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Book reviews

The Southern Ice-Continent: the German South Polar Expedition aboard the Gauss 1901–1903

Eric von Drygalski
Translated by *M.M. Raraty*
Bluntisham Books & Erskine Press, Harleston, UK (1989)
394 pages. £49.95 ISBN 18 5297 0316

It took 85 years to translate into English the narrative of the First German South Polar Expedition 1901–1903 and it took me another 20 months to review the translation. Those delays are deplorable as the book is worth being widely known. The semi-popular narrative should attract everyone interested in the history of polar exploration and polar science. The *Gauss*-Expedition 1901–1903 was part of the 'heroic' period of polar exploration but more importantly was one of the first truly scientific endeavours, carried out in the framework of an international programme of geophysical observations, which had been carefully planned and strictly adhered to by British, Scandinavian and German groups. Germany had turned late to the Antarctic and did not aim for the South Pole although the author would probably have liked to see his flag and name put further south than on a hitherto unknown coast at latitude 65°S in the Indian sector where the *Gauss* became beset by pack-ice for more than a year.

Erich von Drygalski, professor of geophysics, gathered together four excellent scientists and some technical assistants to work in all disciplines of polar research from marine bacteriology to auroral observations. As may be guessed from the name of the vessel, geomagnetism was the key issue in those days, but the studies on the circulation of the Southern Ocean and its fauna and flora had the greatest impact on polar research and on marine science in general. The programme also included observations and collections throughout the Atlantic and the southern Indian Ocean, and the establishment of an observatory on Kerguelen Islands for meteorology and geomagnetism. The long days and nights in the Antarctic pack-ice were used for continuous observations and for taking samples of everything in reach of the people on board and on the ice, including long excursions by dog-sledges to explore the Gaussberg volcano and the edges of the Antarctic ice cap near the 90°E meridian. It took several decades to publish the fat volumes of scientific results from the expedition but the narrative appeared soon after the return of the vessel and is written under the immediate impression of the successes, and mishaps, of the long journey. It is a sober account of scientific work, and seamanship. The translation is superb reflecting the style of a German professor at the turn of the century, his fine sense of humour, his combination of modesty and pride, his leadership, his admiration of the beauty of Antarctic wildlife and landscapes. Young German scientists might even prefer to read the book in English rather than the somewhat old fashioned and involved German of the original text.

In his very informative introduction the translator showed some affection for the author and his scientists and seamen who sailed to the Antarctic and lived there under circumstances which I found hard to imagine when I first read the book on board a modern polar research vessel in the Weddell Sea. The polar community should be grateful to the publishers, financial supporters and especially to the translator who jointly have revived a fine piece of the history of polar research.

GOTTHILF HEMPEL

Fishes of the Southern Ocean

Edited by *O. Gon & P.C. Heemstra*
J.L.B. Smith Institute of Icthyology, Grahamstown. (1990)
462 pages. $120.00. ISBN 0 86810 211 3

A handsome book, not only beautifully illustrated and constructed (even with a blue place-keeping ribbon) but a very reliable source for the little known and spectacular fish fauna of the Southern Ocean. The editors, Ofer Gon and Philip Heemstra, follow in the best tradition of the founder of the institute, Professor J.L.B. Smith and Director, Margaret Smith.

This large volume covering 272 taxa (49 families) is not a vehicle for a special South African expedition or a collection of papers for a symposium. Invited contributors were held to a uniform format covering salient points needed for recognition of taxa, making the book valuable for field identification and shipboard sorting of specimens as well as a standard reference and a guide to current authorities. These taxonomists review the subjects of their speciality but the book is not used as a vehicle for new descriptions or name changes. The one new genus *Helcogrammoides* provided by Richard Rosenblatt for the one triple-fin that occurs within the subject area is the exception, and should read *Helcogrammoides* Rosenblatt 1990.

Members of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) provide a chapter on exploitation and conservation. The book serves well as an intended augmentation to the work of the CCAMLR group. It uses the same base map outlining the several designated fishing areas as they appear in the United Nations FAO literature. This circumpolar delineation shows well the boundaries of a special ocean, with meets and bounds of the latitudes and longitude lines followed (p. 70).

