

# Interior Lives: the age and interpretation of perishable artefacts from Māori rockshelter sites in inland Otago, New Zealand

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## ABSTRACT

Rockshelter and similar sites in inland Otago have produced a relatively large number of Māori artefacts made in readily perishable materials such as flax leaves and fibre, tussock grass or tapa (bark) cloth. Regional preservation is clearly related broadly to the relatively arid climate. However, AMS radiocarbon dates on 11 samples from 10 sites shows that while a few date to the 17th century or earlier, the ages of most cluster in the 18th to early 19th centuries. We argue that this represents a phase of accelerated deposition in which material was left behind deliberately, as logistically-determined storage for future use in a strategic plan for exploiting inland resources. We propose that such a process of ‘furnishing the landscape’ with useful artefacts and stored raw materials became possible when territorial security was achieved by the extension of immigrant tribal authority over the inland region.

*Keywords:* fibre artefacts, rockshelter sites, inland Otago, New Zealand

## INTRODUCTION

The occurrence of readily perishable items in natural or archaeological sites begs questions about site chronology and formation. In New Zealand this is especially the case in inland Otago, in respect of two kinds of remains. Soft-tissues from extinct moa (*Dinornithiformes*), such as sinew, muscle, skin and feathers, occur unusually often in rockshelter sites in inland Otago, relative to other areas of New Zealand. We have argued that while the regional frequency of occurrence reflects enhanced preservation in the arid conditions of inland Otago, the radiocarbon age of the remains (AD 1200–1400) suggests that they did not accumulate by intermittent natural deposition but, rather, represent accelerated frequency of deposition during the moa-hunting era (Anderson *et al.* 2010).

Our interest in moa remains had been stirred by the similarly high frequency of perishable remains of Māori material culture in inland Otago rockshelters. The immediate question was whether these had been associated with moa-hunting, but our first four radiocarbon dates (Table 1: Wk-24468, Wk-25732-4) suggested deposition

long after moa-hunting ceased in about the 16th century. This result raised several new questions. Was a relatively late age a general characteristic of the perishable material culture remains in the region? If so, did it represent a period of accelerated deposition, or simply the ‘residence period’, i.e. the time span over which such remains could survive in those sites? What do answers to these questions suggest about the settlement history of inland Otago? We discuss these matters in the light of results from a project on the AMS dating of Māori artefactual remains from inland Otago.

## RADIOCARBON DATING SAMPLES, METHODS AND RESULTS

### Radiocarbon dating samples

Eleven samples of fibre from Māori artefacts recovered in ten inland Otago rockshelters were submitted to the Waikato Radiocarbon Dating Laboratory. Seven samples are, or appear to be, of flax (harakeke, *Phormium* spp.) although cabbage tree leaves (ti, *Cordyline* spp.) cannot be excluded. Two samples are of tussock grass (*Festuca* spp.), another of unidentified reeds, and a third is from the inner bark of *Broussonetia* spp., or *Hoheria* spp. Only if the last is of *Hoheria* is it likely to have any inbuilt age beyond a decade or so. The other ten samples probably do not exceed 1–10 years in inbuilt age.

All samples were already detached fragments held in the Otago Museum (Table 1). Eight samples are from ar-

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Table 1. Radiocarbon determinations on organic materials from South Island Rock shelters. Calibrations undertaken using OxCal 4.2 (Bronk-Ramsey 2001), SHCal13 (Hogg et al. 2013) and SH1-2 post-bomb curve (Hua et al. 2013).

