General Meeting and Colloquium

A General Meeting and a Colloquium on 'Environmental Control in the Metallurgical Industry' was held on 23rd March, 1977, at Kelvin House, Johannesburg. The Colloquium was attended by 200 delegates, and was opened by the President, Dr M. D. G. Salamon, at 09h00.

Membership

The President announced that the undermentioned candidates, whose names had been published in accordance with By-Law 5.2.2., had been elected to membership of the Institute. He welcomed those newly elected and congratulated those who had been transferred to a higher grade.

Fellow P. Chardon, P. H. Pienaar, M. G. Saner, G. F. Balderson, C. B. J. Szonert, R. M. Tait.

Member D. A. Moore, C. Brown, M. W. Fernon, R. E. Moncrieff, H. N. A. M. van Krevel, A. Webster.

Associate Member Y. J. F. Haven, T. V. van Heerden.

Graduate J. C. Coetzee, D. A. Holtum, F. G. Evans, B. G. Harding.

Associate F. Lloyd, T. G. McCarthy.

Student G. K. Barwise, B. C. Hattingh, K. D. Hodge, A. P. McNae, A. Pretorius, M. J. Prinsloo, D. L. Sparks, G. J. van Wyk, E. K. Harvey, M. G. K. Wiggill.

Transfer to Fellow G. C. Thompson, D. R. Fleming, F. M. G. Egerton, J. Pope.

Transfer to Member D. Bosley, A. W. J. Hancock, J. P. S. Turner, J. P. Loo, R. A. H. Lycett, H. G. Gastrow, R. S. Davis, W. A. Gericke, P. Smith, G. N. Thorncraft, T. R. Twidle.

Transfer to Graduate M. A. de Ruijter, P. M. Jenner, M. McChesney, R. P. Mohring, G. J. Oosthuizen.

Colloquium Papers

The following papers were presented under the chairmanship of Mr R. P. Plasket (Impala Platinum Limited), and Mr J. A. Holmes (Anglo American Corporation of S.A. Limited).

(1) Environmental control of the mining industry, by G. H. Grange (Chamber of Mines of South Africa).

(2) Air pollution and the metallurgical industry, by N. Boegman (Department of Health).

(3) Air pollution and considerations in the planning and siting of industries, by G. P. N. Venter (Air Pollution Research Group, C S I R).

(4) Control of acid mine drainage, by D. Bosman (Anglo American Corporation Research Laboratories).

(5) Potential use of acid mine drainage sludges for water pollution control, by L. R. J. van Vuuren and S. G. Wiechers (National Institute of Water Research, C S I R).

(6) Selection and design aspects of equipment for the cleaning and treatment of gases in the ferrous and non-ferrous metals industries, by J. P. Herselman (Lurgi South Africa (Pty) Limited).

(7) Some aspects of energy and the environment in the steel industry, by J. J. C. Heynike (S.A. Iron and Steel Industrial Corporation).

(8) Control of air pollution at Rand Carbide Limited, Witbank, by J. Meintjies (Rand Carbide Limited).

Geomechanics colloquy

The Austrian Society for Geomechanics is to hold the 26th Geomechanics Colloquy on 13th and 14th October, 1977, in Salzburg.

The themes of the four half-day sessions will be:

— Geological Investigations and Forecasts

— Examples and Practical Application of Diverse Techniques in Tunnel Construction

— The Construction of Underground Excavations from the Mining Engineer's Point of View

— Experiences and Progress in the Construction of Underground Excavations (rock excavation, shotcrete technique, anchoring technique etc.).

The official languages will be English and German, with simultaneous translation of the papers and discussions.

For further information, write to the Austrian Society for Geomechanics, 2 Paracelsusstrasse, 5020 Salzburg, Austria.

Coal research

The Third International Conference on Coal Research was held in Sydney, Australia, in October 1976. The papers and proceedings of the Conference will be published in Australia on behalf of the International Committee for Coal Research in April 1977. The papers deal with the economics and practicability of coal conversion, coal winning, resources assessment, safety and dust, and coal and power generation, together with an appreciation of coal potential by the deputy chairman of the U.K. National Coal Board.

Copies of the report are available to organizations within member countries of ICCR at a cost of 35 dollars (Australian), including postage, by application to the Executive Officer, Third ICCR, Box 3842 G P O Sydney, Australia 2001. Drafts should be in Australian currency payable to Third International Conference on Coal Research.

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. 1836

The analysis of pilot-plant products for copper, zinc, and lead with the Telsec Lab-X-250 Analyser. (28th Mar., 1977).

Suites of sulphide material representative of copper, zinc, and lead concentrates, as well as 'intermediate' products, low-grade material, and tailing samples, were analysed with the Telsec Lab-X-250 Analyser, which is a radio-isotope X-ray-fluorescence instrument using 'balanced' filters for energy selection. A brief description of the instrument is given, stress being laid on the principle of 'balanced' filters. The determination of optimum instrumental parameters is described, and diagrams are provided to demonstrate the efficacy of energy selection.

