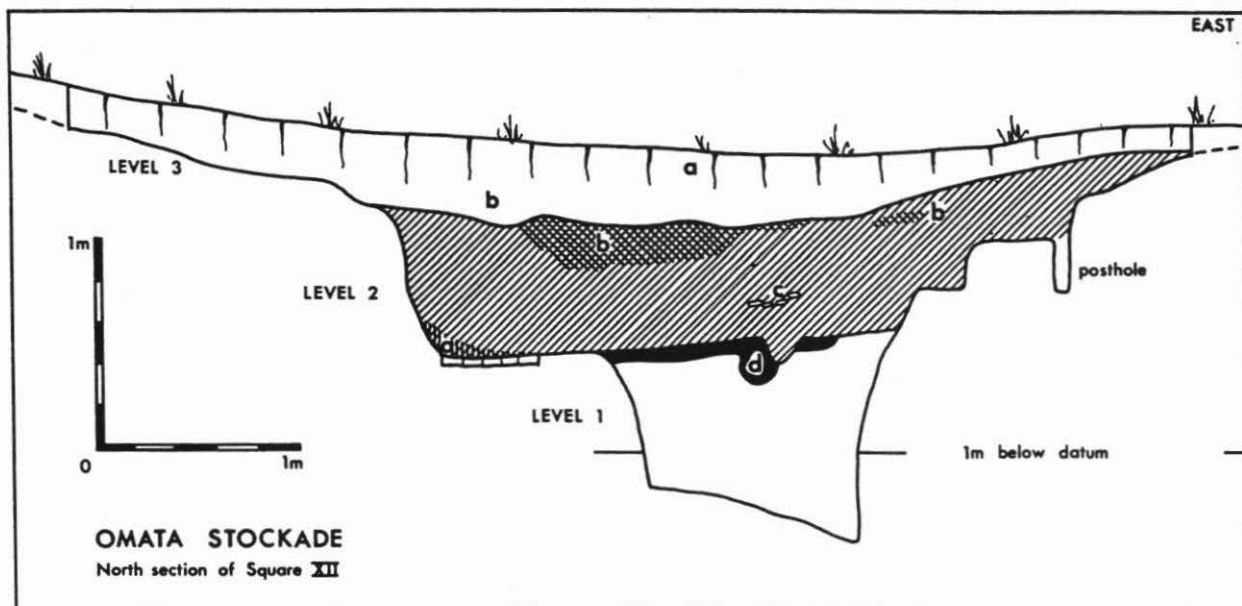


FIGURE 2.20. Defensive ditch, Square XII, north section:

Level 1. Homogeneous water-laid sandy loam.

Level 2. Mixed fill layer. a. Ash on brick hearth. b. Charcoal and ash. c. Water-rolled boulders. d. Highly compacted clay lens, with some small artefacts on top surface.

Level 3. Turf. a. Dark brown loam. b. Compact loam with some ash and charcoal.

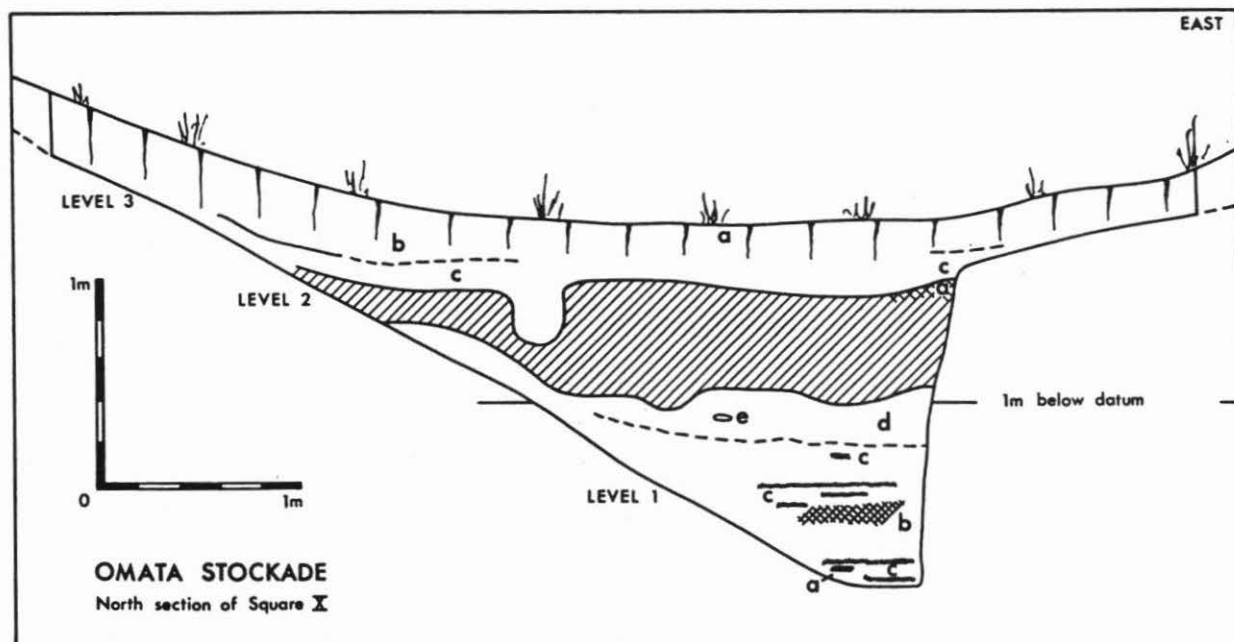


FIGURE 2.21. Defensive ditch, Square X, north section:

Level 1. Homogeneous water-laid dark brown fine sandy loam. a. Slate. b. Mass of broken bottles and other material. c. Fine lenses of black iron sand. d. Sandy loam lighter in colour than below. e. Boot.

Level 2. Mixed fill layer which is unusually homogeneous: loose light brown loamy fill with some charcoal. a. Water-laid sandy loam.

Level 3. Turf. a. Dark brown sandy loam. Beneath is a compact homogeneous brown loam which includes: b. An upper very compacted element, apparently a former occupation surface. c. Underlying more friable material.

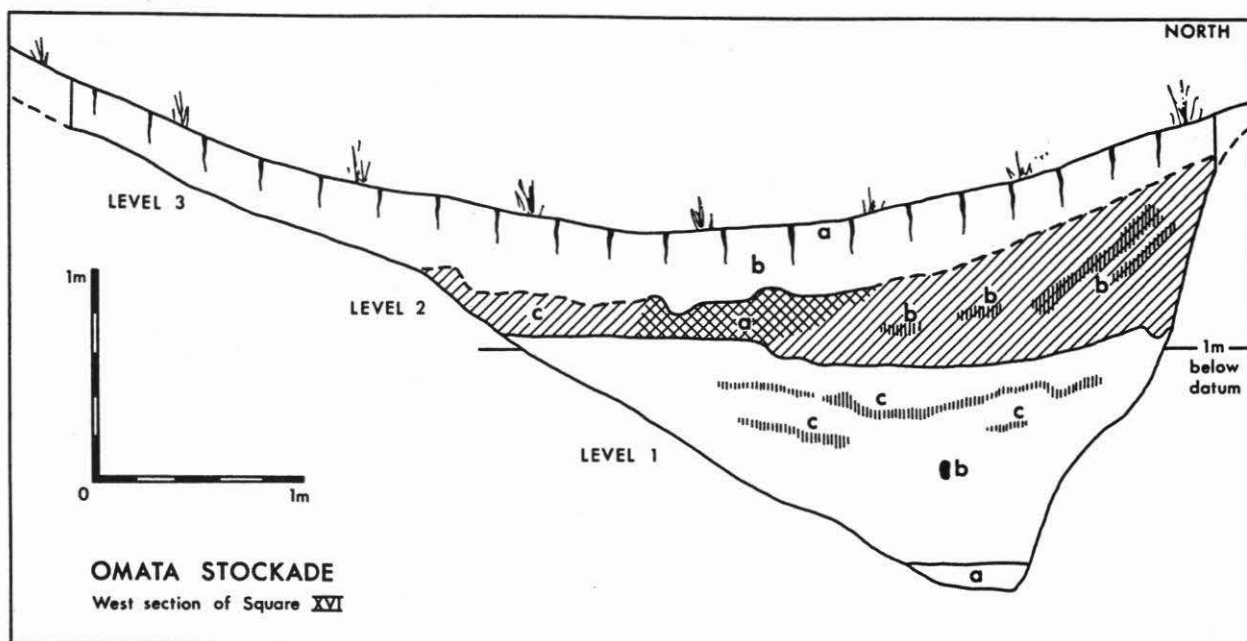


FIGURE 2.22. Defensive ditch, Square XVI, west section:

Level 1. Homogeneous water-laid dark brown fine sandy loam: a. Finely bedded loamy sand lenses. b. Iron fragment. c. Yellow-brown clay lenses.

Level 2. Mixed fill layer. a. Dark brown redeposited topsoil or turf. b. Dark brown loam lenses. c. Compact material, similar to Level 3.

Level 3. Turf. a. Dark brown loam. b. Compacted homogeneous yellow-brown loam.

Contemporary pictures such as that of Colonel Alexander (Fig. 2.5) show a bridge across a ditch. Alexander also gives a useful description of the bridge and how it worked. Archaeological evidence was found in Square XII in the form of a block of natural material which breaks the otherwise steeply sloping scarp from the top platform (see Figs 2.20 and 2.23). This block of material appears to have added strength to the inner (hinged) end of the drawbridge. It would also have served to reduce the span of the bridge to the "ten feet" given by Alexander.

Next to the block of natural material in Square XII is a massive stepped posthole 1 m in depth which is likely to have provided a firm footing for the inner post of the drawbridge. At the foot of the counterscarp 2.6 m away is a second posthole extended in depth by a narrow slot hard against the steep counterscarp wall (see Fig. 2.23). These two postholes mark the southern side of the access bridge across the ditch. The other side is beneath unexcavated ground between Squares X and XII.

Some time during the life of the stockade the drawbridge was replaced by a causeway across the ditch, the compacted surface of which was clear in Square X. A small hut was built alongside this causeway with a brick hearth appearing in Square XII in a step of natural material apparently cut down for the purpose (Figs 2.20, 2.23 and 2.24). A compacted occupation surface extended across the ditch, now filled to a depth of

about a metre. The tramped surface shows that the rubbish was dumped in Level 1 before this alteration to the entrance arrangement.

The ditch is V-shaped with the scarp from the top platform offering no cover from the guns of defenders manning the rifle slits in the stockade above. The steep counterscarp is much as Alexander depicts, being almost vertical the places. The 10 ft (3 m) height given by Alexander from the bottom of the ditch to the level of the stockade wall is only a generalisation; this varied in excavated areas from 4 m in Square XII to 4.5 m in Square XVI.

Most artefacts in the ditch, and indeed the whole site, were recovered from the 'bottle lens' in Squares X and XII. In Square XII material was increasingly abundant to the south. There were some artefacts also in the water-laid sand in Level 1 above and below the 'bottle lens'.

Colonel Alexander noted that elsewhere in New Zealand he had had broken bottles thrown into the ditch surrounding a blockhouse as an added defensive measure; one of the reasons for excavating Square XVI was to check that this was not the reason for the dump of broken glass in the Squares X and XII ditch. The lack of rubbish, broken or otherwise, in Square XVI, indicates that the 'bottle lens' near the entrance way was indeed just a rubbish dump.

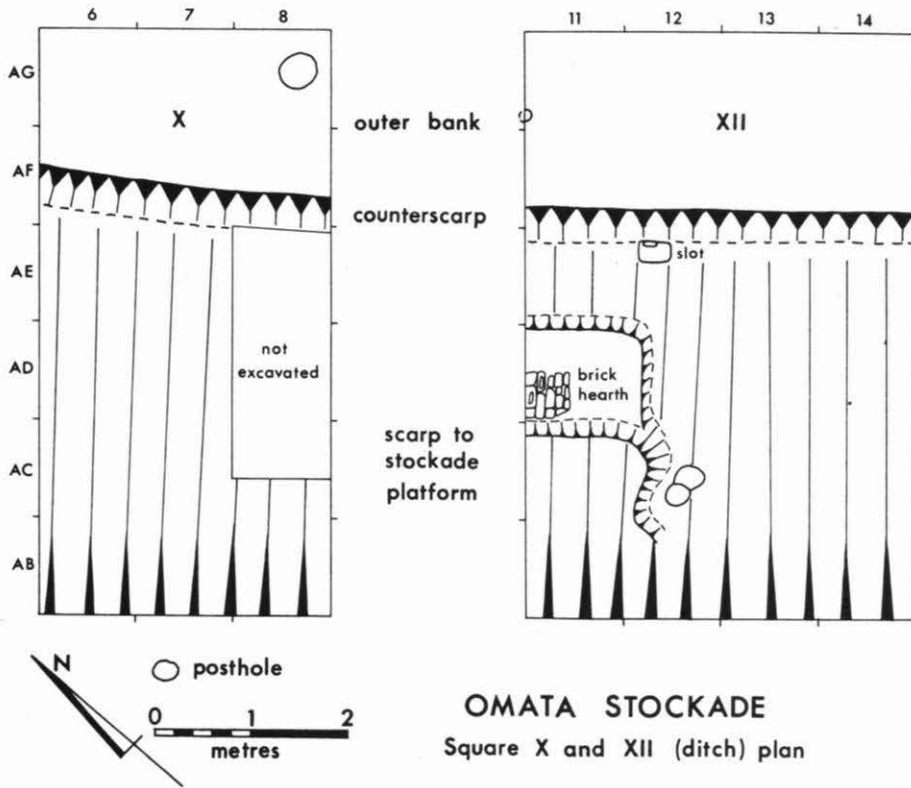


FIGURE 2.23. Defensive ditch, Squares X and XII: plan.

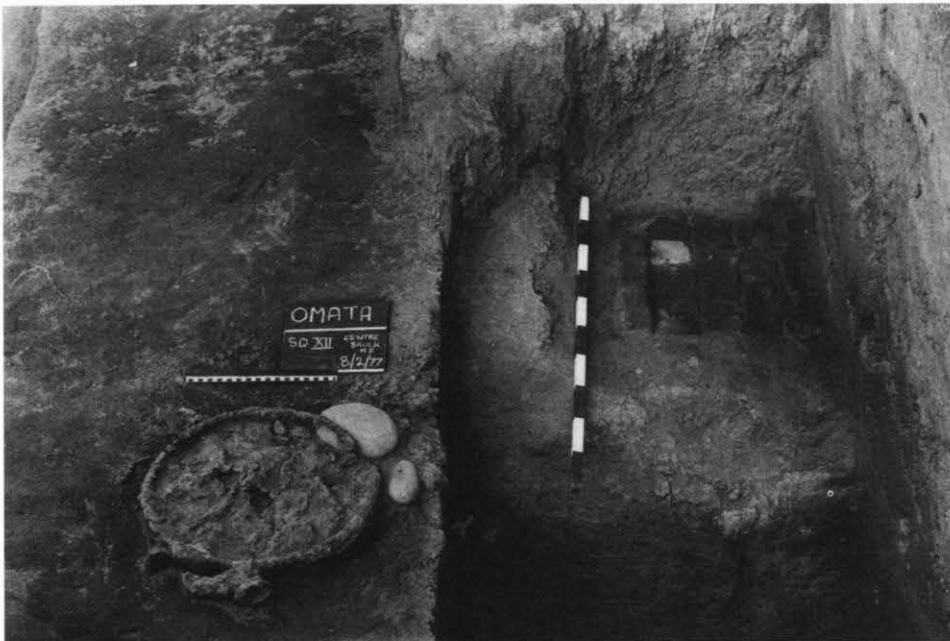


FIGURE 2.24. Defensive ditch, Square XII: at right is brick hearth; left is an iron teapot spout (see Fig. 2.50D) and hoop iron, also a barrel tap (see Fig. 2.52a). Scale intervals 100 mm.

THE ARTEFACTS

Artefacts recovered at Omata are treated here as belonging to one collection. Those who want detailed locations of all finds will have to look at Appendix 3 in my thesis (21). It is possible that some items from the top platform and from upper levels in the ditch belong to a later period, but the general similarity with Level 1 material enables us reasonably, and sensibly, to group all the material together for the purpose of description.

There are two exceptions to this: one is the Maori material and the other is a 1906 penny recovered in Square XVI. The Maori material has been discussed above. It probably relates to the former Ngaturi pa, but may possibly have been brought to the settler stockade as souvenirs.

The 1906 penny was found in Level 2, about 700 mm from the north baulk and 800 mm from the turf surface. Figure 2.22 shows an unusual amount of Level 2 fill in Square XVI to have come from the outer bank compared with the other ditch sections (see Figs 2.19-2.21). It seems likely therefore that there was a minor filling operation this century which saw the lowering of the outer bank in this area. Other material in Square XVI belongs to the stockade period.

The 18th and 19th centuries industrial revolution so increased the quantity and variety of made items that traditional detailed archaeological description of artefacts has to be modified when dealing with recent sites. The sheer quantity of material makes detailed exploration of the origin and technology of Omata artefacts beyond the scope of this account. Here I concentrate on describing and illustrating the objects as fully as possible so that students of the period and of this kind of site may have a useful comparative basis on which to build.

Bottle glass

The most abundant cultural material in the site is bottle glass. Almost all the bottles are broken, only seven in the great mass of glass in Squares X and XII, Level 1, being intact: three black bottles (Fig. 2.25A), two 'brandy' bottles (Figs 2.29B and 2.30A), one "Davis's Vegetable Pain Killer" bottle (Fig. 2.37D) and one small colourless glass bottle (Fig. 2.37G). A "Walden's Ink" bottle is almost intact (Fig. 2.34D).

The Omata Stockade dates from a period when the technology of making bottles was undergoing considerable change. This change is reflected in material from the site by the wide variety of techniques used in manufacture.

In the middle of the 19th century most bottles were made in two or three piece moulds. The bases might be moulded, in which case they could be embossed, or pushed up to form a 'kick-up' in the manner of the earlier free-blown bottles. Tops were sometimes crudely snapped to detach the bottle from the

blow-pipe, making a 'sheared lip', and then a 'string rim' added by running a 'string' of molten glass around the neck just below the top (for example see Fig. 2.29A). The more common way of finishing a bottle, however, was to add an 'applied top' - that is, a piece of glass which was moulded to the desired form was added to the top of the substantially complete bottle (for example Fig. 2.25).

An earlier technology is represented at Omata by the 'prunt', or glass seal, on the shoulder of the J.J.W. Peters 'bitters' bottle (Fig. 2.35A). This was a common method of labelling bottles in the 18th century, but by the middle of the next century was retained only for decorative effect and to add class to the product.

Table 2.1 lists bottle glass recovered at Omata, divided into general categories by colour.

Glass type/colour	Weight (gm)	Percentage
'black bottle'	140703.3	78.64
green (cognac)	15925.2	8.90
aqua	13496.9	7.54
brown ('bitters')	3500.9	1.96
'case gin'	2539.2	1.42
yellow ('schnapps')	889.3	.50
colourless	747.8	.42
light blue	695.0	.39
dark green	203.8	.11
yellow	180.0	.10
dark blue	43.4	.024
embossed dark green	5.0	.003
	<hr/> 178929.8	

TABLE 2.1. Omata Stockade bottle glass.

'Black bottles' (Figs 2.25-2.27)

More than 78% by weight of Omata bottle glass belongs to the so-called 'black bottle' - which usually shows dark green, or occasionally brown, before a strong light. A range of bottles of utilitarian form and popular contents were made of this glass. 'Black bottles' commonly contained beer and it is likely that most or all Omata glass is from beer bottles, as, indeed, is indicated by all the decipherable label fragments. Olive Jones (22) lists wine, fortified wines, porter, ale (beer), cider and distilled liquors, as well as vinegar, spa waters and castor oil in such bottles.

Most 'black bottle' glass belonged to quart bottles of the three basic shapes shown in Figure 2.25. There is also a smaller pint bottle of which two bases and four tops were recovered

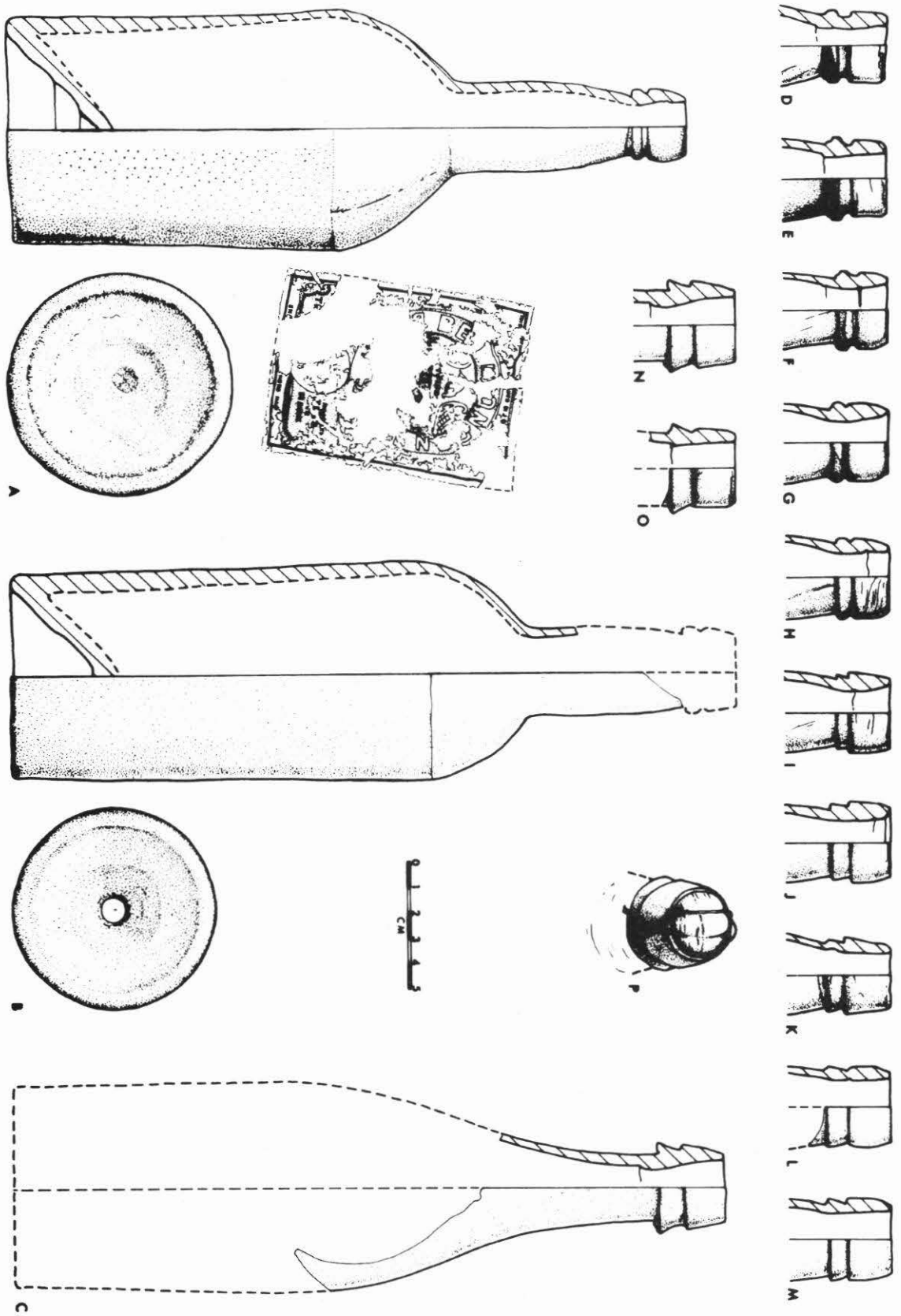


FIGURE 2.25. 'Black bottles' (A).

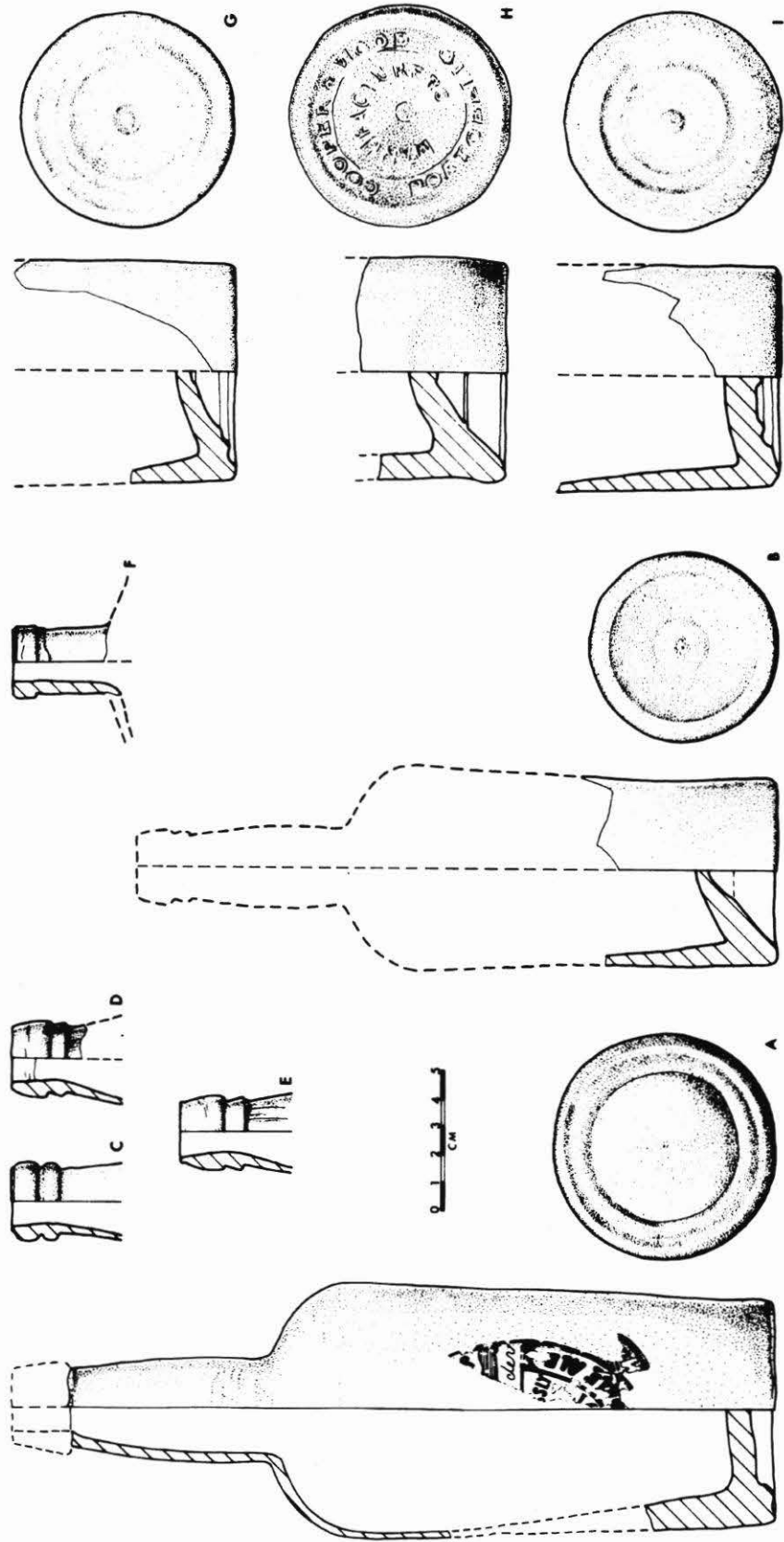


FIGURE 2.26. 'Black bottles' (B).

(Figs 2.26B-E). Figure 2.26F shows the top and neck of a small bottle of 'black' glass of which one example was found in Square X, Level 1. A single embossed fragment of black glass was recovered from the fill of Rua C.

Counting intact and reassembled bases is one way of finding out the number of bottles represented by a mass of broken glass. Their measurements can help in estimating the number of different types. Bases numbering 172 fall into two clear size classes at about 77 mm and 90 mm respectively.

The size class which centres on the 90 mm diameter clearly belongs to the squat form (Fig. 2.25A). All three complete bottles are of this size and diameter; the greater diameter would be needed for these shorter bottles to have the capacity of their taller counterparts which centre on 77 mm diameter.

All black bottles have applied tops. These come in a wide variety of closely similar forms which can be seen in Figure 2.25D-0. They range from the top with a U-shaped notch for the tie wire (Figs. 2.25D-F), to the V-shaped notch with the flared lower rim (Figs. 2.25C and 0).

There are 142 complete and reassembled tops from the site. These may be divided into three groups: 43 U-shaped notches, 74 V-shaped notches and 25 V-shaped notches with flared rims. Since the last group, where enough shoulder exists for this to be established, invariably relate to the bottle shape shown in Figure 2.25C we may use 25 as the likely minimum number of this bottle shape.

The three complete 'black bottles' from Omata weigh approximately 770 g each. Using this as an average and dividing the weight of 'black' glass we arrive at 183 as the total number of bottles represented. This conforms well with the number established from bases.

'Black bottles' containing beer were stopped with a cork tied down with wire and sealed with a lead 'capsule'. Where tie wires remain, the tops with a U-shaped notch are almost always tied with steel wire, while tops with a V-shaped tying notch are tied with copper wire. Figure 2.25P illustrates the method of tying.

Three bottle tops with intact cork and tie wire, and necks neatly sheared off just beneath the top, illustrate a common piece of bravado enjoyed by the men at Omata, and by other British soldiers and drinking men at the time. This was to knock off the entire top - glass and stopper - by the well aimed blow of a bayonet or other object, before knocking off the contents.

It is likely that most, or all, of the lead capsules illustrated in Figure 2.27 belong to 'black' bottles. The "J. Friend" and "J.G. Marzetti" capsules certainly do as they were found intact on the broken tops mentioned above. "Marzetti" also appears on a bottle label (Fig. 2.25A) where the formula "only genuine when capsuled and stamped thus" is employed. The numbers of different capsules recovered are: Marzetti - 6, Friend - 3, Victoria Stores - 3, and John Tyrer - 1.

The status of the firms whose names are stamped on these capsules is not known. Because "Marzetti" also appears on a whisky label (Fig. 2.31B), and because the trade mark employs a kangaroo and sheep, it seems likely that it was a merchant firm engaged in exporting to the colonies, rather than the actual manufacturer. At least one brewer, however, may be positively identified. A small fragment of glass with some label gives the name of the Edinburgh firm "W.M. Younger & Co".

Included here with 'black bottles' are some bottles of finer quality, generally brown to yellow when viewed against the light, and possessing shallow moulded kick-ups. The heavy glass bases of these bottles can be difficult to distinguish from ordinary 'black bottle' material. The top, neck, shoulder and upper part of the body, however, are generally of much thinner glass. A minimum weight of glass from bottles of this type is 3580 g.

Three reassembled examples of bottles of this finer glass are given in Figures 2.26A and 2.28C and D. Bases are given in Figures 2.26G and I. There are six flat bottomed bases as shown in Figures 2.26A and 2.28C, three of the base type shown in Figure 2.26G and 2.28D, and one of the type shown in Figure 2.26I. All are about 77 mm in diameter.



FIGURE 2.27. Lead capsules.

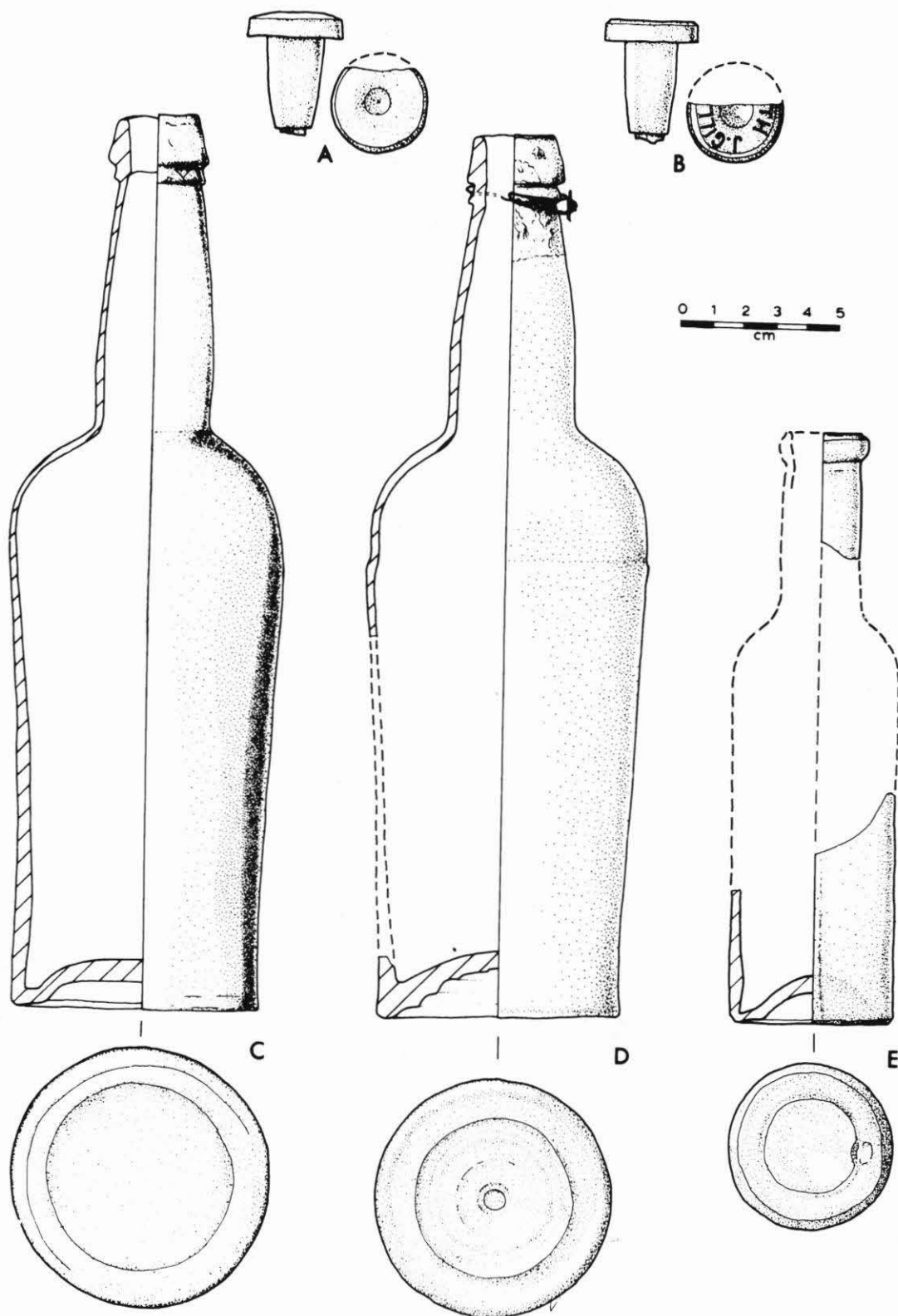


FIGURE 2.28. A and B. Dark green glass stoppers. C and D. 'Black bottles'. E. Dark green glass bottle.

Dark green glass bottles (Figs 2.28A, B and E)

The single identifiable bottle (Fig. 2.28E) is represented by the base and a top fragment as well as other pieces. Two dark green glass stoppers include one embossed "J.GILL...TH" (Figs. 2.28A and B).

'Brandy' bottles (Figs 2.29 and 2.30)

The second largest quantity of glass recovered, 8.9% of Omata bottle glass by weight, was from sea green bottles with high 'kick-ups', most or all of which contained brandy ('cognac'). Included are two complete bottles (Figs 2.29B and 2.30A).

These bottles have no mould lines. Instead, they have marked lines curving up the glass of their necks where the glass-blower has turned the bottle during manufacture. Both

features set them apart from other Omata bottles. Sixteen of the 22 tops (apparently those associated with "Old Brandy" bottles, Fig. 2.29A) have sheared lips with string rims added - made by drawing a 'string' of molten glass around the top below the rim. It has been suggested that the careless finish of such 'string rims' indicates continental manufacture (23).

The long bulbous neck (Fig. 2.30B) is also said to be characteristic of continental bottles. Applied tops are also present among bottles of this group (see Figs 2.29B and 2.30A and B).

The four illustrated labels proclaim contents and manufacturers. Except for the "Compagnie Imperiale" label all are wholly or partly in English, showing that the product was intended for the English market. Manufacturers are "Compagnie Imperiale", "Jas Hennessey" and "Renault (?) and Co". The words 'cognac' or 'brandy' (or both) appear on all labels. The intact "Hennessey" bottle has been used to hold a candle in the

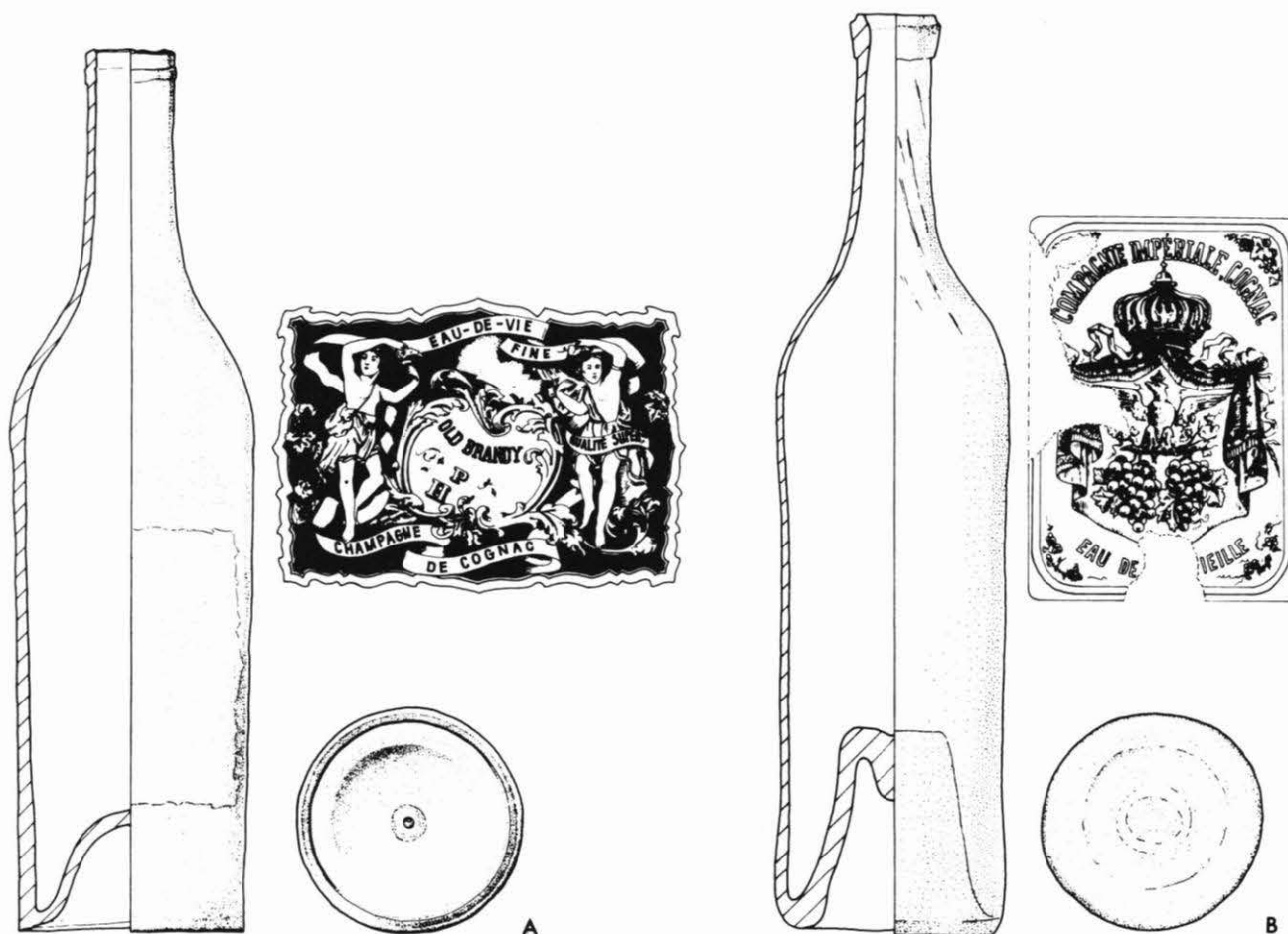


FIGURE 2.29. 'Cognac' bottles and labels (A).

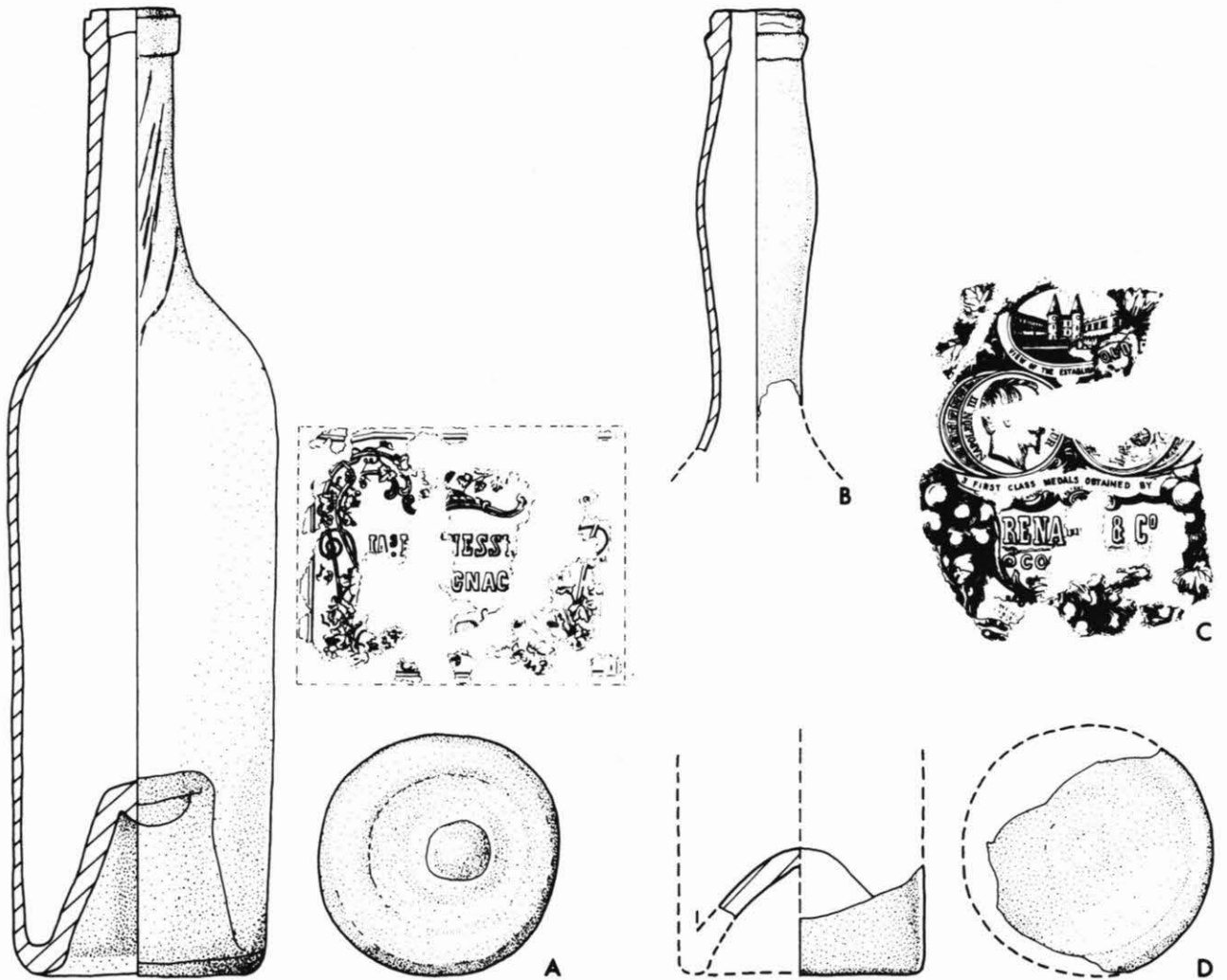


FIGURE 2.30. 'Cognac' bottles and labels (B).

manner of a 1960s coffee bar. In it were two candle stubs and some melted wax.