Biologists can find their way directly to the systematic section while the setting for the scientific discourses is provided up front in a review of southern polar ichthyology, an oceanographic discussion and a comment on fish distribution. Severe environmental influences have shaped the character of the Antarctic biota which, for fishes, is summarized in a section on biology, physiology and what is

known thus far of the ecology of that segment of the world's Percomorph fishes, the notothenoids.

The character sets by which the southern-most fishes are known are augmented by an explanation of the otoliths diagnostic for the species. The systematic section has a key to families with family accounts in which each known species is described. The professional taxonomist will find expert diagnoses and distribution for each species, accompanied with a map and a full broadside figure, the faithful creations of David P. Voorvelt, and the gems of the book. There are in the best tradition of ichthyological illustration. This fine artist has done much throughout the book, illustrating keys and depicting anatomical characters and maps, with 16 of the colour paintings in a section of 12 plates. The figures in some sections are less precise.

Several of the contributors provided figures from their own sources, causing variation in the overall presentation quality, and in some cases, (apparently when a model specimen was not available, as with the overly-large *Dissostichus* members on pp. 286 & 288). the outline of one served with slight modifications for the other.

The book is a must for workers in ichthyology of the Southern Ocean but will also be of great interest to ichthyologists everywhere It will be particularly useful to students for whom no more comprehensive and definitive treatise on the notonothoid fishes and their companion fauna is yet available.

Students are provided with an 11-page glossary of terms, some not familiar to the general taxonomist or field biologist and those not well-versed in English. Thirty pages of titles and authorities cite the core of the Antarctic literature available. Coastal place names appear in an end plate map of the continent. This magnificent volume is authenticated with a preface by present Institute Director Michael N. Bruton and a succinct foreword by Professor Sayed Z. El-Sayed, Chairman of the BIOMASS Executive Council.

The editors shy away from assuming a natural order of species sequence. While the families are shown in a logical progression of relationship, the taxa within appear in alphabetical order, an unfortunate aborting of the systematic process, disturbing to the ichthyologists' concept of ecodiversity. The absence of a comprehensive checklist of the Antarctic ichthyofauna and the omission of a general index (here scientific names only), now so readily produced electronically, make using the book a bit more awkward for the casual user.

The editors had solicited the contributors' recommendations for future research, but that detail did not get included. It is a discussion, however, now developed in the working groups of CCAMLR.

Other small complaints can be corrected with revisions and efforts of other compilers. This volume has been available only direct from the Institute, and not through general distributors. The price in America is approximately $120 by sea mail, with a considerable extra cost for air mail of this weighty 461 page volume. Eventually, the book will be found on many shelves, for Antarctic life is broadly popular as well as, for many of us, a professional obsession. One more reference work on the Antarctic will become a widely used possession.

RICHARD GORDON MILLER.

Commentary on Schematic Geological Map of Antarctica 1:10 000 000

compiled by *R.J. Tingey*
Bureau of Mineral Resources Bulletin 238, Australian Government Publishing Service, Canberra (1991).
30 pages. ISBN 9 780644 143776.

The geological map of Antarctica is intended as an up-to-date replacement for the geological maps compiled by Craddock (1970,1972), and Ravich & Grikurov (1976). Like its predecessors the map, at a scale of 1:10 000 000 is highly generalized. It is accompanied by a 30 page illustrated commentary to explain and describe the map. According to the author, the need for a revised geological map became apparent during the compilation of a monograph 'Geology of Antarctica' based on authorative reviews.

Anybody who succeeds in producing a geological map of a continent almost twice the size of Australia, and overcomes the difficulties of compiling and interpreting information from at least 20 different nations, deserves to be congratulated. People unfamiliar with Antarctic geology will find it a useful summary and introduction to a continent they know little about. It will guide readers to the often obscure Antarctic literature at a time when Antarctica has become the focus of scientific research. However, the Antarctic specialist may not be so impressed. The map contains many errors, some of which the author draws attention to in the accompanying text. Unfortunately for a 1991 production, the map is not as up-to-date as it might appear. The map was compiled in 1985 and 1986, although the text, excluding reference to the 1991 *Geology of Antarctica* volume, includes 1990 references. The delay in publication of the map is a pity as there has been a major proliferation in Antarctic research in the past 5–6 years and many recent advances are not included on the map.

