

Proceedings, Annual General Meeting*, 1988

The 91st Annual General Meeting of The South African Institute of Mining and Metallurgy was held at Kelvin House, Johannesburg, on 17th August, 1988. Mr B.C. Alberts (President) was in the Chair, and declared the meeting open at 16h00.



Mr B.C. Alberts, President 1987/88

Obituaries

The President announced the deaths of the following members of the Institute:

Honorary Life Fellows: H. Britten (Past President 1955/56), Prof. J. de V. Lambrechts (Past President 1962/63), Prof. L. Taverner, and D.A. Viljoen (Past President 1979/80)

Life Fellows: D.E.B. Collett, A.E. Edge, S.A. Hancox, J.X. Harington, R.J. Westwood

Retired Fellows: A.W.T. Barenbrug, D.G. Davies, E.J.G. Gastrell, G.F. Rautenbach, S. Selmer-Olsen, C.H. Townsend, Dr R.S. Young

Fellows: N.G.W. Comyn, J.S. Smith

Retired Member: D.A. Logie

Members: O.M.B. Allman, G. Cappendell, J.E. Clarke, J.A.J. Cunliffe, E. Livesey-Goldblatt, B. Lund

Retired Associate: J.F.B. Jeppe

Associates: D.J. Botha, J.H. Smit, G. Smith.

As a mark of respect to the memory of the deceased and in sympathy with the bereaved, all stood and observed a moment of silence.

Minutes

The minutes of last year's Annual General Meeting,

* The photographs accompanying these Proceedings were taken by Carlos Pais. All the captions read from left to right.

(19th August, 1987) which were published in the *Journal* of November 1987, were confirmed.

Welcome

The President welcomed the following guests and members:

Dr W.J. (Wim) de Villiers and Dr L. Alberts.

Honorary Life Fellows

Dr P.R. Jochens
D.G. Malan
Dr F.G. Hill
Dr R.E. Robinson
P.W.J. van Rensburg
P.A. von Wielligh
Prof. A.N. Brown.

Presidents of Societies (including SACPE)

D.H. Mills	The Associated Scientific and Technical Societies of South Africa
Dr M.J. Viljoen	Geological Society of South Africa
S. van Niekerk	Institute of Land Surveyors of the Transvaal
M. Myers	SA Institution of Mechanical Engineers
C.D. Scott	SA Institute of Assayers and Analysts
G.R. Backer	Institution of Certificated Mechanical and Electrical Engineers, SA
C.M. McMillan	SA Institution of Civil Engineers
S.J. Bluhm	Mine Ventilation Society of South Africa
Prof. J.D. Bradley	SA Chemical Institute
E.C. Hunter	Association of Mine Resident Engineers
L.R. Robinson	SA Council for Professional Engineers
J.T. Hulbert	Affiliation of Societies Representing Engineering Technicians (ASRET)
T.E. Stidworthy	South African Association of Registrable Engineering Technologists (SAARET)
A. Coetzee	SA Federation of University Engineering Students.

Award and Prize Winners, Gene Fivaz (Incoming President), guests, Branch Chairmen, and representatives of the media.

Senior members of the industry, members of the Institute, and the other guests present.

Membership

The names of members admitted and transferred to higher grades of membership are given in the Annual Report (pp. 287 to 305 of this issue). The President welcomed all the new members and congratulated those who had been transferred to higher grades.

Honorary Life Fellowship

President: Honorary Life Fellowship is awarded by Council to Corporate Members who have rendered outstanding service to the industry or to the Institute. This year, these awards are being made for services to the Institute, and it is my pleasure to announce that Council has decided to award Honorary Life Fellowships to Professor R.P. King and Mr J.D. Austin.

Professor Peter King is a Past President of the Institute, having served on Council since 1975. He has always been a very active member on Council. His contributions to the Institute in general have been considerable, and more specifically to the Training and Career Guidance Committee, which he chaired for many years. During the past year, he played a very active role in the organization of GOLD 100 and APCOM '87, and his experience meant a great deal to the organizers of these events. He has also served on the Journal Committee and was responsible for the editing of the Monograph entitled 'The Principles of Flotation'.

Professor King: The honours that are bestowed by the Institute on its members are few but, when one does receive such an honour, one feels very highly rewarded indeed. The President has listed the Honorary Life Fellows who are here this afternoon, and it is a moment of particular pride to me to join that very august group. Thank you very much for this great honour.



Prof. R.P. King receiving his Honorary Life Certificate from Mr Alberts

President: John Austin has served on Council since 1977 and is also a Past President. He has built a monument to himself for his efforts in regard to the publications of the Institute. He has performed many tasks beyond the normal level of work for Council members, and has also been actively involved in the management of the Secretariat over many years. As John Austin is not present today, I call on Professor Peter King to come forward and accept his award.

