

man must behave naturally, without affectations, he must be helpful to others and capable of self control, and of course it is essential that he is efficient at his particular job' (p 120).

Brief character sketches in the narrative bring many survey members, ship's captains and others to life—indeed many a Husky dog, especially Darkie, whom I remember tied up at the back door on Saturday mornings during Sir Vivian's visits to the Scott Polar Research Institute in the 1950s. In the space of a short review it is impossible to do justice to such a splendid book, which can be welcomed as a true record of the BAS and its predecessors from 1943 to 1973. It also reveals the author's sense of humour and his common touch, and yet too his ability to convey calamity and even death with regard and respect. Much of the writing is memorable. As an example, here is a quotation from the author's journal of December 1949 when he went down on a rope into a crevasse to rescue a sledge dog 20 feet down:

. . . Mutt stood quietly without so much as looking round, amidst a shower of tinkling icicles which plunged on past, and speaking gently to him, I fixed the rope to his harness. Then Ray [Adie], who had tied my life line firmly to the sledge, began to haul the 100 pound dog slowly upward. . . . While this was going on I had the opportunity to study the magnificent sight of the narrow cavernous place in which I found myself. Everywhere hung huge icicles 10 to 15 feet long, with bases as much as 18 inches thick. Of these I had to be careful, for a piece could easily be dislodged and could have knocked me out. . . . The walls were hung with an amazing lace-like curtain of ice crystals, the individual crystals being an inch in diameter and linked together to form glittering pendants (p 128–29).

The quotation goes on to describe the technique of Darkie, the lead dog, in crossing crevassed areas, cautiously advancing 'somewhat in the fashion of an heraldic lion or leopard, each paw extended as far as possible to test the surface in front of him'.

The work is illustrated with fine photographs. The maps on end papers and in the text are helpful, but a detailed folding map at the end would have been even more so. It is good to see Greater Antarctica and Lesser Antarctica used as place-names, rather than 'East Antarctica' and 'West Antarctica'. A few misprints have crept into the place-names on the cover and in captions and text. However, I am convinced that *Of ice and men* will be bought and borrowed not only by Survey members and their families but by the British taxpayer, to whom it is dedicated and for whom it was written. It is a 'must' for all concerned with the polar regions whether in the field or at a desk.

## SUB-ANTARCTIC ISLAND ECOLOGY

[Review by W. Nigel Bonner\* of *Colloque sur les écosystèmes subantarctiques, Station Biologique de Paimpont (Université de Rennes) 1–4 July 1981*. Published under the direction of P. Jouventin, L. Massé and P. Tréhen. Paris, Comité National français des recherches antarctiques 51, 1982, 540 p. Softcover.]

Ecologists are fascinated by islands, and for good reason. The spatial isolation of oceanic islands means that they have simpler biotas than continental land masses. In these less complex communities, ecological relationships may be clearer, and adaptive and evolutionary trends more conspicuous. Islands where environmental pressures are extreme have a special role. Their systems are likely to show responses to these pressures, whether adaptive or otherwise, and their study will throw light on the phenomenon of biological response. The sub-Antarctic islands dotted around the Antarctic Convergence in the Atlantic and Indian ocean zones are specially interesting candidates for research. Few, if any, are pristine, but none has been affected by man for much more than a couple of centuries, and in general they constitute a relatively undisturbed part of the world's surface. This provides an opportunity to study natural ecosystems and relate them to their environment. At the same time, the

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perturbations caused by the introduction of species or the recovery of severely reduced indigenous forms may be conspicuous and their effects still developing, providing good opportunities for studying these natural experiments.

Several nations maintain research teams in the sub-Antarctic and a couple of years ago it was judged appropriate to hold a meeting on the topic of sub-Antarctic ecosystems. This was organized by the Comité National Français de Recherches Antarctiques (CNFRA) and the Université de Rennes and held at the university's Station Biologique de Paimpont in July 1981. The proceedings of this colloquium are now published. Papers are in French with English abstracts, or in English with French abstracts. Those who turn to the volume hoping to find a review of sub-Antarctic biology will be disappointed. No attempt at synthesis was made by the organizers, nor were contributors asked to review particular fields. The 52 papers mostly present the results of recent research in the field, much of it still continuing, and these make an impressive and fascinating addition to the literature.

It is difficult to review such a varied field and I can only pick out one or two papers that were of particular interest to me. The papers in the volume are organized into 10 sections. The first two of these, on animal and plant biogeography, are perhaps the least exciting. Clearly, taxonomy is a basic tool, and much can be learnt from a study of distributions, but it takes a specialist to appreciate fully a paper on the endemic diatoms of Iles Kerguelen. On the other hand, the discovery by Friedman and colleagues of cryptoendolithic lichens living in the intercrystalline spaces a few millimeters beneath the surface of rocks in the cold deserts of the dry valleys of southern Victorian Land (while not strictly sub-Antarctic!) will excite a good many biologists. The account by Pascal of the decline in Elephant Seal numbers on Iles Kerguelen was included in these sections, though its interesting conclusion, that the recent fall in abundance may be correlated with heavy fishing around the archipelago, is more related to interactions than to biogeography.

The six sections on adaptive strategies contain many interesting papers. Lauritz Sømme discusses survival of terrestrial arthropods at low temperatures, and reveals that we know more about conditions in the Antarctic than in the sub-Antarctic. Overwhelmingly, Antarctic land arthropods depend for survival on being able to supercool (indeed, only the larva of a midge appears to be freeze-tolerant). Antifreezes in body fluids make this possible, but food residues in the gut can act as ice nucleators and allow freezing to take place. Lewis Smith describes the exceptionally high productivity of southern sub-polar regions compared with most Arctic tundra ecosystems. Jouventin and his colleagues, describing the pelagic distribution of sea birds, show what observations can be made from vessels of opportunity. Although the results reported are not startling, they demonstrate the value of systematic and regular observations. Bester, discussing the effects of the environment on the two sympatric species of fur seals at Marion Island, show how the distribution and habitat selection on low latitude islands is primarily a response to the stresses caused by high ambient temperature to primarily aquatic mammals.

For me, some of the most interesting papers dealt with introduced species. Rats, cats, rabbits and reindeer—all have been introduced, as well as many others. Some died out but others persisted to the general detriment of the ecosystem concerned. Cats were introduced to Marion Island as late as 1949. They have now spread over the whole island and have had severe effects on burrow-nesting petrels. Van Aarde and Skinner review this problem and the means adopted to solve it—the introduction of feline panleucopaemia virus in 1977. Since then the cat population has declined, but it is too early to say whether a final solution has been found. Salmonids have been popular subjects for introduction in many places. Davarine and Beall describe the adaptive strategies of trout at Kerguelen where the fish have established both resident and migratory forms.

Seven papers deal with the ecophysiology of penguins, a field which the French workers have made very much their own. Groscolas and his colleagues compare the adaptation to low temperatures of the extreme Antarctic Emperor Penguin and the sub-Antarctic King. King Penguins can maintain basal metabolic rate down to  $-5^{\circ}\text{C}$  and Emperors to  $-10^{\circ}\text{C}$ . However, the latter by huddling can avoid most of the effects of wind and extreme low temperatures. Barré discusses the geographical distribution of penguins in relation to seawater temperatures when the chicks take to the sea, and heat production in penguin chicks.

I strongly recommend this volume to those interested in biology with a strong polar flavour. CNFRA should be congratulated on bringing out this attractively produced volume within a reasonable time of the meeting.