

Book news

1. Book reviews

● *The geology and mineral resources of northern Sierra Leone*, by A Macfarlane *et al.* London, Her Majesty's Stationery Office, Institute of Geological Sciences Memoir 7, 1981.

Reviewer: J. Lurie

This memoir is based on the work of a team of geologists on behalf of the Overseas Development Administration of the U.K. The proposal for a geological survey of northern Sierra Leone was first raised at a meeting between the Prime Ministers of the U.K. and Sierra Leone.

The fieldwork was carried out during field seasons between 1971 and 1973. Mining is the most important industry in Sierra Leone in terms of employment in the modern sector and exports, and is second only to agriculture in its contribution to the national economy. The minerals are all recovered by surface methods and include alluvial diamonds, iron ore, bauxite, and rutile. Most of the operating mines fall outside the area of the publication, which no doubt provided the motivation to concentrate efforts on the northern part of the country.

The memoir is divided into two parts: the first covers the general geology including the stratigraphy, structure, petrography, and orogenic history of the area; the second deals with economic aspects of the geology and describes occurrences of mineral deposits, construction materials, and water resources. The organization of the material in this manner enhances the value of the publication as a work of reference.

The greater part of the area is underlain by Precambrian rocks of the Basement Complex, consisting of granitoids and gneisses (infracrustal rocks) and greenstone belts (supracrustal rocks), together with metamorphosed basic and ultrabasic intrusives. The entire assemblage is analagous to the terrain in southern Africa encompassing the Barberton Mountain Land and the Transvaal lowveld and extending into Zimbabwe, and appears to be of a similar geological age.

Younger rocks include the so-called Rokel River Group of sedimentary rocks and volcanics; dolerites of an age (185 ± 10 my) that suggests the existence of a late-Karoo basic igneous province in west Africa; and the Bullom Group of Tertiary age consisting mainly of felspathic sandstones and clay.

The report on the mineral potential consists of a summary of previous work, as well as the results of mineral investigations undertaken as part of the project, the aim being to delimit areas of economic potential where follow-up work is recommended.

Three prospecting methods were undertaken: a stream sediment survey for multimetal spectrographic analysis, a panned heavy-mineral survey; and a radiometric survey using hand-held rate meters. Areas were delimited offering potential for the future development of bauxite, iron ore, and nickel. Less-promising occurrences of alluvial diamond, titanium ores, cassiterite, and molybdenite are described.

The memoir will undoubtedly serve the invaluable

function of providing a basis for more detailed work, especially as a guide for economic mineral exploration.

● *Application of rock mechanics to cut and fill mining*. London, Institution of Mining and Metallurgy, 1981. £ 46.

Reviewer: C.L. de Jongh

This volume contains the proceedings of the conference on the application of rock mechanics to cut-and-fill mining, which was organized by the Department of Rock Mechanics and Soil Mechanics, University of Lulea, Sweden, and was held in June 1980.

The papers review fill-mining technology in Australia, Canada, and the U.S.A., and deal with the present state of the art of rock mechanics applied to cut-and-fill mining. Of the 43 papers, 18 describe the investigations carried out in Nasliden Mine in Sweden. The main objective of the Nasliden project was to test the suitability and reliability of numerical methods, such as finite element, through *in situ* stress measurements and monitoring of the fill and rock mass. The rest of the papers cover subjects such as cut-and-fill mining methods, the post-pillar concept, crown-pillar extraction, properties of hydraulic fill, cable support, rock-burst control, and the economic potential of rock mechanics when applied to cut-and-fill mining.

The papers in this volume will provide valuable guidance to all mining engineers using cut-and-fill methods and engineers involved in the design of new mines where cut-and-fill systems are being considered.

2. New books

● *Handbook of exploration geochemistry* by G.S. Govett (Editor). Vol. 1: *Analytical methods in geochemical prospecting* by W.K. Fletcher. Amsterdam, Elsevier, 1981. 256 pp. Dfl. 140.

This first volume of the Handbook is intended to bridge the communication gap that exists between the geologist in the field and the analyst in the laboratory. To this end, it provides an introduction to the choice of analytical methods that might be available to a geologist submitting samples to a typical prospecting laboratory.

● *Coal utilisation: technology, economics and policy*, by L. Granger and J. Gibson. London, Graham & Trotman, 1981. 504 pp. £ 23.

A detailed description of the many uses of coal, the economics associated with these uses, and the proposed policies that the authors believe should be followed to ensure that coal is utilized in the best way.

● *Rock slope engineering reference manual*. Piteau & Associates. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, U.S.A. \$ 50.50.

This manual consists of 8 documents dealing with engineering geology, structural analysis, slope stability and stabilization, blasting, and landslides.

● *Soft clay engineering*, by E.W. Brand, and R.P. Brenner (Editors). Amsterdam, Elsevier, 1981. 750 pp. Dfl. 315.

By their nature, soft clay deposits pose special problems for the foundations of engineering structures, particularly in cities where land is costly and tall buildings are a common feature. Bangkok, Boston, Mexico City, Oslo, and Tokyo are good examples. Furthermore, as all these communities grow and develop, alongside the growing environmentalist lobbies, more and more marginal land is having to be used; and not unnaturally, a better understanding of how to cope with the inherent instability of this land is necessary.

