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The Chronology of Mount Camel Archaic site, Northland, New Zealand

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and

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ABSTRACT

Six new radiocarbon dates have been obtained on shell and charcoal from the Mount Camel or Houhora Archaic site (N6/4). No new excavations were involved. Four samples were extracted from latex pulls of the stratigraphy, and the other two from charcoal samples bagged during excavation in 1965–1966. The charcoal samples are on identified short life-span material. The results are considered in relation to earlier radiocarbon dates and stratigraphy. It is concluded that occupation probably began in the thirteenth century A.D. and was short-lived. At an indeterminate later period there was disturbance of the upper level of deposit, possibly by horticulture.

Keywords: RADIOCARBON DATES, MOUNT CAMEL, HOUHORA, ARCHAIC PHASE.

INTRODUCTION

The Mount Camel Archaic phase site (New Zealand Archaeological Association site number N6/4, metric site number N03/59) at the entrance to Houhora Harbour is the northernmost known example (excluding the rather specialised site at Twilight Beach) of a class of sites regarded as representing an early stage in the prehistoric settlement of New Zealand, perhaps the earliest stage. It is a large coastal midden containing abundant remains of moas and some of other extinct taxa, numerous remains of seals and a suite of artefacts which displays close affinities to early tropical East Polynesian assemblages. The artefacts recovered by Roe (1969) included an example of the horned 1A adze type (Duff 1956), moa bone and seal ivory reels, bonito-type lure shanks and points, large moa-bone bait hooks of circular form, moa-bone chisels, tattooing chisels, and a possible *teka* or dart head. Sites with comparable faunal and artefactual remains are typically located at harbour entrances, particularly along eastern coasts, from the Coromandel to Stewart Island, e.g., Tairua, Paremata, Wairau Bar, Redcliffs, Shag Mouth, Papatowai, The Neck (Green 1975; Davidson 1984; Anderson 1989).

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It is argued by Anderson (1991) that such sites were occupied later than is often proposed and in at least some cases for much shorter periods than the extent and profusion of remains seem to suggest. This, in turn, has implications for the question of when New Zealand was first colonised and for the nature of settlement patterns and economic activities in the early stages of occupation. In part, these views were based on the results of renewed investigations at two of the large Archaic middens in the southern South Island—Shag Mouth (Anderson 1991; Anderson *et al.* n.d.) and Papatowai (Anderson and Smith 1992).

It seemed sensible to focus attention next upon the distant case of Mount Camel, partly to balance the geographical spread of the investigation, but also because it could be suspected that if early Polynesian colonists had preferred to settle in the warmer northern region of New Zealand, as is often assumed, then sites such as Mount Camel might disclose radiocarbon dates of earlier occupation than in the south. There were five radiocarbon dates reported for the site, one of them quite early (NZ-916), but details of none were given consistently or fully in terms of either results or provenances. In this paper we publish details of earlier dates obtained from the Institute of Geological and Nuclear Sciences Limited (IGNS), report new dates, and comment on the chronology of occupation at Mount Camel. This involves not only the results of radiocarbon dates but their relationship to the stratigraphy at the site, and the succession of settlement which might be inferred from stratigraphical arrangements.

STRATIGRAPHY

The stratigraphy at Mount Camel (examples in Figs 1 and 2) was evidently complex within particular squares or deposits of midden, but relatively uniform across the excavation as a whole. Nichol (1988: 201) found 30 different stratigraphical codes on the sample bags surviving from the 1965–1966 excavation, but most of these had a very limited distribution and Roe (1969: 14–20) describes a single pattern. Lying on a sterile dune sand (Layer 4), the lowest cultural deposits (Layer 3) consisted of lenses of fish scales, bone, shell and scattered charcoal in a light-coloured sand matrix. There were some ovens and postholes cut from this level. In places, layer 3 was subdivided into two to three units: Layers 3a (uppermost), 3b and 3c, the distinctions reflecting differential quantities of midden or oven debris.

