explanation. He attempts an *a priori* rejection of the atomic theory of matter in favour of a field theory and he says that his metaphysical views are closest to those of Faraday.

How successful is this ambitious attempt? There is no doubt that the notion of the inner constitution of things is asked to bear more than it can. It cannot help us to understand causal necessity or to establish, against Hume's arguments, that there is any such thing. Harré's attempt to answer Hume's criticism of the notion is very unconvincing indeed (pages 105–111). Nor, without some change of view about the nature of justification or of knowledge, is the fact that things have an inner constitution much help with the problem of induction. First, it does no more than replace the problem of the justifiability of inductive argument with that of the justifiability of argument by analogy. Second, for basic hypotheses such as some of those of mechanics, no acceptable explanation in terms of inner structure has been proposed to help us choose between the alternative hypotheses left open by induction from experimental instances. Harré is forced to relegate such principles as the law of impact, which stand as firm as any in science, to the status of protolaws. Further, although many scientific explanations do rest upon the inner constitution of things, and Harré is right to feel dissatisfaction with the positivist account of such explanation, it is not clear that all do. The principle of the lever is the basis of many explanations but has no concern with inner mechanisms.

There is one feature of the deductivist philosophy which is regrettably absent from Harré's own. The paradoxes in Hempel's rules of confirmation became apparent because those rules were formulated precisely. Harré not only eschews precise formulation of the principles of analogy which he thinks must replace the principles of induction (page 35), but is prepared to embrace principles, such as affirmation of the consequent, which lead to paradoxes just as serious as those of Goodman and Hempel and much more obvious.

The proof reading has been done very carelessly but, in recompense, there is an extremely useful bibliography.

JOHN WATLING

Tropical Medicine

Tropical Doctor: a Journal of Modern Medical Practice. Volume 1, Number 1. Edited by Dr Hugh Clegg. Quarterly. (Royal Society of Medicine: London, January 1971.) 60s annually; 15s each copy.

THE provision of adequate health services for developing countries is a task of

paramount importance and great difficulty in the face of the continued shortage of professional and auxiliary medical staff. There can be no permanent improvement in the present conditions unless the highest possible priority is given to the training of large numbers of health workers of every description.

Many newly independent nations embarked on the development of full scale medical schools while fully realizing that during the next decade or so, the number of graduates cannot be more than a trickle. But mere numbers of graduates is not enough. There is also the need to maintain the quality of medical practitioners—especially those who work in distant rural areas without an easy access to the medical books and journals that characterizes the present "information explosion". *Tropical Doctor*, fathered, carried to term and skilfully delivered by its editor Dr Hugh Clegg, under the auspices of the Royal Society of Medicine and with the assistance of the Commonwealth Foundation, aims at filling this gap in communication. It is being produced primarily for the benefit of the isolated medical worker who is responsible for a large number of people; he cannot decline this mandate without depriving them of their only source of medical help. Much of the medical practice in the tropics is subject to stagnation because of the remoteness of the under-doctored areas. And yet the man in the field must not only retain his original skill, but must acquire new knowledge of the advancing science and technology applied to medicine and public health.

The first issue of *Tropical Doctor* fulfils brilliantly its promise. The contributors to it come from many parts of the world. Chaudhuri from the School of Tropical Medicine in Calcutta provides an informative paper on the treatment of cholera; Khoo Oon Teik of Singapore deals with lobar pneumonia as seen in the tropics; Burkitt of London outlines the diagnosis and treatment of the tumour that bears his name; Norman from the United Arab Republic writes about hookworm, Wosorun from Accra and Adeyoye from Ibadan discuss the management of burns and head injuries respectively; Cook talks about tropical ulcer and Farman about general anaesthesia.

In the series of special reports there are excellent papers on maternity care in the tropics; on control and eradication of smallpox, on "under fives clinics" and on surgical improvisation in the Pacific. "Newsletters" and replies to "Any Questions" are signed by many distinguished names. There are also two shorter sections on drugs and equipment and finally "News and Notes".

The attractive cover of the journal, its excellent layout, its clear print and

illustrations are bound to enlist many faithful subscribers and readers.