Not all glass of this colour is from brandy bottles: a fragment with part of a "J.J.W. Peters" label probably contained schnapps or bitters (see below).

The number of bottles of this type can be estimated by weight, and from tops and bottoms. Twenty-two tops were recovered either complete or capable of reassembly. More fragments could not be reassembled. There are 16 'string rims', and six applied tops which include the other three illustrated top forms - including the long-necked bottle.

Twenty-six bases were recovered complete or were reassembled. These include 15 moulded bases of the type associ-

ated with the "Old Brandy" bottle, four of those associated with the "Compagnie Imperiale" bottle (Fig. 2.29B), three of the high kick-up form associated with the "Jas Hennessy" bottle (Fig. 2.30A) and four of the shape given in Figure 2.30D. Other base fragments could not be reassembled for numbers to be established.

'String rims' suggest there were 16 "Old Brandy" bottles, of which one complete example weighs 480 g. The complete Hennessy bottle is 648.5 g. Incomplete bottles are generally of the Hennessy rather than the "Old Brandy" type. Taking 16 bottles at 480 g and 11 (from bases) at 648.5 g, an average weight can therefore be established at 548.5 g. If we divide the total glass (15,933 g) by the average weight we arrive at a total of 29 bottles.

Aqua bottles (Figs 2.31-2.34)

Bottle glass of an aqua colour - a very pale green or blue-green - makes up 7.5% of the Omata collection by weight. Aqua glass bottles include a wide range of forms. For convenience they are divided into whisky bottles, salad oil bottles, Crosse and Blackwell pickle jar and miscellaneous forms.

Whisky bottles. The items illustrated in Figure 2.31 may be called 'whisky' bottles for convenience; labelled examples show whisky to have been the contents. The bottles were made in a two or three piece mould and have applied tops. All appear to have been of the ordinary 'quart' size.

Figure 2.31A shows the base and part of the body of a bottle 76 mm in diameter. The remains of a faded yellow and white label were too badly damaged to be useful. At least three of these bottles are represented.

One example of the bottle pictured in Figure 2.31B was recovered. Again it is 76 mm in diameter, this time with "BS" embossed on the base. The badly damaged label in red, yellow and white gives the name of the London firm "J.G. Marzetti & Sons". The distiller is unknown.

The bottle pictured in Figure 31C is 69 mm in diameter. The contents, "Superior Malt Whisky", were made by James Henart and Company of Paisley, Scotland. The statement "only genu-

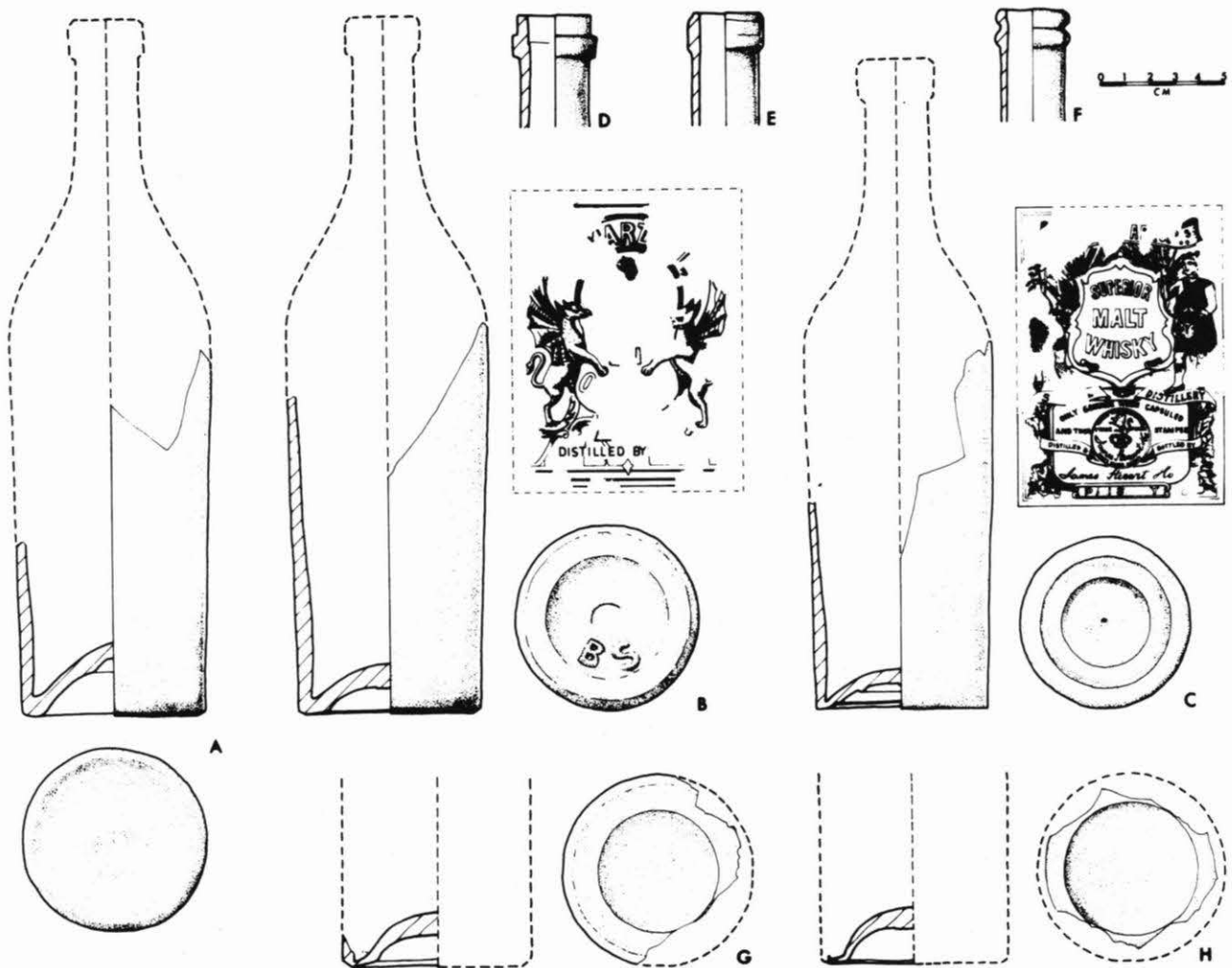


FIGURE 2.31. 'Whisky' bottles and labels.

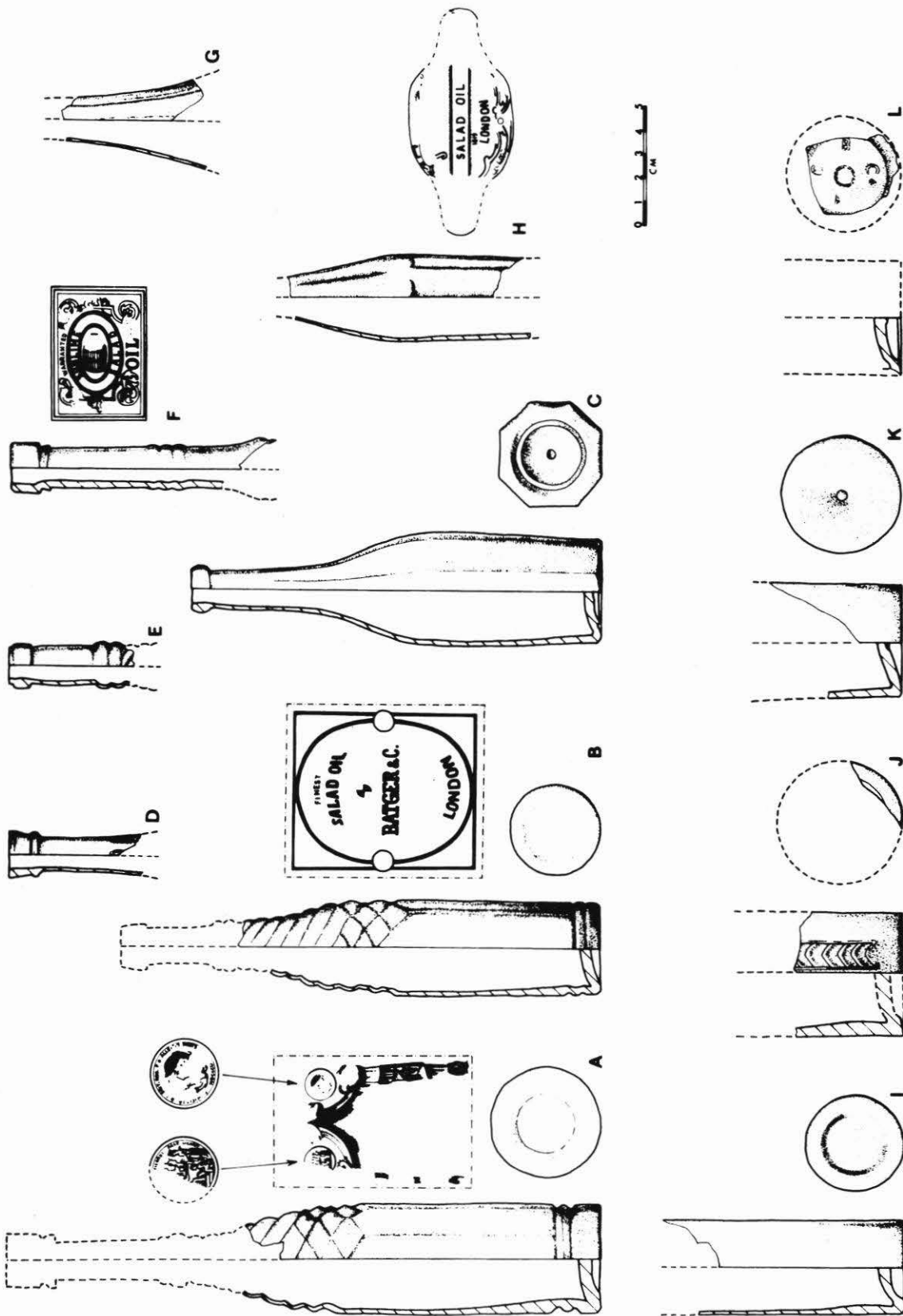


FIGURE 2.32. Salad oil bottles and labels.

ine when capsuled and thus stamped” refers to the use of lead foil capsules and can be compared to a similar formula on the Marzetti label described above. The capsule stamp pictured on the label is not represented among the recovered capsules. Three bases were found of this shape. The illustration has been drawn from two fragmentary bottles.

Figures 2.31G and H show two essentially similar, but slightly different bases which belong in this group. There was one example of each from the site. Figures 2.31D-F give the range of tops for ‘whisky’ bottles. Three examples each of the Figures 2.31D and E tops were found, along with four examples of that shown in Figure 31F.

Complete examples of this type of bottle weigh *ca* 580 g. At Omata 4890 g of whisky bottle glass was recovered, which allows an estimate of nine bottles on the basis of weight. This figure conforms well with estimates based on tops (ten) and bases (nine or ten).

Salad oil bottles. A wide range of aqua bottles from Omata probably contained salad oil (Fig. 2.32). Some we may be sure of since they still have fragmentary labels proclaiming their contents. Others may be included in this group from their size, shape, colour and general character.

Nineteenth century salad oil bottles were usually of a decorated form - partly because the bottle itself would sit on the table and therefore needed to be reasonably attractive. The most common salad oil employed a spiral decoration on the shoulder and neck, sometimes extending to the base of the bottle. Bottles of this type are known to collectors as ‘whirlies’. They come in a number of sizes with many variations on the basic decorative theme. In the Omata collection they are represented by the two examples shown in Figure 2.32A and B.

Other salad oils were of a simpler shape - sometimes fluted (Fig. 2.32D, G and H) or octagonal (Fig. 2.32C). All Omata salad oils appear to have been made in two piece moulds with tops applied.

Figures 2.32A and B show ‘whirly’ salad oil bottles. The larger one is 250 mm high with a base diameter of 47 mm. On one example a fragmentary label with red drapes and light brown (gold?) medallions, apparently depicts an award won at the Great Exhibition of 1851. There is a minimum of two of these bottles. There were also at least two smaller ‘whirlies’ 180 mm in height with a base diameter of 39 mm. The label is of red letters on a white background: “Finest Salad Oil/ Batger & c./ London.” The top shown in Figure 2.32E may come from a bottle of this type.

Figure 2.32C shows an eight-sided bottle, 173 mm tall and with a base diameter of 44 mm. Numerous fragments of glass

from this type of bottle throughout the site suggest that many more bottles are represented than the four counted from tops in Square XII, Level 1.

There are probably three kinds of fluted bottles represented, as shown in Figures 2.32D, G and H. All are fairly small at 170-180 mm high. Except for the bottle shown in Figure 2.32H the glass is thinner than that of other salad oils, and as a result is very fragmentary. Beyond the three bottles illustrated it was not possible to determine the number represented by the many fragments found.

Figure 2.32D shows the neck and applied top of a bottle with four separated flutes just beginning at the break. Figure 2.32G shows a neck only, with eight flutes. Figure 2.32H depicts another form with broad fluting above and below the shoulder. Below the shoulder the fluting only partly encircles the body, almost half the circumference being plain to provide a smooth surface for the label. The pictured label is very fragmentary but appears to be made up of green lettering on a white background, and does give the contents and place of manufacture.

Figure 2.32F shows part of a bottle *ca* 250 mm in height. The break has occurred just where the main decoration begins so we cannot know overall shape without complete bottles to compare. The label appears to have had red lettering on a yellow background and proclaims “Warranted/ Sublime/ Salad Oil”. One example of this top was found. Two plain cylindrical salad oils were found (Figs. 2.32I and K). These are 41 mm and 51 mm in diameter respectively, each represented by one example.

A large number of fragments from the ditch and top platform are decorated with chevrons (Fig. 2.32J). The base diameter of these bottles is 48 mm. Shoulders and necks may have ‘whirly’ decoration. Figure 2.32L depicts a base embossed “A/ B/ C/ Co”. It is 48 mm diameter and may belong to any one of a number of salad oil bottles.

Crosse and Blackwell pickle jar. The “Crosse and Blackwell” pickle jar shown in Figure 2.33 is made in a two piece mould with a well-finished applied top. The height is 237 mm and rectangular base 75 x 60 mm. In Omata examples the shallow ‘kick-up’ has two, three or four dimples. The intact example has a faint label which appears to have had light green lettering and design on a pale (yellow?) background: “CROSSE & BLACKWELL/ BY APPOINTMENT/ PURVEYORS/ TO/ Her Majesty/ 21 SOHO SQ/ .../ MIXED PICKLE”. This bottle is representative of a variety of pickle containers of similar shape, at least six of which were found at Omata.

Miscellaneous aqua glass. This group includes a number of bottles of which only one or two examples were found. For most the contents are not known. Fragments from yet more forms are not illustrated being too small to be useful.

Figure 2.34A shows a Hamilton patent (or 'torpedo'). The Hamilton patent was taken out in 1814 and the bottle continued in use to the end of the century. It was used for aerated water, which enjoyed a great vogue in the 19th century. The shape prevented the bottle from standing upright, and the cork was thus kept wet and tightly expanded in the neck. Two individuals are represented in Squares X and XII, Level 1.

The bottle decorated with a shamrock (Fig. 2.34B) may have contained mustard. It is represented by one individual. The bottles shown in Figures 2.34C, D, E, G, L and M are also

represented by only one individual. The bottle, embossed "WALDENS INK LONDON" is almost complete, having suffered only minor damage at the rim.

Fragments of dimpled bottle glass probably all belong to small bottles as shown in Figure 2.34F. The bottle has four dimples around the base and two lines of dimples up to the shoulder. Such bottles are thought to have contained vinegar, or perhaps salad oil.

A group of aqua glass stoppers is shown in Figure 2.34K. Two are embossed: one, "(GEO)RGE WHYB(ROW)", and the

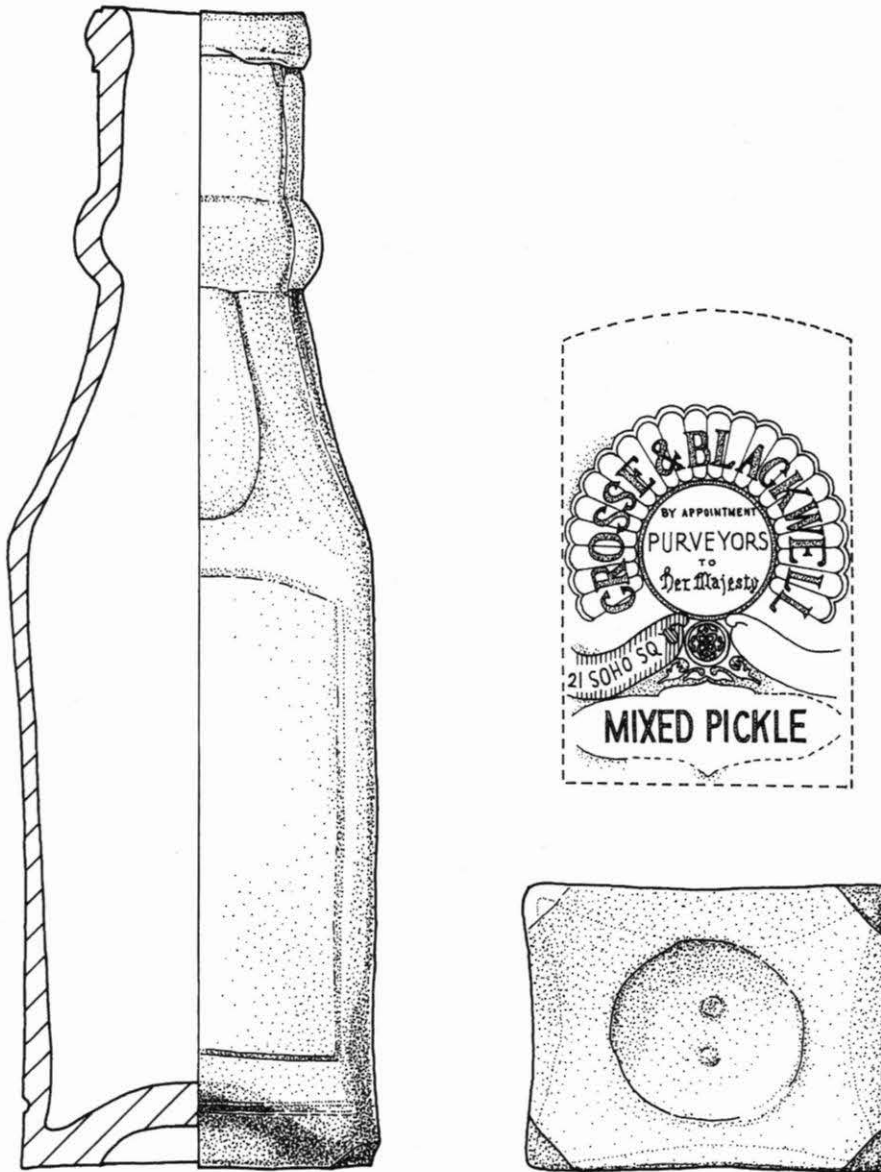


FIGURE 2.33. Crosse and Blackwell mixed pickle jar.

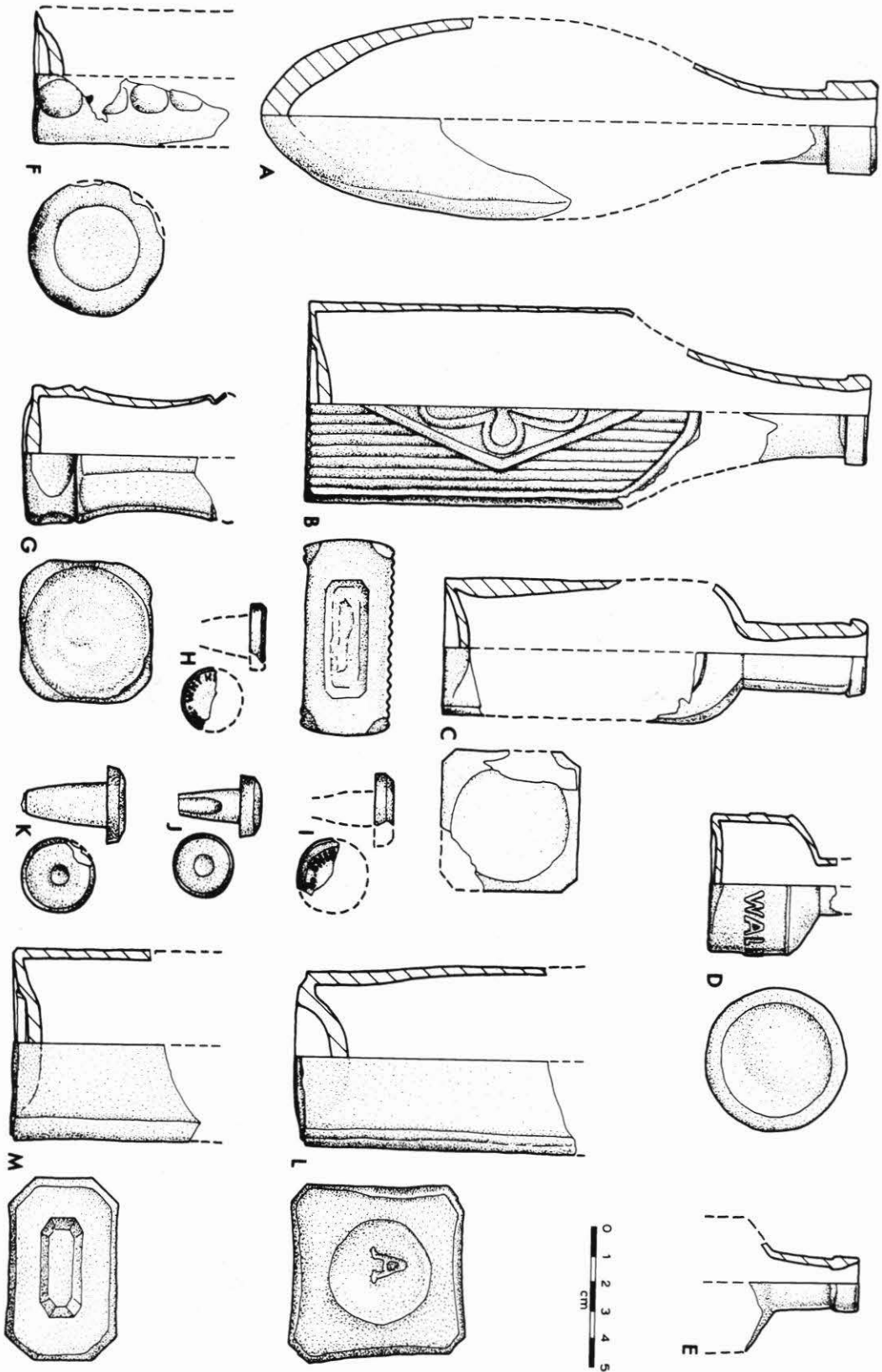


FIGURE 2.34. Miscellaneous aqua coloured bottles and stoppers.

other "(LEA) & (PER)RINS" from the typical Lea and Perrins Worcestershire sauce bottle of the 19th century. Lea and Perrins are, along with Holloway's Ointment (see below), the most persistent advertisers in the *Taranaki Herald* throughout the 1860s. Many fragments from Lea and Perrins bottles were also found in the site: none were large enough for drawing, but in any event the shape is well known, being essentially the same today.

'Bitters' bottles (Fig. 2.35)

Dark brown glass from 'quart' bottles is considered to be all from bottles containing bitters, or possibly schnapps or gin. The bottles are invariably well made with well finished applied tops. Three manufacturers of distilled liquor are represented, all from the Hamburg region of Germany: Conr(ad?) Stoll of Hamburg, Joh(annes?) von Pein, Altona, and Johannes J.W. Peters, also of Hamburg (24). Figure 2.35 shows maker's names embossed on the shoulder (Stoll and von Pein) or base (von Pein), or given in a shoulder prunt (Peters).

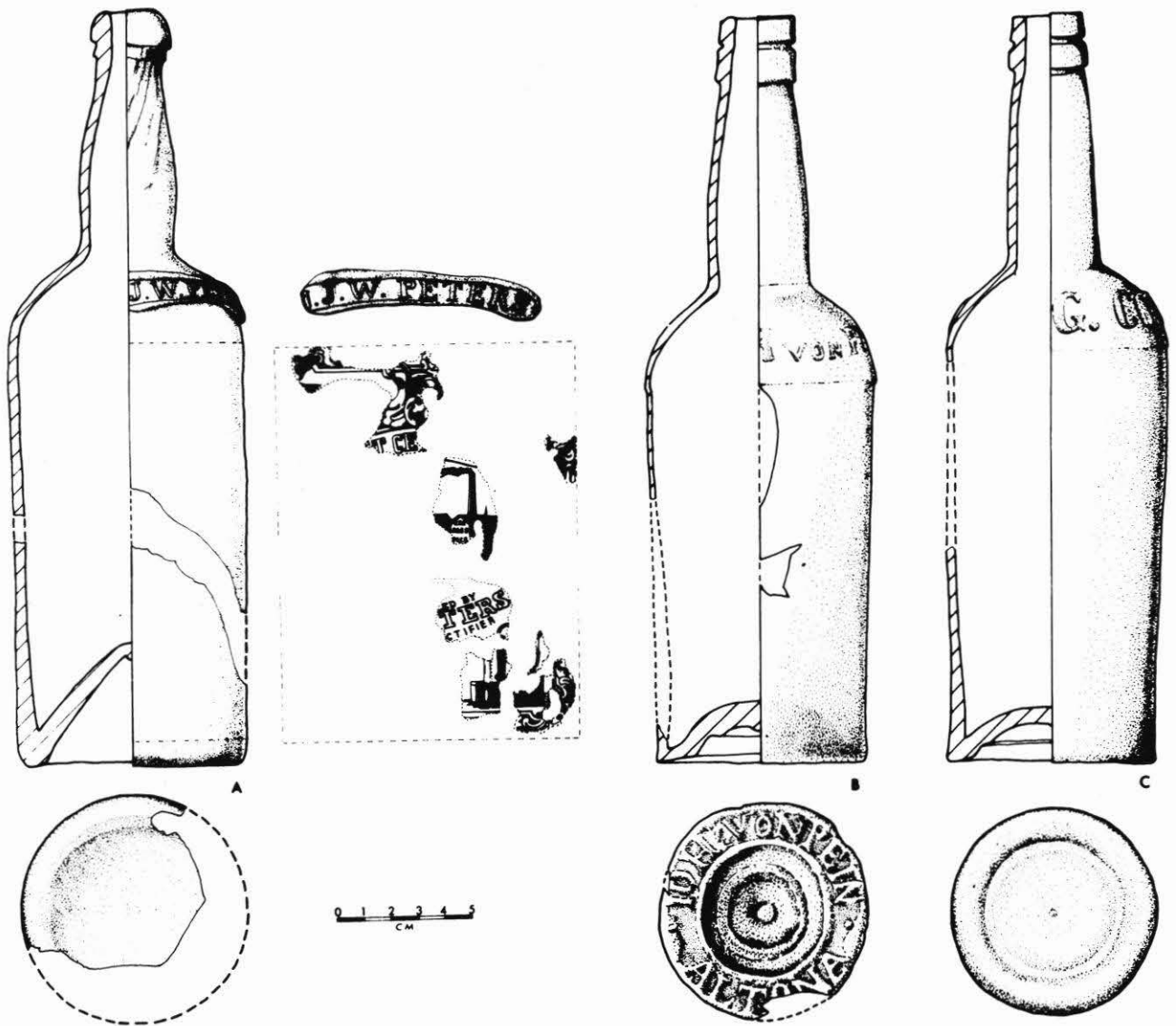


FIGURE 2.35. 'Bitters' bottles, label, embossing and prunt.

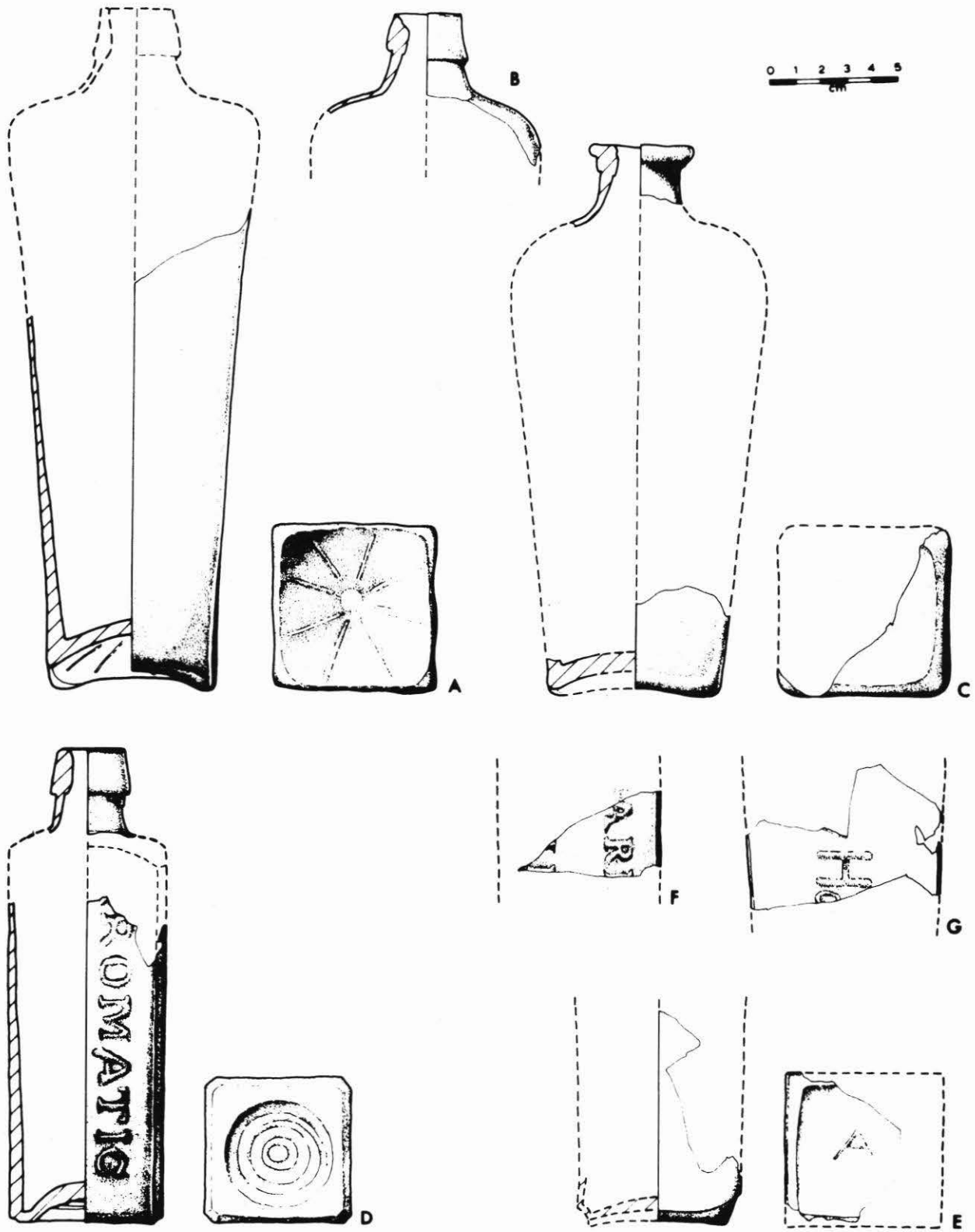


FIGURE 2.36. 'Case gin' and schnapps bottles and embossing.

The von Pein and Stoll bottles are 275 mm high and 80 mm in base diameter. The Peters bottle is 83 mm base diameter, and probably (no example could be fully reassembled) the same height as the other two.

Numbers may be established from brand fragments. Four Peters bottles were found in Square XII, Level 1, one von Pein in Square X, Level 1, and two Stolls, one each in Squares X and XII. The weight of glass, 3500 g (see Table 2.1) conforms well with numbers thus established, allowing 500 g weight for an average bottle. Stoll bottles show the remains of a dark blue label with black lettering. The Peters label illustrated has black lettering on a red and green background (Fig. 2.35A). A different J.J.W. Peters label, of which little could be made out, is on green glass, commonly used for cognac or brandy.

Case gin and schnapps (Fig. 2.36)

Case gin and schnapps bottles may be treated together for their similarity of product and bottle. Case gin (so called because it was made square to fit economically into wooden cases for the export trade) was made in Holland. The bottles are well made, but often have heavy bases with the resulting thin glass on the upper body easily broken.

Of the estimated eight or ten case gin bottles found at Omata at least five different forms are represented. The most notable distinction is between the tall bottle with well finished applied top (Fig. 2.36A and B), and the shorter bottle with an applied top which has been pressed down flat like a pig's snout (Fig. 2.36C). One embossed fragment (Fig. 2.36F) cannot be identified without further knowledge. Figure 2.36G shows a fragment from a bottle of the Dutch gin manufacturer Y. Hoytema & Co., to which the base piece Figure 2.36E may also belong.

There are at least four bottles represented by tops and bases (some very fragmentary) of the bottle type shown in Figure 2.36A and B and three tops of the 'pig's snout' type.

The schnapps bottle shown in Figure 2.36D came in a variety of sizes, all embossed "UDOLPHO WOLFE'S/SCHIEDAM/AROMATIC SCHNAPPS". This bottle is found in considerable numbers in 19th century sites in New Zealand and Australia and indicates a fashion for schnapps which seems to have ended about the First World War in this part of the world (25). At Omata two tops were recovered, but embossed fragments suggest more bottles are represented.

Blue glass (Fig. 2.37A-D)

Blue glass was separated easily into dark blue glass from chemical or medicinal bottles and light blue glass from other bottles, including two patent medicine bottles.

Figures 2.37A and D show patent medicine bottles. The larger has "TOOGOOD'S/ PATENT" embossed on the base and was represented by one individual. The small bottle, often found in 19th century sites in New Zealand, is embossed on the front and sides "DAVIS'/ VEGETABLE/ PAIN KILLER". The Davis bottle is represented at Omata by one intact example and many fragments of perhaps four bottles all told. The third bottle in light blue glass (Fig. 2.37B) is represented by a single very fragmentary example.

Pieces of dark blue (medicinal) glass include only one piece worth illustrating for comparative purposes (Fig. 2.37C); the top is still sealed with lead foil.

Colourless glass (Figs 2.37E-L)

Colourless bottle glass was mostly very fragmentary, the bottles generally being made of very thin glass. In addition to bottle glass there is undoubtedly some tumbler and decanter glass included here which was not always possible to separate out.

Only one example of Figures 2.37E and H bottles were recovered. These bottles, believed to have contained medicines, are common in late 19th and early 20th century sites. Two examples of Figure 2.37G included one which was intact. Figures 2.37F and K show a base and top which may belong to the same larger bottle. Figure 2.37L illustrates what may be the top of a decanter.

Two colourless glass stoppers are pictured in Figures 2.37I and J. The larger is a ground glass stopper, 42 mm in diameter, to fit an open mouthed jar.

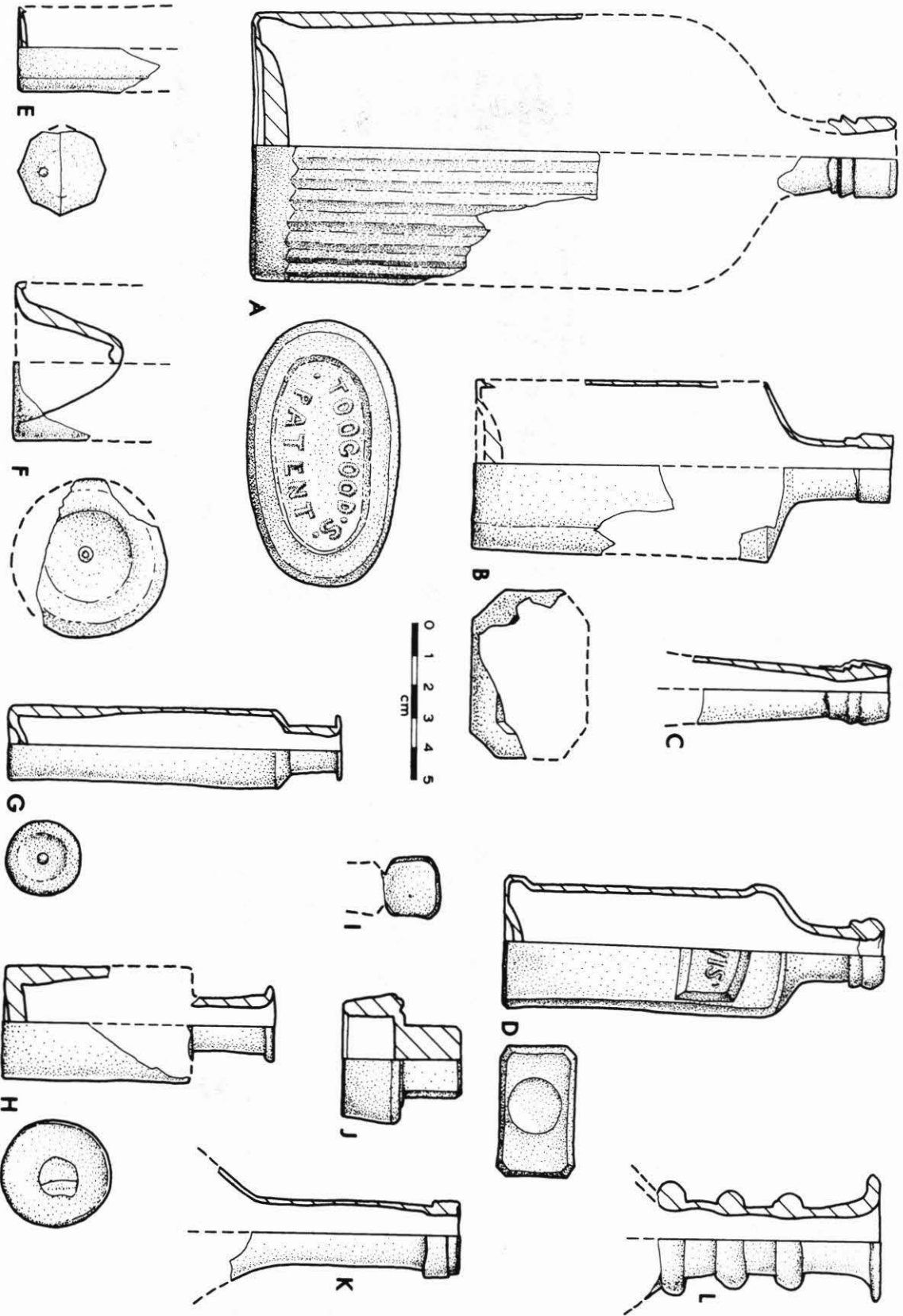
Stone and earthenware bottles and jars (Figs 2.38-2.39)

Off-white ginger beer bottles in two sizes with yellow shoulder, neck and top make up the bulk of stoneware in the site. There are no intact items although several could be largely reassembled.

Large and small bottles are virtually identical in appearance and the whole group is therefore illustrated by one reassembled bottle of the smaller size (Fig. 2.38A). The large size is 255 mm in height with a diameter of 92 mm. The number of these can be established at nine from bases in Squares X and XII, Level 1. The smaller size is 191 mm high and 73 mm in diameter: at least three are indicated by tops and bases. Both sizes usually have a single letter stamped on the side near the base. The bottles were originally stoppered with a cork held by wire and sealed, as shown in Figure 2.38C.

One intact brown ginger beer bottle was found in Square XII, Level 1 (Fig. 2.38B) - its height is 162 mm and diameter

FIGURE 2.37. A-D. blue glass bottles. E-L. Colourless glass bottles and stoppers.



69 mm. The bottle is stamped "VITREOUS STONE BOTTLES, &C./ WARRANTED NOT TO ABSORB./ J.BOURNE./ PATENTEE./ DENBY & CODNOR PARK POTTERIES/ NEAR DERBY."

A larger group of bottles contained ink, oils (such as saddlers' oil) and stove blacking (Figs 2.38D, 2.39A-D). At Omata stove blacking bottles (26) came in two sizes. Figure 2.38D shows the only reassembled example from the site: it is of the small size, 132 mm high and 59.5 mm in diameter. The major part of another came from the fill of Rua C on the top platform. No example of the larger stove blacking bottle could be reassembled. From other sources it can be established at 152 mm high and 74 mm diameter.

Figure 2.39A shows a furniture or saddlers' oil bottle. It is glazed white overall and is 136 mm in height and 68 mm in diameter. Near the base it is stamped "DOULTON & CO/LAMBETH POTTERY", indicating manufacture by the famous London firm.

Three brown stoneware bottles probably contained ink. Figure 2.39B shows the largest of these, 108 mm high and 55 mm diameter. It is stamped "J.BOURNE ..." etc., as the ginger beer bottle discussed above. There was one intact bottle and one largely complete, but in pieces. Figure 2.39C depicts a smaller bottle, 110 mm in height and 44.5 mm in diameter. All this material was found in Square XII, Level 1. Figure 2.39D shows the familiar 'penny ink' pot - height 49.5 mm and diameter 49 mm. One intact example was found, and at least two other examples, one of which was largely complete.

Fragmentary material represents other stone jars and bottles. Heavy off-white pieces are from an open-mouthed jar with a rim diameter 105-110 mm. Brown salt glazed pieces apparently come from a Dutch gin bottle.

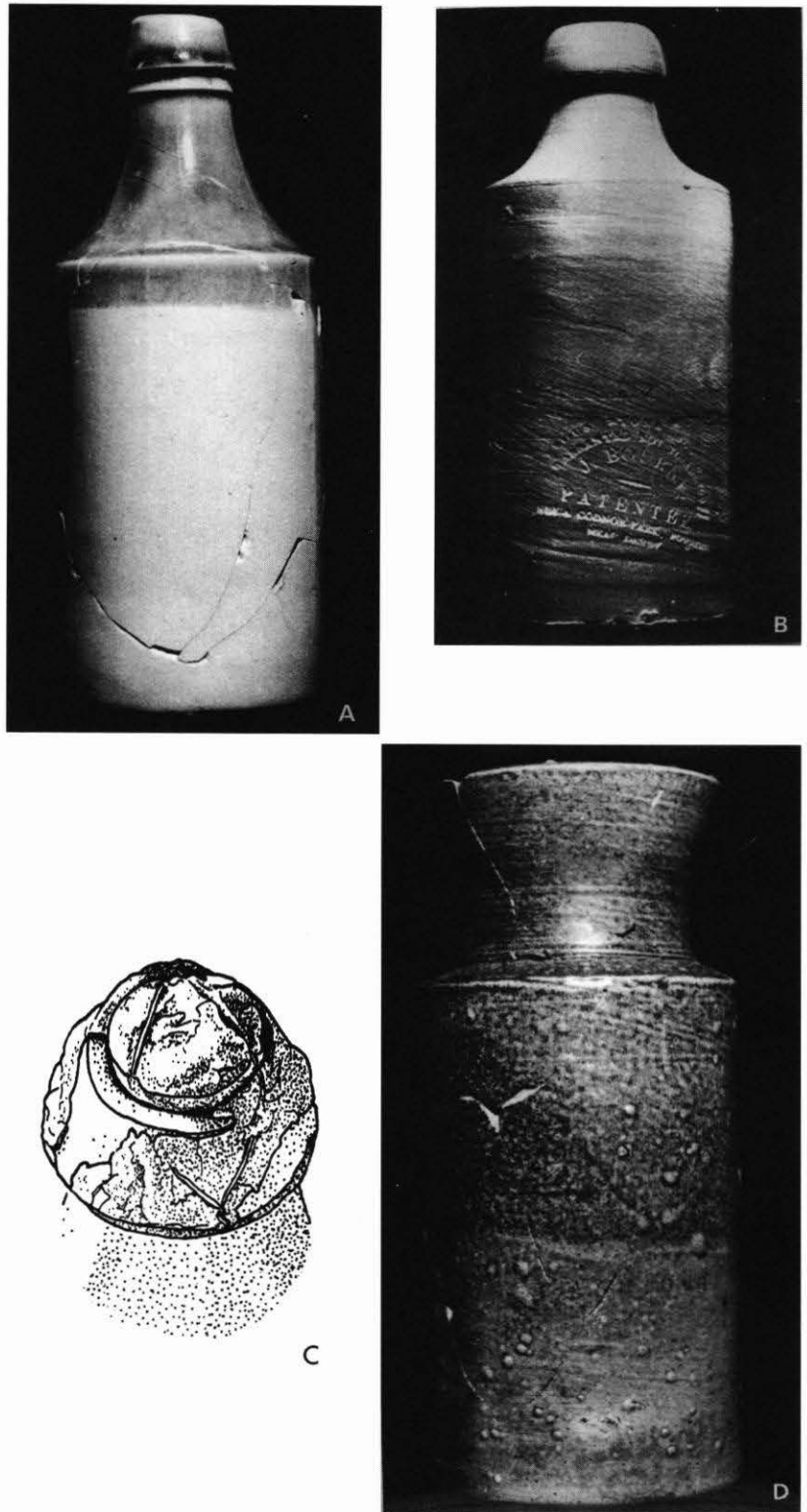


FIGURE 2.38. Stoneware. A and B. Ginger beer bottles. C. Tie wire arrangement on ginger beer bottles. D. Stove blacking bottle.