Correlation diagrams are given for all three elements in each of the materials analysed. The scatter of data points encountered is examined in terms of possible spectral interference and matrix variation. It was found that, within specified limits of acceptability (5 per cent relative for concentrations above 10 per cent, and 0,5 per cent absolute for lower concentrations), all three elements could be determined satisfactorily in copper and lead concentrates and in low-grade material. Zinc concentrates could be analysed only for zinc.

The mechanisms of the spectral interference effects peculiar to the use of balanced filters are discussed, and a correction procedure is described and applied to improve the correlation for copper in the presence of a high zinc content. It is shown that the poor correlation found for 'intermediate' products and for lead in zinc concentrates is mainly due to matrix variations. The concentration range covered, the sensitivity, the precision, and, where applicable, the detection limits are tabulated for all three elements and all types of material analysed. A comparison of the results obtained with the Analyser and those obtained by atomic-absorption spectrophotometry is provided.

Report no. 1839

A valence-bond study of dialkalis and alkali hydrides. (31st Mar., 1977).

An impenetrable-core model is used to derive one-electron wave functions that describe the valence electrons of alkali atoms. In numerical Heitler–London calculations, these functions are found to yield equilibrium internuclear separations that are related linearly to the observed distances and dissociation energies for the alkali hydrides, which are in line with the corresponding values for hydrogenic species. The relation between calculated and observed dissociation energies of dialkalis is obscure and suggests revision of the accepted experimental values.

Report no. 1873

The rapid reduction of gamma-ray spectra with a desk-top calculator. (31st Mar., 1977).

A programme has been written for a desk-top programmable calculator, so that gamma-ray spectra can be processed immediately after the counting of active samples. The programme has some unusual features, among them automatic boundary selection and rejection of insignificant peaks. Operation is quick and simple, and the results agree well with those obtained from an I.B.M. computer, Model 370/158.

Report no. 1880

The electrochemical reduction of silver chloride and its application to the refining of silver. (11th Mar., 1977).

The direct electrochemical reduction of electrodes cast from molten silver chloride, and the electrorefining of the resulting metal, have been investigated. Application to the refining of silver from a local gold refinery has been considered, and preliminary tests have been carried out on crude material produced at the refinery. The advantages and limitations of the method are discussed, and a comparison with the existing process is made.

Report no. 1886

A rapid method for the determination of fluoride in geological samples. (31st Mar., 1977).

An account is given of a rapid procedure for the determination, by use of the specific-ion electrode, of fluoride in geological samples.

The sample is fused with sodium hydroxide in a nickel crucible in a muffle furnace. The melt is leached with water, a buffer of ammonium citrate is added, and the fluoride activity is measured with a specific-ion electrode.

All operations are carried out in the crucible, making possible approximately 100 determinations a day. The precision of the method is approximately 10 per cent at a fluoride concentration of 500 p.p.m., which is acceptable for geological-survey work.

Report no. 1895

A review of applications of plasma technology with particular reference to ferro-alloy production. (14th Apr., 1977).

The present state of the technology relating to plasma generation and plasma furnaces is described, with particular reference to extractive metallurgy and refining techniques. A brief survey is presented of typical applications of plasma technology in metallurgical processing, and the work carried out on ferro-alloy applications is discussed in detail.

The feasibility of the falling-film plasma furnace for the reduction of iron oxide and vanadium oxide has already been demonstrated by the Bethlehem Steel Corporation. In this report, a preliminary evaluation is made of the use of plasma furnaces for the reduction of Transvaal chromite.

Geophysics and geochemistry

Exploration 77, an international symposium on geophysics and geochemistry applied to the search for metallic ores, is to be held in Ottawa from 16th to 20th October, 1977. The symposium, which is being sponsored by the Canadian Geoscience Council, is a sequel to the Canadian Centennial Conference on Mining Geophysics held at Niagara Falls in 1967, and will provide a review, by internationally known authorities, of techniques used in the exploration for metallic minerals.

The following topics are to be included:

Airborne EM Methods; Ground EM Methods; Electric Potential Methods; Other Potential Field Methods; Induced Polarization; Nuclear Geophysics; Induced Nuclear Geophysics; Borehole Logging Techniques; Soil and Overburden Geochemistry; Lithogeochemistry; Particulate and Gaseous Geochemistry; Special Analytical Methods; Biogeochemistry; Stream Sediment Geochemistry; Lake Sediment Geochemistry; Hydrogeochemistry; Remote Sensing Techniques; Computer Compilation and Interpretations; Integrated Exploration Programmes; A series of Examples from Diverse Environments, Mainly Tropical and Temperate Areas of the World.