The most useful contribution, based undoubtedly on the expertise of the author, is that the map depicts an improved understanding of the East Antarctic metamorphic basement, reflecting the age and lithological subdivision of the shield areas. Other aspects of the map are not so pleasing. The use of striping. depicted as a novel feature of the map and used to indicate close intermingling of different rock units in the geologically complex Antarctic Peninsula area, is confusing. In my view, it would be preferable to represent the dominant geology and indicate the variation in the legend. One could argue with some of the correlations on the map, e.g. the inclusion of the largely marine Permo-Carboniferous sedimentary rocks of the Ellsworth Mountains within the terrestrial Beacon Supergroup. Again, this could have been

overcome by including 'marine' in the legend. Another novel aspect of the map is the use of special symbols to depict dyke swarms and sills, but it is a pity the symbols were not placed entirely within the outcrop areas — some are at sea. Geophysical data, used to good effect to depict the subice extent of the Dufek Intrusion, could have been extended to include other areas, e.g. Precambrian basement at Haag Nunataks. Furthermore, the map could have been more informative to a geologist by including subice topographic contours, in preference to ice thickness contours, to define the crustal blocks and former Mesozoic microplates of West Antarctic.

Turning from the map to the report, I was immediately impressed by the front cover. The use of the satellite image brought Antarctica to life in a way that the geological map failed to do. Unfortunately, the rest of the report is disappointing. With the exception of the frontispiece, the illustrations are very poor and badly reproduced. This is a great pity as one of the strengths of Antarctic geology is the superb quality of the outcrops. The inclusion of detailed maps of the Precambrian basement and photomicrographs are unnecessary padding in a general report of this nature. A plate of Palaeozoic and Mesozoic fossils would have been preferable and more informative than one page of Cambrian trilobites.

The report again reflects the expertise of the author and many of the classic areas of Antarctic geology, well documented in the literature, are unreferenced and poorly summarized. The report lacks a modern interpretative approach; this is perhaps just as well as many of the conclusions reached in the report are highly speculative and contrary to modern thinking on Antarctic geology.

As far as East Antarctica is concerned this map clearly represents an advance on earlier maps; the same cannot be concluded for West Antarctica. Although the author criticises previous Antarctic maps as being produced from a Pacific margin perspective, this map and report are a product of an East Antarctic perspective. Surely the answer lies in combining these approaches? Only then will we have a geological map of Antarctica that we can be truly proud of and that will reflect the quality of science throughout the Antarctic continent.

BRYAN STOREY

The FRAM atlas of the Southern Ocean

D.J. Webb, P.D. Killworth, A.C. Coward & S.R. Thompson
Natural Environment Research Council,
Swindon (1991). 67 pages.
£100.00. ISBN 1 85531 036 8

The publication of a new oceanographic atlas is always an eagerly awaited event in scientific circles. The new FRAM atlas sets new standards in this genre. Nicely designed and printed, this volume appeared as a by-product of the FRAM project: Fine Resolution Antarctic Model. It is an infrequent occurrence for the maps of a geophysical atlas not to be the direct result of a subjective or objective analysis of the data, but rather the output of a complex model transforming the initial data according to the laws of hydro-thermodynamics.

The FRAM model is based on the equations of momentum, mass, heat and salt conservation. The basic variables of the model are potential temperature, salinity and velocity. The calculations have been made on a grid covering the whole Southern Ocean south of 24°S with horizontal spacing of about 25 km and 32 vertical levels. Such a grid allows resolution of the mesoscale features of the Ross by radius scale for the area north of the Antarctic Polar Front. Initial data used by the model are the climatic fields of temperature and salinity from the Oceanographic Atlas of the World Ocean by Sydney Levitus. The assimilation of these data into the model is achieved by robust diagnostic method.

