

Annual Report and Accounts

FOR THE YEAR ENDED 30th JUNE, 1973

COUNCIL

The following served on Council during the year under review:

Office Bearers Dr J. P. Hugo (President), P. W. J. van Rensburg and Professor R. P. Plewman (Vice-Presidents), Professor D. D. Howat (Immediate Past-President), and D. G. Maxwell (Honorary Treasurer).

Ordinary Members of Council H. P. Carlisle (until February), R. C. Espley-Jones, G. H. Grange, Dr D. I. Legge, W. W. Malan, J. B. Mudd, Dr R. E. Robinson, Dr M. D. G. Salamon, L. W. P. van den Bosch, D. A. Viljoen (co-opted May 1973), and P. A. von Wielligh.

Branch Chairmen A. Bain (Witbank-Middelburg Branch), C. J. Isaac (O.F.S. Branch).

Past Presidents Serving on Council R. J. Adamson, M. Barcza, H. Britten, J. K. E. Douglas, R. C. J. Goode, P. Lambooy, Professor J. de V. Lambrechts, Dr J. T. McIntyre, J. F. Reid, and V. C. Robinson.

Ten Council meetings were held during the year, with an average attendance of 18, and the standing committees held 29 meetings.

MEMBERSHIP

Twelve Fellows, ten Members, twenty-one Graduates, eleven Associates, thirty-one Students, and forty-two Company Affiliates were elected during the year. One Member was reinstated. Eight Fellows, two Members, and two Associates were admitted to retired membership. Four Graduates were transferred to Members, one Associate to Member, three Students to Members, one Graduate to Associate, two Students to Graduates, and one Student to Associate.

Your Council records with deep regret the death during the year of the following: D. R. Campbell, J. Daniel, M. J. Dennehy, and F. S. C. Rogers (Life Fellows); W. T. Dalling and T. Pryor (Life

Members); C. Boocock, W. Drake, R. J. Moore, M. P. Pearse, J. M. Pike, W. A. Schwezoff, A. I. Sussman, and L. G. S. Wright (Fellows); A. F. Chalmers (Member); and W. R. Gerry and G. T. Rimmer (Associates).

A comparative statement of membership as at 30th June, 1973, and the end of the previous year is shown in the following tabulation:

	30th June, 1972	30th June, 1973
Honorary Life Fellows	5	4
Honorary Fellows	13	9
Life Fellows	181	177
Fellows	541	536
Members	479	487
Graduates	115	128
Associates	182	186
Students	162	183
Company Affiliates	24	64
	<hr/> 1 702	<hr/> 1 774

JOURNAL

The papers that were published in the Journal during the year are listed below:

August, 1972

The effects of chromium oxide, iron oxide, and calcium oxide on the liquidus temperatures, viscosities, and electrical conductivities of slags in the system $MgO-Al_2O_3-SiO_2$, by M. S. Rennie, D. D. Howat, and P. R. Jochens

A study of the dust exposure of South African white gold miners, by R. J. Page-Shipp and Elizabeth Harris

A forecast of the coal and uranium requirements for electric power generation in South Africa, by E. J. Maunders

September, 1972

Mine management by objectives, by A. A. Hazell

Some aspects of the deformation behaviour and temperature rise during instantaneous compression loading of high purity aluminium, by H. J. E. Hamel

Computer control of flotation at the Ecstall concentrator, by M. P. Amsden, C. Chapman, and M. G. Reading

Optimizing the public gains from the exploitation of mineral resources, by A. Azis and J. Zwartendyk

October, 1972

Presidential Address: Nuclear energy: its interactions with mining and metallurgy, by J. P. Hugo

Presidentsrede: Kernenergie: sy wisselwerkinge met mynbou en metallurgie, deur J. P. Hugo

Raise-boring experiences in the gold mines of the Anglo American Corporation

Group, by J. W. Wilson and P. C. Graham

November, 1972

Materials for winding plant components, by G. T. van Rooyen

An analytical solution to the batch-comminution equation, by R. P. King

A new approach to the study of human factors in stope productivity, by A. C. Lawrence