Deposited immediately on top of layer 3 were concentrated patches of midden, generally associated with ovens and oven rake-out debris in a layer of “greasy” black sand. This is layer 2b and, in places, a lower lens called 2c. Midden remains were concentrated in squares C6 to C8 and D7 to D8 where fish scales and bones were particularly abundant (Shawcross 1972: fig. 14.1). Separate lenses of fish scales were observed in some places—in square C7, there were 14 “[fish] scale floors” (Roe 1969: 16), but this seems to have been a quite localised phenomenon rather than general as seems to be implied by Shawcross (1972: 605). Outside this area there were scattered patches of similar material but “considerable areas consisted of sterile 2b matrix” (Roe 1969: 15).

Above layer 2b, and not separated from it by any sterile layer, were deposits designated layer 2a. The division between layers 2a and 2b was often difficult to discern, even in the baulks, and was generally perceived during excavation as a transition from more compacted layer 2a to a looser 2b matrix. Layer 2a appeared to have been disturbed and consisted of a humus-enriched sand with charcoal, broken shell and a few artefactual remains scattered through it. In places there were small “heaps” of stone and shell which appeared to have

been scraped together. Layer 2a was a uniform depth and seemed to occur only on the gentler slopes of the site. Roe (1969: 16–17), argues that it is a horticultural soil and he notes that Cheeseman, who visited the area in 1891, concluded that the southern flank of Mount Camel had been cultivated fairly recently (Roe 1969: 12). Layer 1 was turf.

EARLIER RADIOCARBON DATING

Three radiocarbon dates on charcoal (NZ-914, NZ-915, NZ-916) obtained during excavations in 1965–1966 by Shawcross and Roe (1966), have never been formally published and in consequence have often been reported wrongly or incompletely (leaving aside a common confusion of Libby and Conventional Ages). Thus, Shawcross (1972: 605) gives calendrical estimates of only two dates (evidently NZ-914, NZ-916), and these refer to the earliest cultural deposits; Davidson (1984: 249) transposes the results for NZ-914 and NZ-916, and Coster (1989: 60), following an interpretation of the site by Davidson (1982: 18–19), has NZ-915 as dating an agricultural soil which lay above the main or early occupation. Anderson (1989: 223; 1991: 769), attributes NZ-915 to a middle layer, and NZ-914 to a top layer, which gets the dates correctly in sequence but confuses stratigraphic terminology (see above). In addition, there were two moa bone collagen dates, NZ-5007 and NZ-5008, for which result and provenance details were lacking (Coster 1989: 60). Full results data, obtained from the Institute of Geological and Nuclear Sciences, are shown in Table 1.

According to New Zealand Archaeological Association ^{14}C Sample Record forms (R2171/1–3), the sample for NZ-914 (255 g charcoal from an oven which also contained remains of extinct swan, *Cygnus sumnerensis*), comes from the undisturbed upper unit (Layer 2b), while those for NZ-915 (180 g charcoal from a deep oven cut into and sealed by “dry” [sterile?] sand) and NZ-916 (205 g charcoal from a hearth sealed by dry white sand) are from lower Layer 3 nearby. All are from the southwestern part of the excavation in an area of ovens adjacent to the lensed fish remains noted above.

NZ-5007 consisted of femora of *Anomalopteryx didiformis*, *Euryapteryx curtus* and *Pachyornis septentrionalis* taken from a lens of light-coloured sand (Layer 2c) beneath oven stones and ash (Fossil Record Form R9107/1). NZ-5008 consisted of bones of *Dinornis struthoides*, *Anomalopteryx didiformis*, *Euryapteryx curtus* and *Pachyornis septentrionalis* taken from throughout Layer 3 (Fossil Record Form R9107/2). Both samples are from the eastern fringe of the midden area lying to the northeast of the ovens (see Shawcross 1972: fig. 14.1). The samples were identified by P. Millener (Museum of New Zealand), who submitted them (Coster 1989: 60).

