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# RADIOCARBON DATING OF OYSTER SHELL MIDDEN FROM BESIDE THE DART BRIDGE SITE IN WESTERN OTAGO

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## OYSTER SHELL AT DART BRIDGE

The Dart Bridge site near the head of Lake Wakatipu exhibits a number of unusual features, most particularly rather extensive and curiously shaped stone paving (Anderson and Ritchie, 1986). There are also some indications of maritime activities, despite the deep inland location. A deposit of southern oyster shell (*Ostrea lutaria*), was reported as eroding from the river bank adjacent to the site in 1979 and one shell was found by Neville Ritchie during an inspection of the area in 1980. Excavations in 1981 recovered an unfinished minnow lure shank in a finned form typical of early coastal middens in southern New Zealand and another oyster shell was found in the river bank about 0.8m above the bed and 0.3m deep in the riverbank silt (Anderson and Ritchie 1986: 130-132).

Several aspects of the oyster shell midden suggested that it might be of prehistoric origin. Firstly, at least one shell was found quite deep within a river bank which was well-grassed, bound by the roots of trees and shrubs and at approximately 800m from the usual channel of the Dart River. Erosion of the bank in places appeared to be the result of stock movement rather than river flow. Secondly, so far as could be determined, the oyster shells came only from the *ca.* 10m long section of river bank immediately adjacent to the nearest features of the archaeological site; that is, to the bank lying between complexes B and C, where a test-pitted oven of prehistoric type is only a few metres distant (Anderson and Ritchie 1986: figure 3). Thirdly, artefactual collections made early in the 20th century by Mr Charles Haines, a local enthusiast, and which were presented by him to the Otago Museum in 1919, contained 8 perforated oyster shells. These were all flat (right valve) shells and the holes were roughly punched rather than drilled. One was attributed to the enigmatic Camp Hill site about 10 km from Dart Bridge and the other seven were unlocalised. Since Haines worked extensively on a site which is either that now called Dart Bridge or another which is extraordinarily similar and located in almost the same position, it is quite possible that some of them come from the Dart Bridge site. Anderson and Ritchie (1986: 132) noted that "oyster shells are rare in coastal middens, almost unheard of in inland sites, and exist nowhere else as pre-European inland shell middens so far as we know.

Perforated oyster shells are also a rare artefact type in any context". However, with only two fragmentary valves to go on there was not much else to be said at that time, except to observe (despite expressions of outrage from one referee of the paper), that since some surface grinding on nephrite artefacts in the Haines collection was clearly recent, so might also be the punched holes in the oyster valves (Anderson and Ritchie 1986: 140).

## 1993 COLLECTION AND RADIOCARBON DATE

During an inspection of the site with Department of Conservation staff in March 1993, Anderson noticed more oyster shell eroding from stock tracks in the same area of river bank as earlier. There were both left and right valves in more or less equal proportions and some of the shell was broken. By digging into the brown silty soil of the bank with a knife, at a level about 1.2 m above the cobble bed, some 30 shells were recovered. These were subsequently washed in distilled water, dried at 40° C and consigned for radiocarbon dating to the University of Waikato Radiocarbon Dating laboratory.

The shell was pretreated prior to radiocarbon assay as a precaution against contamination. 2M HCl was used to remove the outer 5-10% of the shell carbonate where contamination is most likely to occur. No XRD analysis was undertaken to determine recrystallisation as in our experience few archaeological shells exhibit this. The method of radiocarbon dating at Waikato University is Liquid Scintillation counting of benzene (LSC). Relevant laboratory procedures are described elsewhere (Hogg, Lowe and Hendy, 1987). The radiocarbon date was calculated according to the procedures outlined by Stuiver and Polach (1977). The conventional age was 106.5±0.3% Modern.$\delta$13C was measured at 1.99 ‰ (normalised to -25‰ w.r.t to PDB). The modern radiocarbon result suggests the'C14' measured in this instance results from oceanic bomb carbon. The shells are thus likely to have been alive since *ca.* 1955 AD. A more exact calendrical date is possible through the application of the measured radioactivity ($\Delta$14C) with a marine calibration curve. In this instance, there is a marine curve that is applicable, that of Kalish (1993), calculated using measurements of snapper (*P. auratus*) otoliths of known historical age. We calculated $\Delta$14C using the recommendations of Stuiver and Polach (1977) with the *absolute international standard activity* modifed for decay since 1950 to the year of measurement (1993). The oyster shell sample $\Delta$14C was measured at 59.0±3.1 ‰ and corresponds with a calendar date on the otolith curve of 1967±5 AD.

## CONCLUSION

The radiocarbon result clearly suggests that the Dart Bridge shell midden is of recent origin and therefore is much younger than the archaeological site adjacent to it. It should be acknowledged that a single date can be misleading and that there would be value in running more samples at some stage, but the

result can be accepted at face value for now. There was a modern radiocarbon date from the site as well (NZ 5327, Anderson and Ritchie 1986: 135), which came from a fireplace that also contained some tinfoil (an association thought coincidental at the time of submission of the sample). Consequently, the use of the site location for camping or picnics is quite likely, and perhaps that is the origin of the oyster shell midden. In any event, it is worth noting that no oyster or any other shell was recovered during extensive excavations of the site in 1981, a circumstance which could be put down to chance when only two valves had been recovered from the riverbank, but which seems more significant now that it is apparent that the riverbank midden contains a sizable quantity of shell. Therefore, the present result suggests that the oyster shell items in the Haines collection did not come from the archaeological site at Dart Bridge. It must cast some further doubt as well upon the credentials of those supposed artefacts in the Haines collection, and perhaps upon the authenticity of other items in it as well. It is possible that oyster shells were collected from the riverbank midden during early investigations of the site and its vicinity, or perhaps actually deposited at that time, and were subsequently modified to make them look like an otherwise scarce artefact type.

## REFERENCES


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