L. J. BRUCE-CHWATT

African Birds

Birds of West Central and Western Africa. By C. W. Mackworth-Praed and C. H. B. Grant. (African Handbook of Birds, Series III, Volume 1.) Pp. xxvii + 671 + 46 plates. (Longman: London, 1970.) 120s.

THE surviving author is to be congratulated on having so nearly completed the ambitious task undertaken 48 years ago; this is the penultimate volume of the six that were planned, and the final one is understood to be well on the way. Captain Grant died in 1958 but had already done much preliminary work even for this last stage. The aim was to provide a work covering all the birds of Africa south of about 20° N latitude. There were to be three series of two volumes apiece, each series constituting an independent regional account. The first dealt with eastern and north-eastern Africa and the second with the southern third of Africa; this one covers west central and western Africa, from southern Mauritania down to the Congo-Zambesi divide in Angola. This area is much more extensive than that covered by either Bannerman's *Birds of Tropical West Africa* (1930–51) or Chapin's *Birds of the Belgian Congo* (1932–54).

The plan inevitably involves substantial overlap between the different series, many species being common to two or all three of the regions. It has thus been necessary, for the sake of consistency, to deal conservatively with changes in nomenclature and new views on taxonomy that have arisen since the earlier volumes were published. The information about individual species and subspecies is on the same lines as before; the stress is on identification and distribution, with brief treatment of chief points of life history and behaviour. There are the same marginal drawings of birds, as well as the colour plates by a number of experienced bird artists; and the same useful distribution maps. Dr W. Serle, with personal experience of this side of the continent, contributes an introductory section on topography and climate.

A. LANDSBOROUGH THOMSON

Antarctic Ecosystems

Antarctic Ecology. Vols. 1 and 2. Edited by M. W. Holdgate. Pp. xx + 604 and x + 607–998. (Academic: London and New York, 1970. Published for the Scientific Committee on Antarctic Research.) 120s and 100s.

THESE are model symposium volumes, well edited and with a strong and coherent theme. They include 81 papers

on all aspects of Antarctic ecology, descriptive, quantitative, behavioural, functional, grouped into fourteen themes, each with a short introduction and a useful edited discussion at the end. The papers are illustrated with photographs, figures and maps, and there are good subject and author indexes at the end of volume two. Volume one deals essentially with marine ecology, volume two with terrestrial and freshwater ecology.

Several of the topics lead into discussions of cropping and conservation of Antarctic ecosystems. Are the krill, supposedly under-exploited by the present decimated whale populations, a potential world food resource, or are they basic to so many Antarctic food chains that it would be hazardous to crop them at all? Cropping at the zooplankton level has always seemed ecologically attractive but mechanically impracticable, but krill are large enough, abundant enough and occur in dense enough shoals to overcome these difficulties. Moiseev suggests that successful exploitation of krill would "probably allow us to double the present catch of aquatic organisms from the world ocean". Other members of the symposium were less sanguine.

What are the hopes for successful conservation of the Antarctic continent, an international resource hitherto almost totally unexploited, with its simplified and presumably vulnerable ecosystems? The Antarctic Treaty, negotiated in 1960, is steadily being endorsed by all the relevant nations and is sometimes hailed as an example of effective international conservation, a model for the internationally agreed world conservation measures essential for man's survival. It is too early to say whether Antarctic conservation is successful and, if so, whether this is because governments have at last seen the light about conservation, or because the economic and/or military advantages of flouting the treaty are negligible. If resources of world fossil fuels become critical and nuclear energy is not an acceptable substitute, will the great Antarctic coalfield be scheduled for exploitation? If so, will the Antarctic Treaty cut much ice?

I would have liked all the maps the same way up. I am surprised the symposium contained only a bare mention of the oft quoted occurrence of organochlorine pesticides in Antarctic animals. A critical discussion of the ecological implications of these results would have been valuable. Few individual scientists will be able to afford *Antarctic Ecology*, though by present standards £11 for one thousand pages is not expensive. All in all, the contributors, publishers and especially the editor are to be warmly congratulated on this *magnum opus* and librarians at least should be encouraged to buy it. It will stand as a major source of reference for many years.

