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## RAT BONE, RECOLLECTION AND RECORD

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In my first expression of scepticism about the radiocarbon dating of *Rattus exulans* bones, I wrote that, “the existence of rat bones beneath Taupo Ash has yet to be demonstrated – the measured sample is from a museum collection made at Hukanui in 1959 by archaeologists and natural scientists who did not mention that *Rattus exulans* bone was found beneath Taupo Ash in writing about the district where it was discovered (e.g. Hartree 1960),” (Anderson 1996: 179). Six years later, towards what one can only hope is the terminal phase of the rat bone dating debate, Yaldwyn (2002) offers his recollections on the matter. Interesting as these are, they do not solve the problem that I identified. As my comments (Anderson 1996, 2000), have evidently been mistaken by Yaldwyn (2002: 119) as a criticism of his “observatory and curatorial skills,” let me set the matter out more clearly.

The central issue is that no evidence other than the brief inscription on the matchbox has ever been offered regarding the provenance of the find. Yaldwyn’s paper serves simply to emphasize that point, just as my response might recall Richard Holdaway’s remark in 1996 that the circumstances could turn into the “matchbox enquiry.” My remarks in 1996 and 2000 sought evidence, not reassurance, because in matters of scientific fact, only evidence will do. Archaeologists should not be asked to accept as a substitute, assertions that depend upon accuracy of recollection, particularly when the events in question occurred almost half a century ago.

Yaldwyn has “photographs, maps and notes” on the site, some of which are discussed in his paper, but he provides no reference in them to an account of

finding the rat bone and the provenance of its recovery. He realised “the archaeological consequence of an early rat date from New Zealand” (Yaldwyn 2002: 124) and recalls discussing it in the excavation trench at the time of discovery with Hartree and Scarlett, and again that evening. Yet there is no reference to a sketch of where the bone was found, its location on the drawn sections, or a description of its provenance in a field book, letter or diary. Furthermore, there is nothing in print, even where a reference might have been expected. Hartree (1960), for example, described the stratigraphic value of dated tephra in Hawkes Bay and went on to mention the usefulness of rat bone in defining the advent of human occupation, in the absence of archaeological remains. He set that point as well within the post-Taupo period, despite the apparent pre-Taupo find at Hukanui #7b some months earlier. Neither Scarlett nor Yaldwyn referred to the “old rat” in their subsequent publications, even though Yaldwyn (2002: 126) says it “clearly remained in his scientific thoughts for almost 40 years.”

It may be true, of course, that publication in 1959 might not have seemed the urgent consideration that it has become today, but the case was both strong and important. The discoverers knew that *Rattus exulans* was an introduced species, and they knew that if it came from below the Taupo Tephra it was older than AD 150, the accepted date of Taupo Tephra in 1959. Consequently, Polynesians had reached New Zealand 500 years or more earlier than the period of arrival as it was conceived at that time, which was generally in terms of a traditional model suggesting that New Zealand had been discovered in the late first millennium AD. There was no need to put the specimen aside against some future eventuality. There was, specifically, no need for a radiocarbon date. As it stood, the discovery was clearly-dated and obviously significant in 1959.

The absence of a public record about the discovery, and perhaps even of a private record, would seem more understandable if there had been some circumstances attending the find, perhaps now obscure or forgotten, that left significant questions about its credentials. For instance, Hartree and colleagues knew that the Hukanui rockshelter site stratigraphies had been disturbed to some degree. In addition, standards of excavation in them were not as they have become in recent years, so there might have been some concern about the provenance. Perhaps the bone seemed to come from pre-Taupo material but not sufficiently clearly to record its provenance except in very general terms? In the absence of a more specific record it would have been prudent to store the specimen and either write a suitably qualified account of the find or else nothing at all.