The atlas opens with a brief foreword by J. Woods, followed by the introductory text written mostly by D. Webb, the planner of the atlas. This introduction of only three pages is very brief but seems to be sufficient for the general description of the model, input data and atlas structure. There are two distinct parts to the atlas. The first part presents property distributions at fixed vertical levels and selected isopycnal surfaces. From 32 model levels seven are selected for the demonstration: 10, 120, 394, 888, 1726, 2617 and 3990 m.

This is certainly enough for the representation of the pecularities of the Southern Ocean water column. Two isopycnals (1031.9 and 1041.48 kg m^{-3}) were chosen to show the spreading of the Antarctic Intermediate Water and North Atlantic Deep Water respectively. Each level and density surface is presented as a set of four maps of potential temperature, salinity, velocity and pressure in stereographic projection. Convenient layout allows immediate comparisons of the fields. All the distributions present an instantaneous state six years after the data assimilation. Two maps of potential vorticity at the isopycnal surfaces and four examples of the Levitus fields round off the first part.

For the reader familiar with the the hydrology of the Southern Ocean just a quick glance at the maps is enough to recognize such prominent features as the Antarctic Circumpolar Current (ACC), the warm and salty western boundary currents and the cyclonic circulation of the Weddell Gyre. But what really draws the attention of the reader are the changes introduced by the model into initially smooth climatic distributions: the fronts have become sharper, currents narrower and more intensive, numerous eddies are seen to be produced by the ACC and western boundary currents. By far the most impressive view of the circulation is given by the velocity maps. The important role of the bottom topography for the whole circulation of the Southern Ocean is well reflected and intensification due to the bottom relief is seen for several regions of the ACC belt. The filamental structure of the ACC differs strikingly from usually smooth maps of the climatic geostrophic currents. Another beautiful example of changes introduced by the model is found in the African sector. The maps give a snap-shot of intense anticyclonic eddies shedding from the Agulhas retroflexion loop and drifting into the South Atlantic —

a mechanism of the inter-oceanic water-mass exchange.

The second part of the Atlas deals exclusively with the distributions of properties along the sections —a contribution of the project to the WOCE hydrographic program. A total of 30 sections are presented with waypoints according to the current WOCE implementation plan. All the sections (except for the Drake Passage) are given at the same scale. Each is supplemented by a brief note, where attention is drawn to the features most likely to be met during the WOCE activities. And here one cannot but agree with J.Woods that such calculations should always preceed oceanographic work at sea.

There is an increasing flood of scientific literature presenting results and analysis of the FRAM project findings. It would therefore have been helpful if the authors had given more thorough guidelines for the interpretation of the maps. Addition of several time-average maps would have also increased the value of the volume. But the atlas still remains a beautiful addition to the Antarctic literature. Being planned partly to meet the needs of the WOCE hydrographic program it can be recommended to anyone engaged in studies of the Southern Ocean. Authors and editors may be congratulated on such a good and already extensively used volume.

VICTOR GOURETSKI

Behaviour of pinnipeds

Edited by *Deane Renouf*
Chapman and Hall, London (1991).
410 pages. $65.00. ISBN 0 412 30540 2.

This scholarly monograph brings together extensive reviews of various aspects of pinniped behaviour. Seven different authors each contribute a chapter on the mechanism, functions and evolution of the behaviour of seals, sea lions and walruses. The book begins with chapters on mating systems in Otariidae and Phocidae by D.J. Boness and B.J. LeBoeuf, respectively. These two carnivore families exhibit striking differences in their mating systems, sexual dimorphism and degree of polygyny. The authors outline the differences between otariids and phocids, offer hypotheses to explain how such differeces might have orginated and make comparisons with terrestrial mammals. W.D.Bowen reviews the behaviour of pinniped pups from birth to weaning,with the underlying assumption that the habitat into which the pups are born determines the principal features of their behaviour. He provides exhaustive, and hence useful tables comparing length of lactation, mass gain during lactation, pelage changes, pup mortality , post-parturient behaviour, suckling and critical events for neonates of various pinniped species. Pinniped communication is treated in a thorough chapter by E.H. Miller. Signal structure, message analysis and agonistic behaviour are described, with numerous specific examples. This chapter benefits from extensive references to theoretical as well as applied studies of communication in other groups of animals.