Brigadier Stokes Memorial Award

President: The Brigadier Stokes Memorial Award was instituted in 1980 to commemorate the outstanding contribution to the South African mining industry made by Brigadier R.S.G. Stokes, Honorary Life Fellow and a

Past President of the Institute. The award consists of a platinum medal and a cash award, and is made to an individual for the very highest achievement in the South African mining and metallurgical industry. It gives me great pleasure to announce that the award for 1988 is to be made to Dr Willem de Villiers.

Willem Johannes de Villiers is in 1921 te Jacobsdal gebore. Hy het sy skoolopleiding aan die Grey College, Bloemfontein, gehad en het die grade B.Sc. (Elek. Ing.), B.Sc. (Meg. Ing.) en Ph.D. (Meg. Ing.) aan die Universiteit van Kaapstad behaal.



Dr Wim de Villiers, recipient of the Brigadier Stokes Memorial Award, and Mr Alberts

His professional career started in 1945 when he was appointed Engineer at the Pretoria Power Station. He joined Anglo American Corporation in 1950 and worked for the Rhokana Corporation (in Zambia) from 1950 to 1960.

He returned to South Africa in 1961 as Anglo American Corporation's consulting engineer in charge of production and productivity on its gold mines. It was during this period that Dr De Villiers first introduced the now widely applied and efficient system of concentrated mining in gold mines. He set out to prove that, in order to increase labour productivity in mining, it is necessary to concentrate the stoping operations. By improving stoping techniques, Dr De Villiers played a major role in the significant increase in tonnage output per manshift achieved by Anglo American mines during the early 1960s. Today, the system of concentrated mining is in general use throughout the industry.

In 1965, Dr De Villiers became managing director of LTA Engineering, and played a leading role in organizing the consortium that was awarded the tender for the Cahora Bassa dam project.

Hy word in 1969 nywerheidsraadgewer vir Sanlam. In 1970 sluit hy aan by General Mining Union Corporation (Gencor) waarvan hy, onder andere, besturende direkteur en uitvoerende voorsitter word. Hierna, in 1983, word hy Voorsitter van die Kommissie van Ondersoek na Eskom en in 1985 doen hy ondersoek na die strategiese beplanning, bestuurspraktyke en bestuurstelsels van die Suid-Afrikaanse Vervoerdienste. In Maart 1986 word hy

'n adviseur vir die regering.

Hy het ook op verskeie ander liggame gedien, naamlik op die Verdedigingsadviesraad, die Verdedigingsbeplankingskomitee, die Administrasiekommissie en die Raad van die Kamer van Mynwese, en was Direkteur van die SA Reserwebank.

Hy is ook die ontvanger van die volgende toekennings en eregrade:

- Tinie Louw-toekenning van die Afrikaanse Handelsinstituut
- Sakeman van die Jaar, 1979
- Man van die Jaar, *Financial Mail*, 1980
- Ereprofessor in bedryfseconomie, Randse Afrikaanse Universiteit
- Britse Institution of Mining and Metallurgy se Goue Medalje vir 1981 vir sy besondere bydrae in die ontwikkeling van ingenieurs- en minerale-hulpbronne in Suid-Afrika
- Ereburgerskap van sy geboortedorp, Jacobsdal
- Hendrik Verwoerd Trust-toekenning vir buitengewone diens van nasionale betekenis
- Ere-doktorsgraad in die handelwetenskappe van die Universiteit van Stellenbosch
- Ere-doktorsgraad in die ekonomiese en bestuurswetenskappe van die Randse Afrikaanse Universiteit
- Ster van Suid-Afrika (Groot Offisier)
- Staatspresident se Dekorasie vir Voortreflike Diens
- Order van die Ster van Suid-Afrika (Siviele Afdeling) in die Groot Kruisklas, 1981.

Dr De Villiers' views on management philosophy and practices, developed from the original work of the French author on management, Henri Fayol, have been published in two books: *Principles of Decentralized Management* and *The Efficient Utilization of Human Resources in the Republic of South Africa*. These books cater specifically for South African needs, and express the view that increased productivity, growth, and employee satisfaction can be achieved only by applying and enhancing the mechanics of management (investigating, estimating, planning, and organizing) at all levels of management and improving management control. A simplified edition of the first-mentioned book with the subtitle *Guide for Supervisors* has also been published to assist in training persons in these skills up to supervisory level. *Strategic Planning* was published in 1983. He has also published a number of articles, dealing mainly with management and technical themes.

Hy het 'n fenomenale bydrae tot die Suid-Afrikaanse sakewêreld gelewer, wat bevestig word deur die posisies wat hy by etlike ondernemings beklee het. Hy is ook deur die regering in verskeie belangrike kommissies aangestel, wat ook sy hoë aansien in regeringskringe bevestig. Sy publikasies getuig van sy bestuursvermoë en insig en van sy geloof in wetenskaplike bestuur. Die toekennings wat hy van die Staat, die akademiese wêreld en die sakesektore ontvang het is verder bewys van sy persoonlike vermoë en kennis en van sy leierskapvermoëns. Hy kan as 'n dinamiese en diepsinnige bestuurder tipeer word, 'n persoon wat hom reeds onderskei het en wat nog steeds aktief in die sakewêreld betrokke is.

