

# Proceedings, Annual General Meeting, 1990\*

The 93rd Annual General Meeting of The South African Institute of Mining and Metallurgy was held in the Highveld Room of the Carlton Hotel in Johannesburg on Wednesday, 15th August, 1990.

## Obituaries

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

*Honorary Life Fellow  
and Past President:*

P.A. von Wielligh

*Other Members:*

A.J. Balasis, G.S. de Villiers, C.G. Hodges, S.C. Newman, E.A.R. Plumstead, R.J. Thornburn, A.D. Vos, G.P. Badenhorst (previous Government Mining Engineer), J. Bigham, B.F. van der Merwe, J.E. van Leeuwen, J.J. Rosslee, P.C.H. Cloete, W.M. Todd, G.J.J. Klein, A.R. Goddard.

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

## Minutes

The minutes of last year's Annual General Meeting (16th August, 1989), which were published in the September 1989 issue of the *Journal*, were confirmed.

## Welcome

The President extended a warm welcome to Mr W.G. Boustred, Mr J.B. Raath (Government Mining Engineer), and Mr L.R. Robinson (President of the Associated Scientific and Technical Societies). He also welcomed senior members of industry, Honorary Life Fellows, Past Presidents, presidents of sister institutes and other associations, Members, and other guests.

## Membership

The names of Members admitted and transferred to higher grades of membership are given in the Annual Report 1989/90 (pp. 237 and 238 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 of the Institute who have rendered outstanding service to the industry or to the Institute. It is my pleasure to announce that Council has decided to confer Honorary Life Fellowship on three persons this evening: Professor Budavari, Mr Van den Bosch, and Professor Van Rooyen.

Professor Sandor Budavari is a native of Hungary, who

obtained his first degree from the University of Sopron and a Ph.D. degree from the University of Newcastle in England. After lecturing at the University of New South Wales for four years, he joined the University of the Witwatersrand in 1974, and since then has been responsible for the teaching of rock mechanics in the Mining Department.

Professor Budavari was elected to the Council of the Institute in 1983, and has been intimately involved with the Institute's activities ever since. He was chairman of the organizing committee for the School on Rockbursts and Rockfalls, which was held in 1989, and of the School of Rock Engineering Management Strategy for Safety and Economy, which took place in 1990. He is also President of the Commission on Education on Rock Mechanics of the International Society of Rock Mechanics. He has given unstintingly of his time and effort to further the science of rock mechanics as applied to mining.



Mr P. Nagy receiving a certificate of Honorary Life Fellowship on behalf of his father-in-law, Prof. Budavari

Mr P. Nagy, Professor Budavari's son-in-law, accepted the award on Professor Budavari's behalf.

*President:* The second recipient is Mr L.W.P. van den Bosch, who was born in Senekal in the Orange Free State. He graduated as a Mining Engineer at the University of the Witwatersrand at the end of 1942, and joined the Marievale Gold Mine, of which, some 30 years later, he was to become Chairman. After working on several mines and finishing as General Manager of Leslie Gold Mine in the new Evander field, he was appointed Consulting Engineer at Head Office. He was promoted to Chief Consulting Engineer in 1970, and was made Executive Director of Union Corporation in 1974. Chairmanship of a number of gold mines followed, as well as participation in broader industry affairs. He was President of the Chamber of Mines of South Africa for two terms, and held the office of Chairman of the Prevention of Accidents Committee of the Chamber of Mines, known

\* The photographs accompanying these Proceedings were taken by Jeremy Campion. All the captions read from left to right.



**Mr Bruce van den Bosch receiving a certificate of Honorary Life Fellowship, on behalf of his father, from Dr Oskar Steffen**

in later years as the Mine Safety Division, for a number of years. He served as President of the Associated Scientific and Technical Societies in 1982/83. He is a Fellow of our Institute, and served on Council from 1970/71 until 1974/75.

Mr Bruce van den Bosch accepted the certificate on behalf of his father.