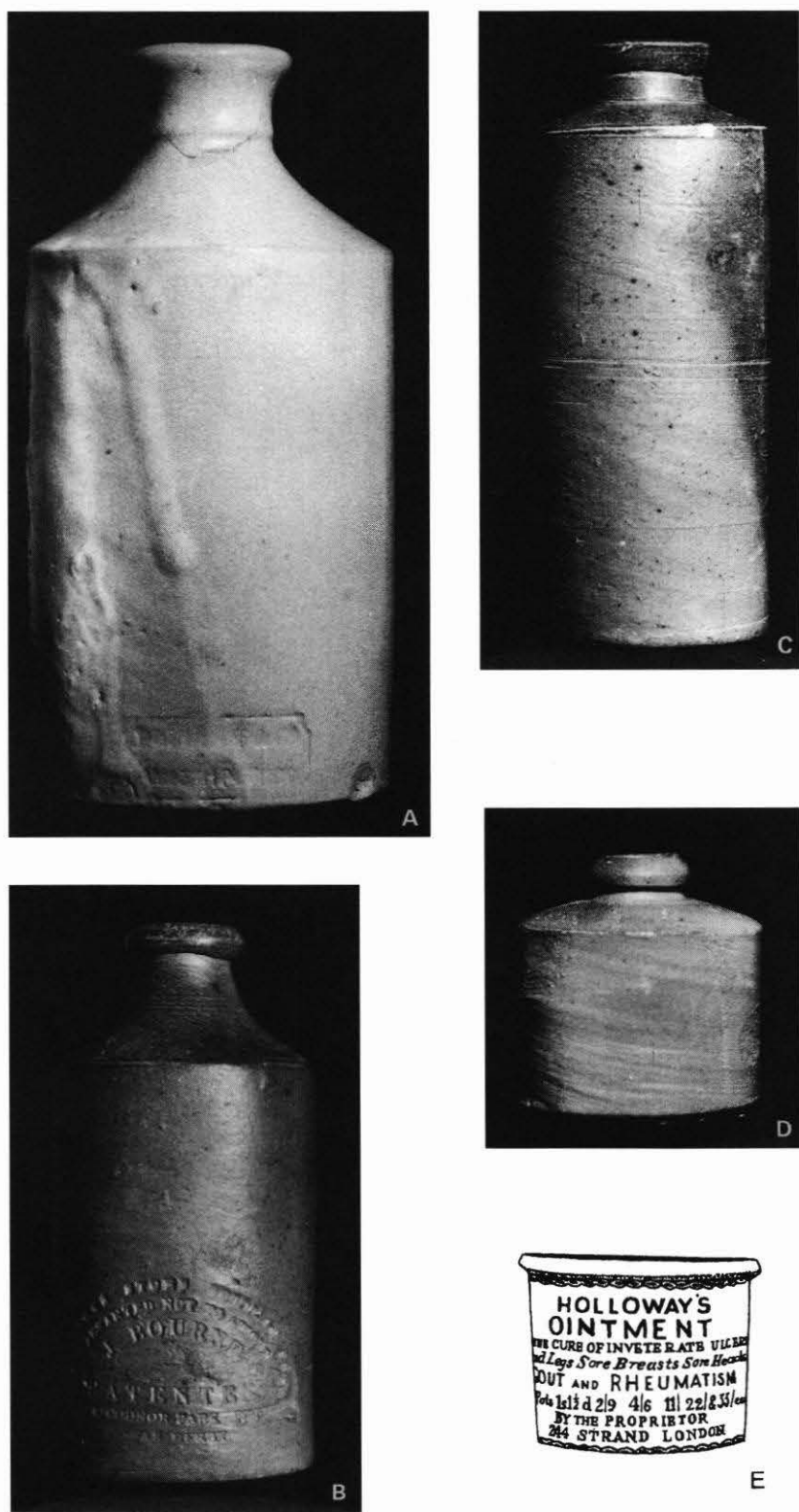


FIGURE 2.39. Stoneware. A. Doulton furniture or saddlers oil bottle. B-D. Ink bottles. E. Holloway's ointment pot.

Fragments of a light, white glaze earthenware pot, mostly from Square XII, Level 2, are of an open cylindrical jar 94 mm in diameter. A groove encircles the body just below the rim. It is identified as a cheese jar and may be compared with similar material found at Warea (see Fig. 3.30M).

One intact 'Holloway's Ointment' pot was found and at least two others are represented by other pieces scattered throughout the site (Fig. 2.39E). The pot is labelled "HOLLOWAY'S/ OINTMENT/ FOR THE CURE OF INVETERATE ULCERS/ Bad Legs Sore Breasts Sore Heads/ GOUT AND RHEUMATISM/ In Pots 1s 11/2d 2/9 4/6 11/ 22/ & 33/ Each/ BY THE PROPRIETOR/ 244 STRAND LONDON".

Thomas Holloway (1800-1883) manufactured his patent medicine in London and sold it throughout the world (27). He was established at 244 Strand from 1839 until he shifted in 1867 to New Oxford St. By 1864 he was spending 40,000 pounds a year on advertising throughout the world. In the 1860s he was the biggest advertiser in the *Taranaki Herald*, his advertisements making fantastic claims for the efficacy of his product.

Earthenware and porcelain domestic wares (Figs 2.40-2.44)

A range of earthenware and some porcelain was found. Plates, mugs, cups, saucers, bowls and jugs were almost invariably represented by only a few sherds. Four items (two bowls, a 'coffee can' and a jug) can be partly reassembled from recovered pieces (Fig. 2.44). There were many fragments, however, which could not be assigned to a particular form, nor in many instances to any particular design. Table 2.2 outlines the distribution of earthenware and porcelain in the site.

Provenance	Weight (gm)
Sq. X/L-1	3.5
L-2	100.8
L-3	45.0
Sq.XII/L-1	1241.1
L-2	353.6
L-3	49.8
Sq.XVI	14.0
Top platform	533.1
	<u>2340.9</u>

TABLE 2.2 Omata Stockade: distribution of earthenware and porcelain.

For many thousands of years pottery has been made by hand, the finished article resulting from the characteristics of the raw material and the potter's experience. In the 18th century there were developed in England factories for the mass production of 'china'. Within a few decades pottery manufacture changed from a craft to a mechanised industry organised along factory lines.

By the middle of the 19th century industrial techniques had largely replaced the old methods based on personal experience. Mechanical methods of mixing clay and forming shapes, and more controlled firing in kilns, allowed the production of vast quantities of earthenware of very even quality. In addition to mechanisation in the production of forms, the introduction of transfer printing allowed accurate repetition of complex decoration. One result of new technology was the production of great quantities of material which was fussy and complicated in form and decoration; and this is reflected in the Omata material.

More than any other artefact, earthenware emphasises the difficulty of accurately attributing fragmentary archaeological material dating from after the onset of the industrial revolution. The aim here is to catalogue and illustrate the Omata material to allow its use in comparable studies. Some identification of manufacturers and wares has been possible with the assistance of Mr Gregory Waite of Auckland.

Cups and mugs

Mugs, or 'coffee cans', are identified from their cylindrical shape, and the heavy base which usually slightly exceeds the general diameter of a vessel. Cups may be divided into three general shapes as shown in Figure 2.40. In the photographs

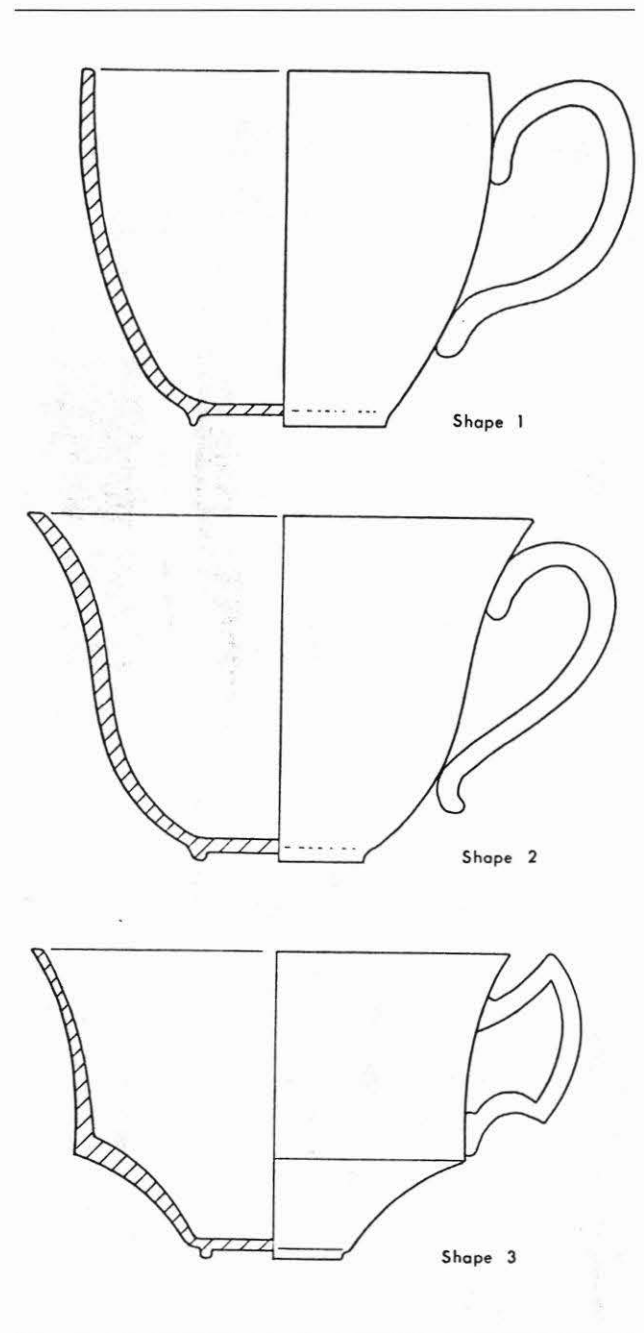


FIGURE 2.40. Cup shapes (refer to text).

(Fig. 2.41) the exterior of vessels is shown unless stated.

1. Cup. Fig. 2.41A. Exterior (left), interior (right). Shape 3. Rim diameter *ca* 120 mm. 'Japan pattern' exterior with free form interior border. Transfer printed underglaze blue. Poorly finished handle. Probably made by Brown-Westhead, Moore and Co., Cauldon Place, Hanley (Staffordshire Potteries), a firm which operated from 1862 to 1904 (28).

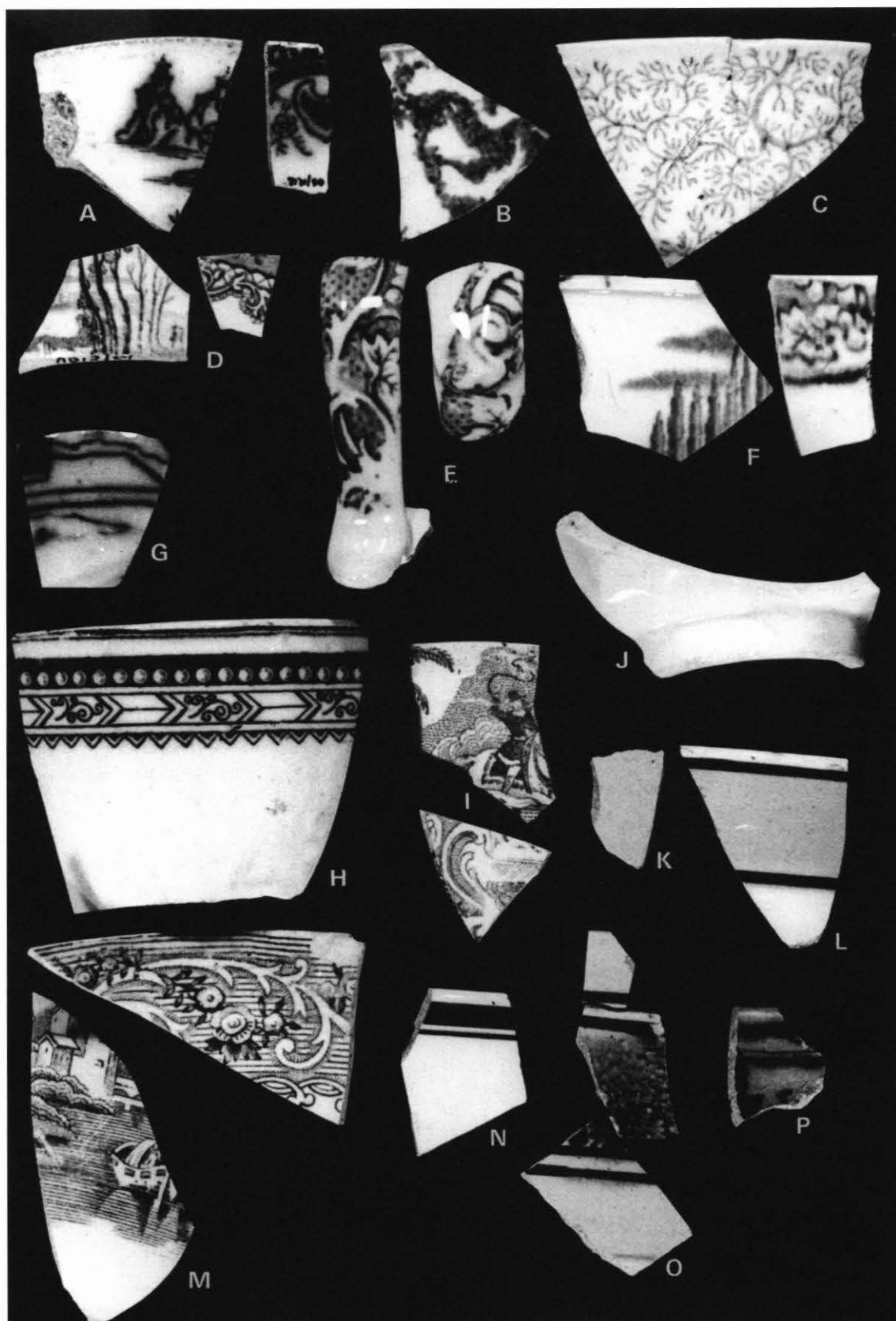


FIGURE 2.41. Earthenware fragments: cups and mugs (refer to text).

2. Cup. Fig. 2.41B. Shape 1? Rim diameter *ca* 100 mm. Hand painted underglaze blue with white interior.

3. Cup. Fig. 2.41C. Shape 2 (or 3?). Rim diameter *ca* 120 mm. Transfer printed underglaze blue, full exterior (?), interior border only. The design may be compared with the saucer illustrated in Figure 2.42D.

4. Cup. Fig. 2.41D. Exterior (left), interior (right). Shape 3?. Rim diameter *ca* 110 mm. Transfer printed underglaze blue: interior border, exterior scene.

5. Cup. Fig. 2.41E. Handle only. Shape 2 or 3? Transfer printed underglaze blue.

6. Cup (or mug?). Fig. 2.41F. Exterior (left), interior (right). Rim diameter *ca* 100 mm. Transfer printed underglaze blue. Free form interior border, exterior scene. Four pieces, 16.0 g.

7. Cup. Fig. 2.41G. Shape 2? Rim diameter *ca* 120 mm. Transfer printed underglaze blue with gilt.

8. Cup. Fig. 2.41H. Shape 1. Rim diameter *ca* 120 mm. Black transfer printed formal exterior border.

9. Cup. Fig. 2.41I. Exterior (top), interior (below). Shape 3. Rim diameter *ca* 120 mm. Red transfer print under glaze. Hunting scene interior and exterior. James and Ralph Clewes, Cobridge Works, Cobridge (Staffordshire Potteries) 1818-34. "The works were rented from William Adams in September 1817, but were not then in good repair. The firm became bankrupt in 1834 or 1835" (29).

10. Cup. Fig. 2.41J. Shape 1. Faceted exterior. Overall off-white glaze. "...NS" stamped on base.

11. Cup. Fig. 2.41K. Shape 1. Light blue overall glaze. William Ridgway (& Co.), Bell Works, Shelton and Church Works, Hanley (Staffordshire Potteries), about 1830-54, formerly J. & W. Ridgway (30). See bowl Number 39.

12. Mug (or cup?). Fig. 2.41L. Rim diameter *ca* 80 mm. Exterior border of a broad grey band bounded by brown stripes.

13. Cup. Fig. 2.41M. Interior (top), exterior (below). Shape 1. Rim diameter 100 mm. Transfer printed underglaze green: exterior a European scene, interior a complex border *ca* 30 mm wide.

14. Cup or mug. Fig. 2.41N. Rim diameter *ca* 100 mm. Two green stripes exterior border, one narrow stripe interior border.

15. Mug. Fig. 2.41O. Exterior shown from rim down: yellow glaze with border of blue 'mocha' decoration marked off by brown stripes. Yellow glaze interior. T.G. Green & Co. (Ltd), Church Gresley, near Burton-on-Trent, Derbyshire, about 1864 (31). "Mocha decoration is rather similar to marbling except that the tree-like design is formed by the chemical reaction of a dark acid colourant on a pale tinted alkaline slip. Mocha

decorated wares are usually utilitarian, mugs and jugs outnumbering all other subjects" (32).

16. Cup or mug. Fig. 2.41P. Shape 1? Rim diameter *ca* 100 mm. Heavy black transfer print interior and exterior.

17. Cup. Not illustrated. Shape 2. Rim diameter *ca* 90 mm. White glaze with thin blue line on exterior border.

18. Cup. Not illustrated. Rim diameter *ca* 100 mm. White glaze with blue stripe on interior border.

19. Cup. Not illustrated. Fragments of fine white porcelain indicate a small cup of shape 1.

20. Mug? Fig. 2.43B. Exterior (left) and interior (right). Rim diameter *ca* 80 mm. Relief moulded yellow glaze exterior and off-white interior.

21. Mug. Fig. 2.43C. Exterior (top left), handle (right), base (bottom). The base piece shows heavy moulding. Rim diameter *ca* 120 mm. Dark blue under glaze.

22. Mug. Fig. 2.44A. 101 mm high, 109 mm rim diameter. 'Cornishware' design of light blue bands. Probably T.G. Green & Co. (Ltd), Church Gresley, near Burton-on-Trent, Derbyshire, about 1864. The company's early wares are unmarked (33).

Saucers

23. Saucer. Fig. 2.42A. Interior, rim to centre. Diameter *ca* 180 mm. Transfer printed underglaze blue. Formal interior border incorporating fleur-de-lys, with central scene.

24. Saucer. Fig. 2.42B. White (any border is missing). Fragment of black maker's mark on base.

25. Saucer. Fig. 2.42C. Diameter *ca* 140 mm. Black transfer design of grapes and leaves on interior border.

26. Saucer. Fig. 2.42D. Diameter *ca* 200 mm. Brown transfer design interior and exterior border (compare with cup Number 3).

Plates

27. Plate? Fig. 2.42E. Fine black transfer print on two base fragments - includes draped figure.

28. Plate. Fig. 2.42F. Rim diameter *ca* 220 mm. Fine black transfer print interior. Fragment of black crown on base, evidently part of a maker's mark.

29. Plate. Fig. 2.42G. Diameter *ca* 220 mm. Two blue stripes, one broad and one narrow, at interior border.

30. Plate. Fig. 2.42H. Diameter *ca* 220 mm. Bled-blue border with undulating relief moulded rim. Typical of Staffordshire

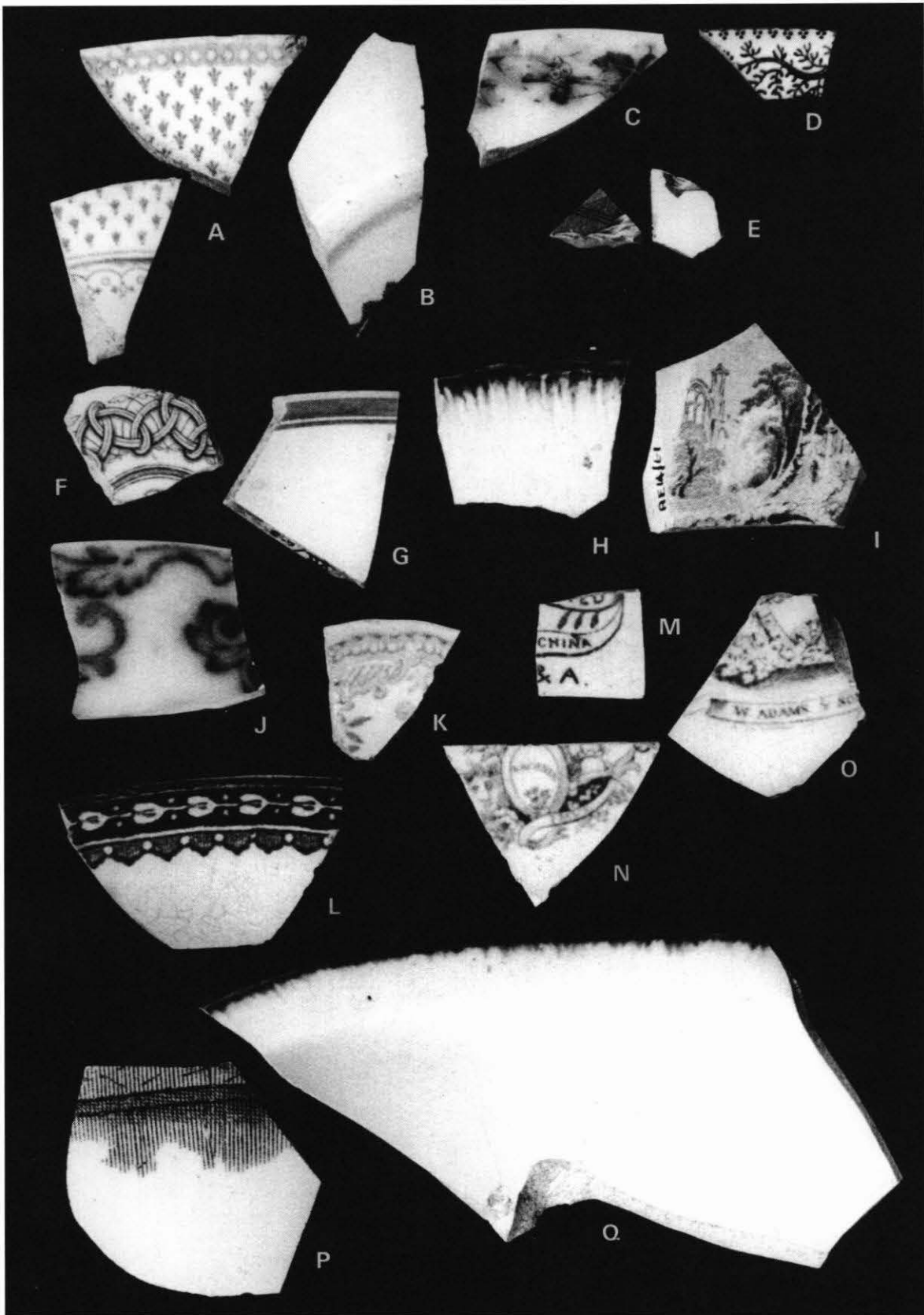


FIGURE 2.42. Earthenware fragments: saucers, plates and bowls, including marked pieces (refer to text).



FIGURE 2.43. Earthenware fragments: plates, milk jugs and mug (refer to text).

Potteries in the mid-19th century.

31. Plate. Fig. 2.42I. Purple transfer print under glaze of 'Gothic' scene.

32. Plate. Fig. 2.42J. Diameter *ca* 220 mm. Blue interior border.

33. Plate? Fig. 2.42K. Blue transfer underglaze interior border. Undulating rim makes diameter measurement difficult.

There are 62 'willow pattern' pieces in the Omata collection. Only the handful of sherds belonging to a soup plate (Number 36) stand out. Other material is of a duller blue suggesting an earlier manufacturing date. Heavy fragments indicate a large plate such as a meat dish. The material is listed under Numbers 34-36.

34. Plate. Fig. 2.43G. Diameter *ca* 230 mm. Good quality 'willow pattern' of 1830s or thereabouts.

35. Plate. Not illustrated. Diameter *ca* 180 mm. Good quality 'willow pattern' of about the 1830s.

36. Soup plate. Fig. 2.43E. Diameter *ca* 270 mm. Clear control-

led cobalt blue indicates later manufacture than Numbers 34 and 35.

37. Meat plate. Fig. 2.43A. Transfer printed underglaze light blue. Design includes leaves, etc.

38. Vegetable dish. Fig. 2.42Q. Oval shape, *ca* 350 x 200 mm. Bled-blue border. Typical of Staffordshire Potteries, mid-19th century.

Bowls

39. Sugar bowl. Fig. 2.44B. 97 mm high, 164 mm diameter. Light blue willow pattern exterior and blue interior border. "Semi China" mark on base. William Ridgway (& Co.), Bell Works, Shelton and Church Works, Hanley (Staffordshire Potteries); about 1830-54. Formerly J. & W. Ridgway (34).

40. Sugar bowl. Fig. 2.44C. 98 mm high, 180 mm diameter. Fine form with excellent glaze. Hand decorated black under glaze interior and exterior. May be an early example of studio designed ware.

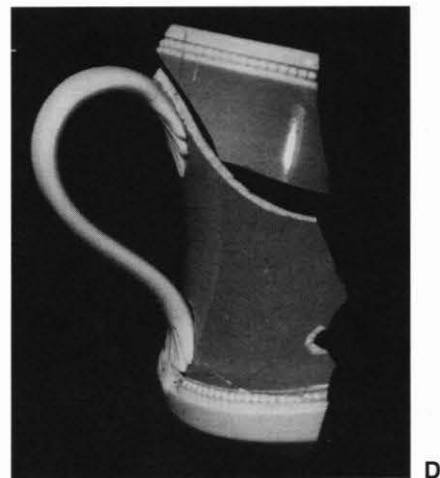
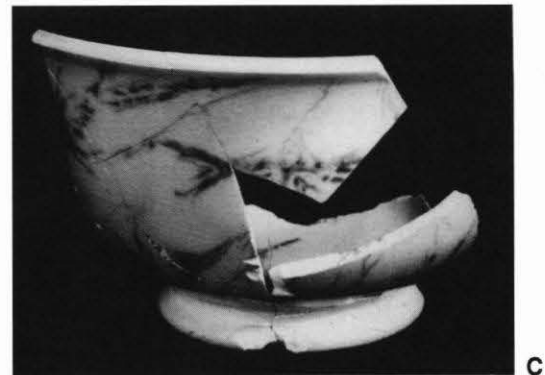
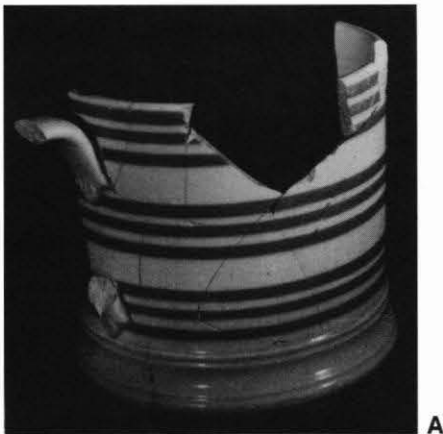


FIGURE 2.44. Reassembled earthenware items. A. 'Cornishware' mug. B. William Ridgway sugar bowl. C. Sugar bowl. D. milk jug.

41. Bowl. Fig. 2.42L. Diameter *ca* 270 mm. Narrow, repetitive interior brown border.

42. Bowl. Fig. 2.42P. Diameter *ca* 150 mm. Green transfer print under glaze, exterior only.

Jugs

43. Milk jug. Fig. 2.44D. Height *ca* 150 mm, 150 mm rim diameter. Light blue body with white rim, base and handle. Some relief moulding. Staffordshire Potteries: typical milk jug of 1850s.

44. Cream jug? Not illustrated. A single piece with part of the handle and body probably belongs to a small jug of identical design and colour to Number 43.

45. Milk jug. Fig. 2.43F. Rim piece shows a relief moulded jug with blue border interior and exterior.

46. Milk jug. Fig. 2.43D. Heavy octagonal jug with under-glaze blue European scene (35).

Makers' marks

47. "W. ADAMS & SON(S)". Fig. 2.42O. William Adams and Sons (Potters) Ltd (earlier names include W. Adams, W. Adams & Co., W. Adams & Son), Tunstall and Stoke, Staffordshire Potteries; 1769- (36).

48. "(M) & A". Fig. 2.42M. Morley and Ashworth, Broad St, Hanley, Staffordshire Potteries; 1859-62. Formerly F. Morley, and subsequently G.L. Ashworth & Bros (37). Plate interior is 'willow pattern'.

49. "T. Goode". Not illustrated. An impressed mark on the otherwise unmarked base of a plate. The only 'Goode' listed in Godden's *Encyclopaedia of British Pottery and Porcelain Marks* is Thomas Goode and Company, South Audley Street, London W.1. "Many 19th and 20th century marks occur which incorporate this famous retailing firm's name. The name does not generally occur before the 1860's" (38). Plate interior is 'willow pattern'.

50. "LACONIA". Fig. 2.42N. Maker not known.

Clay tobacco pipes (Figs 2.45-2.47)

Tobacco smoking was a popular indulgence in England following its introduction from the New World in the 16th century. The habit had lost none of its popularity when Britain lost its American colonies in the late 18th century and began acquiring a second empire. Tobacco smoking was introduced into New Zealand in the early 19th century and was taken up with enthusiasm by the Maori.

Until late the 19th century when briar pipes became popular, tobacco pipes were almost invariably made of clay. The cheapness, abundance and brittle nature of clay tobacco pipes, along with their excellent survival in archaeological conditions, make them an outstanding component of historical sites throughout the world. The many manufacturers and brands, along with changes in shape and stem bore, and an almost inexhaustible variety of decoration, have made clay pipes among the most widely studied of historical artefacts (39). In New Zealand despite some early interest (40), the study of archaeological clay pipes began with the excavations described here.

At the Omata site a total of 374 pipe stem pieces (795.5 g) was recovered, 27 complete bowls (406.7 g), and 664 bowl fragments (566.0 g). The very small items were found scattered throughout the site.

Manufacturers

Fifty-eight bowl and stem pieces show sufficient brand name for the manufacturer to be identified. Other makers will doubtless be recognised from unattributed brands and decorated pieces as knowledge of mid-19th century clay pipes grows. Table 2.3 lists manufacturers found at Omata.

The name 'Balme' was found on seven incomplete bowls or bowl fragments. Two variations are present: "BALME/ LONDON" (Fig. 2.45H) occurred six times, and "BALME/ MILE END", identified from a complete example in the Taranaki Museum, once (Fig. 2.46T). One example of the more common type had an unusual spur with a flattened base.

London manufacturers:	Balme	7
	Crop	2
	Higgins	2
	Joseph	1
	Milo	1
	Reynolds	1
Scottish manufacturers:	Davidson	6
	McDougall	29
	Murray	3
	Tho. White	4
	Wm White	1
Dutch manufacturer:	Sparnaay	1
		58

TABLE 2.3 Pipe manufacturers represented at the Omata Stockade.



FIGURE 2.45. Clay pipe bowls. A. 'ROYAL LANCASHIRE (?)'. B and C. 'McDOUGALL GLASGOW'. D and E. 'TD'. F. 'WHITE'S RIFLE PIPE'. G. 'H. JOSEPH 125 HOUNSDITCH'. H. 'BALME LONDON'. I. 'C. CROP LONDON'. J. 'TW'. K. 'CORK'. L. Fluted bowl. M. 'W. WHITE SCOTLAND'.

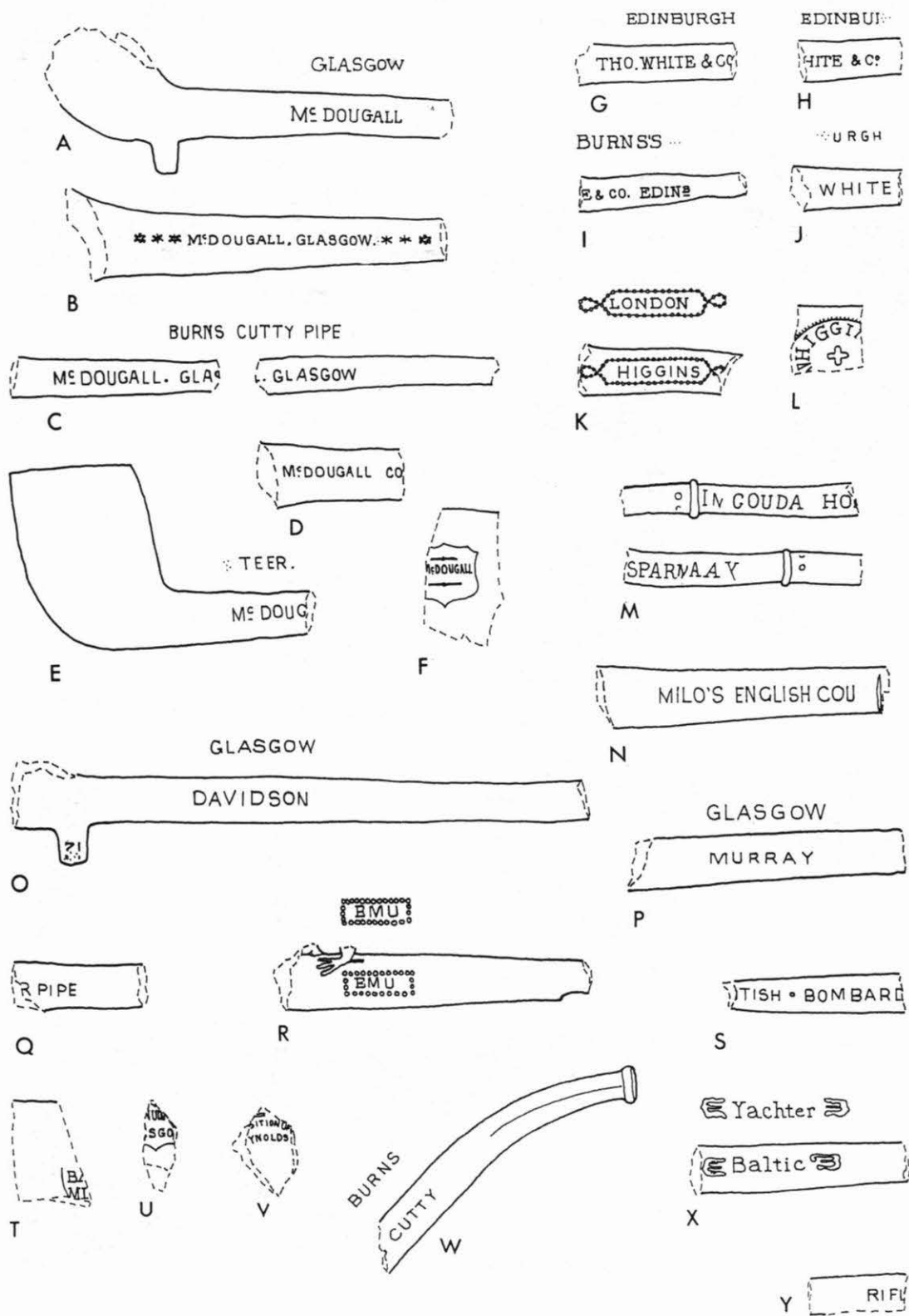


FIGURE 2.46. Clay pipe manufacturers' marks.

In his *Clay Pipes for the Archaeologist*, Oswald records several 'Balmes' in a list of London manufacturers (41). Four have an address at Mile End Road, Whitechapel. They are George Balme, known to be making pipes in the period 1867-76; Thomas Balme, 1805-45; William Balme, 1856-61; and Paul Balme ("Mile End Wharf"), 1832-66. It seems likely from the common address that all were working in the same business and that this business supplied the Omata pipes.

"C.CROP/LONDON" was found on two stems: one is a small (87 mm long) pipe with a curved stem (Fig. 2.45I), while a straight stem has the brand represented only by the "P" of Crop and the "L" of London. The manufacturer is C. Crop and Sons, a firm which operated from 1856 to 1924 (42). Until the end of the 19th century the firm's address was Brooksby Walk, Homerton (43). A Crop bowl held in the Taranaki Museum from the Maori settlement of Maruwehi, near Urenui in north Taranaki, is stamped "HEYWOOD/ LYTTLETON/ NZ", indicating manufacture for specific export markets by this firm.

Two sherds were found belonging to pipes made by the London manufacturer, Higgins (Figs 2.46K and L). They were found together in Square VI and so it is likely they belong to one pipe. Oswald lists two 19th century London pipe makers with the name "Higgins" or "Higgens" (44). John Higgens, Aldersgate St, 1862-91, and William Higgins, Old Brentford, known only to have been making pipes in 1840. Another source gives John Higgens as "Higgins" (45); it seems likely, from the period he was in business, that this was the manufacturer whose product reached Omata.

A well finished bowl is very faintly marked "H.? JOSE)PH/ 125/ (HO/UNDS)DITCH" (Fig. 2.45G). A decorated stem sherd marked "(JO)SEPH" on one side, with part of a patent mark on the other (46), is likely also to have come from this manufacturer (Fig. 2.47O). Oswald lists Henry Joseph of Houndsditch, known to have been making pipes in the period 1862-73 (47).

Another London manufacturer represented at Omata is Milo. A single unusually heavy stem was found (Fig. 2.46N), marked "MILO'S ENGLISH COU(RIER)". Oswald lists Theophilus Milo of Finch Lane, City (of London), who was making pipes in the decade 1860-70 (48).

The bowl fragment shown in Figure 2.46V has been identified with the aid of similar material from the 1841-1865 Victoria Hotel in Fort St, Auckland - excavated in 1989 by Robert Brassey to whom I am indebted for the following information. There were many varieties of this maker's wares at the Victoria Hotel site. The full inscription on the Omata pipe probably read "MADE IN THE EXHIBITION OF 1862 BY J.G. REYNOLDS". J.G.Reynolds is recorded as making pipes in the years 1828-1882. His address was City Road, London. The inscription on this pipe is unique at Omata in that it is not

impressed or in relief but appears to have been stamped in ink on the round bowl surface.

Six stems were stamped "DAVIDSON/GLASGOW" (Fig. 2.46O). Davidson pipes frequently had spurs with embossed numbers on the left side. The spurs depicted in Figures 2.47T and U are probably from this firm. Three stems stamped "MURRAY/ GLASGOW" were found (Fig. 2.46P).

In an article on "Clay pipes from old Sacramento", R.V. Humphrey briefly outlines the history of the Glasgow pipe makers Murray and Davidson (49). The Murray company was founded in 1826 and apparently continued in business until 1861-62, when it was taken over by Davidson. Oswald gives the dates of William Murray & Co. as 1830-61, and those of Thomas Davidson & Co. (Caledonian Pipeworks) as 1863-1910 (50). It follows that Murray pipes were manufactured no later than 1862 and Davidson pipes no earlier.

The manufacturer most abundantly represented at Omata is the Glasgow firm of McDougall, this bearing out the firm's own claim that they were the "largest exporter" (51). Twenty-nine sherds have "McDOUGALL" stamped on them or belong to pipes identified as having been made by the firm. In addition, McDougall was one of many firms making "TD" pipes, so the six bowls thus marked may also have come from this maker, as also the "TW" and "Baltic/ Yachter" sherds (see below).

There are four different McDougall bowl marks in the collection, as well as the "ROYAL LANCASHIRE" bowls which were made by the firm.

Bowl 1. "McDOUGALL/GLASGOW" within a shield. Represented by one almost intact bowl (Fig. 2.45B).

Bowl 2. "McDOUGALL/GLASGOW" without shield. The most common McDougall bowl occurring six (perhaps seven) times (Fig. 2.45C).

Bowl 3. "McDOUGALL" within shield. One example (Fig. 2.46F).

Bowl 4. "McDOUGALL/MANUFACT./GLASGOW" within shield. Represented by one fragment (Fig. 2.46U). Identified from a bowl in the Taranaki Museum.

Bowl 5. "ROYAL LANCASHIRE" with three field guns inside encircling name, and crown on top. The name is uncertain: the two Omata bowls are poorly marked and the name could be "Royal Lancaster". One of the bowls has sufficient stem to show the letters "McDOUG(ALL)" left side and "(...)TEER", right (Figs 2.45A and 2.46E).

McDougall pipes also have a wide range of stem marks. Five different brands are represented among 18 marked stems.

Stem 1. "McDOUGALL/ GLASGOW". This was the most common stem form with nine (possibly ten) examples, one of

which had a spur (Fig. 2.46A). Note that none of the complete McDougall bowls had a spur.

Stem 2. "McDOUGALL" left side, nothing right. There was one example of this type.

Stem 3. "McDOUGALL.GLASGOW/BURNS CUTTY PIPE". 'Burns Cutty' was also used as a trade mark by Thomas White (see below). Five examples (Fig. 2.46C).

Stem 4. "****McDOUGALL.GLASGOW ****", left side only. Two examples (Fig. 2.46B).

Stem 5. "McDOUGALL CO(URIER?)", left side only. Because of damage from re-use it is difficult to decipher the letters following the maker's name. One (possibly three) example (Fig. 2.46D).

Duncan McDougall set up business as a pipe manufacturer in Glasgow in 1846 (52). In 1851 the firm, now the Glasgow Pipe Manufactory, shifted to 277 Parliamentary Road where it was to remain until 1899. At one time the firm had between 800 and 900 moulds in use and employed 250-300 workers. McDougall's finally stopped making pipes in November 1967 when a useful description of the method of clay pipe manufacture was obtained at the factory in the last weeks of production (53).

There was a variety of sherds from the Edinburgh manufacturer Thomas White. Four stem pieces all had slightly different marks.

Stem 1. "THO.WHITE & CO./ EDINBURGH" (Fig. 2.46G).

Stem 2. "(THO.W)HITE & C./ EDINBURGH" (Fig. 2.46H).