Site Complex	Otago Museum number	Lab. Code	Material	$\delta^{13}\text{C}\text{‰}$	$^{14}\text{C}$ Age (yrs BP)	Calibrated Age BC/AD (68.2% probability)	Notes
Puketoi	D24.566	Wk-24469	Flax fibre	-21.6	160±30	Unmodelled: 1685–1950 A = 1680–1735/ 1800–1820 B = 1680–1730	Rockshelter. No European material.
Tallaburn	D34.961	Wk-25732	Tapa cloth <i>Hoheria</i> or <i>Broussonetia</i>	-24.0	179±30	Unmodelled: 1670–1955 A = 1670–1815 B = 1670–1740	Rockshelter. No European material.
Italian Creek	D31.1335	Wk-25733	Flax eel net	-22.3	152±30	Unmodelled: 1690–1950 A = 1680–1820 B = 1685–1730	Rockshelter. No European material.
West Taieri Bridge	D33.1781	Wk-25734	Reed eel pot	-25.0	146±30	Unmodelled: 1695–1950 A = 1690–1825 B = 1690–1730	No context
Mt Benger	D31.1339	Wk-26916	Raincape <i>Festuca matthewsii</i> subsp. <i>latifundii</i>	-23.6	151±30	Unmodelled: 1695–1950 A = 1690–1820 B = 1695–1730	Reports refer to Māori relics, Māori camp and ovens. No European material.
		D-AMS 1217–225		n/a	152±25		
Mt Ross	D40.240	Wk-26917	Sandal fragment (flax?)	-22.0	111±30	Unmodelled: 1705–1960 A = 1700–1830 B = 1695–1725	Rockshelter. No European material.
Diamond Lake	D23.681C	Wk-26918	Sandal fragment (flax?)	-23.2	142±30	Unmodelled: 1695–1950 A = 1690–1825 B = 1690–1730	Found 'with other pieces of sandal and kete'. No European material.
Strath Taieri	D51.489	Wk-39110	Fibre fragment	n/a	404±26	Unmodelled: 1460–1620	Found beneath a rock slab in a cavity. No European material.
Between Sutton & Middlemarch	D34.755	Wk-39111	Twine fragment	n/a	395±26	Unmodelled: 1460–1625	Rock shelter. No European material.
?Kuwrow	D75.12	Wk-39112	Cloak fragment	n/a	167±27	Unmodelled: 1675–1955 A = 1675–1815 B = 1675–1735	No context

tefacts listed in Anderson's (1982: 68–71) table of archaeological remains from the late prehistoric period of Māori settlement in the interior of southern New Zealand (Figure 1). The discovery and provenance information about the samples follows, with headings showing AMS radiocarbon age number/ Otago Museum accession number/ site number in Anderson (1982: 28–69), and name of location:

Wk-24469/D24.566/#6, Puketoi

David McKee Wright, employed as a shepherd on Puketoi Station for a time in the 1890s, supplied the *Mount Ida Chronicle* (22 August 1895: 3) with news of the discovery of a finely woven kete (Figure 2) containing a number of oth-

er artefacts, including hanks of muka-prepared harakeke fibre—in 1895. He said the kete was found by a rabbitier 'in a small cave, packed in a crevice of a rock' about 1.5 km from Puketoi Station, near Patearoa. Augustus Hamilton (1896) published a more detailed account and images of the discovery. The Otago Museum obtained the kete and its contents from Frederick Knapp of Nelson in 1924. The sample came from a hank of muka in the kete (Figure 3).

Wk-25732/D34.961/#21, Tallaburn

George Cockburn Rae of Millers Flat donated a small group of stone and fibre artefacts found in a rock cleft above the Clutha River to the Otago Museum in 1934

