

that from the 1830s some fortified sites assumed the role of permanent or semi-permanent settlements. With the decline in warfare, palisaded or open villages or kainga on low ground became characteristic. The archaeological evidence does not yet provide grounds to question these generalisations, although the use of fortifications prior to the mid-eighteenth century has not been investigated and should not be ruled out.

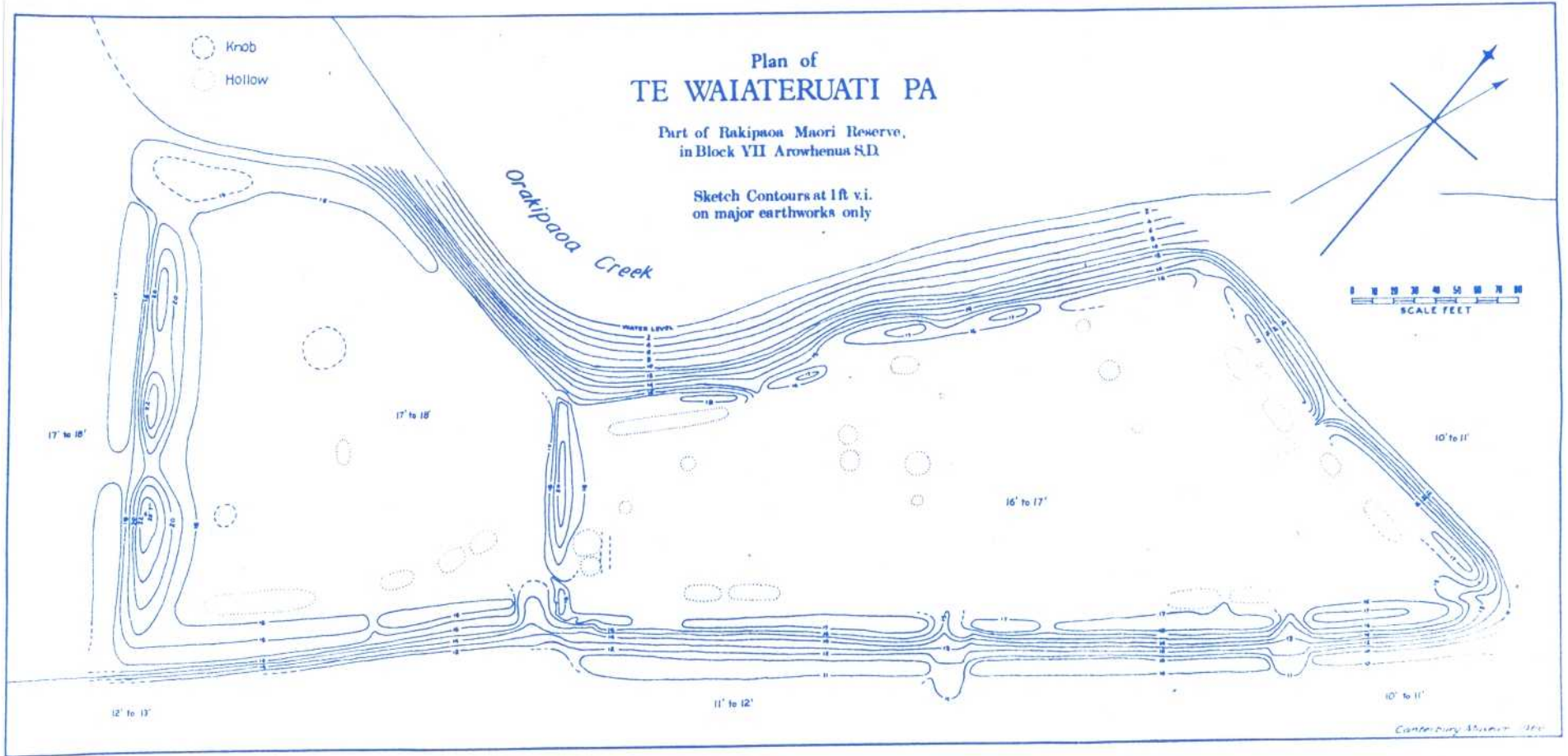
At the two fortifications where excavations have taken place, the defensive structures had more than one phase of occupation, suggesting some persistence of defensive function through time. At Kaiapoi, the Huirapa gateway was a secondary feature, constructed through a previously unbroken defensive perimeter wall (Trotter 1990). The compacted earth bank at the south-west corner of the site contained a quantity of occupational debris indicating occupation prior to the construction of the defences (Jacomb 1992: 100). At Onawe, excavation of the landward earthworks showed that a pair of sub-parallel fences of closely spaced stakes had preceded the earth wall (Trotter 1986a). Artefacts found at these and other sites are consistent with a relatively late date (greenstone adzes, a pendant, and tikis, and a greywacke patu butt at Onawe, McCulloch 1982; a fragment of lead waste from the Kaiapoi bank, Jacomb 1992: 100; and crockery and clay pipes from Te Mata Hapuka, M37/22, site record form).

The existence of fortifications implies the need by social groups to defend their occupation of territory and its resources. The distribution of fortified sites (Figure 20) therefore indicates the existence of permanent populations in the Kaiapoi, Horomaka, Waihora, and Temuka areas. The small sizes of most of the defended areas (up to 6,000 sq m, calculated from available site plans; see Appendix 10) suggest that the populations were not large. Fortified sites with relatively little evidence of interior settlement may have functioned as refuges for occupants of kainga in the vicinity (e.g., Birdlings Pa). Those full of terraces may themselves have been occupied by up to 100 to 250 people; for example, Pae Karoro, about 14 terraces; Oruaka, inner unit, about 30 terraces; Kaitara, about 11 terraces; Pa Island, about 14 terraces; assuming about 9 people per terrace (6 persons, plus small children; Fox 1983: 7). The larger flat land sites (e.g., Kaiapoi, Orariki, Te Mata Hapuka, Waiateruati) are on a scale suggesting permanent occupation. Historical evidence indicates that such populations were nevertheless very mobile. For example, the inhabitants of the Waiateruati district in summer were dispersed at fishing camps, cultivations and ti kouka harvesting sites (Leach 1969: 48; Anderson 1980).

3.3 Terraces and houses

Terraces have been recorded on 9 sites classified as fortifications and at 18 other sites (Figure 20, Appendix 11). All of these, except three of the undefended sites, are on Horomaka (Banks Peninsula), where the topography is conducive to terrace construction.

The field evidence, although of a variable nature, suggests that the terraces supported buildings. Several terraces have been excavated at Pa Bay (the largest terrace site, about 60 terraces; Brailsford 1981: 165-172) and have been shown to have been occupied by substantial rectangular houses. At Panau, up to 20 possible but sites have been identified, 11 with hearths, usually on irregular terraces between the cliff and the beach (Jacomb 1995: 59). Unfortunately the shapes and sizes of the structures are not recorded. Terraces at Napenape, south of the mouth of the Hurunui River (N33/16; site record form), have



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Figure 22 Archaeological plan of Te Waiaateruati near Temuka, K38/12.

shallow bowl-shaped depressions of the sort interpreted as houses in Marlborough (Challis 1991: 105; see also Brailsford 1981: fig. 119).

Most Canterbury terrace sites are small (14 terraces or less), suggesting small populations, perhaps up to 20 to 125 persons, assuming about 9 persons per terrace (Fox 1983: 7). The 25 recorded terrace sites compare with 230 recorded in the Nelson-Marlborough region (Challis 1991: 108), a reduction which may be in part a consequence of regional topographic difference, or in part an indication of climatically induced preference for less elevated or exposed settlement sites, or perhaps also a reflection of lower population densities.

