

Book news

1. Recent books

● D. K. Hsiao, D. S. Kerr, and S. E. Madnick. *Computer security*. New York, Academic Press, 1979. 276 pp. \$18.

In view of the growing national concern with security and privacy, this is an especially timely book. It presents a coherent, up-to-date review of recent research in computer security, together with a critical assessment of this research. For technical managers, programme monitors, and other professionals in the computer industry, the book offers these features: a tutorial, illustrative approach; introduction of the required terminology with intuitive and informal definitions; indications of research objectives and promising future directions; an abundance of illustrations; and a complete annotated bibliography.

● W. C. J. van Rensburg and S. Bambrick. *Economics of the world's mineral industries*. Isando, McGraw-Hill, 1979. R18,95.

This book deals with all aspects related to the optimum exploitation of minerals on a national and global basis. It includes chapters on reserves and resources, physical and social infrastructure, taxes, tariffs and incentives, strategies for the promotion of domestic processing of minerals, energy for mineral exploitation, company and national mineral policies, as well as more technical aspects, such as mineral marketing, prices and trade, forecasting, and sources of information. The emphasis in the book is on comprehensive commodity studies aimed at identifying problems and opportunities in the mineral industries. It should represent an invaluable reference work to all persons interested in mineral economics, resource diplomacy, and the importance of South Africa and Australia as suppliers of minerals and energy to the West.

● *Soviet metallurgical research 1973-1977*. Vol. 1. Subject index and author index (1963-1972). Vol. 2. Chronological listing of titles with full bibliographical information (1960-1972). London, Scientific Information Consultants Limited (661 Finchley Road, London NW2 2HN). £24 per set.

● W. Hoosen. *Miners' dictionary*. London, Institution of Mining and Metallurgy, 1979. (Reprint.) £11 (£9 for members).

● G. J. Pitt and G. R. Millward. *Coal and modern coal processing: an introduction*. New York, Academic Press, 1979. 224 pp. \$18.

The purpose of this book is to provide a succinct and up-to-date introductory account of the formation, structure, and main properties of coal, with brief descriptions of processes for converting it into gas, liquid fuels, coke, and graphite, and for its combustion for heating and power generation. Some of the chapters include accounts of recent work that have not been published elsewhere, and sources of more detailed information are indicated throughout. The book is based on a series of lectures given by the authors at the University College of Wales and presupposes only a basic

knowledge of chemistry. It will, therefore, be particularly suitable as a textbook for graduates and undergraduates in fuel science and chemical engineering, and for all those entering, or thinking of entering, the coal-processing industry. It will also be of use to technical staff in government or industry concerned with the exploitation of energy or with predicting future energy requirements.

● D. Stephenson. *Rockfill in hydraulic engineering*. Amsterdam, Elsevier, 1979. 228 pp. U.S. \$45, D.f.90.

Rockfill is an inexpensive material that can be put to many uses in civil engineering, particularly in the field of hydraulic engineering, where its durability, mass, permeability, roughness, and flexibility can all be employed to advantage. In this book, Stephenson presents the general theory for design of rockfill structures. He assembles and condenses into usable form much research literature on the flow through and over rockfill and the stability of rockfill subject to hydraulic forces. The theory is then applied to the design of such hydraulic works as dams, breakwaters, drainage and earth retaining structures.

2. 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. 2015

The preparation of synthetic standards for use in instrumental neutron-activation analysis.

An account is given of the formulation and preparation of synthetic standards suitable for the routine analysis of minerals, ores, and ore concentrates by instrumental neutron activation. Fifteen standards were prepared, each containing from one to seven elements. The standards contain forty-four elements that produce isotopes with half-lives longer than 12 hours. An evaluation of the accuracy and precision of the method of preparation is given.

Report no. 2029

The commissioning of a 5 kW inductively coupled plasma unit for use with a 3,4-metre Ebert spectrograph.

After the unit had been commissioned, optimum operating parameters were established, and limits of detection for a number of elements were determined.

An investigation was carried out into the ionization interference effects caused by varying concentrations of sodium. Evidence is presented to show that ionization interference is greatly reduced at higher power.

When the unit was operated under optimum conditions, i.e., at a power input of 5,5 kW, interference by sodium in concentrations of up to 30 g/l in the solution was generally found to be less than 5 per cent.