P. J. NEWBOULD

Controlling Parasitism

Recent Advances in Researches on Filariasis and Schistosomiasis in Japan. Edited by Manabu Sasa. Pp. 402. (Tokyo University: Tokyo; University Park: Baltimore, Maryland and Manchester, July 1970.) \$21.

THIS is an account of the work stimulated by the Japan US Cooperative Medical Science Programme which set up a Japanese Panel on Parasitic Diseases in 1965 to study filariasis and schistosomiasis. Medical parasitology as a scientific discipline began with filariasis in 1877, when Patrick Manson discovered that the filarial parasite causing elephantiasis was transmitted by mosquitoes. Filariasis is still a major problem in Asia with more than 200 million people infected. At the time when Manson was working on filariasis in China, Japanese physicians were studying a disease of the liver and bowel that was spreading throughout the Hiroshima prefecture and other parts of southern Japan. The blood fluke causing this disease was eventually discovered by Katsurada in 1904, and he was able to show that it was closely related to the parasite causing bilharziasis in Egypt. Western scientists were completely baffled by this disease and were unable to determine the mode of transmission. The clue came from Japan where Fujinami and others had shown that infection was contracted by bathing in water—Miyairi and Suzuki in 1913 demonstrated that transmission was through a snail host. Professor Yokogawa gives an account of these far reaching discoveries in the section of the book devoted to "Schistosomiasis in Japan"; this is a success story. Japan is one of the few areas of the world where control is effective. In spite of the problem of a large reservoir of infection in animals (which makes control by treatment ineffective), the parasite has been practically eliminated chiefly by killing the snails with molluscicides, and by lining the irrigation canals with concrete to prevent the snails from breeding. In one area the parasite was eliminated when an infected swamp was converted into a golf course.

Elsewhere in the world schistosomiasis is of increasing importance; in Africa and South America practically all new irrigation schemes have been invaded by the snail hosts and control measures are having little effect on the prevalence of the disease. There is no doubt that western scientists and public health workers have still a great deal to learn from their Japanese colleagues when it comes to the control of parasitic diseases. Control is not the only aspect of schistosomiasis dealt with in this book; there are other chapters dealing with the ultrastructure of the parasites, their isoenzymes, the clinical aspects and treat-

ment of the disease and the development of immunological tests.

In the section on filariasis, Professor Sasa and his colleagues show that although this disease has been less effectively controlled than schistosomiasis, there has been a steady decline in the infection rate chiefly as a result of systematic surveys and treatment. As with the work on schistosomiasis there have been numerous supporting studies including observations on spermatogenesis and oogenesis of adult worms using the electron microscope; studies on the dynamics of transmission with a detailed mathematical analysis of epidemiological data; immunological studies with a view to developing better diagnostic techniques; and studies on the periodicity of microfilariae. This latter study takes research on filariasis full circle back to the observations by Manson, who first noted that although the microfilariae are present in the blood in large numbers at night they disappear from the blood during the day. A variety of controlling mechanisms is known but this circadian rhythm is still something of a mystery. Professor Katamine is studying this problem in experimental animals and man in Japan. Of particular interest is the account of the change in rhythm of microfilariae in Japanese emigrants on a two month journey westwards from Japan to Bolivia. This study confirmed that the innate rhythm of the parasites is determined by the sleep rhythm of the host and that there was a gradual shift of peak microfilarial activity in spite of the 13 hour time difference between Japan and Bolivia.

G. S. NELSON

Insect Physiology

An Introduction to Insect Physiology. By E. Bursell. Pp. xiv + 276. (Academic: London and New York, November 1970.) 70s; \$10.

AIMED at the undergraduate and intended as an introduction to physiology, Professor Bursell's book fulfils perhaps the primary requisite of an introductory work in that it can be read easily and completely. As such it contrasts with larger and more comprehensive works such as Chapman's *The Insects, Structure and Function*, and Wigglesworth's *The Principles of Insect Physiology*, which, though excellent works of reference, are at first difficult to grasp as a whole.

Divided into four chief sections, *An Introduction to Insect Physiology* begins with the largest, that concerned with somatic physiology. Here the reader finds the classical subdivisions of physiology, metabolism, digestion, circulation, osmoregulation, excretion and respiration as applied to insects. The second section deals with neuromuscular and