Although excavations have been conducted at over 120 sites in Canterbury, most of these have been small scale, so that little evidence of domestic structures (Appendix 12) or settlement layout is available. Atholl Anderson (1986: 102, 109) has reviewed the scanty evidence, and has concluded that round huts were the standard Maori dwelling type in southern New Zealand in most of the pre-European period. He accepted the 2.8 m diameter hollow at Grays Hills quarry site and the circles of fire ash 4 to 6 m across at Normanby No. 1 (Irvine 1943: 90; Griffiths 1941: 215) as evidence of dwellings. A semi-circular but site 3 to 4 m across at Tumbledown Bay (Te Kaio) is possibly dated to the sixteenth century (NZA 338, NZ 7654, NZ 7656, NZ 7745; Allingham 1988). Arrangements of stones thought to be hearths have been identified at moa-hunting sites in the Waitaki catchment, but no associated structures have been defined (Waitangi, Duff 1956: 272; Killermont No. 2, McGovem-Wilson and Bristow 1991: 31; Te Akatarewa, and Shepherds Flat, Trotter 1970a: 448).

Small rectangular dwellings have been reported at Rakaia River Mouth (4.6 x 2.1 m, thought to be later than moa-hunting; Haast 1871: 96) and at Ikawai near the Waitaki River (2.7 x 2.1 m, also possibly of late or European contact period date; Vincent 1980b: 35). The sizes of the rectangular houses of the European contact period excavated at Pa Bay (from 5.5 x 3.4 m to 11 x 4 m; Brailsford 1981: 165-172) suggest permanent or semi-permanent occupation, consistent with records of "chiefs' houses" elsewhere (Prickett 1982: fig. 4). It is possible that rectangular houses were more prevalent in the late period.

It has been persistently asserted that pre-European Maori houses in the South Island were frequently constructed in pits (Trotter 1977: 373). A round raised-rim pit excavated at Waikakahi has been interpreted as a pit dwelling but, in the absence of detailed publication of the evidence, the reconstruction drawing should be regarded as conjectural (Brailsford 1981: 153-154, fig. 137a). It is likely that shallow bowl-shaped depressions could remain from circular huts (Anderson 1986: 94-95; Challis 1991: 105), and that shallow rectangular depressions could remain from rectangular huts (e.g. M36/14, depression 3 x 2.7 m, 105 mm deep; Stoddart Point, Te Upoko-o-Kuri; Andersen 1927: 223). However, most round raised-rim pits in Canterbury are likely to have been earth ovens (see chapter 2.8).

4. CHANGE

Although the archaeological evidence has limitations, it is apparent that changes took place in the Maori settlement patterns, subsistence activities, and material culture of Canterbury during the pre-European period. This chapter discusses these changes, incorporating conclusions reached in previous chapters together with some additional material.

4.1 Changes in settlement patterns

The rhythm of seasonal change in traditional Maori subsistence and settlement in Canterbury is stressed in ethnographic and historical accounts relating to the early nineteenth century and in inferences drawn from scientific ecology (Leach 1969; Anderson 1988; Beattie 1994). Maori people made regular annual movements, in the period from late spring through summer to autumn, to exploit seasonal flushes in food availability, and to preserve the produce for subsequent use. In the course of this annual dispersal, wide areas of coastal and inland territory were utilised for supplies such as fish, birds, and plant foods. The associated settlement pattern, of permanent base settlements where the population spent much of the winter, and seasonal specialised activity sites to which they dispersed at other times, appears to have been typical of the whole of New Zealand (Davidson 1984: 145-146, 166-170). It has been fully documented for the Waiateruati district in south Canterbury in the period 1844-1853 (Anderson 1980).

Archaeological evidence of patterns of pre-European Maori settlement and seasonality in Canterbury is sparse. Many detailed investigations of settlement sites and analyses of midden materials are required to establish the age and duration of occupation, the seasonality of resource use, and the domestic, communal, and regional patterns of organisation. However, the ethnographic, historical, and ecological evidence of complex seasonal patterns at the time of European contact is strong, and this encourages the interpretation of available archaeological evidence in similar terms.

Most sites associated with moa-hunting on the Canterbury coast have been thought to have been seasonally occupied, because of the limited range of activities and artefacts represented and the limited evidence of dwelling structures (Teviotdale 1939: 178; Trotter 1972a: 144; Orchiston 1974: 3.16-3.78, 3.121-3.145; Anderson 1982: 56-60). The Waitaki River Mouth site has been interpreted as an intermittently occupied moa-hunting camp and as a transit camp for summer inland expeditions into the Waitaki catchment for birds and silcrete. Sites at Waihao River Mouth, Pareora, Normanby, and Opihi River Mouth (these and other sites marked on Figure 3) may also have functioned as transit camps, in relation to a pattern of summer fowling and ti kouka gathering in the south Canterbury downlands. The Rakaia River Mouth site has been interpreted as a specialised moa-kill site occupied seasonally on a prolonged basis. Other coastal sites between the Rakaia and the Rangitata such as Wakanui may have been part of a similar pattern of repeated occupation (Trotter 1977: 358-359). Sites at the mouths of the north Canterbury rivers (the Waipara, Hurunui and Waiau) and smaller streams (such as the Motunau and Jed) have been explained as seasonal transit camps relating to inland bird exploitation.

These coastal moa-hunting sites can therefore be seen to relate to broader seasonal patterns of occupation and specialised activity in the Canterbury region. Generally, it is suggested that inland activities such as birding, fishing, plant food gathering, and probably stone quarrying were accessed from seasonally occupied coastal transit camps. Indications of seasonality of rock shelter occupation include the occurrence of moa egg shell (see chapter 2.1) and the bones of inland-breeding birds (see chapter 2.2). In north Canterbury the downland rock shelter sites may represent seasonal occupations during which birds and kiore were obtained (Orchiston 1977: 115-116; Trotter 1972b: 49-50). Single itinerant events are represented by isolated oven sites such as Mt Donald (Orchiston 1977: 114-115; NZ 1286). Similarly, the rock shelters and umu ti sites of the south Canterbury downlands probably also represent specialised seasonal activity. The collectively numerous but individually temporary and often small scale open sites and rock shelters of the Waitaki catchment can be interpreted in the same way (e.g., Ambrose 1970: 434; Trotter 1969, 1970a).

The moa-associated sites of the north and south Canterbury coast have thus been labelled "landward orientated" (Orchiston 1974: 3.60), meaning that they were occupied because of the values of their hinterlands. They therefore possessed an "interior focus" of subsistence orientation (Anderson 1982: 59). Characteristically they offered the inherent advantages of their usually river mouth locations: safe canoe landings, dry terrace camping sites, fresh water, and good local food resources, along with easy access to the interior. Individually, whether large or small, the sites typically comprise discontinuous patches of ovens and middens (the remains of moa and other locally obtainable resources), representing frequently repeated horizontally separate occupations (Orchiston 1974: 3.27-3.28; Anderson 1982: 60). Separate activity areas for processing of stone tools have usually been identified (e.g., basalt at Waitaki and silcrete at Waihao; Orchiston 1974: 3.39 and 3.77). Collectively the sites form a dispersed distribution, suggestive of highly mobile populations of small group size and low density taking advantage of complex patterns of resource abundance and the congenial travel conditions of the spring to autumn period.

