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ARCHAEOLOGICAL INVESTIGATIONS AT AWAMOA, NORTH OTAGO 1852–2013

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Over 160 years ago, the first recorded archaeology in New Zealand was undertaken on the east coast of the South Island near Oamaru, North Otago on Christmas Day 1852 at the mouth of a small stream then named the Te Awa-Kokomuka (also Te Awa-Koromiko). The pioneering field work was carried out by 33 year old Walter Baldock Durrant Mantell (1820–1895) who renamed the stream Awamoa on account of moa bones he found “in a sandy deposit” a few weeks previously (Mantell 1853).

This paper has three aims:

- to review previous archaeological investigations for this site (site J41/3);
- to report and discuss a recently discovered extension to the site with cultural material revealed by coastal erosion;
- to suggest a possible physical interpretation for the environment along with suggestions for further work.

Mantell’s investigation

Walter Mantell was the son of Gideon Mantell, a medical practitioner, noted palaeontologist and geologist. Walter arrived in New Zealand in 1840, and in 1848 was appointed a government land purchase agent. In this role he was entrusted with the purchase of the Murihiku–Southland Land Block, covering 2.8 million hectares (7 million acres), from Ngaitahu, who in 1853 were paid £2600.

In his travels Mantell, accompanied by Maori guides, camped at Te Awa-Kokomuka (Mantell 1853). At the time he arrived erosion, probably from a previous storm, had uncovered an archaeological deposit from which “tent poles were used dig out the bones.” The site, however, extends further inland beyond the road bridge, along an early stream terrace, then over rising ground

to cover about 1.5 ha in area. Cultivation of this area is likely to have begun about 1903 (Hamel 2002).

Mantell reported large quantities of moa bones, numerous fragments of moa eggs along with other cultural material such as flaked blades of silcrete, along with a ball of baked clay. A carved stone (steatite) bowl, perhaps wrongly attributed to Awamoa, may have its origin at a recent site further south, to the north of the Kakanui river mouth. It is not known where many of Mantell's artefacts now are and moa bones are likely to have been combined with other material he collected from different sites.

As well as using some of the burned oven stones for his own cooking, Mantell compiled a sketch indicating the location of the site along with his interpretation of the stratigraphy (Te Papa Tongarewa Museum of New Zealand, reproduced in Trotter 1991). This indicates he excavated along the north side of the stream near the outlet, although his suggestion of a high sand dune is possibly exaggerated. In his report Mantell (1853) wrote:

The old surface in which the umus had been excavated was buried under a foot of alluvial deposit - beneath this the old sandy soil was blackened by the mixture of charcoal, large lumps of which were scattered among the chaotic mass...

However, as archaeologist Michael Trotter suggests, he "failed to recognise that besides the moa bones derived from moa-hunting activities, there were older natural deposits [perhaps loess] at the site" (Trotter 1980).

In a letter to his father an enthusiastic Mantell wrote "How I wish you were here!" He then sent seven cases of assorted bones to his father in England who in turn passed them to noted palaeontologist Professor Richard Owen. Mantell also used egg shell fragments in an endeavour to assemble complete eggs and concluded that the largest was an extraordinary 10.5 inches (27 cm) long, with a circumference of 24 inches (60 cm). He thought there were about 20 eggs from 6–8 species.

It is not known why so many eggs were apparently in the "ovens" with the moa bones, but this does suggest many females were killed and perhaps the eggs were either cooked with the bird, separately, or the shell was later deposited in the oven. Moa eggs were doubtless used as food and were regarded as a precious commodity and likely used as water vessels. In the case of Wairau Bar and possibly Pleasant River (Anderson 1989) moa eggs were buried with deceased persons.

Further inspection

Later authors, notably Lindsay Buick in the 1930's, a collector of artefacts, wrote extensively on early Maori and the moa along with further refer-

ence to Mantell's excavations. Buick was followed by collectors, including local residents G. Daglish, D. Larnach, and H. Uttley who recovered silcrete blades, parts of argillite adzes and other artefacts. The Daglish collection was recorded by the author in 1958 although it is not known where the artefacts collected by Larnach and Uttley are.

