

THE ARCTIC IMPERATIVE: AN OVERVIEW OF THE ENERGY CRISIS. By RICHARD ROHMER. Toronto: McClelland and Stewart Limited, 1973. 5¼ x 7⅞ inches, 224 pages, illustrations and maps. \$3.95 softbound.

Mr. Rohmer's is, in many ways, a remarkable attempt at a very difficult, if not impossible task. He includes more or less detailed mention of a number of the components of the "energy crisis" as they affect Arctic Canada and Alaska. For example, he comments extensively on the extent of present proven and probable northern fuel reserves, on the degree of foreign control of Canadian reserves, on the efforts, problems, and particularly the failings of the government of Canada with regard to the creation of policies to control northern development under the stress of recent Arctic fuel developments, on the matter of Arctic sovereignty, on the problems of transporting arctic fuel (tankers, planes, ice breakers, dirigibles, trains, and roads are all discussed), on the particular problems of the native peoples, and on the politico-financial problems which rapid development of large northern fuel reserves could present to Canada as a whole. He mentions in passing a host of related topics such as the limitations of predictions of oil resources, the differences between development patterns presented by the oil and gas industries, the role of the military in northern development etc.

In his treatment of most topics Mr. Rohmer presents some interesting and useful information, and naturally raises questions rather than providing answers. The plea of the entire book, for the development by the government of Canada of an *overview* policy on northern development is, however, an "answer" of sorts. Difficult though this may be, it is undoubtedly of the greatest importance that the government (of whatever political persuasion it may be) find and adhere to some broad philosophy in its approach to the North. Mr. Rohmer, for example, assumes throughout this book, sometimes explicitly, sometimes implicitly, that fuels found in the Arctic *will* be exploited and that "development" of the North will inevitably follow from this. This is a very simple assumption but a very important one, and one that has enormous ramifications. It is an assumption which could be political dynamite (even Mr. Rohmer is now less ardent than he was about northern development), but surely it would be healthier in the long run if a government and the country openly accepted this assumption and used it openly in the development of an overview policy towards the North?

In this book, Mr. Rohmer presents the views of what might be described as a fairly "careful developer" — that is to say a developer who is

reasonably conscious of the problems which his efforts will raise (socially, ecologically, financially, etc.). I find it interesting that this point of view and the more extreme "develop or bust" point of view are so much better publicized than the "no development" or "develop extremely slowly" positions. It would be most interesting to have an "overview of the energy crisis and the arctic" based on the assumption of a complete freeze on northern developmental activities. Does the anti-development camp have a Richard Rohmer?

This book is an attempt to grapple with a complex area of current affairs within which daily events effect significant changes. It was completed in January 1973 but it contains additional information on events which occurred considerably after that date. However, although we badly need an overview of the energy crisis, is it possible for a single person to produce one without the benefit of several years' hindsight? The federal government, presumably bringing to bear mammoth resources, was able only to begin to tackle this task with the publication of the carefully titled *An Energy Policy for Canada, Phase I, Analysis Volume 1*, seven months after Mr. Rohmer put his manuscript in the hand of his publisher.

The stringencies of a publication deadline may account for the fact that the book reads like the roughly edited tape of a series of political speeches. There are more than the usual number of printing and other errors in it and it does not read as a whole.

Furthermore, the style is flashy to the point of irritation. This is not something which can easily be conveyed by examples but the use and abuse of the word "imperative" is one case in point. The clause "It is imperative" is used to end many of the chapters and other uses of "imperative" include:

"... the Arctic Imperative required that the Manhattan experiment should take place . . . (p. 70)."

"These comparative figures are dramatic evidence of the rapidly increasing power of the Arctic Imperative . . . (p. 175)."

"... the Arctic Imperative is truly a monster out-of-hand." (p. 195).

"If the physical, developmental and environmental forces brought into being by the mushrooming Arctic Imperative are enormous, so indeed are the implications of the financial impact . . ." (p. 196).

"The Arctic Imperative is very much alive, it is very much a monster and it is very much out of Canada's control." (p. 313).

It is possible that the style is intentional, intended to heighten the sense of urgency which the book undoubtedly possesses, but in my view it weakens the thrust of the arguments.

