

Penguin mortality in the Falklands

February in the Falklands was marked by reports of large numbers of dead penguins being found throughout the Islands: almost 300 dead gentoo penguins *Pygoscelis papua* on Sanders Island, 100 dead rockhoppers *Eudyptes crestatus* on Pebble Island, many dead rockhopper chicks and 160 dead adults washed ashore on New Island. The reports continued throughout March and April, and on 25 May 3000 dead rockhoppers were counted at the Settlement Rookery on New Island. Most of the penguins found dead were rockhoppers, but many gentoos also died. Magellanic penguins *Spheniscus magellanicus* were not found dead in high numbers, although they would be less visible since they nest in burrows, and there were no reports of exceptional mortality among black-browed albatrosses, king shags, prions or petrels.

Heavy chick mortality is not unusual in severe weather conditions in the Islands, but such large numbers of dead adults are exceptional. The rockhoppers also appear to have been laying a high proportion of infertile eggs; 55 per cent of eggs collected on the Jasons by Richard Hill were infertile compared with the normal infertility rate of 8 per cent. Richard Hill believes that the infertility is due to diet problems and also noticed that great skuas on the Jasons were paralysed in their legs. His explanation for this is that the large number of infertile rockhopper eggs provided the skuas with a diet higher in protein than usual. He found that captive skua chicks fed on a high-protein diet of mice also developed leg paralysis, which disappeared when their diet was changed to fish.

Alarmed by the sheer number of penguin deaths and the emaciated condition of the corpses, the Falklands Islands Development Corporation asked the Falklands Islands Foundation to organize a post mortem. Two consignments of the first dead rockhoppers to be found were flown to the Ministry of Agriculture Veterinary Investigation Centre in the UK. Dr Ian Keymer who examined them is '99 per cent certain' that the birds died of starvation. Another consignment was sent in after the 3000 dead birds were found on New Island. These too had apparently died of starvation.

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Dr Keymer suspects that many birds may have been affected by a seabird disease, puffinosis, and he discovered higher than expected concentrations of lead in the liver and kidneys. While neither puffinosis nor lead alone would account for the deaths, the combination of the two may have weakened them sufficiently to prevent them feeding. Dr Keymer believes that other factors, such as shortage of food, may also be involved and further investigation in the field is needed to discover the causes of the deaths.

Food shortages, if they were a contributory cause, may be the result of the massive escalation of fishing in Falklands waters over the last three years. Japanese, Taiwanese, Korean and Spanish boats have been taking enormous catches of squid, which forms a substantial part of the rockhoppers' diet. Albatrosses and petrels also feed on squid and might be expected to be affected too. The apparent absence of any effects on these birds could, however, be explained by the fact that they forage over a much larger area than the penguins in the breeding season.

So little is known about squid population dynamics and seabird feeding requirements that more research is clearly needed if we are going to be able to answer the questions raised by the penguin deaths. The Falkland Islands Foundation sent two scientists to the Falklands in September on a two-year project to carry out dietary and population studies on rockhopper penguins and other seabirds. At the end of the project a report on seabird food requirements and on the extent of competition with commercial fisheries will be prepared. At present, although overfishing is implicated as a possible cause of penguin mortality, there is no evidence. Perhaps this project will provide it.

Source: Lyster, S. 1986. Penguin deaths worry. Newsletter from the Falkland Islands Foundation, 5.

Postscript

Rockhopper and gentoo penguins are also dying in Argentina, according to a report in *Nature* (24 July 1986, page 296). At a press conference at the Soviet Embassy in Buenos Aires the Soviets suggested that radioactivity could be involved, claiming that four British ships sunk during the 1982 Falklands conflict had been carrying

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Rockhopper penguins (Ian Strange).

nuclear weapons, the casings of which had leaked. The Argentine National Atomic Energy Commission ruled out this possibility and when asked to comment on the deaths of 300 penguins near Piero Deseado, stated that, even if some radioactive material had escaped into the sea, the concentrations would have been far too low to be dangerous.

A scale insect problem on an endangered palm

Wendy Strahm writes of an interesting discovery from Round Island, Mauritius, where she is working on endangered plants. With Don Merton of the New Zealand Wildlife Service she collected some of the scale insects that were covering one of the two remaining *Dictyosperma album* var. *conjugatum* palms on the island. They planned to spray the palm, but before doing so took the insect to the Commonwealth Institute of Entomology in the UK where it was identified as a new species *Asterolecanium dictyospermae*. According to D. J. Williams and J. R. Mamet, this sap-sucking insect probably evolved on Round

Island with the palm variety, but now that the palm is under stress from other causes the numbers of scale insect have increased, thereby threatening the survival of not only the palm but of the insect itself.