Fundamental studies of the flotation process: the work of the National Institute for Metallurgy, by N. P. Finkelstein and V. M. Lovell

Growing use of deionised water in surface coating techniques, by W. F. Lorch

December, 1972

The development and application of a computer system to aid in the planning of production in mines, by F. H. Deist, L. F. Duvel, J. D. Austin, and H. D. Small

PERT, and how PERT techniques can be used in modern mine management, by E. J. Boome and A. C. Schmidt

A critical comparison of specific cooling power and the wet kata thermometer in hot mining environments, by J. de V. Lambrechts

January, 1973

Liquidus temperatures in the Cr-Fe-Si system in the composition range representative of ferrochromium-silicide produced in South Africa, by J. C. M. Wethmar, D. D. Howat, P. R. Jochens, and O. A. W. Strydom

Platinoids in the Witwatersrand System, by C. A. Cousins

The development of a continuous recording scintillation counter mounted on a cyclometer, by P. D. Toens and D. Visser

February, 1973

Computer analysis, modelling, and optimisation of gold recovery plants of the Anglo American Group, by M. I. Brittan and E. J. J. van Vuuren

The significance of the mineralogical and surface characteristics of gold grains in the recovery process, by C. E. Feather and G. M. Koen

Statistical valuation of diamondiferous deposits, by H. S. Sichel

March, 1973

The effect of the reactivity of lime on desulphurisation efficiency in the basic oxygen furnace, by A. A. Hejja, D. D. Howat, and P. R. Jochens

A review of real-time particle size analysers, by A. L. Hinde

In situ measurements of the surface heat transfer coefficient in underground airways, by K. R. Vost

April, 1973

An investigation into the kinetics and mechanisms of the oxidation of iron (II) by oxygen in aqueous chloride solutions, by R. P. Colborn and M. J. Nicol

Electric smelting at Rustenburg Platinum Mines Limited of nickel-copper concentrates containing platinum-group metals, by J. C. Mostert and P. N. Roberts

Metallurgical considerations in the

automation of gold-recovery plants, by H. E. Cross

May, 1973

A review of some aspects of shaft design, by G. W. Holl and E. G. Fairon

The influence of economics on the design of mine shaft systems, by H. M. Wells

Design features of a deep-level shaft, by D. H. Hillhouse and G. Lange

June, 1973

Some factors influencing gold recovery by gravity concentration, by M. D. Bath, A. J. Duncan, and E. R. Rudolph

The adsorption of gold from cyanide solutions onto constituents of the reef, and its role in reducing the efficiency of the gold-recovery process, by M. R. Urban, Jill Urban, and P. J. D. Lloyd

The size distribution and morphology of gold particles in Witwatersrand reefs and their crushed products, by D. K. Hallbauer and P. J. D. Lloyd

July, 1973

Recent developments in the instrumentation and automation of uranium-processing plants, by G. Sommer, G. T. W. Ormrod, and R. P. Chaix

The estimation of some properties of South African coals from proximate analyses, by J. W. de Kock and J. P. Franzidis.

A facility at the National Nuclear Research Centre, Pelindaba, for the calibration of gamma survey meters used in uranium-prospecting operations, by P. D. Toens, D. van As, and Constance M. Vleggaar

The Institute wishes to record its thanks to Mr H. P. Carlisle, who retired as editor of the Journal during February 1973, for his valuable work over the past years, and we welcome our new editor, Dr Helen Glen.

COCKTAIL PARTY

An enjoyable cocktail party was held in the Main Hall of Kelvin House at the conclusion of the Annual General Meeting on August 30th, 1972. The Institute was honoured by the presence of many distinguished guests, among whom were the Hon. Dr P. G. J. Koornhof, Minister of Mines, who is an Honorary Vice-President of the Institute, and the Hon. I. B. Dillon, Minister of Mines for Rhodesia, an Honorary Member of the Institute.

The staff of the Associated Scientific and Technical Societies are to be congratulated on the excellent catering provided for guests and members.