Some analytical applications are described, including the analysis of rare-earth elements and concentrates.

Report no. 2032

The Cancer Project: a summary of the computer-aided operation of a 48 MV.A ferrochromium furnace.

A description is given of the computer system that was

implemented to control a 48 MV. A submerged-arc ferrochromium furnace, and of the dedicated microcomputers developed for weighing the raw materials and controlling the electrodes. Reports produced by the computer are reproduced, and the findings that were particularly important in increasing the production of ferrochromium are discussed.

Report no. 2036

The determination of thallium in ores, concentrates, and metals.

This report describes the separation, concentration, and determination of thallium in sulphide concentrates, ores, and metals. After the sample has been dissolved, the thallium is separated by liquid-liquid extraction, and is determined by spectrophotometry, atomic-absorption spectrophotometry with carbon-rod atomization, or anodic-stripping voltammetry. Of these, the spectrophotometric method is the most rapid, sensitive, and precise. The limit of determination is 0,1 p.p.m., and the precision (relative standard deviation) ranges from 0,017 at 15 p.p.m. to 0,086 at 2 p.p.m. A detailed laboratory method is given in an appendix.

Report no. 2040

A solid-state constant-current power unit for the magnetic analyser of the MS702R mass spectrometer.

A description is given of a solid-state unit that was

developed to supply a constant current to a magnetic analyser. The original unit had failed to give a current that had an operating stability within the manufacturer's specifications. Tests showed that the unit developed performed extremely well, the average variation of current being ten times less than that specified. (The specified variation is 25×10^{-4} per cent for 10 minutes and 100×10^{-4} per cent for 30 minutes.)

Report no. 2044

The separation and determination of anions by ion chromatography.

The separation of anions on low-capacity anion-exchange resins with eluant solutions of potassium benzoate, potassium hydrogen phthalate, or tri-potassium citrate is described. The separated anions were detected by conductivity measurements. The simultaneous separation and determination of mixtures of three to four anions were achieved. A strongly acidic cation-exchange column was used for the conversion of ion salts to acids. The use of the column resulted in a considerable enhancement of detection sensitivity, and allowed the determination of anions in concentrations as low as 10^{-4} g/l. Experimental determinations of anions in tap water and in tungstic oxide are described. These showed sufficient promise to warrant a consideration of more fundamental studies and optimization of parameters.

Computer congress

In October 1980, Japan and Australia are hosting the 8th World Computer Congress. This Congress is a triennial event conducted under the sponsorship of the International Federation for Information Processing. The Congress is a major event in the computer scene and normally attracts over three thousand local and international visitors.

Part one of the Congress will be held in Tokyo from 6th to 9th October, and will have as its theme 'Challenges of a Computer Presence'. Over 200 papers are planned to be presented in the following fields:

- Theoretical Foundations of Information Processing
- Computer Architecture and Hardware
- Business and Government Applications
- Social and Economic Applications
- Software
- Data Base and Information Systems
- Information Processing and Education
- Computers in Everyday Life.

Further information is obtainable from The 8th World Computer Congress, I.F.I.P. Congress '80, Kikai Shinko-Kai Bldg, 3-5-8 Shiba-Koen, Minato-ku, Tokyo 105, Japan.

In addition to the technical sessions of the Congress and the associated equipment exhibition, which promises

to be one of the largest ever held, a number of special ancillary activities are planned. These ancillary activities are being constructed round aspects of computing that are of particular significance in Australia or Japan. One of the most important of these ancillary activities is a 'Computers in Mining' seminar. This seminar will be held on 13th October, 1980, in Melbourne, and will involve those organizations known for their contribution in the application of computers in mining. The proposed programme of selected papers for the seminar is as follows:

- Coal deposit evaluation studies
- Control of mineral processing plants
- Mineral inventory modelling and ore reserves estimation
- Processing of aerial prospecting data
- Use of small computers at remote mining sites
- Computer applications in oil exploration
- Project evaluation and financial decision making
- Processing of Landsat imagery data for mineral exploration.

Further information on the 'Computers in Mining' seminar can be obtained from Mr G. S. Stacey, Chairman of Organizing Committee for 'Computers in Mining' Seminar, C/O M.I.M. Holdings Limited, G.P.O. Box 1433, Brisbane, Australia 4001.