Stem 3. "(THO.WHIT)E & CO. EDINB./ BURNS'S (CUTTY PIPE)" (Fig. 2.46I).

Stem 4. "(THO.) WHITE (& CO.)/ (EDINB)URGH" (Fig. 2.46J).

Stems 1-3 employed lettering of similar style. Stem 4 lettering was slightly larger and extremely faint. The bowl marked "TW" (Fig. 2.45J) also may refer to Thomas White, although McDougall and possibly other makers as well also used the "TW" mark. Oswald lists "T. Whyte & Co." of Edinburgh, said to be manufacturing pipes in the period 1832-64 (54).

The only complete pipe from Omata is that of the Glasgow manufacturer William White and Sons (Fig. 2.45M). It is marked "471 W.WHITE/ SCOTLAND". This pipe was found in disturbed ground outside the old defences during the search for a dump dating from the stockade period, and therefore may not belong to the military occupation of the 1860s.

Humphrey (55) writes that William White and Sons advertised as being the largest Glasgow manufacturer. (While McDougall advertised as being the largest exporter). In 1867

the firm produced clay pipes from some 700 moulds. The number preceding the maker's name on the left side of the stem probably identifies the mould.

There were eight examples of a bowl mark "WHITE'S/ RIFLE/ PIPE" from Omata (Fig. 2.45F). Presumably the pipe was made by one of the two Whites, most likely Thomas.

One Dutch manufacturer is represented at Omata, by two fitting stem pieces marked "SPARNAAY/ IN GOUDA HO(LLAND)" (Fig. 2.46M). The letters on this pipe are in raised relief, not stamped into the pipe as on other stems.

Dutch pipes turn up in large numbers in 19th century sites in North America (56). The maker "A. Sparnaay" is reported among pipes found at Rome, New York (57). Humphrey writes that the town of Gouda was the pre-eminent Dutch centre of manufacture for the export trade (58).

Other brand names

A second group of sherds includes brand names, unidentified makers' names and fragmentary names. With a wider knowledge of 19th century pipes the manufacturers of these pipes should become known.

A group of nine (possibly ten?) stems are marked "Baltic/ Yachter" (Fig. 2.46X). "Baltic" is on the left side, which among British pipes of the period is generally reserved for the maker's name. Among manufacturers who used this trade name was the Glasgow firm of McDougall, which includes the mark in a price list dating from about 1875.

A small bowl is marked "CORK" with harp and shamrock decoration (Fig. 2.45K). In their "London clay tobacco pipes", Atkinson and Oswald record pipes with Irish emblems being made in London in the 19th century (59). McDougall also made 'Cork' brand pipes. The mark appears similar to a bowl illustrated by Oswald, which came from excavations in Carlisle, England (60).

Two stem sherds are marked on the right side "(BRI)TISH.BOMBARD(IER)" (Fig. 2.46S). Nothing is known of the maker. The style of lettering is more similar to London than Scottish pipes.

Two interesting stem sherds have the word "EMU" stamped on each side within an embossed surround (Fig. 2.46R). From the remains of a bird's legs and toes above the brand it seems that an emu representation originally stood up from the stem. Nothing is known of the maker; it may have been made in Australia - or perhaps elsewhere for the colonial market.

Two other branded stems are similar to the 'emu' pipe in their use, or apparent use, of colonial motifs. A stem sherd has a kangaroo, minus its head and the tip of its tail, sitting astride

(Fig. 2.47Q). The word 'kangaroo' was apparently stamped on the right side (assuming the animal to be facing the bowl). The other example is less certain: the letters "...OSSU..." suggest 'possum' or 'opossum' (Fig. 2.47P). Again the animal's representation seems to have surmounted the stem.

The use of the letters 'TD' as a brand mark has already been mentioned. The subject is discussed at length by Walker (61). Among other firms McDougall made a variety of TD pipes. Wide use of the mark makes it difficult without further knowledge to attribute to a manufacturer five bowls with the rather crude stamped mark shown in Figure 2.45D (although TDs of this style by W. White are known), or the one example of a second 'TD' form (Fig. 2.45E).

Remaining brand fragments need little discussion. The sherd with "...R PIPE" on it (Fig. 2.46Q) gives no clue as to its manufacturer without further knowledge. Figure 2.46Y shows what may be the beginning of the word "RIFLE" on a stem. This may relate to the 'White's Rifle Pipe' bowls. The curved stem with, we may assume, "BURNS CUTTY" on both sides (Fig. 2.46W) may belong among McDougall pipes, although use of the brand name by Thomas White suggests that 'BURNS CUTTY', like the 'TD' brand, may have been widely used.

Decoration

With few exceptions decorated sherds cannot be assigned to specific manufacturers. An almost complete fluted bowl was found in three pieces (Fig. 2.45L); but for not having a spur it is identical to a bowl illustrated by Humphrey from Sacramento (62). Another complete bowl has a single strong rib front and rear. The bowl was evidently highly prized by its owner: the blackened interior shows signs of much use and the broken stem has been trimmed to fit into a new holder.

The 'head of wheat' motif shown on Figure 2.47B probably served in part to obscure the mould line. Pipes known to have been made by the Glasgow manufacturer William White are identical to this fragment. Figures 2.47C, D and E show something of the wider range of leaf, branch and fern motifs that were used on bowls. Similarly, the fabrication of stems as imitation branches, sometimes with leaves, was quite popular. Figures 2.47L, M, O and P give examples.

Other bowl decorations can be seen in Figures 2.47A, F, G, H and I. The bird's claw (Fig. 2.47A) is an example of a popular treatment in the late 19th century. Figure 2.47G gives an example of a 'roulette' decoration which encircles the bowl near the rim. Among Omata material such items were otherwise unmarked, although bowls with 'roulette' decoration are associated elsewhere with a McDougall mark (63). Figure 2.47H shows a decoration which employed what appears to be

a fragment of sealing wax to enhance part of the design. Figure 2.47I shows part of a bowl apparently moulded to imitate a turreted castle wall.

Remaining decorated stem pieces are shown in Figures 2.47J, K, N and W. Figures 2.47J and K show what is essentially the same design - formed by rolling the pipe stem over a die, hence the unevenness of the imprint. Figure 2.47N shows a 'scallop' decoration which occurred once in the assemblage. Figure 2.47W shows a small animal figurine (a beaver?), which has presumably been broken from the top of a stem. It is this kind of extravagant decoration which would have surmounted the 'emu', 'kangaroo' and 'possum' stems discussed above.

Figure 2.47Y represents an attempt to reconstruct a pipe which belongs to unusually heavy sherd with a bore hole through it, apparently in part a spur.

Use and re-use

Omata clay pipes had a varied amount of actual smoking use. Some, such as the heavily ribbed bowl mentioned above, had been much used, with the inside of the bowl and the rim quite black and part of the outside of the bowl altered from long use to a grey colour. The stem was broken close to the bowl and had been trimmed and inserted into a replacement. Other pipes were apparently never used at all: the 'Cork' bowl is an example.

Among the material is some evidence of the maintenance of broken pipes for further use. Stems were often re-used after breakage - by nicking a new 'grip' for the teeth in the top and bottom, but often without any such refashioning, the smoker's teeth themselves wearing a new 'grip'.

Many re-used stems showed very slight wear at the new grip, indicating little further use before another break, or a new purchase, saw the truncated pipe discarded. The stem shown in Figure 2.47X, however, shows evidence of a great deal of re-use after initial breakage. This sherd also gives an idea of the lengths to which smokers would go to retain a pipe.

Figure 2.47S shows a copper tube 20 mm long which has been fitted over a broken clay stem (the stem has been broken again and part of it remains in the tube). The end of the tube has been pressed flat by the smoker's teeth.

Figure 2.47R shows an amber pipe mouth piece with an internal screw thread for attachment to a pipe. There was one other amber fragment designed for such use found. These mouth pieces could hardly have been used with clay pipes so it is clear that clay pipes were not the only smokers' equipment in use at Omata.



FIGURE 2.47. Clay pipe miscellany. A-Q and W. Decorated pieces (O-Q with makers' marks). R. Amber mouth piece. S. Makeshift copper mouth piece. T-V. Spur marks. X. Piece illustrating the extent of re-use. Y. Unusual spur form.

Cloth

A number of fragments of cloth survived in the site, mostly not attached to anything which might help to suggest a garment or other use. The material was examined by Research Institute Textile Services of Lower Hutt, to whom I am indebted for the following information.

Sample 1. Top platform, metre square L11. Appears to be either knitted or woven. If woven then the original weave was of fairly loose construction and the cloth may then have been subjected to a felting process to consolidate it. The main fibres present were wool, with some bast fibres present as an integral part of the fabric. This fragment of material was attached to the Green & Co., Saville Row, button (Fig. 2.48, Type 2W).

Sample 2. Square X, Level 1. Of woven construction but probably subjected to a felting process. Wool is present, but no cellulosic fibres (such as cotton).

Sample 3. Square X, Level 1. This fabric has a herringbone weave and was probably used as a trim. Constituent fibres are protein, probably wool. No cellulosic fibres are present. The sample consists of a strip of cloth, or ribbon, 20 mm wide.

Sample 4. Square XII, Level 1. Woven construction. The constituent fibre is wool.

Sample 5. Square XII, Level 1. This had obviously been a woven fabric but only yarns in one direction are still present. The fibre is wool, with no cellulosic fibres present.

Sample 6. Square XII, Level 1. Of woven construction, with wool the constituent fibre. No cellulosic fibres are present. Incorporated into the fabric are a few white fibres which appear to be animal hairs, similar to dog hairs. Four buttons were still attached (see Fig. 2.48V).

Sample 7. Square XII, Level 1. Woven construction; made of cotton. This piece of cloth is held in some fragments of brass and may have been part of uniform webbing.

Sample 8. Square XII, Level 1. Woven construction; made of cotton. This fabric was of a very even weave and was probably an expensive material.

Sample 9. Square XII, Level 2. Probably woven, this sample was severely degraded and for this reason its constituent fibre is uncertain, although it is cellulosic (probably cotton) and not wool.

Sample 10. Square XII, Level 1. Of woven construction; made of wool. No cellulosic fibres are present. This fabric and Sample 5 are very similar and could be from the same item of clothing.

Sample 11. Square XII, Level 1. Very loose weave incorporating fine yarns. The fibre is cotton.

Sample 12. Square XVI. This fabric is badly degraded, but probably of woven construction. The fibres present were protein, probably wool. No cellulosic fibres are present. Attached to Moses Levy & Co button (Fig. 2.48P).

Six of the 12 samples are apparently fairly coarse wool cloth. Sample 3, also wool, is of finer material altogether. The cotton is generally of a finer weave than the wool and in the case of Sample 8 is very fine indeed. At least three of the samples (3, 7 and 8), of wool and cotton, appear to be from the finish of a garment or from a use such as uniform webbing.

Cotton samples are usually in better condition than wool which is extremely fragile and fragmentary. This may indicate that wool has not survived well in the site and that cotton is over-represented in what remains. It is not known what clothing the material represents. The only clues are the possible webbing, the use of Sample 7 in a uniform as suggested by attached fragments of brass, and Samples 1, 6 and 12 which were found attached to 'trouser buttons'.

Buttons (Figs 2.48-2.49)

One hundred and eleven buttons were found of 67 different kinds, 50 of them represented by only one example. The buttons are divided here into six groups for the purposes of description and illustration. One cut-glass cufflink in a brass setting is also shown. Figure 2.48 shows one piece buttons and Figure 2.49, two piece buttons.

Type 1 buttons, used probably on underwear, includes the most abundant buttons in the Omata collection (Fig. 2.48). They belong to a type known as 'small chinas'. Buttons similar to those represented in the Omata collection are illustrated by Peacock (64). They are made, "... from dry clay and pressed out almost in the manner of biscuits," a process which was invented about 1840 by Richard Prosser of Birmingham (65).

A. 11.8 mm diameter. Represented by 16 examples.

B. 10.0 mm diameter. Seven examples.

C. 9.0 mm diameter. Three examples.

D. 11.5 mm diameter, apparently slightly misshapen after it was stamped. One example.

E. 11.5 mm diameter. One example.

Type 2 buttons are stamped out in one piece of brass (Fig. 2.48). They are sometimes referred to as 'trouser buttons'. It is generally assumed that the brand names on the front refer to the clothing manufacturers, while 'back marks' refer to button makers - Types 2Z, e and f may be exceptions.

A. 12.8 mm diameter. One example.

- B. 13.0 mm diameter. Two examples.
- C. 13.1 mm diameter. "HIAM & Co/ OXFORD ST" are represented by three different buttons (Types 2C, S and X). One example.
- D. 13.3 mm diameter. Has very faint lettering on the front - in parts suggestive of 'Moses Levy & Co, London'. One example.
- E. 13.3 mm diameter. A very faint design on the front is not shown in the drawing. One example.
- F. 13.3 mm diameter. Similar to Type 2D but lacks design. One example.
- G. 13.3 mm diameter. Faint unreadable brand name on front. Three examples.
- H. 13.3 mm diameter. Two examples.
- I. 14.2 mm diameter. "MILES/ 82 NEW BOND ST" (street number could be 32 or 62). One example.
- J. 16.0 mm diameter. "MOSES LEVY & Co/ LONDON" - this firm of clothing manufacturers is given on six different buttons (Types 2J, 0, P, c, d and 4M), and possibly Type 2D. Three examples.
- K. 16.0 mm diameter. One example.
- L. 16.1 mm diameter. Very corroded, the letters "BEST ... EDGE" can just be made out on the front. One example.
- M. 16.5 mm diameter. One example.
- N. 16.8 mm diameter. This button appears to be made of copper, not brass. One example.
- O. 16.8 mm diameter. "MOSES LEVY & Co/ LONDON". Two examples.
- P. 16.8 mm diameter. "MOSES LEVY & Co/ LONDON". Identical to the previous button but lettering on the front is divided by dots rather than stars. Still attached to cloth, probably wool; see Textile Sample 12. One example.
- Q. 16.8 mm diameter. The single example is incomplete.
- R. 16.8 mm diameter. One example.
- S. 16.8 mm diameter. "HIAM & Co/ 86 OXFORD ST". One example.
- T. 16.8 mm diameter. Faint unreadable brand name on front. One example.
- U. 17.0 mm diameter. "WHITEMAN/ POWIS ST WOOLWICH" (London). One example.
- V. 17.0 mm diameter. Four buttons found together in Square XII, Level 1, were still attached to cloth which is probably wool; see Textile Sample 6.
- W. 17.0 mm diameter. "GREEN & Co/ SAVILLE ROW" (London). This button was still attached to a cloth fragment which has been identified as mostly wool; see Textile Sample 1. One example.
- X. 17.0 mm diameter. "HIAM & Co/ OXFORD ST". One example.
- Y. 17.0 mm diameter. Faint unreadable brand name on front. One example.
- Z. 17.0 mm diameter. "J.E.HOUSFIELD & Co/ LONDON", other very faint letters above 'London' may read 'Regent St'. One example.
- a. 17.2 mm diameter. One example.
- b. 17.4 mm diameter. "EXTRA QUALITY" back mark. One example.
- c. 17.5 mm diameter. "MOSES LEVY & Co/ LONDON". Four examples.
- d. 18.0 mm diameter. "MOSES LEVY & Co/ LONDON". One example.
- e. 19.0 mm diameter. "S.W.S. & Co/ L" back mark (probably S.W. Silver & Co, London - see Type 2f). One example.
- f. 19.5 mm diameter. "S.W. SILVER " Co/ CLOTHIERS & c LONDON" back mark. One example.
- Type 3* includes buttons stamped out in one piece of material other than brass, or, in one case, of brass that has been enamelled (Fig. 2.48).
- A. Pewter? *Ca* 12.5 mm diameter, only a small part remains. One example.
- B. Black enamel over iron. 14.0 mm diameter. One example.
- C. Black material (?). 13.0 mm diameter. One example.
- D. Black 'small china.' 15.5 mm diameter. Two examples.
- E. Black enamel over brass. 17.0 mm diameter. "J. BANHAM/ WISBEACH" on front, probably the clothing manufacturer or retailer; "BARTLEET & SONS/ MANUFACTURERS" back mark, probably button makers. Two examples.
- F. Wood coated with black paint. 14.0 mm diameter. One example.
- G. Pewter. 13.3 mm diameter. One example.
- H. Black enamel over iron. 13.0 mm diameter. One example.
- Type 4* two piece buttons are made up of separately stamped back and front pieces (Fig. 2.49). The front is usually of slightly greater diameter than the back so that its rim may be fastened over the back to hold the two pieces together.

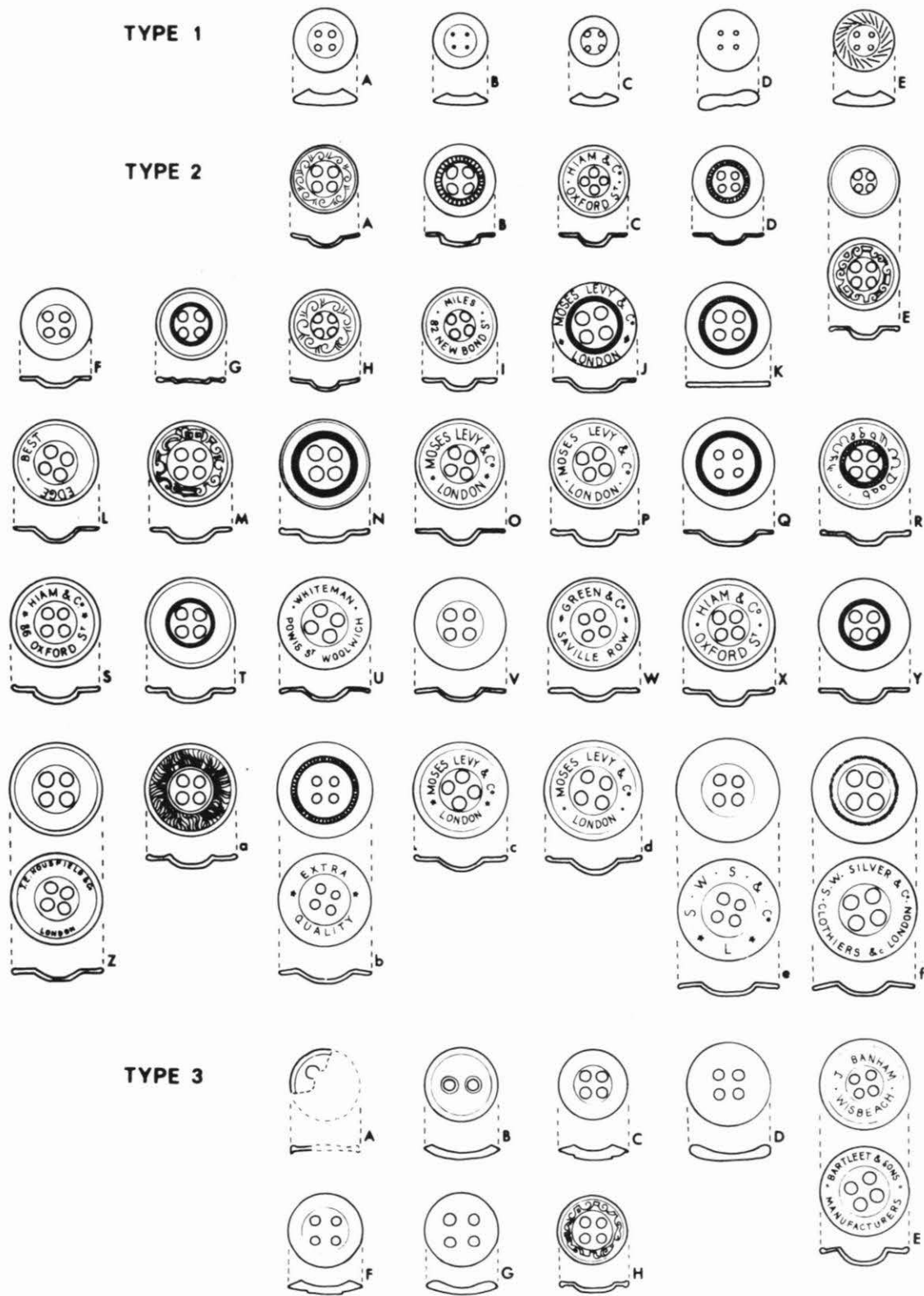


FIGURE 2.48. One piece buttons (refer to text).

Two basic kinds of two piece buttons are made: those with sewing holes through the button as with the one piece examples (Type 4), and those with shank loops of various kinds (Types 5 and 6). The latter, it can be seen, offer the possibility of domed and decorated fronts uninterrupted by thread holes, thus they were almost invariably used on uniforms, and indeed still are. They may be referred to as 'Sanders' buttons, after their inventor who was an early 19th century Birmingham button maker (66).

Type 4 includes buttons made in a wide variety of slightly different ways; what they have in common is thread holes through the button. Some are stamped out in two pieces with the thread holes formed by matching holes in the front and back parts (Types 4A, C, F and I). Others have thread holes strengthened by having the material which is cut to form the holes, bent over a central dividing piece (Type 4D). Others again have small bars (Types 4B and E) or crosses (4H) inserted to make the thread holes, these being held in place by the front and back pieces of the button. A rather different button is made up of a piece of bone (Types 4K and M) or papier-mache (4L), stamped out as a one piece button with a rim of brass then added.

- A. Brass. 13.0 mm diameter. Two examples.
- B. Steel. 14.0 mm diameter. One example.
- C. Brass. 17.0 mm diameter. "E & S/ PATENT" back mark. Two examples.
- D. Black enamel over brass. "GELERT'S PATENT/ H & I" back mark. Three examples, one of which still has a fine leather strip tied through the thread holes.
- E. Steel (?). 17.0 mm diameter. Identical in style and manufacture to 4B. Two, possibly three, examples.
- F. Brass. 17.0 mm diameter. One example.
- G. Brass. 17.0 mm diameter. One example.
- H. Black enamel over brass. 15.8 mm diameter. "T & S/ PATENT" back mark. One example.
- I. Brass. 17.0 mm diameter. One example.
- J. Steel. 18.0 mm diameter. One example.
- K. Bone (?). The brass rim that surrounded this button insert has almost entirely disappeared. The bone itself is 16.0 mm diameter, the button may therefore have been 17.0 mm diameter or more. One example.
- L. Papier-mache. Like Types 4K and M this is apparently only the centre of a button, the brass rim having disappeared except for copper staining. The complete button might have been 17.0 mm in diameter. One example.
- M. Brass rim on bone. 18.0 mm diameter. "MOSES LEVY & Co/ LONDON" on the front. One example.

Type 5. Types 5 and 6 are shank buttons: Type 6 is given separate treatment, not on technological grounds but as an easily separated group of uniform buttons.

A. Brass. 12.0 mm diameter. One example.

B. Steel. 16.5 mm diameter. One example.

C. Black glass. 11.8 mm diameter. This is not strictly a two piece button but is included here as it shares the method of attachment with others of this group. The shank in this instance is of thin copper wire. "Black glass buttons, commonly and improperly called "jet", were the most numerous inhabitants of grandmother's button box" (67). One example.

D. Cloth over steel. 18.5 mm diameter. One example.

E. Steel. 13.0 mm diameter. One individual.

Type 6 - uniform buttons. Brass buttons were introduced to the British army in 1855 to replace the pewter buttons previously worn by rank and file; gilt remained in use for officers' buttons (68). The regimental buttons shown here were in use until 1871 (Fig. 2.49).

A. Brass. 18.2 mm (3/4inch) diameter. The common militia and volunteer uniform button. "VR" on the front with a back mark giving the maker "SMITH & WRIGHT/ BIRMm". Slightly different back marks denote different production batches. Two examples.

B. Brass. 19.0 mm (3/4 inch) diameter. 57th Regiment uniform button. "ALBUHERA/ 57" on the front. Albuhera was a battle of the Peninsular War where the 57th earned the name 'Die Hards' from their commander, Colonel Inglis, calling out to the regiment when hard pressed by the French to, "Die hard" (69). "FIRMINS/ LONDON" is perhaps the most famous button maker to the British army. The firm was established in the 17th century and in the mid-19th century was operating from a factory at 13 Conduit St, London (70). Two examples are represented only by very fragmentary remains.

C. Brass. 25.4 mm (1 inch) diameter. 57th Regiment uniform button. "ALBUHERA/ 57" on the front and the back mark "ROGERS & CO/ KING ST/ COVENT GARDEN/ LONDON." One example.

D. Brass. 25.0 mm (1 inch) diameter. 65th Regiment uniform button. "65" on the front and "SMITH KEMP & WRIGHT/ BIRMINGHAM" back mark (71). One example.

Cufflink. The single cufflink is made of amber coloured cut glass in a brass setting (Fig. 2.49).

Uniform pieces

'VR', and 57th and 65th Regiment buttons are already accounted for. The well made clothing buckles given in Fig.

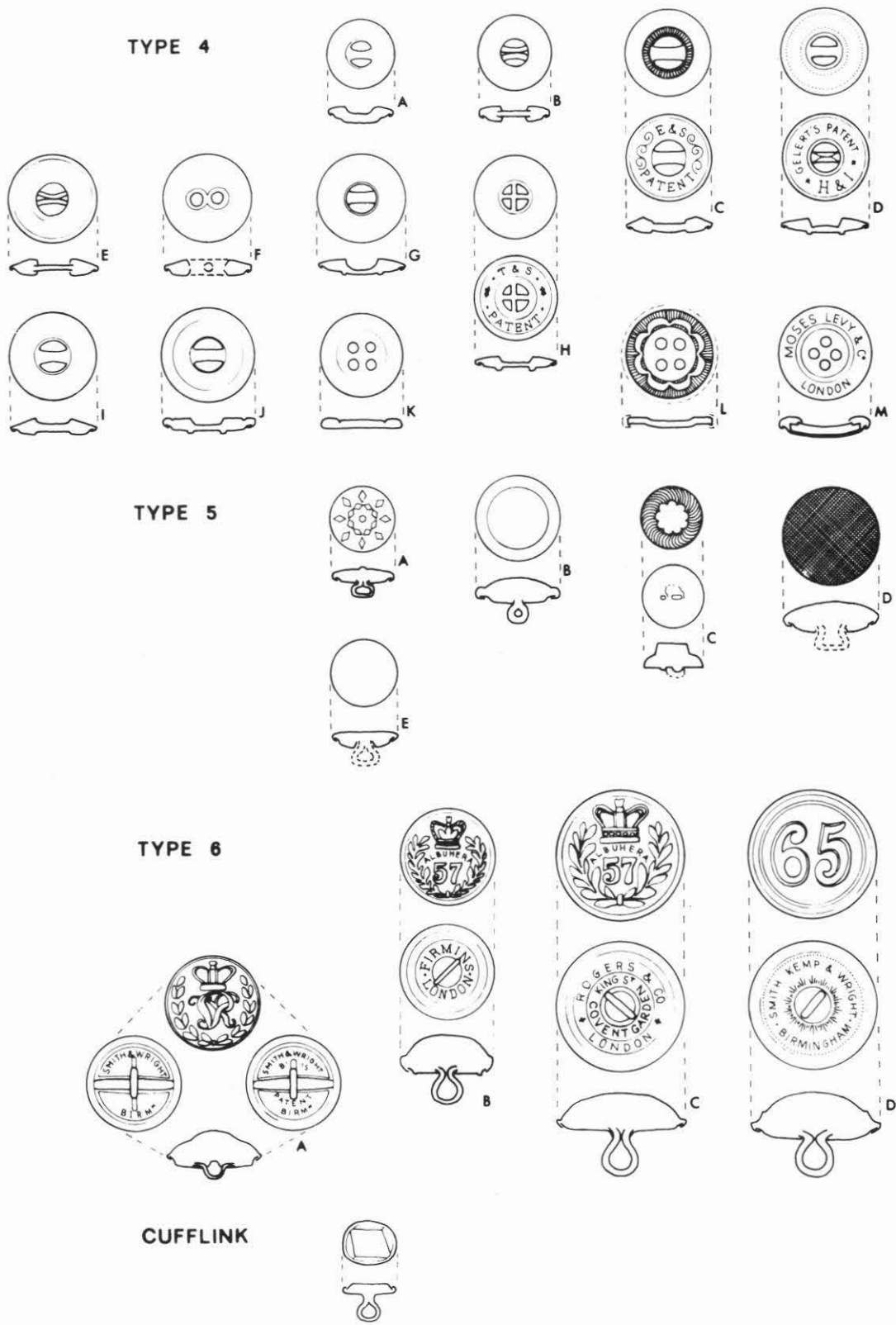


FIGURE 2.49. Two piece buttons including military buttons (refer to text).

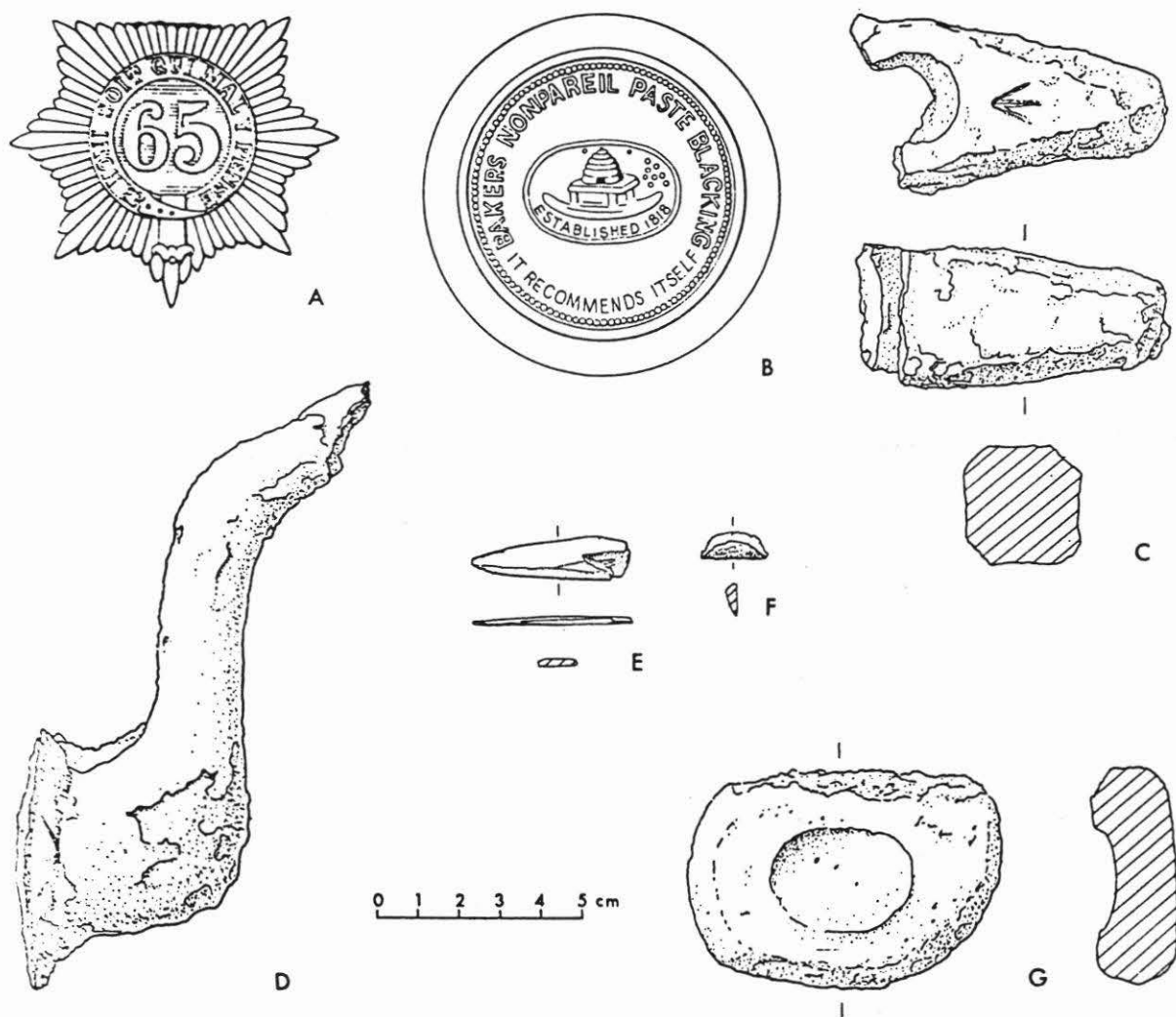


FIGURE 2.50. Miscellaneous items. A. 65th Regiment shako plate. B. Boot blacking tin lid. C. Iron object with War Office mark. D. Iron teapot spout. E. Fragment of polished nephrite. F. Chert flake. G. Tattooing pigment pot.

2.52D and E are also likely to have come from uniforms. Another item which may belong to a uniform is a small brass leaf broken off some larger piece (not illustrated).

The 65th Regiment shako plate (Fig. 2.50A) was found in Square XII, Level 1. A shako was a tall military headdress popular in European armies of the 19th century. A stamped metal plate which identified the regiment or corps was on the front. The style of this item dates it to the period 1855-61 (72), exactly those years the regiment was in Taranaki. The 65th arrived in the province in 1855, fought through the First Taranaki War and left soon after the ceasefire of March 1861. The item is missing its crown. It was apparently required ritual to break the crown off shako plates which were to be discarded

Footwear (Fig. 2.51)

The Omata Stockade was occupied at a time of enormous change in the manufacture of footwear. From early in the 19th century new technologies were introduced which transformed what was formerly a craft into a highly mechanised industry. At the same time the producer's market grew from a local one to being national and even world wide in scope. These changes, particularly in the Massachusetts footwear industry of the north-eastern United States, have attracted considerable interest from economists and social historians (73).

The greatest changes occurred in the 1850s and 1860s. In the United States and elsewhere the introduction of the 'McKay'

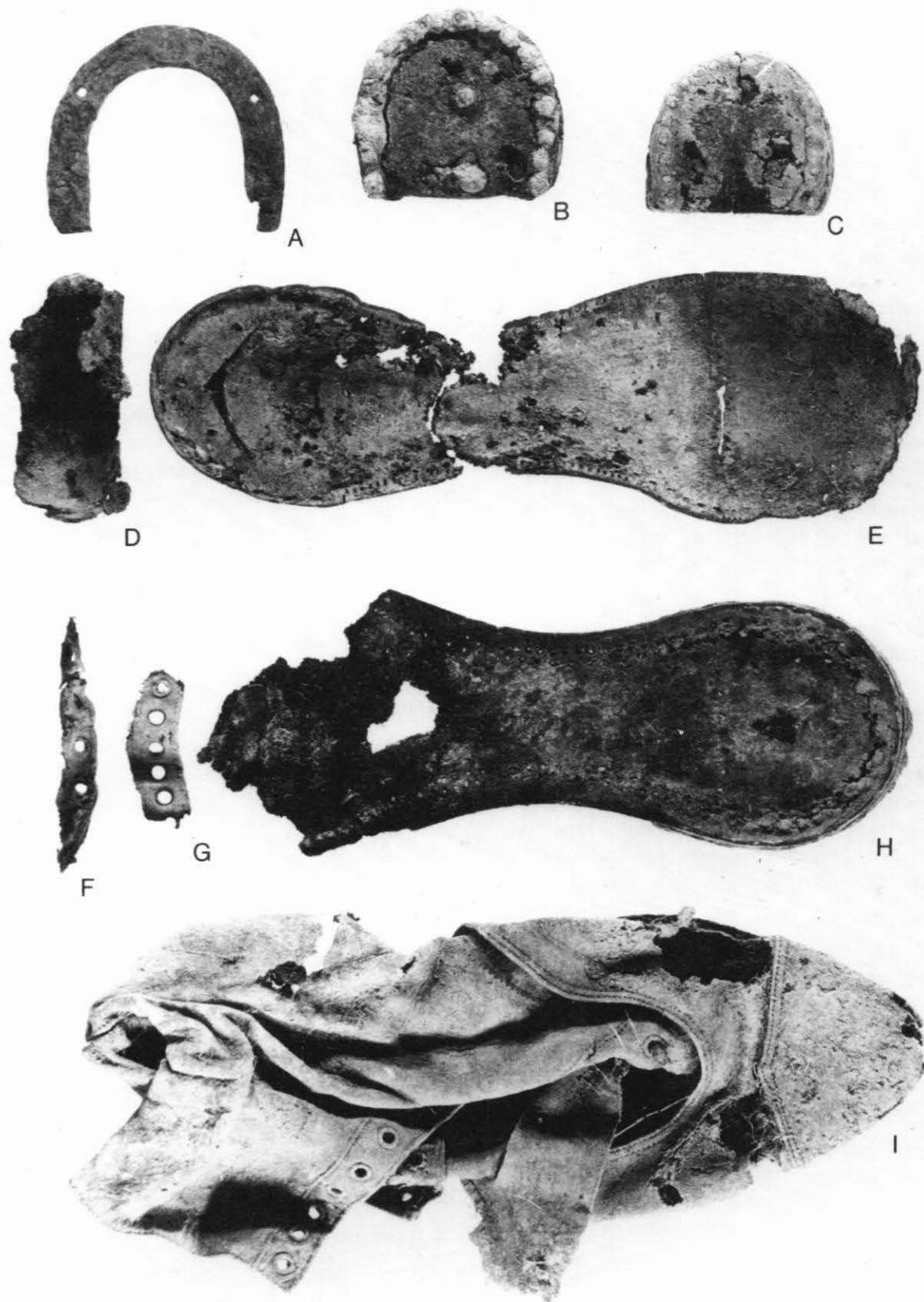


FIGURE 2.51. Footwear. A-C. Boot heels. D and E. Counter and sole of boot. F and G. Eyelets. H. Boot outsole. I. Lady's boot.

sewing machine for attaching soles to uppers revolutionised the industry (74). At the same time the American Civil War resulted in large orders for footwear being placed which could be met only by organisation of workers into factories (75). With many of their fellow craftsmen away fighting, the men of the Massachusetts footwear industry were drawn into the new factories to ensure a productive capacity impossible under the old craft system.

In a useful article on "The archaeology of mass-produced footwear", Adrienne Anderson reviews changes in boot and shoe manufacture in the 19th century, especially in the period of greatest change in the 1850s and 1860s (76). These technological changes can be seen even in the most fragmentary archaeological remains. The main developments centred on the application of machinery to the job of attaching the sole to the upper. Where it can be determined, the Omata boot and shoe material all shows the effect of the developments of the previous decade, the uppers being machine nailed or machine stitched to the sole.

Footwear is represented at the site by iron heel plates, leather soles and heels, and the fragmentary remains of uppers. The most important of this material is illustrated in Figure 2.51.

Figure 2.51A shows a good example of an iron heel plate - three others were heavily rusted. Plates were fastened to heels by five nails. At least one of the heel plates (not shown) has a groove around the length of it in which the nailing holes are sunk, rather in the manner of a horse shoe. The heel plate shown is 70 mm across and 62 mm deep.

Figure 2.51B shows a heavily nailed heel which was found along with some sole fragments. It is made up of four pieces of leather and is 60 mm across. Here iron nails without a plate protect the heel. Attached fragments of sole leather indicate nailing as the method of joining the upper to the outsole.

The smaller heel shown in Figure 2.51C, again found with part of a sole, seems likely to have been from a lady's (right?) boot. It is made up of five pieces of leather with a thin piece of wood on top, and is 55 mm wide and 22 mm high. The bottom is protected by copper nails. Construction of the boot was by sewing at the ball and nailing at the shank. A clean cut across the sole (not shown) shows that part of the sole was deliberately removed for some other purpose when the boot was discarded.

Figures 2.51D and E show the counter and sole of a man's (left?) boot. The point of the sole is missing but the boot was clearly more than 230 mm long. The heel is made up of six pieces of leather protected by copper nails. Construction is by sewing.

Two eyelet rows, each with five eyelets, are shown in Figures 2.51F and G. Other eyelet rows found at Omata had two or three eyelets. Individual eyelets were also found.

Figure 2.51H shows the heel and part of the outsole of a man's (right?) boot. The heel is made up of three pieces of leather and is 73 mm wide and 12 mm high at the instep. The sole shows machine nailing and lockstitch construction.

The lady's (left?) boot shown in Figure 2.51I is apparently complete, though no longer intact. It is 230 mm long and 74 mm across the outsole at its broadest. The heel, built up of four pieces of leather, is 50 mm across and 12 mm high at the instep. The upper is sewn to the outsole. Each side has 14 eyelets, in some of which there are fragments of black fabric laces still attached. This item may date from the stockade's short use as a schoolroom before demolition. Other boot and shoe material from Omata includes heel and sole fragments, eyelets and three iron heel plates.

Miscellaneous objects of copper and brass (Fig. 2.52)

Many small artefacts of brass and copper were recovered, a large number of them only fragments. A selection is shown in Figure 2.52.

A. (Refers to Fig. 2.52A). A copper pipe 75 mm long, split at the join.

B. Copper bottle tie wire, an example of much similar material.

C. Copper pin 31 mm long. There was also another copper pin, 19 mm long.

D. Buckle, black enamel on brass. One side is stamped "G & Cie", with a coat of arms and "SOLIDE", and the other (shown) is stamped "PARIS/ 1862". Assumed to be part of a uniform.

E. Buckle in brass. Stamped "G & Cie" (no coat of arms) and "1855" - because of corrosion it is not possible to see more, if indeed it is there. Also found were the teeth of another similar buckle.

F. A group of brass percussion caps from Square X, Level 1. Six plain (three open and three closed) and two grooved caps (upper right) illustrate the variety.

G. Wall hook (twisted during demolition?).

H. Wall hook. Identical to G but missing screw for attachment to wall.

I. Swivelling eye screw for attachment to wood.

J. Loose ring on a screw fitting.

K. Broken brass ring or chain link.

L. Two joined rings, the smaller one swivelling. From a pocket watch?

M. End of a small pocket knife.

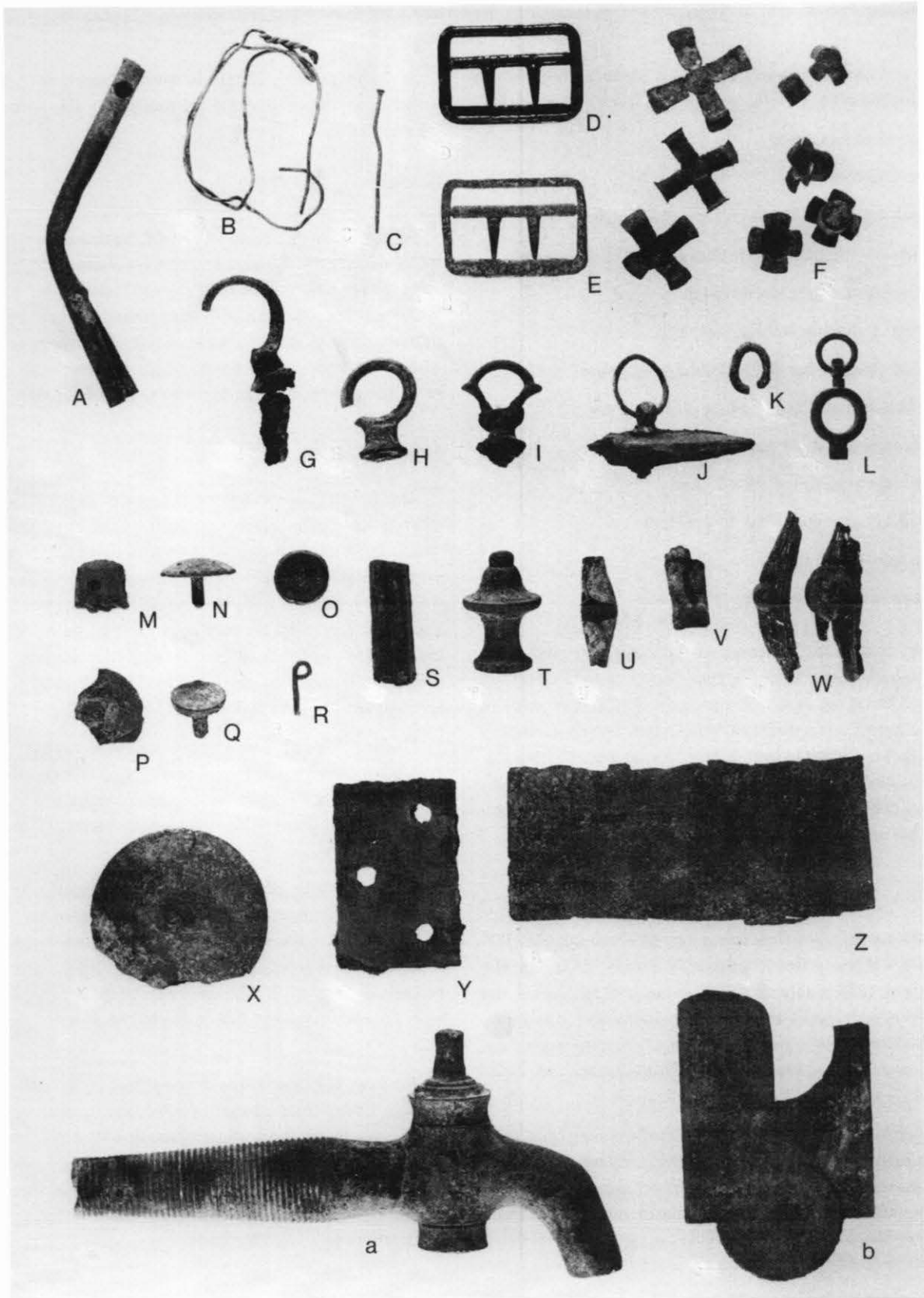


FIGURE 2.52. Miscellaneous objects of copper and brass, ca 90% actual size. Letter designations refer to text.

