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ARCHAEOLOGICAL EVIDENCE AND THE BREEDING SEASON OF THE TAIKO  
PTERODROMA MAGENTAE

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Two Pterodroma sp. which were captured on 1 January 1978 in the Tuku catchment on the south-west coast of Chatham Island have been identified as taiko, Pterodroma magentae (Giglioli and Salvadori, 1868). However, there is some division of opinion as to the accuracy of this identification and the reconstruction of the breeding season of the taiko from the evidence of the captured birds. One opinion is that these birds were captured outside the breeding season. This is based on the apparent absence of an incubation patch on either bird, the failure of the birds to regurgitate any food when handled, as might be expected of breeding adults, and on the lengths of the primary feathers. This interpretation is supported by the view that incubation patches are present and identifiable in breeding birds and older pre-breeders. On the other hand, others may argue that the birds captured were breeders, maintaining that incubation patches are difficult to identify and that these may have been unemployed birds attached to an occupied breeding colony. Birds without incubation patches could be part of the younger component of the population.

The truth of the matter will probably not be resolved until further live birds are captured. Archaeological evidence from two sites near the capture location, however, supports the view that these birds were captured during the breeding season of this species.

The two sites involved are known as CHA and CHB (N.Z.A.A. Site Numbers C240/681 and 680 respectively). They are located on a leading spur 1 km from the sea and approximately 2 km south to Point Durham. They were excavated in 1976 by the Otago Archaeological Expedition. A detailed analysis of the bird bone recovered has been reported by Sutton (1979a). The association within these middens of bone of petrel fledglings and other species which are present only seasonally is of particular importance.

First the erect-crested penguin (Eudyptes sclateri) is represented by immature bone, believed to represent chicks, at the nearby Waihora site (C240/283) which is dated to the sixteenth century (Sutton, 1979b), and in CHB. The erect-crested penguin is therefore thought to have bred in the area. Warham's (1972) data on the breeding timetable suggests that chick raising would have occurred in the summer months. The presence

of its immature bone in CHB may therefore indicate summer occupation of that site.

There is also the humerus of a young seal pup, estimated (Ian Smith, pers. comm.) to represent an animal approximately four months old, present in the CHB midden. This supports the suggestion of summer utilisation of this site because seal pups are born in the interval from November to the end of December (Sutton, 1979b:Fig. 2:10). Summer occupation is also suggested by the absence of bone of any of the seal species known to visit the Chathams from the subantarctic south in winter. These are the leopard seal, elephant seal and Hooker's sea lion (Sutton, 1979b: Appendix 2:5).

All of these species were identified by Smith (1977) from the nearby CHC site (C240/689). The presence of these species at CHC and the Waihora site suggests that those sites were occupied during winter. The absence of any evidence of these winter visitor species from the CHB midden suggests summer occupation of that site.

Prions are represented at CHB by a minimum of 30 broad-billed prions (Pachyptila vittata) and four fairy prions (P. turtur) including immature and adult bone. The seasons at which the fledglings of these species were available to the Moriori birders can be reconstructed on the basis of their present breeding ecology. Richdale's (1965) paper on the broad-billed prion suggests that they would have been available for approximately three months in the height of summer: October - December. Fatty fledglings of fairy prion on the other hand appear to have been available significantly later in January and February, and perhaps the first quarter of March.

This suggests that the earlier period coincides closely with the time at which taiko fledglings were available and at their heaviest; that is, a short time before they left the colony. There are no less than 339 taiko represented in CHB. This was calculated to be the minimum number represented by Sutton and Marshall (1980) using a method developed by Leach (1970).

A survey of osteological immaturity in the scapulae of taiko, the scapulae and coracoids of diving petrel (Pelecanoides urinatrix subsp.) and the coracoids of broad-billed prion showed that at least 65.5% of the taiko were pre-flight fledglings at death. This is to be regarded as a minimum figure in view of the expected differential loss of immature bone through time. Similar results were obtained for the diving petrel

where 35.6% of the scapulae and 43.3% of the coracoids were immature. Richdale's (1965) data from Whero Island in Foveaux Strait indicate that this diving petrel bone represents birds taken in or before the third week of January. There was a minimum number of 69 diving petrels represented in CHB. Finally, as many as 16.6% of the tiny coracoids of broad-billed prion which survived were osteologically immature.

### Conclusion

The presence of a large number of taiko in a prehistoric midden presents an opportunity to assess the season at which fledglings were available and thereby the breeding season of the species.

The absence of winter indicators, notably the large southern seal species mentioned, suggests summer occupation of the site and that taiko fledglings were taken at that time of the year. The task of deciding the most likely period within the summer season is more difficult. However, the presence of bone of fledglings from the broad-billed and fairy prion and diving petrel makes this possible. In view of the proportions of these species present it appears to be most likely that taiko fledglings were available in the period between mid-December and late January.

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