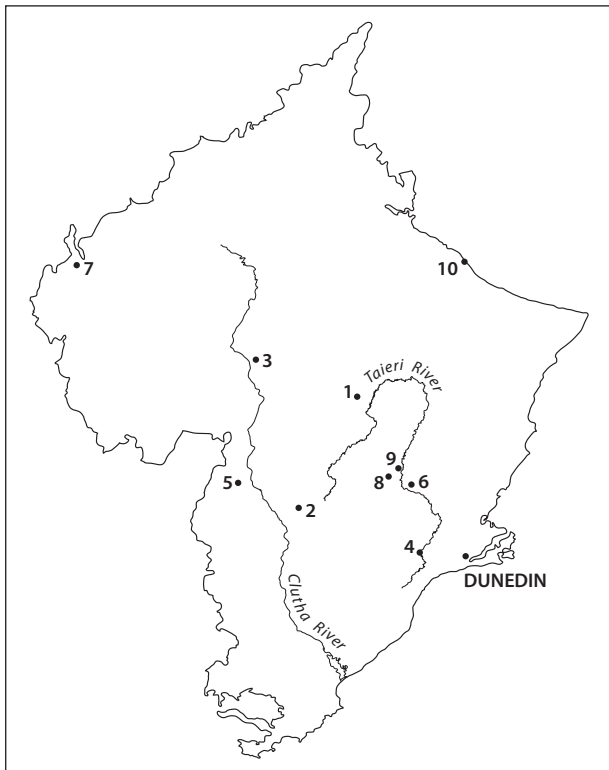


Figure 1. Map showing the location of: 1. Puketoi Station; 2. Talla Burn; 3. Italian Creek; 4. West Taieri Bridge; 5. Mt Benger; 6. Mt Ross; 7. Diamond Lake; 8. Glenavon; 9. Site between Sutton and Middlemarch; 10. Kurow



Figure 2. Woven flax bag (kete) from Puketoi Station, containing materials and implements for making clothes and sandals, plus some partly or wholly finished items.

(Otago Museum, 1935:8). The location was the same as that in which he found a tapa-wrapped and lined waka-huia containing huia (*Heteralocha acutirostris*) and kaka (*Nestor meridonalis*) feathers, which he had donated to the Otago Museum the previous year (Otago Museum, 1934:8). There are two accounts of the location: one has it at the confluence of the Talla Burn and the Clutha River; the other a little upriver, above Craig Flat (pers. comm



Figure 3. A hank of prepared flax fibre (muka), part of the contents of the kete from Puketoi Station. The dated sample Wk-24469 came from this.

William Dacker). The sample came from small fragments of tapa in the second donation.

Wk-25733/D31.1335/#25, Italian Gully

William Arthur rose from assistant district surveyor of Otago to Provincial Engineer and, in 1877, to Chief Surveyor of Otago. He died in 1885. (*Otago Daily Times*, 30 December 1876:3; 14 August 1885:1). An eel net (purangi, Figure 4) from Italian Gully (now Italian Creek) near Clyde was gifted to the Otago Museum. Ritchie (1982:26–27) argues that it was probably found by Arthur in 1869 in the Italian Creek rock shelter (NZAA G42/183) when he camped at the mouth of the creek. In the floor of the Italian Creek rockshelter were several fire pits or ovens containing fragmented moa eggs. These features, dating to AD 1400 or earlier clearly precede the deposition of the eel net (Anderson *et al.* 2005).

Wk-25734/D33.1781, West Taieri Bridge

Mona Snow Welch was the daughter of Mary and Arthur Welch, and granddaughter of George Freeling Welch who

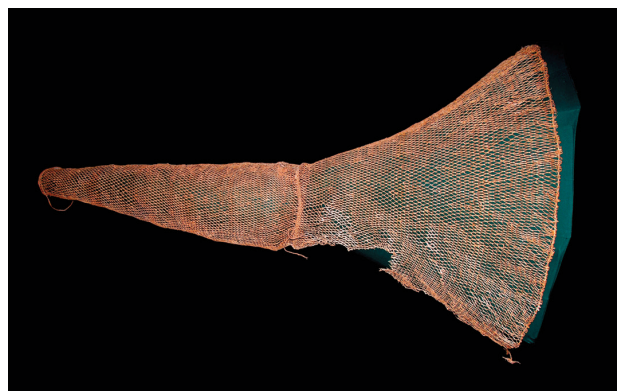


Figure 4. The eel net (purangi) from Italian Creek rockshelter (dated by Wk-25733).

was the manager of Lee Flat Station for many years in the late 19th century. She was almost certainly the Miss Snow noted in the Museum Register as the donor of an eel pot with a West Taieri Bridge provenance in 1933. There is no note of the date or circumstances under which the pot was found.

