

BOOK REVIEWS . . .

GEOREF THESAURUS AND GUIDE TO INDEXING Third Edition

Sharon J. Riley (ed.)

American Geological Institute, Falls Church, Virginia, U.S.A., 1981, ISBN 0-913312-53-3, 431p., \$45.00 (paper) or \$20.00 (microfiche).

Information has been called the resource of the 1970s, or the 1980s, or the 21st century. It is estimated that up to 80 per cent of the world's population is involved in the information industry. This is certainly true of the sciences where information forms both the basis and the product of a scientist's work, and may be the only resource that is both renewable and reusable. In order to use information, however, it must first be found, and computer-based bibliographic files (or databases) are gaining in acceptance as an effective way of doing so. Besides being a convenient tool, reference databases are also having effects on the sciences which they serve by accelerating the classification, organization, description and dissemination of knowledge.

The most visible and concise representation of a database is usually either its thesaurus or its classification. The GEOREF Thesaurus and Guide to Indexing is the product of one of the major international geological databases, the American Geological Institute's GEOREF. This Third Edition shows refinement in its presentation, and more importantly, reflects maturing trends in the information industry.

The explanatory portions of the Thesaurus and Guide have been thoroughly revised, and readers who were puzzled by the layout and jargon of earlier editions will find this version more straightforward. Useful distinctions are made between the needs of the indexers who prepare entries for GEOREF, the content of the online version, and the characteristics of the printed product (the Bibliography and Index of Geology). Changes in the content of the database, and therefore the keyword portion of the Thesaurus, reflect more extensive coverage of geophysics, growth in engineering and environmental geology literature, and publication of the Bibliography of Fossil Vertebrates series.

This edition of the Thesaurus has also been affected by an extremely challenging project that has been undertaken by AGI - the exchange of bibliographic references with the French Bureau de Recherches Géologiques et Minières (BRGM) and the Centre National de la Recherche Scientifique (CNRS) through the PASCAL-GEODE database. GEOREF will provide citations to North American publications, and BRGM-CNRS will supply the European citations. West Germany, Spain, Romania, Poland, Czechoslovakia, Hungary, and Finland will furnish references to their own literature with coverage from other areas of the world being shared between AGI and the French organizations.

In addition to improving worldwide literature coverage and reducing duplication, this project will allow users access to the combined resources of AGI plus BRGM-CNRS when they use their 'home' database, whether in North America or Europe. Plans for this exchange have brought about changes in indexing practice on both sides. The work toward a uniform indexing vocabulary is reflected in both philosophical and detailed changes to the Thesaurus keyword lists. The success of the exchange will be monitored with keen interest by geologists as well as information scientists.

*K.L. Gunn
Geological Survey of Canada*

APPLIED GEOTECHNOLOGY:

A Text for Students and Engineers on Rock Excavation and Related Topics

Roberts, A.,

Pergamon Press, Headington Hill Hall, Oxford OX3 0BW, U.K., 1981, 352 p., \$50.00/21 pounds (H): \$25.00/10.50 pounds (F).

Based on a series of lectures to mining students in 1969-74 (with some updating), this book attempts to describe how the basic ideas and tools of geotechnology (described in an earlier and well-received companion volume by the same author) are applied to some aspects of engineering ground materials. Its aim is to draw the attention of potential miners to other activities occurring in their underground domain while at the same time introducing them to more of the scientific principles involved. Although much geotechnology occurs on the surface, the reader spends most of his time underground and only surfaces to consider blasting, shaft sinking, mine dumps and tailings dams.

Those aspects of direct interest to the traditional miner are generally well presented but there are occasional lapses. The first four chapters summarize the explosives industry's promotional material on blasting without stressing the significant effects that rock-mass anisotropy can have on the results. In chapters 5 to 8 theories and strategies of rock breakage in drilling and standard tunnelling procedures lead to an outline of some of the novel approaches which may in time prove beneficial to miners. Two chapters describe the monitoring and control of groundwater in both underground and surface mine workings. Despite the author's professed concern for environmental protection, he does not discuss the possibility of tailings ponds failing chemically (and thereby contaminating water supplies) as well as physically. Chapters 13 to 15 deal with theories of pillar and roof support of workings in weak rocks with a yield point (e.g., coal mines) and ground subsidence, but without much emphasis on monitoring what actually occurs.

