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TAERUTU GULLY PA, PEGASUS TOWN, CANTERBURY

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Introduction

Work continues at Pegasus Town, a large new development about 20 km north of Christchurch. Archaeological fieldwork has accompanied earthworks for nearly three years (Witter and Witter 2007). The archaeology has proved far more widespread, abundant, varied, and complex than anticipated. A unique site with fishing net weights has already been reported (Witter 2007).

This is a preliminary report on an unexpected discovery at Pegasus: the Taerutu Gully pa. This is likely to be the oldest dated pa in the South Island and includes an exceptional assemblage of stone and bone artefacts as well as a large and important wet perishable artefact assemblage.

The development is located on the north Canterbury coast, between the Waimakariri and Ashley Rivers. It consists of an alluvial plain sloping east from State Highway 1 to a zone of old sand dunes, and an extensive wetland between the old sand dunes and the coastal dunes (Witter and Witter 2007). The coastal dunes and coastal beach are outside the town area. The development is immediately south of Kaiapoi Pa, sacked by Te Rauparaha in 1832. The westernmost, oldest and highest line of dunes, the Western Ridge, has been made into a conservation area which includes Hohoupounamu, a greenstone manufacturing site (Challis 1995). Taerutu Gully is the water channel which runs roughly south-north between the Western Ridge and the alluvial plain, on the boundary of the conservation area (Figure 1).

The new pa is on the alluvial plain on the western bank of Taerutu Gully (Figure 2), opposite the Hohoupounamu site, which is located on the highest part of the Western Ridge. The pa is situated on a small flat peninsula formed by two side channels that cut into the edge of the alluvial plain.

In the original assessment by Jacomb (1998) this area was ploughed and artefacts were noted along the edge of Taerutu Gully. In the supporting document for the New Zealand Historic Places Trust (NZHPT) authority this

area was identified as a likely place for a village due to the charcoal darkened soil, fire-cracked rock and occasional artefacts (Witter 2005).

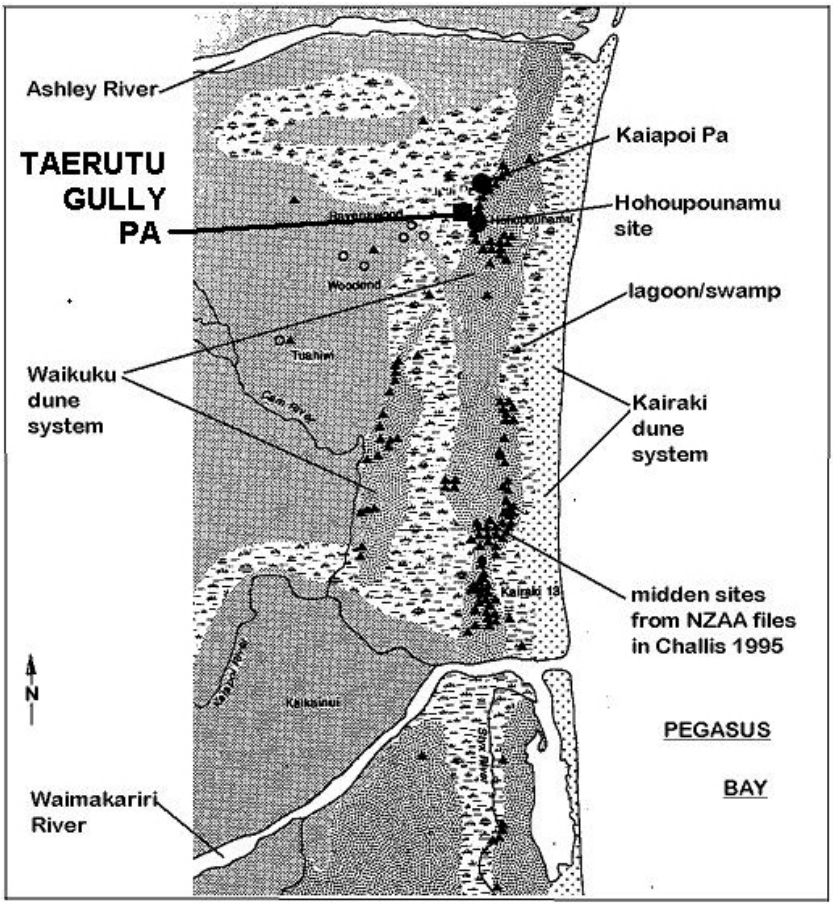

Figure 1:Landscape on the Pegasus Bay coast with sites recorded prior to Pegasus Town fieldwork (map from Challis 1995). The Taerutu Gully Pa is shown in relation to the Houhoupounamu site and Kaiapoi Pa.