In May 1956 the author was first shown the site. Cultural material was exposed along the north side of the stream outlet. Here a mantle of sand and beach gravel had been removed during a southerly storm, revealing an extensive area of blackened sediment and charcoal along with burned and fractured beach stones, moa bones and artefacts. Because of earlier road and bridge work the extent of the site then seen was considered perhaps much less than that observed by Mantell.

While a pupil at Waitaki Boys' High School and traveling by bicycle with a shovel strapped to the bar along with a case of field equipment (Kodak 127 camera, notebook, pencils, trowel and tape) on the carrier, three small salvage excavations, each about one square meter in this area, were done in 1956–1957. The locations were not surveyed into a reference point, as it was clear others had been recently digging and would continue to do so.

A few artefacts (a greywacke spawl, silcrete, flint and obsidian flakes, adze flakes, an awl of bird bone) were found along with bones of moa, other birds and marine shells. Notes were taken and a report was completed for the NZAA Site Record File (Harrowfield 1956–58). Neville Turner, a member of the North Otago Scientific and Historical Society and Custodian for the North Otago Pioneer Gallery (now North Otago Museum), submitted an article about the artefacts to the Otago Daily Times (1957: 18). This soon attracted others to the site.

In 1958 Trotter inspected the site and filed a Site Record. He observed the site was badly damaged by fossicking, stream erosion and a road works depot (195860). Tar had spilled over the ground surface.

In March 1959 the author, after shifting to Christchurch, passed the collection to Ron Scarlett, osteologist at Canterbury Museum. From faunal material, Scarlett identified bones of *Euryapteryx gravis*, *Emeus crassus*, kereru (*Hemiphaga novaeseelandiae*); little blue penguin (*Eudyptula minor*), crested penguin (*E. pachyrhynchus atratus*), paradise duck (*Tadorna variegata*), New Zealand fur seal, dog (kuri) and rat (kiori) (Scarlett *pers.com* 1959).

Otago University

No record has been cited for archaeological work during the next decade, although Oamaru residents are thought to have fossicked here. In 1968–69, however, the Otago Anthropological Society under the guidance

of Foss Leech, Helen Leach and Stuart Park excavated parts of the site in the same vicinity as that by the author.

Trotter (1970), in his useful summary of North Otago sites, drew attention to the variety of bird and mollusc species identified by Scarlett. Stuart Park, who also examined the site in the 1970s, collected charcoal for dating although the result of 984 ± 37 BP was considerably earlier by 300 years than that obtained later for faunal material (McCulloch and Trotter 1975). For Awamoia radiocarbon dates from moa bone collagen, suggested the site was occupied 660 ± 54 BP, with a date for marine shell 678 ± 58 BP (Trotter 1980) while Anderson cites 635 ± 36 BP for marine shell along with 992 ± 49 BP for charcoal (Anderson 1989). Natural moa bone was dated 1670 ± 75 BP. (Trotter 1980).

Further work was done in 1978 by Otago University archaeologist Atholl Anderson and others, as part of a site survey along the coast. At this time the party found “the entire potato paddock” (elevated area beyond the bridge and above the stream, presently with neatly mown grass, a replica moa and Old Bones Backpackers) was estimated by Anderson to cover 1.5 ha, with “oven stones, fragmented moa bones, silcrete, chert and other industrial rocks” (Anderson et al. 1978).

In March the following year, following discovery of a large quadrangular adze, Trotter dug 15 test excavations along the side of the stream above the bridge. Excavations indicated 15–20 cm of ploughed brown loamy soil over, in places, 20–40 cm of silty-yellowish clay. He also examined recently ploughed ground with blackened soil, burnt stones, artefacts including stone flakes, and collected samples for radiocarbon dating. Large ovens appeared to have been cut through earlier layers containing cultural material (cited Anderson 1989).

Faunal material included bones of little blue, white-flippered (*E. albosignata*) and crested (possibly *E. pachyrhynchus* or *E. pachyrhynchus atratus*) penguins, kereru, Stewart Island shag (*Leucocarbo chalconotus*), two species of moa (*Euryapteryx* and *Emeus*), moa egg shell, bones of dog, rat, fish and shellfish. Artefacts included

a section of cut fossil Dentalium shell, a drilled tab of red stone, pieces of worked bone, and fragments of flaked and ground adze heads of argillite and similar materials. The whole assemblage is much more representative of the type of material we would expect from an early South Island site rather than the limited range reported by Mantell... (Trotter 1980).

