RATS AS AVIAN PREDATORS: DISCUSSION

by W.R.P. Bourne[1]

Since F.I. Norman concludes at the end of a review of the role of "The murine rodents *Rattus rattus, exulans* and *norvegicus* as avian predators" (Atoll Research Bulletin No. 182, 1975) that "it appears that the rats' role as an avian predator has been overestimated... the basic facts should be established before widespread control campaigns are undertaken", and this conclusion may be used as an argument for procrastinating over such campaigns, it should perhaps be made clear that many people have no doubt at all about the harm caused to birds by rats, and will refuse to accept such a cautious conclusion for a moment.

The situation is of course complicated, and the literature relating to it vast. Rats were introduced to many sites where the worst damage has occurred long ago, before reliable witnesses arrived, and those that were present commonly reacted by introducing cats, owls or other predators, which confused the picture. Rats do most of their work by night, and since it only takes them a few seconds to remove an egg or bird it may be hard to obtain direct evidence of their activities. They are inveterate scavengers, and may take abandoned eggs or birds which died of other causes. The extent to which they prey on other animals may vary with the relative size and numbers of the rat and its prey, the availability of alternative foods, and the occurrence of a seasonal climatic regime liable to lead to restrictions on the food-supply available to the rats at some seasons which limits the numbers able to act as predators when birds are present at other seasons. Their activities may also affect the ecology of other species indirectly, by competition for food, or through damage to the habitat, for example by eating the roots of tussock grass on subantarctic islands. It is dangerous to make facile generalisations about the situation except to say that a legion of witnesses have now reported for centuries that their presence has almost invariably been considered harmful.

The situation may be illustrated by taking a few examples:-

1. An exceptionally rich marine avifauna breeding on Amsterdam Island in the southern Indian Ocean may have been partly exterminated by hogs and cats at the beginning of the last century, but most of the surviving bones were found in rat-holes (C. Jouanin and P. Paulian, Proc. XII Intern. Orn. Congr. 368-372, 1960).

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2. Five native birds, *Gerygone insularis*, *Rhipidura cervina*, *Zosterops strenua*, *Apolonis fuscus hullianus*, and *Turdus xanthopus vinitinctus* disappeared from Lord Howe Island within twenty years of the arrival of *Rattus rattus* in 1918 (see especially a symposium on the island in Australian Natural History 18(2) for June 1974).

3. The havoc caused by rats among both land and sea birds in the New Zealand area is documented by a series of contributions from the Wildlife Service and Royal Bird and Forest Society to the forthcoming Proceedings of the XVI World Conference of the International Council for Bird Preservation. Norman is wrong in identifying the muttonbird virtually exterminated on Stewart Island as *Puffinus tenuirostris* since it was *Puffinus griseus*; the endemic Southern Saddleback *Philesturnus c. carunculatus* which he mentions was threatened when *Rattus rattus* reached the outer islets in 1964 was only saved by emergency transplantations elsewhere, while the local race of bush wren *Xenicus longipes variabilis* and snipe *Coenocorypha aucklandica iredalei* may have been lost entirely.

4. While the petrels *Pterodroma cahow* and *Puffinus lherminieri* do appear to have been eliminated from the main Bermuda islands and confined to outliers by the activities of rats among other predators, and rats may take occasional tropic-bird *Phaethon lepturus* eggs there, this exceptionally aggressive species has in fact managed to hold its own in the face of attacks by not only rats and cats but tens of thousands of people. Norman quotes R.C. Murphy (Oceanic Birds of South America, 1936) incorrectly in attributing the rat predation to *Rattus exulans*, since this was in fact a repetition of the original report by Gross (Auk 29:49-71, 1912) that he had seen one egg taken by *Rattus rattus*. *Rattus exulans* does not occur in the North Atlantic.

5. The impact of rats on birds in the British Isles is extremely variable. They are important predators on many species but especially those nesting on the ground inland where rat numbers are high, though it is not always easy to distinguish their work from that of other small mammals. They exterminate storm petrels wherever they go, but their impact on larger burrow-nesting birds varies. They exterminated a large Puffin *Fratercula arctica* colony on St Tudwal's Islands, North Wales, and severely reduced their numbers on Lundy, Puffin Island (also north Wales), and Ailsa Craig without exterminating them, whereas a large colony long continued to flourish in the presence of rats on the Shiant Islands. They exterminated the Manx Shearwater *Puffinus puffinus* at its type locality on the Calf of Man, and it only recolonised when they were controlled by poisoning. Small numbers survive in the presence of rats at a number of other sites, a larger colony suffers severely from predation in some years but not others on Canna, and a vast one in the hills of Rhum appears to escape it. Terns suffer severely in areas heavily infested with rats but may escape their attention elsewhere (references for some of these sites will be found in S. Cramp, W.R.P. Bourne and D. Saunders, "The Seabirds of Britain and Ireland", 1974).

The situation appears to have been particularly bad on many oceanic islands because there were no natural predators or inclement seasons to control the numbers of introduced rats, and the native wildlife had no innate defences against them. The petrels which bred there were particularly vulnerable because they leave their small, defenceless chicks alone in their burrows by day soon after they hatch. It will be noted that while Norman found that rats took the unguarded eggs of Short-tailed Shearwaters *Puffinus tenuirostris* but avoided encounters with the large, aggressive adults (J. Zool. 162:493-503, 1970) he did not investigate what occurred when the rats encountered small chicks. While the situation may often have been made worse by the introduction of alien predators in an attempt to control rats, there is an obvious correlation between a decline of the smaller and more defenceless seabirds in historic times and the introduction of rats throughout the world. However, I agree that it remains difficult to assess the full amount of harm they have caused because it is impossible to say how many insular landbirds they have exterminated as well. A rat may only need to eat two or three eggs or chicks a year to cause serious damage, whatever it eats the rest of the time.