● *Handbook of international alloy compositions and designations, volume III — aluminium* by W. Kehler (Compiler). Obtainable from Aluminium-Verlag GmbH, P.O. Box 1207, Königsallee 30, D-4000, Düsseldorf 1, West Germany. DM 350.

This book is the long-promised volume of a series on metals and alloys covering the aluminium-based alloys that are available internationally. The overall objective is to provide a reference book to identify the chemical composition, standards, and specifications for the wide variety of aluminium alloys in use throughout the modern world.

● *Disseminated/replacement gold deposits*. Obtainable from Minobras Mining Services, P.O. Box 262, Dana Point, CA 92629, U.S.A. \$ 69.70.

Included in the book are descriptions of the replacement, oxidation, and enrichment processes, geology, mineralogy, production data, geochemical guides, exploration models. Guidelines are given for the heap-leaching process, an economical method for the processing of low-grade gold ores. Descriptions of mines, deposits, and occurrences are given by section, township-range for U.S.

deposits in Alaska, Arizona, California, Colorado, Georgia, Idaho, Montana, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Utah, Virginia, Washington, and Wyoming. Also included are deposit descriptions for twenty countries in North and South America, Europe, Asia, Africa, Oceania, and Australia.

3. New journals

● *Metals Society World*, edited by B. Garland, monthly, published by The Metals Society, 1 Carlton House Terrace, London SW1Y 5DB. This journal replaces *Metals and Materials*, which ceased publication at the end of December 1981.

Through a combination of news, articles, reports, conference information, book reviews, correspondence, and other regular features, the new journal will be a lively and authoritative guide to events in the metals world. It will provide news from industry and the international metals community together with articles on important topics of metallurgical interest; regular, comprehensive coverage of the activities of The Metals Society and its members, including its technical groups and twenty-five affiliated metallurgical societies throughout the U.K.; and a forum for members' views on the Society's work and future development and on all aspects of metals production and use.

● *Mining Monthly*, edited by R. Louthean, published by Lodestone Press Pty Ltd, P.O. Box 362, Nedlands, Western Australia 6009, \$A 66 for 11 issues per year (no January issue). This journal replaces *Mining Quarterly*, which ceased publication towards the end of 1981.

Uranium reference materials

Council for Mineral Technology (Mintek), in collaboration with the South African Atomic Energy Board and the Nuclear Fuels Corporation, announces the availability of ten uranium-bearing materials (UREM 1 to 10) that have been certified as reference materials for total uranium content.

The ten materials consist of two residues from the acid leaching of uranium-bearing ore, three concentrates of iron pyrite, a slimes dam (tailings) material, a calcine (roasted iron pyrite) from the manufacture of sulphuric acid, a Witwatersrand ore, a Karoo ore, and a calcrete material. All the materials were supplied by the South African uranium industry.

Analyses of the materials were received from twenty-two laboratories in seven countries. Mintek report M16 contains information on the preparation, homogeneity testing, and analysis of the materials by the participating laboratories. The statistical evaluation of the analytical data received and the assignment of certified values are also described.

The report is available free of charge, and the reference

materials are available in 200 g units at R100 per unit. Approximately 50 kg of each material is available for use by laboratories outside the Republic of South Africa. Purchase orders for these reference materials should be sent to the address given below.

The values are less certain for the three pyrite concentrates than for the other materials, and more analytical data would therefore be desirable for these concentrates. Analysts who have suitable reference methods and are prepared to analyse the pyrite concentrates should write to the address below. Samples for analysis will be sent, free of charge, to analysts who are accepted as participants.

Council for Mineral Technology,
Private Bag X3015,
RANDBURG, 2125
Republic of South Africa.
Telegraphic Address: Minteksa, Johannesburg.
Telephone – South Africa: (011) 793-3511
International: 27 11 793-3511
Telex: 4-24867 SA

Mine water

An intensive course for practising engineers on industrial and mine water systems will be presented by the Water Systems Research Programme, at the University of the Witwatersrand, from 28th to 30th June, 1982.

The subject matter covers water purification and desalination. Water-cooling systems will be discussed as well as scaling and corrosion. The third day will be con-

cerned with high-pressure pipework design, water hammer, economics, and pumping.

Enquiries should be directed to Professor D. Stephenson, Water Systems Research, Department of Civil Engineering, University of the Witwatersrand, Johannesburg 2000. Telephone: (011) 716-2560.

Seismicity in mines

The South African National Group of the International Society for Rock Mechanics, in collaboration with the South African Institute for Mining and Metallurgy, is organizing an International Symposium on Seismicity in Mines, which is to be held in Johannesburg from 13th to 17th September, 1982.

Rockbursts have been a problem on the gold mines of South Africa since the turn of the century. The problem increased when the mining operations became more extensive and went to greater depths. As early as 1940, it became clear that rockbursts were closely related to areas of active mining. Intensive research since then has resulted in some understanding of the mechanism and cause of rockbursts. There are strong indications that most rockbursts are scaled-down versions of natural earthquakes. This offers the possibility of increasing our fundamental knowledge of earthquake mechanisms.

