

Kinsky & Fowler (1973) suggested that Manx Shearwaters may associate with flocks of Fluttering Shearwaters (*P. gavia*) while in New Zealand waters. From 1985 Beach Patrol Cards so far received (R. G. Powlesland, pers. comm.) there is no evidence of any unusual seabird species being off the Wellington west coast at the time this specimen was found. However, low numbers of at least six shearwater species were found, including Fluttering Shearwaters.

Manx Shearwaters closely resemble Fluttering Shearwaters and Hutton's Shearwaters (*P. huttoni*), and New Zealand beach specimens may easily be confused. A useful table for distinguishing between these species is presented by Kinsky & Fowler (1973). Features most helpful in distinguishing this specimen from Fluttering and Hutton's Shearwaters were

- (a) Relatively white underwing,
- (b) Extensively black-tipped white axillaries,
- (c) Exposed under tail-coverts with lateral black bars, and
- (d) Longer wing and tail measurements.

The record has been accepted by the OSNZ Rare Birds Committee, with whom a report and photographs are filed. I am grateful to J. A. Bartle, J. F. M. Fennell, M. J. Imber, R. L. Palma, R. G. Powlesland and J. Warham for their help and encouragement, and to J. A. Bartle for his comments on and modifications to this note.

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Occurrence of disease in Tui

During a study on the behaviour of colour-banded Tui (*Prosthemadera novaeseelandiae*) on Auckland's North Shore during 1984 a number of unexplained Tui deaths occurred. In July and August 1984 two banded Tui were found dead below trees where they had been feeding. No obvious cause for death could be found in birds of otherwise good condition (Colwyn Smith, veterinary surgeon). At the end of November, a Tui rescued from a cat in Beachhaven, Auckland, was found to be suffering from some disease, the symptom being inability to perch firmly, reluctance to fly, and wing shuffling, head flicking and, later, clouding of the eyes. Four more cat-killed banded Tui were reported between August and November 1984, one from the Whangaparaoa Peninsula and three in Birkenhead, Auckland.

During the same period two Tui were found unable to fly by the ranger on Little Barrier Island. One of these later died, and one seemed to recover and was released.

Further reports of similar symptoms and deaths came in from Birkdale, Coatesville, Whenuapai, Titirangi, Hillsborough and Remuera, all within 30 km of Auckland. In three of these instances the Tui, which was feeding, suddenly dropped to the ground and then convulsed or appeared partly paralysed. The symptoms common in sick birds were inability to fly or perch followed by

twitching or paroxysm and breathing difficulty with excess mucus in the throat and nostrils. One banded Tui in Birkenhead had the initial symptoms of breathing difficulty and clumsy flight during July and August 1984 but has since fully recovered in the wild and is still healthy to date (October 1985).

In December 1984 a fledgling was received from Sunnyvale, Auckland, with all the typical symptoms of paralysis, excess mucus and breathing difficulty. Shortly after death this bird, together with two further fresh and two frozen Tui also suspected of disease, was sent to the Whangarei Animal Health Laboratory for investigation.

The specimens were received by M. P. Kearns (District Veterinary Officer) and examined by J. Sutherland (Veterinary Clinical Pathologist). J. Sutherland reported that, in two of the fresh specimens, large spirochaetes (15-25 μ long) were found that were morphologically consistent with *Borrelia* spp. (probably *B. anserina*). Both these birds had congested livers and mucus in the intestines. In the two frozen specimens no spirochaetes were found but both had congested and distended spleens and livers and one had mucoid hyperplasia in the small intestine. The symptoms and post-mortem appearance were consistent with avian spirochaetosis.

Avian spirochaetosis caused by the spirochaete *Borrelia anserina* has not been identified in New Zealand before (M. P. Kearns, pers. comm.) but is known in Australia (Seddon 1953). *Borrelia* is a blood parasite requiring a vector between hosts (Hungerford 1969). The usual vector is the fowl tick (*Argas persicus*) but this tick does not occur in New Zealand (Kearns, pers. comm.). However, *Culex* mosquitoes have been known as carriers of the spirochaete (Zuelzer 1936) and can act as true carriers in much the same way as the fowl tick. The red mite *Dermanyssus avium* has been shown to be an effective mechanical vector (Hungerford 1937, Hart 1937) and probably any bloodsucking insect may mechanically transmit the disease (Hungerford 1969).

It is not known whether the spirochaetosis found in Tui is specific or can occur in other avian species nor whether it is endemic or, if not, whether it is a recent introduction or has been in the population for some time but unidentified.

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*Syn. *Borrelia anserina*

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