Wk-26916 & D-AMS 1217-225/D31.1339/#23, Mount Benger

Richard Parks Cocker was a cordial manufacturer who lived at Ettrick. He donated a tussock tag raincape (Figure 5) from Mount Benger to the Otago Museum. Cocker's interest in the prehistory of the area and the Māori artefacts he unearthed there was reported by the *Tuapeka Times* (7 July 1875: 2). There is a note of Cocker sending 'a dried specimen of a rat found by him in a cave, along with some old Māori mats, etc., on Mount Benger' to the Otago Museum (Hutton, 1877: 288) but no more precise details of its recovery. The cape's tussock tags have been identified as *Festuca matthewsii* subsp. *latifundii* (White and Lord, 2012: 380-1).

Wk-26917/D40.240, Mt Ross

George McNicol Fisher lived near Middlemarch and died in 1918. He owned a farm at Springs, near Middlemarch until 1905 (*Otago Witness*, 26 July 1905: 37) and was the Middlemarch agent for the stock and station agents, Stornach, Morris & Co (Thompson, 1977: 135). His widow, Mary Ann Fisher, died in 1937 and bequeathed her husband's collection of artefacts to the Otago Museum. H. D. Skinner described it as one of two 'small but important' collections donated to the Museum in 1940: 'All these pieces are from clefts and rock-shelters in Central Otago and are of great rarity and scientific interest' (Otago Museum, 1941: 8). A note of the donation appeared in the *Otago Daily Times* (16



Figure 5. The remains of a tussock-tag rain cape from Mount Benger (dated by D-AMS 1217-255 & Wk-26916).

August 1940: 3). Few items have precise location details but the Museum Register gives a Mt Ross provenance for the sandal fragment from which this sample came.

Wk-26918/D23.681C/#27, Diamond Lake

Charles Haines had a farm near Glenorchy at the head of Lake Wakatipu for many years, moving to Queenstown only near the end of his life. He donated the small group of material from which this sample came in the early 1920s, but gave the Museum more than 200 other Māori artefacts, most from the area between Glenorchy and the Dart River, in 1944. The Museum Register notes that this material was 'found at foot of cliff near Heaven's Gate, Diamond Lake'.

Wk-39111/D34.755, Strath Taieri

George Fenwick emigrated to Otago with his family as a boy. He began an apprenticeship with the *Otago Witness* in 1899, and two years later, the *Otago Daily Times*. From the late 1860s to the early 1870s Fenwick was involved with newspapers in the Lawrence and Cromwell areas. We know Fenwick had an interest in and owned some Māori artefacts. A ball of fine cord was registered in 1934 as an existing Otago Museum collection item donated by Sir George Fenwick. Details of its collection are not known other than an old label that gives its provenance as 'Found in cave, Strath Taieri'.

Wk-39110/D51.489/#10, Sutton-Middlemarch

Agnes and Robert Kidd lived at Glenavon, near Sutton – one of the Gladbrook runs subdivided for the settlement of returned WWI soldiers. The homestead was about 11km from Middlemarch. In 1951 one of their sons, Jock, found a dogskin bundle beneath a loose piece of rock in a cleft of a large rock outcrop on the property, part of the Lammerlaw Range, and 20m from the stream. Agnes and her son brought the intact bundle to the Otago Museum where it was unwrapped and described by H.D. Skinner (1952: 130). The radiocarbon sample came from a length of fibre, part of material enclosed by the dog skins.