*President:* The third person honoured with Honorary Life Membership is Professor G.T. van Rooyen, who is Head of the Department of Material Science and Metallurgical Engineering at the University of Pretoria. Gerrit Tertius van Rooyen was born in Benoni and matriculated from the Monument High School in Krugersdorp in 1947. He subsequently studied at the University of the Witwatersrand, where he obtained a B.Sc. degree in Mechanical Engineering in 1951. He was employed by Iscor for two years, during which he continued with his studies and obtained the MBA degree from the University of Pretoria in 1953. He then went to MIT in the US, and obtained an SM degree in 1955 and the Doctor of Science degree in 1956. On his return to South Africa, Dr Van Rooyen joined the staff of the CSIR but, at the inception of the Faculty of Engineering at the University of Pretoria, he was appointed to the staff of the Department of Mechanical Engineering. He was appointed as



**Professor G.T. van Rooyen being congratulated on the receipt of Honorary Life Fellowship**

Professor and Head of Department of Metallurgical Engineering at the same university in 1960, and has held this position for the past 30 years. Professor Van Rooyen has participated and supported the Institute's activities for many years and continues to do so today.

One of Professor Van Rooyen's many attributes is his concern for his students. Through his outstanding efforts and superb intellect, he has managed to achieve high academic standards while maintaining goodwill and a relaxed working environment for his students and colleagues. He was the first teacher of high academic repute in metallurgical engineering in an Afrikaans-language university, and he has made a major contribution to the advancement of this profession and discipline.

### **Brigadier Stokes Memorial Award**

*President:* This item on the agenda represents one of the highlights of our Institute's activities during the year. 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.T. Stokes, who was an Honorary Life Fellow and Past President of this Institute. The award 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 1990 is to be made to Mr W.G. Boustred.

William Graham Boustred has been described by those who know him and are aware of his many achievements as the complete industrialist. He has earned this reputation from the high standards of performance that he sets for himself, as well as for others. His CV is, indeed, impressive. He is Deputy Chairman of the Anglo American Corporation, and Chairman of Anglo American Industrial Corporation, Anglo American Coal Corporation, Scaw Metals, and the Richards Bay Coal Terminal Company; he is also on the boards of several other companies. His major contributions stem from three principal areas to which he has dedicated his working life:

- (1) the development of Scaw Metals,
- (2) the bold and innovative Highveld Steel & Vanadium venture, and
- (3) the amalgamation of Anglo American's various coal interests into the Amcoal Group.

All three entities have grown significantly as a result of the direction and leadership qualities of Graham Boustred. These corporations have not only made major contributions to the South African economy, but have provided employment opportunities for many thousands and have earned valuable profits for their shareholders.

Graham Boustred attributes a great deal of his success to his scientific background. He studied chemistry at Oxford and regards chemistry as a broad-base discipline with relevance to a great deal of modern industrial activity. This training provided him with a natural entry into the technically intensive disciplines of steel manufacturing, engineering, and mining.

In the early sixties, Scaw's performance and Boustred's contribution caught the eye of Anglo American, which saw in the company a valuable component for AMIC and in Boustred one of the men it needed for the complex and innovative Highveld Steel venture. He was appointed

MD of the Highveld Steel & Vanadium Company in 1965 and became its Chairman in 1974.

Boustred's next additional responsibility was the amalgamation of Anglo's coal interests into Amcoal. He was appointed its Chairman at the end of 1975. At the time he said that coal mining interested him because of the enormous development potential. How right he has proved to be—coal's take-off in the seventies grew from a rapidly expanding domestic electricity requirement, and a significant potential derived from coal exports. He is a firm believer in executive selling, and has constantly traversed the world in this regard.

His move to coal in 1973 coincided with the oil crisis and was a critical time for the South African coal-mining industry. He brought with him a penetrating faculty and an absolutely clear idea in business terms about what things were right and what things were wrong. As a result of the oil crisis and the consequent upturn in coal prices, the Richards Bay project turned from a high financial risk to a highly successful export facility capable of handling 43 million tons of coal during 1989, worth R3,6 billion. This makes coal second only to gold in terms of foreign-exchange earnings. This capacity is being extended to approximately 53 million tons in 1991.

The development of the Richards Bay terminal was an important factor in South Africa's ability to export coal and an equally important factor in stimulating mines to produce coal. Today South Africa has one of the most efficient deepwater ports in the world, and transportation to the port comes from a totally dedicated coal railway built by the South African Transport Services.

