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## MASS MORTALITY OF *PUFFINUS GRAVIS* (O'REILLY) ON THE COAST OF SURINAME (AVES, PROCELLARIIDAE)

by

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In July 1974, a seabird was received for identification from Mrs. M. P. Panday of Paramaribo, Suriname. The bird proved to be an immature specimen of the Great Shearwater, *Puffinus gravis* (O'Reilly), a species not previously recorded from Suriname or the adjacent countries, which explains why Mrs. Panday had been unable to identify it with the literature available to her.

Further information received from Mrs. Panday was that she had found the dead bird on the beach of the fauna reserve Bigi-Santi (east of Paramaribo) during a visit made from 13 to 15 June, 1974. There were many dead shearwaters on the beach at the time, but only a few (like the one collected) were fresh, most of the birds found were already entirely desiccated, and would have been dead for at least a week or so. The total number of dead birds must have been considerable; the two wardens of the reserve estimated that they had seen about 150 between Matapica and the mouth of the Oranjekreek, a distance of 35 km, but the actual number would have been much greater as half of this stretch, between Motkreek and Oranjekreek, is never done on foot but by boat, so that dead birds on the beach would have remained unnoticed. In addition, the wreck may have extended to beaches beyond the area indicated, which are rarely visited.

The bird received was forwarded in a frozen condition, its weight on arrival was 390 grammes, and in the short time (less than a month) it had been frozen, the loss of weight through cold storage would have been negligible. This weight indicated, and autopsy confirmed, that the bird was very thin. Few weights of healthy birds of this species appear to have been published, but Hagen (1952: 92) gave for a series of 14 adult birds of both

sexes weights of 715-950, average 834 grammes. These weights were taken at the breeding places, and the birds were in a very good condition. During migration the weights would conceivably range lower, but even so the weight of our bird would be much below normal.

The bird was made into a study-skin (RMNH reg. no. 73679), and the following additional particulars were noted: sex ♀, ovary undeveloped, measurements: wing ca. 325 mm, tail 120 mm, exposed culmen 50 mm, tarsus 56 mm, stomach empty.

The plumage is fresh, in particular the primaries, secondaries and rectrices, and there are no obvious signs of moult. It is on the basis of this plumage-condition that I believe the bird to be a young of the year. Others have used this same criterion (cf. Collins & Tikasingh, 1974), although I realise that it is not entirely satisfactory.

Mass mortality of *Puffinus gravis* has been recorded on previous occasions. The most recent one is from Trinidad, where some 40 birds were found dead on Manzanilla Beach in June 1973, as first mentioned by French (1973: 43) and discussed in more detail by Collins & Tikasingh (1974). A far more impressive mortality took place on the eastern coast of the United States in June 1969 (Watson, 1970). Specimens from Trinidad and the United States agreed with the one from Suriname in that the weights were well below normal, and the stomachs were empty or almost empty. The mortality in the United States yielded abundant material for autopsies and tests for the presence of toxic chemicals and infectious diseases, but neither could account for the mass mortality, which remained unexplained.

The specimen from Suriname does not contribute to the solution of the problem of what causes the mortality. In the period of the mortality there had been no unusual weather conditions. Mrs. Panday reported a very low salinity of the seawater near the coast, and also a low content of silt. In as much as shearwaters are pelagic, it is hardly likely that these conditions, existing near the coast, would have been of a great influence.

Although the cause of mass mortality remains uncertain, the most likely explanation seems to me starvation. As indicated by Voous & Wattel (1963: 144) and Stresemann & Stresemann (1970: 383-384), the pattern of migration of the species is such that, from the eutrophic zones of the southern Atlantic where it breeds, it rushes through the dystrophic tropical Atlantic to the eutrophic zones of the northern Atlantic where it winters. It appears plausible that the inexperienced young birds would in some years be unable to procure enough food during their passage of the tropics, and that this could lead to the observed mortality. The emaciated condition of the victims, and their empty stomachs support this hypothesis.

## LITERATURE

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