South African scientists are among the world leaders in the study of mine-induced seismicity. At present seven mine-wide seismic networks are in operation and a further six are in the planning stage. This emphasizes

the extent to which the South African mining industry is involved in seismic monitoring for both research and mine-planning purposes. Increasing use is being made of computers for on-line location of seismic events, thus providing management with a rapid evaluation system and scientists with a large source of data.

Prominent seismologists and mining engineers have been invited to prepare papers dealing with the following broad topics:

- Mechanism of seismic events
- Monitoring of seismic events and systems layout
- Relationship between mining and seismicity
- Rockburst damage and its prevention
- Strategy in mine design
- Precursive phenomena and prediction.

In addition to the main papers, prepared contributions will be welcomed from all interested persons.

Further details are available from the Conference Secretary, South African National Group on Rock Mechanics, P.O. Box 61809, Marshalltown, 2107. Republic of South Africa.

Mine lighting

The National Committee on Mine Illumination will be holding an 'International Mine Lighting Conference' in Johannesburg from 20th to 21st September, 1982.

The conference will be attended by overseas and local representatives of the International Committee on Mine Illumination and by local persons and organizations.

Anybody who is interested in presenting a paper should submit a synopsis of the paper to J. Burrows, P.O. Box 809, Johannesburg 2000. Further details are available from Mr Burrows, telephone number (011) 726 3020.

Rock mechanics

The 14th Canadian Rock Mechanics Symposium on the theme 'Rock Breaking and Mechanical Excavation' will be held in Vancouver, Canada, from 13th to 14th May, 1982.

For further information, write to Hamish D.S. Miller, Suite 408, Kapilano 100 Building, West Vancouver, B.C. Canada, V7T 1A2

Strata control

The Seventh International Strata Control Conference in underground workings will be held in Liège, Belgium, from 20th to 24th September, 1982.

The Conference is being organized by the Institut National des Industries Extractives (INIEX), with the co-operation of the Commission of the European Communities (CECA).

The selected themes are as follows:

Strata control

- in stone drifts, dip headings and staple pits;
- on longwall faces and in gate roads;
- in room-and-pillar workings and their access roads;
- in other types of workings, and as affected by the new

technologies.

A whole day has been set aside for underground visits to mines in the Belgian and German coalfields, or to the open-cast lignite mines in the Aachen-Cologne coalfield.

The Conference languages are English, French, Dutch, and German. Simultaneous interpretation into each of these four languages will be provided for the presentations.

For further information, please apply to Secrétariat de la 7e Conférence Internationale sur les Pressions de Terrains, c/o INIEX, Rue du Chéra 200, B-4000 LIÈGE, Belgium.

Mineral processing

The XIV International Mineral Processing Congress, hosted by the Canadian Institute of Mining and Metallurgy, is to be held in Toronto from 17th to 23rd October, 1982.

The theme is the 'Worldwide Industrial Application of Mineral Processing Technology'. The nine technical sessions will feature Flotation, Comminution, Modelling

and simulation, Plant design, Precious metals recovery, Energy minerals recovery, Industrial minerals recovery, Materials processing, Mineralogy applied to ore dressing.

Further information is obtainable from XIV International Mineral Processing Congress, The Canadian Institute of Mining and Metallurgy, 400-1130 Sherbrooke St. West, Montreal, Quebec, Canada H3A 2M8.

Surface analysis

The Analytical Division of the Royal Society of Chemistry is organizing a Symposium on Surface Analysis at St. Catherine's College in the University of Oxford on Wednesday and Thursday, 15th and 16th December, 1982. The Symposium will be concerned with various methods of surface analysis and the results obtained for different types of materials.

As part of the Symposium proceedings, it is planned to visit AERE at Harwell.

Further details about the Symposium are available from Miss P. E. Hutchinson, Secretary, Analytical Division, The Royal Society of Chemistry, Burlington House, London W1V 0BN, England.

Steel alloying metals

A symposium on the Extraction of Steel Alloying Metals is to be held at the Technical University of Lulea Sweden, from 15th to 18th March, 1983.

Many of the non-ferrous metals have gained in importance due to rising demand, diminishing natural resources, and increasing prices. The metallurgy of the base metals has been covered fairly well in recent symposia. This symposium is intended to provide an opportunity for the presentation and discussion of recent advances in the technology of extraction of non-ferrous metals. It is the intention to cover non-ferrous metals such as Cr, Mn, V, Ni, Co, Sn, W, Mo, Nb, Ta, Ti, As, Se, Te and

others.

The lectures will comprise papers on mineral resources, supply and demand, mineral processing, hydro- and pyrometallurgy.

Those who wish to contribute papers in the areas outlined are kindly requested to submit an abstract of 200 to 400 words before 31st May, 1982.

Further details are available from The Division of Mineral Processing, Technical University of Lulea, S-951 87 Lulea, Sweden. Telephone: 46-920-91 311, 91 310. Telex: 80447 LUHS.