

Annual Report and Accounts

FOR THE YEAR ENDED 30TH JUNE, 1979

Council and Standing Committees, 1978-1979

President: Dr M. G. Atmore.

Vice-Presidents: D. A. Viljoen and Dr P. R. Jochens.

Honorary Treasurer: J. K. E. Douglas.

Immediate Past President: P. A. von Wielligh.

Members of Council: J. D. Austin, A. N. Brown, H. E. James, Prof. R. P. King, Dr D. G. Krige, Prof. F. Q. P. Leiding, D. G. Malan, C. S. McPhail, J. C. Mostert, G. Y. Nisbet, H. G. M. Rose, W. T. Ruhmer, G. C. Thompson, R. A. von Maltitz.

Chairman, Witbank-Middelburg Branch: T. S. Wilmot.

Chairman, Orange Free State-Klerksdorp Branch: H. M. W. Eschenburg.

Past Presidents Serving on Council: R. J. Adamson, H. Britten, J. K. E. Douglas, Prof. D. D. Howat, Dr J. P. Hugo, D. G. Maxwell, Prof. R. P. Plewman, Dr R. E. Robinson, Dr M. D. G. Salamon, P. W. J. van Rensburg.

Standing Committee Chairmen: Membership, Dr P. R. Jochens; Technical Programme — Metallurgy, Prof. R. P. King; Technical Programme — Mining, H. G. M. Rose; Vacation School — Metallurgy, J. C. Mostert; Vacation School — Mining, D. G. Malan/J. D. Austin; Awards, P. A. von Wielligh; Excursions, D. A. Viljoen; Adjudication, P. A. von Wielligh; Constitution, Rules and Policy, P. A. von Wielligh; Monograph Series, Dr R. E. Robinson; Professional and Technician Training Committee, Dr M. D. G. Salamon; Career Guidance, D. G. Malan; Phoenix National Committee, Dr R. E. Robinson; 1982 World Congress, Dr M. G. Atmore; Witbank Coal Colloquium, Dr P. R. Jochens; Mines and Works, P. A. von Wielligh.

Representatives on Other Bodies

Federation of Societies of Professional Engineers:

Representatives: D. A. Viljoen, A. N. Brown.

Alternates: Dr M. G. Atmore, Dr M. D. G. Salamon.

Federation of Societies of Professional Engineers Executive Committee:

D. A. Viljoen.

FSPE Technician and Education Liaison Committee:

R. A. von Maltitz.

FSPE Publicity Committee:

J. D. Austin.

Council of Commonwealth Mining and Metallurgical Institutions:

D. J. Rogers, G. J. Mortimer.

The Associated Scientific and Technical Societies of South Africa — Controlling Executive:

Representatives: Dr M. G. Atmore, P. A. von Wielligh.

Alternates: Dr P. R. Jochens, D. A. Viljoen.

South African Council for Professional Engineers:

Member: P. W. J. van Rensburg.

Alternate: W. T. Ruhmer.

South African Committee on Tunnelling:

Member: D. G. Malan.

Alternate: R. P. Plewman.

Engineers Liaison Committee — Pretoria:

Member: Prof. F. Q. P. Leiding.

Alternate: Dr J. P. Hugo.

World Mining Congress National Committee:

Members: Dr M. D. G. Salamon, Prof. R. P. Plewman, Prof. F. Q. P. Leiding.

Career Guidance and Recruitment

The shortage of mining engineers in the industry poses a real threat to future expansion, and the main objective of the Career Guidance Committee has been to focus attention on this aspect and to encourage students to embark on mining and metallurgical careers.

Under the wing of this committee, the Phoenix Programme has been fostered. This programme was devised to encourage interest in the mining industry by the development of activities with teachers, student teachers, and school pupils. The budget for the current year is R28 500, and the organization is now under the guidance of the Chamber of Mines, who are fortunate to have Mr Chris de Wilzem and Mr Don Walton to lead the activities. Apart from the Chamber of Mines, the main contributors to the expenses incurred in the running of various projects are Iscor, Samancor, Sentrachem, Ferro-alloys, Rio Tinto, and our own Institute.

During 1977 schools had to be cajoled into participation, but during 1978 a change in attitude was evident: all the activities designed for school pupils were oversubscribed, and it was possible to select participants of a high calibre.

The overall objective during 1979 remains the improvement of communication links between schools, universities, and the mineral industry. The current programme outlined to pursue the objective is attractive, and is definitely producing results.