Wk-39112/D75.12/#1, ?Kurow

The sample came from a degraded and fragmentary cloak. It is known to have been in the Museum's collection since at least 1967 and it is referenced by Simmons (1968).

### Radiocarbon methods and results

Radiocarbon samples were prepared and analyzed at the University of Waikato Radiocarbon facility in New Zealand following standard accelerator mass spectrometry (AMS) protocols, whereby charcoal samples were treated with a series of dilute HCl, multiple NaOH and HCl wash-

es prior to CO<sub>2</sub> collection. The radiocarbon samples were calibrated using OxCal v4.2 (Bronk Ramsey 2001) with the SHCal (Hogg *et al.* 2013) and SH1-2 (Hua *et al.* 2013) pre- and post-bomb calibration curves. The 68.2% probability distributions for these calculations are shown in Table 1, with most dates clearly displaying a wide calibrated age range – most into the mid AD 1950s; caused by the burning of fossil fuels during the industrial revolution (Suess effect). To refine the dating of samples from the South Island rock shelters we used the *terminus ante quem* ('before' constraint in OxCal) which sets a date before which the calibrated age range must occur. This *prior* historical information is incorporated in a Bayesian statistical model, resulting in more precise calendar results (Bronk Ramsey 2009).

The rationale for this is an assumption that the absence of European material in any of these sites suggests that they were occupied prior to exchange relations between Māori and Europeans. Evidence of absence is inherently weak, since there might be reasons why European material, already available at the coast, was not carried inland (e.g. it was scarce or too highly valued to carry about, it belonged to people other than those travelling inland, it was not of useful types etc.). Consequently, we set two approximate dates before which an absence of European material in inland seems likely, one which we think the latest that is reasonably conceivable and the other which we think might be more realistic. These are AD 1830 (A), and AD 1790 (B), respectively (Table 1, Figures 6 and 7).

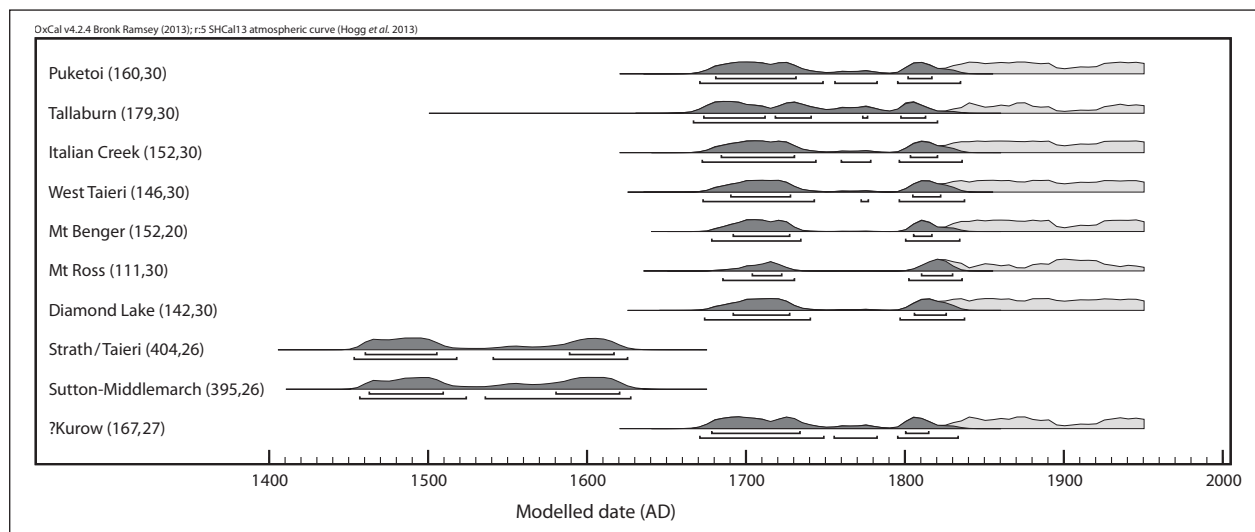


Figure 6. Calibrated radiocarbon ages for interior South Island sites discussed here, assuming a *terminus ante quem* of AD 1830.

