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**NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER**



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EDGE DAMAGE ON BIVALVE SHELLS - A POSSIBLE CAUSE

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Utilised valves of pipis (*Paphies australe*) have been identified in excavations in New Zealand (Shawcross and Terrell 1966: 425; Terrell 1967: 63), and a variety of industrial uses have been suggested as possible causes. Though there is ethnographic evidence for numerous uses of shells by the New Zealand Maori, this paper is written to offer one non-industrial explanation.

I once heard the suggestion that bivalves that were opened when raw would be damaged in a way that might be distinctive, so that finding archaeological shells with the damage pattern would allow the raw opening to be recognised. To test this, two friends and I attempted to open fresh raw pipis by levering at the hinge using obsidian, chert, greywacke flakes, fresh and sub-fossil shells, fresh bone, and the edge of a strip of hard timber. We failed to open even one pipi.

The animals were then run under very hot tap water for a few minutes, then rinsed in cold water. All the animals remained closed, but, with the exception of the obsidian flakes, each of the set of tools listed above was now capable of prising the shells apart.

If I were opening par-boiled pipis, when almost any tool would do, I would use the first thing that came to hand. And of course that is another pipi shell, as I would still be holding the last one opened.

When using pipi valves to open heated pipis there is indeed a striking damage pattern, and, as is probably to be expected, the damage is to the valve used as a tool. The effect is to remove small flakes and chips from the inside of the lip, and as these accumulate with continued use, concavities appear in the outline of the shell. And these concavities are not unlike those appearing on shells illustrated by Shawcross and Terrell (1966: fig. 3), and Terrell (1967: fig. 19). Unfortunately, none of the shells figured could be relocated, so a detailed comparison was not possible. However, it is quite likely that the operation suggested should have been carried out in New Zealand in prehistory, as at least one of the cooking methods Sutton (1971) describes is likely to produce bivalves that need levering open: 'stone boiling' (ibid: 58-59), where red-hot stones are dropped into a container of water and the food to be cooked. It is of course possible to boil water by this method, but it is also possible that the addition of stones would be stopped before boiling-point was reached, and the result would be the production of shellfish in a condition similar

to those resulting from the treatment described above.

In practice I was able to open five to ten animals with one valve before the edge became too damaged to be effective, so that five to ten percent of all valves would show the pattern suggested. Of course, this would be reduced if a method produced some animals needing to be levered open, while opening others completely, or if a more effective method of heating was used on other animals finding their way into the same deposit. However that may be, numerous specimens showing the damage pattern probably exist, and the possibility should be kept in mind when faced with comparable damage on archaeological shells.

Where no heat is available, it is still possible to get at the meat by holding animals in the palms of the hands and bringing them sharply together, though this does get fragments of shell in the flesh. This method will result in almost exactly fifty percent of all valves being badly shattered, but more valves could have broken since then. Such a pattern is most unlikely to appear in the debris associated with any substantial occupation, as it is a tiresome way of getting food, and fires would generally be used.

#### Acknowledgements

I would like to thank Mr D. Simmons of the Auckland Institute and Museum for some of the materials used in the experiment, and Mr A. Daylight and Mr P. Hoskins for their practical assistance.

#### References

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