We give active support to *Archimedes*, an excellent bilingual easy-to-read scientific journal that is published on a non-profit basis as a service to the youth of South Africa. Council agreed to our recommendation to donate R200 to sponsor the circulation of *Archimedes* to aspirant students undergoing army training.

The Committee is also active in the field of radio and television, with a view to broadcasting articles and documentation aimed at encouraging youngsters to embark on metallurgy and mining as a career.

A seminar on 'The Training Programmes for Mining Engineers' was held at the Witwatersrand University in September 1978, for a free exchange of views and experiences of young graduates in the mining industry. This proved worth while, but the absence of senior experienced mining engineers was unfortunate.

Council awards prizes annually to students of the Pretoria and Witwatersrand Universities in their third and fourth years of study in mining and metallurgy. Students and lecturers from each university were invited to an informal Cocktail Party at Kyalami Ranch Hotel to meet members of Council and leaders of the mining industry, when the prize-winners were announced. The function was an outstanding success and assisted materially in fostering the good relations between students of the two universities.

Professional and Technician Training Committees

Following on the success last year of the seminars arranged for metallurgical and chemical-engineering students, a similar get-together was organized for the students and staff of the Mining Departments of the Universities of Pretoria and the Witwatersrand. This seminar took place in Johannesburg in September 1978. A significant number of recent graduates in mining engineering, some senior colleagues, and several representatives of personnel departments in the mining industry were present. The presentation of graduate training programmes of various mining groups was followed by a lively discussion. It would appear that differences exist between the expectation of undergraduates and the requirements of mining companies. Also, there was some uncertainty with regard to the relevance of university courses to practical mining needs. It seems obvious that the mining-engineering profession is undergoing a significant change as a result of changes in mining technology. The Institute will have to keep abreast of these changes if it wishes to remain relevant in the eyes of its younger members.

To fill a long-felt need, a careers brochure outlining the mining- and metallurgical-engineering professions has been drafted, and it is undergoing its final stages of editing. The brochure, which is expected to appear shortly, places in proper perspective our two professions with respect to the field of engineering as a whole.

In collaboration with the Career Guidance Committee, the following prizes were awarded at a very successful informal function held on 31st March, 1979:

Dept of Mining Engineering, University of Pretoria:

Prestige Prize of R250: W. H. Schroeder.

Book Prize of R50: F. Robberts.

Dept of Metallurgical Engineering, University of Pretoria:

Prestige Prize R250: H. J. Marais.

Book Prize of R50: C. van Loggerenberg.

Dept of Mining Engineering, University of the Witwatersrand:

Prestige Prize R250: A. J. Graetz.

Book Prize of R50: R. L. Proctor.

Dept of Metallurgical Engineering, University of the Witwatersrand:

Book Prize of R50: M. Cortie.

No Prestige Prize was awarded.

Journal

The following papers and notes were published in the first 12 numbers of Volume 79 of the *Journal of the South African Institute of Mining and Metallurgy*.

August 1978

The design of spray chambers for bulk cooling of the air in mines, by S. Bluhm and A. Whillier.

Solid-waste packing as a support medium at depth, by N. C. Joughin and A. J. Jager.

A comparison of electric smelting on pilot and industrial scale, by J. Grundersen and H. Skretting.

September 1978

The effects of fast-neutron irradiation on the mechanical properties of austenitic stainless steel, by J. H. Dalton.

The interaction of silicon monoxide gas with carbonaceous reducing agents, by J. M. Paull and J. B. See.

Longterm trends in domestic metal prices under conditions of differential inflation rates and unstable currency exchange rates, by D. G. Krige.

October 1978

The compatibility of stainless-steel cladding materials with uranium carbide fuel, by W. E. Stumpf and S. Venter.

The design of circuits for electric shotfiring, by P. C. Seligmann.

The design of a stoping scraper scoop, by V. J. Solomon and P. van Niekerk.

November 1978

Presidential address: Problems for the mining industry.

December 1978

Considerations in the design of integrated systems for distributing refrigeration in deep mines, J. van der Walt and A. Whillier.

The design and testing of pipe-sticks for underground stope support, by P. J. J. van Vuuren.

January 1979

An integrated mining and extraction system for use on Witwatersrand mines, by P. J. D. Lloyd.

Reactions in the production of high-carbon ferromanganese from Mamatwan ore, by A. Koursaris and J. B. See.

Computer simulation of mining in faulted ground, by S. L. Crouch.

February 1979

A prediction of the long-term future of tin, by A. G. W. Knock.