Further details are available from Exploration 77, Rm 567, Geological Survey of Canada, 601 Booth Street, Ottawa, Canada K1A OE8.

Jet cutting

The series of bi-annual international symposia on jet cutting that BHRA introduced in April 1972 has seen the venue move from Coventry to Cambridge in the U.K. and then to Chicago in the U.S.A. The Fourth Symposium will be held at the University of Kent at Canterbury, England, from April 12th to 14th, 1978, and will again be organized by BHRA Fluid Engineering.

Rising costs of materials are forcing manufacturing companies throughout industry to re-examine their production techniques. New and sophisticated cutting and profiling techniques are significant among the many new processes being studied and developed, and this meeting will provide a further occasion for the advances in jet cutting technology to be presented and discussed.

It is appreciated that the emphasis in the subject matter of these conferences has swung from the initial theoretical and laboratory studies of the practicality of jet techniques to the preparation and testing of prototype systems in field applications. By the time of the fourth meeting, it is expected that equipment described at the third symposium will have been tested under industrial conditions.

The topics of the Symposium are as follows:

— Fluid mechanics of jets
— Applications of high-pressure cutting operations in industry and civil engineering, and in mining and tunnelling
— Design and operation of jet cutting equipment
— Jet cleaning
— Safety measures
— Economics.

Enquiries should be addressed to: Organizing Secretary, 4th ISJCT, BHRA Fluid Engineering, Cranfield, Bedford, MK43 0AJ, England.

World mining congress

The Tenth World Mining Congress will be held in Istanbul, Turkey, in October 1979, with the following programme:

6th to 13th October, 1979—Exhibition of mining machinery
8th to 12th October, 1979—Congress
13th to 19th October, 1979—Study tours.

The Turkish National Committee has proposed to the International Organizing Committee that the Congress should deal with the following subjects under the general theme 'Mining and mineral raw materials in the service of mankind':

1. Utilization for energy purposes of low calorific materials such as lignite, bituminous shale, asphaltite.
2. Mining problems related to small ore deposits of chromite, boron, manganese, lead–zinc, etc. and their utilization.
3. Mining of deposits under difficult geological conditions (off-shore deposits, marine deposits, deposits under high pressure).
4. Feasibility and profitability studies related to the economics of mineral deposits.
5. Round-table discussions.

The proposal is preliminary and will be finalized in due course. Members of the Institute are being informed now since it is desirable, not only that as many South Africans as possible should participate in the Congress, but also that as many papers as possible from South Africa should be presented. It is hoped that this early warning will help to solicit papers. Enquiries should be directed to Dr H. G. Denkhaus, C S I R, P.O. Box 395, 0001 Pretoria. Telephone (012)-749111, ext. 2127.

GUIDE TO THE PREPARATION OF PAPERS FOR PUBLICATION IN THE JOURNAL OF THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY

The following notes have been compiled to assist authors in the preparation of papers for presentation to the Institute and for publication in the *Journal*. All papers must meet the standards set by the Council of the Institute, and for this purpose all papers are referred to at least two referees appointed by the Council.

Although the worldwide readership of the *Journal* results in a preference for papers in English, the Council treats papers in Afrikaans on an equal basis, but, to meet the needs of the majority of readers, an English summary of some 500 to 750 words should be provided.

STANDARDS FOR ACCEPTANCE

To merit consideration, papers should conform to the high standards that have been established for publication over many years. Papers on research should contain matter that is new, interpretations that are novel or of new significance, and conclusions that cast a fresh light on old ideas. Descriptive papers should not be a repetition of well-known practices or ideas but should incorporate developments that would be of real interest to technical men and of benefit to the mining and metallurgical industry.

In some cases, a well-prepared review paper can be of value and will be considered for publication. All papers, particularly research papers, no matter how technical the subject, should be written with the average reader of the *Journal* in mind, to ensure wide interest.

The amount of textbook material included in a contribution should be the minimum essential to the argument. The length of a paper is not the criterion of its worth, and it should be as brief and concise as possible consistent with the lucid presentation of the subject. Only in very exceptional circumstances should a paper exceed 15 pages of the *Journal* (15 000 words if there are no tables or diagrams). Six to ten pages is more normal.

NOTE: Papers in the *Journal* are printed in 10 point type, which is larger than the 8 point type used on this page. For special publications, Council may decide on page sizes smaller than A4 used for this *Journal*.

The text should be typewritten, double-spaced, on one side only on A4 size paper, leaving a left-hand margin of 4 cm, and should be submitted in triplicate to facilitate the work of the referees and editors.

LAYOUT AND STYLE

Orthodox sequence

Title and author's name, with author's degrees, titles, position.

Synopsis, including a brief statement of conclusions.