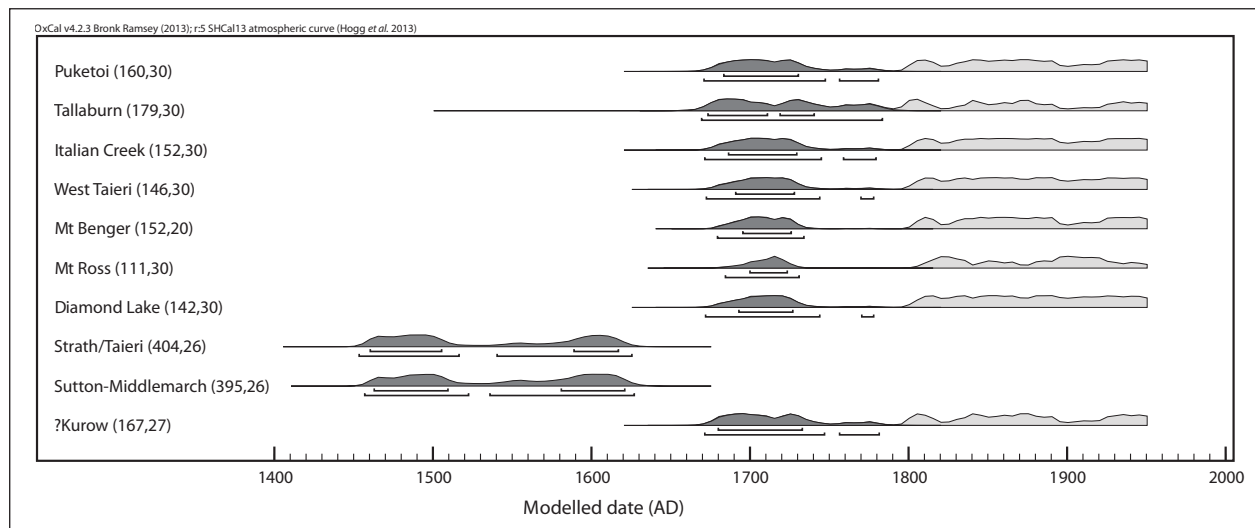


Figure 7. Calibrated radiocarbon ages for interior South Island sites discussed here, assuming a *terminus ante quem* of AD 1790.

These dates were chosen on the basis of historical evidence. European artefacts, such as glass beads and iron spike-nails and adzes were found in abandoned Māori settlements in inland Otago dating to the mid-19th century (Anderson 1982: 66), and northern Māori, carrying muskets, hatchets and other European artefacts, traversed the Otago interior in 1836, finding small communities of southern Māori. Those people had come from coastal settlements adjacent to European whaling stations and, almost certainly, would have had some European artefacts of their own (Anderson 1986). By 1830, Europeans in the sealing and whaling trades had taken up residence with Māori families around the southern coasts on New Zealand, and items of European material culture, including whale boats, iron tools, domestic pottery, bottle glass, cotton clothing, and potatoes, pigs and domestic fowl, were all in common circulation (Anderson 1998). As coastal Otago communities moved seasonally into the interior, hunting weka (*Gallirallus australis*) and fishing for eels (Anderson 1988), it is highly likely that rockshelter sites used by that time would disclose some remains of these. About 1830 is therefore the latest conceivable *terminus ante quem* for the rockshelter occupations discussed here.