Company Affiliates

The following members have been admitted to the Institute as Company Affiliates.

- AECI Limited.
Airco Engineering (Pty.) Limited.
Amalgamated Collieries of S.A. Ltd.
Apex Mines Limited.
Associated Manganese Mines of S.A. Ltd.
Blackwood Hodge (S.A.) (Pty.) Ltd.
Black Mountain Mineral Development Co. (Pty.) Limited.
Blyvooruitzicht Gold Mining Co. Ltd.
Boart International Limited.
Bracken Mines Ltd.
Buffelsfontein Gold Mining Co. Ltd.
Compair S.A. (Pty.) Limited.
Consolidated Murchison (Tvl.) Goldfields & Development Co. Ltd.
Davy Ashmore South Africa (Pty.) Limited.
Deelkraal Gold Mining Co. Ltd.
Delfos & Atlas Copco (Pty.) Ltd.
Doornfontein Gold Mining Co. Ltd.
Dowson & Dobson (Pty.) Ltd.
Durban Roodepoort Deep Ltd.
East Driefontein Gold Mining Co. Ltd.
East Rand Proprietary Mines Limited.
Eimco (Pty.) Limited.
Engineering Management Services Ltd.
Envirotech (Pty.) Ltd.
Free State Saaiplaas Gold Mining Co. Limited.
Gardner-Denver Company Africa (Pty.) Ltd.
Gold Fields of South Africa Limited.
- The Griqualand Exploration & Finance Co. Ltd.
The Grootvlei (Pty.) Mines Ltd.
Haleys CMO (Pty.) Ltd.
Harmony Gold Mining Co. Ltd.
Hartebeesfontein Gold Mining Co. Ltd.
H. Heimscheidt Mining & Hydraulic Equipment S.A. (Pty.) Ltd.
H.L. & H. Mining (Pty.) Ltd.
Highveld Steel & Vanadium Corp. Ltd.
Hubert Davies Heavy Equipment (Pty.) Ltd.
Impala Platinum Limited.
Ingersoll Rand Company S.A. (Pty.) Ltd.
Johannesburg Consolidated Investment Co.
Kinross Mines Limited.
Kloof Gold Mining Co. Ltd.
Lenning Holdings Limited.
Leslie Gold Mines Limited.
Leco South Africa (Pty.) Limited
Libanon Gold Mining Co. Ltd.
Lonrho South Africa Limited.
Lorraine Gold Mines Ltd.
Marievale Consolidated Mines Limited.
Matthey Rustenburg Refiners (Rustenburg) (Pty.) Ltd.
The Messina (Tvl.) Development Co. Ltd.
Mitchell Cotts Projects S.A. (Pty.) Ltd.
Montan Chemicals (Pty.) Ltd.
Natal Cambrian Collieries Limited.
The Northern Lime Co. Ltd.
O'Okiep Copper Co. Ltd.
Palabora Mining Co. Ltd.
Photometric Sorters.
President Steyn Gold Mining Co. Ltd.
Pretoria Portland Cement Co. Ltd.
- Prieska Copper Mines (Pty.) Limited.
Rand Mines Limited.
The Randfontein Estates Gold Mining Company Witwatersrand Ltd.
Rooiberg Minerals Development Co. Ltd.
The Robbins Co. (Africa) (Pty.) Ltd.
Rustenburg Platinum Mines Ltd. — Union Section.
Rustenburg Platinum Mines Ltd. — Rustenburg Section.
Sandvik (Proprietary) Limited.
Shaft Sinkers (Pty.) Ltd.
S.A. Cyanamid (Pty.) Ltd.
R. J. Spargo Limited.
St. Helena Gold Mines Limited.
Senmin (Pty.) Limited.
Shell South Africa (Pty.) Ltd.
Southern Prospecting (Pty.) Limited.
Steel Engineering Co. Ltd.
Stilfontein Gold Mining Co. Ltd.
T. H. Mining Supplies (Pty.) Ltd.
Transvaal Consolidated Land & Exploration Co.
Trans-Natal Coal Corporation Limited.
Tsumeb Corporation Limited.
Union Corporation Limited.
Vaal-Reefs Exploration & Mining Co. Ltd.
Venterspost Gold Mining Co. Ltd.
Vergenoeg Mining Co. (Pty.) Ltd.
Welkom Gold Mining Co. Ltd.
West Driefontein Gold Mining Co. Ltd.
Western Areas Gold Mining Co. Ltd.
Western Deep Levels Ltd.
Western Holdings Limited.
Winkelhaak Mines Limited.
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INFACON 80

The Second International Ferro-Alloys Congress, organized by IPFEO (Institute of Western European Ferro-alloy Producers), is to be held in Lausanne, Switzerland, on 13th to 16th October, 1980.