Other collections have included similar species, along with fish bones including sharks and Elephant seal.

A further inspection was made by archaeologist Brian Allingham in the 1980s. Like others, he reported the entire area west of Beach Road as having cultural material.

All this material is indicative of an important early site in New Zealand's prehistory, with a cultural assemblage similar to other moa-hunter or archaic Maori sites in New Zealand. Although over a century of fossicking has taken place, the course of the stream changed, and farming, road and bridge works have altered the site, further evidence of occupation is possibly protected by a lack of cultivation.

Contemporary management and preservation issues

In 2002 Dunedin archaeologist Jill Hamel considered archaeological values and compiled a report for MWH Consulting. Hamel also examined a cooking area near where the large adze was found. Later a sign (still present although recently damaged) was erected drawing attention to the site near the stream outlet and prohibiting removal of sand. A further examination for MWH was made later that year by Amanda Symon (Symon 2002) with recommendations to Waitaki District Council concerning potential road realignment programmes, along with the need to establish the southern boundary of the site.

The vulnerable nature of the site was evident again in 2008-09 when a contractor unknowingly exposed further cultural material including flaked artefacts and whalebone, on top of the low cliff adjacent to the north side of the stream outlet.

That year archaeologists Angela Middleton and Justin Maxwell (Middleton and Maxwell 2012) undertook an assessment of sites along Beach Road from the North Otago Golf Club to Kakanui. This work arose out of concerns from Waitaki District Council and New Zealand Historic Places Trust regarding local archaeological sites.

The site is further exposed

Along the north side of the creek outlet, the site is being further exposed by ongoing, long term coastal erosion, the main agent for change being scour of overlying sediments by run-up during southerly storms. This is a problem reported elsewhere along the South Island east coast.

In May-June 2012 at Awamoia, storm conditions exposed an extensive, previously unreported area of the site, below the seaward face of the dune south of the creek mouth. Under a thin veneer of beach sand was dark brown silt estimated at 20 cm depth, overlying occasional ash fragments and remnant organic material. This deposit extended along the back beach about



Figure 1. View south towards site of former lagoon (Author 2012).



Figure 2. New occupation revealed in 2012 (Author 2012).

100 m south from near the stream and, in places, about 3 m seaward from the dune base.

From discussion with a resident who collected a moa femur, silcrete blades and greywacke spawls exposed on the surface, cultural material appeared to be spread throughout the layer which appeared to extend landward beneath the dune. Artefacts and faunal material were either in situ or perhaps redistributed.

On the surface examined by the present author, below the above stratum was an estimated 20 cm of pale yellow-grey clay (loess?) interspersed with occasional thin lenses of pea gravel, a stratum with about 10 cm of loess, 10 cm of beach pebbles interspersed with shell fragments appearing to represent various depositional events, followed by a further 5 cm of loess, then 5 cm of beach cobbles and pebbles perhaps forming a narrow storm beach ridge, then loess of undetermined thickness.

The overall sequence of the upper two main horizons (20 cm dark silt and 20 cm pale yellow-grey clay) appeared similar to sediments exposed on the north side of the stream. Several photographs of the site were taken. About 150 m further south of the site dune sand overlies a dark grey soil horizon over loess.

Questions arise as to what was the likely position of sea level and did the stream have an outlet at the time of occupation?

Environmental interpretation

Previous interpretations for the Awamoa site have failed to consider two of the on-going and dominating geomorphic processes that have formed the lower region of the site. The fact that this reach of the North Otago coast has a long history of coastal erosion has already been mentioned but its detailed effects on the site and its changing environment seem not to have been explored.

Less well known but of equal importance may be the fact that tide records from Port Otago show that sea level in the area has been rising since at least 1900. Since it is also known that sea level rise has been occurring for most of the last several thousands of years, it is readily apparent that the site had both a very different position with respect to the beaches and fore-dunes of 600 or more years ago and sea level was at least a meter lower during the period of occupation. This establishes a robust framework for an improved physical interpretation of the changing environmental conditions at the site, including the effect of longer term increase in sea level.