Dr De Villiers is a man of exceptional qualities who has made his mark in the business world. It is an honour for the Institute to award him the Brigadier Stokes Award

for his contributions to the mining industry and to the South African business world in general.

Dr De Villiers: Dit was so teen die einde van 1949 wat ek in hierdie selfde saal 'n verhandeling gelees het wat eintlik gegaan het oor die tesis wat ek ingehandig het by Wits Universiteit. After that meeting and after the discussion, Mr George Bradford and Mr T.K. Douglas of Anglo American approached me and asked whether I would go up to the Copper Belt. I didn't realize that evening that I was saying farewell to being an electrical and mechanical engineer and entering the field of metallurgy and mining. The next 11 years my wife and I spent on the Copper Belt—daar het ek toe uiteindelik 'n mynbestuurder geword sonder om een dag ondergrond te werk. Dit is nie elke dag wat dit gedoen word nie!

Ek wil baie dankie sê vir hierdie toekenning. Dit is 'n lang tyd wat ek in die mynbou en in die metallurgiese bedryf gestaan het en dit besonder geniet het, want ek dink dit is die bedryf wat vir 'n mens die grootste bevrediging gee en waarin jy jou kan uitleef. Ek het dit terdeë geniet en ek glo die kollegas, die persone wat hier sit wat ek ken en ook in hierdie bedryf staan, geniet dit vandag net so. Thank you very much for this honour.

Presentation of Medals

President: One of the key performance areas of the Institute is to maintain and foster the interest of individual members. To achieve this objective, the Institute makes awards, in the form of medals, prizes, and certificates, in recognition of technical excellence, to stimulate a sense of pride in high standards of performance, and to encourage individuals involved in the minerals and metals sector to share the results of their work through publication. The following categories are eligible for awards: individuals for the very highest achievements in the South African mining and metallurgical industry, members and non-members for papers of the highest standard published in the *Journal* and other publications of the Institute, and students from universities and technikons for exceptional academic performance.

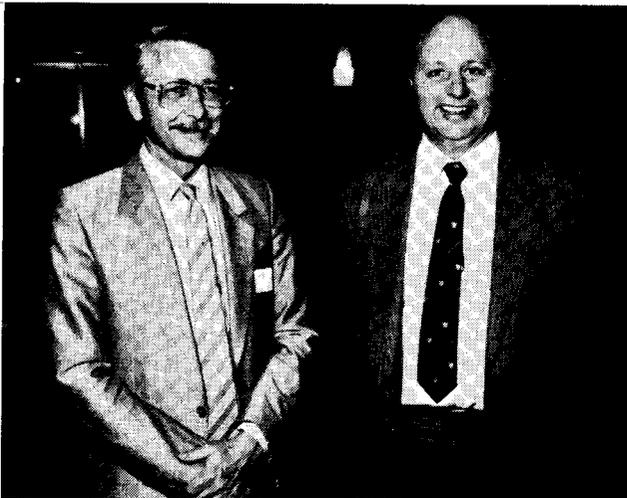
Journal Papers

This year Dr J.A. Ryder is awarded a gold medal for his paper entitled 'Excess shear stress in the assessment of geologically hazardous situations', which was published in the January 1988 issue of the *Journal* (motivation on p. 290 of this issue).

E.B. Viljoen, M.S. Janssen, and J.L. Taylor are awarded silver medals for their paper entitled: 'The first six years of the Chemwes uranium plant', which was published in the April 1987 issue of the *Journal*.

This paper is one that has set an unusual but very necessary precedent in that it covers a project from its commissioning in 1979 to the next six years of operations, and compares actual performance with predicted performance. This aspect of follow-up is generally left unsaid. The trials and tribulations both during and after commissioning are sometimes spoken of within the organization but not presented to the technical world at large. The monthly performance figures over the six-year period and the method of presentation are excellent.

Dr M.A. Ford and H.A. Simonsen, co-authors of the above paper (who are not members of the Institute) are awarded certificates.



Dr J.A. Ryder, recipient of an SAIMM gold medal, and Mr Alberts

APCOM '87—Volume 1—Mining

A silver medal is awarded to S.J. Bluhm for his paper entitled 'ENVIRON: A computer program for the simulation of cooling and ventilation systems in South African gold mines'.



