

## SHORT NOTES

### A very early observation of helicoidal intestines in the Procellariidae

A peculiar twisted or helicoidal morphology of the upper intestine has been reported in certain of the Procellariiformes by Kuroda (1955, 1986), Naurois & Prévost (1972), and Imber (1985). The condition supposedly occurs only in *Pterodroma*, but not in all species of that genus, a fact that Imber (1985) regarded as taxonomically important. Kuroda (1986), however, found intraspecific variation in this structure in *Pterodroma* that suggests it may be of uncertain phylogenetic application.

Nevertheless, it is of passing historical interest to note that helicoidal intestines were observed in petrels as long ago as the second of Captain James Cook's three celebrated voyages, which took place from 1772 to 1775, with the naturalists Johann Reinhold Forster and his son Georg accompanying the expedition. Many of J. R. Forster's original observations from this voyage were not published until long after his death, in a volume entitled *Descriptiones Animalium* that appeared in 1844. In this, at the end of a section including observations made from 17 August to 10 October 1773, is the following quote (p. 209), which I give in the original Latin and in English translation kindly supplied by George Steyskal, Dept of Entomology, Smithsonian Institution:

Omnes postremae tres Procellariae intestinorum habent peculiarem structuram. Est nempe duplicatura in interiore parte intestinorum spiralliter excurrans: unde extus intestina videntur arte contorta, inque globulos divisa.

The last three Procellarias have a peculiar structure of the intestines. It is merely a doubling of the inner part of the intestines extending outward spirally: seen from the outside of the intestine it is tightly twisted, seeming to be divided into globules.

Preceding this were accounts of five species of petrels in order as follows: *Procellaria antarctica*, *P. inexpectata*, *P. tristis*, *P. leucocephala*, and *P. haesitata*. According to various synonymies these names should be equivalent to the following names in current use: *Thalassoica antarctica*, *Pterodroma inexpectata*, *Puffinus griseus*, *Pterodroma lessonii*, and *Procellaria cinerea*. Although Forster attributed helicoidal intestines to the last three species, of these, the condition supposedly occurs only in *Pterodroma lessonii* (Imber 1985). Because it also occurs in *P. inexpectata* (but not in *T. antarctica*), perhaps faulty recollection or editorial reordering of the sequence of species will account for the discrepancies. Regardless, Forster clearly observed helicoidal intestines in more than one petrel, and at least two of the species he mentions are known to possess this trait, although the better part of two centuries passed before it was called to attention again.

#### LITERATURE CITED

- FORSTER, J. R. 1844. *Descriptiones Animalium, Quae in Itinere ad maris Australis Terras per Annos 1772, 1773, et 1774 Suscepto Collegit, Observavit et Delineavit*. Berlin: Duemmler. A.A.H. Lichtenstein, ed.
- IMBER, M. J. 1985. Origins, phylogeny and taxonomy of the gadfly petrels *Pterodroma* spp. *Ibis* 127: 197-229.
- KURODA, N. 1955. On the osteology of the gadfly-petrels, *Pterodroma*. *Annotationes Zoologicae Japonenses* 28: 171-177 [Not seen].