N. Circular disc 15 mm diameter with stem (similar to W, below).

O. Disc 11.5 mm diameter essentially identical to Q but the stem broken off.

P. Disc 23 mm diameter.

Q. See O above.

R. Hook for clothing hook and eye attachment.

S. Grooved strip of copper broken off at both ends.

T. Brass knob with screw thread in the base.

U. Brass clothing or webbing fastener.

V. Brass clothing fastener still holding fragments of cloth.

W. Rivetted studs from rattan or cane furniture.

X. Light brass disc, 38 mm diameter.

Y. Part of a brass hinge, 38 x 25 mm.

Z. Crudely cut copper strap 74 x 33 mm.

a. Tap for wooden barrel.

b. Hinge of carpenters' rule.

Very little of this material cannot be identified with reference to items in use today. Percussion caps are no longer used and the barrel tap is now frequently replaced by wooden or plastic taps of rather different form - where barrels are used at all for holding water or beer. Likewise a number of the smaller objects may be less commonly used today. Omata Stockade being a military post the buckles are of special interest, apparently having come from a uniform or accoutrement.

Coins

Four copper coins were found, one of which was the 1906 Edward VII penny from Square XVI already discussed. The other three presumably all belong to the stockade period, but are in very poor condition making dates impossible to decipher. Detailed information on size and design given in Peck's *English Copper, Tin and Bronze Coins in the British Museum 1558-1958* (77) is essential for their identification.

A copper penny with the Queen Victoria 'young head' is 34 mm in diameter. The date cannot be discerned but reference to Peck makes it clear from the position of the last colon on the reverse (after "DEF") that this coin must be dated 1846, 1847, 1851 or 1853-57, and from Britannia's apparently plain trident the date probably falls between 1853 and 1857 (78).

A copper half-penny is 28 mm in diameter. This coin is extremely corroded but a head which may be the 'young head' of Queen Victoria may just be discerned on one side. The coin

must date to prior to the introduction of bronze coinage in 1860 (79).

A copper farthing 22 mm in diameter again has a Queen Victoria 'young head'. Like the half-penny this dates from prior to 1860.

Ammunition (Fig. 2.53)

Ammunition recovered at Omata represents a range of weapons of the most important period of change in small arms since the invention of the gun. The old 'brown bess' musket, which was issued to the British army since the beginning of the 18th century, was replaced in the middle of the 19th century by a series of improved weapons which led eventually to the breech-loading bolt action Martini-Henry rifle of 1869 (80).

The arms

The 'brown bess' musket was for most of its life a flint-lock weapon, that is, the charge was set off by a piece of flint being struck against steel on the side of the gun which set off igniting powder in an open 'pan', in turn setting off the main charge within the barrel. Muskets were by definition muzzle-loaders since the charge and the ball were rammed down from the muzzle. This made loading and firing a fairly lengthy operation. The 'brown bess' calibre was .75 or .775 of an inch, approximately 19 and 19.7 mm (81).

The first change was in the manner of ignition. Early in the 19th century the percussion-lock was developed; rather than the igniting spark being struck by a flint, a hammer now struck a detonating compound (initially fulminate of mercury) to set off the main charge.

About 1820 the percussion cap was invented which enclosed this detonating charge in a small copper or brass cap - this being more convenient to handle than the old open 'pan', as well as being proof against the weather. By the late 1830s muskets issued to the British army were of the percussion-lock type. The last sale of gun-flints to the British army was in 1838 (82).

We may now turn to the development of the rifle. Very briefly, 'rifling' in the barrel of a weapon involves grooves which cause the projectile to spin thus allowing a straighter and more accurate trajectory. The difficulty with early rifles was that they were muzzle loaders. This meant that the bullet needed to drop into the barrel, but had somehow to expand to fit the rifling grooves when fired.

The first rifle issued to the British army was the Brunswick rifle of 1837 (83). This weapon had two-grooved rifling in a barrel of .704 inch (17.9 mm) calibre. It was designed for use with a belted ball - a round ball with a raised ridge around

it, the ridge engaging in the rifling grooves to impart the necessary spin to the projectile.

The next important development was a conical bullet more akin to a modern projectile. This was developed by Captain C.E. Minie of the French army (hence rifles of a number of makes, such as the Enfield rifle, are sometimes referred to as 'Minie rifles' during this period).

The bullet had a hollow base with an iron plug in it, so designed that on firing the plug would move forward, expanding the 'skirt' of the bullet to engage the rifling grooves (84). Later it was discovered that the plug was not needed to expand the projectile's skirt since the explosion of the charge would achieve this without help; the British army, however, continued to use boxwood or clay plugs to prevent damage to bullets in packing (85).

In the early 1850s the 'Pattern 1853' rifled musket was developed in Great Britain, to be rapidly brought into production at the onset of the Crimean War of 1853-56 (86). This was a muzzle-loading, percussion-lock rifle of .577 inch (14.7 mm) calibre. It is commonly known as the 'Enfield' after the north London borough where it was first made.

The fourth major change in small arms was the introduction of breech-loading weapons. As early as 1841 the Prussian army was using the 'needle-gun', a bolt-action, breech-loader with a central firing pin - essentially the same in principle as is almost universally used today. It was not until 1864, however, that the breech-loader impressed itself on the British army sufficiently for a committee of officers to recommend its adoption. This was rapidly pushed ahead after the 1866 Prussian victory over Austria.

Enfield rifles were converted into breech-loaders by the 'Snider' method which consisted of cutting away two inches of the upper part of the breech end of the barrel to admit the cartridge, which was pushed forward into a chamber formed by enlarging the end of the bore. Proposals were then invited for a new breech-loading rifle and in 1869 a combination of the Martini breech action and the Henry barrel was decided on for future manufacture, this being the well-known Martini-Henry rifle.

The industry

Along with rapid changes in the design and technology of small arms in the mid-19th century, the mode of production also underwent considerable change. In his *Harper's Ferry Armory and the New Technology* Smith (87) has documented for the Harper's Ferry Armory in the United States the change in the small arms industry from a skilled craft, to factory production methods which employed less skilled workers, each carrying out fewer tasks.

As in other industries this was strongly resisted by the old craftsmen. Nonetheless, to promote increased production, a reduced period of worker training and a uniform product allowing interchangeability of parts, the shift of production from craft workshops to large factories was of the utmost importance. It was this which allowed rapid introduction of the technological changes outlined above, and enabled production sufficient to meet the requirements of growing national armies.

In Britain the demand for Enfield rifles at the outset of the Crimean War precipitated the change to modern production methods which had already been carried through in the United States at the Springfield factory and to a lesser extent at Harper's Ferry.

"The Royal Small Arms Factory at Enfield Lock, Middlesex was not put on a serious footing until 1854. For the first fifty years of its existence it was mainly concerned with the assembly of arms from parts received under contract from private manufacturers...

By early 1854, the complete failure of the traditional contractors to deliver the arms urgently required in the face of the threat of war with Russia induced the government to press for the establishment of a mechanized state arms manufactory. After much bitter debate, a Select Committee, undoubtedly influenced by evidence from America of the possibilities of economic use of machinery in the production of high-grade arms, recommended the experimental mechanization of the existing factory at Enfield. A considerable quantity of machinery, and technicians to oversee its installation, were procured in the United States." (88)

In summary then, the middle years of the 19th century saw the standard weapon of the British army change from a flint-lock, smooth-bore, muzzle-loader to a breech-loading rifle with a centre-fire cartridge. At the same time, the old craft based industry gave way before the demands of a rapidly changing technology and the increasing requirements of modern field armies.

The Omata material

The range of ammunition recovered at Omata is shown in Figure 2.53. Included are used and unused .577 Enfield bullets, pistol ammunition, a Brunswick rifle belted ball and balls ranging in size from 'brown bess' calibre down to shotgun pellets.

Twenty-eight .577 Enfield bullets were found, 16 of them unused bullets of the typical size, weighing *ca* 32.5 g (Fig. 2.53A). Two more bullets are of a smaller size with a hollow nose (Fig. 2.53C). One bullet that was stuck in a barrel has been withdrawn by the standard ball drawer attachment to the ramrod of the period (Fig. 2.53B). In addition there are seven

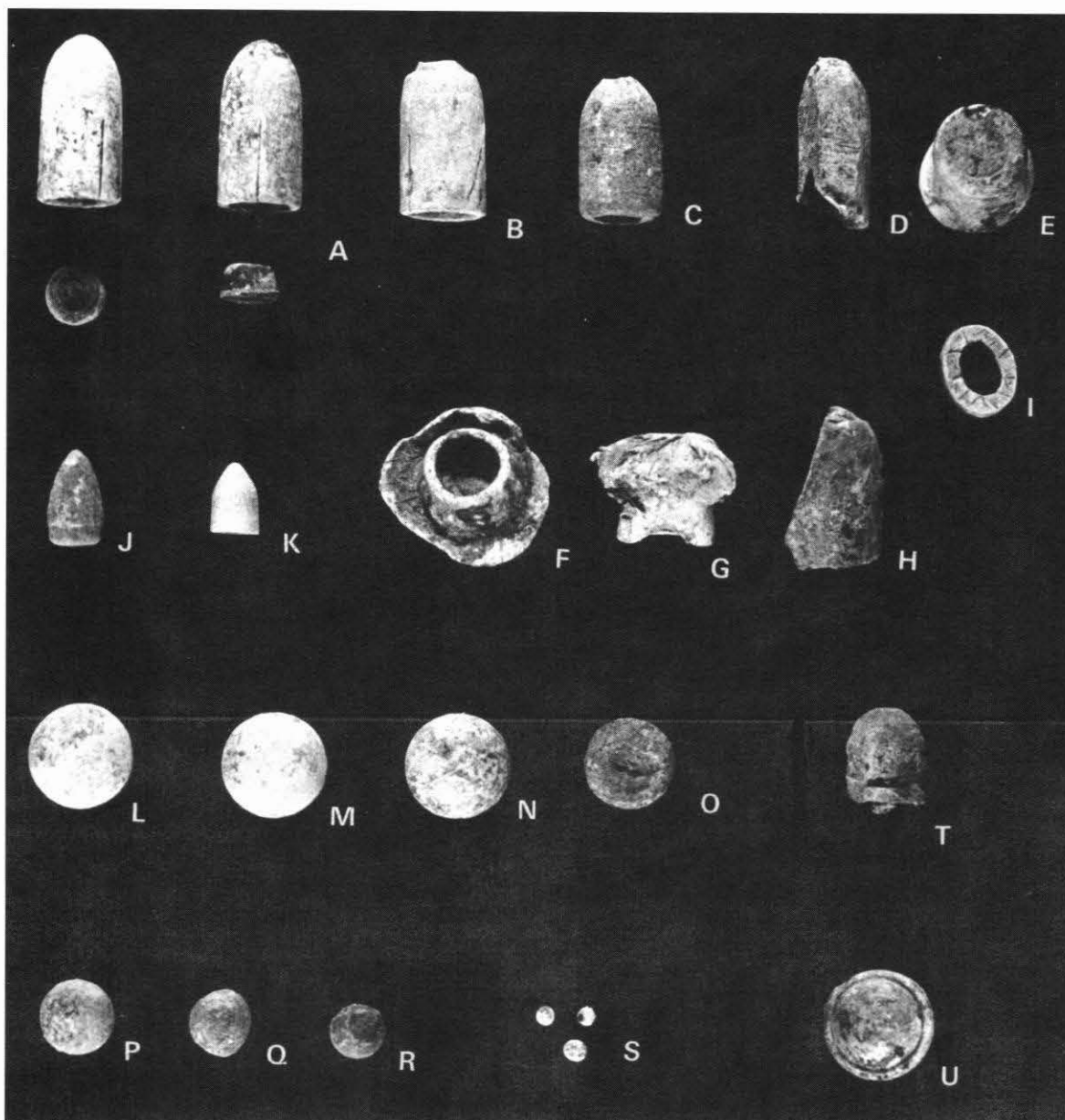


FIGURE 2.53. Ammunition, actual size. Descriptions in text.

bullets which have clearly been fired, being misshapen in a variety of ways; Figures 2.53E-H give examples. Two substantially complete bullets (Fig. 2.53D) and three fragments (Fig. 2.53I) have been cut or crimped before being fired.

One Brunswick rifle belted ball was found (Fig. 2.53U). The maximum diameter (around the 'belt') is 18.8 mm (.74 inch) and the normal diameter, 16.5 mm (.65 inch). The weight is 28g.

Balls for muskets and pistols come in a variety of sizes. The most abundant is *ca* 18 mm (.71 inch) in diameter weighing *ca*

31 g (Figs 2.53L, M and N). The five recovered balls of this size are well made and presumably were for use with the .75 or .775 inch calibre 'brown bess' musket.

Other balls were represented by one example each. These may be briefly listed giving diameter (metric and inches) and weight: 17.0 mm/.67 inch, 24.9 g; 16.1 mm/.63 inch, 21.2 g; 15 mm/.59 inch, 16.5 g (Fig. 2.53O); 13.0 mm/.51 inch, 10.8 g (Fig. 2.53P); 11.0 mm/.43 inch, 5.9 g (Fig. 2.53Q); and 9.5 mm/.37 inch, 4.1 g (Fig. 2.53R). These are mostly poorly finished. The smaller calibres suggest pistol balls. Five shotgun pellets were found (Fig. 2.53S).

In addition to the balls of pistol size there are two conical pistol bullets. One is 9.9 mm (.39 inch) in diameter and 7.9 g, with an encircling groove near the tail (Fig. 2.53J). The other is 8.5 mm (.33 inch) in diameter and 5.1 g (Fig. 2.53K). Another bullet, illustrated in Figure 2.53T, is also likely to have been used in a pistol. It is 12.8 mm (.50 inch) in diameter and 15.2 g in weight, again with a groove around the tail.

In addition to the various bullets, evidence for firearms comes from 243 percussion caps (Fig. 2.52F). These are of two different types: plain, of which 229 were recovered, and cut all round by slight grooves, of which 14 were found. The grooved percussion caps are without the flaps which enclosed the charge. The plain caps are either opened right out (flat) or with only the ends of the enclosing flaps blown out.

Musical instruments (Fig. 2.54)

Pieces of at least two musical instruments were found. The music making part of a mouth organ - a lead alloy plate with brass reeds - is shown in Figure 2.54C. Other illustrated pieces are apparently from a concertina. They include a decorated piece of brass from the sound box (Fig. 2.54A), a single reed (Fig. 2.54B), and a key with part of the brass attachment to the sound box (Figs. 2.54D and E).

The mouth organ was developed in the 1820s by German and English musical instrument makers; the concertina was invented in 1829 by Charles Wheatstone of London (89). Together with other instruments of the 'reed-organ' family they rapidly became popular for casual music making, particularly among mobile and less affluent groups in society.

Miscellaneous lead

As well as ammunition other small pieces of lead had been fashioned deliberately to shape. The purpose or use of these is not clear. More lead showed no sign of deliberate shaping. Fragments of lead roof sheeting totalled 119.5 g.

Miscellaneous iron

In Square XII, Level 2, was a mass of demolished building material. This is discussed below in connection with cut nails and identification of the main stockade door. Other material from this area includes a heavy iron door lock which was found in two pieces: the large (100 x 130 mm) and ornate outer plate in cast iron, and part of the lock interior with a return spring mechanism.

Iron material in Square XII, Level 2, but not directly

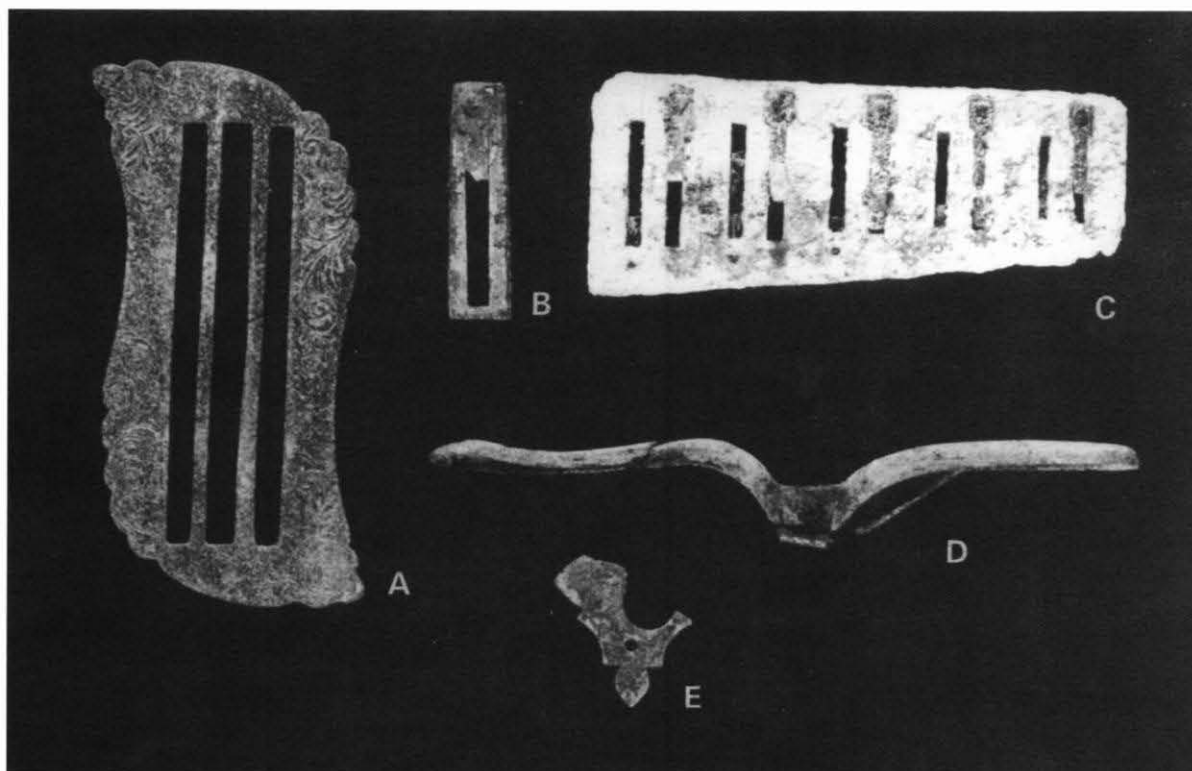


FIGURE 2.54. Musical instrument pieces (A-E), and miscellaneous lead items (F-O), actual size. Descriptions in text.

associated with the demolition rubbish, also includes two large objects of unknown use. The first is a heavy iron collar 300 x 250 mm and *ca* 10 mm thick, with a hole in the centre *ca* 150 x 100 mm. The second is a sheet of lightweight iron (or 'tin') which has been crimped to a circular disc shape 430 mm in diameter and strongly bounded by 5 mm diameter wire or rod (see Fig. 2.24). Adjacent to this was found a heavy iron teapot spout 150 mm in length, with a rounded pot end suggesting a teapot of 200 mm diameter (Fig. 2.50D).

In Square XII, Level 1, resting among bottle lens material, were the broken remains of the leading part of a horse-drawn agricultural implement including a massive notched piece of iron for setting the implement. Also found close together here were two pulley wheels 53 mm in diameter with axles *ca* 80 mm in length. These are characteristic of counter-weighted casement windows common until recent years. A used horseshoe was also found in Square XII, Level 1.

Iron material in Square X, Level 1, was abundant. There were numerous 'tin cans', matchboxes and nails. Other objects which deserve mention include two iron straps, 32 and 39 mm across, similar to modern guttering straps, a 220 mm long three-cornered file, and a 190 mm length of straight rod 7 mm in diameter. The "BAKERS NONPAREIL PASTE BLACKING" lid (Fig. 2.50B) comes from a boot polish container.

A very heavy piece of iron from this part of the site is *ca* 75 mm in length, 30 mm deep and tapering from 38 mm width to a rounded end (Fig. 2.50C). It has been broken from the complete object through the weakness allowed by a 20 mm diameter hole. The well-known arrow symbol of the British army is impressed on one side. It comes from a piece of heavy military equipment - possibly a field gun or gun carriage.

Hinges, buckles, shackles, horseshoes and boot heels were each represented by more than one example from different parts of the site. Boot heels have already been discussed under

Provenance	Height (mm)	Diameter (mm)
Sq.XII/L-1	-	<i>ca</i> 300
Sq.X/L-1	-	110
Sq.XII/L-1	125	80
Sq.XII/L-1	125	80
Sq.XII/L-2	122	78
Sq.X/L-1	-	80
Sq.X/L-1	100	<i>ca</i> 80
Sq.X/L-1	106	75
Sq.XII/L-1	101	77

TABLE 2.4. Omata Stockade 'tin cans'.

footwear. In addition to the horseshoe mentioned above, part of another was found in the fill of the drain cut through the north-west bastion.

Two identical light shackles were found, *ca* 40 x 40 mm. Both closing bolts are without the wing-nut or other device which occur today on shackles of this type to enable use without a spanner or other tool. Three harness buckles were in poor condition for accurate measurement: outer dimensions were *ca* 34 x 34 mm, 27 x 25 mm and 20 x 19 mm. Two door hinges, 63 mm high and 50 mm across and 53 x 45 mm respectively, both have three screw holes on each side.

'Tin cans'

'Tin cans' are represented by material which in many cases is so fragmentary that shapes and sizes cannot be determined. Flat pieces of 'tin' probably belonged to square boxes, which were apparently made up in sheets, bent over to join at the corners. One complete, but flattened box of this kind measuring 225 x 160 x 105 mm was found in Square X, Level 1. Another side of a larger box measures 320 x 290 mm. It is not possible to estimate the number of rectangular 'tin' boxes in the site but it is certainly in excess of these two. Nor is it known what they contained.

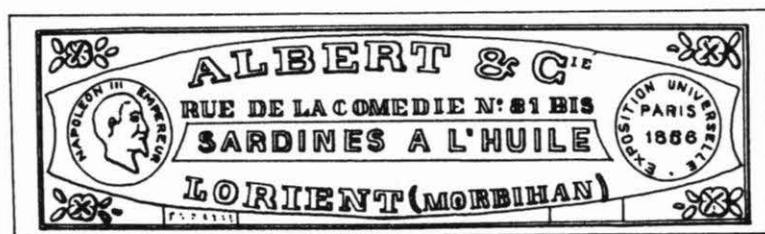
Because of their smaller size and strong construction round 'tin cans' frequently allowed accurate measurement (see Table 2.4). They were very similar to the ubiquitous 'tin can' of today, except that they were lapped and soldered rather than crimped by machine. There is no clue as to their contents. We may guess that they contained much the same kinds of food as crowd supermarket shelves today.

Sardine tins (Fig. 2.55)

Sardine tins are instantly recognised from their shape, and in some instances have their contents confirmed by stamped copper labels attached to their sides (Fig. 2.55). The manufacturer, size, number and distribution of sardine tins in the Omata site is summarised in Table 2.5.

Allowing for slight differences in recorded measurements (none too difficult given the rusted and often fragmentary remains), Omata sardine tins appear to fall into six size groups. It must be remembered that automatic canning machines were not in use at this time and minor variation in size might be expected even from one factory or production run.

Another aspect of modern sardine tins which post-dates the Omata sample is the use of an opening key or tab. Omata tins were opened by a tin-opener of the common levering kind - or by a knife which can be used in the same way - and the tops then bent back. On the label of a sardine tin found at Warea Redoubt



A



B



C

FIGURE 2.55. Sardine tin copper labels (A is 90 mm long).

is the instruction “this tin may be easily opened with a pocket knife” (Fig. 3.32A).

Manufacturers are given on the copper labels shown in Figure 2.55. They are Albert & Cie of Lorient, in the French department of Morbihan, R. Balestrie of Concarneau, and B. Basset of La Rochelle. All are fishing ports on the Bay of Biscay coast, two in Brittany and the third (La Rochelle) just to the south.

In describing the archaeology of a military site it is relevant to note that the canned food industry owes its origins and development to the problem of feeding armies in the field.

“The canning industry (‘tinned food’) owed its origin to the exigencies of the Napoleonic Wars, developed its social significance in the American Civil War, and proved itself as

a world industry by its capability of maintaining enormous armies in the field in the First World War.” (90)

The principle of preserving food by boiling in an enclosed container was first developed about the turn of the 19th century by Nicolas Appert of France who initially used sealed glass jars (91). The first canned foods were produced in 1812 by John Gamble, John Hall and Bryan Donkin at their factory in Blue Anchor Road, Bermondsey, London (92).

The canning of sardines began in 1824 in France at the establishment of Joseph Colin, No 9 Rue des Salorges, Nantes (93). Initially the industry was strongly centred in France on the Bay of Biscay fisheries. Since then it has become more firmly based to the north (Norway) and south (Portugal) with access to larger and more lasting supplies of sardines.

Provenance	'Albert'	'Basset'	'Baletrie'	No label
Sq.X/L-1	ca 111x80x28 (2)		111x78x32	111x79x33
Sq.XII/L-1		121x99x33.5		111x78x28 (5)
Sq.XII/L-2	107x77x27 another was too fragmentary for measurement			120x98x36 105x72x(28?) 108x85x26
TOTALS	4	1	1	9

TABLE 2.5. Omata Stockade sardine tins (measurements in mm).

Matchboxes (Fig. 2.56)

The remains of more than 60 rectangular 'tin' wax vesta matchboxes were recovered, along with fragments of more boxes no longer useful for measurement or identification of maker. Of the 63 measured boxes, brands could be established in 33 cases. Similar construction was employed in all boxes

Maker	ca 72x41x23 mm	Other sizes
'Bell and Black'	3	
- Type 1 (Fig. 2.55A)	7	
- Type 2 (Fig. 2.55B)	10	95x40x33 49x37x23 (2)
- Type 3 (Fig. 2/55C)		49x49x21 49x38x21
'Letchford'	6	
'Dowler'	1	
'Warranted' etc. brand (Fig. 2.55F)		48x35.5x16
Unidentifiable or no brand	23	128x46x40 128x40x33 126x41x41 97x40x33 (2) 53.5x38x? 52x33x22
TOTALS	50	13

TABLE 2.6. Omata Stockade matchboxes.

with a thin wire hinge attaching the top to the rest of the box. Labels are impressed in the box tops. Some boxes are apparently without impressed labels (but may have had paper labels). The collection is summarised in Table 2.6.

Makers are Bell and Black of 15 Bow Lane, Cheapside, London (Figs 2.56A-C); R. Letchford and Co., Three Colts Lane, Bethnal Green, London (Fig. 2.56D); Dowler's Patent (Fig. 2.56E) and an illegible brand (Fig. 2.56F). A curiosity is the error perpetrated by the box manufacturer in the Figure 2.56A label.

Fifty of the 63 boxes are ca 72 x 41 x 23 mm in size. Others range from 128 x 46 x 40 mm down to 48 x 35 x 16 mm. In addition to the rectangular matchboxes there is the small matchbox shown in Figure 2.56G. This box is 35 mm wide and 35 mm high. A lid fitted closely over the top 7 mm. The bottom is serrated for striking. There was no lid with the box, but a lid was found elsewhere in the site which belongs to something similar (Fig. 2.56H).

Nails (Fig. 2.57)

A large part of the iron in the site is made up of nails. On the top platform almost all iron recovered was pieces of cut nails too fragmentary to be measured; while in the ditch five-inch (125 mm) cut nails probably come from the demolished door into the stockade.

Until the end of the 18th century nail making was a cottage industry, usually carried on in a lean-to against the maker's cottage, since all that was required was a small blacksmith's hearth and an anvil. The nails were hand made from rod iron (94).

Before the American Revolution nail manufacture was not allowed in the thirteen colonies, in order to protect the English

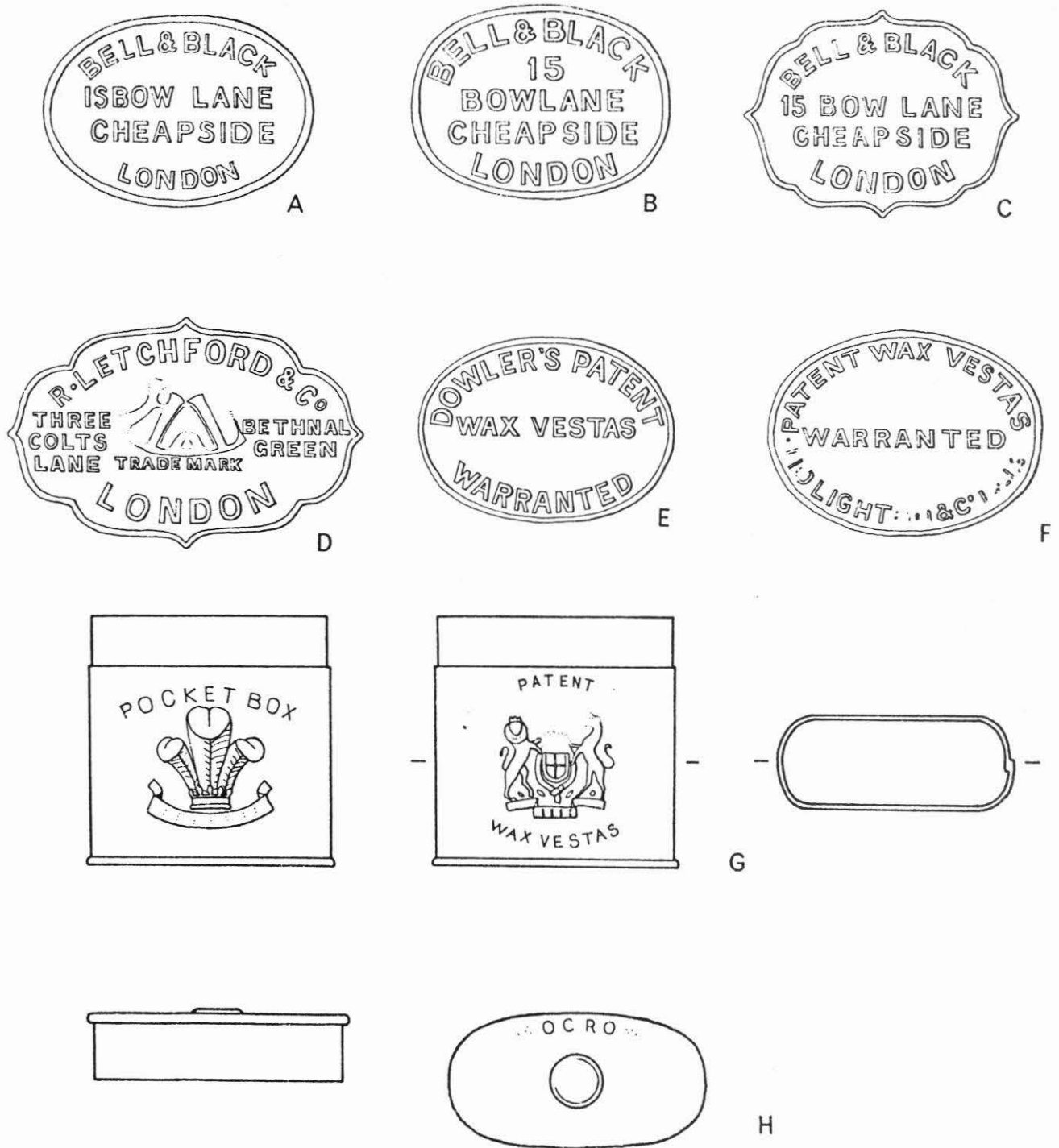


FIGURE 2.56. Matchboxes. A-F. Embossed labels. G. Wax vesta box. H. Wax vesta box top.

industry. It is no coincidence, therefore, that the first process for cutting nails from unheated iron rod was devised in 1777, the year of American independence, by Jeremiah Wilkinson of Cumberland, Rhode Island. A subsequent superior machine, patented in 1786 by Ezekiel Reed of Massachusetts, proved the forerunner of modern nailmaking machines. The first patent in England was granted in 1790 to John Clifford (95).

Hand-made (wrought) nails and machine cut nails can easily be distinguished by the cross-section - the former being square-sectioned (reduced to the point on all four sides) and the latter oblong sectioned, being cut on two sides only (96; see Figs 2.57U and V). The Omata nails are all machine cut.

Figure 2.57 shows the variety of cut nails recovered. An interesting group recovered in Square XII, Level 2, almost certainly relates to the stockade door. One hundred and eleven nails of 130 mm (five inch) length, include 51 straight nails and 45 rivetted (see Figs. 2.57U and V), the remainder being incomplete. Alexander's description of the stockade includes an account of the "entrance-gate":

"...made of two thicknesses of "heart of pine" timber, each 2 1/2 inches thick, the outer running up and down, the inner diagonally, and strongly nailed together with spike nails, rivetted." (97)

Associated with this mass of nails were the remains of timber planks, one of which had an end cut at a 35 degree angle. These too, almost certainly belong to the main stockade door. Those that could be measured were 215 mm (8 1/2 inches) across. There was as well a 170 mm nail rivetted to the same length as the 130 mm (5 inch) nails (Fig. 2.57S), also a door lock already discussed, and fragmentary sheet zinc.

The most important change to come about in nail manufacture since nails were first used was the invention of the wire nail, made by feeding wire into a machine which automatically cut the nail and hammered the head. Wire nails first came into use in France in 1834. The first wire nail machine in the United States began production in New York in 1851 (98). Since then manufacture of wire nails has vastly outstripped that of cut nails, the former being almost universally used today.

Two wire nails were found at Omata, both in Square XII, Level 2 (Fig. 2.57A and B). They are 103 mm and 70 mm long respectively. There was no associated material to indicate use.

Four copper tacks are illustrated in Figures 2.57J-M: one is 16 mm long, two are 20 mm and one 29 mm in length. Seven 15 mm iron tacks were recovered from the ditch area.

Nuts and bolts (Fig. 2.57)

Five screw threaded bolts or bolt fragments were found, one complete with a nut. All were from the top platform.

The bolt given in Figure 2.57P, along with the attached nut, is representative of two other fragments not illustrated. Figure 2.57Q shows a short bolt of 8 mm diameter apparently made of brass, which is hollow, squared off down two sides and notched back from the end on two sides. A nut holds in place the remains of sheet iron to which the bolt was once attached. The other illustrated bolt (Fig. 2.57R) appears also to be made of brass. It is 4 mm in diameter with a well finished, decorative head.

Window glass

Fragments of window glass vary from 1.3 mm to *ca* 5.0 mm thickness. Some have been painted on one side to render them opaque, either with ordinary off-white paint or with gritty textured 'paint' of a grey colour. These pieces tend to be thicker than the plain glass. One almost complete pane of 4.5 mm thick unpainted glass is 176 x 125 mm in size.

Slate

Slate is in two forms: pencil fragments and pieces of flat writing, or possibly roofing, slate. Seventeen pieces of slate pencil include one complete pencil in two pieces, 130 mm long. Two shorter pencils of 54 and 55 mm show no sign of breakage.

Roofing material includes one almost complete slate 202 x 128 mm weighing 424.2 g recovered from near the bottom of the north section of Square X (see Fig. 2.21). The calculation:

226
<u>22</u>
452
<u>452</u>
4972

is scratched on the surface. Seven other fragments of roofing slate scattered throughout the site total only 5.2 g.

Other building materials

Fragments of brick were found throughout the site, with complete bricks making up the hearth in the Square XII ditch (Fig. 2.24). The maker is not known: there were brick manufacturers in New Plymouth at an early date; other possible sources are Auckland, Australia, or perhaps England. Mortar pieces may relate to the brick.

Pieces of wood found in the ditch were very fragmentary. Timber, including the 'door' material from Square XII, was identified by Rhys Gardiner, formerly of the Department of Scientific and Industrial Research, Mt Albert, Auckland, as podocarp. Rimu suggests itself as the abundant podocarp of the Taranaki region, commonly used for building in the province in the early years of European settlement.



FIGURE 2.57. Nails, tacks and bolts, ca 95% actual size. Descriptions in text.

Pieces of zinc sheeting were found throughout the site, especially with the deposit of timber and nails in Square XII. Much of it was associated with a fibre packing which suggests the use of zinc sheeting to line containers of some sort.

In Square XII, Level 2, were found about 150 flat-sectioned river cobbles, 150-200 mm in diameter. These may have been used for paving although lack of surface wear seems to deny this.

Coal

Some 294 g of coal was found in the site, almost all of it in fragments, only one piece weighed more than 20 g. Six samples were forwarded to the late New Zealand Geological Survey where they were examined by Mr J.H. Lowery to whom I am indebted for the following information. The characteristics of the coal seem to rule out a New Zealand origin. It is suggested the samples are all of Gondwana-type coals which are mined in Australia, India and South Africa. India may be regarded as a possible point of origin but more likely it is Newcastle coal from the northern part of the Sydney Basin.

Coal was mined at Newcastle as early as the end of the 18th century. The Omata samples are consistent with the Newcastle Coal Measures and the Tomago Coal Measures. Newcastle coal is frequently advertised in the *Taranaki Herald* in the early 1860s; for example, in the issue of 17 December 1864 the merchant Warwick Weston is advertising "Newcastle screened coals".

Bone

A large number of fragmentary and fragile animal bones have been examined by Professor Higham of Otago University. Cattle bone includes rib, tibia, phalanx, astragalus and a tooth. The small sample and the even smaller number of identifications makes it difficult to draw many conclusions from this material.

Shell

Some very fragmentary shells were recovered including white rock shell (*Thais orbita*), dark rock shell (*Haustorium haustorium*), catseye (*Turbo smaragdus*) and cockle (*Chione stutchburyi*) fragments and the periostracum of the green mussel (*Perna canaliculus*).

All shell material is extremely fragmentary and many identifications, including all cockle, cannot be more than tentative. It is unlikely that this small collection of shells is evidence of food eaten at the stockade. Gastropods in particular are not among shellfish popular with European settlers. Probably the shells remained from Maori occupation of the hill, surviving

both the Pakeha settlers' destruction of Ngaturi pa and subsequent demolition of the stockade.

CONCLUSIONS

The Omata Stockade was excavated in order to examine a Pakeha fortification of the Taranaki Wars and to recover a range of artefacts associated with such works. Of particular interest was its role as a largely defensive militia post close to the main European settlement of New Plymouth. The excavation has added much to Colonel Alexander's description of the work, as well as correcting some of his measurements and aspects of his plan.

The stockade closely fitted the prepared platform, to the extent even of being turned slightly off-square so that the two bastions could be completely accommodated within the platform rim. The defensive scarps within and beyond the counter-scarp were carefully sculpted to give defenders complete command over all approaches. The stockade and fashioned skirts of the hill make up a total fortification of great strength.

The mass of material dumped in the ditch provides an invaluable array of artefacts of the early 1860s to describe the economy and technology of the Omata garrison, as well as allowing comparison with other military sites of the period. The value of the collection was evident during later excavations at Warea Redoubt when identification and description of a smaller body of material depended on experience gained at Omata.

The ambition to identify the use of different parts of the stockade was not fulfilled. Destruction of the platform rim meant that there was no chance of locating the various quarters from artefacts left *in situ*.

The Omata Stockade was an unusual Pakeha fortification of the New Zealand Wars, in its design, its essentially defensive rather than offensive purpose, and its long use by local forces. In the next chapter the excavation of a more typical European fortification of the period is described: an earthwork redoubt thrown up by British troops in taking the war to the Maori.

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CHAPTER 3. ARCHAEOLOGICAL EXCAVATIONS AT WAREA REDOUBT

Warea Redoubt (New Zealand Archaeological Association site record number P20/17, map reference 770187), is situated on the Taranaki coast 5 km north of Cape Egmont (see Fig. 1.2). Excavations at the site began on 2 January and ended 12 February 1978. Financial support came from the Auckland University Research Committee and financial and logistic support from the Anthropology Department, University of Auckland. The work was carried out under permit 1977/66 from the New Zealand Historic Places Trust.

HISTORY OF WAREA REDOUBT

Colonel H.J. Warre, officer commanding the British troops in Taranaki, ordered troops to Warea on 28 April 1865 following an ambush of eight men of the 43rd (Monmouthshire) Light Infantry and Taranaki Mounted Volunteers south of Stoney River on 22 April. The *Taranaki Herald* reported on 29 April:

“In consequence probably of the attack on the party of Mounted men and soldiers last Saturday, Colonel Warre has felt himself at liberty to move south as well as north in accordance with the desire of the Government. Warea we believe, was occupied yesterday by a force under Colonel Synge of the 43rd.”

The garrison at Warea was reduced on 2 May when some of the troops marched south to another post which had been established at Opunake on 29 April. Colonel F.H. Synge (Fig. 3.1) remained in command of 170 men at Warea (1).

The earthwork fortification at Warea was laid out and constructed under the supervision of Lieutenant C.M. Clarke, 57th Regiment, who was Deputy Assistant Quarter Master General in New Plymouth at the time (2).

On 31 May 1865 the Warea garrison was made up of one field officer, two captains, eight subalterns, one staff, ten sergeants, eight drummers and 186 rank and file, 43rd Regiment, along with seven rank and file Taranaki Militia (probably Mounted Volunteers), and one captain, one sergeant and 15 rank and file of the Commissariat and Transport Corps (3).

With the addition of some artillerymen and an engineer the garrison was essentially the same on 1 July (4).

The Warea district saw some of the last fighting of the Second Taranaki War. Colonel Warre took out a force of 43rd and 70th Regiments and Bushrangers to attack Maori settlements inland of the redoubt on 13 June 1865 (5). Another



FIGURE 3.1. Colonel F.H. Synge, 43rd (Monmouthshire) Regiment. (Alexander Turnbull Library, Wellington.)

skirmish took place nearby on 28 July when Major T.E. Holmes, 43rd Regiment, was in command at the post (6). On 2 August 1865 a strong force marched from the redoubt under Lieutenant Colonel F.M. Colville, once more to attack inland villages (7).

Warea Redoubt was occupied by 170 of the 43rd on 29 January 1866 when Major General Chute arrived at the post, on his return to the Patea district after marching through the bush inland of Mt Egmont (8). While at Warea Chute took the opportunity again to attack Maori villages inland of the redoubt.