A method for the determination of haul-truck requirements in an open-pit operation, by R. H. A. Plaistowe and M. B. Algeo.

A modern study of the kinetics and mechanism of the cementation of gold, by M. J. Nicol, E. Schalch, P. Balestra, and H. Hegedus.

March 1979

Hopper clarification of gold pregnant solution at Vaal Reefs South, by L. E. Kun, R. O. Oelofsen, and E. J. J. van Vuuren.

Hydraulic cleaning of stopes, by D. O'Beirne.

Wet high-intensity magnetic separation for the concentration of Witwatersrand gold-uranium ores and residues, by I. J. Corrans and J. Levin.

April 1979

The replacement of conventional gathering-arm loaders and shuttle cars with diesel-operated load-haul-

dump units at Greenside Colliery, by E. L. Atkinson and G. W. Leach.

Improvements to the trackless-mining equipment and operation at Prieska Copper Mines (Proprietary) Limited, by T. M. Espach.

Viscosities, electrical resistivities, and liquidus temperatures of slags in the system $\text{CaO-MgO-Al}_2\text{O}_3\text{-TiO}_2\text{-SiO}_2$ under neutral conditions, by J. van der Colf and D. D. Howat.

May 1979

Slag-metal equilibrium in the production of low-carbon ferromanganese, by N. A. Barcza.

The use of activated carbon for the recovery of gold and silver from gold-plant solutions, by R. J. Davidson, V. Veronese, and M. V. Nkosi.

The kinetics and mechanism of the non-oxidative dissolution of some iron sulphides in aqueous acidic solutions, by M. J. Nicol and P. D. Scott.

June 1979

Developments in the application of carbon-in-pulp to the recovery of gold from South African ores, by P. A. Laxen, G. S. M. Becker, and R. Rubin.

Viscosities, electrical resistivities, and liquidus temperatures of slags in the system $\text{CaO-MgO-Al}_2\text{O}_3\text{-TiO}_2\text{-SiO}_2$ under reducing conditions, by J. van der Colf and D. D. Howat.

The mechanism in the poisoning of anion-exchange resins by cobalt cyanide, by C. A. Fleming and R. D. Hancock.

July 1979

Rates of oxygen removal from titaniferous oxide melts in graphite crucibles, by J. van der Colf and D. D. Howat.

The geostatistical evaluation of low-ash coal reserves in No. 2 seam, Witbank area, by I. D. Wood.

An analysis of the potential benefits to the State of realistic adjustments to the mining tax structure, by D. G. Krige.

Awards

Papers published in the latter part of Volume 78 and the first part of volume 79 of the *Journal* were considered eligible for an award by Council, and the undernoted authors achieved this distinction:

Gold Medals

Dr A. K. Haines for his paper 'The development of continuous fluidized-bed ion exchange in South Africa and its use in the recovery of uranium'.

Dr P. J. D. Lloyd for his paper 'An integrated mining and extraction system for use on Witwatersrand mines'.

Silver Medal

Dr D. G. Krige for his paper on 'Longterm trends in domestic metal prices under conditions of differential inflation rates and unstable currency exchange rates'.

Student Awards

Prizes for the best student papers written in part fulfilment of the B.Sc. Engineering degree and submitted to the Institute for consideration were awarded as follows:

Mining

Strain wave phenomena in blasting, by R. P. Gould.

Makrofaktore wat die beplanning en finansiering van myne beïnvloed, deur A. W. de Villiers.

Metallurgy

The kinetics of decomposition of the beta-phase in the copper-tin system, by M. Cortie.

Laboratory project and design 1978, by D. Wiggill (Miss).

Excursions

A well-attended visit to ERGO took place on 9th May, 1979. One hundred and sixty delegates were guided through the flotation, uranium- and gold- recovery site, and the new tailings-disposal area.

The management of ERGO are to be congratulated on their excellent arrangements, and the Institute wishes to record its thanks for the opportunity given to its members to visit this exciting new metallurgical development.

Mining Colloquia

Two colloquia were held during the past year.

The first colloquium, 'Developments in rock handling and earthmoving', was held on 14th September, 1978, in conjunction with the Electra Mining Exhibition at Milner Park. It was most successful. Ten papers were read, and several contributions were offered during the discussion period.