We do not know how Hartree's section was sampled on 28<sup>th</sup> May 1959 and whether the rat bone was recovered from the surface of the exposed section or from within it. If the former, then the specimen might have moved down during Hartree's digging. If the latter, it might have been re-deposited by bioturbation that was not visible in the exposed section. There is considerable evidence of bioturbation in the Hukanui shelters, particularly by rabbits, as noted by Holdaway and Beavan (1999: 194) who comment of the Hukanui Pool site that rabbit burrows were conspicuous towards rear parts of the excavation and went from the surface deposits through the Taupo Tephra, in that site up to 65 cm thick. Bioturbation is not always obvious, and it raises particular concerns in relation to a single find, as in this case. At Hukanui #7b, the exposed section was recorded by Yaldwyn as undisturbed, but that does not exclude the possibility that material had been taken through the thin (20 cm thick) Taupo Tephra by rabbits or other agencies behind the recorded section. There were petrel and rabbit bones on the surface of the site.

Disturbance is certainly one explanation of the considerable discrepancy between radiocarbon dates on the two bones that were found together by Yaldwyn: the rat bone dated  $1775 \pm 93$  BP (NZA 6636) and the pigeon bone dated  $3088 \pm 72$  BP (NZA 6357). If these bones had been in the positions suggested by their ages then, on balance, the rat bone would have been recovered from around the Taupo tephra (ca. 1850 BP) and the pigeon bone from close to the Waimihia tephra (ca. 3280 BP). As Yaldwyn found them in close association either the context must have been disturbed or one or both of the dates are substantially inaccurate. It is interesting to note in this connection, that the Hukanui #7b rat bone was not the first to have apparent pre-Taupo credentials. A rat bone from the Hukanui #1 shelter was regarded as from an undisturbed, pre-Taupo, context when it was submitted for dating in August 1995. It produced a result of  $732 \pm 92$  BP (NZA 5883), but no other details have been published. Holdaway and Beavan (1999: 199) assign it a post-Taupo provenance citing "W.H. Hartree unpubl. notes..." In this case, as at Hukanui #7b, the issue should remain in suspense until the publication of actual, specific, details of provenance and dating removes any question of doubt.

Considerable inconsistencies between radiocarbon dates on rat bones and those of other sample types, or stratigraphic levels, are all too common in the sites that have been investigated in New Zealand. The Hukanui #7b case might be no more than an artefact of the approximately 90% concentration into the first millennium AD or earlier of all New Zealand natural (mostly predator site) and archaeological rat bone ages produced at the time - in 1995-1996 - irrespective of provenance (Anderson 2000).

Rat bone radiocarbon ages are open to various potential explanations, but if we ask whether the results in general express reliably the time of death of the specimens concerned, then the clear answer is that they do not. When some data are unreliable or of unknown reliability, then it is very difficult to argue that a particular instance should be accepted unless its credentials are beyond question. Regrettably, Hukanui #7b is not such a case on the evidence which so far has been brought forward. Indeed, Yaldwyn's recollection that the rat dentary and pigeon coracoid were found together casts rather more doubt upon the results than existed hitherto.

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### References

- Anderson, A.J. 1996 Was *Rattus exulans* in New Zealand 2000 years ago? AMS radiocarbon ages from Shag River Mouth. *Archaeology in Oceania* 31: 178-184.
- Anderson, A.J. 2000 Differential reliability of 14C AMS ages of *Rattus exulans* bone gelatin in south Pacific prehistory. *Journal of the Royal Society of New Zealand* 30: 243-261.
- Hartree, W. H. 1960 A brief note on the stratigraphy of bird and human material in Hawkes Bay. *Newsletter of the New Zealand Archaeological Association* 3: 28.
- Holdaway, R.N. and Beavan, N.R. 1999 Reliable 14C AMS dates on bird and Pacific rat *Rattus exulans* bone gelatin, from a CaCO<sub>3</sub>-rich deposit. *Journal of the Royal Society of New Zealand* 29: 185-211.
- Yaldwyn, J.C. 2002 The match box – the rat bone – the Hukanui #7b excavations 1959. *Archaeology in New Zealand* 45: 118-127.