Behaviour, and especially communication, has been studied in more detail for Otariidae than for Phocidae, but the physiological mechanisms behind the behaviour are poorly understood for both families. Thus, models from terrestrial mammals often must be applied by analogy, as noted by D. Wartzok who reviews the physiology behind pinniped behaviour.

The studies of reproductive and foraging energetics have expanded tremendously during the 1900's. This is due mainly to the development of microprocessor-controlled devices for monitoring animal activity and to the use of radio isotope-labelled water to calculate energetic requirements. In his review of the energy of activity D.P.Costa demonstrates the extreme variation in energy balance of foraging in elephant seals (phocids) and fur seals (otariids). It is evident that the developing technology will provide even more insights into at-sea behaviour and energetic aspects of pinniped behaviour. In a final chapter D. Renouf reviews the sensory reception of pinnipeds and, once again, emphasizes the differences between notariids and phocids. Despite a large number of studies, the cues or senses used by seals to navigate and detect their prey remain poorly known. Renouf discuss the various routes of reception and their possible role(s) in orientation.

Some chapters overlap in their treatment of the subjects, but this can be an advantage when various authors interpret the same information differently or put different emphases on their topics. A major strength of the book is its comparative approach, although this seems to require a certain amount of repetition. Together, the seven chapters constitute the first comprehensive comparative review of pinniped behaviour. It will undoubtedly become mandatory reading for pinniped scientists and, hopefully, have a wide appeal to others involved in studies of mammals at sea or on land. The book is nicely produced, with high-quality graphs and photographs and—most importantly—a wealth of references.

MADS-PETER HEIDE-JORGENSEN

Antarctic Acanthocephala

Krzysztof Zdzitowiecki
In Synopses of the Antarctic Benthos, Volume 3, edited by *J.W. Wagele & J. Sieg.*
Koeltz Scientific Books, Koenigstein (1991).
116 pages. ISBN 1 878762 18 4.

Zdzitowiecki's monograph deals mainly with descriptions of 26 species of Acanthocephala taken from definitive hosts in the Antarctic region. The emphasis of the book concerns systematics and a key for the identification of species. The descriptions are helpful, unambiguous and concise and points of morphological importance are clearly illustrated by good line drawings. Where possible the author provides interesting notes on the host ranges, habitats, life histories and distributions of the species. In addition to the systematic section, which

occupies 80 pages, there are brief chapters about the structure, biology and collection, and preparation of acanthocephalan species. There are also citations to 85 publications, 22 of these being to the author's own work on acanthocephalan parasites collected in the Antarctic region.

Helminthologists who specialize in the study of the Acanthocephala are strongly advised to obtain a copy of this brief, authoritative monograph. It is also to be hoped that copies will be purchased by the libraries of universities, museums and scientific institutions. Although the book covers only a few members of the phylum, they happen to be representatives from a special and exciting ecosystem. The book has been produced to a high standard with good quality paper, a pleasing typeface and an attractive hard cover.

D.W.T. CROMPTON

Antarctica and global climatic change

C. M. Harris & B. Stonehouse
Polar Research Series, Bellhaven Press, London and Lewis Publishers, Boca Raton, Florida (1991).
198pages. £33.00. ISBN 1 85293 187 6.

This volume is a collection of 14 papers presented at a conference in Cambridge in June 1990 marking the occasion of the 150th anniversary of signing the Treaty of Waitangi. The theme of Anglo-New Zealand association in Antarctic exploration and research is strongly demonstrated through the work. Virtually all the authors are from the U.K. or New Zealand and the papers cover a wide range of disciplines.