The second colloquium was held in conjunction with the Geological Society of South Africa at the National Institute for Metallurgy on 4th May, 1979, and proved to be the most successful colloquium yet conducted by the Institute. Over three-hundred delegates from all parts of Southern Africa attended the colloquium, which was entitled 'Exploration feasibility studies and investment analysis'. The key-note speaker was Dr Leo Miller, Vice President of Texas Gulf Incorporated, Golden, Colorado, who spoke on 'The economics of Western World mineral exploration based on the political reality of 1979'. Other papers were presented by D. G. Millenbruch (delivered by P. D. Danchin), D. G. Krige, and H. V. R. von Rahden.

Metallurgical Colloquia

A very successful colloquium on recent advances in gold metallurgy was held at Milner Park in conjunction with the Electra Mining Exhibition. Thirteen excellent papers were read at the colloquium, and these presented new research results on most aspects of gold recovery from sorting to smelting. Several of the papers generated a great deal of interest, and it is particularly noteworthy that the research on the recovery of dissolved gold by adsorption onto activated charcoal, which was announced at the colloquium, generated considerable discussion in the technical press during the year. This is a good example of the value of the Institute's colloquia in ensuring early dissemination of important research findings from the various groups of research workers in South Africa.

A successful colloquium on foundry practice was held in collaboration with the South African Institute of Foundrymen at Milner Park during February 1979. This colloquium was again held in conjunction with a

major technical exhibition at Milner Park, and attracted a large number of delegates, including several from abroad.

The Technical Programme Committee will continue to collaborate with other interested professional institutes in organizing colloquia of mutual interest. In February 1980 the Institute will collaborate with the South African Institution of Chemical Engineers and the National Institute for Metallurgy in the organization of a colloquium on ion exchange and solvent extraction in the metallurgical industry. A colloquium on project management in the metallurgical industry will be arranged for late 1980.

Witbank Coal Colloquium

During 1978, Council approved the formation of the Witbank Coal Colloquium Committee consisting of members from the Technical Programme Committees for Mining and Metallurgy, the Witbank and Middelburg Branch, and the South African Coal Processing Society, with the object of organizing a colloquium on coal mining and coal processing.

Seven papers under the title 'Mining methods and economics for improved coal extraction' will be presented on 3rd October, 1979, and eight papers under the title 'Coal processing and preparation' will be presented on 4th October, 1979. On 3rd October, delegates not attending the technical programme on mining will have a choice of seven visits to steel and stainless-steel plants, and collieries and power stations. On 4th October, delegates not attending the technical programme on coal processing will have a choice of eight visits to coal mines (both underground and surface), the export loading terminal, and the Chamber of Mines' rescue drill.

A social programme, including a ladies programme, has been arranged. The Committee looks forward to a technically stimulating programme and the opportunity to see the rapid developments in the Witbank-Middelburg area.

Vacation School — Mining

Two successive one-week vacation schools were held at the University of the Witwatersrand in October–November 1978. They were entitled 'Drilling, rockbreaking, and blasting techniques' and were attended by 63 people. The high standard of the schools was due largely to the lectures by engineers from industry and to the amount of assistance provided by AECL.

The Committee has not planned a school for 1979, but preparations are well in hand for a school on 'The economics and management of underground rock boring', which is to be held in February 1980.

Vacation School — Metallurgy

The Committee decided, with Council's approval, to hold a vacation school every two years.

The next school will deal with pyrometallurgy, and will be held in April–May, 1980. Arrangements are well in hand, and Professor N. Bell, of the University of Strath-Clyde Glasgow, Scotland, has agreed to act as Course Leader. Dr C. Finn, of the University of the Witwatersrand, has agreed to be the Course Manager.

Several other local prominent technologists from industry and research establishments have agreed to give lectures on a variety of subjects covering several aspects in the pyrometallurgical field. The National Institute for Metallurgy will conduct a case study on a chosen subject.

During the year, the Committee was fortunate in being able to co-opt three additional members to assist with the arrangements for the vacation school: Dr C. Finn, Dr R. F. Sandenbergh, and Dr N. Barcza.

Monograph Series

As announced last year, Council has embarked on a venture to produce a series of technical monographs, and steady progress can be reported in the pattern of sales to many parts of the world.

The first work of the series, that by Dr D. G. Krige on geostatistics, was well received, and up to the end of June 1979 709 volumes had been sold. Consideration is at present being given to the publication of a second edition. The second work, also on geostatistics but by Dr J.-M. Rendu, was published late in 1978, and by the end of June 1979 558 copies had been sold.