Taerutu Gully Pa

As the ploughed surface of part of this "village area" was stripped away by the digger, a number of postholes, stake holes and other features were uncovered. Fourteen large post holes, together with two or three smaller

stake moulds between each large post, have now been excavated in a 13 m long line. The postholes were about 50 cm in diameter and 90 cm deep below the plough soil, with post moulds 25 to 30 cm thick, some of which contained fragments of the wooden butt. A few had large pieces of greenstone and adzes. Another 23 unexcavated postholes have been exposed in the same line. The row of postholes has been interpreted to be a 50 m long palisade that cuts off the peninsula between the two side channels of Taerutu Gully. Internally, about a third of the pa surface has been exposed and another 30 postholes or stake holes within the pa area have been found. This site seems similar to a palisaded site on a bend of the Tamiki River which also lacked ditch and bank defences (Foster and Sewell 2002).

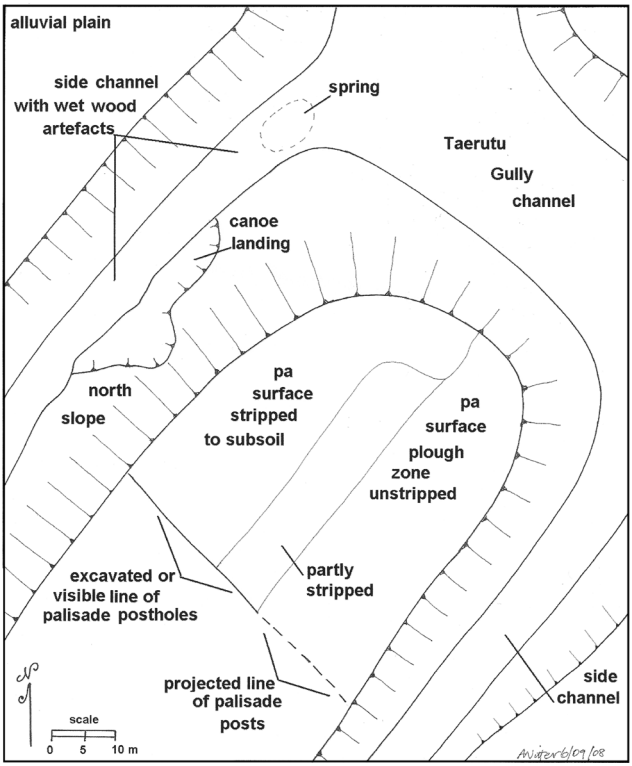

Figure 2: Sketch map of Taerutu Gully pa.

The digger also exposed midden material on the slope of the northeastern side channel. The midden was a mix of tuatua, cockle, pipi, mudsnail and freshwater mussel and contained dog, rat, fish and bird bone. It was about 50

cm thick and stratification was evident, with masses of freshwater mussel at the base. Several thousand stone artefacts were recovered, of various materials including flint (marine chert), greenstone, obsidian, silcrete, greywacke, meta-argillite, chalcedony, and sandstone. The greenstone included complete and broken adzes/chisels, as well as adzes/chisels in varying stages of manufacture (in this assemblage it is not clear at what point a small adze becomes a chisel). Cut bone and bone tools, including several needles with eyes, were also recovered, as were ornaments of bone and greenstone and even one of a shark's tooth.