Until the past few decades, sophisticated rock engineering was largely the preserve of the miner. Now, however, major advances in the understanding of the mechanics of rock masses and how to engineer them have reached the point where it is nearly as cheap and efficient to engineer space beneath the surface as above. This trend can be seen among such diverse groups as military strategists, environmental lobby groups and urban land developers who appear to be driving utilities underground. Generating plants, computers and libraries have joined the fuels, waters, and some of the communication systems already housed beneath the surface.

Chapters 11 and 12 briefly acknowledge some of the concepts dealing with subsurface storage of oil and gas and underground disposal of mine and radioactive wastes. There is only a passing mention of solution cavities. No reference is made to hydrofractured or leached zones of increased permeability and porosity, either to store liquids or gases or to extract geothermal energy (or more traditional ores). Given the general bias toward mined open cavities, it is surprising that there is no mention or illustration of the vast underground power halls which are arguably the cathedrals of our time.

The author writes well and this neatly-presented book quotes useful references on the topics it covers. Nonetheless, geotechnology is already more exciting and significant than this book is able to convey. In fact, the book's contents suggest that, even in the developed countries, miners now being trained will only have an inkling of the revolution occurring beneath the ground.

*C.J. Talbot
Department of Geology
University of Dundee, Scotland*

EUROPEAN FOSSIL REEF MODELS

D.F. Toomey (ed.)

Society of Economic Paleontologists and Mineralogists, Special Publication No. 30, 1981, 546 p., \$22.00 (members), \$28.00 (others).

This book adds to and complements earlier SEPM special publications on carbonates and reefs, especially No. 18, *Reefs in Time and Space* (1974). Although this volume is rather long, it is of SEPM's usual high quality and its low cost makes it accessible to many students as well as professional geologists.

The book grew out of a visit to Austria by Dr. D.F. Toomey who became aware of interesting research on reefs being written in German but generally unknown to an English-speaking audience. He decided to organize a volume in English of reef models from all of Europe - the result is the present publication of 18 papers by 25 authors, covering reefs in 16 European countries.

Unfortunately, the treatment is uneven with nearly half the volume taken up by four long papers of 50 to 70 pages by R. Riding, T.P. Burchette, E. Flügel, and S.H. Frost. The papers do show, however, the varied nature of reefs and reef-related carbonate complexes, whose complexity makes it necessary to provide more description and illustration than for other geological phenomena.

The volume begins with a useful summary by M.W. Longman who writes on modern reefs from a sedimentological and petroleum geologist's view, using the Belize Barrier reef complex as his model. Longman outlines the interaction of depositional processes and biologic activity in reefs to determine characteristic shapes and facies patterns that should exist in both modern and ancient reef complexes. He strongly emphasizes the difficulties of interpreting biological processes in ancient reefs because of extensive modification by destructive physical and biological factors. He neglects, however, to incorporate important information and models coming from Smithsonian Institution geologists who are coring modern reefs (see Adey, 1978, *Science*, v.292, p.831-837). Although Longman provides the reader with clear summary diagrams and tables, some people may be misled by the exaggerated topographic highs and slopes used in some of the diagrams.

Riding's paper reviews work on the Silurian Wenlock limestones of the Welsh borderland, Oslo successions, Gotland, and Estonia - all shelf sequences deposited on the Baltic shield. He recognizes four major reef types. Although they all lack a cavernous frame structure of modern reefs, two types - the Kuppe biostromes and Holhallar laminar frame - approach a real framework (unfortunately using place names for reef types is not very meaningful). Burchette provides an up-to-date summary of Devonian reefs in Belgium, Germany, Austria, Poland and Spain, adds some new observations and interpretations of cycles in back-reef limestones in western Germany, and redefines biostrome and biostromal complexes.