AWARDS

The following have been awarded gold medals by the Council of the Institute:

H. S. Sichel, for his paper entitled 'Statistical valuation of diamondiferous deposits'.

F. H. Deist, for the significant contributions made by him to the application of computer technology in the mineral industry, as manifested by several papers over a number of years, and, in addition, for his papers entitled 'Aids to planning production in coal mines' (with M. P. Roberts, visitor), and 'Computer applications in rock mechanics' (with E. Georgiadis and J. P. E. Moris, visitors). These two papers were published in the Proceedings of the Tenth International Symposium on the Application of Computer Methods in the Mineral Industry (APCOM).

Prizes for Student Papers have been awarded to the following:

F. G. E. Beetge for his paper entitled 'Investigation of sigma phase and descaling of the 26Cr-6Ni stainless steel'.

A. L. Painting for his paper entitled 'A study of the end effects in specimen cores under compression tests with a view to eliminating these end effects'.

K. L. M. McDonald for his paper entitled 'Automation of a tippler station'.

EXCURSIONS

The following excursions took place during the year, with an average attendance of fifty members:

September 20th, 1972, Hendrina Power Station and Optimum Colliery

November 23rd, 1972, Modderfontein Dynamite Factory

February 14th, 1973, Premier Diamond Mine

May 23rd, 1973, Atomic Energy Board, Pelindaba, and Hartebeeshoek Tracking Station.

These excursions proved most interesting and successful, and the Institute wishes to record its thanks to those concerned for the opportunity given to members to visit these organizations.

COLLOQUIA, SYMPOSIA, WINTER SCHOOL, AND OTHER ACTIVITIES

Two major metallurgical colloquia were arranged during the year. The first was a joint undertaking with

the Instrument Control Society of Southern Africa on 'Practical Applications of Instrumentation in the Mining and Metallurgical Industries'. The following papers were presented:

The use of specific ion electrodes for the control of cyanide concentrations in the solutions of a gold plant, by A. H. Mokken, Consulting Metallurgist, Union Corporation (Pty) Ltd

Metallurgical consideration in the automating of gold recovery plants, by H. E. Cross, Consulting Metallurgist, Gold Fields of South Africa, Limited

The need for suitable instruments in the optimization of plant performance, by Dr M. I. Brittan, Anglo American Research Laboratories

A review of on-line particle-size analysers, by Dr A. L. Hinde and Dr P. J. Lloyd, Chamber of Mines Research Laboratories

Recent advances in the instrumentation and automation of uranium-processing plants, by G. Sommer, G. T. W. Ormrod, and R. P. Chaix, National Institute for Metallurgy.

The colloquium excited a great deal of interest. Over 200 people attended, and the proceedings were well reported in the press.

The second colloquium, held in March 1973 on the subject 'Developments in Gold Recovery Processes', represented an opportunity to the staff of the Anglo American Corporation to present the results of their work on improvements in the recovery of gold in reduction plants. The proceedings once again proved to be very interesting and informative, and the meeting was well attended, 162 people being present.

Two extremely successful mining colloquia were held during the past year. On November 15th, 1972, a colloquium on 'Shaft Sinking' took place under the chairmanship of Dr A. H. Taute, at which 152 people were present and a full report of which appeared in the *Johannesburg Star*.

On May 16th, 1973, a colloquium attended by approximately 200 delegates was held on 'Trackless Mining in Underground Metal Mines', under the chairmanship of Mr V. C. Robinson. An international flavour prevailed, with the presentation of

papers from South West Africa, Zambia, Sweden, and Canada.

Further colloquia are planned for the remainder of the calendar year: 'Base Metal Processing' on September 12th; 'Construction of Slimes Dams' on November 14th and 15th; and, together with the South African Archaeological Society (Witwatersrand Centre), on October 16th and 17th, a symposium entitled 'Ancient Mining and Metallurgy in Southern Africa'. The last-mentioned will be preceded and followed by weekend excursions to sites of archaeological interest at Melville Koppies, Olifantspoort, Rooiberg, and Thabazimbi.