There have been unavoidable delays in the production of the volume on rock mechanics due, in the main, to problems associated with the co-ordination of the contributions of a multiplicity of authors. Professor Budavari is acting as technical editor and has devoted many hours in an effort to produce a worth-while volume that promises to attract international interest.

Good progress is reported on the production of the volume on the principles of flotation. Judged by the tremendous interest shown in the vacation school on this subject, a ready response is expected from buyers both locally and overseas. Professor King has unselfishly applied himself to the task of preparing all the chapters of this volume, which is scheduled for marketing by the end of 1979.

Another volume in the pipeline deals with the cooling of mine air and is by Dr Austin Whillier.

The aim in this Monograph Series is not to make large profits, but rather to disseminate up-to-date technical information in a prestige form for the benefit of members and interested parties.

World Mining Congress

The Tenth World Mining Congress will be held in Istanbul, Turkey, from 17th to 21st September, 1979. The main theme will be mining and mineral raw materials in the service of mankind.

The Congress will consist of technical sessions and an exhibition of mining equipment. Technical and sight-seeing tours will be arranged both before and after the congress.

Twelfth Mining and Metallurgical Congress

The offer of the Institute, in collaboration with the South African Geological Society, to host the 1982 Congress of the Commonwealth Mining and Metallurgical Institutions was accepted by the Council of that body. During the year, a start was made with the preparations, and a permanent Steering Committee under the Chairmanship of Dr M. G. Atmore was brought into being.

Representatives of the South African Geological Society were invited to serve on this Committee and agreed to do so. The authorities and the Chamber of Mines gave the Institute significant assistance and encouragement, and Mr McPhail was appointed Manager for the Congress. He was also co-opted onto the Council of the Institute for this purpose.

In January 1979, the President of the Institute attended a meeting of the Council of Commonwealth Mining and Metallurgical Institutions held in London. At this meeting it was unanimously decided to amend its title to the Council of Mining and Metallurgical Institutions.

The last Congress held in Johannesburg was in 1961, and it is proposed that the theme of the 1982 Congress will be 'Twenty-one Years Progress' or 'The Advances Made since the Previous Congress'. The Institute is strongly of the opinion that the concept should be a Southern African Congress, and the Institute will make all possible efforts to stress this aspect wherever possible.

The Associated Scientific and Technical Societies of South Africa

The Institute, as in previous years, participated in the activities of the A.S.&T.S. as fully as possible, and during the year attention was focused on the form that the A.S.&T.S. Diamond Jubilee celebrations will take in the middle of 1980. Considerable progress has been made, and it is probable that a *conversazione* will form part of the activities. A number of societies connected with the mining industry have agreed to collaborate wherever possible in preparing an exhibit. The Institute will participate fully in this, and we acknowledge the help being received from the Chamber of Mines Public Relations Department.

The A.S.&T.S. Trust continues to make progress, although donations during the year were slightly disappointing. A total of R100 000 is, however, within sight.

Dr Austin Whillier, a prominent member of our Institute, was elected President of the A.S.&T.S. during the year, and we offer him our congratulations on achieving this high office.

The Institute wishes to record its appreciation of the services rendered by the A.S.&T.S., most particularly for the efficient secretarial services, and the use of meeting and catering facilities in Kelvin House.

South African Council for Professional Engineers

During the previous parliamentary recess, a Commission of Inquiry heard evidence from a large number of people and organizations regarding the Professional Engineers' Amendment Bill. On the basis of their report, the Bill was passed towards the end of the most recent session of parliament.

The new Act makes provision for the replacement of Professional Advisory Committees by Committees of Council appointed from nominations by the relevant Institutes. It also increases the number of representatives from professional institutes from seven to eight by providing for a representative of the mining profession and the metallurgical profession separately, where pre-

viously our Institute had only one nominee representing both professions.

The new Act provides for the first time for statutory recognition of engineers in categories other than professional engineering. This has implications for members of our Institute, which will have to be considered by our Council in the coming year.

A major amendment in the new Act, which was the subject of considerable controversy and opposition from a number of quarters, is the extension of the jurisdiction of the Act to companies. In addition, a revised fee structure has been established to allow more flexibility in the tariffs that Professional Engineers may charge clients.

The Council dealt with a number of contraventions of the Act and Regulations during the year, and lodged charges against certain unregistered persons who held themselves out to be Professional Engineers.

There has been increasing awareness in the Registration Committee of the Council of the need for improved training for graduate engineers. A new statement of Policy 1/3 dealing with the principles of acceptable engineering work for the Engineer-in-Training was published during the year. Discussions also took place with the military authorities in an attempt to ensure that, where possible, newly graduated engineers are used on engineering tasks. The main work of this Committee was that of dealing with the 1152 new applications for registration that were received during the year.