Not all moa-associated sites on the Canterbury coast appear to fit the "interior focus" characterisation. Dashing Rocks at Timaru, for example, appears to have been a fishing camp of no great duration (predominance of fish and seal bone, with moa, smaller bird, and kuri bone, shell midden, and uncompleted fish hooks; Mason and Wilkes 1963a; Anderson 1982: 59). Some moa-associated sites on Horomaka (Banks Peninsula) may also have been predominantly coastally orientated, small and briefly occupied (e.g., Purau and Pigeon Bay; Trotter 1977: 357; also Takamatua; Trotter 1973a). An additional pattern of temporary "coastal focus" camps on rocky coasts is indicated.

It has been suggested that the permanent settlements in the moa-associated period would have been located where a full range of resources (of the rocky shore, soft shore, open sea, estuary, wetland, and forest) were all accessible, permitting a year-round broad-spectrum subsistence strategy (Anderson 1982: 59-61). Horomaka has been suggested as the likely area (Orchiston 1974: 3.45). One site generally thought to have been a permanent overwintering base camp is Redcliffs Flat (Trotter 1975b: 204-207; Orchiston 1974: 3.45-3.59; Anderson 1989a: 126-128). Reasons for this assessment include the variety and wealth of local environments and associated food supplies, the substantial faunal lists from midden

analyses, the diversity of artefacts and the evidence of artefact manufacture (adzes and fish hooks), the large size and repeated use of ovens, the evidence of vertical stratigraphy, the nearby burial area (Haast 1874b), and the sheltered local climate. A long-term multiple function site is indicated.

Other permanent or semi-permanent base camps were probably established on Horomaka. At Panau (Figure 11, the beach terrace marked "excavated area", N36/72), occupation may have occurred without a break from the fourteenth century onwards (Wk 2569 and Wk 2570; Jacomb 1995: 98-104). At Tumbledown Bay (Te Kaio), occupation may have spanned the sixteenth and seventeenth centuries (discussed in chapter 4.3) and may have been semi-permanent (Allingham 1988). The Tumbledown Bay site lay close to a variety of local environmental zones and was not far distant from the lakes and wetlands bordering Horomaka to the south west. It exhibited a range of fish, shellfish, and bird exploitation, separate activity areas for dwelling, cooking, and adze manufacture, vertical stratification, and an adjacent burial ground. The Panau and Tumbledown Bay evidence suggests some continuity of settlement pattern through the transition from moa availability to moa extinction and possibly an increase in relatively permanent coastal settlement. It has been suggested that, after moa extinction and substantial deforestation had occurred, patterns of settlement were more concentrated on and near Horomaka. This area permitted a coastal subsistence orientation substantially based on fishing and shellfishing (Anderson 1981b: 156).

Patterns of dispersed seasonal specialist activity apparently continued, although the dominance of river mouth sites characteristic of the moa-associated period was not maintained. Long term patterns of seasonal fishing, birding, and plant food gathering are probably represented by the many oven and find spot sites, undated but in most cases apparently not associated with the moa, recorded on Ka Pakihi Whakatekateka o Waitaha (the Canterbury Plains), on the river terraces, and in the foothills (e.g., Smith 1900; Trotter 1973b: 142; Rains and Rains 1992). In the downlands, cropping of ti kouka at sites such as Limestone Hills and Holmeview, and visiting of rock shelter sites such as Timpendean and Glen Gynk, continued. The discovery of a framed back pack at Flock Hill dated to the fifteenth to early seventeenth century (NZ 7466) illustrates inland load-carrying activity (Trotter 1987). Dispersed coastal occupation continued (e.g., Motunau Beach, NZ 1538, probably sixteenth century). Such wide ranging patterns of seasonal settlement probably continued through into the nineteenth century when they were recorded historically (Anderson 1988: 74-83).

Major concentrations of evidence in low-lying areas north and south of Horomaka suggest settlement nucleation in these vicinities. Persistent and intensive activity is indicated by 60 ovens or groups of ovens recorded on the western side of Waihora and over 100 areas of deflated ovens recorded on Kaitorete Spit (Orchiston 1974: fig. 2.155; Palmer 1980: fig. 4). Although in most cases any material other than stone in sites on Kaitorete Spit has been blown away, a rare discovery of scraps of in situ faunal material (Palmer 1985: 5) included the bones of seal, kiore, fish, and bird including moa (Leach 1993). Radiocarbon dates from two other Kaitorete ovens suggest use of the area both during and after the moa-hunting period (NZ 7055, NZ 7056, charcoal of indeterminate inbuilt age). In the Kaiapoi vicinity, 140 shell middens have been recorded (see Figure 9), 50% of them

with associated oven evidence, suggesting persistent activity from the fifteenth century onwards (see chapter 2.6).

The existence of fortifications, possibly mostly after the mid-eighteenth century, implies permanently settled populations in the Kaiapoi, Horomaka, Waihora, and Temuka areas (see Figure 20). A pattern of fortifiable coastal positions adjacent to village sites is apparent (Orchiston 1979: 179), and is illustrated at Pa Bay, where a headland fortification lies adjacent to a village of apparently permanent rectangular houses of the European contact period (Brailsford 1981: 165).

Lists of Maori settlement sites of the early nineteenth century have been compiled from traditional and historical sources (Orchiston 1974: table 2.5; Anderson 1988: figs. 14 and 15). Maori kainga or villages of this period were usually palisaded. Some have been recorded archaeologically (e.g., Kaikainui near Kaiapoi, location marked on Figure 9, M35/17; Waikakahi, M36/78; Brailsford 1981: map 95d, 151-154). The importance of food storage is illustrated, for example, by the prominence of raised platforms in sketches of Rakawakaputa near Tuahiwi in the 1840s (Brailsford 1981: pl. 39, 40). By this stage there had been a migration of populations to the Horomaka harbours frequented by trading vessels and whaling ships, particularly to Akaroa, Koukourarata (Port Levy), and Whakaraupo (Lyttelton Harbour; Anderson 1988: 34-35, 76). There was increasing nucleation of settlement elsewhere at permanent locations a short distance inland (e.g., Kaiapoi-Tuahiwi, Arowhenua-Waitemate near Temuka, and Waimate). The market economy and the introduction of new crops required a more sedentary settlement pattern (Anderson 1988: 78-81).

Continuities in Maori settlement patterns in Canterbury prior to European influence were the apparently limited number of permanent settlements, and the wide ranging dispersal of seasonal transit camps and specialist activity sites. Permanent settlement always focused on Horomaka at various localities, with later nucleations also in the Kaiapoi, Waihora, and Temuka areas. Seasonal occupation in the moa-associated period was dominated by river mouth locations which provided access to the open sites and rock shelters of the interior, principally in the downlands and the Waitaki catchment. Later the role of the river mouth sites was much reduced, but seasonal dispersal remained complex and widespread on the coasts, plains, river terraces, and foothills. Under the effects of European influence, settlement patterns became increasingly nucleated and sedentary.

4.2 Economic change

The Canterbury coast offered abundant and varied terrestrial, riverine, and marine food resources for new human populations (McGlone *et al.* 1994: 150). It has been suggested that because of this it was one of the first areas of New Zealand to be settled by Maori (Grant 1994: 183, 188). The priority of its initial settlement cannot be proved. However, the evidence of subsequent food consumption demonstrates a wide range of easily obtained meat supplies, particularly seals, shags, shearwaters, petrels, penguins, fish, and shellfish in the marine environment; terrestrial shrubland birds, notably the moa species and also wekas and quails; waterfowl, freshwater fish, and freshwater shellfish in lagoons, braided rivers, and streams; and forest birds. It is envisaged that highly mobile groups camped at the mouths of streams and rivers and applied hunting and gathering techniques to an

abundant and easily exploited food resource. Inland areas were also scoured for materials for tools, and food was obtained in transit.