The bone collagen results are essentially the same, despite the sample origins in different layers, and the charcoal results also suggest that stratigraphic variation has little chronological significance. The greatest difference in results is on samples from adjacent squares in the same lower layer, while the sample from a higher layer gave a result between these two. There is no evidence in these data to support the view that undisturbed levels of Layer 2 were deposited much later than Layer 3, and the results say nothing about the age of the supposed agricultural level, Layer 2a. Taken as a whole, these earlier results are fairly consistent and suggest occupation of unknown duration between about A.D. 1200–1400. Nevertheless, since the charcoal composition is unknown and variation in bone collagen results is unpredictable (Anderson 1991), it seemed desirable to test this conclusion by obtaining additional radiocarbon dates.

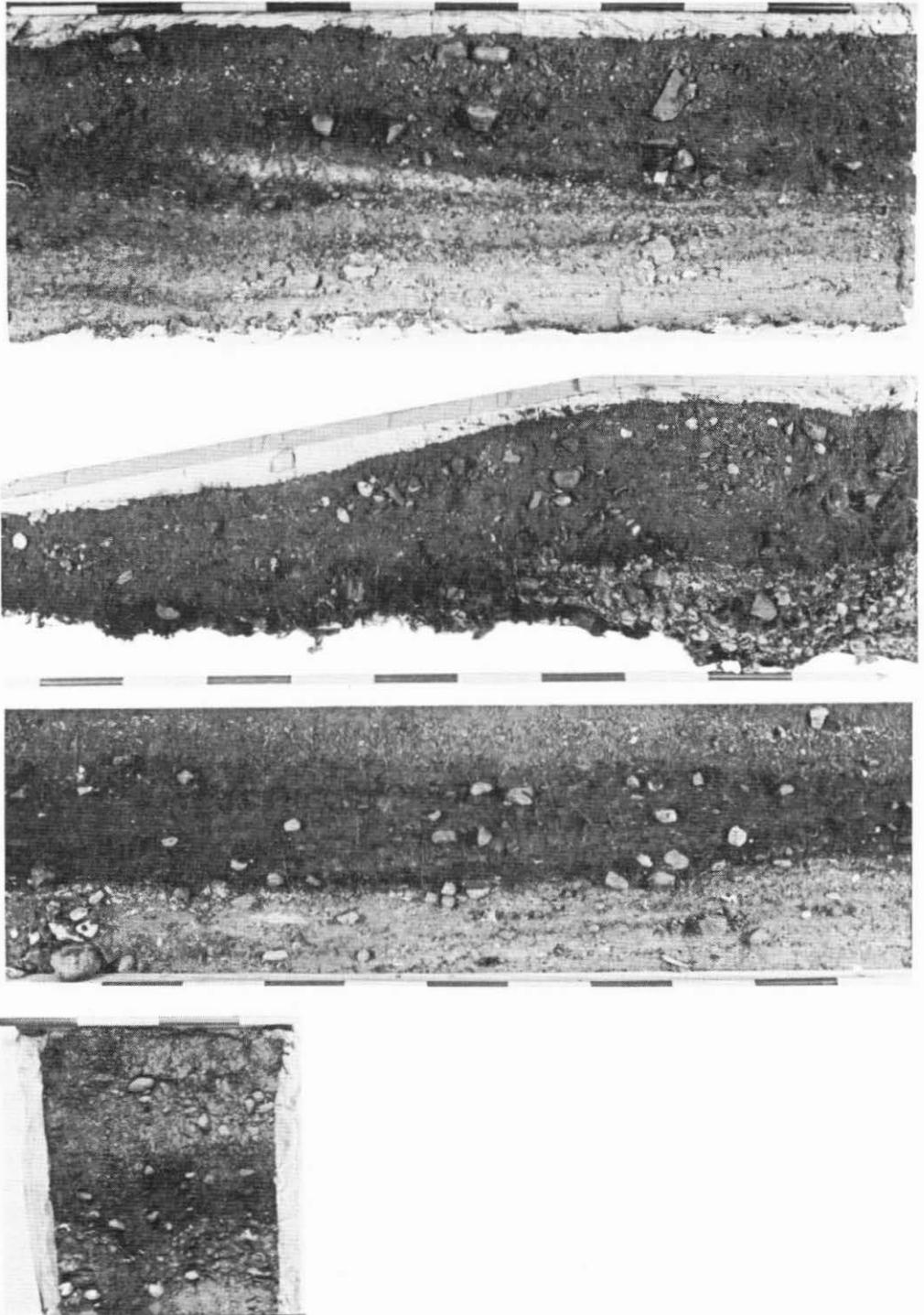


Figure 1: Latex pulls from the 1965–1966 Mount Camel excavations: from top to bottom, pull 1, pull 2, pull 3, pull 4. Scale on ranging rod in 0.20 m divisions.

