

ion of gold. With this in mind, the efficiency of separators that form part of the milling circuit ought therefore to be determined and expressed in terms of the separation of particles of free gold and free gangue (and other free minerals) as against particles in which gold is still locked and therefore in need of further comminution.

Mr De Kok has mentioned the use of screens as sizers of potential value. When comparing screens with cyclones (as cyclones were originally compared with mechanical classifiers), we observe the re-introduction of moving parts, the possibility of mechanical failure with interruption

of flow, the need for maintenance, and the provision for larger operating areas. Admittedly, fine screening has received much attention over past years, and new concepts in screen operation and design are still being proposed.

It is interesting to note in passing that most, if not all, of these developments are of overseas origin, with local talent lagging behind, in spite of the immense financial resources that the industry could muster in searching for and establishing improved techniques.

Our acceptance of the screen as a sole or partial separating device should be approached with caution.

Particles passing through a screen of selected aperture would admittedly be free of oversize, but the screen cannot differentiate between free and locked particles. Herein lies the danger, and it would still be the function of the hydraulic classifier, with its accepted inefficiencies, to safeguard the operation by returning heavy particles in the screen undersize back to the mill. In very simple terms, in a gold ore in which the specific gravity of the gold and silver particles could be taken as 18,0 and that of the gangue as 2,70, any particles of whatever size with a specific gravity of 2,71 and over would be suspect.

OFS Branch

Minutes of the General Meeting Held at the President Steyn G.M. Ltd Canteen on Wednesday, 13th November, 1974, at 3.55 p.m.

Mr D. A. Smith (Chairman of the O.F.S. Branch) was in the Chair. There were also present:

Two Fellows

Messrs A. N. Shand and E. T. Wilson (Committee Members)

Four Members

Messrs D. D. Comley, A. F. Goetzsche (Committee Member), N. Mayer, and E. R. Penny.

Five Associates

Messrs D. F. Cleary, E. C. Hunter, A. J. Johansen, R. R. Perkin, and W. M. Todd

Thirty-five Visitors

Total Present

Forty-seven.

Welcome

Mr Smith declared the meeting open and extended a warm welcome to all those present. He expressed his gratitude for the good attendance, and thanked the management of President Steyn G.M. Limited for hosting the local Branch of the Institute.

A special welcome was extended to Messrs G. Bowmer and N. Bennett of C.C.L. (S.A.) (Pty) Limited.

Apologies

Apologies for non-attendance were received from Messrs J. W. Briedenhann, H. M. W. Eschenberg, H. G. Mosenthal, and Z. J. Lombard.

Minutes of Previous Meetings

The Minutes of the General Meeting held on the 12th June, 1974, were taken as read, and their adoption, proposed by D. D. Comley and seconded by E. T. Wilson, was carried. Likewise, the Minutes of the Annual General Meeting held on the 31st July, 1974, were taken as read, and their adoption, proposed by A. N. Shand and seconded by D. D. Comley, was carried.

Main Business

The Chairman introduced Mr G. Bowmer and Mr N. Bennett from C.C.L. (S.A.) (Pty) Limited, who had kindly consented to describe and demonstrate the Rauföss implosive method for the compression jointing of aluminium and steel cables and reinforcing bars with the use of detonating cords.

In his address, Mr Bowmer outlined the principle of the technique, and went on to describe the numerous applications that had proved successful. This talk and the most convincing demonstration that followed were well received.

The Chairman called upon Mr E. T. Wilson to thank the guests. In his vote of thanks, Mr Wilson said he was sure that the afternoon's instruction had been of great interest to the members and visitors present, and pointed out that it had again highlighted how particular methods

or sciences were being applied on specialized bases.

Closure

The Chairman thanked members and visitors for their attendance and declared the Meeting closed at 5.30 p.m., after which refreshments were served.

Minutes of the General Meeting Held at the Welkom G.M. Co. Ltd Canteen on Wednesday, 12th February, 1975, at 4.00 p.m.

Mr D. A. Smith (Chairman of the O.F.S. Branch) was in the Chair. In addition, there was a total of 33 members and visitors present including:

Four Fellows

Messrs M. G. Cullen, Z. J. Lombard, A. N. Shand (Committee Member), and E. T. Wilson (Committee Member)

Six Members

Messrs F. J. Bayley, D. E. Couperthwaite, E. J. Dominy, B. J. Drysdale, H. G. Mosenthal (Committee Member), and E. R. Penny

One Associate Member

J. W. Briedenhann

Seven Associates

Messrs D. F. Cleary, W. F. de Lange, A. J. Johansen, R. A. R. Kebble, R. R. Perkin, C. F. K. Poulton, and C. V. van Heerden

Two Graduates

Messrs A. M. Jones and P. S. Wentworth

One Student

Mr A. P. S. Howard.