One important point is mentioned but quickly forgotten and buried under following detail: that is the fact that natural gas reserves in arctic Canada are only just reaching economic levels and that reserves of oil are nowhere near that level although extremely optimistic speculations have been made about their size. Despite the *present* urgency in the search for natural gas (which Mr. Rohmer brings out well), one cannot help feeling that, in the end, it is the development of oil reserves which will have the widest ramifications — in industrial, political, economic, social, or ecological terms. If massive reserves of oil are not found in the Canadian Arctic, the tone of this book will, in ten years' time, appear to have a hysterical ring. If, however, such reserves *are* found, this book will be seen as a timely first attempt at a virtually impossible task.

W. P. Adams

ARCTIC LIFE OF BIRDS AND ANIMALS INCLUDING MAN. BY LAURENCE IRVING. *Ecology and Zoophysiology Vol. 2. New York: Springer-Verlag, 1972. 6 11/16 x 9 15/16 inches, 192 pages, 59 illustrations. \$14.00 U.S.*

A book on the life of birds and mammals in the Arctic by a zoophysiologicalist might well be devoted to an exhaustive and possibly exhausting account of the adaptations to cold shown by the arctic representatives of these two classes of animals. But Laurence Irving unlike most physiologists, who are largely laboratory orientated, is also a field naturalist and he devotes nearly half of his book to various aspects of the natural history of arctic birds and mammals under the general headings of migrations and maintenance of populations. The first section of the book is preceded by a useful introductory chapter on the arctic environment in general dealing with topics such as climate and the history of the arctic climate particularly during the Pleistocene in relation to migrations of animals and man into the area. This latter subject is again considered in more detail in later chapters on mammals and birds. As an example of the many points of interest in this section of the book one might cite the persistence of breeding on shore ice in the land-locked population of ringed seals in Lake Baikal and the Caspian. These seals are presumably relics of a southward displacement into the temperate zone from the Arctic, where the vast bulk of the species lives, during the Pleistocene. In the account of ptarmigan movements on p. 56 one might have expected some reference to Weeden's work on spatial

separation of the sexes in winter in these birds. I also missed any reference to Alwin Pedersen's 166-page monograph on the polar bear in this section.

Since the work of others has shown a definite trend for clutch size in passerine birds to increase with latitude, more data on clutch sizes in the Arctic compared to other zones, beyond the brief comparison of a few arctic white-crowned sparrow clutches to more southern ones, might have been expected.

The larger clutch sizes of northern birds are attributed to longer days during the breeding season permitting longer periods of gathering food for the young. This raises a topic of some interest not dealt with in Irving's text, not as a matter of omission but rather because it has not been systematically studied, namely the effect of the 24-hour daylength of the arctic summer on the waking sleeping rhythm of birds.

The last seven chapters of the book deal with the maintenance and control of body temperature in the warm-blooded animals of the Arctic. "Cold Physiology" has been built up into something approaching a subdiscipline of its own. It is therefore refreshing to find that these chapters present this material not just for specialists but in a way which makes it accessible and useful to the general scientifically-orientated reader.

It is shown that of the various ways theoretically available for maintaining body temperature in a cold environment, essentially only one is used, namely high insulation provided by feathers, fur and, in pinnipeds, over most of the body by blubber. Body temperatures of arctic animals are not elevated compared to those of animals from other climates, nor is their resting metabolic rate strikingly high though it is raised to some degree in some. Ptarmigan have higher-basal metabolic rates than would be expected from general equations relating this rate to body weight in a variety of animals from various climates, and resting metabolic rate is reported as 25 per cent higher in northern Indians and Eskimos than in whites.

The efficiency of insulation in willow ptarmigan in winter is shown by their low critical temperature (the environmental temperature at which body production must be raised above the resting level to balance heat loss) of -6.3°C , the lowest yet recorded for any bird. It is about 25° in the temperate zone house sparrow. Arctic foxes have shown critical temperatures below -30°C . whereas that of man unclothed of 27°C ., corresponding to his probable origin, places him in this respect among tropical mammals. The last chapter is devoted to man in the cold. Beyond the moderate elevation of resting metabolic rate in natives of the Arctic