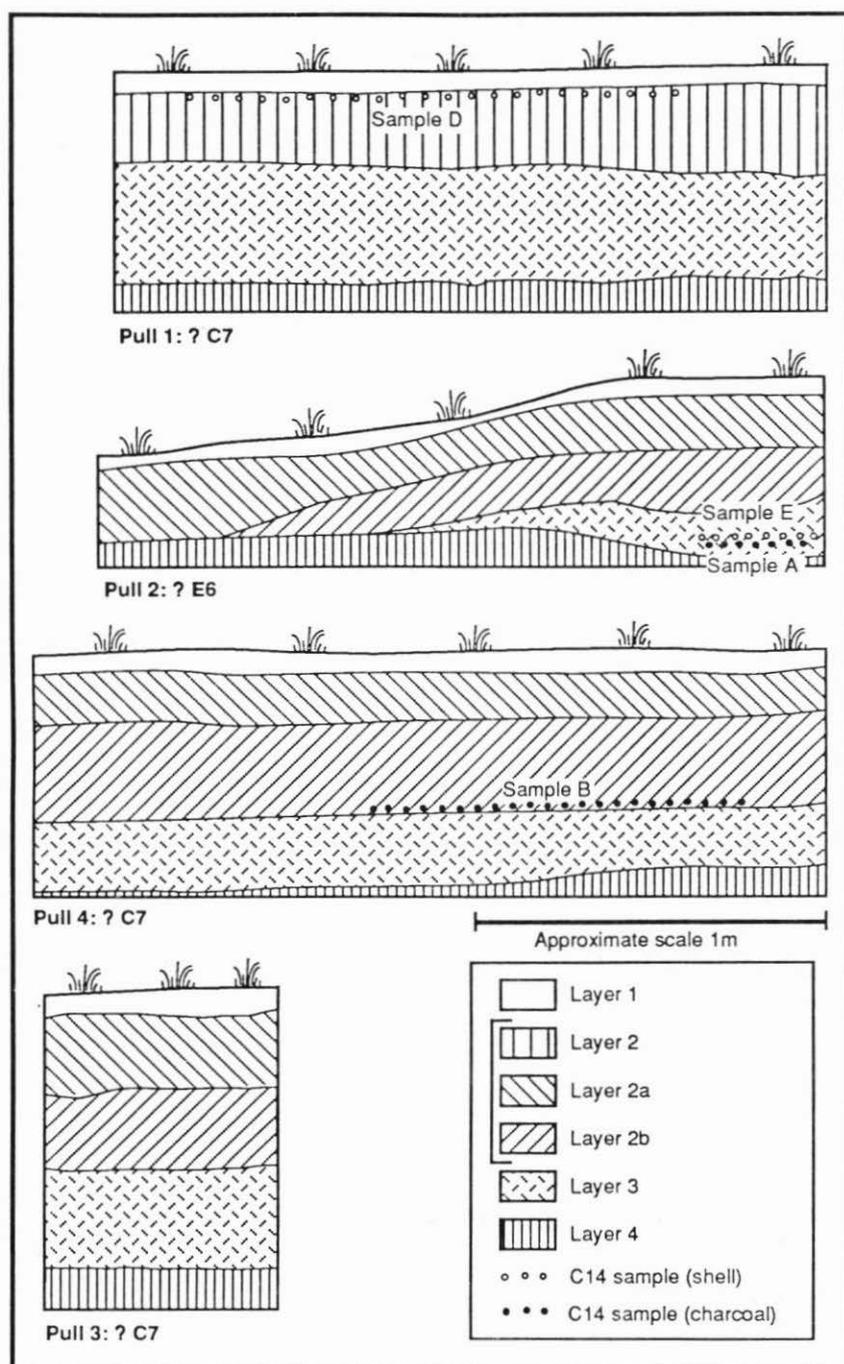


Figure 2: Stratigraphic diagrams of the latex pulls, showing the location of samples taken for radiocarbon dating. From top to bottom: pulls 1, 2, 4, 3.

