Book news

1. New books

● P. Sarnoff. *Trading in gold.* Cambridge, Woodhead-Faulkner, 1980. 136 pp. £3.50 by airmail.

A complete account is given of gold trading for the individual investor, covering the markets, the mechanics and strategies involved, and price research and forecasting. The author evaluates, making clear his own preferences, the various trading media and forms of gold ownership available – physicals such as bullion, coins and jewellery, certificates and delivery orders, futures, options, and the shares of gold-mining companies. The varying viewpoints of gold traders are not overlooked: the book describes the hedging techniques needed by the commercial user of gold for price protection, discusses the merits of bullion and coins as a long-term investment, and demonstrates how futures and options can be used to make profits on downward as well as upward price movements. A clear analysis of the factors influencing the price – including inflation and the price of oil, U.S. Treasury and I.M.F. auctions, and the supply/demand picture – is accompanied by an explanation of some indicators that traders can use to forecast future trends. An epilogue has been added to take account of events since the main text was written, which have amply confirmed the author's analysis of the basic gold price trend. Tables and diagrams are given throughout the book, and there are useful appendixes of trading information, as well as a glossary of gold terminology.

● Environmental Planning Professions Interdisciplinary Committee (EPPIC). *Proceedings: Joint EPPIC/Habitat Symposium: Shaping Our Environment.* Johannesburg, EPPIC (P.O. Box 61019, Marshalltown 2107), 1980. R3 per set of 2 issues.

These are the proceedings of the above Symposium, which was held in August 1979.

● H. P. Patra and K. Mallick. *Time-varying geoelectric sounding.* Amsterdam, Elsevier, 1980. 420 pp. U.S. $87.75.

This is the second volume of Geosounding Principles. The first volume developed the theory of the flow of direct electrical current in a horizontally layered earth, and applied this theory to the derivation of modern interpretation methods for resistivity-sounding observations. This volume deals with theoretical, computational, and interpretational approaches for geoelectric soundings, using various controlled and natural time-varying fields (alternating current, transient, magnetotelluric, and geomagnetic) covering a wide frequency range and including some significant applications. Written primarily for students, it is a comprehensive work that will also be a valuable reference for exploration geologists and geophysicists. It gives a thorough background knowledge of the various depth-sounding tools, gradually develops the theoretical, computational, and interpretational approaches and outlines the merits and demerits of their applicability.

● Die Suid-Afrikaanse Steenkoolverwerkingsvereniging. *Steenkoolvoorbereidingskursus.* Johannesburg, dieVereniging, 1930. 335 pp. Members of Chamber of Mines of South Africa R15, non-members R40.

This book is one of the first comprehensive technical publications on coal to be published in Afrikaans.

● D. R. Derry. *A concise world atlas of geology and mineral deposits.* London, Mining Journal Books, 1980. 110 pp. £26.25 by airmail.

2. Journal

● *Remote sensing of environment (RSE).*

Remote sensing is one of a very few environmental information-gathering methods that has gone beyond promise to performance. *RSE* has chronicled the field's dynamic progress of the last few years, and this coverage of new applications and current research will continue as the field moves further ahead. Totally interdisciplinary, the journal publishes scientific and technical results on theory, experiments, and systems design in remote-sensing technology and applications in the following areas: agriculture, forestry and ecology, geography and cartography, geology and mineral resources, hydrology and water resources, meteorology, and oceanography.

Volumes 9 and 10 (8 issues) are covered by the 1980 subscription, which is $110+$32 for airmail postage and should be sent to Elsevier North Holland Inc., 52 Vanderbilt Avenue, New York, NT 10017, U.S.A.

3. NIM reports

The following reports are available free of charge from the National Institute for Metallurgy, Private Bag X3015, Randburg 2125, South Africa.

Report No. 2064

The on-line monitoring of gold in barren solutions.

An account is given of the development and use of an automatic system for the monitoring of the gold content of so-called barren solutions from the cyanidation of gold ore. The system is based on the use of flameless atomic-absorption spectrophotometry and the deposition of the sample in the form of an aerosol.

The relative standard deviation of the measurements when the system was tested under plant conditions was 0,14 for a gold concentration of 0,002 mg/l.

Report No. 2065

The determination, by X-ray-fluorescence spectrometry, of gold, silver, and base metals on activated carbon.