When the 43rd sailed for England in March 1866 (9) it was replaced in Taranaki by the 50th Regiment (The Queen's Own), a detachment of which was posted to Warea (10). The redoubt was in command of Lieutenant Colonel F.G. Hamley, 50th, from 24 March to the end of June (11; Fig. 3.2). Hamley became commanding officer in Taranaki in early July (12) and

so shifted to New Plymouth, leaving Captain M.A. Clarke in charge at Warea (13). In late August 1866 there were still 145 rank and file at the redoubt (14).

The 50th remained at Warea until 3 May 1867 when they were withdrawn from their posts at Stoney River, Warea and Opunake before leaving New Zealand. Warea was then occupied by 25 militia under Lieutenant Charles Messenger (15).

In September 1867 70 men of the Patea force, under Lieutenant Colonel Thomas McDonnell, marched along the coast to New Plymouth in a show of strength. On the return journey, 25 men under Ensign von Rotter (Fig. 3.3) were left to relieve the militia at Warea, coming under the command of Lieutenant Colonel Lepper at New Plymouth (16).

At the beginning of 1868 Warea was abandoned, as was Pukearuhe, the only other military post in north Taranaki outside New Plymouth still to have a garrison (17). Early in February an Armed Constabulary force was raised in the



FIGURE 3.2. Colonel F.G. Hamley, 50th (The Queen's Own) Regiment of Foot. (Auckland Museum.)



FIGURE 3.3. Lieutenant von Rotter, in command at Warea from September 1867. (Taranaki Museum.)

province. Twenty-four men were sworn in and started for Warea on 8 February, probably under Captain W. Newland (18). Only one month later, however, Warea Redoubt was abandoned for the last time when the A.C. returned north to establish their headquarters at Sentry Hill between New Plymouth and Waitara (19).

SURFACE EVIDENCE

Warea Redoubt is situated between the old coast road and the sea, 600 m south of the end of Stent Road, just north of the Teikaparua (now Warea) River mouth. It is located on the edge of a terrace above a narrow and steeply shelving boulder beach (Fig. 3.4). Beyond the beach is a rocky shelf which extends as much as 300 m offshore at low tide.

Surface evidence indicates an unusual 10 m² redoubt with flanking defence 7 m² at the south angle and a projection from the opposite angle to provide flanking defence for the remaining two sides (Fig. 3.5). North and west of this work are the remains of an earlier redoubt 40 x 30 m in size. Much of the earlier fort is no longer visible on the surface. Its shape and size are shown by a disproportionately large flanking angle on the small redoubt, which was inherited from the earlier work, and by remaining ditch and bank defence along the seaward side.

The first redoubt on the site was a rectangle with flanking defence at two opposite corners to cover three sides. The seaward (west) face was unflanked. This was the earthwork laid out by Lieutenant Clarke and thrown up by the 43rd Regiment in April 1865.

The small redoubt which dominates present surface evidence dates from May 1867 when the substantial 50th Regiment garrison was replaced by 25 militiamen. Major Stapp (Fig. 3.6), who was at this time in charge of local forces in Taranaki, reported to Wellington on 2 May 1867 that the militia had marched that morning for Warea:

“The imperial troops vacate that post at 6 o'clock A.M. tomorrow morning the 3rd Instant. I am proceeding myself to see what alterations are necessary to make the detachment secure. The redoubt at present would accommodate about three hundred men.” (20)

The militia redoubt made use of the south-east bastion and adjacent 10 m lengths of the south and east sides of the earlier work. The north and west sides of the main square and the projection from the north-west angle are new. A large part of the original redoubt was thrown down, almost certainly on construction of the second work to prevent an attacking party making use of the cover it might otherwise have provided.



FIGURE 3.4. Warea Redoubt (aerial).

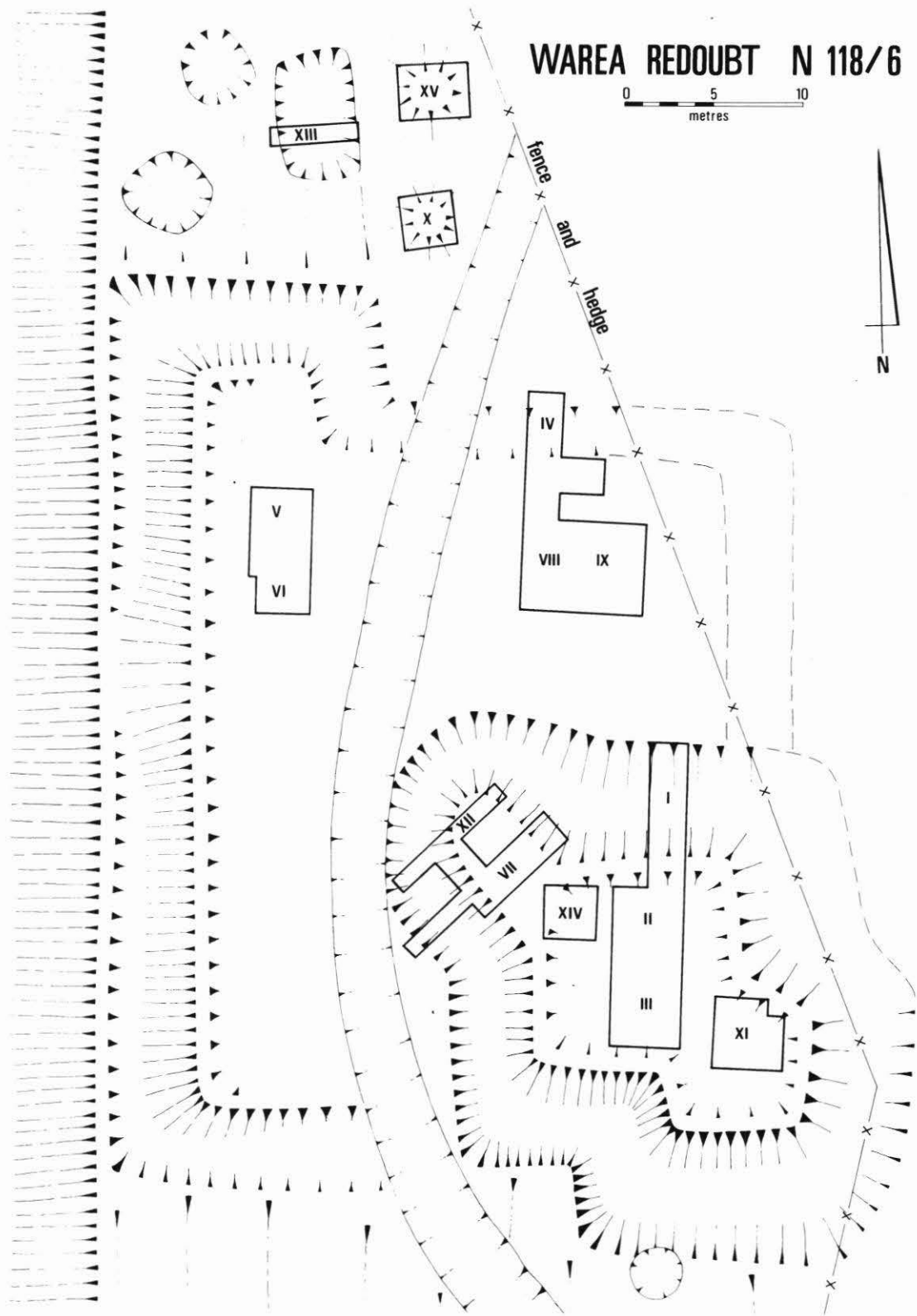


FIGURE 3.5. Warea Redoubt: site plan showing location of excavations.

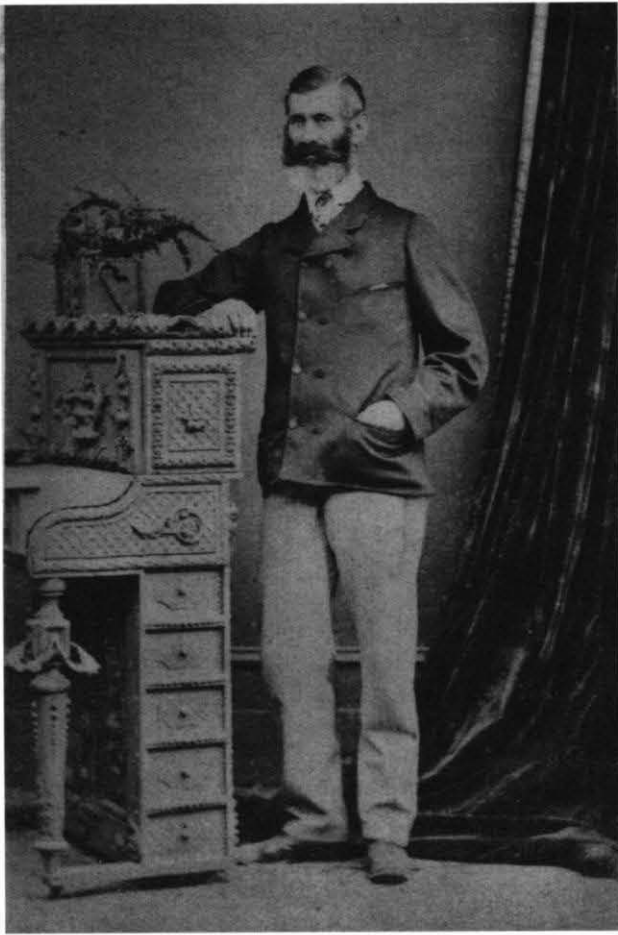


FIGURE 3.6. Major Stapp. (Taranaki Museum.)

North of the redoubt is surface evidence of eight semi-subterranean hut depressions, and three mounds from which protrude the upper courses of well made stone hearths (Fig. 3.7). Two of the hearths were excavated; the third is at one end of a large depression 10 x 6 m in size. South of the fortification on the gentle slope to the river are two more depressions, 3 x 2 m and 4 x 2.5 m respectively. These also mark sites of semi-subterranean soldiers' huts, of the style commonly used throughout the Taranaki campaigns in association with field fortifications.

Between the 1867 redoubt and the sea can be seen the remains a road which veered off the old coastal highway to run through the camp and past the redoubt gateway. This road must date from after the earlier redoubt which it crosses. The old coast road is marked by boxthorn hedges immediately inland of the redoubt, and may be followed crossing the paddocks seaward of the end of Stent Road. Until the present main road was built in the early 1880s during the Parihaka Campaign the coast road provided the main route south to Opunake and beyond.

Below the redoubt heavy boulders have been removed from a 15 m stretch of beach, to about 25 m across the inter-tidal platform, making an excellent swimming hole. This is without doubt the work of soldiers once garrisoned at the redoubt a few metres away.

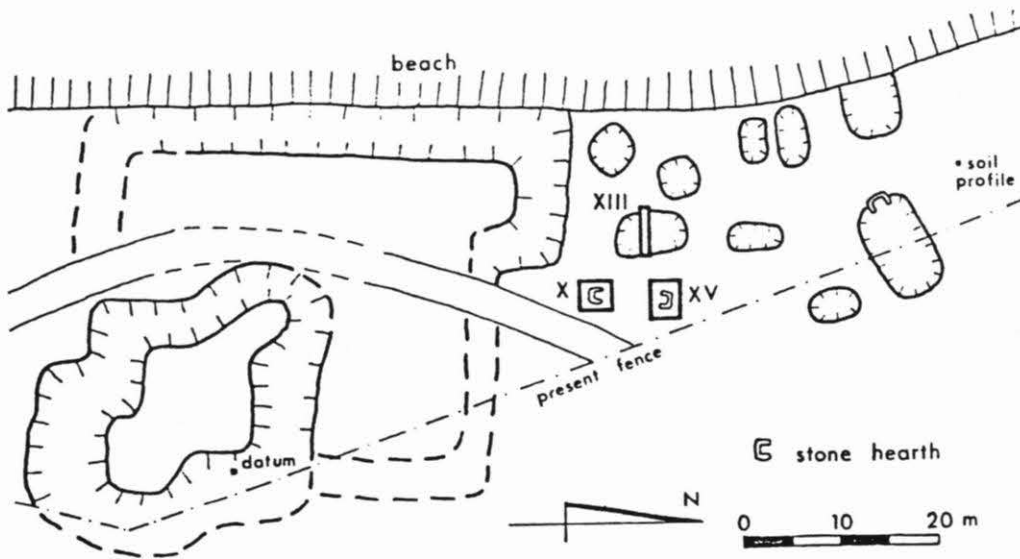


FIGURE 3.7. Warea Redoubt and external living quarters.

Natural stratigraphy

The natural soil profile was examined 30 m north of the site in an area which had apparently undergone no modification by the military occupation. The present topsoil is a light brown sandy loam, 140 mm deep in the test pit. Below is a 50-150 mm yellow sandy clay layer with some small stones. Below this is coarse grey sand and fine gravel, 130 mm deep in the test pit but as much as 250 mm in depth over some parts of the site.

Under the coarse grey sand was a black silt loam, 200 mm deep at the test pit but less elsewhere in the site area. It includes some sand, and abundant charcoal in places. From the charcoal and the mixed boundary with underlying yellow/brown clay loam this appears to be a cultivated soil horizon. Thus, at the redoubt site there was a Maori garden subsequently covered by sand and fine gravel on which soil developed for some years before the arrival of the military.

THE EXCAVATION

Aims of the excavation at Warea included some which were peculiar to the post and some of general interest for this type of site. The two phase history of the site was of particular interest. The unusual flanking projection from one corner of the second redoubt also required examination. General aims included examination of the defences, redoubt interior and external

living quarters of this most common type of European fortification of the New Zealand Wars.

Each area was given a Roman numeral when it was opened up for excavation (Fig. 3.5). Many of these units were later extended and baulks between adjacent areas were removed. As in the Omata report each metre square is given a unique letter/number designation.

Examination of the first (1865) redoubt involved excavation of 77.5 m² (Squares IV, V, VI, VIII and IX); in the second (1867) redoubt 105.5 m² was excavated - this, of course, being part of the first redoubt as well (Squares I, II, III, VII, XI, XII and XIV); and in the living area, Squares X, XIII and XV came to 26 m². In all 209 m² was excavated. Two general views of the excavations are given in Figures 3.8 and 3.9.

The 1865 redoubt

Squares IV, VIII and IX. Examination of the 1865 Warea Redoubt of the 43rd Light Infantry began with a 5 x 2 m trench (Square IV) laid out across the defensive ditch of the north face of the work (see Fig. 3.10). Here the ditch could barely be seen on the surface, having been deliberately filled in by militia when the redoubt was reduced in size two years later.

The ditch here proved to be 1.8 m deep (Figs 3.11-3.13 and 3.14A and B). There were three general levels.



FIGURE 3.8. Warea Redoubt excavations. View south-west across the 1867 (militia redoubt): showing Squares I, II and III, and VII in front.



FIGURE 3.9. Warea Redoubt excavations. View north from the militia redoubt: in the foreground, Squares II (lower right), VII and XII); to Squares V and VI; also IV, VIII and IX (upper right); and Square X excavation in distance.

Level 1. At the bottom of the ditch was 300-400 mm depth of grey sand, evidently blown in by the wind and subsequently compacted by water.

Level 2. Mixed deposits resulting from deliberate infilling of the ditch were as much as to 1500 mm deep.

Level 3. The turf layer was *ca* 100 mm deep.

Level 1 belonged to the regimental period (1865-67). Doubtless the ditch was cleaned out many times over the two years. Just how rapidly natural filling might occur was shown when excavations were under way at the site, a strong wind over 36 hours (5-6 February 1978) dumping 200 mm of sand in the cleared out Square IV ditch.

Artefacts recovered from Level 1 include bottle glass and clay pipe fragments, part of a slasher ('fern hook'), 43rd and 50th Regiments and "VR" uniform buttons (see Fig. 3.31), bullets, earthenware fragments and 'tin' matchboxes. Items found at Warea are treated as one collection and are discussed following the account of excavations.

As can be seen in the section drawings Level 2 is made up of a mixture of material (Figs 3.14A and B). Most was deliberately thrown in and dates from demolition of the first redoubt in May 1867. Initially the old redoubt wall was thrown into the ditch, most clearly shown in the west section (Figs 3.11 and 3.14A), where a deep, homogeneous deposit which came from the south side of the ditch is overlaid by a number of thin lenses of different material also from the south side. The smaller body of fill above this came from the north side of the ditch.

On the east side of the Square IV ditch excavation (Figs 3.12 and 3.14B) the picture is much the same, except for blocks of natural yellow clay and stones near the bottom. These relate to the location here of the main entrance to the redoubt and as such are discussed below along with evidence for the gateway. Within Level 2 were a very few items including bottle glass, clay pipe fragments, earthenware and pieces of shell and bone, all of it, of course, thrown in when the ditch was filled.

Level 3 consisted of recent soil build-up and contained only fragments of bottle glass.

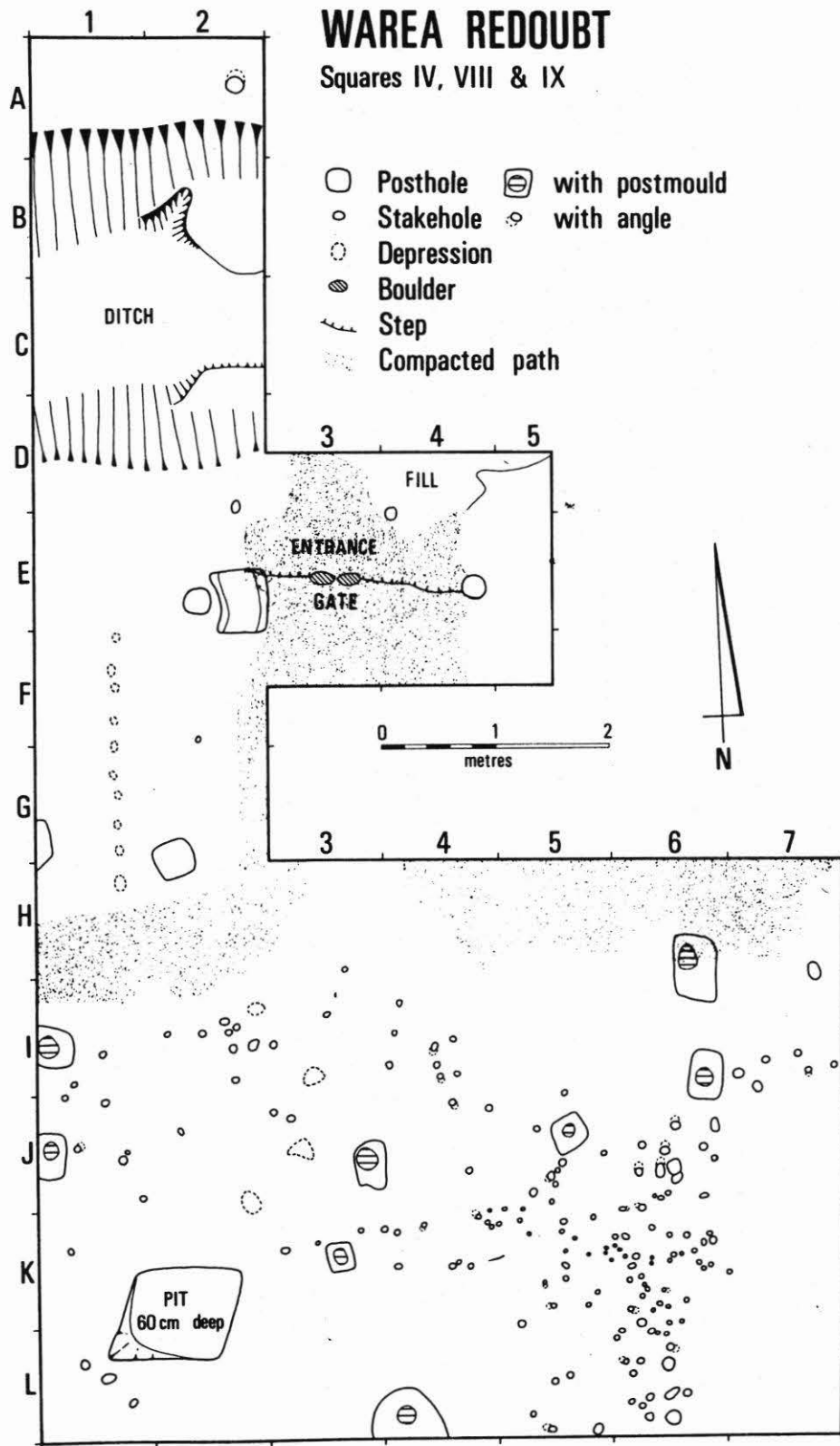


FIGURE 3.10. Squares IV, VIII and IX: plan.

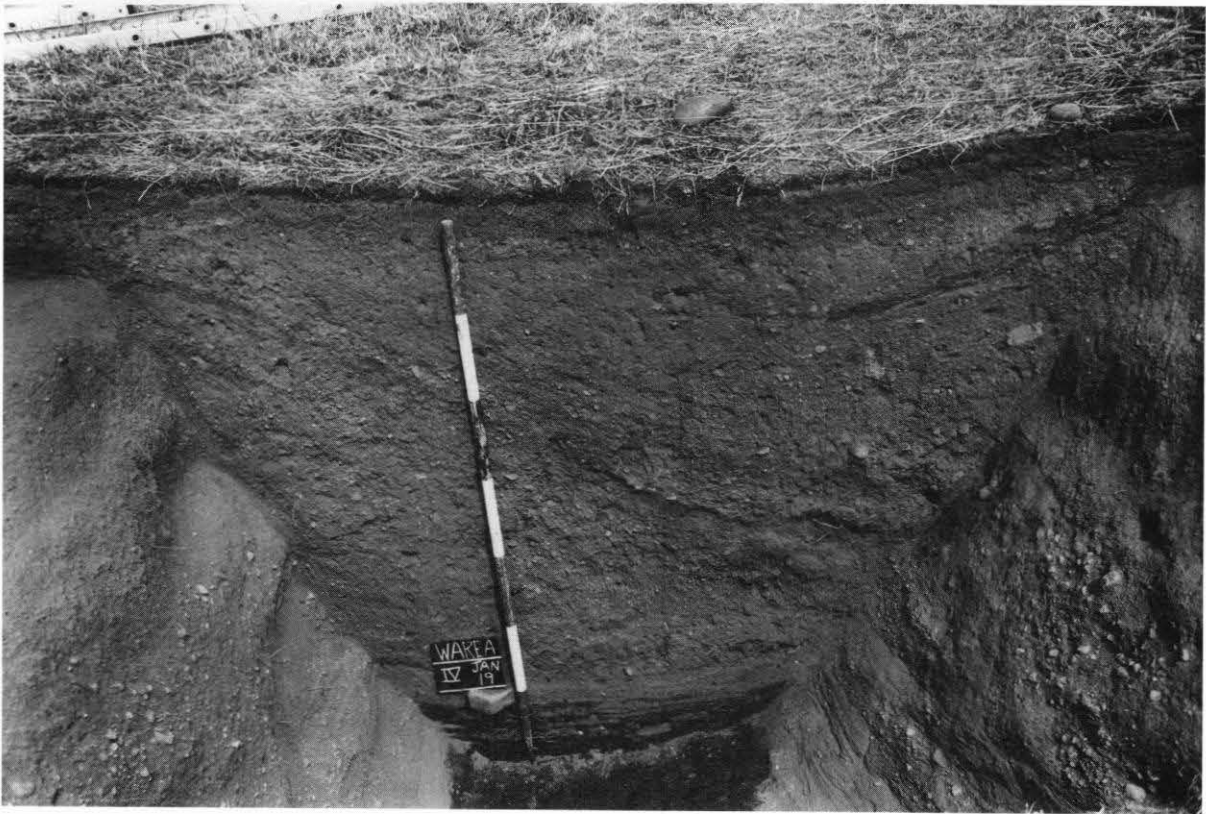


FIGURE 3.11. Square IV: 1865 redoubt defensive ditch, west section. The scale intervals are 250 mm. Compare with Fig. 3.14A.

Square IV was later extended to join Squares VIII and IX in the redoubt interior (Fig 3.10). A series of shallow depressions running most of the way through the redoubt wall might be drip holes from a building roof, although obviously this cannot have been during occupation of the early fort. Complete demolition has made the base of the wall difficult to measure; if we allow the width to be slightly less than the distance between the ditch and the interior path found in Squares VIII and IX, then it might be a little more than 3 m.

At the east section of the trench, intact blocks of natural material 600 mm high extended from both sides part way across the ditch (see Figs 3.12, 3.13 and 3.14B). On the north bank above these blocks was a single posthole (Fig. 3.10).

When the 2 x 2 m baulk was removed to the south and the compacted path surface in Squares VIII and IX found to run through the wall it became clear these features were in some way connected with the redoubt entrance.

An extension of 2.5 x 2 m was made and evidence for the entrance found to include the path, the actual gateway marked off by two postholes 2.4 m apart, and two beach boulders set into the step in the centre of the doorway to act as stops for what was probably a double gate hinged to both posts (Figs 3.10 and

3.15). It is likely the blocks of natural material left in the ditch helped support a bridge into the redoubt.

Close to Square IV, two adjacent 3 x 3 m squares (VIII and IX) were located to find out something of the interior layout of the redoubt (Fig. 3.10). These squares were later extended to cover 35 m² (5 x 7 m), and were joined to Square IV and the gateway extension to make up a total area excavated here of 54 m². Squares VIII and IX lay within the redoubt. Features uncovered include a path, postholes, a large number of small stake holes and a small pit.

The path extended along the north side of the excavated area, then through the redoubt entrance to the bridge over the ditch and so outside. It was formed partly as a result of compaction through much use and partly as a result of deliberate addition of a mortar or cement. In places it was extremely hard, like a thin layer of concrete on top of the natural coarse grey sand. Pressed into the path surface were small items such as a button, percussion cap, clay pipe fragments and peachstones.

In the south-west corner of the excavated area was uncovered a small pit 600 mm deep and 400 x 400 mm in plan. In it were tin cans, matchboxes, clay pipe fragments, buttons, .577 bullets, bottle glass and some cattle and pig bone.

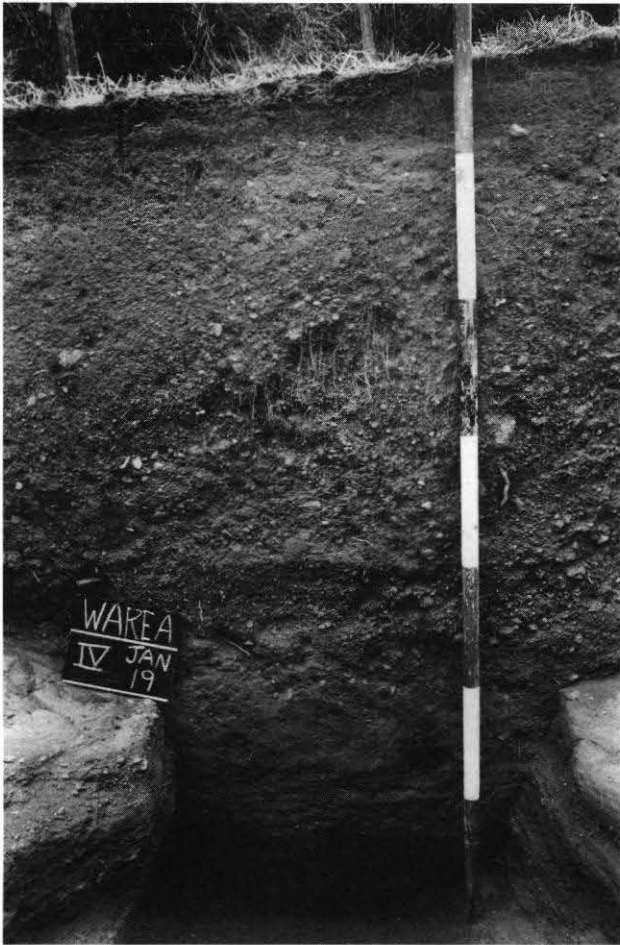


FIGURE 3.12. Square IV: 1865 redoubt defensive ditch, east section. The scale intervals are 250 mm. Compare with Fig. 3.14B.

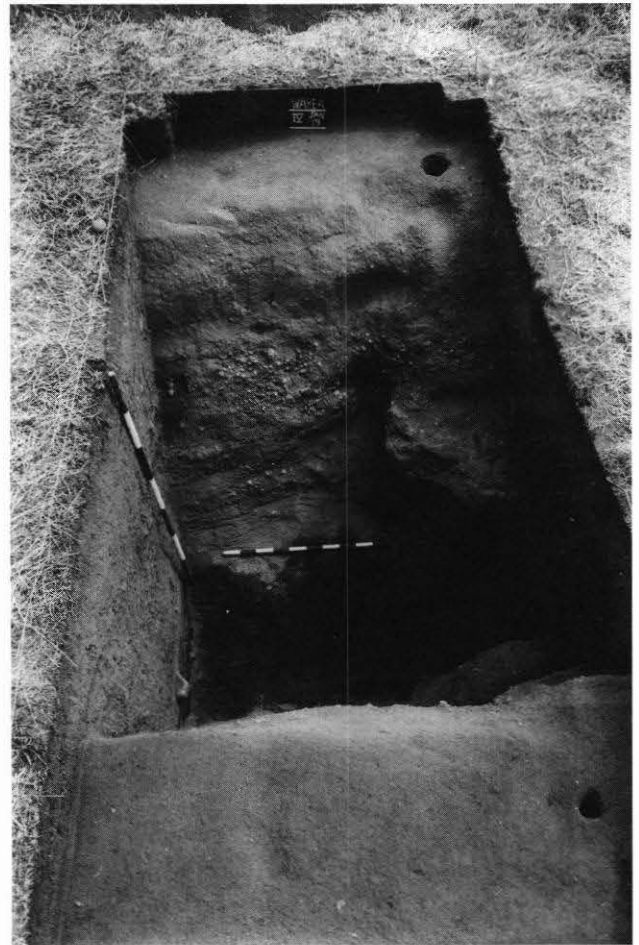


FIGURE 3.13. Square IV: 1865 redoubt defensive ditch, view to north. Showing the blocks of material at the base of the ditch which supported the entrance-way, and associated postholes on both sides. Scale intervals: vertical 250 mm, and horizontal 100 mm.

The scatter of postholes in Squares VIII and IX is not easy to interpret but certainly does not suggest any large structure. Stake holes found over much of the area probably relate to two of the round 'bell' tents used by the British army throughout the 19th century. The holes form segments of two overlapping circles approximately 7 m in diameter. The large number suggest that tent pegs were shifted repeatedly as they worked loose in the light ground.

Squares V and VI. At the north-west corner of the redoubt, close to the bastion, two 3 x 3 m squares (V and VI) were opened up, later extended to make a total excavated area here of 23.5 m² (Figs 3.16 and 3.17). Again there was a path immediately inside the redoubt wall, in this case turning off into the bastion. A large number of stake holes again may be interpreted as peg holes for bell tents.

Along the western margin of the excavated area, and requiring an extension for their full investigation, were four postholes,

of which three are more than 300 mm deep. Just what this line of posts represents is not clear. It was clearly a strongly made structure, but it cannot have been very wide as there were only 2 m at most from the posts to the seaward parapet. It is possible that they mark a windbreak which gave some protection to the tents and redoubt interior from the prevailing westerlies of this exposed coast.

The 1867 redoubt

Squares I, II and III. Excavation of the second redoubt began with an 8 x 2 m trench (Square I) across the ditch and through the wall on the north side, and two adjacent 3 x 3 m squares (II and III) inside the redoubt. With extensions and removal of the baulks, the total excavated area here was 52 m². The plan is given in Figure 3.18, and the section drawings in Figures 3.14C and D.

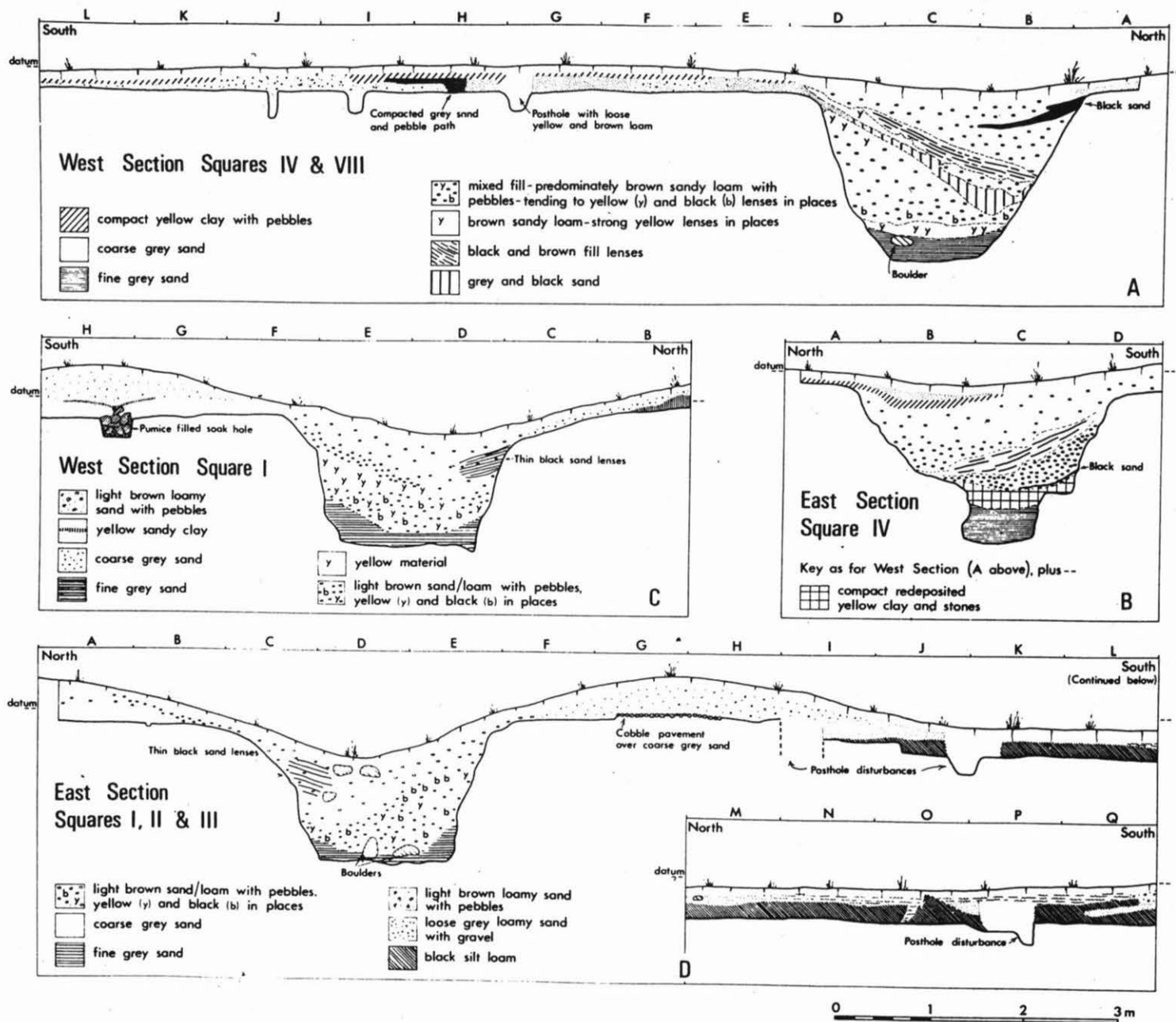


FIGURE 3.14. Warea Redoubt defensive ditch sections. 1865 redoubt: A. Squares IV and VIII, west section. B. Square IV, east section. 1867 redoubt: C. Square I, west section. D. Squares I, II and III, east section.



FIGURE 3.15. Square IV: 1865 redoubt gateway postholes and boulder door steps; view to the west. Scale intervals are 100 mm.

The ditch was found to have been 1.6 m deep, and the wall base 3 m wide. Rare items in the ditch fill included pieces of clay pipe and bottle glass, buttons, percussion caps, matchboxes and other material. A glance at the section drawings (Fig. 3.14) and photograph (Fig. 3.19) shows the ditch to have been different to that of the 1865 redoubt. The earlier ditch has sloping sides to make it almost V-shaped, whereas the later has steep sides, and a flat floor 1.5 m wide.

Within the wall a 1 m wide platform of small beach boulders must relate to the first redoubt. The upper surfaces of the boulders showed signs of wear; the platform is thus interpreted as the doorstep of a building. Also beneath the wall of the 1867 redoubt - and therefore relating to the earlier fortification - was a small hole packed with blocks of pumice. This may have served as a soak hole to allow rapid drainage from the roof of a building. An 1844 shilling found beneath the wall must also belong to the earlier redoubt.

Inside the 1867 redoubt, in Squares II and III, a number of postholes fall mostly into two rows (Figs 3.18 and 3.20). These evidently belonged to a building at least 5 m and possibly 7 m long. The full size of the structure is not easy to sort out: a single posthole in Square XIV (see Fig. 3.21) may also belong, in which case it was as much as 5 m wide. It evidently occupied a large part of the main square of the 1867 redoubt. A path ran into the excavated area inside the north wall of the redoubt (Area XIV, Fig. 3.21), ending abruptly at what is likely to have been a door into the building.



FIGURE 3.16. Squares V and VI: view to north-west. Scale intervals are 100 mm.

WAREA REDOUBT

SQUARES V & VI

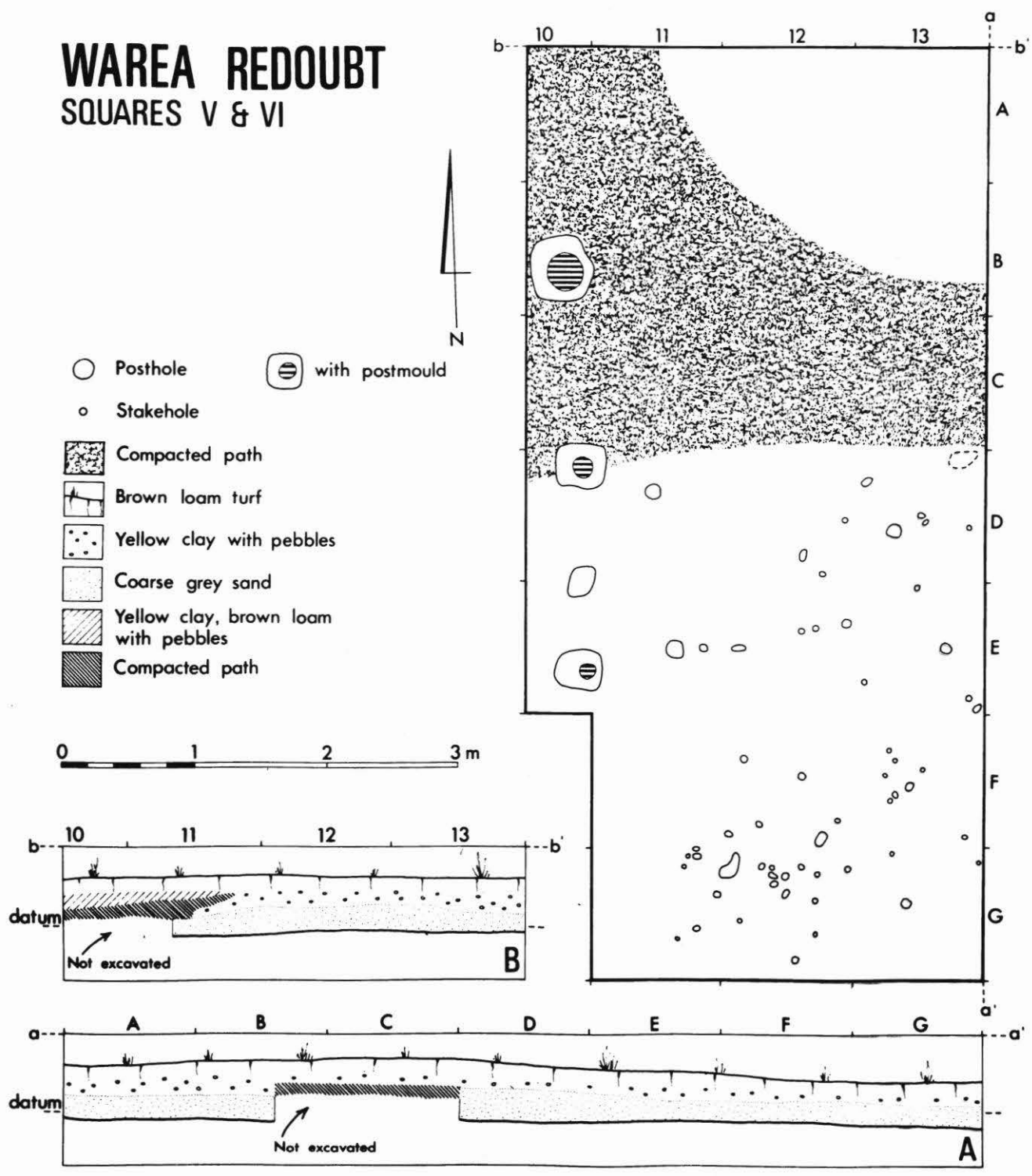


FIGURE 3.17. Squares V and VI: plan and sections.

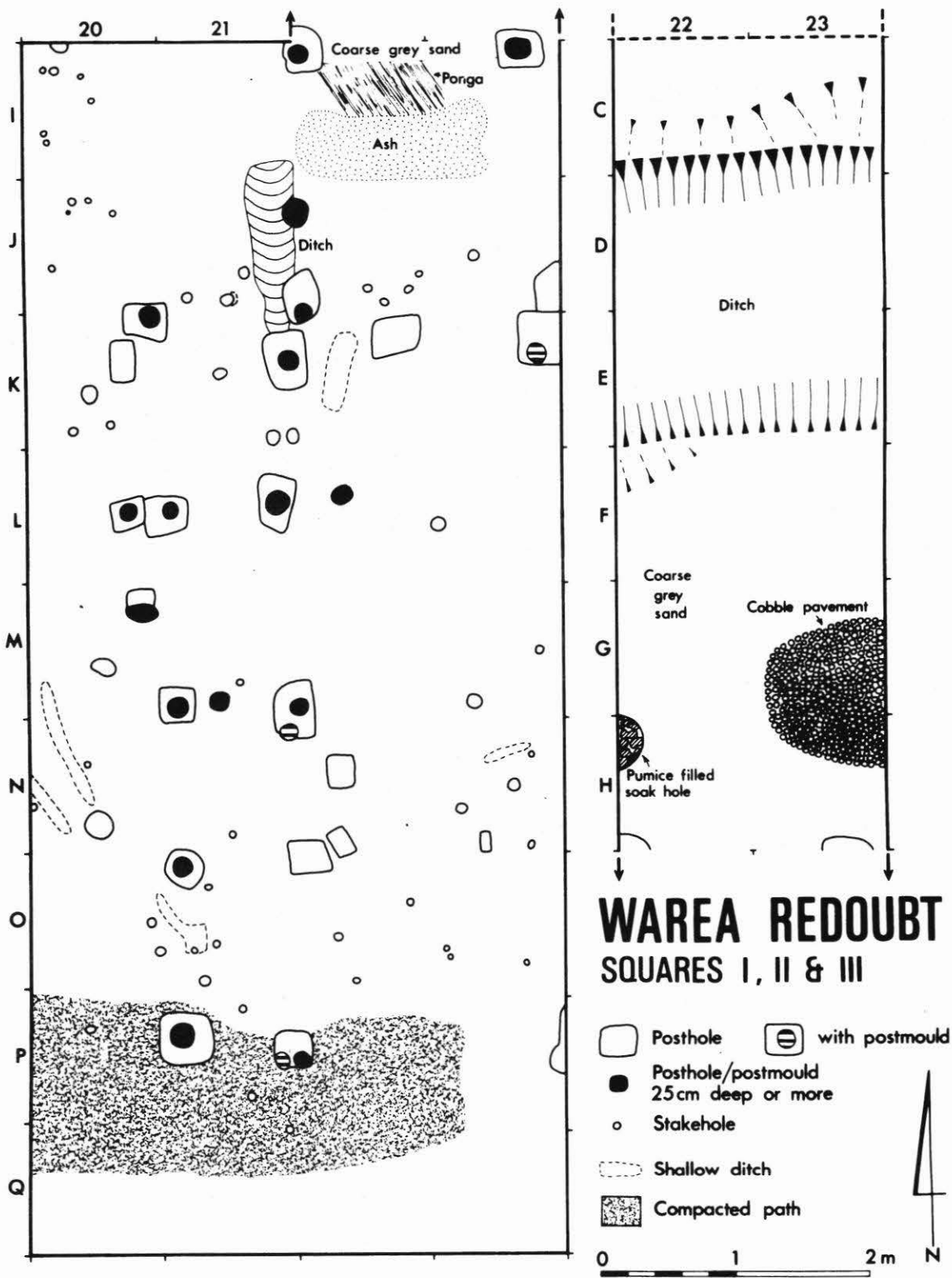


FIGURE 3.18. Squares I, II and III: plan.