TABLE 1

RADIOCARBON DATES FOR HOUHORA

Lab No	Provenance	Material	$\delta^{13}\text{C}$ ‰	C.R.A. (B.P.)	Cal 68% (A.D.)	Cal 95% (A.D.)
NZ-914	Square G6 Layer 2b	Charcoal	-25*	697±49	1274-1312 (39%) 1353-1384 (28%)	1266-1396 (95%)
NZ-915	Square E4 Layer 3	Charcoal	-25*	563±61	1315-1351 (25%) 1387-1437 (44%)	1290-1450 (95%)
NZ-916	Square E3 Layer 3b	Charcoal	-25*	775±61	1216-1292 (68%)	1161-1321 (87%) 1342-1392 (8%)
NZ-5007	Square D9 Layer 2c	Moa collagen	-21.1	563±56	1317-1348 (23%) 1388-1436 (46%)	1295-1447 (95%)
NZ-5008	Square D10 Layer 3	Moa collagen	-22.5	585±46	1314-1351 (33%) 1386-1422 (35%)	1297-1433 (95%)
NZ-7920	Square ?E6 Layer 3	Marine shell	+0.9	812±37	1455-1508 (68%)	1432-1543 (95%)
NZ-7921	Square unknown Layer 2-3	Charcoal	-26.0	300±54	1514-1602 (39%) 1615-1667 (26%) 1786-1791 (1%) 1950-1953 (1%)	1473-1680 (79%) 1743-1803 (12%) 1939-1954 (3%)
NZA-2391	Square ?C7 Layer 2a	Marine shell	+1.34	675±82	1522-1681 (68%)	1465-1807 (95%)
NZA-2436	Square ?E6 Layer 3	Charcoal	-26.2	632±86	1296-1400 (68%)	1262-1445 (95%)
NZA-2437	Square ?C7 Layer 2b	Charcoal	-26.3	774±87	1173-1305 (63%) 1361-1378 (5%)	1047-1093 (5%) 1118-1399 (90%)
NZA-2438	Square A7 Layer 3	Charcoal	-25.2	727±86	1244-1321 (43%) 1342-1392 (24%)	1165-1419 (95%)

C.R.A. = Conventional Radiocarbon Age (uncalibrated or B.P. results). Calibrated (A.D.) results from IGNS using their conventions: marine shell calibrations according to Stuiver, Pearson and Braziunas (1986) with geographic offset ΔR set to -30 ± 13 radiocarbon years; terrestrial calibrations according to Stuiver and Reimer (1986) with offset of 30 radiocarbon years after Stuiver and Pearson (1986).

* $\delta^{13}\text{C}$ assumed, not measured

ADDITIONAL RADIOCARBON SAMPLES

Uncertainty about the chronology of Mount Camel as well as about other aspects of its archaeology might be resolved, ideally, by renewed excavation and analysis, especially since it does seem that part of the site remains undisturbed (E. J. Wagener (Wagener Museum, Houhora) pers. comm.; K. Peters pers. comm.). However, preliminary discussions about renewed investigations, initiated by Anderson, have been protracted and may never meet with success, so we have taken another tack in trying to test the chronology.

Material from the 1965–1966 excavation of Mount Camel is stored in the Anthropology Department, University of Auckland. It includes a large box labelled "Radiocarbon samples". In addition, a series of rubber latex 'pulls' was made by Karel Peters during the excavation in order to preserve a visual record of the stratigraphy. For many years three of these (numbers 1–3), were part of a display at Auckland Museum while the other (number 4) was on display on the 7th floor of the Human Sciences Building, Auckland University. All are now stored at the University.