A historical introduction by Trevor Hatherton indicates the progress of knowledge of the Ross Dependency — and concludes with some interesting ideas on future developments between New Zealand and Britain. This is followed by a useful summary of prominent issues related to climatic change, completing Part One of the book. Whilst palaeontological material demonstrates a vastly different earlier climate in polar regions it is unfortunate that the meteorological data of James Clark Ross and others is not assessed here since one and a half centuries is a good period for comparative diagnosis of change.

Physical phenomena in Antarctic regions, ranging from meteorological effects to variations in sea-ice cover and their global implications, are discussed in Part Two. Future trends are predicted, and the reliability of these is estimated. The relative rate of glaciological variations compared to geological processes gives an indication of the state of flux of natural variations regardless of perturbation by man.

Part Three is an interesting account of the biological reactions to physical changes. Potential threats to Antarctic ecosystems are considered with examples drawn from reactions of indigenous species and alien biota. The subject of the two concluding chapters of this part is strategy for mitigating effects of climatic changes. The first of these refers predominantly to the New Zealand experience (examples are drawn from the Treaty of Waitangi) whereas the second concerns global consequences — both indicate the vast range of problems involved and briefly consider politics and economics (which quite reasonably may be regarded as in the biological domain). The work concludes with a useful guide to recent literaturewhich could have been an opportunity to consolidate the bibliographical material as every paper has a list of references many of which are repeated throughout the volume.

The book is a useful summary of current problems of climatic change — global and Antarctic — and a timely assessment of what will continue to be a major subject of research for a long period of time.

R. K. HEADLAND

Life under extreme conditions

Edited by *Guido di Prisco*
Springer-Verlag, Heidelberg (1991).
144 pages. $65.00. ISBN 3 540 53108 4

The impetus for this book was a session of the 1989 meeting of the Federation of European Biochemical Studies which treated the topic "Biochemistry Under Extreme Life Conditions". The book contains eight articles, written by leading researchers in the various fields, which cover biochemical adaptations in a broad phylogenetic range of organisms, with special emphasis on Antarctic fish (3 articles), Arctic mammals (1) and microorganisms (4). With the exception of the excellent introductory article by Cheng and DeVries on petide and glycopeptide antifreeze in marine cold-water fish, the predominant theme of the book is an analysis of how macromolecules, (especially proteins, but including membranes), have evolved to function in the most extreme environments on the earth. Environmental parameters treated include the low temperatures endured (indeed preferred) by thermophilic bacteria and archaebacteria, and the extreme salinities of halophilic microorganisms. In addition to the antifreeze proteins in fish, macromolecular adaptations covered are (1) O_2- transport proteins in Antarctic fish (d'Avino *et al.*), Arctic krill and mammals (reindeer, musk ox, cervus and whale) (Giardina *et al.*); (2) microtubules in Antarctic fish (Detrich); (3) lipids and membranes in Archaebacteria (DeRosa *et al.*); and (4) enzyme and other protein adaptations in thermophilic (Fontana, Rossi *et al.*) and halophilic (Zaccai and Eisenberg) microorganisms.

The coverage of different biochemical adaptations in phylogenetically diverse organisms inhabiting extreme habitats ranging from the coldest (subzero polar regions) to the warmest (bacteria living at 110°C and perhaps higher) to the saltiest obviously underscores a major take-home message of

this book, namely, that life, and the macromolecules on which life depends, can adapt to virtually any habitat on earth. While this diversity of topics is a major strength of the book, this same broad range of topics is the basis of my only major criticism. Specialists may be somewhat frustrated to find just four articles on adaptation in polar animals, three on thermophilic microorganisms or two covering halophiles. However, maintenance of protein function under temperature or osmotic extremes does provide a unifying theme.