Population numbers may have risen rapidly after first settlement in the favourable conditions afforded by abundant supplies of hunted and gathered food (McGlone *et al.* 1994: 154-155). Radiocarbon dates indicate occupation of a number of coastal sites near rivers and streams in the fourteenth and fifteenth centuries (see Figure 2). In the same period, substantial deforestation occurred. The largest coastal sites were near major river mouths (e.g., Rakaia River Mouth and Waitaki River Mouth, and Redcliffs Flat, to which the mouth of the Waimakariri River was at that time adjacent). The proportions of different food supplies such as seals, moas, other birds, fish, and shellfish varied from site to site. For example, there was large scale specialisation in the hunting of shrubland species of moa at Rakaia River Mouth and Waitaki River Mouth, suggesting the preservation of seasonal surpluses. In contrast, there was a diversified economy with emphasis on seals at Redcliffs Flat (see Table 1). Seasonal inland expeditions may have been frequent, including the hunting of moas in the nesting season and the taking of forest birds and waterfowl, kakahi (freshwater mussel), eels, and native trout. Ti kouka exploitation in south Canterbury, and perhaps more widely, constituted a significant seasonal horticultural activity.

By the sixteenth century, substantial deforestation had occurred. The South Island goose and the New Zealand swan may have been extinct, and moas and other vulnerable bird species such as the adzebill and Finsch's duck were probably scarce. Kekeno (New Zealand fur seal) colonies had retreated to the south. At this stage, settlement may have become more focused on the Horomaka (Banks Peninsula) coast, where fishing (particularly for maka, hoka and hapuku), shellfishing, and fowling (including remnant moas) provided a continuing livelihood. This transition can possibly be observed at Tumbledown Bay (Te Kaio) where a wide range of foodstuffs in layer 3 (including moas, marine mammals, kuri, kiore, fish, and shellfish) was followed in layer 2 by the disappearance of moas and later in layer 1 by the dominance of shellfish (Allingham 1988). Greater emphasis may have been placed on the preservation of seasonally abundant foods.

Pressure on a reduced range of hunted and gathered foods might have led to a slight decline in population (Anderson 1988: 82). It has been suggested that a period of cooler weather in the seventeenth and early eighteenth centuries made conditions particularly difficult (Grant 1994: 170, 189). The unsuitability of the Canterbury region for kumara horticulture, a fundamental comparative disadvantage of southern New Zealand, is likely to have been a factor leading to smaller population size compared with areas further north in the period after moas ceased to be abundant.

During the seventeenth and eighteenth centuries, settlement appears to have focused in the Kaiapoi, Horomaka, and Taumutu areas, in proximity to marine fishing and shellfishing grounds and to extensive areas of swamp and lagoon. An increased dependence on locally concentrated resources such as estuarine shellfish and raupo rhizome could be represented, respectively, by many shell midden sites in the Kaiapoi vicinity, and many oven sites west of Waihora (see Figures 9 and 12). Marine mammals, birds, and kakahi (freshwater mussel) were still taken. Karaka orcharding occurred in sheltered coastal localities. It

is thought that the occupation of general-purpose coastal settlements was probably continuous and permanent (e.g., Panau; Jacomb 1995: 71, 104).

Although all the main settlements were located in the coastal zone, inland foraging continued over large areas for a wide variety of seasonal foods documented ethnographically but rarely archaeologically, perhaps particularly eels, wekas, kiore, and plant foods (Leach 1969: 84, 88; Anderson 1988: table 5, figs. 28-30). Ti kouka harvesting in the south Canterbury downlands and foothills continued, but with rectangular umu ti rather than round, late in the sequence. There are exclusively Canterbury distributions of adze forms of the middle to late pre-European period which have been claimed to relate to widespread plant food gathering on Ka Pakihi Whakatekata o Waitaha (the Canterbury Plains).

Non-archaeological evidence (historical and ethnographic, Anderson 1980; 1988: figs. 14 and 15) provides a clear indication of the pattern of Maori subsistence in the early nineteenth century. The introduction of the potato allowed the extension and intensification of agriculture. The seasonal round of extensive coastal and inland hunting and gathering, which had provided continuity of subsistence patterns at least since the earliest colonising period of greatest abundance, was not abandoned (Leach 1969: 43-57), but declined as access was denied by European occupation. The success of the potato, the utility of European materials and technology, and the benefits of trade and the market economy brought extensive modification of economic patterns.

It is estimated that in 1840 the Maori population of mid-Canterbury was about 500, and of south Canterbury and north Otago was unlikely to have exceeded 200 (Anderson 1988: 32, 38). The population may have been higher than this at the height of moa-hunting, and slightly higher around 1800 AD following the introduction of the potato (Anderson 1988: 82).

The principal subsistence continuities in the Maori economy of Canterbury prior to European influence were the reliance on the hunting and gathering of a wide range of natural food supplies over large areas from settlement foci in the coastal zone, the unimportance of kumara horticulture but the cropping of ti kouka and other plants, and the use of the earth oven cooking method (Anderson 1988: 81-83). Economic changes within these continuities were associated with progressive reductions in species diversity and availability through extinctions and contractions in range (particularly of avifauna and marine mammals), and the process of deforestation. Hunting of the larger species such as moas and seals became less important, and fishing, shellfishing, and probably plant food gathering became more important. These changes, which appear to have been in progress in the sixteenth century, might have led to a slightly reduced population size. The advent of European influence was marked by a major subsistence discontinuity, the introduction of the potato, which ushered in the progressively massive changes in settlement and economy in the nineteenth century caused by the European influx.

4.3 Changes in material culture

In their interpretations of cultural change in the South Island, archaeologists have identified two main phases: a so-called Moa-hunter Period or Archaic Phase, followed by a so-called Maori Period or Classic Maori Phase (Golson 1959; Duff 1962, 1967). Detailed artefact

analysis has suggested a path of gradual development within Archaic material culture, followed by a sharp change to widespread new artefact forms described as Classic Maori (e.g., Hjarno 1967:40-41; Simmons 1973: 52-53,55). The apparent lack of a perceptible period of progressive typological transition from the late Archaic to the Classic Maori has made it impossible for archaeologists to effectively classify Canterbury material culture in other ways. It has encouraged the view that this cultural change was not brought about by progressive regional developments or by cumulative influences such as trade, but was caused by incursions of people from the North Island (Duff 1967: 124-128; see also Leach, B.F. 1978; Leach, H.M. 1978). An important recent artefact analysis by Chris Jacomb has allowed a reassessment of the extent to which the two-phase framework is consistent with the archaeological evidence from Canterbury (Jacomb 1995).