Since these pulls are the only part of the site with intact stratigraphy that is readily accessible, we arranged to remove charcoal and shells and prepare them as dating samples. Charcoal from the stored radiocarbon samples was submitted as well. Before samples were extracted, photographs of the pulls were made using a large format camera (Fig. 1). Sketches of our view of the stratigraphy of each pull are shown in Figure 2, which also indicates the places where charcoal and shell samples were removed. The stratigraphy represented by the pulls is based on Roe (1969: Figs 2 and 3) and the suggested square location of the pulls from which samples were taken follows the analysis of site layout by Nichol (1988: 202). It should be noted, however, that no pull matches any of the sections in Roe (1969: Fig. 3), and therefore that arguments for locating the pulls in particular parts of the excavation grid are tenuous. Similarly, our interpretation of the stratigraphy might not match precisely the view reached by the excavators—although there is now no way of telling. A further potential difficulty (according to Coster, pers. comm.), is that some parts of the pulls were apparently 'retouched' by sticking the odd shell or other such piece from bagged material on to the latex pulls. This was not done extensively, but it does represent an additional source of uncertainty.

Samples from the pulls were taken by identifying a suitable charcoal or shell lens and plucking off as much material as possible without altering the general appearance of the sections. The amount of charcoal obtained was very small because the pulls present an illusion of bulk while being only 'skin deep'. Sufficient material was collected to supply two charcoal samples for tandem accelerator dating and two shell samples for gas counting dates. Two further charcoal samples were obtained from bags of stored material.

Pull samples were processed in the following way. In the case of charcoal, rubber latex adhering to the pieces was ripped or cut off. Each piece was then examined under high power with an incident light microscope to check for further contamination and to extract material from short lived species or of twig origin. With shell samples the latex was removed by soaking in hot water, light etching with dilute hot hydrochloric acid, scrubbing with a stiff-bristled brush and oven drying at 50 degrees C. The two dating samples from the bags of charcoal stored with the other site material were prepared by extracting the twig and short-lived species material. The resulting four charcoal and two shell samples are described in detail below.

Sample A (NZA-2436) is from pull 2. It is from the very base of Layer 3 where a concentrated lens of shell and charcoal occurs. The 13.1 g of charcoal was dominated by

pohutukawa (*Metrosideros excelsa*), puriri (*Vitex lucens*) and taraire (*Beilschmiedia taraire*)—species judged unsuitable for dating. Five pieces from other species were chosen (Table 2). Sample B (NZA-2437) is from pull 4. It was taken from the contact between Layer 3 and Layer 2b, a thin lens of charcoal in oven rake-out overlying a fish-scale lens. A total of 13.5 g of charcoal was removed and it was dominated by pohutukawa, matai (*Prumnopitys taxifolia*), maire (*Nestegis* sp.) and taraire. Four pieces were judged suitable for dating (Table 2). Sample C (NZA-2438) is from a bag of charcoal stored at the Anthropology Department, Auckland University. The bag was labelled "MC72, A7/3" which means (according to Karel Peters, pers. comm.), Mount Camel, 1972, Square A7, Layer 3, although it seems more likely that the sample derives from the 1965–1966 excavation. There were 63 g of charcoal in the bag with a species composition dominated by pohutukawa and there were also taraire, matai, puriri and totara (*Podocarpus totara*). Fourteen pieces of other species were chosen (Table 2).

Sample D (NZA-2391), was all cockle, *Chione stutchburyi*, removed from pull 1. It came from the top of layer 2a, i.e., just under the modern topsoil. The shell at this level is fairly concentrated, possibly by the worm action that formed the modern soil. The shells date either to the earlier hunting-gathering events or the later horticultural activity, or perhaps both. Sample E (NZ-7920), was mainly cockle with a small amount of pipi (*Paphies australis*) included. It was taken from pull 2 and is from the base of Layer 3 directly in contact with the underlying dune sand. Sample A is from the same location.

