

COLLOQUIUM AND GENERAL MEETING

Trackless Mining in Underground Metal Mines

A General Meeting and Mining Colloquium on the above topic was held on Wednesday, May 16th, 1973, at Kelvin House.

Dr J. P. Hugo (President) was in the chair.

The colloquium was attended by approximately 200 delegates, and was opened by the President at 9.15 a.m.

OBITUARIES

The President: It is my sad duty to announce the death of the following:

W. A. Schwezoff and L. G. S. Wright, Fellows; A. F. Chalmers, Member; and W. R. Gerry, Associate.

As a mark of respect to the memory of the deceased and in sympathy with the bereaved, I would ask you all to rise and observe a few moments' silence.

MEMBERSHIP

The President: I have much pleasure in announcing that the names of the undermentioned candidates, having been published in accordance with By-Law 5.2.2., Council has elected them to membership of the Institute in the following grades:

Fellow:

G. J. Bernfeld, V. J. Moore, G. B. Blore

Member:

N. Mayer, P. T. Hucklesby

Associate:

A. W. D. Legrat

Graduate:

A. P. Bugden, R. B. Gill, R. O. Wellman, R. L. C. Maggs

Student:

C. Mills.

I welcome the new members to the Institute and congratulate them on their election.

ELECTION OF SCRUTINEERS

In terms of Clause 9.4. of the Constitution, the following were nominated and duly elected as Scrutineers of the ballot: J. P. Hugo, P. W. J. van Rensburg, R. P. Plewman, D. G. Maxwell, D. D. Howat, R. J. Adamson, H. Britten.

CO-OPTION TO COUNCIL

In terms of Clause 3.9. of the Constitution, the President announced that Council had co-opted Mr D. A. Viljoen to serve for the remainder of the 1972/73 session.

COLLOQUIUM

The Chairman for the first session was Mr C. S. Macphail, Senior Consulting Engineer, Union Corporation Limited. The first paper, 'Trackless Mining at Prieska Copper Mine', was presented in two parts. Mr M. S. Grobler, General Manager at Prieska, discussed the history of the mine and the considerations that led to the adoption of a trackless system of mining. He described the various mining methods considered, and the reasons for the choice of a long-hole sub-level open stoping system. Mr P. J. Constancon, Assistant Consulting Mechanical and Electrical Engineer, Anglo-Transvaal, described the types of cleaning equipment considered and the reasons for the choice of the front-end loader type of machine. Some initial problems had been tyre life, maintenance, brakes, and smoking and filter problems.

A contribution, 'Trackless Mining at O'okiep Copper Company Limited', was presented by Mr J. B. Nangle, General Superintendent (Mining Operations), O'okiep Copper Company. Three trackless mining methods are used, viz, the direct-trucking, conveyor-decline, and ore-spiral methods. Some success had been achieved in the reduction of costs.

The second session was chaired by Dr J. T. McIntyre, a Past President of the Institute and at present a private consultant. Mr C. F. Hews, Assistant Manager of Mines, International Nickel Company of Canada Limited, presented a paper, 'Trackless Mining at the International Nickel Company of Canada, Limited'. The first load-haul-dump machines had been introduced in March 1966, and 70 per cent of current production was being handled with this type of equipment. Slides were

shown on the trackless equipment in use underground in Canada. He stated that maintenance was as important as the operating of equipment, and discussed the cost breakdown of drilling and mucking for different sizes and types of machines. Mr J. Rutherford, Ventilation Engineer, Ontario Division, International Nickel, briefly discussed some aspects of ventilation in Canada.

Mr G. Maude, Mine Manager Underground, Leslie Gold Mines, presented a contribution that dealt with the trial and results achieved with a one-cubic-yard load-haul-dump machine in a typical strike-track stope at Winkelhaak Mines.

A paper by Mr Lars Hermansson, Technical Department, LKAB, Kiruna, Sweden, entitled 'Trackless Mining at LKAB, Sweden', was introduced by Dr M. D. G. Salamon, Director, Collieries Research Laboratories, Chamber of Mines. He summarized the paper, which dealt with a highly mechanized and automated operation in Sweden.

A contribution, 'Trackless Mining at Oamites' was presented by Mr K. E. Mantell, Mine Manager, Oamites Mine, S.W.A. He highlighted a few points in his contribution, gave reasons for using trackless mining, and illustrated with slides the sequence of operations at the mine.

After lunch, the session chairman, Mr D. Deacon, Technical Manager, Anglo-Transvaal, introduced Mr M. Kirchner, Production Manager, Thabazimbi Mine, who presented his paper, 'Trackless Mining at Thabazimbi Mine'. He discussed some important parameters in sub-level caving and mentioned that the cost of the load-haul-dump operation had been reduced from 45 cents per ton in 1959, when shuttle-cars had been used, to below 15 cents with the use of load-haul-dump equipment.