The early period or so-called Archaic Phase in Canterbury can be defined most conveniently by association with the moa (Jacomb 1995: tables 4 and 5). Artefacts found in sites dated to the fourteenth and fifteenth centuries include a distinctive range of adze forms, frequently in metasomatised argillite from the Nelson region and occasionally in basalt, and often massive (particularly Duff types IA, 2A, and 4A; e.g., Rakaia River Mouth and Motukaraka; Trotter 1972a: 146-147; Duff 1940). Greenstone adzes were not common. Distinctive butchering and food processing tools (knives of slate and greywacke and blades of silcrete), fishing equipment (especially simple one-piece bait hooks of moa bone and minnow-shaped lure hooks), and ornaments (reel, whale tooth, shark tooth, and *Dentalium solidum* forms) were characteristic of the moa-hunting period (Anderson 1989a: 154-170). Many artefacts display an impressive technological artistry which in some cases extends well beyond the functional. The ornamental minnow-shaped lure shank in red argillite from Rakaia River Mouth (Trotter 1972a: fig. 4a), knife-shaped pectoral amulets decorated with incised fish designs (Skinner 1974: figs. 4.97 and probably 4.99), whale tooth and reel ornament forms, the use of the prodigious green silicified tuff from Gawler Downs (Figure 13), and massive adzes, suggest a demonstratively chiefly or ceremonial element in society. An early style of rock shelter art, named Early Polynesian by Tony Fomison, displays communal preoccupations with hunting and ancestry (Figure 17 and Figure 18 upper). Detailed chronological and typological progressions within South Island Archaic material culture have been proposed (Orchiston 1974).

It is sometimes suggested that the early communities were visitors whose permanent habitations lay to the north (Teviotdale 1932: 91; Grant 1994: 189). The presence of imported materials, particularly Nelson metasomatised argillite and Mayor Island obsidian, indicate far-reaching networks. However, regionally distinctive elements of material culture, in the period during which the moa was extant, suggest permanent populations within the region. These include the discovery, exploitation, and localised distribution of Canterbury stone resources, particularly Gawler Downs silicified tuff and possibly Horomaka basalt, and the distribution of slate and greywacke knives which are rarely found north of Canterbury (Anderson 1989a: fig. 12.1). Regional and local variations in Fomison's Early Polynesian Style of rock art (e.g., different in south Canterbury from north Otago) suggest established groups with defined territories rather than freely ranging groups from distant homes. Graves accompanied by adzes and dentalium shell ornaments at Moa-bone Point, adjacent to the permanent settlement at Redcliffs Flat (Haast 1874b; Harrowfield 1969: 101), represent one locus of group identity.

The material culture of the so-called Classic Maori Phase is very different from the Archaic (Jacomb 1995: tables 4 and 5; distinguished for the South Island generally in Simmons 1973: some types of artefact listed in his table 12). There were some continuities of long-lived simple functional forms, such as plain rectangular-sectioned adzes and flake adzes, bone needles and pins, plain bird spears and harpoons, and stone flakes and hammers. Apart from these, the artefact types previously described as characteristic of sites associated with the moa are not present in so-called Classic Maori assemblages.

One example of the late period material culture in Canterbury is an assemblage from Hohoupounamu (Figures 23 and 24; excavations not published; information courtesy of Canterbury Museum). Radiocarbon dates from the site (Appendix 2) suggest a first occupation possibly in the fifteenth or early sixteenth century, and subsequent occupation probably in the seventeenth or eighteenth century. Artefacts include a small argillite adze (Figure 23A) and part of another (23B) of indeterminate form, many greenstone adzes and chisels, most of them very small (23C-J), fully barbed bird spears (24C-E), a notched and barbed two-piece fish hook point (24F), a plain unperforated tattooing chisel (24K), a patu (24L), bone toggles (24M, N), perforated teeth (human and dog, 24P), pendants in greenstone (24Q, unfinished) and bone (straight, curved and kinked, 24R-U), a bone comb (24V), *Dentalium nanum*, and bone pins, needles, awls, and threaders (not illustrated). The Hohoupounamu items appear utilitarian, in contrast with the high status of other late forms of artefact such as hei-tiki and large greenstone adzes known from the nearby Kaiapoi pa (Jacomb 1995: 72-73).

Also different in the later period in contrast with the earlier in Canterbury is a style of rock art named Classic by Tony Fomison (more mythological and not so symbolic of hunting; Figure 18 lower). Not found in moa association are distinctively Canterbury forms of adzes (Orchiston types J3 and K3; see Figures 14 and 15). These, and the rarity of certain adze types characteristic of other areas (e.g., chin-ridged adzes common in the Nelson region), suggest a relatively self-reliant Canterbury population and the ongoing development of regional cultural distinctiveness. The extent of greenstone working suggests a well established local industry based on a South Island resource.

It is important to determine whether any perceptible transition exists between the so-called Archaic Phase and Classic Maori Phase of material culture in Canterbury. Occupation at Tumbledown Bay (Te Kaio) spanned the transition from moa availability (layer 3, probably sixteenth century) to local moa extinction (layers 2 and 1, sixteenth and seventeenth centuries and possibly later; Allingham 1988; excavations not yet fully published; see Appendix 2 for radiocarbon dates). Elements of material culture in layer 3 characteristic of the Archaic Phase are adzes of Archaic form (types IA and 3C), one-piece fish hooks in moa bone, and a whale bone amulet (Allingham 1988: fig. 4; a form termed the Parson's pendant and regarded as early by Orchardson, 1974: 2. 287, fig. 2. 194; cf. Ahuriri, Ambrose 1970: fig. 4a). Various other artefacts thought typical of the Archaic Phase are not present: there are no minnow lure points or shanks, and no ornaments of reel type. However, there are items usually thought typical of the Classic Maori Phase in layer 3, such as a broken butt of a possible gouge in sawn greenstone, shell discs (some with notched edges), shank barbed one-piece fish hooks (Allingham 1988: fig. 5o, p; Hjarno type D4f), and notched and barbed two-piece fish hook points (Allingham 1988: fig. 5j, m; Hjarno type C4).