Sample F (NZ-7921) is from a bag of charcoal found in the same box as sample C. It was labelled, somewhat imprecisely, "R C sample, Houhora terrace, junction of layers 2–3". The sample constituents, all suitable for dating, are shown in Table 2.

Analysis of the charcoal samples for the new date series showed that only an average of 3.5% of it was regarded as suitable for dating, possibly because of the site location on a beach where a major source of firewood was probably driftwood.

NEW RADIOCARBON RESULTS

The two charcoal results from Layer 3 and that from Layer 2b (Table 1, Fig. 3), are much the same, suggesting that the stratigraphic division is chronologically insignificant and that occupation began in the period A.D. 1250–1400 (at 1SD). The remaining charcoal result (NZ-7921) is inconsistent. The sample composition is suitable but its provenance is imprecise. Possibly it is from a part of the site where disturbance reached to the bottom of layer 2.

The two shell dates are both comparatively late. It may be that NZA-2391 reflects the later age of material in the disturbed Layer 2a, where agricultural activities are suspected (and if so, NZ-7921 which is comparable in age may reflect the same activity). However, since NZ-7920 is significantly later than NZA-2436 from the same context at the base of the site, it is more likely that the shell dates are later than charcoal dates at Mount Camel, as generally at Shag Mouth (Anderson 1991), for sample constituent or technical reasons which are not yet understood. These results underline the desirability of treating chronologies on different materials as separate, at least in the first instance.

TABLE 2

COMPOSITION OF SAMPLES SUBMITTED FOR RADIOCARBON DATING

Sample and Lab number	Sample composition	No. of pieces	Total Wt
Sample A NZA-243	<i>Pittosporum</i> sp.	1	0.6 g
	<i>Dodonaea viscosa</i> (akeake)	2	
	<i>Leptospermum scoparium</i> (manuka)	1	
	<i>Beilschmiedia taraire</i> (taraire) twig	1	
Sample B NZA-2437	<i>Olearia</i> sp.	1	0.3 g
	<i>Beilschmiedia taraire</i> (taraire) twig	1	
	<i>Pseudopanax</i> sp.(<i>arboreus</i> ?)	1	
	<i>Leptospermum scoparium</i> (manuka)	1	
Sample C NZA-2438	<i>Coprosma</i> sp.	5	2.2 g
	<i>Pittosporum</i> sp.(<i>tenuifolium</i> ?)	6	
	<i>Brachyglottis repanda</i> (rangiora)	1	
	<i>Hebe</i> sp.	2	
Sample D NZA-2391	<i>Chione stutchburyi</i>	-	20.0 g
Sample E NZ-7920	<i>Chione stutchburyi</i>	-	48.6 g
	<i>Paphies australis</i>		
Sample F NZ-7921	<i>Plagianthus betulinus</i> (ribbonwood) twig	3	10.2 g
	<i>Cassinia retorta</i>	5	
	<i>Melicytus ramiflorus</i> (mahoe)	1	
	<i>Olearia</i> sp.	2	
	<i>Leptospermum scoparium</i> (manuka)	3	

DISCUSSION AND CONCLUSIONS

Taking the earlier and new radiocarbon dating series together, there is an obvious consistency about the four charcoal results for Layer 3, indicating initial occupation in the period A.D. 1150–1450 at 2SD (Fig. 3). These can be pooled, after Leach (1972), to a single estimate of 698 ± 23 B.P. The Layer 3 moa collagen date (NZ-5008) fits well with the new results and when it is added, the pooled estimate becomes 672 ± 25 B.P. Using the

Ward and Wilson (1978) Case II method, the pooled results are 673 ± 36 B.P. and 641 ± 29 B.P. respectively. Lower, or undisturbed, Layer 2 (2b, 2c), has two charcoal dates and one on moa collagen which overlap substantially. The charcoal dates can be pooled as 745 ± 19 B.P., and with the collagen date added, as 690 ± 30 B.P. (660 ± 35 B.P. by Ward and Wilson (1978) Case II).