Below the midden was a layer of clay about half a metre thick, and below the clay was a "platform" of well spaced but roughly parallel logs with numerous well spaced smaller logs laid at roughly right angles across them. Tree stumps were interspersed between the logs. Stone artefacts were associated with the platform, including cached adzes and other implements. This was interpreted as a canoe landing, with roller logs on top of the platform of parallel logs, which had been abruptly covered with mud.

The digger cut through about two metres of dry clay in the bottom of this channel then broke into a wet bog deposit, and uncapped a sealed spring. The digger brought up a perfectly preserved adze handle (Witter and Witter 2008). Additional pieces of worked wood artefacts appeared, and then a skull came up in the digger bucket. The perishable artefacts include part of roughly shaped canoe, a burnt post with a large knob carved on it, various patu-like implements, digging sticks, adze handles, a spinning top, pieces of coiled vine, gourd fragments, a kete fragment, other fibre fragments, and a large quantity of wood by-products. An extraordinary object was half of a manaia carving on a plank, showing the toothed beak, and three-fingered hand on the belly. There are about 50 finished wooden items and over 200 other pieces which have been worked. The various by-products of woodworking are estimated to number about 500.

A sluice system was designed by Jeremy Habberfield-Short to wet-sieve for anymore human bone that had been brought up by the digger, and pieces of a second skull were recovered. The sluice was also used to recover wet wood, stone and bone artefacts.

The channel containing the wet wood artefacts was about 50 x 10 m in size. The area excavated on the pa area and on the side slopes was 360 m2, and about 150 features have been recorded. There are about 4000 bags of artefacts, bone and shell inventoried. A small amount of excavation work remains before the site will be covered with fill and conserved as a landscape feature (which still contains considerable archaeological material), and will carry interpretive signage.

Field Operations

Work in the Taerutu Gully "village" area had been start-stop since May 2007. When it was recognised as a pa in October 2007, the intention of the developers was to develop the entire 55 by 50 m site, which raised the issue of a large salvage operation. The planners for Pegasus Town were approached to preserve the pa landscape feature and not to strip the remaining two-thirds down to the subsoil. To do this, the pump station (to provide irrigation water for the golf course) had to be relocated, and the lake to be used for a pumping reservoir reconfigured. This was accomplished, but in doing so, it became urgent that the reservoir lake be completed, starting in January 2008. This was when the extent of the midden on the north slope was found, and the wet wood artefacts in the channel were discovered.

When the perishable artefacts suddenly appeared I considered the options of stopping the development to preserve the swamp site; delaying the development to undertake a full scale excavation of the swamp deposit by hand; or devising a methodology for rapid excavation using machinery. The deposit was an accumulation from the pa above. Adze handles, digging sticks, patu etc were placed in the channel for preservation and building debris and other refuse had been thrown in the channel. For the golf course to go ahead (a principal part of the Pegasus Town project) the construction of the lake was essential, as previously approved by the Environment Court. The alterations in planning to preserve the pa had already caused delays and left no room for further flexibility in design.

I had serious concerns about being able to ensure long term preservation of the deposit now that the water source was breached and hydrology altered. Indefinite long-term preservation seemed difficult to guarantee. Hand excavation of the bog with the thick layer of sedge-like material would be difficult, and probably require about two years of continuous work, and with the ongoing risk of drying out. The options for excavation seemed to be either a very long slow process, or a rapid one using machinery, with nothing in between. I decided on the rapid process, with Pegasus willing to cooperate with a huge increase in manpower.

The wooden artefacts were located within a 50 cm horizon in the channel mud. With the digger working very slowly under the direction of an archaeologist, and with several monitors observing every scoop, there was considerable reliability in finding the artefacts at a much faster rate than hand-digging. The material removed was later sluiced, but relatively little more wooden material was recovered. However, the use of a digger made control of the provenance more difficult. The channel was divided into six segments ten metres long, and precise locations of all the logs and artefacts exposed in situ were shot in.

An extensive portion of the midden on the slope was excavated by hand, and all of the logs belonging to the canoe landing were mapped.

The other conservation issue was the preservation of the wet wood artefactual material. Dilys Johns from Auckland University came down to provide instruction on how to care for the perishable artefacts.