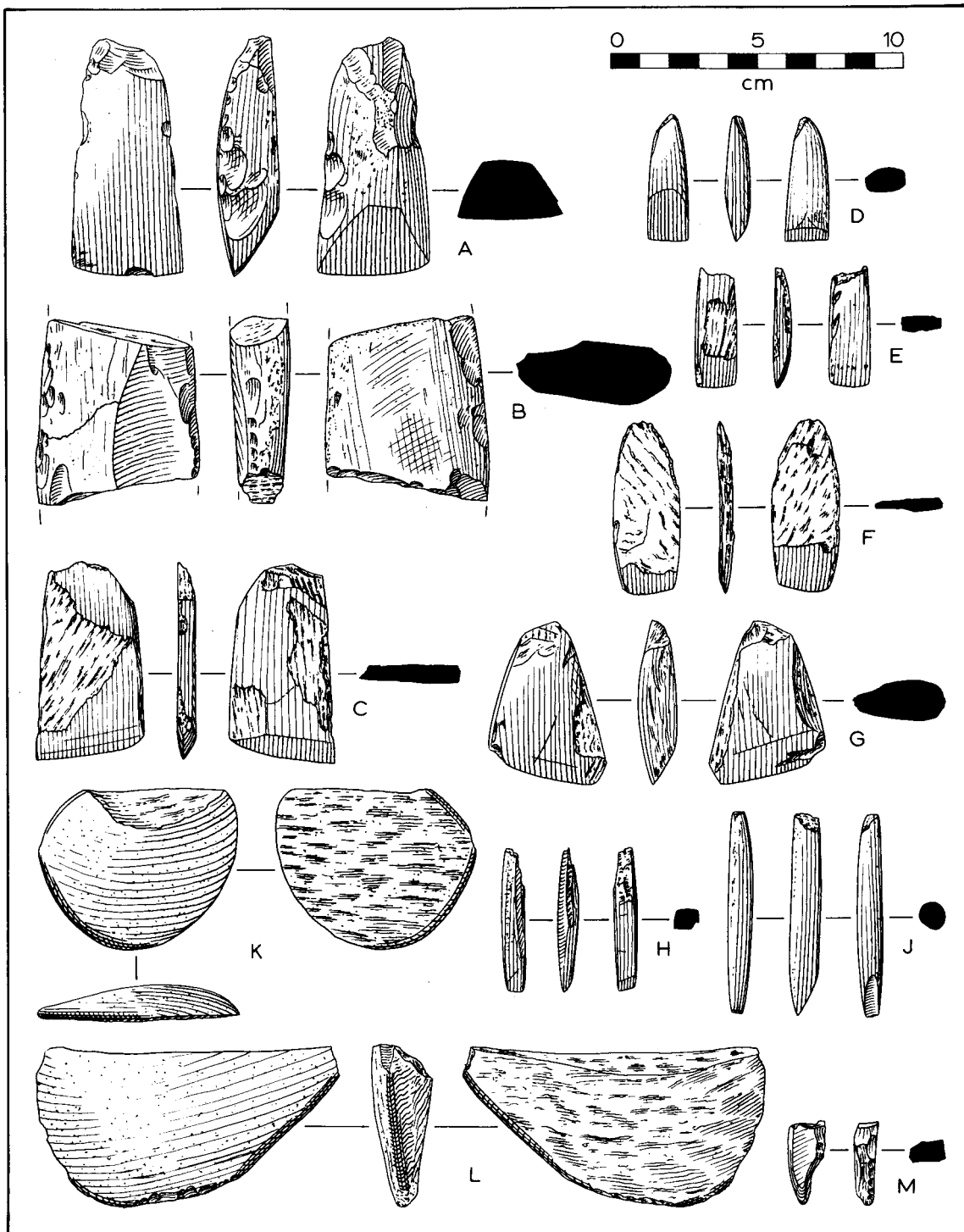


Figure 23 Artefacts from Hohoupounamu, M35/12 (A, C, G: middle layer; D, E, H, K, L: upper layer). A: metasomatised argillite adze; B: (?) argillite adze; C-J: nephrite adzes and chisels; K-L: greywacke spall cutters; M: flint drill point (descriptions in Appendix 13.4).

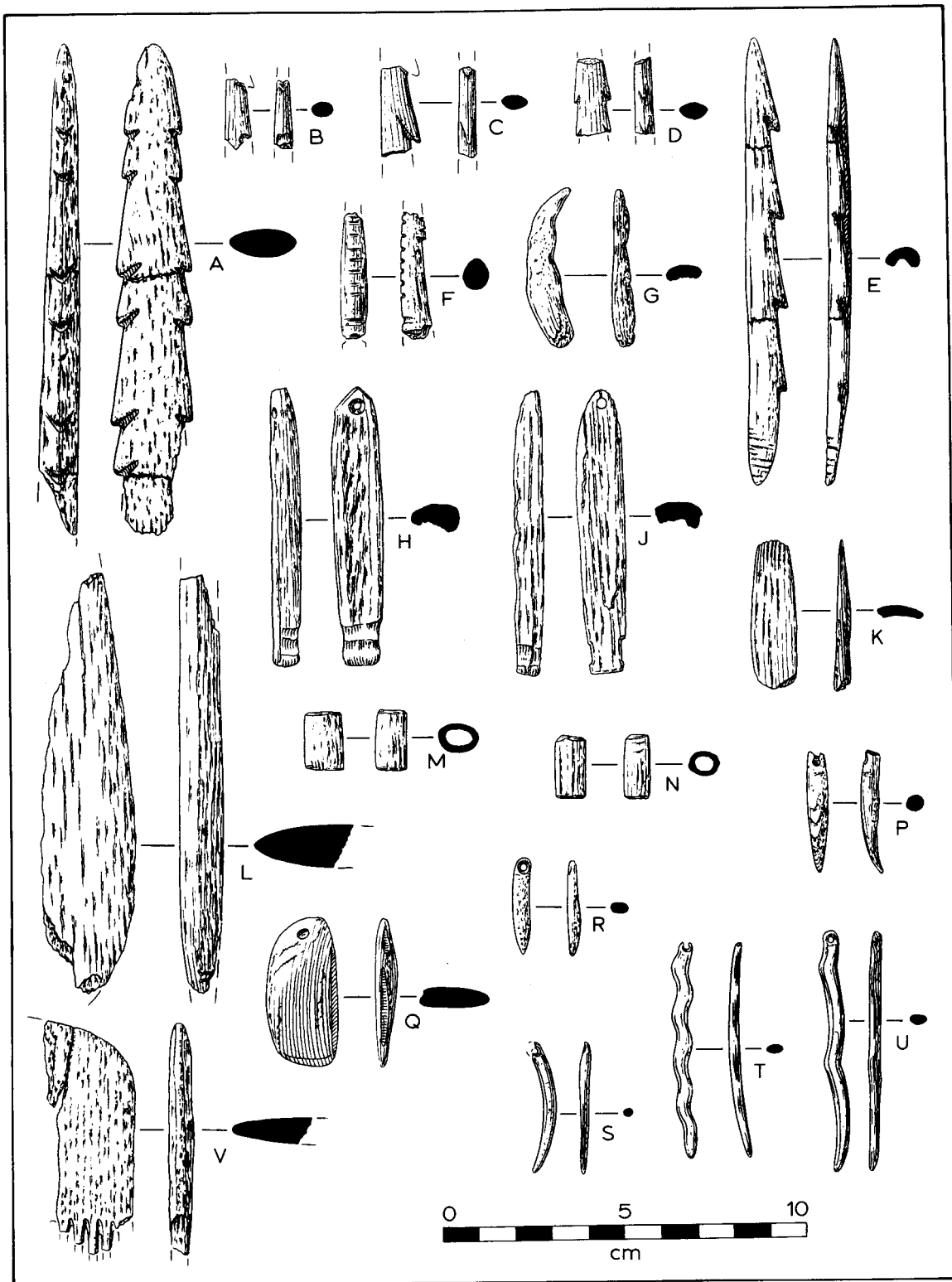


Figure 24 Artefacts from Hohouponamu, M35/12 (E, M: lower layer; H, P, R, S: middle layer; A, B, C, G, K, N, T, U, V: upper layer). A: whale bone spear point; B: bone harpoon point; C, D, E: bone spear points; F: bone fish hook point; G: bone barracouta lure point; H, J: moa bone minnow lure shanks; K: bone tattooing chisel; L: whale bone patu; M, N: bird bone toggles; P: dog tooth pendant; Q: nephrite pendant; R, S, T, U: bone pendants; V: whale bone comb (descriptions in Appendix 13.4).

The importance of the Tumbledown Bay evidence is that forms related to both the Archaic Phase and the Classic Maori Phase as previously defined by archaeologists are present in the same deposit. This calls into question the basis of the two phase classification.

Further, the Tumbledown Bay assemblage contains a range of forms which are characteristic of neither the so-called Archaic Phase nor the Classic Maori Phase. Fish hook forms identified in a recent seriation study as transitional between the two phases (Jacomb 1995: 193-198) are bone two-piece bait hook points of Jacomb type C3c (Allingham 1988: fig. 5k, 1), bone two-piece bait hook shanks (Allingham 1988: fig. 5a, h), shell one-piece hooks (Hjarno type D1a; Allingham 1988: fig. 5q), and notched barracouta points (Hjarno type A2; Allingham 1988: fig. 5g, s). These forms may represent an intermediate period between the Archaic Phase and the Classic Maori Phase. To them might be added the shank barbed one-piece fish hooks and the shell discs mentioned above, and possibly an increasing use of greenstone. The recent seriation study (Jacomb 1995: fig. 170) has also identified the assemblages from Moa-bone Point Cave and Monck's Cave as similarly transitional, characterised by some of the same intermediate forms (Skinner 1923; 1924; Trotter 1975b: fig. 13).