However, the first few European artefacts were distributed to Otago Māori by Captain Cook in 1773, when the *Resolution* was anchored in Dusky Sound. As some of this material was later found in coastal eastern Otago, it is very likely that the Dusky Sound people were seasonal foragers from the larger eastern settlements. In any event, European sealing began in 1792 around the southern coasts and sealers were living in Māori settlements by 1809 (Anderson 1998). Consequently, it is possible that southern Māori travelling into the interior would have deposited some European items, had they access to them, in the rockshelters represented here. About AD 1790, therefore, is a more realistic cut-off point for Māori rockshelter occupation in the interior prior to deposition of items of European material culture. The adjusted calibrated age ranges (68.2% probability) for AD 1830 and AD 1790 are shown in Figures 6 and 7.

## DISCUSSION AND CONCLUSIONS

The sample size of 11 results (two are on samples of the same item from Mount Bengier) is too small for any statistical analysis but it provides, at least, a point from which to begin thinking about the issues noted in the Introduction. The distribution of ages shows that most samples (9 of 11) were deposited in the period AD 1680–1820 (model A) or AD 1680–1730 (model B). The remaining two samples, dating to AD 1460–1625, suggest that fibre artefacts could survive considerably longer than those represented in the phase of predominant deposition. In other words, if more such material had been deposited in the late 15th to early 17th centuries then it ought to have survived into the modern era. Fibre artefacts dated to that age range occur

in other inland rockshelters, at Flock Hill in Canterbury (Trotter 1988) and at Lee Island in Southland (Anderson & McGovern-Wilson 1991), not to mention in coastal sites, as at Monck's Cave on Banks Peninsula (Jacomb 2008). We propose accordingly that the predominance of late pre-European ages on our samples does not reflect an inherent short residence span of fibre items in the rock shelters of inland Otago, but rather a late period of accelerated cultural deposition. This is an argument analogous to that proposed for some samples of moa soft tissues (Anderson *et al.* 2010). The two samples dating AD 1460–1625 are from sites situated at relatively low elevation in the Strath Taieri basin and might reflect some continuity through the pre-European era of expeditions from coastal settlements about 30 km to the east.

The lateness, post-AD 1680, of the phase of predominant deposition of fibre artefacts is worth further consideration. The artefacts are of types associated with seasonal hunting, foraging and everyday life: sandals, capes, bags, fish traps and cordage, and the raw materials for making these, which doubtless occurred throughout southern New Zealand across all or most of the span of Māori occupation. Other artefacts also found in inland Otago rockshelters, for example fibre snares, fire-making equipment and spouted wooden bowls (Anderson 1982, 1983), are similarly functional types which were associated ethnographically with seasonal fowling expeditions. It might be guessed that the seasonal use of the Otago interior was a pattern that had been established at the beginning of human settlement, or at least after the early disappearance of moa, and therefore that it was not any significant change in the foraging and related settlement pattern that is represented by the late use of the inland rockshelters. Two other propositions seem more plausible to us.

First, there is an argument about population and climate. Population density seems to have stagnated or declined in southern New Zealand after the megafaunally-oriented Archaic phase occupation prior to about AD 1500. This may have been through attenuation of resource networks (Jacomb *et al.* 2010), but population loss could also reflect a more basic decline in regional habitability through climate deterioration. The New Zealand climate became cooler and wetter after AD 1350 and it was especially cold and wet AD 1500–1650, with some renewed glaciation in the southern mountains. Conditions after 1650 were dry and cool, with some cold intervals up to the end of the 17th century, but then ameliorated into conditions similar to those today from about the beginning of the 18th century (Anderson *et al.* 2014: 121–122, and associated references). Climatic deterioration would have been felt most strongly in the southern region, and perhaps most acutely in the dry, high ground of the interior. It is possible that inland Otago rockshelters were largely abandoned for several centuries, with only occasional forays into the coastal hinterland (as represented in the two lower Taieri dates, Wk-39110, Wk-39111), and only came back into sys-

tematic use with climatic amelioration in the 18th century.