An Afrikaans translation of the synopsis.

Introduction.

Development of the main substance.

Conclusions, in more detail.

Acknowledgements.

References.

Title: This should be as *brief* as possible, yet give a good idea of the subject and character of the paper.

Style; Writing should conform to certain prescribed standards.

The Institute is guided in its requirements by:

Collins, F. H. *Authors & Printers' Dictionary*—Oxford University Press.

Hart, H. *Rules for Compositors and Readers*—Humphrey Milford (familiarly known as the *Oxford Rules*).

Fowler, H. W. & F. G. *The King's English*—Oxford University Press.

General: A few well-selected diagrams and illustrations are often more pertinent than an amorphous mass of text. Overstatement and dogmatism are jarring and have no place in technical writing. Avoid the use of the first person, be objective, and do not include irrelevant or extraneous matter. Avoid unnecessary use of capitals and hyphens; punctuation should be used sparingly and be governed by the needs of sense and diction. Sentences should be short, uninvolved, and unambiguous. Paragraphs should also be short and serve to separate basic ideas into compact groups. Quotation marks should be of the 'single' type for quotations and "double" for quoted matter within quotations.

Interpretations in the text should be marked off by parentheses ( ), whereas brackets [ ] are employed to enclose explanatory matter in the text.

Words to be printed in italics should be underlined *singly*. For small capitals they are to be underlined DOUBLY and for large capitals TREBLY.

If there is any problem in producing formulae accurately by typewriter, they should be handwritten in ink.

Abbreviations and symbols are laid down in *British Standard* 1991. Abbreviations are the same for the singular and plural, e.g., cm for centimetre and centimetres, kg for kilogram and kilograms. Percentages are written in the text as per cent; the symbol % is restricted to tables. A full stop after an abbreviation is used only if there is likely to be confusion of meaning.

Metric System: The Système International d'Unités (SI) is to be used for expressing quantities. This is a coherent system of metric units derived from six basic units (metre, kilogram, second, ampere, kelvin, and candela), from which are derived all other units, e.g., the unit of force is the newton (N) for kilogram metre per square second (kg m/s^2). Always use the standard metric abbreviations.

The comma must be used as a decimal indicator and must not be used for separating groups of digits. For ease of reading, digits should be grouped in threes counting from the decimal indicator towards the left and right. However, where there are only four digits to the left to right of the decimal indicator, there should be no grouping.

Illustrations: Drawings and diagrams are to be in black India ink and should be about 18 cm wide. When submitting graphical representations, avoid a fine grid if possible. Curves should be in heavy line to stand out. Lettering too should be bold, as a reduction in size is often involved in the printing process.

Numbering of tables should be in Roman numerals: I, II, etc., and figures in Arabic numerals: Fig. 1, Fig. 2, etc. (Always use the abbreviation for figure.) Photographs should be black and white glossy prints.

As a guide to the printer, the author should indicate by means of notes in the typescript where tables and figures, etc. are to appear in the text.

Paragraphs: A decimal system of numbering paragraphs may be used when the paper is long and complicated and there is a need for frequent reference to other parts of the paper.

Proof correction: Galley proofs are sent to authors for the correction of printers' errors and not for the purpose of making alterations and additions, which may be expensive. Should an author make alterations that are considered excessive, he may be required to pay for them. Standard symbols as laid down in *British Standard* 1219*C* should be used.

SYNOPSIS

It is most important that the synopsis should provide a clear outline of the contents of the paper, the results obtained, and the author's conclusions. It should be written concisely and in normal, rather than abbreviated, English, and should not exceed 250 words, except when an English summary of an Afrikaans paper is involved. While the emphasis is on brevity, this should not be laboured to the extent of leaving out important matter or impairing intelligibility. Summaries simplify the task of abstractors and therefore should present a balanced and complete picture. It is preferable to use standard rather than proprietary terms.

FOOTNOTES AND REFERENCES

Footnotes should be used only when they are indispensible. In the typescript they should appear immediately below the line to which they refer and not at the foot of the page.

References should be indicated by super-script, thus . . .[1] . . .[2]. Do not use the word *Bibliography*. When authors cite publications of other societies or technical and trade journals, titles should be abbreviated in accordance with the standards adopted in this *Journal*.

GENERAL

The Council will consider the publication of technical notes taking up to three pages (maximum 3000 words).

Written contributions are invited to the discussion of all papers published in the *Journal*. The editors, however, are empowered by the Council to edit all contributions. Once a paper or a note has been submitted to the Institute, that document becomes the property of the Institute, which then holds the copyright when it is published. The Institute as a body is, however, not responsible for the statements made or opinions expressed in any of its publications. Reproduction from the *Journal* is permitted provided there is full acknowledgement of the source. These points should be borne in mind by authors who submit their work to other organizations as well as to the Institute.