FIGURE 3.19. Square I: 1867 redoubt defensive ditch, east section. The scale intervals are 100 mm. Compare with Fig. 3.14D. The chalk board showing Square III is incorrect.

It thus seems likely that the 1867 redoubt was thrown up in the south-east corner of the earlier fortification, at least partly to enclose an existing building. Entry to the building, formerly gained by the step of beach cobbles and a small porch, was now gained directly at the north-west corner.

At the north end of the building a small open hearth backed by upright trunks of ponga or tree fern (see Fig. 3.18) replaced the earlier porch, the change probably taking place with construction of the 1867 defences.

Close to the south wall of the redoubt, the remains of a compacted path were cut by postholes of the later building. This path was similar to that inside the north wall of the earlier redoubt and, along with a number of stakeholes in the adjacent excavated area, suggests an initial arrangement of defensive wall, path and tents in the 1865 redoubt here, similar to that of Squares VIII and IX. The tents were replaced by the building before the new parapet was thrown up on the north and west side to enclose the militia redoubt.

Among the large collection of glass, clay pipes, stoneware and nail fragments, percussion caps, buttons, .577 bullets, peach stones and other items from the 1867 redoubt interior

were three unique items. From the area once covered by the building came a token issued by Hanks and Lloyd of Sydney, "To commemorate the opening of the Sydney Railway 26th Sept 1855" (Fig. 3.31Z), and the bone-handled pocket knife, manufactured by Harrison Brothers and Howson (Fig. 3.30L). A wine glass stem fragment (Fig. 3.32I) was recovered from the south parapet of the redoubt.

Squares XI and XIV. Two other squares were opened up in examining the interior of the second redoubt: Square XI (15 m²) in the south-east bastion, and Square XIV (9 m²) at the north-west angle (Fig. 3.21). In the bastion a number of postholes were found of which six were large at 400 mm or more depth.

Immediately inside the east parapet in Square XI was a compacted clay path or platform, which possibly served as a banquette (raised firing platform behind the redoubt wall). At the north-east corner of the excavation, and apparently extending beneath the parapet, a 300 mm deep nest of beach boulders may have been designed to strengthen the wall at the corner of the bastion. No other wall angle was excavated in either redoubt to see if this feature was unique.



FIGURE 3.20. Squares I, II and III: view to the north. Areas VI, VIII and IX are beyond the spoil heap, upper left. Scale intervals are 250 mm.

Square XIV was situated at the north-west corner of the redoubt interior. In it the path mentioned already in discussing Squares I, II and III, was found to continue alongside the north wall of the redoubt interior before cutting through the wall at the north-west angle. Within the slumped north wall was found the Commissariat Staff button shown in Figure 3.31R. A large posthole next to the west wall and adjacent to the path may relate to the already mentioned building within the redoubt.

Squares VII and XII. The projection surrounded by a ditch which extended from the north-west angle of the redoubt was examined by means of two trenches cut across it at right angles (Fig. 3.22). These were subsequently extended to total 29.5 m².

A sequence of changes to this angle of the redoubt was discovered (Fig. 3.23). Initially there was to have been a simple unflanked corner here (see Fig. 3.24). Before this was completed the partly cut ditch was refilled and a 1.2-1.4 m deep ditch dug at right angles from both sides of the redoubt to loop around a platform little more than 6 m in diameter (see Figs 3.22, 3.23 and 3.25).

On this platform was placed a 3 x 3 m (10 ft) building, doubtless a loopholed blockhouse which provided the defensive works at this angle of the redoubt. Something similar can still be seen at Manaia Redoubt in south Taranaki (see Fig. 1.10). The pebble path running through Square XIV at the north-west corner of the redoubt led across Square VII and into the blockhouse (see Fig.3.22).

The final alteration to this corner of the 1867 redoubt took place when the ditch was re-dug from the north and west walls of the redoubt and, instead of making right angled corners, now struck off at 45 degrees to join the earlier ditch further out as it encircled the flanking platform (Fig. 3.23E). The triangular area inside the new ditch line was refilled. This would have greatly strengthened the earthworks here, and formed the projection as it now appears.

One of these changes to the redoubt angle probably relates to a known historical event. The partly cut ditch which was to have made an unflanked corner was dug to a depth of only 500 mm (see Fig. 3.22, Section B, and Fig. 3.25), before work was stopped. The ditch was then refilled and directed around the flanking platform on which the blockhouse was to be placed. It has been described above how Major Stapp went to Warea the day after the militia force, with the specific purpose of re-working the original redoubt to allow defence by 25 men. It seems likely that work on the new redoubt had already begun when he arrived and that he ordered the change to this angle.

Among artefacts from Squares VII and XII were 43 unused .577 bullets recovered from the Square VII ditch on the south side of the bastion. There was also the usual assortment of clay pipe and bottle glass pieces, buttons, percussion caps and a fragmentary Bell and Black matchbox.

The external living quarters

Three small areas were excavated in the soldiers' living quarters north of the redoubt (see Fig. 3.5). Two mounds were dug to reveal well made hearths of beach boulders (Squares X and XV), and a trench was excavated across one of a number of rectangular depressions in the area (Square XIII).

Square X. In 3 x 3 m Square X a stone hearth and part of a cobble pavement in front were uncovered (Fig. 3.26). Excavation revealed a well made fireplace of beach boulders, many of which had been worked with skill to present flat faces to the hearth interior.

The hearth was 1.3 m across the front, 1.05 m across the back and 1.1 m deep. The surviving 500-550 mm high rear wall seems unlikely to have been any higher, if we are to judge from the lack of worked boulders among surrounding debris. At the rear of the hearth were two boulders, which would have been used as direct supports for cooking vessels, or in support of an

WAREA REDOUBT SQUARES XI & XIV

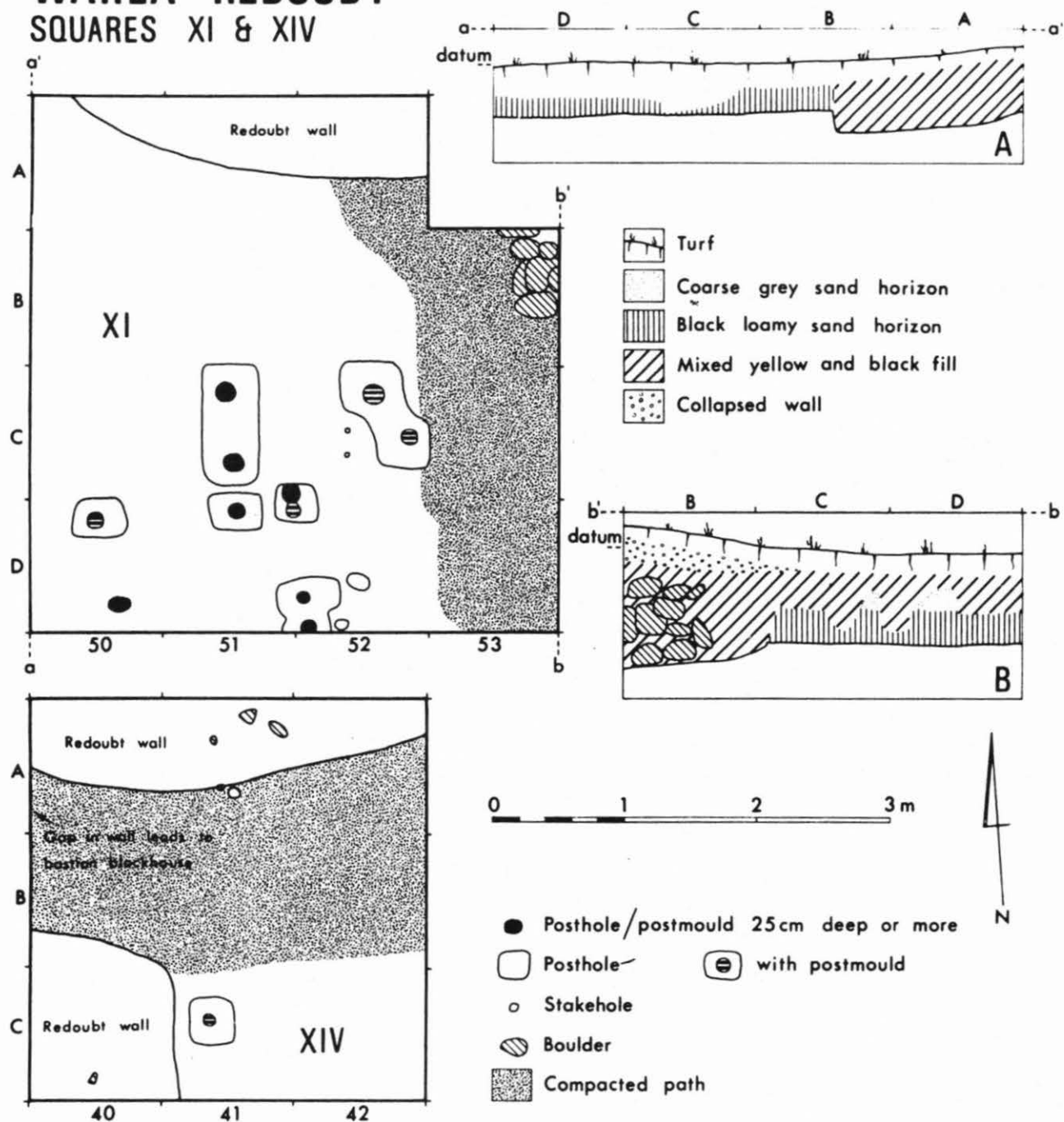


FIGURE 3.21. Squares XI and XIV: plans and sections.

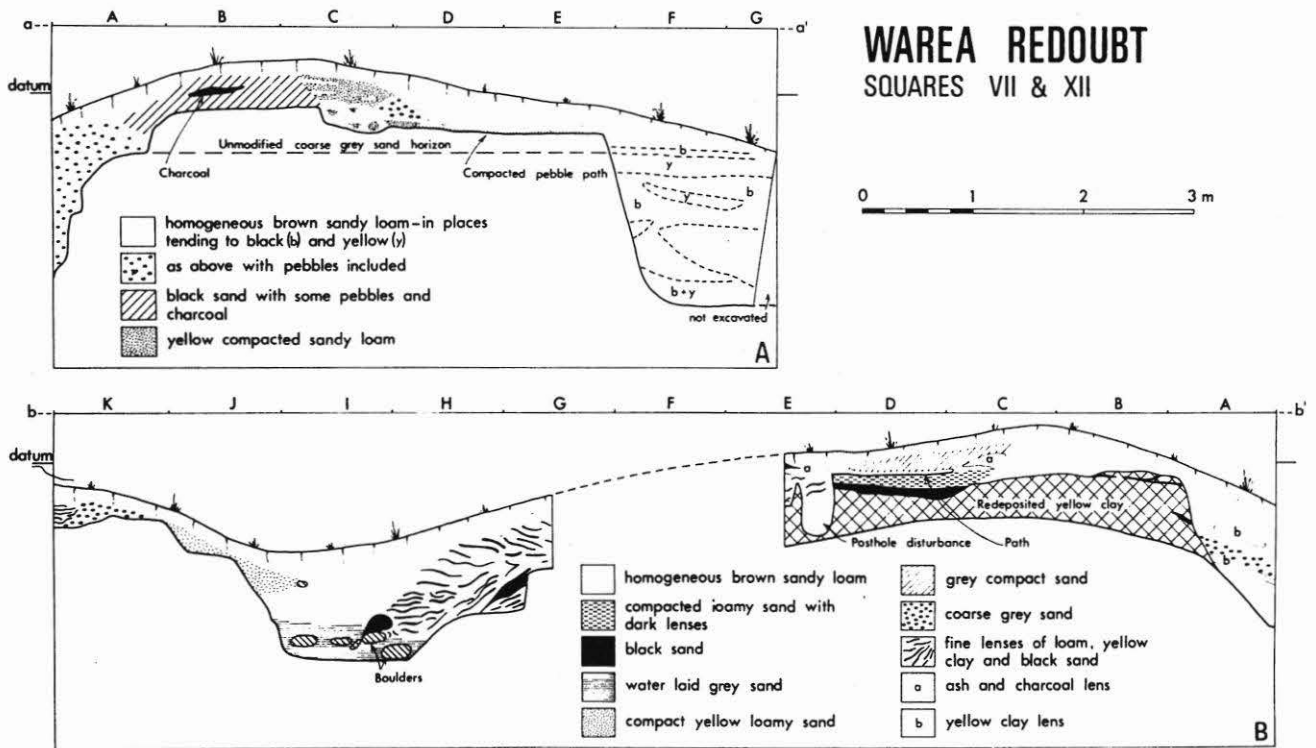
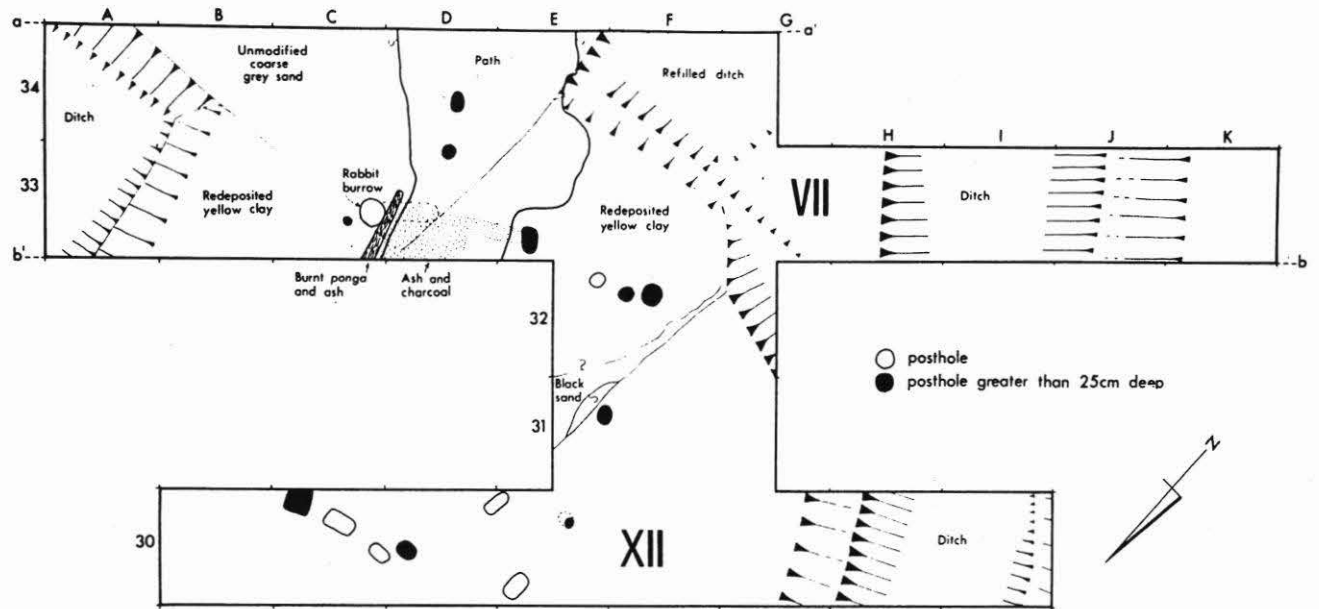


FIGURE 3.22. Squares VII and XII: plan and sections.

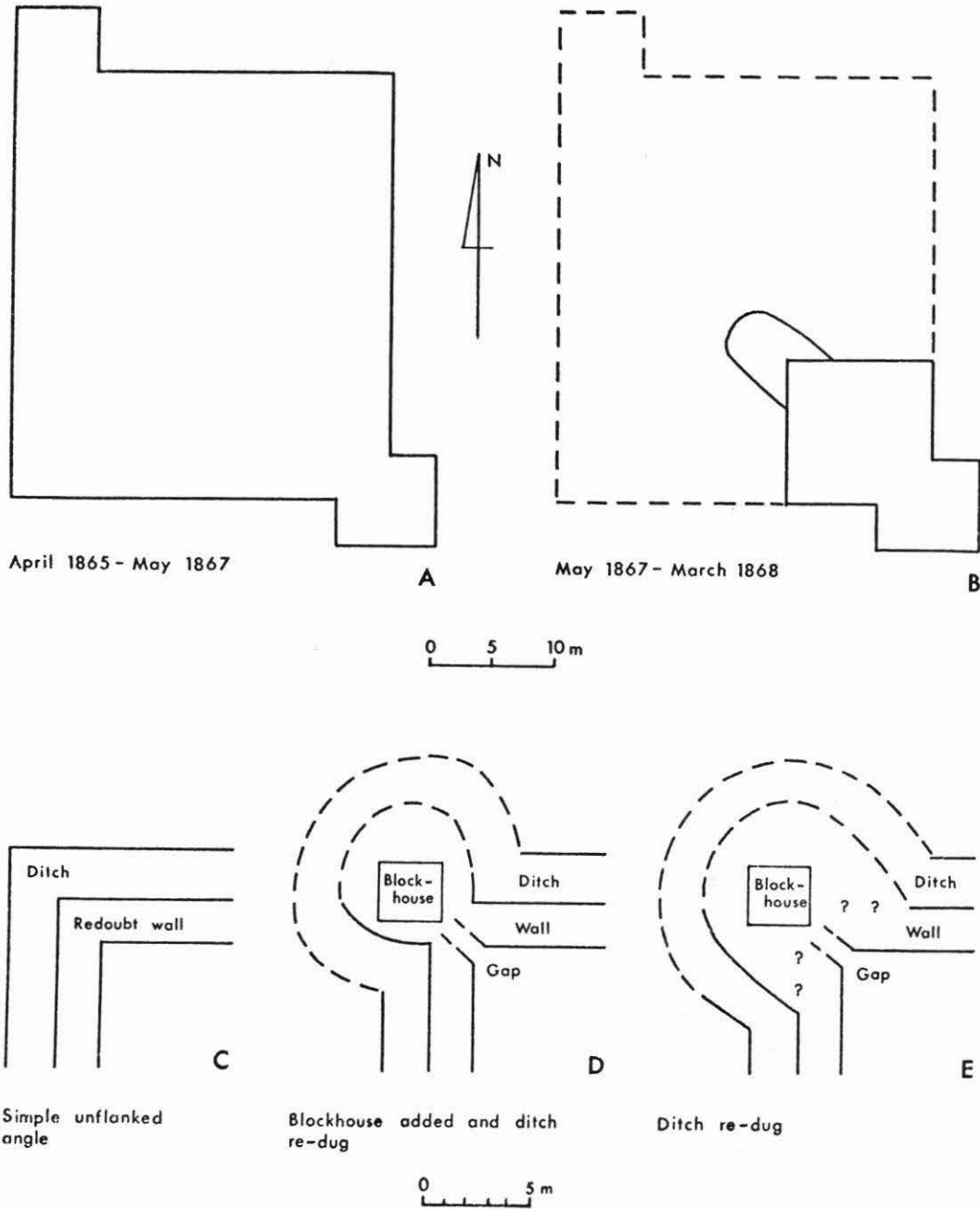


FIGURE 3.23. Outline plans of first and second redoubts (A and B); and sequence of changes to north-west angle of second redoubt (C-E).

iron grid which in turn supported cooking pots. The hearth floor comprised large flat boulders and interspersed smaller ones.

Fitted into the hearth was a brick with the maker's name "STEPHENSON" stamped into one side (Fig. 3.32K). The brick was almost certainly made at the Throckley, Newcastle-upon-Tyne, works of William Stephenson, founded in 1856

and still making bricks today under the name Gibbons Northern Brick Company (21).

In front of the hearth a cobble floor extended to the east and north margins of the excavated area. On the west side the floor ended abruptly and three postholes were found outside the cobbles (see Fig. 3.26). To judge from the lack of any other



FIGURE 3.24. Square VII: showing initial right angle corner at north-west angle of second redoubt, with the partly dug ditch refilled by pale material (left).



FIGURE 3.25. Square VII: showing, at left, the fill returned to the partly dug ditch; below which can be seen the material which was not dug out. The changed line of the new ditch strikes out at right angles from the redoubt's west side. Behind is the intact corner of the 1867 redoubt platform.

disturbance in this area there seems likely to have been a wooden floor here.

Rubbish recovered from Square X included bottle and window glass, nails, clay pipe and earthenware fragments, percussion caps and a Bell and Black matchbox. Less usual items included a black enamel buckle marked "1856" on both sides (Fig. 3.31U), which compares with similar buckles at Omata (Fig. 2.52D and E). There was also an almost complete (albeit in pieces) white earthenware cheese jar, 125 mm in diameter and 115 mm high (Fig. 3.30M).

Square XV was 4 x 3 m in size and included a second stone hearth and much of its associated mound (Fig. 3.27). The hearth was not as well made as that in Square X, although it was of the same construction with worked beach boulders, loosely put together on the side and rear walls, and flat or worked boulders on the floor. The hearth was 950 mm deep, 1 m across the front

and 300 mm across the rear wall. The walls appear close to their original height at 350 mm.

Within the hearth a piece of flat iron lay across the floor and curved up the rear wall. Two iron hoops lay in the ash on top of this along with a third in front of the hearth. They look like barrel hoops and may have dropped from a barrel chimney during destruction of the building by fire. Barrel chimneys are to be seen in contemporary photographs of Taranaki redoubts at Pahitere and Kaitake near Oakura (22). The sheet iron was placed in the hearth, probably to support cooking pots over the fire. A large quantity of charcoal and ash was found above and beneath the iron.

In front of the hearth were the charred remains of a wooden floor, to show that the fireplace was associated with a well made building. Overlying the burnt floor was a 30-50 mm layer of burnt ponga trunks, probably representing part of the chimney



FIGURE 3.26. Square X: showing fireplace with cobble floor in front and postholes of framed building at right. View to south. Scale intervals 100 mm.



FIGURE 3.27. Square XV: fireplace with burnt wooden floor in front. View to north-east. Scale intervals are 100 mm.



FIGURE 3.28. Square XIII: the trench excavated across the semi-subterranean hut. Behind is Square X, with the corner of Square XV at upper left. Scale intervals: horizontal 250 mm, vertical 100 mm.

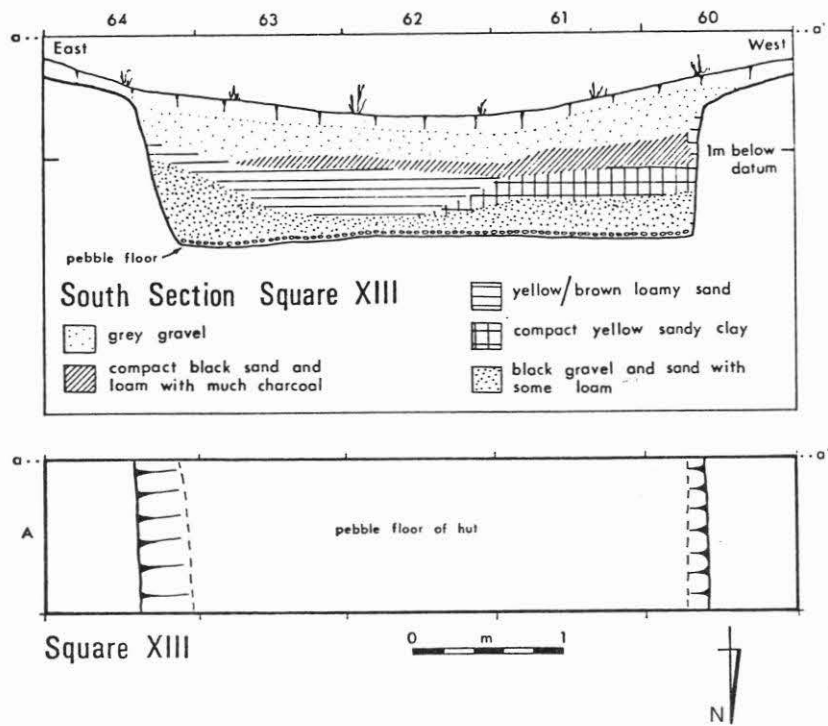


FIGURE 3.29. Square XIII: plan and section.

which collapsed in the final conflagration. The only artefacts recovered from Square XV were fragmentary hoop and sheet iron, and nails.

The two excavated stone hearths face each other over a gap of 6 m and may have belonged to one building. The different flooring need not rule this out. Both hearths were used for cooking, and would also have provided warmth for the soldiers stationed at Warea Redoubt throughout cold winters on the exposed Taranaki coast.

Square XIII consisted of a 5 x 1 m trench excavated across a rectangular depression immediately seaward of the two hearths (Figs 3.28 and 3.29). The depression marks a semi-subterranean soldiers' hut, typical of a number in the vicinity. Approximately 800 mm below the grass at the centre of the depression was found a 3.4 m wide pebble-strewn hut floor.

Big pieces of charcoal in the fill, 500 mm above the floor, suggest that the hut was used early in the occupation of the redoubt, but was more than half filled by natural erosion at a time when some nearby huts and other buildings were still in use. The hut was probably abandoned after May 1867. The charcoal may relate to the use of nearby buildings, or may date from their destruction.

Items recovered from the fill include the usual fragments of clay pipes, nails, bottle and window glass, a piece of boot leather, two sardine tins and an almost intact 'Jas Hennessey Cognac' bottle like that from Omata shown in Figure 2.30A. Just below the turf was a heavily built door lock, evidently from a nearby building which was demolished some time after the excavated hut was abandoned. A cattle bone was found in the fill about 100 mm above the hut floor. Nothing was recovered from the hut floor itself.

THE ARTEFACTS

In some parts of the Warea site, such as the Layer 1 fill of the 1865 defensive ditch (Square IV) and the original ground surface beneath the slumped parapet of the second redoubt (Square I), rubbish may reasonably be assigned to the early period of occupation.

It is more difficult to associate items with the later militia occupation as this will certainly be mixed with earlier material. Even the fill of the later ditch might include material from the earlier occupation since this would have been scattered about within the earlier redoubt from where at least some of the ditch fill originated. An example of the mixing that occurred is the British army Commissariat Staff button found in the slumped parapet of the militia redoubt.

Most items recovered at Warea relate to the occupation by imperial troops. This period saw upwards of 150 men at the post

for two years; the later occupation by 25 militiamen lasted only nine months. Whatever the actual origin all material is treated together here.

No rubbish dump was found at Warea and so comparatively few artefacts were recovered. Most Warea material was also found at Omata and so is pictured in the report on that site. Nonetheless there are useful additions, especially among clay pipes, buttons and 'tin' containers.

Bottle glass

A total of 7313.9 g of bottle glass was recovered, almost all in a highly fragmented state. No intact bottles were found and only one, the James Hennessey cognac bottle from Square XIII, was reasonably complete. Types and quantities of bottle glass are summarised in Table 3.1.

Glass type	Weight (gm)	Percentage
'black bottle' glass	4361.4	59.6
aqua	1331.5	18.2
'case gin'	729.1	10.0
green 'brandy'	656.0	9.0
colourless	175.6	2.4
dark green	31.4	0.43
light blue	25.5	0.35
dark blue	1.9	0.03
brown ('bitters')	1.0	0.01
yellow ('schnapps')	0.5	0.007
	7313.9	

TABLE 3.1. Warea Redoubt bottle glass.

Black bottle glass. 'Black bottle' glass was recovered from throughout the site. There was no indication that anything other than the standard quart bottle is represented (see Fig. 2.25).

Base pieces include four of the high 'kick-up' shape, at 78 mm (two individuals), 83 mm and 90 mm diameter respectively, and one of 90 mm diameter with a low 'kick-up' (see Fig. 2.26A). Fragments of tops may represent a dozen bottles of which three have wire-tying notches of the U-shape (see Fig. 2.25D-F), all others having V-shaped notches.

Experience at Omata shows that we may associate lead capsules with the black bottle glass. Warea examples were mostly unmarked or too corroded or fragmentary for the manufacturer to be ascertained.

From one capsule in the Square IV ditch, however, it was possible to establish the manufacturer as “CROSSE & BLACKWELL/PURVEYORS TO HER MAJESTY/21 SOHO SQ LONDON” (Fig. 3.32J). In Squares VIII and IX, a “J. Friend & Co.” capsule apparently identical to Omata examples (see Fig. 2.27A), was found trodden into the path surface just inside the 1865 redoubt gateway. Another fragment marked “CAM.../ BETTS L(ONDON MAKER?)”, has what may be a signature in the centre. This came from beneath the 1867 redoubt parapet in Square I.

Aqua bottle glass. Aqua bottle glass also was found throughout the site. Most is probably from salad oil bottles, although very small pieces make positive identification difficult. Easily recognisable is the type known as ‘whirlies’ (see Figs 2.32A and B), fragments of which were found almost everywhere. Another form common at Omata and also strongly represented at Warea is the eight-sided bottle shown in Figure 2.32C, pieces of which were especially common in Squares II and III, and in Square X where they included an intact top and neck.

A plain salad oil bottle similar to that shown in Figure 2.32K is represented by material recovered from Square X. The base appears to have been 50 mm in diameter. Other bases include two of 50 mm diameter embossed “ABC Co” (see Fig. 2.32L), and three more, also 50 mm in diameter but without marks.

Large aqua bottles, labelled ‘whisky’ in the Omata report, are represented by fragments of at least two bottles from Squares I and X.

Pieces from pickle jars, like the Omata example in Figure 2.33, were found in Squares IV and XIII, indicating at least two bottles. Also in Square IV was a piece of a ‘penny ink’ similar to the Walkden’s bottle from Omata (Fig. 2.34D).

A total of five complete or part aqua glass stoppers were found. These include the stoppers pictured in Figures 3.30I and J, and fragments of three separate Lea and Perrins Worcester-shire sauce stoppers (see Fig. 2.34I).

Case gin. Almost all the dark green ‘square’ or ‘case’ gin bottle glass belongs to only two items. Immediately west of the hearth in Square X were pieces of a bottle with a base similar to that shown in Figure 2.36A, and a ‘pig’s snout’ top as in Figure 2.36C. More interesting is the bottle represented by more than 60 fragments in Square XI. Crudely finished in a heavy bubbly green glass, the embossed fragments identify ‘V. Hoytema & Co.’, a 19th century Dutch gin maker.

Brandy bottle glass. The small quantity of sea green brandy bottle glass at Warea was made up largely of a single almost complete bottle which was found in fill 80 mm above the pebble strewn hut floor in Square XIII. The bottle and label remains are identical to the Hennessy cognac bottle from Omata (Fig. 2.30A).

Colourless bottle glass. Colourless bottle glass was extremely fragmentary. The only pieces useful for identification were from an applied top *ca* 40 mm in diameter and a base *ca* 45 mm in diameter, which apparently belonged to the same bottle recovered from Squares VIII and IX; and from Squares I and II, a base fragment of a container *ca* 100 mm in diameter. A complete ground glass stopper was found in Squares VIII and IX (Fig. 3.30K), of a diameter just too large to fit a fragment of a ground glass rim found in Square VII.

Other bottle glass. Dark green glass was found in small quantities. Most came from Square XI and belonged to what was probably a single bottle of the type illustrated in Figure 2.28E from among Omata material. Fragments from the Square IV ditch may belong to a similar bottle.

The only light blue bottle glass which could be identified were three fragments from the Square IV ditch of a “DAVIS’ VEGETABLE PAIN KILLER” bottle (see Fig. 2.37D).

Tiny quantities of dark blue, brown and yellow glass almost certainly represents medicinal, German ‘bitters’ and ‘schnapps’ bottles respectively. Pictures and descriptions are given in the Omata report.

Other glass

Four pieces of 9 mm thick glass from Square X made up 70% of almost 500 g of flat glass; its use is not clear as it seems too thick for window glass. What obviously was window glass was very fragmentary and much thinner.

Fragments of colourless moulded glass from tumblers or jugs were found in Squares I, II and III and XIII. Within the parapet of the late redoubt was found the stem of a wine glass also in colourless glass (Fig. 3.32I).

Stone and earthenware bottles and jars

Among fragments of stone and earthenware bottles and jars were 32 pieces of a white earthenware pot from the Square X hearth (Fig. 3.30M). It probably contained cheese or meat paste and is 115 mm high and 123 mm in diameter. Other fragments of this type of jar were found in the Square IV ditch and in Square VII.

An off-white ink bottle with a well-formed pouring spout was recovered from the Square IV ditch. Its diameter is 58 mm, and height, *ca* 120 mm. From the Square I ditch came two pieces of a plain cylindrical off-white jar *ca* 105 mm in diameter. Pieces of white and brown stoneware in the site probably represent ginger beer and other bottle types illustrated from Omata in Figures 2.38 and 2.39. Two pieces of Holloway ointment pots (see Fig. 2.39E) were found.

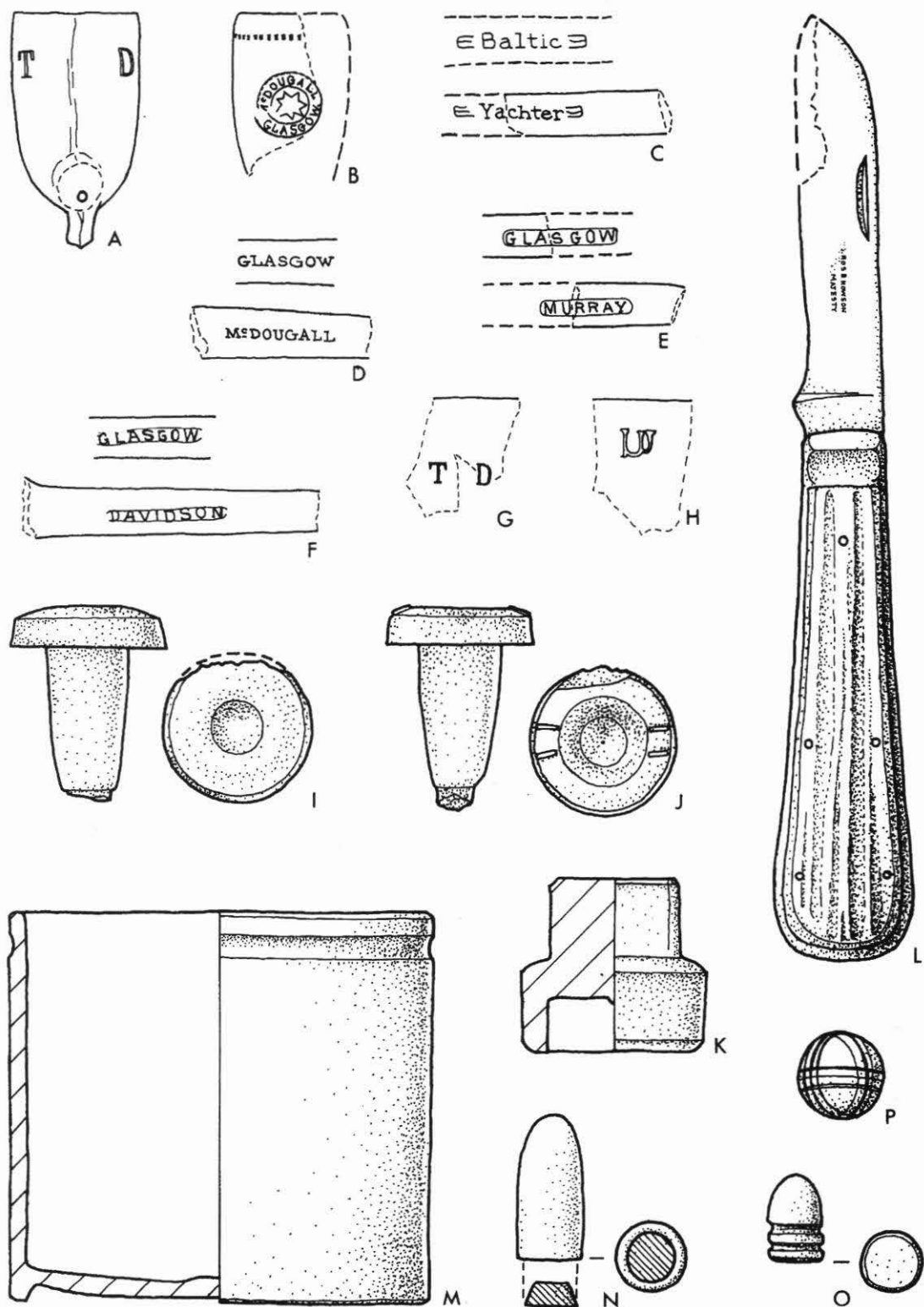


FIGURE 3.30. Miscellaneous finds (A). A-H. Clay pipe pieces. I-K. Glass stoppers. L. "Harrison Bros & Howson" bone handled pocket knife. M. Earthenware 'cheese' jar. N and O. Ammunition. P. Marble. For descriptions refer to text.

China and porcelain

Fragmentary china and porcelain was scattered throughout the excavation. Seven pieces of plain white china and the same number of strongly moulded white glazed pieces, all came from Squares VIII and IX. Nine fragments with blue transfer decoration include two from the Square IV ditch, probably from a heavy serving plate, and a saucer piece from within the 1867 redoubt. A white dinner plate piece shows something of a decorated gold border, this also coming from the ditch of the early redoubt. A single porcelain fragment from Square X comes from a white saucer with a thin gold line border.

Clay pipes

Compared with Omata few clay pipe pieces were recovered. Three manufacturers can be established, the Glasgow pipe-makers Davidson, McDougall and Murray. Other brand names are the stem mark "Yachter/ Baltic" and the bowl mark "TD" (Table 3.2). Table 3.3 gives the distribution of clay pipe pieces.

Stems:	Davidson/Glasgow	22
	McDougall/Glasgow	8
	Murray/Glasgow	2
	Yachter/Baltic	5
Bowls:	Embossed 'TD'	12
	Stamped 'TD'	1
	McDougall/Glasgow	3

TABLE 3.2. Warea Redoubt clay pipe makers' marks.

The Glasgow manufacturer Thomas Davidson and Co. (Caledonian Pipeworks) is represented by 22 stem pieces (see Fig. 3.30F) and in all probability by some or all the 12 embossed "TD" bowl fragments (Fig. 3.30A). The connection between this firm and that of William Murray has been outlined in the Omata report. It is enough here to say that the two stem pieces marked "MURRAY/GLASGOW" (Fig. 3.30E) are of interest since the firm was taken over by Davidson in 1861 or 1862, some years before Warea Redoubt was established.

Duncan McDougall's Glasgow Pipe Manufactory is the source of at least eight pipes at Warea, established from eight stem and three bowl fragments. Unlike Omata where 18 McDougall stem marks were shared between five different designs, at Warea only one design was represented (Fig. 3.30D). There was also only one bowl mark (Fig. 3.30B) - different to any of the five bowl marks found at Omata. The

Squares	Stem pcs		Bowls		Bowl pcs		Spurs	
	No	Wt	No	Wt	No	Wt	No	Wt
I	30	54.3			63	32.5	1	0.6
II & III	52	113.1	1	15.2	55	54.2	2	1.4
IV	35	41.2			99	37.2		
V & VI	5	15.4			4	5.7		
VII	15	26.9	1	13.7	23	22.8	4	7.7
VIII & IX	55	104.3	2	36.0	66	46.0	1	2.6
X	7	12.1			18	11.3	1	0.7
XI	3	9.3			1	0.3		
XII	6	10.5			6	3.2		
XIII	1	0.9			7	7.0		
XIV	7	14.7			15	14.7		
TOTALS	216	402.7	4	64.9	357	234.9	9	13.0

TABLE 3.3. Clay pipe material (586 pieces; 715.5 g).

stamped "TD" mark which occurred once at Warea (Fig. 3.30G) may also belong to a McDougall pipe (see discussion in the Omata section on these marks).

Five stems marked "Yachter/ Baltic" (Fig. 3.30C) were found in Squares II and III within the militia redoubt. It is possible these pipes were available to the militia but not to the earlier troops. They are also common at Omata, also a militia post. The predominance of Davidson and McDougall pipes at Warea, in contrast to the variety of makes at Omata, also suggests that the troops had their own source of supply.

Four stem fragments showed parts of the word "GLASGOW" and could belong to any of that city's manufacturers.

The embossed bowl mark which may be a "W" occurred at least twice, but is difficult to interpret because of uneven application (Fig. 3.30H).

Approximately ten spurs were embossed on the left side, usually with a number but once with what appears to be the letter "Z" in reverse. The numbers are difficult to read but include 24, 26, 28, 34, 36 and possibly 38. Such numbers probably indicate particular mould or pipe designs among several hundred that might be used by a large manufacturer.

Few decorated pieces were found. Bowl fragments with 'roulette' decoration around the rim were the most abundant and appear to have belonged to McDougall pipes (see Fig. 3.30B). Two stem pieces with the die-applied 'spiralling circle' decoration (see Figs 2.47J and K) and one fluted bowl fragment were recovered (Fig. 2.45L). One stem piece possessed a 'rope' decoration which encircled the stem as shown in Figure 2.46M.

Ammunition

Ammunition recovered at Warea was confined almost entirely to .577 calibre bullets of the Pattern 1853 Enfield rifled musket. Sixty-eight unused rounds were found - almost all with clay plugs intact in the tail (Fig. 3.30N). Fifty-seven came from Squares VII and XII, mostly in deep fill on the south side of the militia redoubt north-west bastion platform.

One extracted .577 bullet was found. The Enfield rifled musket was loaded from the muzzle and ammunition sometimes jammed in the barrel. Ramrods had an attachment designed to screw into the soft lead nose of the bullet so that it could be withdrawn. The technology of this and other weapons is discussed in the Omata report.

One bullet with a hollow nose was found, apparently for use with the Enfield rifle. Use of hollow-nosed ammunition became widespread in the late 19th and early 20th century as it promoted mushrooming of the projectile on impact for maximum effect. This bullet weighed 30.8 g as opposed to the standard 33-34 g of ordinary Enfield ammunition. Six truncated or whittled pieces of .577 bullets were also found.

The remaining ammunition is made up of one musket ball *ca* 18 mm in diameter and weighing 16.7 g, and a pistol bullet of 12 mm diameter and 14.9 g (Fig. 3.30O). The musket ball is likely to have been for use with the .75 or .775 inch calibre 'brown bess' musket. It is, however, different from Omata examples being made of altogether lighter material only half the weight of lead balls of the same size. It is not clear what weapon used this as muskets are unlikely to have been issued to any of the Warea garrisons. It may be an enemy ball; the Maori were often short of lead ammunition and made or acquired musket balls of other material.

A total of 103 percussion caps were found. They were an essential part of the firing mechanism of the Enfield rifle. A discussion of the percussion cap and the 19th century development of the rifle is given in the section on Omata.