The following papers are to be presented:

J. Gall, President/General Manager, SOFREM: *The adaptation of the ferro-alloy industry to technical and economic evolution factors.*

H. Bromet, Scientific Director, CUAEM: *A technical and economic comparison among the various types of furnaces used for the production of ferro-silicon and ferro-and silico-manganese.*

E. Madero B., Chairman and President, Cia Minera Autlan: *Comments on the growth perspectives of the manganese alloy industry.*

G. Sommer, N. A. Barcza, I. J. Barker, M. S. Rennie, and A. B. Stewart, South African National Institute for Metallurgy: *Computer aided control for the production of ferro-chromium in a submerged arc furnace.*

A. B. Stewart and I. J. Barker, South African National Institute for Metallurgy: *Interaction effects on the electrical circuit of a submerged arc furnace and a solution to overcome these.*

J. H. Downing, Associate Director of Technology, Metals Division, Union Carbide Corporation: *Mathematical model of an electric smelting furnace.*

J. P. Kearney, Chairman and Chief Executive Officer, S.A. Manganese Amcor Limited: *Development of the ferro-alloy industry in South Africa.*

D. A. A. Reeves, Chief Metallurgist, BSC Stainless: *The role of ferro-alloys and the demands on them in the melting and refining of stainless steel.*

C. A. Fornaini, Ferro-Alloy Division, Montedison: *The chrome ores in the high carbon ferro-chrome production at the electric furnace — Evaluation rules of the chrome ore — Diversified methods of utilization in the reduction process according to the chemical-crystalline structure — Influence of the granulometric distribution of the chrome ore and consequent choice of the reducing agent.*

C. S. Kucukkaragoz and C. W. P. Finn, Research Group, South African National Institute for Metallurgy: *Reaction mechanisms for the pre-reduction of Winterveld*

chromite spinel.

G. Piccardo, General Manager, Carlo Tassara S.p.A.: *Comparison between open and closed furnaces in the production of high carbon ferro-manganese.*

F. J. Potgieter, Production Manager, West Plant Metalloys: *Operation of an 81 MVA high carbon ferro-manganese furnace.*

Tetsuo Izawa, General Manager of Niigata Works, Nippon Kokan K.K.: *Development of silico-manganese smelting at Niigata Works.*

T. Tomioka, Chairman, Japan Ferro-Alloy Association, President, Japan Metals & Chemicals Co. Ltd.: *Environment regulations and pollution control of the ferro-alloy industry in Japan.*

R. Rylander, Department of Environmental Hygiene, Göteborg University: *Major health and work environment problems in the ferro-alloy industry.*

F. R. Culhane, Vice President, International Operations, Wheelabrator-Frye Inc.: *Fabric filters: an effective means of air pollution control in the ferro-alloy industry.*

F. Schmitt, Technical Director, Filter-Media, Lyon: *The fight against air pollution in the ferro-alloy industry.*

S. Strangert, Senior Research Engineer, Development and Application of Fabric Filters, AB Svenska Fläktfabriken: *Modern fabric filter technology for cleaning gases from ferro-alloy furnaces.*

J. K. L. Andersen, Assistant Director, Ferro Alloys Division, and A. G. Arnesen, Assistant Director, Engineering Division, Elkem-Spigerverket a/s: *The energy situation in the ferro-alloy industry and its implications for the future.*

Three Senior Technicians at CMI, South Africa: *Operation and control of a submerged arc furnace to produce high carbon ferro-chrome from pre-reduced pellets.*

Shoji Yoneka, Deputy General Manager, Ferro-Alloy Technical Division, Japan Metals & Chemicals Co. Ltd.: *Consideration of furnace dimensions and dynamic operation based on research of reduction burden in a model furnace.*

Lenhard J. Holschuh, Secretary General, International Iron and Steel Institute: *The world steel industry — present state and prospects.*