These results suggest that occupation began in the thirteenth century and no substantial time elapsed between the occupations represented by the two layers. Since there is no sterile horizon between them, despite sterile dune sand lenses occurring within each layer, the same conclusion could be drawn on that ground as well. In addition, Roe (1969: 36) observed that there were no changes in the form of hooks or adzes between layers 2b and 3. If the lower layers as a whole do represent a single, fairly brief occupation, then it could be suggested that the greatest overlap of the dates as a whole occurs in the late thirteenth or fourteenth centuries (Fig. 3). Leaving out the anomalous NZ-7921, the remaining six charcoal dates can be pooled at 690 ± 28 B.P. (Ward and Wilson (1978) Case II).

Upper, disturbed, Layer 2a has only one date, a late result on shell which may not represent the actual age of the deposit. The chronological relationship between the lower deposits and the disturbance of the upper layer remains unknown. Quite probably, Layer 2a is a mixture of deposits. Some of these, perhaps most, may be insignificantly younger than those in Layer 2b—or to put it another way, simply constitute the upper disturbed level of what was deposited as a single layer. Additional material may have been introduced by cultivation on more than one later occasion up until the post-European era. There is no reason to assume that horticulture was practised on the site during the period represented by the midden remains in layers 2b and 3, though equally that cannot be ruled out.

According to these results the Mount Camel site was first settled at about the same time as comparable sites in the southern South Island and as a hunting and fishing station may

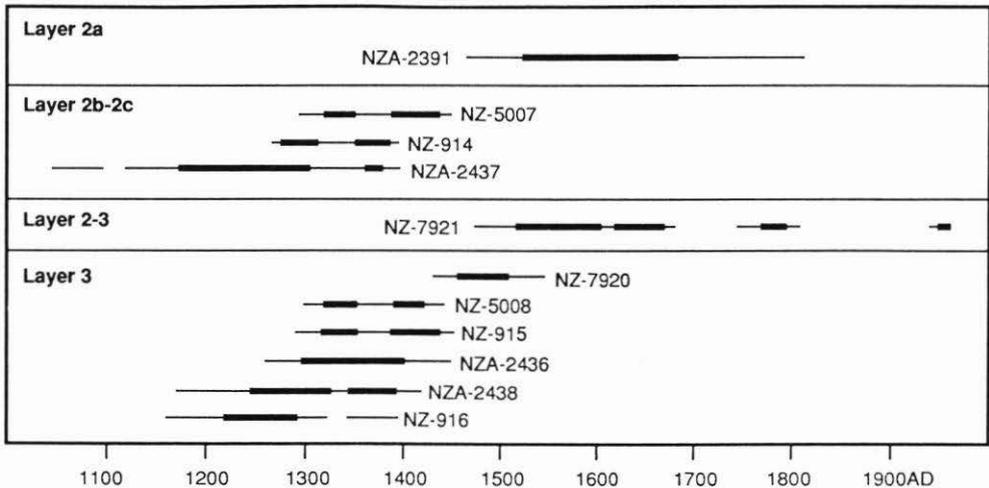


Figure 3: Calibrated radiocarbon dates from Houhora shown at 68% (thicker line) and 95% ranges.

have been similarly occupied only briefly. Neither the evidence of stratigraphy, nor the corpus of radiocarbon dates, suggests a lengthy occupation but there was at least one later use of the site, quite possibly for horticulture. The consistency of the results with those from other large, Archaic, coastal middens which have recently been investigated chronologically, can be held to support the proposition that these sites represent an initial, rapidly-expansive, settlement phase. That view should be tested further by continuing to examine the chronology of similar sites and by investigating with similar rigour the chronologies of alternative classes of putatively early sites.

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Editor's Note

It is possible that Sample F, labelled "R C sample, Houhora terrace, junction of layers 2-3", is not from the main Mount Camel site under consideration here. Pamela Swadling dug small test pits and collected shell samples from six other sites at Mt Camel as part of her MA thesis research. One of these was termed the Terrace (Swadling 1972). Such a provenance for Sample F would explain its apparently anomalous result in relation to the other dates from the excavation.

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