The Council dealt with proposals for the establishment of engineering faculties at the Rand Afrikaans University and the Potchefstroom University for Higher Christian Education. The establishment of faculties was considered justifiable, but it was noted that faculties at other universities were often not fully utilized and, more particularly, that there was often a general shortage of suitable staff.

The number of registered Professional Engineers and Engineers-in-Training at 30th June, 1979, was 9096 and 3058 respectively. These compare with the figures of 8844 and 2770 at 30th April, 1978. A matter for some concern to our Council is that, of these persons, only 510 Professional Engineers and 51 Engineers-in-Training are from the branches of mining and metallurgy. Altogether, our Institute has 1287 Corporate Members and 105 Graduate Members.

The Federation of Societies of Professional Engineers

Important issues dealt with included the establishment of engineering courses at the University of the North and Zululand, accommodation facilities for Black students of the University of the Witwatersrand, liaison with Defence authorities, SACPE's Policy statement 1/3, Engineers-in-Training, and the amendment to the Professional Engineers' Act of 1968.

Various areas of common interest were discussed at a meeting arranged by FSPE between representatives of FSPE, SACPE, and the Deans of Engineering Faculties. FSPE-SACPE relations were discussed in a meeting attended by officials from FSPE, EXCO, and SACPE.

At a meeting attended by constituent societies, it was unanimously agreed that the present FSPE structure is

preferable to a unitary system, which had been proposed by EASA.

The need for improved co-operation between SACPE and FSPE was discussed at a meeting between officials of FSPE, EXCO, and SACPE. It was agreed that, in view of FSPE's endeavour to be more effective, SACPE should work through FSPE when it wished to contact professional institutions; that there should be proper feedback from its representatives so that SACPE could be well informed of the profession's opinions; and that this could be achieved through closer liaison between FSPE and SACPE in the spirit of equality, goodwill, and understanding.

A special meeting was held to discuss comments by member societies on the proposed amendments to the Professional Engineers' Act (Act 81 of 1968). The consensus of the meeting was submitted to the Commission of Enquiry as the considered view of the engineering profession.

FSPE called a meeting of nominees of the societies concerned to examine aspects concerning boards of control for Part II engineers under the terms of the amended act, which caters for the extension of registration.

Joint SACPE-FSPE seminars for Engineers-in-Training were held in Natal, Cape Town, and Pretoria. The seminars highlighted the difficulties being experienced by engineering employers and employees, and were well attended.

Several meetings between FSPE representatives and Defence officials took place. The Federation was repeatedly assured that the Army was doing all it could to put graduate engineers on engineering projects.

FSPE continued to sponsor articles in *Opportunities for Matriculants and School Leavers in South Africa* and the *South African Bursars' Guide*. A tear-out slip advertisement in *Civvy Street* elicited a very good response from young men doing their national service.

The consensus of a meeting attended by members of all the university engineering faculties was that FSPE should again remind the Department of National Education of its responsibility for providing adequate staff. FSPE had decided that a submission would be made to the Minister of National Education. Although SEIFSA is unwilling to take a lead regarding the subvention of salaries of engineering lecturers, they have offered the services of members of their staff to assist in structuring a scheme.

A submission from FSPE, prepared by Professor Plewman, concerning the inadequacies of 'new maths' was forwarded to the Committee of Heads of Education and the Secretary of the Joint Matriculation Board.

With the help of funds from member societies and commercial firms, courses on engineering drawing and design have been introduced at the Universities of the North and Zululand. A similar course, sponsored by the Department of National Education, also exists at Fort Hare. As a result of these courses, over 30 Black engineering students enrolled at the University of the Witwatersrand, over 40 at the University of Natal, and a few at the University of Cape Town, at the beginning of this year. FSPE has been active in helping to solve the

problem of accommodating the Black Witwatersrand students. At the suggestion of the University of the Witwatersrand and in collaboration with the Anglo American Corporation, the Salvation Army Hostel at Mofolo, Soweto, was examined and selected; R50 000 of the R100 000 required for major repairs and refurbishing will be donated by Anglo American, while FSPE has launched a campaign to collect the balance. Contributions received so far include a donation of R5000 from the South African Institute of Mining and Metallurgy.

A final report compiled by the manpower committee has been forwarded to member societies, SACPE, the press, and other interested private and government bodies.