Mr Alberts and Prof. H.S. Sichel, recipient of an SAIMM gold medal

The environmental engineering laboratories of the Chamber of Mines' research programme have updated and refined the earlier methods of predicting heat flow into mine workings. The result is a computer programme called HEATFLOW, which gives the user a highly flexible tool for modelling heat sources and cooling appliances in a mine network. Concurrent with this development, a programme called VENTFLOW was produced, giving the user the facility to model the mine airflow network. While the latter programme is not unique, the combination of HEATFLOW and VENTFLOW, which constitutes the latest programme, ENVIRON, now broadens the potential scope of mine modelling to an extent formerly unknown. This valuable work, which is described in the paper, is indeed worthy of this award.

F.H. von Glehn, B.J. Wernick, and G. Chorosz, who are co-authors of the above paper but not members of the Institute, are awarded certificates.

APCOM '87—Volume 3—Geostatistics

Professor H.S. Sichel is awarded a gold medal for his paper entitled 'Some advances in lognormal theory' (motivation on p. 290 of this issue).

Presentation of Student Prizes

President: Prizes were awarded to the following students for the best project reports in part fulfilment of the B.Sc. (Eng.) degree:

W.J.S. van Zyl, Departement van Mynbou-Ingenieurswese, Universiteit van Pretoria, 'n toekenning en 'n sertifikaat vir sy skripsie getiteld 'Ondergrondse koeltoering—Free State Geduld Goudmyn'.

P.C. Pistorius, Departement van Materiaalkunde en Metallurgiese Ingenieurswese, Universiteit van Pretoria, 'n toekenning en 'n sertifikaat vir sy skripsie getiteld 'Using the scanning reference electrode technique and a finite difference method to study galvanic corrosion'.

Mr Pistorius gave an authoritative overview and analysis of the relevant literature, and his experimental work was outstanding. But what impressed most was the exceptional quality of his synthesis. He made a scientific contribution of significance far beyond the normal abilities



B.J. Wernick and F.H. von Glehn (winners of certificates) with Mr Alberts and S.J. Bluhm (recipient of an SAIMM silver medal)



Mr Alberts and Mr W.J.S. van Zyl, certificate winner—University of Pretoria



Mr Alberts and Mr P.C. Pistorius (certificate winner—University of Pretoria)

of an undergraduate student, and deserves a special award for this most outstanding and exceptional contribution. His work involved the experimental characterization of the potential distributions in the electrolyte adjacent to corroding surfaces. He then used the results to verify a mathematical model of the corroding system and to predict possible galvanic corrosion rates between metal couples.

Other prizes, awarded to students at the Universities of the Witwatersrand, Pretoria, and Potchefstroom, were presented at faculty prize-giving ceremonies and are listed on p. 291 of this issue).

Annual Report and Accounts (See pp. 287 to 308 of this issue)

President: In line with the Institute's rationalization programme, which was started in the presidential year of Mr Henry James, partially implemented in his year of office, and followed by further implementation in Dr Wagner's presidential year, I think we have reached the stage when the programme has been fully implemented. We are now working in accordance with the organization envisaged after the strategic planning exercise undertaken at Thabazimbi in 1986.

The President then presented the Annual Report with the help of slides, and called on Dr Horst Wagner to present the financial report and to second the adoption of the Annual Report and Accounts. Before seconding the adoption, Dr Wagner commented on points in the financial report, which is included in this issue on pp. 306 to 308.

Office Bearers and Members of Council for 1988/89

President: I have pleasure in announcing that, in accordance with clauses 3.2 and 3.3 of the Constitution, the retiring Council has elected the following Office Bearers for the ensuing year: *President* C.E. Fivaz; *President Elect* Dr O.K.H. Steffen; *Senior Vice-President* H.G. Mosenthal; *Junior Vice-President* R.D. Beck; *Immediate Past President* B.C. Alberts; *Honorary Treasurer* Dr H. Wagner.

In terms of the election of ordinary members of Council, there is a letter from the scrutineers stating that 'we have to report that we have inspected the nomination papers for members of Council for the 1988/89 session, and have found that the ballot papers sent out to Corporate Members of the Institute were in order. There was a return of 496 papers, representing a return of 33,9 per cent. There were 6 spoilt papers. As a result of our scrutiny, we find that the following members have been elected: D.A.J. Ross-Watt, J.S. Freer, J.A. Cruise, R.J. Dippenaar, V.J. Moore, R.A. Snodgrass, J.P. Hoffman, G.A. Fourie, G.A. Brown, H. Scott-Russell, L.A. Cramer, R.P. Mohring, P.M.T. White, and P.C. van Aswegen'. In addition, Dr J. Lurie and Mr D. Wilson were elected unopposed to represent non-corporate members on Council.

In terms of clause 3.2.8 of the Constitution, the Chairmen of the Johannesburg Branch, Mr G. Emère, the Orange Free State Branch, Mr J. McCallum, the Pretoria Branch, Mr J.P. Deetlefs, the Vaal Triangle Branch, Mr F.D. Abbott, the Western Cape Branch, Dr J.P. Franzidis, the Western Transvaal Branch, Mr N. Devine, and the Witbank/Middelburg Branch, Mr A. Henderson, will serve on Council.