Plans have reached an advanced stage for the International Ferroalloys Congress (INFACON) being organized by the Institute in conjunction with the National Institute for Metallurgy and the Ferro Alloy Producers' Association of South Africa, which will be held in Johannesburg during April 1974. The aim of INFACON is to stimulate technical interchange on all aspects of ferro-alloy production, and will be followed by visits to many ferro-alloy plants, where delegates will have an opportunity of seeing the latest developments in production in this country.

As a completely new venture, the Institute appointed a special sub-committee to make arrangements for the holding of a Winter School on 'Mineral Processes: Their Analysis, Optimization, and Control'. Two overseas lecturers were invited to present the course, Professor A. Mular of the University of British Columbia and Professor R. Bull of the Colorado School of Mines. Attendance at the Winter School was limited to 50 delegates, and more applications were received than could be accommodated. The Winter School, which took place over a period of two weeks during July and was held at the University of the Witwatersrand, provided an excellent opportunity for senior people in the mining and metallurgical industry to be brought up-to-date on the latest developments in certain aspects of mineral processing. It is hoped that these Schools will become a permanent feature of the Institute's activities.

Another extremely successful new undertaking was the formation of a Pyrometallurgical Discussion Group under the leadership of Dr P. R. Jochens. A total of seven discussion meetings were held in an informal atmosphere, which permitted a free exchange of ideas on a number of controversial technical subjects. The popularity of this type of activity is indicated by the fact that an average of 35 persons attended each of these discussion-group meetings, in which fourteen topics were discussed. Here again it is hoped that this type of activity can be extended to cover a wider field.

A volume containing the Proceedings of the Tenth International Symposium on the Application of Computer Methods in the Mineral Industry (APCOM) was published during the year, and has been received with great interest in South Africa and overseas. The editors are to be congratulated on the high standard both in format and technical content.

The Institute continued to participate in the activities of the Engineers' Liaison Committee, Pretoria.

THE ASSOCIATED SCIENTIFIC AND TECHNICAL SOCIETIES OF SOUTH AFRICA

Mr R. C. J. Goode, Fellow and Past-President of the Institute, was inducted as President of the Associated Societies in November, 1972. Messrs V. C. Robinson and D. G. Maxwell represented the Institute on the Controlling Executive, with Professor D. D. Howat and Dr J. P. Hugo as their respective alternates.

A full account of the activities of the Associated Societies is given in their Annual Proceedings, a copy of which is sent to all members. There are certain matters, however, which need to be highlighted.

The Proceedings refer to the death on the 7th July, 1972, of Dr A. J. Orenstein, who was one of the founders of the Associated Societies and its first elected President. Dr Orenstein died in his 93rd year, after a long and distinguished career serving the mining industry.

The report also recorded the death of Dr F. Meyer, who was

President in 1960/61, and a Life Fellow of the Institute.

During the year, the series of lunch-hour public lectures was continued and attracted considerable interest.

With funds donated by member societies, further paintings have been purchased for the dining room, and Haggie Rand (Pty) Ltd generously presented to Kelvin House a painting by Thornley Stewart. The walls in the foyer have been decorated with the registration certificates of Society coats-of-arms.

For the talks and lectures given at Kelvin House, an overhead projector with associated transparency maker has been acquired, and the public address system has been completely overhauled and improved.

Lastly, permission has been obtained to admit ladies to the bar in Kelvin House. It will be named the Cazalet Bar to commemorate the name of the Associated Societies' first President.

THE FEDERATION OF SOCIETIES OF PROFESSIONAL ENGINEERS

The Institute was represented on FSPE by two members of Council, Messrs R. C. J. Goode and J. K. E. Douglas. Numerous matters of common interest to the Engineering Societies were handled during the year. The objectives of the Federation were debated at length, and a revised Constitution incorporating these was submitted to the member Societies for approval. Agreement on this will be welcomed because there had been some concern regarding the Federation's role in relation to that of the Societies.

An important activity of the Federation has been the organization of the Sixth Conference on Engineering Education. This Conference was devoted to discussion of the important subject of 'Training of Engineering Technicians'. The Federation continued to collaborate closely with the South African Council of Professional Engineers and the Government authorities in all matters relating to the engineering profession.