Publication of *The Professional Engineer* was terminated by EASA with the October 1978 issue.

Under the guidance of Mr Laburn, FSPE affairs have been well managed, and significant contributions have been made in a variety of areas of concern to professional engineers.

South African National Committee on Tunnelling

SANCOT is the forum for exchanges of opinion and information among all the organizations and institutions involved in and concerned with tunnelling in Southern Africa and, as a member of the International Tunnelling Association (I.T.A.), is informed of the latest developments overseas.

SANCOT again received active support from its Corporate Members despite the low economic state in the field of tunnelling in the civil-engineering sector. Increased activity, however, was experienced during the year in the mining sector.

The main activities of the Committee concerned the following.

Safety

Good progress was achieved by the I.T.A. Working Group on tunnel safety, in which SANCOT plays the lead. This group is currently working in three directions: safety signs, accident statistics, and the preparation of an index of safety codes and standards, which it is proposed to establish internationally.

Research

It was established that SANCOT's recommendations are not being implemented on a large scale while funds for civil-engineering tunnelling research are not available. Owing to the decline in civil-engineering activities, only laboratory investigations are being carried out by the CSIR in the Geomechanics Division. It is clear that tunnelling research applicable to mining is well covered by the Chamber of Mines.

Contracting practices

Following the I.T.A. General Meeting in Tokyo in 1978, a circular containing the recommendations adopted in respect of contractual sharing of risk from the I.T.A. working group was distributed for comment to all local members.

Collection of demand data

This group has been active in the preparation of a catalogue of tunnel works, and 27 reports covering road, rail, sewer, and water tunnels have been presented for

publication. Four of these reports have already been published in the journal *South African Tunnelling*. Data for a further 48 projects have been collected and will be prepared for publication in 1979.

Review of existing legal requirements

Agreement was reached in principle that there would be one Act in regard to mining operations, but that separate sets of regulations should be promulgated to control the different types of mining operations, i.e. one for mines and works and one for civil engineering. It had been hoped to have these ready for the 1979 parliamentary session, but it had proved impossible. Good progress is now reported on this project.

New working groups

During the year, new I.T.A. working groups were formed in the following spheres:

- (i) maintenance and repair of underground structures,
- (ii) structure design,
- (iii) seismic effects on underground structures,
- (iv) technological interchange.

SANCOT continues to provide a worth-while service to all organizations interested in tunnelling.

Orange Free State-Klerksdorp Branch

Office Bearers

H. M. W. Eschenberg (Chairman), W. C. Mather (Vice Chairman), A. N. Shand (Immediate Past Chairman), V. E. Kisbey Green (Honorary Secretary).

Committee Members

E. C. Hunter, W. G. H. Jackson, Z. T. Lombard, H. J. Rheeders, P. S. Wentworth, C. J. C. Young.

P. S. Wentworth, C. J. C. Young and H. J. Rheeders resigned from the Committee and the Branch during the year because of their transfer to other areas.

General Meetings

Two General Meetings were held during the year.

29th November 1978: 57 members and visitors attended a talk and a demonstration of 'An all analogue fire detection system for gold mines' by Messrs N. T. van der Walt and J. Bout of the Anglo American Electronic Laboratory, which was followed by a slide presentation and description of a fire at a uranium plant, by Mr J. Flinn of Mather & Platt (S.A.) (Pty) Limited.

29th February 1979: 49 members and visitors attended a 'Question and answer' session on corrosion conducted by Professor F. P. A. Robinson, Professor of Metallurgy at the University of the Witwatersrand.

Visits

A very interesting and successful visit to the Drakensberg Pumped Storage Scheme at Tuva was attended by 18 members on 23rd May, 1979.

Membership

The membership of the Branch did not change substantially during the year.

	June 1978	June 1979
Fellows	18	12
Members	52	43
Associate Members	40	44
Graduates	13	14
Students	10	29
	—	—
	133	142
	—	—

Witbank-Middelburg Branch

During the year under review, the activities of the Branch were reasonably supported by members.

Meetings

Four committee meetings and two general meetings were held during the year.

The first general meeting was held at Secunda on 1st February, 1979, when Mr Keyter, the Public Relations Officer of Sasol II, outlined the operation and later conducted a bus tour through the new construction site.

On 5th April, 1979, another meeting was held, when an address was given by Mr T. S. O'Connor, the Regional Manager of Escom (Eastern Transvaal Area), on the development of Escom from the early days at Witbank in 1927 to the present giants of the Kriel and Matla power stations.