The following Past Presidents have signified their willingness to serve on Council for the ensuing year: P.W.J. van Rensburg, Prof. R.P. Plewman, Dr R.E. Robinson, P.A. von Wielligh, Dr P.R. Jochens, G.Y. Nisbet, Prof. A.N. Brown, Prof. R.P. King, H.E. James, J.D. Austin, and Dr H. Wagner.

I thank our Past Presidents for their continuing support, I congratulate all those elected, and I thank all those who have agreed to serve another term of office.

Mr R.P. Mohring: Mr Hugh Scott-Russell has been called away unexpectedly and offers his apologies. On behalf of the newly elected members of Council, I wish to express our sincere gratitude to the members for the confidence placed in us to serve on this prestigious body. We all regard it as a singular honour to be given the opportunity to serve on Council and, in so doing, serve the interests of the members of our Institute and the mining industry in general. I assure you that we shall endeavour to serve with distinction. The Council has a proud tradition and a unique role to play in the industry, and we shall do our best to continue in this tradition and contribute to the future well-being of the Institute and the industry.

Induction of President

President: Gene Fivaz, Pr. Ing., is 'n Metallurgiese Raadgewer vir sowel die Navorsingsorganisasie as die Kamer van Mynwese. Nadat hy aan die Universiteit van Stellenbosch gegradueer het met 'n M.Sc.-graad in Chemie, was hy vir 'n kort rukkie 'n lektor voordat hy in 1958 by Rand Mines aangesluit het en hom direk aan ekstraksiemetallurgie gewy het waar hy oor die volgende 27 jaar ondervinding op 'n breë basis opgedoen het. Hy was gedurende hierdie tydperk betrokke by metallurgiese N & O, projekteerinswese en produksie. Hy het in 1972 ook die Ontwikkelingsprogram vir Uitvoerende Beamptes aan die Graduate School of Business Administration van die Universiteit van die Witwatersrand voltooi.



Mr Gene Fivaz and Mrs Josie Fivaz

As Consulting Metallurgist and Chief Consulting Metallurgist of the Rand Mines Group from 1977 to 1984, he had the overall responsibility for all the metallurgical operations and related activities in the gold, uranium, coal, and base-minerals fields, and the design and commissioning of several new plants. In addition, he was involved in the metallurgical aspects of exploration activities, from laboratory investigations through to pilot-plant stage, and the evaluation of the technical and economic viability of such projects in conjunction with other disciplines.

Hy het Rand Mines in 1984 verlaat om as privaatkonsultant te werk maar het daarna in 1985 besluit om by die Kamer van Mynwese se Navorsingsorganisasie aan te sluit as Hoof van die Afdeling Waternavorsing in wat destyds die Tak Materiaalingenieurswese was, waar hy ook verantwoordelik was vir die koördinerende van alle gesamentlike metallurgiese navorsing binne die Kamer van Mynwese. Met die rasionalisasie van die takke in 1986 het hy na metallurgie oorgegaan en is hy as Metallurgiese Raadgewer aangestel. Gene dien in verskeie komitees van die Kamer van Mynwese en Rand Refinery Limited.

His association with The South African Institute of Mining and Metallurgy began in 1960, when he joined as an Associate Member, and he became a Fellow in 1971.

He was elected a Member of Council in 1979 and President Elect in 1987.

Gene is met Josie getroud en hulle het 4 kinders—'n seun, Cecil, en drie dogters, Almarie, Hermine and Josie.

Sy sport-aktiwiteite behels gholf en muurbal asook tennis en swem. In sy jonger dae het hy rugby, in die posisie van flank, gespeel.

Sy stokperdjies is fotografie en om te lees.

Incoming President: Dit is met trots, maar terselfdertyd opregte nederigheid dat ek die posisie as President van Die Suid-Afrikaanse Instituut van Mynbou en Metallurgie aanvaar. Ek is ten volle bewus van die eer wat hiermee gepaard gaan. My voorgangers het 'n baie hoë standaard gestel en dit gaan my beste vermoëns verg om hulle voetspore te volg. Met die ondersteuning van die ampsdraers en die Raad, hoop ek om die eer wat my te beurt geval het, waardig te wees. Ek is inderdaad bevoorreg om op die hulp, wysheid en toegewydheid van dr. Oskar Steffen as aangewese President en mnr. Gordon Mosenthal as Senior Vice-President en mnr. Richard Beck as Junior Vice-President te kan staatmaak. Ek is besonder dankbaar dat dr. Horst Wagner homself beskikbaar gestel het om in die komende jaar voort te gaan as Ere-Penningmeester en ek bedank hom vir sy volgehoue en toegewyde diens in belang van die Instituut.

In die lig van die voorafgaande, gaan ek my uiterste bes doen om die vertroue wat u in my gestel het, gestand te doen.