The method proposed involves ashing of the sample at a low temperature in a muffle furnace, mixing of the ash with alumina and boric acid in a Siebtechnik mill, and briquetting of the mixture. The elements are measured in the briquette by the use of X-ray-fluorescence spectrometry. The detailed laboratory method is given in an appendix.

Report No. 2068

The determination of platinum, palladiuim, rhodium, and gold in ores and concentrates by the fusion technique with lead as the collector.

This report describes a rapid, modified fire-assay

technique for the determination of the total content of platinum, palladium, rhodium, and gold – or of gold alone – in ores and concentrates. The analytes can be determined individually by use of an atomic-absorption technique after cupellation of the lead button at a low temperature.

● **Report 2061**

The determination, by anodic-stripping voltammetry, of copper and lead in silicate reference materials.

Feasibility tests were carried out on the direct determination, by anodic-stripping voltammetry, of zinc, lead, and copper in the six NIMROC samples and two certified reference materials of the United States Geological Survey. All the samples were soluble in a 10 : 1 mixture of hydrofluoric and nitric acids at room temperature or at 150°C in a Teflon-lined pressure vessel. After the samples had been dissolved, free hydrofluoric and fluorosilicic acids were eliminated by evaporation, and the residue was dissolved in a mixture of 1 M sodium hydroxide and 0,3 M triethanolamine, in neutral or alkaline 1 to 3,5 M potassium fluoride, or in neutral 0,5 M sodium tartrate.

It was found that, with all these electrolytes, iron(III) interfered with the determination of zinc, and that the results for lead and copper were unreliable unless there was close control of the chemical and voltammetric conditions to prevent the coprecipitation of trace elements or interference from film-forming complexes during stripping. For all samples, the only successful procedure for the determination of lead and copper was the elimination of the fluoride ions by repeated heating with nitric acid followed by differential-pulse anodic-stripping voltammetry from 1M nitric acid. The results for lead agreed closely with the peak values on the frequency histograms derived from the original NIMROC certification programme, and the copper concentrations confirmed the present certified values.

● **Report 2062**

The reduction by computer of photoplate data obtained by spark-source mass spectrometry.

A computer programme for the processing of mass-spectrometry data obtained from photoplates is described. The programme incorporates a grain-distribution function, saturation transmission, a slope for the characteristic curve of 1,33, and the use of relative sensitivity factors for the calculation of sample concentrations. It includes a number of novel features, such as point rejection and re-introduction, correlation coefficients of the calibration curves, and a background correction down to 70 per cent transmission.

● **Report 2071**

The determination, by X-ray-fluorescence spectrometry, of tin and tungsten in scheelite and cassiterite ores and concentrates.

A method of analysis is presented that is applicable to sample mixtures of cassiterite and scheelite in concentrations of 0,2 to 70 per cent. Matrix variations are compensated for by dilution and fine grinding with coarse river sand, potassium chloride being used as a binder. Residual matrix effects are corrected for by the use of chemically analysed scheelite and cassiterite standards.

For tin, the relative standard deviation at a concentration of 60 per cent is 0,0063, and, at 10 per cent, 0,028; for tungsten, it is 0,013 at a concentration of 40 per cent. The lower levels of detection for tungsten and tin are 0,26 and 0,23 per cent respectively, and the time required for the analysis of 10 samples and 5 calibration standards by this method is 5 hours.

A detailed laboratory method is given in the appendix.

Tunnelling

Tunnelling '82, the third international symposium in the series, is being organized by the Institution of Mining and Metallurgy, with the co-operation of the British Tunnelling Society, the Institution of Mining Engineers, and the Transport and Road Research Laboratory. It is to be held at Brighton from 7th to 11th June, 1982.

The papers will deal with practical developments in safety, technology, and cost-effectiveness of all types of tunnelling. The programme of technical sessions will include the following principal topics:

Methods and machines — shields, full-face boring machines, drilling and blasting methods

Geotechnical topics — site investigation, dewatering, grouting, freezing, lining and support; ground stability and practical measurements

Services — planning and surveying, contractual and legal aspects, ventilation, safety and health

Complete projects — tunnels for mining and civil engineering purposes worldwide

The *Tunnelling '82 International Exhibition*, to be held in conjunction with the Symposium, will include plant, equipment, material processes, and ancillary services for all types of tunnelling and underground excavation. It will embrace traditional and new developments in design and construction for the mining, civil engineering, and construction industries throughout the world. Some 4 400 m² of exhibition space will be available for display purposes. All enquiries should be made to the exhibition organizer, Christopher Bradley, CB Technical Exhibitions, Ltd, 78 Vineyard Hill Road, Wimbledon, Park, London SW19 7JJ, England (telephone: 01-946 3471, telex: 22914 CCC G).