The most intense period of salvage was from mid-January to mid-May 2008. At times there were 24 people working on site, including consultant archaeologists, members of Te Ngai Tuahuriri and students.

Future Work and Research

It is expected that the archaeological field work for Pegasus will finish by January 2009. This will be followed by the analysis and report writing in line with NZHPT authority standards. In keeping with normal practice the analysis provides a systematic account of the results of the field work. The report will be mainly descriptive, but provide comment on potential areas of research and suggest various models. A database for all of the sites will be included. There will be in excess of 700 recorded sites including about two hundred find spots, historic post holes and other non-deposit points. Many of the deposits were ploughed, impacted by forestry works, or otherwise redeposited. There will be however over 300 in situ deposits which were tested, sampled and sometimes extensively excavated. It is estimated that there will be nearly 4,000 excavation square sheets and 10,000 bags of midden shell, oven stones, bone, artefacts, charcoal etc. The collected material is contained in plastic cube stack-boxes lining the sides of five shipping containers.

The Taerutu Gully pa is part of this and will comprise a large component of the analysis and reporting. This will include posthole and other feature patterns, as well as artefact, bone and shell analysis and dating.

Dating by carbon 14 will be possible using the outer growth rings of some of the logs including one which had a plank split out from it and some bark still attached. A stand of trees on the floor of the canoe landing was felled using adzes. This was probably the first stage of occupation and the logs may have been used for the pa. The stumps were all covered by the layer of clay and midden deposit. These have been sectioned for potential tree ring dating. If this is possible it would provide a calendar date for the beginning of the pa.

There are number of research issues associated with the Taerutu Gully pa which are outside the scope of the NZHPT report to consider in detail, including carpentry, greenstone flaking and cultural and landscape evolution.

Carpentry

The wooden artefact assemblage in itself is a major subject of study, with descriptions and functional interpretations of the various pieces. Wood-working by-products were also recovered and will be preserved for study. Among this assemblage there were five adze handles. All were for mounting different sized adzes, at different angles and with different methods of lashing indicated. The site also produced a wide range of adze/chisels showing differences in size, shape, types of bevels and usewear. There must have been a large "carpenter's tool box" with different types of function-specific adzes and chisels.

The worked pieces of wood include dressed boards and four-cornered posts, and there are a large number of by-products which also show tool marks. These tool marks may be with the grain, at right angles to the grain, or across the grain. Some of the strokes appear to be from an adze and others by a chisel (Riki Manuel, pers. comm. 2008). These artefacts provide a considerable potential to understand much of the carpentry which took place at the site

Greenstone Flaking

Working greenstone using flake saws, grindstones and hammer dressing is well understood (Beck and Mason 2002). However, flaking greenstone seems to have been little addressed. Great quantities of greenstone (e.g. nephrite, semi-nephrite and bowenite) flakes were recovered during excavation, including abundant micro-debitage.

Much of the greenstone flaking was on semi-nephrite which is relatively schistose with the crystalline fibres in foliation planes. This appears to have been done more in the manner of splitting slate rather than working a homogeneous conchoidally fracturing material. The result is flat plate-like pieces of various sizes as artefact blanks. These appear to be trimmed into shape by flaking off smaller fragments. Some clearly had a bevel ground on them for use as an adze with no further treatment.

The fully felted nephrite also seems to have been worked by hammerstones. In some cases it appears that it was heavily pounded along the grain as though to propagate a fracture along a plane of schistosity. This would be a faster thinning method than stone-sawing, and some large preforms were discarded at this stage. Shaping by the removal of small foliate flakes also seems to have occurred.

Greywacke hammerstones are perhaps the most revealing evidence for the flaking process since they show wear facets unlike those for other kinds of hammerstone use and sometimes in unusual places. Greywacke stone-saws were present but not common. The flaking techniques were integrated with the grinding and sawing processes, and many of the flakes show a ground facet.

Flaking greenstone allowed mass production. Although still labour intensive, greenstone manufacturing could be sped up by flaking blanks and performs. Blocks were transported by canoe or over the greenstone trails from the West Coast to a place where there was a labour force and an adequate food supply to accomplish ongoing manufacturing. The amount of greenstone debitage appears to be in excess of local requirements but would be consistent with production for exchange. This site probably belongs to the early stages of the locality becoming a major greenstone exchange centre.