I congratulate the members who were re-elected to Council and also give a hearty word of welcome to Dr L.A. Cramer and Messrs G.A. Brown, R.P. Mohring, H. Scott-Russell, and P.M.T. White, who are joining us on Council for the first time. I thank the Past Presidents who have indicated their willingness to serve on Council. We have relied on their experience and wisdom to a considerable extent in the past, and I am convinced that this will also be the case in the coming year.

I also thank those employers who allow their senior staff to participate in the affairs of the Institute.

Ek sien daarna uit om in die jaar wat voorlê met ons Sekretaresse, Celeste Mackintosh en haar span, Pamela Binstead, Caroline Jansen en Sonja Blom, asook met die bestuurder van GW & TV onder leiding van Jennie Nel, ten nouste saam te werk. Ons Sekretariaat het in die afgelope jaar dikwels en onder moeilike omstandighede, besondere toegewyde en effektiewe diens gelewer. Ek glo dat met die her-struktureëring wat plaasgevind het, dit vorentoe nog beter sal gaan. Ek is daarvan oortuig dat u, saam met my, ons opregte dank en waardering teenoor ons Uittredende President uitspreek vir die onbaatsugtige diens wat hy gedurende sy presidentsjaar gelewer het. Hy het met kenmerkende doelgerigtheid en aansteeklike entoesiasme die leierskap geneem. Opofferings aan sy en sy garde, Ansie, se kant, was altyd op innemende wyse gemaak. Elke presidensiële jaar bied, afgesien van die normale pligte, baie besondere uitdagings. Ook in hierdie opsig het ons Uittredende President sy merk gemaak met die aanbieding van die besondere suksesvolle simposium wat gegaan het oor bestuurstegnieke in die mynbou- en metallurgiese bedryf.

Ten slotte bring ek graag hulde aan Ben en Ansie vir hulle besondere bydrae tot die sake van die Instituut. Namens die Raad vra ek vir Ben om 'n skild, waarop die

wapen van Die Suid-Afrikaanse Mynbou en Metallurgie aangebring is, in ontvangs te neem, om hom gedurig aan sy ampsjaar te herinner.

I now invite Dr Steffen, the President Elect, to take the chair on my right, and Mr Beck to join me on the rostrum.

Appointment of Auditors and Honorary Legal Advisers

Incoming President: I propose that Aiken & Peat be re-appointed, and Van Hulsteyn, Duthie & Saner be re-appointed as legal advisers to the Institute for the coming year.

General

Dr P.J.D. Lloyd: I would like to thank the outgoing President for the very strong statement on the rationalization of the engineering profession. I am sure many members of the Institute were as surprised as I was when I received *Engineering/Ingenieurswese* for July 1988, in which we were requested to vote for a rather nebulous proposal. In that Journal, the Chairman of The Interim Council said, 'The Interim Council has been overwhelmed by the positive response and constructive criticism received from the Institutions and Societies of the engineering profession. The Interim Council wishes to obtain a yes or a no answer, from which a decision will be made to proceed with the next phase which will be the official launching of the South African Engineering Association. It would be a great tragedy for the engineering profession if the formation of the South African Engineering Association could not commence in the shortest possible time'.

The matter is further confused by a message in the same issue from Professor Van Duuren, National Chairman of the Engineers Association of South Africa, requesting a questionnaire about the Society of Professional Engineers to be returned to his Association as soon as possible. I am sure many members are not aware of the differences between the South African Engineering Association, the Engineers Association of South Africa, the Society of Professional Engineers, and the Federation of Societies of Professional Engineers. I feel strongly that we should not receive from another organization messages urging us to vote for something which, far from rationalizing the profession, is increasingly confusing. The message from our Outgoing President should warn our members not be rushed into voting for something so ill-defined.

President: Thank you, Dr Lloyd. We have noted the matters that you have just raised, and these will be dealt with in the very near future by the Institute.

Dr J-P. Franzidis: I have spent the last few days at the 5th National Meeting of the South African Institution of Chemical Engineers in Pretoria (which is why I happen to be here, because somebody else paid for my ticket from Cape Town!). This meeting is held every four years and is a valuable opportunity for chemical engineers from industry, research organizations, and universities to meet and discuss progress and current research, and to hear position papers from leading international people from overseas. The South African Institute of Mining and Metallurgy is surely one of the largest, if not the largest, professional body in South Africa. I know we have lots of technical meetings, and Dr Wagner has pointed out how successful these were financially, but I cannot understand why we don't have national meetings. They have

such meetings in the USA, Canada, and Australia, which I know of, and affiliated with these there are conferences at which members of the individual professions meet. I know many people overseas would like to attend such a meeting and, in fact, have been waiting for such an opportunity to visit this country, particularly with the state of our currency at the moment. I would like to propose that Council should investigate and consider such a regular national meeting.

President: Thank you, Dr Franzidis. Dr Franzidis is the Chairman of our Western Cape Branch. We take note of your comments and will certainly follow them up.