SOUTH AFRICAN COUNCIL FOR PROFESSIONAL ENGINEERS

The following statistics of registration have been provided by the South African Council for Professional Engineers:

Application forms posted	26 150
Application forms received	12 370
Total registered 1969	2 436
1970	2 232
1971	1 105
1972	1 545
Total registered to	
June 1973	7 673
Under consideration	239

WITBANK/MIDDELBURG BRANCH

Committee

The following members served on the Branch Committee during the year under review:

A. Bain (Chairman), G. E. Carlyon (Vice-Chairman), I. Botha, A. W. Brereton, B. T. Hosking, E. J. Jackson, and B. D. McNeice. Co-opted during the year: V. N. Crowder, A. L. Melvill, and D. Morris.

Meetings

The meetings and attendance during the year were as follows:

Annual General Meeting, 18th August, 1972,	60 present
General Meeting, 28th November, 1972,	42 present
General Meeting, 20th July, 1973,	14 present.

Committee Meetings

2nd November, 1972,	4 present
28th June, 1972,	8 present.

Papers and Addresses

Biblical archaeology, by Professor D. D. Howat, Past President 1971/1972

Industrial gases, by Mr Black of Afrox

The problems of abrasion in industry, by M. Wills.

Visits

A visit was arranged to Phalaborwa and was enjoyed by those who attended.

A visit to Swaziland Iron Ore Development Company was arranged, but owing to change of management had to be postponed to a later date.

Secretariat

The Branch records its appreciation for the services rendered by

Mrs A. Bain, who provided secretarial services during the year.

ORANGE FREE STATE BRANCH

Committee

The following members served on the Branch Committee during the year under review:

C. J. Isaac (Chairman), E. T. Wilson (Vice-Chairman), J. M. Meyer (Immediate Past Chairman), C. Mostert, P. L. Nathan, D. Rankin, D. A. Smith, R. B. Sutherland, and G. E. J. Young.

Meetings

The meetings and attendance during the year were as follows:

Annual General Meeting, 3rd October, 1972,	57 present
General Meeting, 31st January, 1973,	39 present
General Meeting, 6th March, 1973,	51 present
General Meeting, 16th May, 1973,	72 present.

Attendance at meetings has shown a tremendous improvement, and members are to be thanked for their support of the Institute.

Committee Meetings

Two committee meetings were held during the year, and thanks are due to all committee members for their help on these occasions.

Papers and Presentations

Recruitment and research for metallurgists, by Professor D. D. Howat, Past President 1971/1972

Research into gold extraction, by Mr G. James and Mr E. van Vuuren
Role of the Mines Department in the industry, by Mr T. L. Gibbs

Two film shows were held during the year: 'Nickel mining in Canada', and 'North Slope, Alaska'.

Visits

The following visits took place during the year:

18th May, 1973,	Vierfontein Colliery and Escom Power Station
7th August, 1973,	Local visit to President Steyn No. 4 Shaft and task-force training at Virginia.

Both these visits were informative and of great use to those who attended.

Membership

The total membership of the O.F.S. Branch at 15th July, 1973, was 110, a decrease of 14 over the

previous year, made up as follows:

Fellows	23
Members	36
Associates	30
Graduates	11
Students	10
	—
	110
	—

The Branch membership has decreased constantly over the past three years, and members are requested to make a serious effort to recruit new members.

FINANCE

The annual accounts, which follow this report, showed an excess of income over expenditure of R24 018. However, this figure was reduced by R465, which was the loss on sale of an investment, and by R10 330, which was written-off money on call. The latter item was money held on call on behalf of the Institute by P. Wilson and E. Mansfield & Co. This company, of course, is now insolvent, and it was deemed advisable to write off the whole sum. After these amounts had been written off, the surplus transferred to the accumulated fund amounted to R13 223.

Once again symposia, colloquia, sales of publications, and subscriptions were important contributors to the surplus. In contrast to last year, however, there was a substantial loss on the journal.

The loss of the R10 330 mentioned above meant that it was necessary to delay the initiation of some of the new activities mentioned in the previous annual report. However, now that the position is clarified and the financial results for the year are favourable, it should be possible to proceed with these developments.