A contribution, 'Trackless Draw-point Loading at Nchanga Consolidated Copper Mines Limited', was presented by Mr J. P. Raisin, underground manager, Rokana Division, Nchanga Consolidated Copper Mines

Limited. He described the three basic forms of trackless draw-point loading at Rokana, and stated that the two-cubic-yard machines were preferred to the larger ones owing to problems with bigger excavations. Rokana has an unusually high geothermic gradient, and most of the loaders at the mine operate in areas where the virgin-rock temperature is about 110°F (43,3°C). In addition to this, rock-skin temperatures can rise by up to 4°C even in well-ventilated ends where loaders operate. Because of the difficulty and cost of maintaining workable temperatures by conventional ventilation and refrigeration methods, efforts were being directed towards micro-climate cooling to enable loader drivers to operate effectively in higher temperatures.

Some discussion on the papers presented ensued at this stage, with

several contributions from the floor.

In answer to a question on union problems in the mechanization of a mine, Mr Hews maintained that men were far happier working with big equipment than they had been before. He had, however, found it necessary for the machines to be thoroughly cleaned before services to minimize complaints from maintenance staff.

An interesting point during the earlier proceedings had been the elimination of most of the higher-speed gears on the loaders at Prieska to prevent vehicle damage. This could also be achieved by de-rating the bucket size of loaders or the pay-load of trucks, and maintaining the higher speeds.

It was revealed that dust and heat caused most damage to loader engines, and a problem existed in controlling ventilation at draw-

points. Normally, the draw-points are pressurized to get the air flowing up into the stopes through the muck-pile. Improved conditions could be achieved by linking the draw-point to a return-air-way with a small drift or by using a waterblast.

Dr McIntyre suggested that, because mines were getting deeper and hotter, theoretically 60 ice-tons of refrigeration equipment would be required to cool each machine. It was suggested that equipment designers might concentrate on the problem of machine performance in hotter areas.

The colloquium chairman, Mr V. C. Robinson, Past President of the Institute and at present Chairman of P.A.C., thanked the individual authors and stated that the colloquium had been worthwhile and of interest.

The meeting closed at 4.00 p.m.

Notices

EIGHTH WORLD MINING CONGRESS

The Eighth World Mining Congress will be held in Lima, Peru, from 3rd to 8th November, 1974. The theme of the Congress is 'Prognosis of mining development up to the year 2000', with the following sub-themes:

- (1) the present world situation of raw materials, ore deposits, reserves, distribution, and demand,
- (2) methods and terminology for forecasting the raw-material situation in the world in 2000,
- (3) programme for technical progress in mining engineering, mining technology, and mining economics,
- (4) forecast of basic indices related to the consumption of labour, energy, and materials,
- (5) the future for the protection of the environment, and
- (6) mines of the future, including the qualifications of mining engineers in the year 2000 (round-table conference).

A World Mining Fair (called TECOMIN) will be held from 3rd to 12th November, 1974, and technical excursions and sight-seeing tours will be arranged for after the Congress. The Congress fee is U.S. \$80 for participants and U.S. \$20 for accompanying persons.

Further information can be obtained from Dr H. G. Denkhaus, c/o CSIR-NMERI, P.O. Box 395,

Pretoria, not later than 1st September, 1973. He will submit a list of interested persons to the Organizing Committee so that bulletins and further information can be sent direct to them.

Persons who wish to present papers at the Congress are asked to inform Dr Denkhaus of the titles and to send him a brief abstract of, say, half a page at their earliest convenience.

The previous seven World Mining Congresses were held in Warsaw, Poland (1958); Prague, CSR (1961); Salzburg, Austria (1963); London, U.K. (1965); Moscow, USSR (1967); Madrid, Spain (1970); and Bucharest, Roumania (1972).

INFACON 74

Readers are reminded of the International Ferro-alloys Congress being organized by the National Institute for Metallurgy, in conjunction with the Ferro Alloy Producers' Association of South Africa and the South African Institute of Mining and Metallurgy. The Congress is to be held in Johannesburg in 1974, and the following dates are of interest:

28th February, 1974: Deadline for receipt of Registration Forms and fees.

1st April, 1974: Deadline for receipt of hotel booking forms.

21st April, 1974: Registration of delegates.

22nd April, 1974: Opening ceremony. 22nd to 26th April, 1974: Technical sessions.

27th April to 1st May, 1974: Post-Congress tour.

The majority of the speakers will be from overseas, and there will be specially invited guest speakers from Japan, the U.S.A., Sweden, and West Germany. The technical sessions will cover a wide range of topics in ferro-alloy technology and production, and will include the following:

- (1) burden preparation, blending, pelletization, handling, reducing agents,
- (2) electric smelting furnaces—design, operation, management, smelting optimization, shop practice, refractories,
- (3) mineralogy, reduction behaviour, smelting reactions, slags,
- (4) automation, pollution control, and
- (5) applications, trends in consumption, trends in composition specifications.

Visits will be arranged to the plants of leading ferro-alloy producers, there will be a full social programme for delegates, and a ladies' programme of visits to places of interest is being drawn up for the wives accompanying delegates.

Registration forms are available from the Secretary, Organizing Committee, INFACON 74, Private Bag 7, Auckland Park, Transvaal.