Welcome

Mr Smith declared the Meeting open and welcomed all those present. He expressed the hope that everyone would find the afternoon's proceedings fruitful. Mr Smith thanked the management of Welkom G.M. Co. Ltd for hosting the local Branch of the Institute.

Apologies

Apologies for non-attendance were received from Messrs D. Bosley,

D. D. Comley, H. M. W. Eschenburg, C. Mostert, and G. J. C. Young.

Minutes of Previous Meeting

The Minutes of the General Meeting held on the 13th November, 1974, were taken as read, and their adoption, proposed by Mr A. N. Shand and seconded by Mr C. F. K. Poulton, was carried.

General Business

Mr Smith asked members to submit, by 14th February, 1975, their completed questionnaires on the proposed visit to the Tugela-Vaal Water Scheme.

Concerning the travelling arrangements for this trip, Mr E. T. Wilson

suggested that cars should be used instead of a bus. No discussion took place on this matter, and Mr Smith ruled that it would be taken up at the next Committee Meeting.

Film Show

Two films were screened: 'South African Techniques in Shaft Sinking', and 'Out of the Blue'.

These were well received.

Closure

The Chairman thanked members and visitors for their attendance, and declared the Meeting closed at 5.10 p.m., after which refreshments were served.

Nim reports

The following reports are available free of charge from the National Institute for Metallurgy, Private Bag 7, Auckland Park 2006.

Report no. 1696

The preparation and certification of a reference sample of a precious-metal ore.

A sample consisting of 7000 kg of a precious-metal ore from the Merensky Reef of the Bushveld Igneous Complex in South Africa has been prepared, and preferred values have been given for the eight precious metals. The method used for the grinding and mixing of this large sample is given, together with its source, chemical and mineralogical composition, and particle-size distribution. Thirty-six laboratories in seven countries contributed over 2000 results. These results were subjected to statistical tests, and it was concluded that the sample is sufficiently homogeneous for it to be used as a reference sample.

The recommended values and their confidence limits for the precious metals were determined by the rejection of outlying results, which were identified by statistical tests. The results were also examined by the calculation of mean values using three weighting techniques.

As the co-operating analysts from leading laboratories in several countries gave summaries of their methods, it was possible to assess the present state of precious-metals

analysis. This appears to be as follows: fire assay with collection of the precious metals in lead is still the commonest method for the separation of the precious metals from base metals; atomic-absorption spectrophotometry, emission spectrography, and colorimetry (in that order) are the most frequently used techniques for measuring the concentration of the precious metals. Few analysts used non-destructive methods, but, where such methods were used, the results usually appeared to be unsatisfactory.

Report no. 1705

The effects of various matrix elements on the efficiency of the fire-assay procedure using nickel sulphide as the collector.

The efficiency of the published fire-assay procedure that uses nickel sulphide as the collector for the determination of the noble metals is investigated in the presence of eighteen elements that can be associated with the noble metals, and that can affect their collection and determination.

Minor modifications to the existing procedure are proposed, so that it can be used satisfactorily for chromite ores with a chromium content of up to 40 per cent.

The coefficients of variation of the modified procedure range between 3,42 and 4,69 per cent for the various platinum-group metals when they are present in concentrations between 0,6 and 3,9 p.p.m.

Report no. 1720

The initial development of processes for the direct leaching of iron-nickel-copper mattes containing platinum-group metals, and for the production of ferronickel.

Two different processes for the direct leaching of iron-nickel-copper mattes containing platinum-group metals (PGM) are proposed. The processes, which avoid the classical converting step, reduce atmospheric pollution by sulphur dioxide, and recover sulphur, ferronickel, and a PGM concentrate. The testing of the different stages, some to the pilot-plant stage, is described.

The first process includes a controlled ferric sulphate leach of the matte, followed by the electro-winning of a ferronickel alloy, whereas the second process consists of a hydrochloric acid leach of the matte, followed by a pyrohydrolysis step to regenerate the acid and produce iron and nickel oxides.

The further treatment of the copper sulphide and PGM residue, which involves a ferric leach and the plating of copper in ferrous chloride medium, has also been tested.

There seem to be no major technical problems in the treatment of matte, but the economics depend on the cost of overcoming the air-pollution problem and on the price of the ferronickel alloy or ferronickel oxide produced.