Because it is not a corporate body, the Institute experienced some problems during the year in getting shares registered in its name. This matter is in the hands of our honorary legal advisers, and it is hoped that it will be resolved in the near future.

The MacArthur-Forrest Memorial Fund shows an excess of income over expenditure of R155, and the total fund was therefore increased by that amount to R4657.

The balance sheet shows that the market value of quoted shares and debentures increased during the

year from R11 331 to R39 500, which is R6105 in excess of book value. Accumulated funds now amount to R57 752, compared with R44 529 a year ago.

HONORARY SERVICES

Appreciation is recorded of the services of the Honorary Legal

Advisers, Messrs van Hulsteyn-Douglas, and your Council is most grateful for the valuable services rendered by Mr D. G. Maxwell as Honorary Treasurer, Mr H. P. Carlisle as Honorary Editor, and the Chairmen of the Metallurgical and Mining Colloquia Committees as Honorary Assistant Editors.

SECRETARIAT

The Institute records its appreciation to the Associated Scientific and Technical Societies for the services rendered during the past year. In particular, thanks are due to the Manager, Mr E. Boden, the Deputy Manager, Mr D. S. Trueman, Miss Theron, the Secretary, and her assistant, Miss Miller.

Company affiliates

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

AE & CI Limited.
Afrox/Dowson and Dobson Limited.
Amalgamated Collieries of S.A. Limited.
Apex Mines Limited.
Associated Manganese Mines of S.A. Limited.
Blackwood Hodge (S.A.) Limited.
Blyvooruitzicht G.M. Co. Ltd.
Boart & Hard Metal Products S.A. Limited.
Bracken Mines Limited.
Buffelsfontein G.M. Co. Limited.
Cape Asbestos South Africa (Pty) Ltd.
Compair S.A. (Pty) Limited.
Consolidated Murchison (Tvl) Goldfields & Development Co. Limited.
Doornfontein G.M. Co. Limited.
Durban Roodepoort Deep Limited.
East Driefontein G.M. Co. Limited.
East Rand Prop. Mines Limited.
Free State Saaiplaas G.M. Co. Limited.
Fraser & Chalmers S.A. (Pty) Limited.
Gardner-Denver Co. Africa (Pty) Ltd.
Goldfields of S.A. Limited.
The Grootvlei (Pty) Mines Limited.

Harmony Gold Mining Co. Limited.
Hartebeesfontein G.M. Co. Limited.
Hewitt-Robins-Denver (Pty) Limited.
Highveld Steel and Vanadium Corporation Limited.
Hudemco (Pty) Limited.
Impala Platinum Limited.
Ingersoll Rand Co. S.A. (Pty) Ltd.
James Sydney & Company (Pty) Limited.
Kinross Mines Limited.
Kloof Gold Mining Co. Limited.
Lennings Holdings Limited.
Leslie G.M. Limited.
Libanon G.M. Co. Limited.
Lonrho S.A. Limited.
Lorraine Gold Mines Limited.
Marievale Consolidated Mines Limited.
Matte Smelters (Pty) Limited.
Northern Lime Co. Limited.
O'okiep Copper Company Limited.
Palabora Mining Co. Limited.
President Steyn G.M. Co. Limited.
Pretoria Portland Cement Co. Limited.
Prieska Copper Mines (Pty) Limited.
Rand Mines Limited.
Rooiberg Minerals Development Co. Limited.

Rustenburg Platinum Mines Limited (Union Section).
Rustenburg Platinum Mines Limited (Rustenburg Section).
St. Helena Gold Mines Limited.
Shaft Sinkers (Pty) Limited.
S.A. Land Exploration Co. Limited.
Stilfontein G.M. Co. Limited.
The Griqualand Exploration and Finance Co. Limited.
The Messina (Transvaal) Development Co. Limited.
Trans-Natal Coal Corporation Limited.
Tvl Cons. Land & Exploration Co.
Tsumeb Corp. Limited.
Union Corporation Limited.
Vaal Reefs Exploration & Mining Co. Limited.
Venterspost G.M. Co. Limited.
Vergenoeg Mining Co. (Pty) Limited.
Vlakfontein G.M. Co. Limited.
Welkom Gold Mining Co. Limited.
West Driefontein G.M. Co. Limited.
Western Deep Levels Limited.
Western Holdings Limited.
Winkelhaak Mines Limited.

THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY

Income and Expenditure Account for the Year ended 30th June, 1973.

1972		1973		1972		1973	
R	R	R	R	R	R	R	R
				24 628			24 426
12 927	Secretarial fee and overhead charge— Associated Scientific and Technical Societies of South Africa	15 054		220	Subscriptions		—
125	Audit fee	125		4 400	Life membership subscriptions		9 000
1 194	Contribution to Federation of Societies of Professional Engineers	482		514	Company affiliates subscriptions		340
—	Bad debts written off	414		2 141	Entrance fees		3 208
200	Donation to South African Federation of University Engineering Students	300		361	Interest received		467
739	General expenses	451		3 961	Dividends		6 845
13	Medals	92			Surplus on sale of publications Symposia and colloquia	3 771	—
1 652	Postages	2 201			Less Provision for printing		—
1 432	Stationery and printing	1 619		4 992			3 771
1 000	Provision for doubtful subscriptions	—		—	Transfer from provision for doubtful subscriptions		250
1 000	Provision for doubtful debts	—					
4 000	Provision for re-printing publications	—					
	Printing of publications	24 118					
	<i>Deduct</i> Provision	24 000					
			118				
	Institute journal Expenses	15 692					
11 530	Secretarial fee	2 656					
2 455							
13 985		18 348					
6 491	<i>Deduct</i> Advertising	3 967					
9 568	Sales	8 398					
	Subventions Department of Nat- ional Education . R2 550	—					
2 000	Chamber of Mines of South Africa	—					
510							
18 569		14 915					
Cr. 4 584	Excess of income over expenditure carried down	3 433					
21 519		24 018					
<u>R41 217</u>		<u>R48 307</u>		<u>R41 217</u>		<u>R48 307</u>	
—	Loss on sale of investment	465		21 519	Excess of income over expenditure	24 018	
—	Cash at call with Wilson and Mansfield written off	10 330					
21 519	Surplus transferred to accumulated fund	13 223					
<u>R21 519</u>		<u>R24 018</u>		<u>R21 519</u>		<u>R24 018</u>	

Visit to Prieska Copper Mines (Pty) Ltd

On 8th August, 1973, 57 members of the Institute visited Prieska Copper Mine at Copperton in the North Western Cape.

After tea, the group was welcomed by the Management of the Mine, and Mr Grobler, the General Manager, gave an introductory talk.

After they had been taken on a bus tour of the property, the members split up into groups and proceeded underground or to the concentrator.

Of special interest to the mining members were the rock-handling methods in use at the mine. The stoping method that has been adopted is the continuous, long-hole sub-level open stoping system. The broken ore is moved with rubber-

tyred front-end loaders from the stope drawpoints to the ore passes. On the main trammig levels, the ore is collected by electric locomotives and discharged into the main shaft system at the bottom. At the shaft ore-pass system, a gyratory crusher that can accept rocks up to 1 m in diameter has been installed. The crushed product (minus 150 mm in diameter) will then be hoisted by a Koepe winder, which has a rated capacity of 900 tons per hour. The mine is also served by a declined roadway from surface, which facilitates the movement of heavy equipment.

The most striking aspect is the productivity that can be achieved by the use of a trackless-mining system. For the production of

230 000 tons per month, it is estimated that 6 stopers and 7 developers will be required. The total labour force will be approximately 2500—2000 Bantu, 200 Coloured, and 300 Europeans. Training of maintenance and operating personnel is of the utmost importance, and it was interesting to note the extent to which non-White labour is being used in these occupations.

Lunch was served at the single quarters, after which the group proceeded to the airfield for the return trip to Johannesburg.

On behalf of the visitors, Professor de V. Lambrechts thanked Mr Grobler and his staff for the most interesting morning and for their hospitality.