The Tumbledown Bay evidence therefore suggests an intermediate phase characterised by transition and innovation. It provides an impression that cultural change was in progress within the region, rather than introduced by incursions of people from elsewhere. For example, the distinctive Canterbury sub-variety among the barbed two-piece fish hooks (Jacomb type C3c; see Figure 8) suggests that the proliferation of notched and barbed two-piece hooks was at least in part a Canterbury development. The shank barbed one-piece hook, present in the lowest cultural level at Tumbledown Bay, cannot be interpreted as a marker of late intrusion from the North Island. The evidence suggests that the intermediate phase occurred in the sixteenth and seventeenth centuries.

However, many of the so-called Classic Maori artefact forms, some of which were found at Hohouponamu, are absent from the Tumbledown Bay excavated assemblages. Ornaments of the types observed by early European visitors to New Zealand, and weapons such as patu, were evidently not yet characteristic. Tumbledown Bay does not demonstrate a sequence extending into the full Classic Maori material culture. Sites which do may have existed, perhaps particularly on Horomaka (Banks Peninsula), where a variety of marine resources may have encouraged continuity of settlement following the demise of the moa. An example is Panau (the excavated occupation area, N36/72, marked on Figure 11), from which small numbers of artefacts of Archaic type and some characteristic of the intermediate phase are present in large collections dominated by items of Classic Maori type. Chronological indicators range from limited midden moa bone and two radiocarbon dates of the fourteenth to early fifteenth century (Appendix 2), to evidence of European contact in the form of an iron adze cached with four greenstone ones. There are no suggestions of a significant break in occupation (Jacomb 1995: 73, 103-104, 276-278, figs. 94-98). Unfortunately, the investigations at Panau from which the artefact collections were derived were not carried out according to archaeological methods of stratigraphic excavation and recording (Jacomb 1995: 43-46).

There is no evidence of a period of conflict during which transitional populations might have resisted new groups. Fortifications appear to be associated with so-called Classic Maori material culture, not with the Archaic or the intermediate (see chapter 3.2). Perhaps fortifications were a reaction to later processes of conflict after Classic Maori material culture had become established - a manifestation of the need of small populations frequently dispersed for seasonal hunting and gathering to take up defensive positions (McGlone *et al.* 1994: 157), in the troubled times after 1769.

Therefore, the archaeological evidence currently available from Canterbury does not support the traditional two-phase cultural framework. The evidence is not consistent with the theory of sudden change from Archaic to Classic Maori material culture, nor with the explanation that the change was largely externally inspired. An intermediate phase has been defined. During this time, distinctive new artefact forms arose, and a range of previous forms passed out of use. The cultural history of Canterbury did not decline with the demise of the moa. On the contrary, there appears to have been continuity of occupation and cultural development, particularly focused in the sheltered bays and caves of Horomaka.

The evidence of change in Maori material culture associated with the European incursion has been scarcely touched upon archaeologically. At Pa Bay, European items such as iron nails, adzes and gouges, a Jew's harp, trade beads, and bottle glass were found in association with ongoing aspects of Maori material culture such as obsidian scrapers, greenstone adzes, and whalebone patu (Thacker 1960: 10-12; Brailsford 1981: figs. 152-157, 159, 161). At Te Mata Hapuka, pieces of clay pipe and crockery were found with greenstone items (site record form; site listed in Appendix 10). Maori material culture was not immediately supplanted by the new technology. Most Europeans lived in separate settlements, a few of which are recorded archaeologically (e.g., Horomaka whaling sites at Oashore Bay, Ikirangi Bay, Whakaki or Island Bay, and Peraki Bay; M37/162, M37/163, N37/16, N37/18; site record forms). Progressively in the nineteenth century, Maori material culture succumbed to the European, through processes well documented historically (Evison 1993).

5. CONCLUSIONS

Archaeological knowledge of the Maori occupation of Canterbury is less extensive and precise than that available for Otago or Southland (cf. Anderson 1982). Despite this, the conclusions which can be drawn, which are summarised in this chapter, have some important implications.

Further research is necessary. Unfortunately, much of the field evidence has already been destroyed (Challis 1992: 4-11). Archaeological sites which survive merit protection because of their capacity to advance the understanding of past human activity and associated environmental change, and because of their cultural significance to the present day Maori community.

Maori activity in Canterbury appears to have been widespread in the fourteenth and fifteenth centuries, in association with the moa. No archaeological sites relating to a pre-fourteenth century early colonising period of occupation have been clearly defined. This lack of evidence, together with the apparent initial abundance of food resources which would have permitted relatively rapid population growth, suggests that the early colonising period between first settlement and the fourteenth century was short rather than long. First settlement may have occurred several hundred years later than archaeologists have previously generally accepted (Davidson 1984: 57). This conclusion is consistent with and dependent on recent reassessments of radiocarbon dates (McFadgen *et al.* 1994: 231).

In the fourteenth and fifteenth centuries, Canterbury settlement patterns were dominated by the seasonal occupation of river mouth sites. There were also temporary fishing camps, and probably permanent coastal settlements on Horomaka (Banks Peninsula). After moas had become scarce, the dominance of river mouth sites ceased. However, there was some continuity of settlement pattern through the transition from moa availability to moa extinction, particularly in the sheltered bays of Horomaka.

The distribution of fortifications indicates a later coastal pattern of permanent settlement in the Kaiapoi, Horomaka, Taumutu, and Temuka areas. Fortifications were apparently a late occurrence, mostly after the mid-eighteenth century and subsequent to the establishment of so-called Classic Maori material culture in Canterbury.

Certain associated subsistence patterns also appear characteristic of Canterbury. There is evidence of large scale specialised moa-hunting in the fourteenth and fifteenth centuries, particularly on the south Canterbury coast. The subsistence orientation of much of Canterbury at this time has been characterised as "interior focus", because the occupation of river mouth locations was related to wide-ranging patterns of seasonal inland activity, particularly in the downlands and the Waitaki catchment. The hunting and gathering of a range of food supplies over wide areas seems always to have been characteristic. Ti kouka exploitation was probably always a significant part of this pattern, certainly in the south Canterbury downlands and possibly more extensively. As moas and other vulnerable bird species and marine mammals became scarce, an increasing reliance on fish, shellfish and plant foods probably developed. The relative unimportance of kumara horticulture in the face

of climatic constraints may have been a major factor limiting population in the region compared with areas further north in the period after moas ceased to be abundant.

There is evidence of extensive environmental change associated with the Maori occupation of Canterbury. Widespread deforestation occurred early in the present millennium, probably mainly in the fourteenth and fifteenth centuries. The extinction of moa species, which are not clearly apparent in archaeological association after the sixteenth century, was probably caused directly by human predation. Human predation is also thought to have been the cause of the southward contraction in the ranges of kekeno and whakahao (New Zealand fur seal and Hooker's sea lion). Archaeological evidence is insufficient to suggest that human predation was the main cause of extinctions and reductions in range of avifauna other than the moa. Most species of birds, fish, shellfish, and plants which the archaeological record suggests were exploited by the Maori remained abundant until European settlement.