Flow measurements

Accurate measurement of fluid flow is a common requirement in both industry and the laboratory, but at present the choice of flowmeter for a particular application is always a matter of compromise. The user must trade those meter variables which are essential for his application against the penalties, for example, ease of installation against the penalty of meter failure. Plant layout may also impose limits on the installation of a meter, which may have to be placed closer to an upstream fitting than the Standards recommend. BHRA is organizing an international conference on Advances in Flow Measurement Techniques to enable industry's needs to be discussed in the light of the current research and development of flow-metering devices.

The Conference is to be held in Coventry, England, from 9th to 11th September, 1981.

The subjects to be covered are listed below, but related topics will also be considered.

Flow measurement needs, including industry's requirements for difficult fluids; metering mixtures of solids/liquids and multiphase systems; difficult environments; very high-reliability applications; very high accuracy, etc.

Measurement of other fluid parameters, such as pressure, temperature, viscosity, density, pH, constituents, particulate matter, solids distribution, gas distribution, and steam quality.

New designs, future instruments, further research and development, greater accuracy and reliability, and non-intrusive devices that have solved a particular problem or an outstanding need.

Further details are available from the Conference Organizer, Flow Measurement, BHRA Fluid Engineering, Cranfield, Bedford MK43 OAJ, England.

Seminars at McGill University

The Department of Mining and Metallurgical Engineering at McGill University, Montreal, Canada, will be holding the following seminars in the first half of 1981. Further information is available from Lorna McFadden, Department of Mining and Metallurgical Engineering, McGill University, 3480 University Street, Montreal, Quebec, Canada H3A 2A7.

Mine lighting	19th to 21st January
Designing jobs for people	26th to 29th January
Blasting systems	2nd to 6th February
Geostatistical ore reserve estimation	9th to 13th February
Mineral industry economics	16th to 27th February
Organizing for results in resource-based industries	2nd to 6th March
The financing and implementation of mineral projects	9th to 13th March
The planning and execution of mineral development strategies	16th to 20th March
Mineral processing systems	23rd March to 3rd April
Geophysical data processing and interpretation	6th to 10th April
Pay, motivation and productivity	13th to 16th April

Powder metallurgy

Powder metallurgy can be defined as the pressing of metal or ceramic powders into green compacts of a specified shape and the heat treatment or sintering of these compacts in whatever atmosphere is suitable to develop particular mechanical, physical, or electrical properties. The Powder Metallurgy Association of South Africa recently came into existence, and has the following aims and objectives.

To further powder metallurgy and related topics in all branches of science and industry.

To arrange meetings of powder metallurgists (and workers in associated disciplines) in Southern Africa.

To liaise and co-ordinate activities between the Association and other powder metallurgy associations and related organisations.

The next Powder Metallurgy Conference, 'Powder Metallurgy 1981' is to be held in Pretoria on 10th and 11th March, 1981, and is the second conference and exhibition organized by the Association.

The Conference is intended to be a forum where some of the most recent research-and-development work undertaken in the country can be presented and discussed, and where overseas experts and manufacturers of the most modern powder metallurgy can make contributions that will enhance the value of powder metallurgy to South African industry.

The provisional programme for the Conference is as follows:

Tuesday 10th March, 1981.

Following registration and the keynote address, three sessions will cover.

Powders—Manufacturing and Processing
Compaction and Sintering
Quality Control, Marketing, and End Uses.

The first day's proceedings will be followed by a cocktail party and the Conference dinner.

Wednesday 11th March, 1981.

Three sessions will cover
Special Ceramics
Cemented Carbides
Finishing operations

The Association's annual general meeting will also be held during the second day.

Reduced fees for students of metallurgy and ceramics will enable these groups to take advantage of the Conference.

Enquiries should be addressed to the Conference Secretary, CSP, CSIR, Pretoria, 0001.