Presidential Address

Dr Steffen then took the Chair while Mr Fivaz delivered his Presidential Address entitled 'How the MacArthur-Forrest cyanidation process ensured South Africa's golden future', which is reproduced on pp. 309 to 318 of this issue.

Dr Steffen: Mr President, only now do I realize how much time and effort go into the preparation of a Presidential Address, and I can understand why you were always so anxious to get away from meetings when we came to 'General' on the Agenda. I am not so sure about the recovery side, but, if I have to judge recovery on the basis of the recovery of slide projections that went along during the presentation, I have a lot of faith in the recovery processes presented by a metallurgist to us tonight.

I have pleasure in inviting Dr Wagner to propose the vote of thanks to the President.

Dr Wagner: It is my great pleasure to thank Mr Fivaz, as Incoming President of The South African Institute of Mining and Metallurgy, for his stimulating address on the development of the cyanidation process by J.S. MacArthur and the Forrest brothers, and the impact it had on the South African gold-mining industry.

His address was very appropriate, not only because it was delivered in the centenary year of the invention of this metallurgical process, but also because there are many similarities between the state of the gold-mining industry today and what it was one-hundred years ago. In my view there is, therefore, more than a historical and technical interest in what we have heard today.

I would like to reflect on some of the historical aspects, and draw some comparisons with the present situation of the industry. As our President has pointed out, the gold recovery from the amalgamation of oxidized ore in the outcrop zone was between 75 and 85 per cent. When these easily accessible ore deposits were extracted and mining progressed to greater depths, a new type of banket ore was encountered, and recovery efficiencies by the amalgamation process dropped disastrously. The situation deteriorated even further when pyritic ore was treated. Within a few years, as we heard earlier, the gold-mining industry appeared to be doomed, and there was little hope for the future. It was largely through the invention of the cyanidation process that the future of the gold-mining industry, and indeed the economic development of the country, was secured.

Today, one-hundred years later, the gold-mining industry is strong and forms the backbone of the country's economy. However, in my view there are a few dark clouds on the horizon that should not be overlooked.

First of all, the average grade dropped from about 13,5 grams per ton to about 5,16 grams per ton over the period 1970–1985; the gold ore mined decreased from 1000 tons in 1970 to about 606 tons in 1987; and the ton load, as we heard earlier, increased from about 75 million tons to 120 million tons.

Furthermore, and of equal concern, is the change in working costs. The working costs, expressed in rands per ton yield, have risen over the past 15 years at a rate that is twice the rate of the consumer price index. If you look at the working costs in terms of cost per kilogram of gold mined, then the costs have increased at five times the consumer price index; so there is a very high cost inflation in the industry. The combined effect of decreasing grade and increasing cost is that the role of South Africa as a gold producer has been reduced, both in terms of market proportion and in terms of competitiveness. In 1974 South Africa produced nearly 1000 tons of gold per annum, which amounted to 70,6 per cent of the world's gold production, while in 1987 this dropped to 606 tons of gold or 44,2 per cent of the world's gold production.

As a result of the high cost inflation, South Africa now ranks only fifth among the major gold-producing countries of the world in terms of costs, after having been the lowest-cost producer for years. In 1974 South Africa was still ranked No. 1, whereas by 1987 it had dropped to No. 5.

To date, the effects of all these factors have been compensated for by the decrease in the value of the rand when compared with other currencies, and the industry has been able to continue making an important contribution to the economy of the country. Assuming that the cost trend continues and the gold price in dollar terms remains stable, then only a sliding rand can secure the industry. However, the implications of such a development for the overall economic development of the country are obvious.

There are many factors that contribute to inflation. The most important of these is the increase in wages. These have increased twentyfold since 1970 without really significant increases in labour productivity. Other contributors are the cost of capital goods, which are imported, and the high increase in the cost of electricity.

How sensitive the gold-mining industry is to changes in working costs can be seen from the amount of recoverable ore reserves that are being lost as a result of a change in working costs. If we take 1977 as the sort of base point, and if we assume a reduction in working costs of R15 per ton, another 35 billion rands will become available in terms of economically recoverable ore reserves. If, on the other hand, the working costs increase by R15 per ton, then about 30 billion rands worth of gold is being lost to the industry. This shows the significant sensitivity of the gold-mining industry to changes in working costs.

I think you will agree with me that the parallel between one-hundred years ago and now is quite clear. A century ago, poor gold recoveries threatened the industry. Today

the threat doesn't come from the gold recoveries so much, but from cost inflation and the emergence of low-cost producers in other parts of the world.

Mr Fivaz, in his address, has shown how innovative thinking, dedication, and entrepreneurship on the part of MacArthur and the Forrest brothers resulted in significant improvements in extraction efficiencies, which are now in excess of 96 per cent. It is obvious that men with the very same qualities are needed today to bring hope to the ever-escalating working costs in our mines.

