

inhibitors in triticale; in spite of this, the authors devote four pages to these components of wheat and rye. Triticale is a new crop on which much more research and development are needed. Its superiority to its parents is not yet unequivocally established but is probable. It seems clear that triticale is potentially a valuable crop: someone ought to write a book specifically about it.

N. W. PIRIE

Polar humans

Polar Human Biology. (Proceedings of the SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic.) Edited by O. G. Edholm and E. K. E. Gunderson. Pp. xii+443. (Heinemann: London, November 1973.) £6.00.

THE symposium from which this book resulted took place in Cambridge during September, 1972. The editors are to be congratulated on producing it within a reasonable time and the publishers have provided an attractive format and a price which is not excessive. Certainly, the book deserves to be read widely, for it describes the state of the art of research into polar human biology and medicine at a time when great advances have been and are being made.

The book falls naturally into five sections. An initial series of reviews of the individual contributions to Antarctic research by the several countries concerned is followed by two papers on dental problems and a larger section on virological and immunological research. Next follow a group of papers on various aspects of thermal adaptation, activity patterns and circadian rhythms. The book ends with a large section devoted to psychological and social problems of life under the severe conditions which constitute the polar environment.

As might be expected with such a large range of subjects, the treatment is very uneven. Several of the papers are either anecdotal or present largely unanalysed sick-report data. Though of practical interest they seem out of place here. On the other hand a few papers seem destined to become classics in the study of man at extreme latitudes. In particular the two papers of Shephard and his collaborators Godin and Rode seem to me to combine all that is excellent in a multidisciplinary study of the response of the Eskimo to his rapidly changing pattern of life. Roger's paper on cold adaptation in members of the Commonwealth Trans-Antarctic Expedition of 1958 is equally admirable—indeed, perhaps more so, since the conditions of work must have been much more severe. His conclusion—that general biological adaptation to severe cold does not occur—is interesting to say the least!

The importance of psychological and cultural factors in polar adaptation is rightly stressed. Much of it is of an applied nature, in particular for personal selection, and several of the papers reflect this interest. Again, though, one wonders if this book is the right vehicle for such reports.

Though the book contains much that is good and some things which are really excellent, it is impossible to escape the general conclusion that the international organisation of polar (and particularly Antarctic) research in human biology is in a pretty anarchic state. A good many papers show considerable areas of overlap of topic and similarity of methodology and it seems sad that the impetus of the International Biological Programme towards cooperation and standardisation seems to have petered out in the far south. I hope, though, that this book will be a spur to the greater integration of research. If this happens the enormous devotion and self sacrifice of many of the scientists, working often in an environment as lethal as any in the world, will be fully rewarded.

E. J. CLEGG

Biological information

Elementary Principles of Probability and Information. By R. F. Wrighton. Pp. viii+91. (Academic: London and New York, January 1974.) £1.95; \$5.50.

THE author is primarily concerned with the applications of statistical inference and information theory to the biological sciences. He complains that biologists are 'currently witnessing a resurgence of anthropomorphism as information notions percolate into biological enquiry conceived at the molecular level'. He foresees that present macro-theories, derived essentially from 'purely subjective interpretations of probability' and applied to information processes of macro-systems in which it is always possible to distinguish between 'the label and the labelled', will break down at or near the molecular level.

At first sight, his programme seems to imply a direct though difficult reduction of biology to physics. But the programme is even more fundamental than that. In his last chapter, noting that anthropomorphic heresies, in the form of traces of communication notions, pervade both quantum and relativity theories, the author looks forward to a 'complete fusion of information theory with quantum theory rather than to any less intimate association'. He is therefore claiming that the much closer physical analysis he seeks of biological processes could solve some of the epistemological problems of modern physics. That is an ambitious programme. Is it possible for man to establish a science from which all anthropomorphic residues

Corrosion of metals research 1924-1968

This book, written in a semi-popular style, by Dr Wormwell of the National Physical Laboratory, is intended for people with an interest in corrosion and its prevention. It is a modest contribution to the history of government science and offers an example of what can be achieved by a long-maintained team working in one broad area of endeavour.

£1.65 (£1.72)

A code of practice for the detailed statement of accuracy

The main purpose of this Code of Practice, prepared by the National Physical Laboratory, is to put forward recommendations as to how uncertainty can be expressed so as to avoid ambiguity, and discusses some of the ways in which estimates of uncertainty can be derived from individual measurements.

£1.05 (£1.10)

Prices in brackets include postage

Government publications can be bought from the Government bookshops in London (post orders to PO Box 569, SE1 9NH), Edinburgh, Cardiff, Belfast, Manchester, Birmingham and Bristol, or through agents and booksellers. The Bookseller section of Yellow Pages gives your nearest stockist.

HMSO BOOKS

are completely eliminated? If so, then at least we have to begin by identifying those residues that can be discerned and considering what might be done about them. And that is what the author attempts to do.

Unfortunately, the reader finds himself embarking on this fundamental programme without being clearly informed about where he is being led. The seven chapters discuss familiar topics in an unfamiliar way—randomness, the basic Shannon model, noise, inverse problems in probability, sampling techniques, and so on. These topics, dealt with in terms of elementary mathematics, enable the author to air the serious problems he has in mind. But it is only slowly and with much re-reading that the reader builds up any coherent picture of the author's objectives. So it is difficult to see to what readers this book is addressed. Those seeking techniques for immediate practical application will find none: those interested in the fundamental problems discussed will be misled by the title and would not expect so serious a programme to be presented in this form.

But the author's ideas are stimulating. Information concepts derived from telecommunications and other physical systems do seem to be inadequate for enquiry into the processes of 'information transfer' on which all living organisms depend. B. C. BROOKES