A major value of this book may be to educate those who believe that laboratory rats and *E. coli* alone provide an adequate background in biochemistry. Whilst most chapters are too advanced to make the book useful as an accessory for undergraduate courses and the cost is too high to recommend it as a second text for graduate courses (a softcover edition would be useful), those preparing lectures for courses in the biological sciences ranging from general biology, undergraduate cell biology, biochemistry, evolution or microbiology to graduate courses on cell membranes or protein chemistry will find ample material to beautifully illustrate the excitement of comparative biochemistry. Imagine the student enthusiasm that could be generated by the addition of a discussion of the unusual membrane adaptations of thermoacidophilic archaebacteria to the standard treatment of cell membrane structure. In addition to the fascinating basic biology offered by these topics, their proven applications (i.e. the polymerase chain reaction techniques which depend upon the thermostability of DNA-polymerase from *Thermus aquaticus*) provide an additional impetus for the study of these systems. Thus, experts looking to useful reviews on specific topics, as well as novices searching for introductions into the exciting areas of comparative biochemistry, will both find this book to be useful.

JOHN DUMAN

Elsevier's Dictionary of Geosciences, Russian-English

Compiled by *K.P. Bhatnagar*, edited by *S.K. Battacharya*
Elsevier, Amsterdam (1991),
1023 pages, $225.50. ISBN 0 444 88425 4.

How does one begin to review a dictionary? Setting aside the old joke about the dictionary being an easy book to read because it explains all the words as you go along, the beginning is always a good place to start. The preface points out that this particular dictionary "contains approximately 56 000 Russian terms used in geochemistry and physical chemistry, geology and tectonics, meteorology and climatography, mineralogy, oceanology, paleontology, petroleum engineering pertaining to oil deposits and their explorations [sic], petrology, petrography and rock mechanics, and sedimentology"; an impressive list. There follows a formidable list of reference works on five and a half unnumbered pages. This, I thought would give me an idea of the authority of the new dictionary. However, this is where I found my first misgivings. The editor, who can spot every last typographical error, has yet to be born, but the number of errors in this list of reference works is disturbing. The word "dicationary" and variants appear so many times that I actually reached for my *Shorter Oxford English Dictionary* to see if this was a new word with which I was unfamiliar.

Now, I am not a Russian scholar but, in the course of my work, I do need to translate passages of Russian text from time to time and am left wondering, if the English is anything to go by, how much confidence I may place on the Russian half of the text in this dictionary. If I cannot find a word, is it because it is not included in the dictionary, or because it is misspelt?

There is a strong bias in the content of the dictionary towards mineralogy and the more applied end of geology. It is particularly noticeable that just about every known mineral is listed in its Russian form but, if you are a palaeontologist looking for anything more technical than *trilobit* or *ammonit*, then forget it. What is more, you do not need a dictionary to translate such words, nor do you for *cal'tsit*, or *kianit*, or *malachit* or *serpentin*. The list is endless. Look up the word *svita* [= suite, series, formation] and you will find *svita morison* [Morrison formation], *svita porteydzh* [Portage formation], *svita pottsvill* [Pottsville fomation] and a few others. The logic for singling out these specific formations from the thousands available escapes me. If all such illogicalities and phonetically equivalent words had been filtered out there would have been far more space to devote to the translation of difficult phrases and words or the proper explanation of Russian terms for which there is no satisfactory equivalent. The last twelve pages are devoted to an appendix of abbreviations, followed by their Russian equivalents and word-for-word English translations, which are not always helpful. Thus I am left wondering what LGK - *landschaftnyy geocomplex* [= landscape geocomplex] actually means.

But, looking through this dictionary was not without its lighter moments. On checking my *Glossary of Geology*, I discovered that 'bastard rock' (*poroda ublyudkovaya*) is a genuine term and does not refer to a well-rounded block of gneiss that refuses to break under even the heaviest hammer. The translation of *bityum myagkiy* as pissasphalt on p. 46, however, seemed to stretch credibility too far. *Myagkiy* means soft and, sure enough, on p. 29 we find *asfal't myagkiy* [pitasphalt, soft asphalt] and also *asfal't vyazkiy* [viscid bitumen, pittasphalt].

One could go on and on picking out illogicalities, clumsy translations and typographical errors. The standard of editing is poor and the selection of terms all too often appears to be random or fortuitous. A great opportunity of producing a really useful dictionary has been let slip. As the scientific community has come to expect, any text from Elsevier is highly priced and well beyond the pocket of the average research worker. However, for once, you need not feel disappointed.

M.R.A. THOMSON