Second, evidence from historical traditions suggests that there was an influx of people into southern New Zealand at about the time when the rock shelters were mainly used. This is the period when various hapu (clans) of Ngai Tahu moved across Cook Strait from the Wellington district and proceeded to annex much of the South Island. The beginning of migration was dated to AD 1677 on whakapapa (genealogical) grounds by Stack (1878), but more recent analyses of whakapapa and other historical data suggest that it was slightly younger. Tau and Anderson (2008: 29) propose initial Ngai Tahu migration about AD 1710, annexation of Canterbury and Otago about AD 1730–1770, and the truce between Ngai Tahu and Ngati Mamoe in Southland about AD 1790. That would mean that inland Otago came under the authority of Ngai Tahu in the mid-18th century. If so, then newly widespread use of the inland rockshelters might have reflected heavier exploitation of inland resources because of increased population density through the Ngai Tahu migrations.

These two propositions are not mutually exclusive and might be combined into an hypothesis which states that a phase of widespread, late pre-European, use of the inland rockshelters occurred when climatic amelioration coincided with an increase of population density initiated by regional immigration.

Perhaps there is a third proposition to add; the deposition of material might itself have been deliberate. That could have involved ritual activity but the general character of the material does not encourage such an argument. Rather, deliberation might have been strategic. With more regular or intensive use of the interior, it would have been logistically advantageous to leave equipment, such as nets and bowls, spare clothing such as sandals and capes, and tools and materials for making these and similar artefacts, in rockshelters to which return was more or less assured. It is noticeable that nearly all the perishable material had either been made into finished articles or worked into a state from which articles could still be finished a year or two subsequently; e.g. flax scutched, some of it dyed, and the tomentum of *Celmisia* stripped from its leaves, etc. (Hamilton 1896).

Deposition of clothing, equipment and materials might be seen as caching behaviour, similar to the caching of adzes which is recorded for the Archaic phase (Duff 1977: 141–142, although there is a question about how often apparent caches had actually been burials, the bones having decayed). Caching, although debated (e.g. Hiscock 1988, 1989; Morwood 1989), has the core attribute of deliberate concealment, usually underground. It often refers to burying of stone cores or tools, prepared where the material is abundant, in places where it is scarce, both as a form of insurance against not having the necessary implements when they are required (Hurst 2006), and as protection against illicit retrieval. The underlying point here is that caching is an activity that could be expected when terri-

toriality was poorly defined or patrolled between groups, as it probably was in the early years of Māori settlement.

In the inland Otago rockshelters, however, the material was placed out of the weather in clefts or crevices, sometimes behind loose rocks, or simply left on rockshelter floors, but it was not buried or otherwise carefully concealed. It falls more naturally into Binford's (1979: 256–257) category of 'passive gear', which consists of material culture left at sites used repeatedly in predictable seasonal activities. We envisage behaviour that amounted to 'furnishing the landscape', i.e. to placing tools ('site appliances' in Morwood's (1989: 37) interesting phrase), clothes, footwear, containers and raw materials in sites where they were most usefully located for anticipated activities in an envisaged strategy of movement about the landscape; a concept which draws on the notion of the perceived landscape as a 'room' (Gansum *et al.*, 1997; Fry *et al.* 2004). The wisdom of such behaviour would depend upon territorial security, and when such authority had been achieved it might have been signalled by the largely unconcealed deposition of useful or valuable material. Our conjecture is that the main chronological horizon of deposition in the inland Otago rockshelters represents the material expression of Ngai Tahu authority over the interior of the South Island.

We are well aware of the tenuous nature of these propositions, but they are at least amenable to investigation. Continuing radiocarbon dating of inland archaeological sites will test the validity of our argument that perishable remains signify primarily a late pre-European phase of deposition; more widespread support for it from throughout the South Island (except the northern districts which have a different tribal history) might be seen more clearly as marking Ngai Tahu immigration. At any rate, the archaeology of the South Island interior seems well worth further research aimed at understanding the nature and variation of its pre-European settlement and society.

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