Finance

All activities were self financing. The balance in the savings account at the end of the year was R121,28.

General

The Chairman thanks committee members for their support during the year, and asks the members of the branch to give the incoming committee their full support in the new year to ensure the success of the October colloquium.

Honorary Services

Appreciation is recorded for the services of the Honorary Legal Advisers, Messrs van Hulsteyn, Duthie and Saner, and the Council is most grateful for the invaluable assistance given to the Institute by the Honorary Treasurer, Mr J. K. E. Douglas.

Gratitude is expressed to the chairmen and members of committees for their invaluable assistance and co-operation in the organization of the many and varied functions of the Institute.

THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY
Income and Expenditure Account for the Year ended 30 June 1979

1978		1979		1978		1979	
R	R	R	R	R	R	R	R
	34 183	Secretarial fee and overhead charge — Associated Scientific and Technical Societies of South Africa	43 620	33 300	Subscriptions	33 551	
	285	Audit fee	255	16 000	Company affiliates subscriptions	16 600	
1 279		Contributions — Federation of Societies of Professional Engineers	1 792	783	Entrance fees	749	
—		Environmental Planning Professions inter-disciplinary committee	200	10 702	Interest and dividends received	9 960	
200		South African National Committee on Tunnelling	200	1 567	Surplus on sale of publications	1 331	
	1 479			4 915	Symposia and colloquia	6 713	
	84	Bad debts written off	2 192	9 019	Vacation School	21 522	
	300	Donation—South African Federation of University Engineering Students	476	—	Transfer from provision for doubtful debts	1 070	
	2 180	General expenses	3 513	723	Bad debt recovered—Dividend from insolvent estate P. Wilson & E. Mansfield & Company	—	
	20	Medals	310	264	—Miscellaneous	25	
	2 592	Postages	3 622	—	Witbank-Middelburg Branch functions	111	
	6 082	Stationery and printing	7 230		NOTE: Voluntary contributions by members amounting to R1 464 were collected and paid over by the Institute to the A.S. & T.S. Trust and are not included in the income statement (1978 — R1 295).		
	—	Provision for doubtful subscriptions	853				
	—	Council of Commonwealth Mining and Metallurgical Institutions	1 700				
22 020	1 320	Provision for doubtful debts	—				
5 085		Institute journal—Expenses	26 268				
		—Secretarial fee	5 700				
27 105			31 968				
11 905		Deduct: Advertising	6 544				
9 656		Sales	6 232				
2 448		Subvention—Department of National Education	2 958				
24 009			15 734				
12 844	3 096	Monograph series—Expenses	18 554				16 234
3 452		Deduct: Sales	15 744				
	9 392	Excess of income over expenditure trans- ferred to accumulated fund	8 517				
	16 260						
	<u>R77 273</u>		<u>R91 632</u>		<u>R77 273</u>		<u>R91 632</u>

Automation

The Third Symposium on Automation in Mining, Mineral and Metal Processing is to be held in Montreal, Canada, from 18th to 20th August, 1980. The Symposium will provide an opportunity to review the progress made in the application of automatic control in these fields since the Second Symposium, which was held in Johannesburg in 1976.

The following topics will be discussed:

- *Mining* — prospecting; computer-aided mine design techniques; materials handling; transportation; mining equipment and methods; environmental control; monitoring; equipment dispatching and production scheduling.
- *Mineral Processing and Extractive Metallurgy* — grinding and flotation; agglomeration; beneficiation; blast furnaces; direct reduction; electrolysis; pyrometallurgy; sintering; kilns operation.
- *Metal processing* — steelmaking; non-ferrous metal production; reheat furnaces; rolling mills; continuous casting.

- *Computers and Control Equipment* — system design techniques; equipment design; interfaces and data transmission; man/machine communications; distributed systems; control software; realtime operation systems; procedural languages; problem oriented languages.
- *On-Line Instrumentation* — measurement techniques for the above processes; use and design of sensor-data acquisition, and telemetry systems.
- *Control Theory* — identification; modelling; optimization; sensitivity and stability analysis; control algorithms relevant to the above processes.
- *System Engineering* — economics of computer control; reliability; human factors; integrated system approach; case studies of computer control systems.

Further information is obtainable from Secretariat IFAC/AMMMP, Centre de Développement Technologique, École Polytechnique, C.P. 6079, Succ. "A", Montréal, Quebec H3C 3A7, Canada.