There were differences in material culture between Canterbury and other regions of New Zealand. Distinctive attributes in the so-called Archaic phase include early rock art styles and local utilisation and distribution of stone materials such as Gawler Downs silicified tuff, red argillite, and probably also basalt, greywacke, and silcrete. Later developments in Canterbury included distinctive types of adze (Orchiston types J3 and K3) and fish hook (Jacomb type C3c), suggesting continuity of cultural development within the region. Specialisation in greenstone working occurred on coastal settlements from the eighteenth century.

Recent analysis suggests that the customary two-phase classification of Maori material culture, variously dichotomised as the early and the late, the moa-associated period and the period after moa extinction, or the Archaic Phase and the Classic Maori Phase, is inadequate. Evidence from Tumbledown Bay and other sites indicates an intermediate phase characterised by distinctive forms. The intermediate phase of material culture appears to have been current in Canterbury in the sixteenth and seventeenth centuries. Unfortunately the archaeological evidence is not sufficient to illuminate the processes of cultural change in detail.

Maori settlement patterns, subsistence economies and material culture in Canterbury prior to European influence were all characterised by distinctive adaptations and developments. Major discontinuities followed in the early nineteenth century under European influence.

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APPENDIX 1
Selected non-archaeological radiocarbon dates

1.1 Radiocarbon dates for charcoal derived from forest fires

Site name	Lab No.	Conventional age BP	Calibrated 95% confidence interval AD	Comments
Porters Pass	NZ 304	559±40	1317-1346 (7%) 1391-1455 (88%)	<i>Nothofagus solandri cliffortioides</i> ; Molloy <i>et al.</i> 1963: 70
Yaldhurst site 9	NZ 382	625±40	1305-1423	<i>Leptospermum ericoides</i> ; Cox and Mead 1963: 37
Broken River	NZ 391	587±40	1309-1357 (26%) 1383-1442 (68%)	<i>Nothofagus solandri cliffortioides</i> ; Molloy <i>et al.</i> 1963: 70
West Melton site 16	NZ 429	1099±92	781-1189	<i>Podocarpus spicatus</i> ; Cox and Mead 1963: 37
Yaldhurst site 4	NZ 434	1008±91	894-1256	<i>Podocarpus spicatus</i> ; Cox and Mead 1963: 37
Woolshed Hill	NZ 655	396±44	1458-1642	<i>Nothofagus solandri cliffortioides</i> ; Molloy 1977: 161
Woolshed Hill	NZ 656	512±60	1319-1344 (3%) 1392-1526 (80%) 1559-1632 (12%)	<i>Nothofagus fusca</i> ; Molloy 1977: 161
Woolshed Hill	NZ 657	792±61	1168-1320 (85%) 1343-1392 (10%)	<i>Nothofagus solandri cliffortioides</i> ; Molloy 1977: 161
Woolshed Hill	NZ 658	486±49	1406-1522 (80%) 1567-1628 (15%)	<i>Nothofagus fusca</i> ; Molloy 1977: 161
The Pyramid	NZ 659	568±60	1304-1472	<i>Nothofagus fusca</i> ; Molloy 1977: 161
Trig H	NZ 660	493±60	1399-1529 (75%) 1547-1635 (20%)	<i>Nothofagus fusca</i> ; Molloy 1977: 161
Craigie Burn	NZ 662	470±44	1417-1523 (76%) 1564-1630 (19%)	Unspecified charcoal; Molloy 1977: 161
Craigieburn Range	NZ 4962	558±56	1306-1479	<i>Nothofagus sp.</i> ; McGlone 1983: 14
Dry Acheron Valley	NZ 5197	662±45	1295-1407	Unspecified charcoal; McGlone 1983: 14
Dry Acheron Valley	NZ 5198	711±33	1284-1325 (40%) 1336-1395 (55%)	Unspecified charcoal; McGlone 1983: 14
Mt Richardson	NZ 5199	772±57	1213-1396	Unspecified charcoal; McGlone 1983: 14
Mt Mathias	NZ 5366	538±33	1402-1454	Unspecified charcoal; McGlone 1983: 14

1.2 Radiocarbon date for wood buried by flood

Site name	Lab No.	Conventional age BP	Calibrated 95% confidence interval AD	Comments
Christchurch site 23	NZ 312	753±40	1238-1317 (73%) 1345-1392 (22%)	Unspecified wood; Cox and Mead 1963: 37

Note: Conventional ages may differ from previously published figures. They are derived from the current records of the Institute of Geological and Nuclear Sciences (previously Nuclear Sciences Group, New Zealand Department of Scientific and Industrial Research) whose cooperation is acknowledged. The 95% confidence intervals are calibrated ages provided by B.G. McFadgen (see note for Appendix 2). Comments are derived from the stated references.

APPENDIX 2
Radiocarbon dates from archaeological deposits

(This list is ordered by NZMS 260 map sheet and site number, from north to south; that is, in the order of NZMS 260 map sheets: M33, N33, 033; L34, N34; etc.)

Site	Lab No.	Conventional age BP	Calibrated 95% confidence interval AD	Comments
M33/11 Timpendean rock shelter	NZ 893	811±61	1065-1075 (1%) 1159-1315 (89%) 1348-1391 (5%)	Freshwater shell, <i>Hyridella</i> sp., same deposit as NZ 3655; Trotter 1972b: 49
M33/11 Timpendean rock shelter	NZ 917	252±86	1513-1954	Moa bone carbonate; same sample as NZ 918; Trotter 1972b: 45
M33/11 Timpendean rock shelter	NZ 918	1192±62	724-736 (1%) 771-1015 (94%)	Moa bone collagen; same sample as NZ 917; Trotter 1972b: 45
M33/11 Timpendean rock shelter	NZ 3655	744±58	1459-1657	Marine shell, <i>Amphidesma</i> sp. and <i>Mytilus</i> sp.; previously NZ 892 and NZ 1034; Trotter 1972b: 49
N33/3 Mt Donald oven	NZ 1286	928±45	1037-1246	Charcoal; base of oven; Orchiston 1977: 115
N33/10 Pentland Downs rock shelter	NZ 1534	1224±134	906-1393	Marine shell, <i>Paphies</i> sp.; same context as NZ 1535; Trotter and McCulloch 1973: 177
N33/10 Pentland Downs rock shelter	NZ 1535	1318±90	634-965	Charcoal, <i>Podocarpus</i> sp.; floor deposit; Trotter and McCulloch 1973: 177
N33/14 Glen Gynk rock shelter	NZ 1532	546±56	1651-1901 (92%) 1927-1950 (3%)	Marine shell, <i>Lunella</i> sp., <i>Mytilus</i> sp., etc., depth 300 mm; Trotter and McCulloch 1973: 177
N33/14 Glen Gynk rock shelter	NZ 1533	939±93	998-1285	Charcoal, depth 450 mm; Trotter and McCulloch 1973: 177
O33/11 Hurunui River Mouth	NZ 1839	646±85	1264-1451	Moa bone collagen; oven; Davidson 1984: 252
L34/2 Flock Hill	NZ 7466	468±66	1411-1635	Wood, <i>Coprosma</i> sp., twig; beneath back pack; Trotter 1988: 87
N34/4 Teviotdale Cave	NZ 1536	819±57	1408-1613	Marine shell, <i>Mytilus</i> sp.; from base of deposit; Trotter 1975c: 226
N34/8 Motunau Beach	NZ 1538	720±57	1474-1668	Marine shell, <i>Haliotis</i> sp. aragonite; Anderson 1989a: 223