There are three varieties of *D. album* in the Mascarene Islands—all three occur on the main island, Mauritius, where they interbreed, and it is only on Round Island that *D. album* var. *conjugatum* occurs without the other two varieties and thus produces seed that is 'pure'. If the palm can be propagated then the insect may also survive. A suitable parasite might be found to keep the scale insect in reasonable numbers rather than having to spray the tree with insecticides, thus affecting the survival of other possibly rare insects. The new insect is closely related to two others described from palms in the Mascarene Islands: one of these, *Asterolecanium spectabile*, is a conspicuous and unusual species with a striking bright orange-scarlet colour, but despite an extensive search it has not been seen since 1932 and is probably extinct. Wendy Strahm reports that a rabbit eradication programme was due to start on Round Island in June 1986 and that if this is successful there will be an opportunity to propagate the rare palm and save the insect too.

Reference

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An inconsistent rain-forest policy

Although preserving rain forests is at the top of the United States' international agenda, the nation is letting its own few rain forests disappear, according to Catherine Caufield in a recent article in the *New Scientist* (5 June 1986). The bulk of its rain forests are in Hawaii, where 95 per cent of its flowering plants and 99 per cent of its animals are endemic. A long history of forest destruction, beginning with Polynesian settlement 1500 years ago and increasing 200 years ago with the arrival of the Europeans and North Americans, has left about one-third of the native rain forest, much of it very fragmented. Of 57 species and subspecies of bird, 23 are now extinct and 23 endangered. Of the 3000 native plant species, 270 are extinct and 800 are endangered.

Present day forest destruction is taking place on private land, encouraged by state and federal laws. In turning forest into cattle pasture a land-owner can often benefit in two ways: firstly by selling the timber to the Hawaii Electric Light Company, and secondly, since many rain forests are in state-designated agricultural zones, by a reduction in taxation if they destroy forests and start a cattle ranch or plant crops. Last year 400 ha (1000 acres) of what a botanist described as 'the best rain forest left in Hawaii' was turned into pasture. Now a plan to extract geothermal heat threatens 3500 ha (8650 acres) on the slopes of Kilauea Volcano. Campbell Estate wants to lease the land to a Wyoming company, True/Mid-Pacific, which would drill 86 wells to tap volcanic steam and build up to five power plants to generate electricity from it. The state has approved the scheme, but environmentalists and native Hawaiians are fighting it, saying it would damage a conservation zone that is home to several rare species of plants and birds. The extra electricity is not needed by Hawaii, so the state and federal governments are spending \$27 million on a feasibility study to send it by cable 300 km (186 miles) north-west to Oahu.

Breeding tuskless elephants in the wilderness

by J.I. Boshe

There are fewer elephants in Africa today than ever before, and their range is now confined to certain areas south of the Sahara. Some of these existing populations show irregularities, either in the population structure, tusk growth and development, or both. Increasing frequencies of single-tusked and tuskless elephants have been reported in some parts of Africa. Loss of tusks or poor tusk development in elephants due to injury or disease have both been documented (Perry, 1953; Carrington, 1958; Sikes, 1971). However, it is suspected that selective hunting for large tuskers may be having a long-term effect on the proportion of large tuskers in elephant populations.

Annual quotas have been set for harvesting the species in those countries whose elephant population levels are considered viable. Such quotas

are based on presumably frequent and reliable population surveys to establish total population sizes, irrespective of the 'quality' of such populations. Assessment of the condition of wildlife populations has often been based on total population sizes, and some other important parameters associated with general health and quality of the population gene pools have not received enough emphasis. Body size at maturity, reproductive potential, and tusk or horn growth and development should be among the factors to be considered when assessing the status of a given wildlife population.

African elephants have been hunted for trophies for many years, and large-tusked individuals are most sought after. It has been claimed that large tuskers are rare now because hunting pressure does not allow elephants to grow to maturity. There is some evidence, however, that in some populations even very old animals no longer carry tusks of appreciable size. Sikes (1971) observed that tuskless African elephants occur as a distinct genotype, this characteristic appearing in particular clans and continuing from generation to generation. It seems probable that tusk size also is genetically determined, although there is no conclusive evidence.

If this is true and if hunting continues in its present form, the genes for large tusks will be depleted and this could lead to populations made up of small-sized animals with small or deformed tusks or no tusks at all. There is a need to call upon all governments and conservation organizations to ensure that whenever elephant hunting is necessary, issuing of licences and hunting are planned and carried out in such a manner that a few large and heavy-tusked individuals are protected in every population so that the genes determining these characteristics are preserved.

References

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