The author considers a depression below the road indicates that at the time of occupation, an extensive lagoon was present. This extended further

southward and beyond the macrocarpa trees and the present car park. At this time the Awamoia stream probably discharged into the lagoon. Such lagoons are common at stream and river mouths along the east coast, for example about 3 km north, Kaiarero Stream below Cape Wanbrow discharges into a large lagoon, seldom open to the sea. At Awamoia a pond presently extends from beneath the bridge towards the outlet.

About 650 years ago the inhabitants probably lived on the elevated ground of the former “potato paddock” where a thin, vegetated soil had developed over post-glacial loess. At the time of occupation vegetation was probably confined to tussock grass, *Coprosma* sp. and perhaps scattered MATAGOURI scrub along with a few stunted trees. This would not have provided much shelter and because of European cultivation, no evidence for any form of shelter has been found. Most of the cooking of moa along with other food appears to have been done in shallow hearths lined with small beach boulders, either side of the present stream area by the beach with some also on higher ground and perhaps in proximity to habitation.

From an examination of the stratigraphy exposed seaward of the dune in mid-2012 an interpretation of the environment at time of occupation can be made.

A large depression below the road along with varves or fine laminae in the upper 20 cm of sediment overlying clay suggests an extensive lagoon fed by the Awamoia stream periodically flooded the site. The sediment suggests the strata developed over a relatively short space of time and supports the idea of heavy rain or lack of drainage, resulting in ponding as at Kaiarero, with deposition over a basal layer of post-glacial wind-blown or water deposited loess, on which the occupants did their cooking. Faunal material and artefacts were covered by silt from flooding over which a dune system formed.

The present fore-dune, with introduced marram vegetation, is a post-occupation feature with the cultural layer extending inland beneath the dune, although how far was not determined. Dune sand terminates near or over the edge of the former lagoon.

It is possible that there was an earlier dune sequence seaward of the southern area at Awamoia and as sea level gradually rose this was eroded. When the area was occupied the coast would have been further seaward and sea level lower than now. At the time of writing the exposed component of the Awamoia site revealed in 2012 is again obscured by sand and shingle.

Conclusions

North Otago and other areas of the South Island’s east coast have a long history of coastal erosion, although the extent varies from place to place

and is determined by the geomorphology. At Awamoia stream there is clearly on-going change in the physical environment. The site, especially near the stream outlet, will, as with others sites such as in Southland, continue to erode and attract interest from the public.

Although at risk from erosion, Hamel suggests other areas such as beneath early bridge abutments that were probably manually formed may be intact. Although coastal change is evident in aerial photographs taken 1972–1996 by David Hamilton and Associates (Hamel 2002) and from visits by the author, the site along the north side near the stream outlet shows little variation in nearly 60 years.

Of particular value would be the use of small soil corers to establish not only the full extent of the site but also the stratigraphy. From the author's examination of the newly discovered occupation material in July and August 2012, the occupation level was shown to extend landward beneath the recent foredune although how far towards the former lagoon is not known.

Pollen grains if present could provide important information on the vegetation during occupation. Organic material from sediment of the former lagoon could also be radiocarbon dated, thereby placing the site in context with occupation.

What appears certain is that the original occupants about 600 years ago lived by a large lagoon which at some stage closed off, had access to fresh water and had an economy based on moa-hunting, fowling, fishing, gathering of shellfish, trade of stone resources along with tool making and clothing manufacture. The coast was then further away and sea level was lower.

With coastal erosion likely to have taken place during and since occupation, coupled with sea level rise, this has led to formation of the fore-dune which has developed over the site although this appears to be subjected to erosion along the seaward face. Formation of the dune contributed to the lagoon present at the time of occupation being subsequently closed off.

As Trotter wrote “we have to rely largely on archaeological investigations for details of the culture and economy, the environment and even the physical characteristics of the people who lived there” (Trotter 1991).

Walter Mantell the father of New Zealand archaeology, later Third Minister of Maori Affairs, a member of the Fox Government in 1861 and a Member of Parliament until 1866 never returned to Awamoia. He died in Wellington in 1895 aged 75.

Acknowledgments

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