Flügel provides a succinct summary of Lower Permian buildups in the southern Alps and compares these *Tubiphytes/Archaeolithoporella* buildups with the Permian Reef complex of the U.S.A. D.B. Smith includes two papers on the Upper Permian shelf edge or barrier reef of NE England and bryozoan-algal patch reefs (25 m long by 8 m thick) of Yorkshire. This barrier reef complex, which attained a height of more than 100 m., appears to represent a general shallowing upwards sequence with bryozoan frameworks and is overlain by increasing amounts of algal rocks and laminar

organic or inorganic encrustations. Shallow water stromatolitic and other laminated limestones are at the top.

The following 10 papers cover reefs of Mesozoic age with five papers on Triassic reefs, two on Upper Jurassic reefs, and three on Cretaceous coral-rudistid buildups. R. Bradner and W. Resch describe Middle Triassic reefs in the Wetterstein limestones near Innsbruck, Austria; J. Car and others outline Upper Triassic circular coral bioherms from NW Yugoslavia. P. Schäfer and B. Senowbari-Daryan document the facies and paleoecologic zonation of four Upper Triassic patch reefs near Salzburg, Austria, three of which grew in basinal settings. W.E. Piller, who reinvestigated the Upper Triassic Steinplatte reef complex near Salzburg, shows that a distinct reef zone borders a carbonate platform with a width of about 40 km.

In a long paper, Flügel uses the standard microfacies types of J.L. Wilson (1975) and tables and diagrams to skilfully summarize the facies and paleoecology of all known Upper Triassic reefs from the northern Calcareous Alps of Austria. Flügel and T. Steiger also provide an excellent overview of the complexities that occur in a single Upper Jurassic sponge-algal buildup (Mullersfelsen) in Bavaria that grew below wave base. They suggest that the sediment-binding activity of the algae were more important than the trapping and baffling of suspended sediment by sponges. D. Turnsek and others describe an Upper Jurassic reef complex from NW Yugoslavia, a barrier reef along a shelf margin.

J.-P. Masse and J. Philip outline Cretaceous coral-rudistid buildups from three areas in France and interpret these reefs in a series of progradational models of carbonate platform margins. They do not, however, compare them with Cretaceous buildups elsewhere. F. Carbone and G. Sirna describe various Upper Cretaceous reef models from central Italy that use new road outcrops. A. Polsak outlines an Upper Cretaceous biolithitic complex from northern Yugoslavia composed of coral and rudistid bioherms which developed on the slopes of an island arc near a Tethyan subduction zone. L. Babic and J. Zupanic discuss various pore types and fillings in a Paleocene reef in northern Yugoslavia. The concluding paper by Frost is a detailed overview of paleoecologic distribution of Oligocene reef corals in the Vicentin area of NE Italy. He includes ecologic controls and the preservation potential of the various reef communities, and an appendix of Tethyan Oligocene reef corals.

It is unfortunate that a common nomenclature is not used throughout this volume and that the types of carbonate buildups, organic masses and reefs are defined but used in a variety of ways. I am beginning to despair that there will ever be a more uniform usage of terms such as reefs. It would also have been easier for readers if most of the authors had followed Flügel's approach of using Wilson's standard microfacies types ("*Carbonate Facies in Geologic History*", 1975, Springer-Verlag).

Some sedimentologists will be disappointed that diagenesis was not covered and the lack of an index makes it more difficult to know what topics are included. These shortcomings are relatively minor, however, and Toomey and SEPM are to be congratulated for bringing together such an enormous amount of well-illustrated and documented information on European fossil reefs. This book is highly recommended to all sedimentologists, paleontologists, stratigraphers, economic geologists, and graduate students concerned with reefs.

E.W. Mountjoy
McGill University, Montreal
Canada