Fortunately, the leaders of industry, with considerable foresight, have initiated and supported the far-reaching research and development programmes that were launched in the early 1970s. The results of this investment in the future of the industry are now forthcoming, and many developments have reached the application stage. The carbon-in-pulp process, developed by Mintek in close collaboration with the gold-mining industry, has already found widespread application, and has helped in cutting the capital costs of new extraction plants. Mine cooling has made major advances through the introduction of chilled-water and ice-cooling systems. The back-filling of mined-out areas using reduction-plant tailings and crushed waste rock is finding application. Hydraulic drilling, water-jetting, and hydro-power are gaining acceptance by the mines, and Trekkers Mining Equipment have introduced the age of mechanization in our deep mines. None of these developments has come to soon.

There is no doubt in my mind that future generations of mining engineers will view the developments that are taking place in industry at the present moment in the same light as we view the MacArthur–Forrest cyanidation process. However, there is one major difference: one-hundred years ago a single process changed the fate of the industry; today we have to introduce entirely new technologies to stem the cost inflation.

Mr Fivaz, we are grateful to you that, through your address, you have allowed us to see some of our present problems in historical perspective.

I congratulate Mr Fivaz on his appointment to the high office of President of the Institute, a position that, I believe, he will fill with distinction. I thank him again for his stimulating and thought-provoking Presidential Address, and I wish him every success during his year of office.

Dr Steffen: Dr Wagner, in his own unique manner, has made a valuable contribution to the address by our President. I understand from people who have been through this exercise before that preparing a vote of thanks can be as arduous as preparing a major presentation. I thank Dr Wagner for the time and effort that he put into his vote of thanks.

Closure

President: I now ask the Office Bearers to join me at the rostrum, and, while they are coming up, I thank Dr Wagner for his kind words.

The meeting ended at 18h30.

At the cocktail party after the Annual General Meeting

**Greg Wilson and
Andries de Wet (Plassrail)**



**Danie Bester
(Chemserv-Steinhall), Karin
Bester, Brian Watson
(Chemserv-Steinhall) and
Yvonne Watson**

**Theunis Botha
(Chemserv-Steinhall), Martin Huttingh
(Chemserv-Steinhall), Jessie Huttingh,
and Greg Nellson
(G.M. Associates)**





Peter Smith (Anglo American Corporation), Jules Lurie (Velmet), and John Prater (Anglo American Corporation)



Pat Willis (Gold Fields), Hilary Lyndon, and Graham Lyndon (Gullick SA)



Peter German (Bateman Process Instrumentation), Steve Burkes (Rand Mines), and Malcolm Storey (E.L. Bateman)

**Terry Hook and Dave Thomas (SA
Cyanamid)**



**George Brown (Anglo
American Corpora-
tion), John Freer
(Gencor), Eugene
Tupholme (Chamber
of Mines Research
Organization), Pam
Freer, and Gill Brown**

**Deitrich van Salderen (Klockner
Becorit Corp.), Helen Joughin,
and Gunter Weisbrod (Klockner
Becorit Corp.)**





Ben Alberts with students from the University of Pretoria



J-P. Franzidis (Chairman of the Western Cape Branch), Alan Haines (Gencor), Ronnie Snodgrass (Gold Fields), Lyn Moore, and John Moore (Anglo American Corporation)



Morris Viljoen (President of the Geological Society) and Henry James (Mintek)

Martin Huttingh (Chemserve-Steinhall), Peter Lambert (retired from S.A. Cyanamid), Danie Bester (Chemserve-Steinhall), John Taylor (Gencor), and David Boydell (Simon Carves)



Mark Demmer (Chamber of Mines), Ludi Nel (Isacor), and Riaan Dippenaar (University of Pretoria)

Malcolm Vowles, Peter van Aswegen (Gencor), and Con Fauconnier (Johannesburg Consolidated Investment Co.)





Celeste Mackintosh (Secretary of the SAIMM), with her husband Bill Mackintosh



Peter van Rensburg (retired) and Philip Lloyd (E.L. Bateman)

Johannesburg Branch

The Johannesburg Branch of the South African Institute of Mining and Metallurgy hosted a very successful evening meeting at Kelvin House on 28th June, 1988.

The Guest Speaker, Mr Roger Layton of Roger Layton Associates, presented a talk on 'Expert Systems in the Minerals Industry'. Mr Layton is well known for computer applications in the mining industry, and the presentation was attended by more than 60 people. The presentation covered the role that expert systems can play, their im-

portance to the industry in the future, and a short description of the stages involved in the development of an expert system in industry.

After the presentation, the meeting adjourned to the cocktail room for a finger supper and drinks, kindly sponsored by Mr Lucas Poroulis of Golden Dumps.

The Johannesburg Branch again wishes to thank both Mr Layton and Mr Poroulis for their contributions to this very interesting and enjoyable event.