Cultural and Landscape Evolution

The Pegasus project comprises a 2 x 3 km area which has been almost entirely exposed by earthmoving machinery, all of which was monitored for sites. All sites were recorded and there were extensive excavations over a three-year period. The result is a complete, systematic and detailed record for a large landscape with hundreds of sites. Within this landscape are three pa: the one on Taerutu Gully, the Hohoupounamu site on the nearby Western Ridge, and Kaiapoi Pa which is immediately to the north. These three are probably a chronological succession, with considerable Ngai Tahu oral history about Kaiapoi Pa.

When the Taerutu Gully pa was occupied it had access to ocean beach tuatua as well as estuarine shellfish. There is a thin layer at the base of the Hohoupounamu site with tuatua, with the main overlying deposit all estuarine shells (Challis 1995). Nearly all of the shell middens in the dune area were estuarine. It is conjectured that this triangular dune area, about 1 x 2 km in size, was used as a bracken field with the rhizomes gathered and prepared in various strategic locations. The estuarine shellfish were brought in as the protein component for these meals, which were outside the domestic areas (Witter and Witter 2007). This would be an effective method of supporting a periodic large labour force, such as might be convened to work greenstone. The adjacent lagoon provided the necessary large estuarine environment. This would have been formed by a new coastal dune built an off-shore barrier bar due to a large discharge of sediment into Pegasus Bay that was dislodged by a tectonic event about 500 years ago (Goff and McFadgen 2002). Thus for Hohoupounamu site to become the dominant greenstone manufacturing and exchange centre it would have needed these resources as well as the technology for the mass production of greenstone articles.

The other requirement is a social system able to coordinate and organise the labour force. This was in a process of evolution in the North Island with its massive defensive earthworks and military development. As people from the north migrated south they would have taken with them a social system able to

integrate and organise people on a greater scale. With the founding of Kaiapoi Pa by Ngai Tahu, apparently about 1700 AD, the scale was greatly extended. The food supply was not only local but ranged from Kaikoura to Bluff.

To conclude, the archaeological field work at Pegasus is nearing conclusion. The archaeological research potential has exceeded all expectations. The Taerutu Gully pa was a major surprise, but it was in the context of an extraordinary abundance of other archaeology within a large landscape. There is now a body of data which should help to define further the role of this area in Canterbury prehistory.

Acknowledgements

Excavating the Taerutu Gully pa area was a massive undertaking. Alison Witter coordinated the data and later looked after the wet wood material, Jeremy Habberfield-Short supervised the excavation and sluicing, and Brian Allingham participated as well. The Te Ngai Tuahuriri field crew consisted of Andre Codyre, Joe Hullen, Bill Murphy, Cherie Williams, Frankie Williams and Hoana Williams and the sluice team included Hannah Geddis, Te Ngarahau Mason, Amber Philpot, Jaime Philpot, Campbell Pitama and Eugene Riwaka. The University of Otago contingent included (for varying periods) Maria Butcher, Matt Carter, Logan Coote, Bill Edwards, Amy Findlater, Rachel Fuller, Jason Gay, Patrick Harsveldt, Rod Jansen, Chris Jennings, Sheryl McPherson, Carmen Sarjeant, Ben Shaw, Rhonda Steele and Erin Williams and students from the University of Canterbury were Iain Gover and Annie O'Brien. Advice on the treatment of wet perishable artefacts was provided by Dilys Johns of Auckland University and Roger Fyfe of Canterbury Museum. Murray Thacker of the Okains Bay Museum and woodcarvers Riki Manuel, Fayne Robinson and Caine Tauwhare supplied useful comments on the wooden artefacts. The Pegasus Town project management, contractors, digger operators and surveyors were most helpful and patient while the archaeology was underway. Te Marino Lenihan, cultural advisor and liaison for Pegasus Town, Claire Williams, chairperson for the marae at Tuahiwi and kaumatua John Croft provided support.

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