Knives

Knives included three bone-handled pocket knives and a sheath knife with wooden handle. The sheath knife is represented by a rusty fragment with some wood adhering to what remains of the rivetted handle. The knife was much used to judge from the stump of blade. The handle is more than 20 mm across, while the blade was sharpened down to *ca* 10 mm width. This is typical of butchers' 'boning' knives. It was found in Square XIV, inside the militia redoubt.

The bone-handled pocket knives include the almost complete item illustrated in Figure 3.30L, from within the militia

redoubt. It has a handle length of 105 mm and width of 29 mm. The blade is 80 mm long. The manufacturer, "(HARRISON B)ROS & HOWSON/(CUTLERS TO HER) MAJESTY", can be partly made out. A smaller knife with handle measuring 81 x 15 mm may have been discarded after the blade snapped. It was found beneath the militia redoubt parapet in Square I; as was the remaining knife represented only by the butt end of a bone handle slightly more than 15 mm wide.

Buttons

Seventy-six buttons were found of about 26 different kinds. Of the 20 illustrated types, 15 are represented by only one example. Warea buttons may be divided into 'small chinas', iron and other one-piece 'trouser buttons', two-piece buttons, a fabric-covered shank button and military buttons.

'*Small chinas*' (Figs 3.31A-D). These small white buttons made of clay were probably used on underwear. Only six examples of four different types were found; three are of the type shown in Figure 3.31A. The buttons shown in Figures 3.31A, C and D may be compared with Omata examples illustrated in Figure 2.48 (Types 1A, B and D).

One-piece buttons (Figs 3.31E-M). This group includes brass buttons of the kind commonly known as 'trouser buttons', and others stamped out of one piece of pewter, bone, and iron or steel.

The most numerous buttons, found throughout the site, were one-piece buttons with four holes, made of iron or steel. They were mostly reduced to small lumps of rust, recognisable as buttons only after some experience. Because of their condition measurements are very approximate and only one is illustrated to show what appears to have been the usual form (Fig. 3.31L). Approximate diameter measurements may be grouped at 1 mm intervals: seven at 16 mm, nine at 17 mm, 13 at 18 mm, ten at 19 mm and one at 20 mm, making a total of 40 buttons of this type. Occasionally they were found together, clearly belonging to a vanished garment - as were five buttons in Squares V and VI.

Brass 'trouser buttons' may be briefly itemised. There is one example of each. Figure 3.31E depicts a small button 13.1 mm in diameter with decoration on the front. Figure 3.31F shows a button 15.5 mm in diameter with 'rope' decoration on the front. It may be compared with the slightly larger button pictured in Figure 2.48 (Type 2K) from Omata.

The "TURNER & CO/ PATENT" backmark button (Fig. 3.31G) is an unusual disc shape, 16.8 mm in diameter. Figure 3.31H shows a plain button of typical form, again 16.8 mm in diameter. The "J. MIDDLEMASS/ EDINBURGH" button is 17.1 mm in diameter (Fig. 3.31I). From "MOSES LEVY &

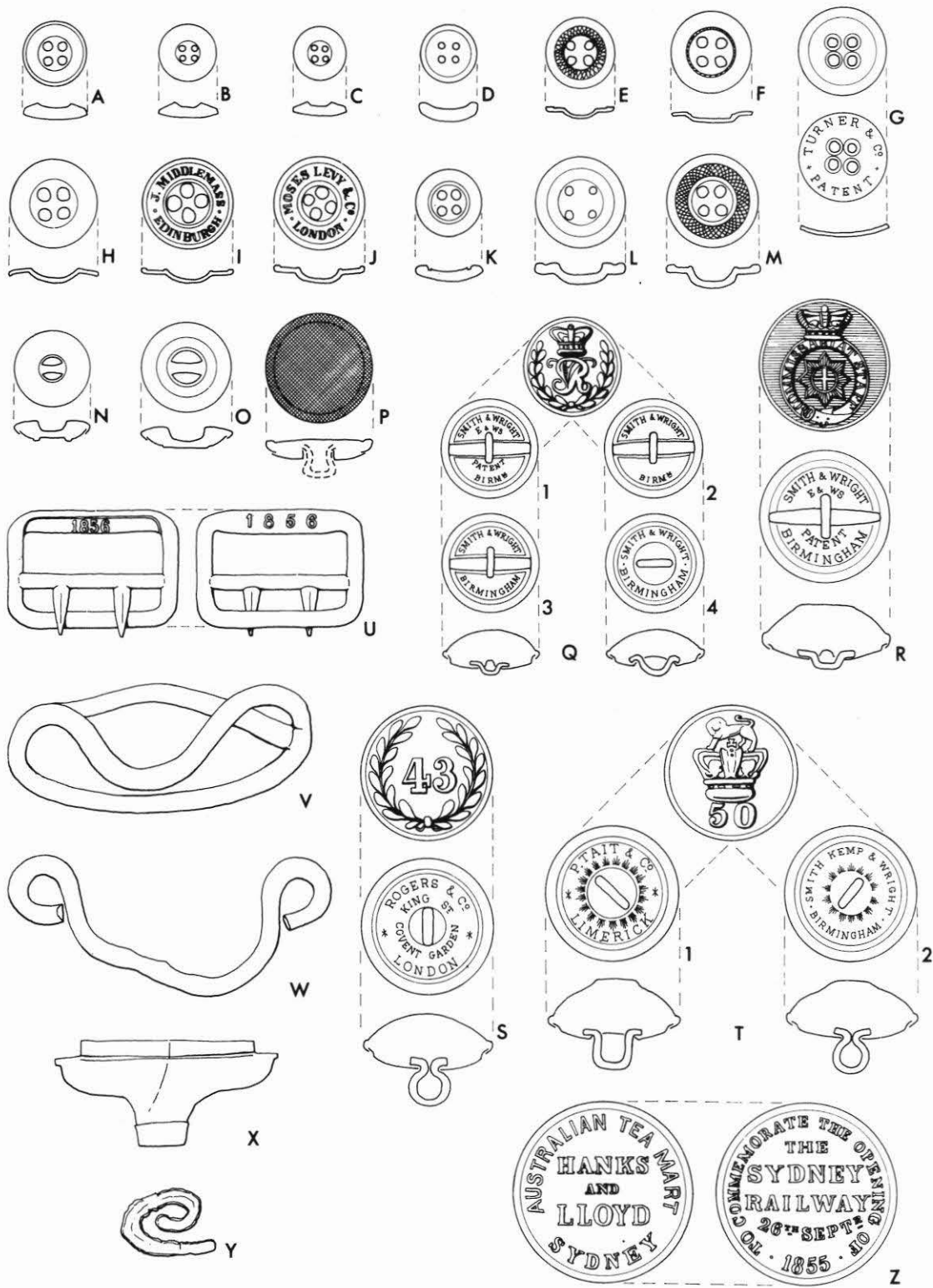


FIGURE 3.31. Miscellaneous finds (B). A-T. Buttons. U. Buckle. V and W. Uniform fittings? X. Picture rail hook. Y. Brass uniform decoration? Z. "Hanks and Lloyd" token. For descriptions refer to text.

CO/ LONDON” comes a button (Fig. 3.31J) 17.5 mm in diameter, which may be compared with a number of this firm’s buttons in the Omata collection (see Fig. 2.48).

One well finished bone button was found (Fig. 3.31K), 12.8 mm in diameter and stamped out in one piece like the other one-piece buttons.

Figure 3.31M depicts a button 17.8 mm in diameter, which appears to have been made of pewter or other tin or lead based material; there were two examples. Two more four-hole one-piece pewter buttons were found in the Square I ditch. These were extremely fragmentary and are not illustrated, *ca* 12 mm and 17.2 mm in diameter respectively.

Two-piece buttons (Figs 3.31N-P). A brief description of the manufacture and characteristics of these buttons is given in the Omata report.

Figure 3.31N illustrates a pewter button 14.5 mm in diameter which may have had a maker’s name on the back. The bar which spans the large hole in the centre and makes the two thread holes is of iron. Figure 3.31O shows a composite button, 17.0 mm in diameter, which appears to have a brass face fastened to a back of iron. This is different to the pewter button in that the dividing bar forming the two thread holes is stamped out in the same operation, from the same material as the front and back. There is one each of these buttons.

An unusual button is made of two pieces of iron fastened together, with a piece of cloth drawn over the front plate now apparent only as a pattern of rust (Fig. 3.31P). It is 20.5 mm in diameter and may be compared with the button shown in Figure 2.49 (Type 5D) from Omata. This button had a shank loop attachment like the contemporary military buttons.

Military buttons (Figs 3.31Q-T). A useful collection of military buttons was found at Warea. All are of the ‘Sanders’ type with shank loops. Both long-serving British regiments at the post are represented, as is the British army Commissariat and Transport Corps. Smaller “VR” buttons may have been used by the militia as well as by imperial troops.

Ten “VR” buttons were found including six in Squares I, II and III. All were made by the Birmingham firm of Smith and Wright, with four different backmarks: four each of the backmarks shown in Figure 3.31Q numbers 1 and 2, and one of numbers 3 and 4. All are of the standard 3/4 inch size (18-19 mm diameter).

The 43rd Light Infantry was represented by one button, made by the London firm of Rogers and Co., Covent Garden (Fig. 3.31S). It is of the standard one inch (25.4 mm) size. Three 50th Regiment buttons were found (Fig. 3.31T), also of the standard one inch size, two made by P. Tait and Co., Limerick, Ireland, and the other by Smith, Kemp and Wright of Birmingham,

apparently a predecessor of Smith and Wright. The one “Commissariat Staff” button was in excellent condition (Fig. 3.31R). Again it was made by the firm of Smith and Wright to the standard one inch size.

Footwear

The range of footwear represented at Omata is quite absent at Warea. Two iron boot heels were recovered. Leather consisted of seven small fragments with a total of 16 attached copper eyelets and two very fragile heels. It seems likely that all the material came from standard army boots in this outlying military post which never had a civilian presence.

Miscellaneous artefacts of copper and brass

A small number of copper or brass items were found of which some are illustrated here. Figure 3.31U depicts what is probably a military uniform buckle. Two such buckles came from Squares IV (Layer 1) and X, one with a fragment of white cloth adhering. The buckles are virtually identical to two recovered at Omata, but which also had “G & Cie” on them, one of them dated “PARIS 1862” (Fig. 2.52D-E).

A group of what may be brass uniform fittings is illustrated by two examples. One example was found of that shown in Figure 3.31V, and two of the item pictured in Figure 3.31W. They were strongly made of heavy copper rod. Figure 3.31Y shows what may be a fragment of brass uniform insignia. It has been broken off a larger item at the open end.

Other copper items include a 33 mm long pin, and eight tacks or nails of which four were 22-23 mm long and the others 27, 29, 30 and 37 mm respectively. Three brass links may be from a pocket watch chain. A small axle 22 mm long with a single cog may also come from a pocket watch. Figure 3.31X depicts a picture rail hook which is an unexpected touch of domesticity in a remote military outpost. A piece of brass plate 29 x 13 mm in size may have been broken off a rifle.

Coin and token

Figure 3.31Z depicts a penny token issued by Hanks and Lloyd of the Australian Tea Mart, Sydney. On the reverse is the inscription “To commemorate the opening of the Sydney Railway 26th Sept 1855”. Tokens were issued by numerous commercial firms throughout the Australasian colonies in the 1850s and 60s to overcome a shortage of legal tender. They were declared illegal in Victoria in 1863, and in other colonies over the next two decades (23).

An 1844 shilling in good condition was found beneath the militia redoubt parapet in Square I.

Iron

Approximately 21 kg of iron recovered at the site was rusty, very fragile, and heavily encrusted with the sand or soil in which it had been embedded.

'Tin cans'. The fragmentary remains of several tin cans were found. They included five round cans similar in shape to those in common use today (Table 3.4), and the remains of two, possibly three, large rectangular 'tin' boxes. As with the Omata tin cans, the range of sizes suggests they were produced prior to widespread standardisation. All the cans almost certainly contained food.

Provenance	Height	Diameter
Sq. I	?	ca 90
Sq. II/III	?	64
Sq. V/VI	?	ca 105
Sq. VIII/IX pit	185	ca 100
	?	89

TABLE 3.4. 'Tin cans' (measurements in mm).

Flat sheets of 'tin' which probably came from large rectangular boxes were found in the Square I ditch, the Squares VIII/IX pit and Square XIII. None was sufficiently intact for any useful measurements to be made. The size of such boxes at Warea may be guessed from those listed among Omata material.

From the Square VIII pit came the extremely fragmentary top of a round 'tin' container ca 88 mm in diameter. The top bore an embossed manufacturer's mark, address and other information which because of the condition cannot be determined except for "LONDON" and "1861". It is similar to the top of the boot blacking lid found at Omata (see Fig. 2.50B).

Sardine tins. Four sardine tins were found of a shape virtually identical to that in use today (see Fig. 3.32B), all from the Square XIII hut fill and Squares V and VI. Two had identical copper labels giving the manufacturer as "Balestrie a Concarneau" (Fig. 3.32A). This manufacturer is also represented at Omata, by a different label (Fig. 2.55B; and see discussion of the mid-19th century Bay of Biscay sardine canning industry in the Omata report). Both were 110 x 75 x 27 mm in size. The other two sardine tins had no label. They were 110 x 95 x 27 mm and 110 x 75 x 27 mm in size respectively.

Matchboxes. Fifteen 'tin' matchboxes were found at Warea. Five different impressed labels are represented: two of Bell and

Black (Figs 3.32F and G), and one each of George Dowler (Fig. 3.32C), Levy Brothers (Fig. 3.32D), and of the unidentified manufacturer whose partly made out label was present at Omata (Fig. 2.56F) and Warea (Fig. 3.32H). Figure 3.32E shows shape of these boxes. Sizes are given in Table 3.5.

Maker	Size: ca 72 x 41 x 23	Other
Bell & Black		97 x 39 x ?
- Type 1 (Fig. 3.32F)	2	
- Type 2 (Fig. 3.32G)	1	
George Dowler (Fig. 3.32C)	1	
Levy Brothers (Fig. 3.32D)	2	
Unidentified label (Fig. 3.32H)		50 x 38 x ?
No label apparent	6	50 x 38 x ?
	12	3

Table 3.5. Warea Redoubt matchboxes.

Miscellaneous iron. Iron objects included the buttons and boot heels already mentioned, also harness buckles, two heavy bolts, a gate hinge, door lock, slasher blade and some hoop and sheet iron.

The door lock is typical of the period, fitting the outside of the door rather than being set inside as is commonly the case today. Much of the internal mechanism is still intact. It was found in the Square XIII fill which incorporated some rubbish of later stages of the military occupation, and it suggests the demolition of nearby buildings. Also found here was an iron hoop of 40 mm width and 235 mm diameter, possibly off a nail barrel. The three fragmentary barrel hoops in Square XV have already been mentioned. They were 23-30 mm wide and 450-500 mm diameter.

The gate hinge strap was turned over crudely at the end to form a loop for fitting over the hinge peg. It measured 380 x 35 mm. From Layer 1 in the Square IV ditch came the slightly curved head of a slasher, or 'fern hook', about 400 mm long. A few fragments of sliced nails of 100-130 mm length were recovered, also one 15 mm iron tack.

Three fragments of iron harness buckles were found. They were in poor condition and heavily encrusted with rust and earth; their measurements are approximately 31 x 40 mm, 32 x 31 mm and 32 x 25 mm. Two bolts were associated with the Square X hearth. One was a 'coach' bolt (for screwing into wood) ca 80 mm long, and the other a very large ordinary bolt ca 195 mm in length and 15 mm in diameter.

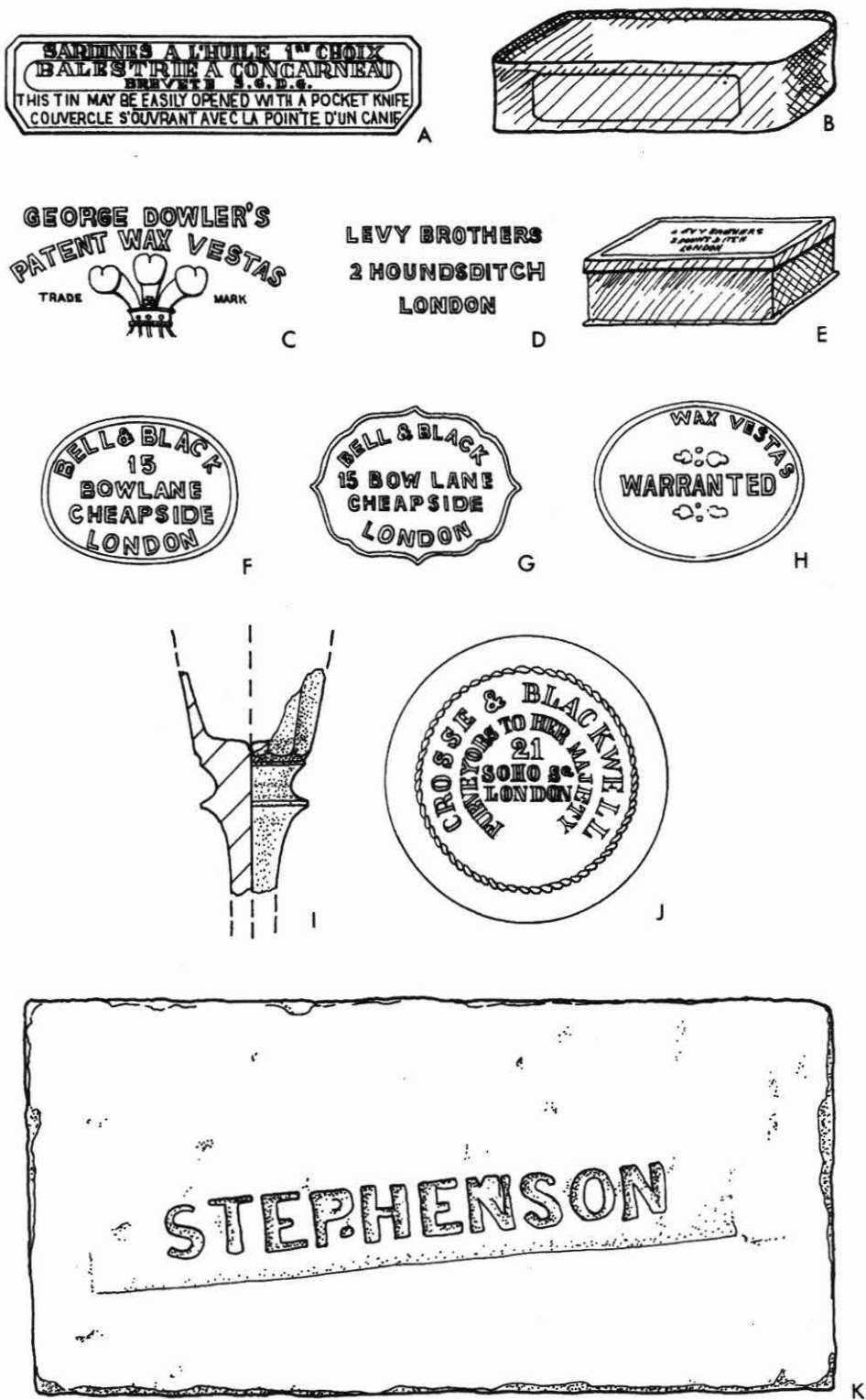


FIGURE 3.32. Miscellaneous finds (C). A and B. Sardine tin and label. C-H. Embossed matchbox labels and typical box form. I. Wine glass stem. J. Lead capsule (compare with Fig. 2.27). K. "Stephenson" brick. For descriptions refer to text.

Slate

Pieces of slate pencil and writing or roofing slate were not common. Pencils are represented by three pieces totalling 133 mm length. Within the militia redoubt in Squares II and III were 24 fragments of sheet slate totalling 82.3 g. From nearby Square I came the only other sheet slate fragments found in the entire site: two fragments weighing 2.4 g.

Brick

Incorporated in the Square X hearth was a 235 x 115 x 60 mm firebrick stamped "STEPHENSON" (Fig. 3.32K). This brick has been mentioned above and was almost certainly made at the Throckley, Newcastle-upon-Tyne, works of William Stephenson.

Bone

A total of 1018.8 g of bone was found throughout the site, much of it too fragmentary for identification. The Square I ditch fill included three cattle bones: a scapula fragment, proximal fragment of a right humerus and a long bone (tibia?) fragment. The earlier ditch in Square IV contained a proximal epiphyseal tibia fragment belonging to a cattle beast up to two and a half years of age, also a cattle scapula fragment and the just erupted - or pre-erupted - molar/premolar fragment of a pig. In Squares V and VI was the distal fragment of sheep or goat tibia. The Square XIII house fill contained a single unfused cattle hind metacarpal, again belonging to an animal up to two and a half years of age.

In the Square VIII pit were three or four pieces of cattle rib, cattle vertebral fragments, a distal radius fragment of sheep or goat, and tibia, radius and ulna fragments of pig.

Atholl Anderson, who was then at Otago University, identified this material. He wrote,

"The lack of cranial, vertebral and limb extremity material suggests this is previously butchered (i.e. elsewhere) meat. The bone collection would be covered (excluding the pig tooth) by one side of young cattle beast, one hindquarter of an older cattle beast, one side of pig and one side of sheep/goat." (24)

Shell

Fragmentary shell material found at Warea included catseye (*Turbo smaragdus*; 12 individuals), top shell (*Melagraphia aethiops*; seven), paua (*Haliotis* sp.; four), white rock shell (*Neothais scalaris*; three) and dark rock shell (*Haustrum haustorium*; one).

Miscellaneous

Lead. As well as bottle capsule fragments and ammunition treated above, other lead totalling 68.2 g was found throughout the site. All were shapeless lumps except for 5.9 g of sheeting found in Squares VIII and IX.

Zinc. Pieces of zinc sheeting were found scattered throughout the site, over 90% of material by weight from the vicinity of the Square X hearth.

Mortar. A 50 g lump of mortar was found in Square VII, and another of 9 g in Square I.

Tinfoil. Pieces of tinfoil were found in Square I and Squares V and VI. It was presumably used in lining tea chests or other containers.

Pencil 'lead'. Three fragments of pencil lead, possibly from a propelling pencil, were found in Squares V and VI.

Comb teeth. Four black tortoiseshell comb teeth were found scattered throughout the site.

Pumice. Pumice is not uncommon on the beach today but only two small fragments were found in the site, in Square XIII fill and in Squares I and II.

Seeds. Eighty-three kowhai (*Sophora microphylla*) seeds were scattered throughout the site. One flax seed was found in the Square IV gateway extension.

Marble. A marble was found in the Square I ditch (Fig. 3.30P) - of the same kind as a fragment found at Omata (25).

Adze fragment. Incorporated in the path surface at the north-west corner of Squares II and III in the militia redoubt was a hammerdressed and partly polished pre-European Maori adze fragment of poor quality dark grey argillite.

Peachstones. A total of 59 peachstones were recovered, including 29 from Squares II and III within the militia redoubt. It is likely the fruit came from trees established at nearby Maori settlements.

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CHAPTER 4. THE MEANS AND ENDS OF COLONIAL WARFARE

The Omata Stockade and Warea Redoubt were chosen for archaeological investigation because of their contrasting histories, defences and location, as set out in Table 4.1. Both were occupied for some years, and so were likely to prove more interesting than fortifications occupied only briefly in the long period of military conflict in Taranaki between Pakeha and Maori.

	Omata Stockade	Warea Redoubt
Established:	February 1860 (beginning of First Taranaki War)	April 1865 (near end of Second Taranaki War)
By:	Local farmers organised as Taranaki Militia	Imperial troops (43rd Regiment)
To:	Protect homes and farms	Carry the war to the Maori
Located:	Close to New Plymouth	Remote from New Plymouth
Defended by:	Wooden stockade and ditch	Earth bank and ditch

TABLE 4.1. Historic and archaeological differences between the Omata Stockade and Warea Redoubt.

The Omata Stockade was an unusual Pakeha fortification in Taranaki, and in the New Zealand Wars as a whole. The only comparable post was the blockhouse and stockade at Bell Block, also built by local settlers who were their own military engineers. The two works were designed to defend homes and farms and to act as refuges in case of Maori attack. Both were built on land that had been in European hands for some years, and were essentially defensive posts.

Warea Redoubt, on the other hand, was an offensive work, thrown up by imperial troops to a standard redoubt form. In this it represents most European fortifications of the New Zealand Wars in Taranaki and elsewhere. Changes to the fort add to historical and archaeological interest. The distance from New Plymouth and lack of a civilian presence makes it likely that items recovered at Warea relate strictly to campaigning troops in 19th century New Zealand.

THE DEFENCES

Omata Stockade

Archaeological evidence for defences at Omata consists of the trench on the top platform in which stockade posts were set, the ditch below, and the commanding situation of the fort on its isolated hill. The stockade posts were originally set three feet six inches (1070 mm) into the ground (1), although because of damage during demolition, only 200-300 mm of this depth remained for archaeological confirmation.

From Colonel Alexander's account the stockade height can be established at ten feet (3 m). Stockades in Taranaki were invariably loopholed - for firing through, not over. Bastions at two corners commanded all four sides. The excavated north-west bastion was 3.2 x 2.3 m in plan. Alexander's perspective sketch (Fig. 2.5) shows there to have been two rows of three loopholes on all four sides of the bastions, with an additional floor beneath the roof which added to the very considerable fire which defenders could bring to bear on any threatened wall.

Excavation shows the gateway of the stockade to have been *ca* 850 mm wide, the door being braced with timber when closed. The entrance was covered from the south-east bastion 15 m distant.

Outside the stockade was a narrow platform, from which the main defensive scarp sloped directly to the bottom of the ditch 4-4.5 m below the base of the stockade wall. This was designed so that defenders firing from their loopholes along the walls had complete command of the scarp to the bottom of the ditch. The

counterscarp was almost vertical, where excavated rising 1.8-1.9 m from the bottom of the ditch. Beyond, a more gentle slope to the base of the hill was again completely covered from the stockade loopholes.

The situation of the Omata Stockade on top of its small hill is typical of Taranaki stockades. During the war of 1860-61 an elevated site was chosen because these forts often doubled as line of sight signal stations, using masts and signal balls. The view over a wide area of country also enabled stockades to fulfil their long term garrison, or policing, role.

Warea Redoubt

Warea Redoubt was well located from the point of view of access and defence, on the edge of an extensive coastal terrace. Northward the troops' road lay along the coast where open ground offered few opportunities for ambush. To the south, gently sloping ground to the river offered no protection to an attacking party. Below the seaward parapet the low sea-cliff does offer some cover, but access to the short section which cannot be seen from the redoubt is exposed to defenders in the fort. The nearest ground even slightly higher than the redoubt is more than 200 m inland.

The post at Warea was defended by an earth ditch and bank, to represent the most common form of European fortification of the New Zealand Wars. The initial 43rd Regiment redoubt was *ca* 33 x 44 yards (30 x 40 m) in size, of an area excluding bastions of *ca* 1200 m². This may be compared with a standard 200 man redoubt of 38 x 46 yards (35 x 42 m), 1470 m² according to Colonel H.J. Warre, who was for long commanding officer in Taranaki, and who ordered the move to Warea (2).

Two bastions covered three sides. The seaward side was unflanked. At the south-east angle was the stronger bastion which covered the south and east sides of the redoubt. This was the forward angle and commanded that part of the Teikaparua River valley as could be seen from the post, as well as a wide view inland and south along the coast.

The bastion here was 7 x 7 m in size. This was large enough to take the artillery which was at the post in the winter of 1865. Within the west and north parapet of the bastion was a compacted clay path, presumably much trod by sentries for whom this would have been a key post at the fort. The smaller bastion at the north-west angle covered the entrance gate and the north side of the redoubt.

Excavation showed the base of the wall to have been a little more than 3 m wide. This width presumably would have included both banquette and the wall proper. It may be compared with the 11 ft (3.35 m) wide base of wall and banquette, shown in a cross-section drawing of redoubt defences at Waitara

by Colonel Thomas Mould, who was in command of the Royal Engineers in the First Taranaki War (3).

As the soil at Warea is light and sandy it seems likely there was a considerable slope to the parapet to ensure it did not collapse. In his *Hints on House Defence, Blockhouses and Redoubts*, Captain H.W. Young (4) in 1869 suggests that four inches (100 mm) extra width at the base was necessary for every foot of height and thus, for an 8 ft (2.4 m) high parapet, the top was likely to have been 32 inches (810 mm) within the base line. The top might have been 3 ft (910 mm) wide, with the remaining width taken up by the interior face (again sloped according to Captain Young's formula), plus the tread and ramp of the banquette.

The gateway to the redoubt was 2.4 m wide, within which was probably a double door, hinged to posts at the sides (Fig. 3.10). It is likely there was a horizontal timber joining the tops of the posts as shown in contemporary picture of Kaitake Redoubt, also in Taranaki (Fig. 1.6). The bridge across the ditch may have been drawn up at night. There is no indication of replacement of the bridge by a causeway. The covering north-west angle is 14 m from the redoubt entrance. The defensive ditch proved on excavation to be 1.8 m deep and almost 3 m wide.

The militia redoubt was of unusual form. Two squares of 11 x 11 m and 7 x 7 m enclosed about 170 m². Also there was a blockhouse at the north-west angle. The south-east angle of the 1865 redoubt was probably chosen for the later work because of the control it offered over approaches to the post from the nearby river valley. Command of the northward approach would not have been lost since the ground in that direction was level.

Archaeological evidence indicates that there was already a building at this corner of the 1865 redoubt, and that the new work neatly enclosed it. A gap in the corner of the militia redoubt led to a 3 m (10 ft) square blockhouse at the north-west angle. The redoubt entrance was not found, but the south and west sides are unlikely as they were forward faces and the north side can probably be ruled out following excavation. That leaves only the west (seaward) side.

The base of the militia redoubt wall in Square I (Fig. 3.14) was *ca* 3 m wide. The ditch was a little more than 2 m wide and *ca* 1.5 m deep.

Apart from trace (plan) and size there are other conspicuous differences in the defences of the 1865 and 1867 redoubts. The earlier defences were more substantial than the later. The total depth of ditch and bank in Square IV was *ca* 6.5 m; in Square I it was 5 m. The earlier ditch was also 300 mm deeper than the later. The ordered depths will have been five and six feet respectively. Where excavated, the earlier ditch was almost V-

shaped in section while the later was flat bottomed with almost vertical walls (see Fig. 3.14).

Manning levels

The barrack buildings which surrounded the yard at the Omata Stockade were able to accommodate men with an economy of space impossible with men under canvas in a redoubt. The maximum garrison at Omata was 80 men, to give *ca* 3 m² space per man within the fort. At Warea, even the largest garrison of 240 men at the end of May 1865 had 5 m² per man within the defences.

At Omata the 260 m² stockade had a perimeter of 75 m including bastions, to give the maximum garrison of 80 men not quite a metre each of wall to defend. At Warea there were 240 men in May 1865 defending a total fortified area of 1265 m², again including bastions. Here, however, the perimeter was approximately 180 m, to give each man just .75 m to defend. There is a considerable efficiency in larger works in terms of perimeter manning levels.

Captain Young in his 1869 manual gives two rules for garrison manning levels in "European warfare".

1. A work should have two men per running yard of its parapet.
2. There should be fifteen square feet of internal space per man." (5)

He goes on to say that the first rule applies to larger works and the second to smaller.

The reality is shown by the Warea militia redoubt, which had a maximum garrison of 25 men. In this case the area was *ca* 150 m², and perimeter *ca* 70 m - both figures including bastion and blockhouse. This meant there was one man per 6 m² of area, which was close to the figure for the maximum 1865 redoubt garrison. But there was almost 3 m of perimeter per man, one quarter the manning level of the earlier work at its maximum garrison.

ACCOMMODATION

In living arrangements, the major difference between the two posts results from the practicalities of stockade and earthwork defence. At Omata the living quarters used the stockade as one wall and surrounded an open central yard: at Warea tents were pitched throughout the redoubt, and the area behind the wall kept clear for easy access to any part of the defences.

At Omata and Warea, as elsewhere in Taranaki, the garrisons soon moved out of their defences to make themselves more comfortable outside. Doubtless a guard was maintained within the fortification, which may also have held the hospital,

storerooms and other facilities, but most of the garrison would have slept and eaten outside the walls. At Omata use was made of three existing farm houses adjacent to the work; at Warea a substantial camp was established close to the redoubt gate.

Colonel Warre's redoubt plans show something of the formality of their internal arrangement. Rows of round 'bell' tents take up most of the enclosed area. These are shown back to back, with the outer rows opening to the defences and the inner tents towards a small open area in the centre.

Archaeological evidence at Warea suggests the redoubt was at first entirely filled with tents. Wherever there were excavations, there was evidence for bell tents. The numerous stake holes describing segments of circles in Squares VIII and IX, and also V and VI, suggest that tents occupied this place for longer than within the southern parapet of the redoubt, where stake holes in a thin circle are scattered among the substantial postholes of a later building.

With each tent taking up a circle of approximately 7 m diameter, the redoubt could have accommodated as many as 20 - in four rows of five. This suggests that even at the earliest stage, in May 1865, at least some of the 240 men were accommodated outside, probably also in tents. Colonel Warre allows 12 men in each of 17 rank and file tents, but another 13 tents for officers' accommodation and other purposes. This makes a total 30 tents for a standard two company redoubt, ten more than is likely to have been within the defences at Warea.

We may guess that accommodation and other facilities would have been laid out according to established rules in a standard earthwork such as Warea. This would have been arranged to allow maximum military efficiency, and to maintain order and command structure in the detachment. How this might have been achieved is indicated by Colonel Warre's plan. The actual arrangement at Warea was not discovered.

It was hoped that differences in the rubbish scattered throughout the site might have enabled us to locate the officers' and men's quarters. This proved impossible at Warea as at Omata, but the prospect should not be ruled out in future excavations. There is much of interest that might be said of the relationship of material culture and social structure, as well as of practical arrangements within 19th century fortifications.

An interesting insight into the question of spatial translation of a military structure within a fortification is given in Colonel Alexander's account of the Omata Stockade.

"For a militia force composed of persons of all classes of society, the break in the sleeping apartments caused by the intervention of the officers' room, commissariat store, &c. &c., is a great advantage, as allowing more classification and greater privacy than if the whole were in one long undivided room." (6)

As an Englishman of the officer caste, Alexander was probably more interested in this question than the colonial garrison at the post. Nonetheless, his comment does demonstrate a social factor in space requirements which had to be set against the manning needs of defence.

Within the northern and southern defences of Warea Redoubt, archaeology revealed the path which gave access to the parapet in case of attack. This may also have provided the main route about the redoubt interior as the close packed tents would make movement difficult elsewhere. There is no evidence within the entrance of the 1865 work of any path doing other than turning hard right and left along the walls.

ARTEFACTS

The most obvious difference between the Warea and Omata collections is their sizes. At Omata a substantial rubbish dump was found, whereas at Warea the only concentration of dumped items were the 'tin' cans and bone in the Square VIII pit. The difference between the two collections is shown by bottle glass, almost 180 kg of which was recovered from Omata and only 7.3 kg from Warea. Earthenware and porcelain at Omata totalled 2310.4 g whereas only 54 g was found at Warea. The differences in scale were repeated for other material.

Most items found at Warea were also present at Omata. An interesting aspect of the Warea material is its limited range. This reflects both the isolation and the purely military character of the post.

Clay pipe material gives an example. A total of 35 pieces marked with three identified makers' names were recovered at Warea. From Omata came 57 pieces from 12 manufacturers. Clearly there was a restricted source of supply for Warea. This may have been the result of limited purchasing opportunities, or perhaps favourable terms for troops offered by particular suppliers, or there may have been a contract to supply the army. Nor should the influence of fashion be ruled out among an isolated and close-knit body of men.

The appearance of pipes by the Glasgow maker Murray is a surprise since this firm was taken over three or four years before the post at Warea was established. This may be interpreted in the light of the large number of Davidson pieces. Davidson took over the firm of Murray and may have continued to supply the same outlets from which the troops obtained their pipes. The militia at Omata presumably had ready access to the retailers of New Plymouth. The collection from that post probably reflects the general availability of clay pipes in New Plymouth in the early 1860s.

In buttons too, the Warea range does not match that from Omata. In particular, a wide range of 'trouser buttons' may reflect the character of Omata as a civilian post, with many of

the militia wearing their civilian clothes when not on active duty. Over half the buttons found at Warea were one piece steel buttons which are probably from army issue clothes.

The 43rd and 50th Regiment buttons found at Warea neatly reflect the long-term role at this post by those regiments. It is more difficult to account for the 57th and 65th Regiment buttons and the 65th shako plate at Omata. During the First Taranaki War regimental troops were involved in escorting provisions for Omata. The Omata buttons may reflect that escort duty. The 57th Regiment was alone in providing the British army garrison in Taranaki between the first and second wars, and during those years may have furnished part of the Omata garrison.

Ammunition recovered at Omata also reflects the civilian and amateur nature of the garrison. The presence of bullets from 'brown bess' muskets, Brunswick and Enfield rifled muskets, shotguns, and pistols of six or eight different calibres, indicates a range of arms at the stockade in addition to issued weapons. The .577 Enfield bullets found at Warea represent the standard issue weapon in the British army of the time.

Other Omata material was quite unrepresented at Warea. The abundance of building demolition material in the Square XII ditch, also cloth, coal, footwear, many of the items in brass and iron, the range of earthenware and porcelain, and some types of bottle glass were largely absent. Some of the gaps may reflect the failure to find a substantial dump at Warea. Others will reflect an actual absence.

Fragments of coal were found throughout the excavated area at Omata; none was found at Warea. Omata was close to the source of supply at New Plymouth, and may also have lacked alternative firewood close at hand. Also, during the war of 1860-61, Maori control of rural Omata would have made wood gathering out of range of the stockade's guns a dangerous business. At Warea wood was the only available cooking fuel.

The brick fragments found at Omata, show, along with the Square XII hearth, a considerable use of this building material. Only the one brick was found at Warea, where there were none of the many fragments which indicate wide use at Omata. Again, bricks were not an item likely to win much space in carts transporting supplies to distant troops in the field. Hearths at Warea were made up of boulders from the adjacent beach, worked to shape.

The lady's boot found at Omata was a surprise; it would have been even more of a surprise at Warea. It is possible this item dates from the stockade's final role as a schoolroom. In any event it certainly indicates a civilian presence.

The Omata Stockade was a civilian post with easy access to New Plymouth shops for militia on a day's leave. The range of material found reflects settlers turned soldiers whose wives and

families lived nearby and who were part of the local economy and community. The collection tells a story of the common material culture of Pakeha Taranaki in the early 1860s. The Warea collection is more restricted: it reflects an isolated body of men, with particular sources of goods, campaigning far from their supply depots.

THE INDUSTRIAL REVOLUTION AND COLONIAL ECONOMY

In the middle years of the 19th century there took place what might be termed a second industrial revolution. Whereas the first originated in Britain and was based on steam power and the factory system, the second originated in the United States of America and was based on the production line, on techniques of standardisation, and on the interchangeability of parts in manufactured products. Items recovered at Omata and Warea reflect the influence of the "American system of manufacturing" (7) on industrial production.

Despite the 18th century introduction of steam power and the factory system, for many decades after the turn of the 19th century much industrial production even in Britain was still carried on in the old craft way. By this system, the craftsman, with his own tools and place of work, purchased raw materials and fashioned them into a finished product for sale. The method of manufacture remained substantially the same when the craftsman was supplied with his raw material, under what may be called the "merchant employer system" (8). In this, the merchant employer would pay his outworkers according to production.

The factory system, however, saw the craftsmen and other available labour brought into factories owned by the manufacturer, where they became wage-earning workers (9). The concentration of labour enabled full use of the new machinery and sources of energy. It also allowed the rapid introduction of production line techniques, and the standardisation of parts and processes when new technology became available.

In 1855 was published a British Parliamentary Paper entitled the *Report of the Committee on the Machinery of the United States of America* (10). Along with the reports of George Wallis and Joseph Whitworth on the New York Industrial Exhibition, published among Parliamentary Papers the previous year, the 1855 report served to document and bring to the attention of British manufacturers the great advances being made across the Atlantic in methods of industrial production.

The committee of 1855 was interested particularly in firearms - small arms and artillery. A direct result of its journey to America was the purchase of machinery which allowed enormous expansion of the Enfield works in north London. The technical changes in firearms which took place over the middle

decades of the 19th century have been discussed already in Chapter 2. In Britain, and in Europe as a whole, the manufacture of sufficient new weapons to equip growing national field armies followed introduction of the 'American system of manufacturing'.

Among the material recovered at Omata and Warea, firearm projectiles best demonstrate the rapid advances in the design and efficiency of finished industrial products. The change from smoothbore musket to a breech-loading rifle with centre-fire cartridge was of enormous significance in the history of warfare - and warfare was, of course, what the occupants of the two posts were engaged upon.

The 'brown bess' musket was reasonably accurate up to approximately 150 yards. The Enfield rifle possessed a useful range of 1000 yards. Thus the British soldier in New Zealand benefitted from the urgency imparted to the Board of Ordnance by the Crimean War and other European developments (11).

Other items from Omata and Warea which clearly exhibit technological advances made in previous decades include bottles, china and porcelain, buttons, footwear, 'tin cans' and wire nails. The particular improvements which led to the new products, or vastly improved production of the old, have been dealt with in Chapter 2. Of interest here is the link between increased industrial productivity and the European colonial and military effort in distant New Zealand.

Among manufactured products found at Omata and Warea almost nothing was produced in New Zealand or the Australian colonies. New Zealand exported only raw materials (wool, timber, whale oil and kauri gum), and imported almost all manufactured goods (12). Material found at Omata and Warea tell very clearly of the economically dependent colonial settlement in Taranaki.

Further to this, in the first part of the 1860s the reliance on imports was increased by the large body of economically unproductive troops stationed in the province, at a time when farmland was out of production in the general insecurity.

Regarding the revolutionary changes in production which are reflected in the Omata and Warea collections, one more point might be made: that technological advances are hastened by military requirements is not a characteristic only of the present century. The key industry which impressed upon conservative British manufacturers the advantages of the 'American system' was that of small arms. An entrenched manufacturing system was swept aside by the requirements of national defence. Similarly, the craft-based Massachusetts boot and shoe industry was overcome by the McKay sewing machine when the American Civil War required production which could not be met by the old methods.

In these instances the exigencies of national defence enabled the rapid introduction of available technology, in other industries military needs themselves promoted a search for new methods of production. An example is the preservation of food in 'tin cans', which was developed during the Napoleonic Wars in direct response to the needs of field armies. The Taranaki excavations show this technology also to have played its part in maintaining troops and colonial forces in the field in New Zealand.

It has been suggested that American technological inventiveness in the 19th century resulted from a shortage of labour (13). In America, but not in Europe, capital intensive production was cheaper than labour intensive methods. Even immigration did not greatly increase the supply of labour since cheap land in the New World held a greater attraction than a place at a workbench (14). Thus labour productivity rapidly increased to supply a large home market. In the Civil War the proportion of producers to consumers changed very rapidly. New technology was required for output to keep pace with demand. The Massachusetts boot and shoe industry is a good example of this (15).

In America, improvements in the productivity of labour supplied the growing home market. In Britain and elsewhere in the Old World, new technology resulted in a drive to export the increased production. It also led to redundant skilled and semi-skilled workers in the towns and a lack of urban opportunities for the rural poor. Emigration became an attractive alternative for many people, who in turn helped swell the new colonial market.

Land was central to this process. Primary producers in the colonies complemented the industrial productivity of the Old World. The demand for land lay at the heart of two decades of European military expansion in Taranaki, and in the New Zealand Wars as a whole. At the industrial centre, growing overseas markets reinforced the drive to greater productivity. The redundant workforce meanwhile emigrated to new worlds, carrying with them the products of new technologies to subdue both indigenous people and land.

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