The development of Richards Bay required co-operation among disparate, highly competitive companies. As Chairman of the Richards Bay Coal Terminal Company, Graham Boustred played a key role in achieving commonality of purpose within this group, and today all the parties recognize his significant contribution in this respect. It is due to men of such vision that this country can boast an infrastructure that sets us apart from other developing countries.

The second major area on which Graham Boustred brought his influence to bear was in the formation of Amcoal. The amalgamation of a number of companies into one large coal company, Amcoal, in 1975 resulted in a coal-mining company with significant strength and ability to raise capital and undertake major capital investments. This concept has been mirrored by other companies within the industry.

In summary, Amcoal's pre-eminent position in coal production for the South African energy market, as well as for export, grew significantly under Boustred's leadership. He always emphasized that there should be a balance between local and export markets. The bold and highly risky decision to establish export collieries, a dedicated export railway line, and the Richards Bay Coal Terminal concerned not only his company's interests but those of the industry at large. He was and remains the first Chairman of the Richards Bay Coal Terminal Company, an entity which, under his tutelage, has become perhaps one of the most admired of such operations in the world.

Those with whom he works credit his success to his leadership, which is of the very best kind—by example.

He is particularly well known for his toughness in business, although this is contrasted with a soft-hearted concern for people's welfare. He admits that he enjoys big and complex problems, and draws much satisfaction from working with people who feel motivated and who are proud of what they are achieving.

Graham Boustred is also very much a family man. He is married and has five children, and they enjoy the outdoors when his rigorous schedule permits.

It is fitting, perhaps, to conclude with a story that encapsulates the spirit of this great South African. It relates back to the early and difficult days when Graham Boustred and his team were grappling with the earlier stages of the Highveld Steel & Vanadium project. While travelling abroad, he remarked to one of his colleagues, 'You know, Highveld is going to come right'. To which the reply was, 'Yes, Mr Boustred.' 'Do you know why it is going to come right?'—to which a list of possible reasons was forthcoming. Graham Boustred replied that it was none of these solutions alone, although they would certainly help. He said that things would come right because they damned well *had* to come right! This sums up the man and his absolute determination to see things through.

It is my very great privilege, on behalf of The South African Institute of Mining and Metallurgy, to present the Brigadier Stokes Award to Mr Boustred.



**Mr W.G. Boustred with Dr Steffen after receiving the Brigadier Stokes Memorial Award**

*Mr Boustred:* It is indeed a very great honour for me to be standing here this evening to receive the Brigadier Stokes Memorial Award for 1990. When I look back through the recipients of this award since 1980, it makes me feel even more gratified and, perhaps, humble. The list includes many of my very old friends in the mining and metallurgical industry: the first is Mr Harry Oppenheimer, with whom I have been associated for many years; Dr Bill Bleloch, who, by the way, was a pioneer in many ways, and who developed the process on which the Highveld Steel & Vanadium Project was based; my old friend, Dr Wim de Villiers; Dr Tommy Muller and Robin Plumbridge; and many other very

distinguished metallurgists and mining executives.

There is, perhaps, a sting in the tail of the citation—it says here very carefully that it is not necessarily based on technical expertise! Perhaps that is right in my case, although I have always regarded myself as a technical person and, I believe, I speak today to technical people. I have always believed, gentlemen, that we have an edge over accountants and lawyers—it is much more difficult for them to understand what we are talking about, and we are often able to understand what they are talking about.

The President referred to my interest in the coal-mining industry, and I thought it might be appropriate to briefly review the progress in the coal industry since I first became directly associated with it some 17 years ago.

In 1973 the total coal-sales output in the Republic of 61,5 million tons was mined 70 per cent by conventional underground mechanized methods, 25 per cent by labour-intensive handgot methods, and only 5 per cent by open-cast methods. There was only one walking dragline in operation and, of the overall total of 61,5 million tons produced, a modest total of less than 2 million tons was exported.

By last year, i.e. 16 years later, the production total had almost trebled to slightly more than 178 million tons. Significantly from a mining-technology point of view, open-cast yielded the largest percentage output, at 40 per cent, followed by conventional mechanized underground methods (31 per cent) and continuous miners (22 per cent). The number of draglines in service had expanded significantly to 22, with a further 5 on order, and the application of maximum-extraction underground mining is expanding; handgot production has almost disappeared. Productivity, which is a very important factor in our country today—and criticism has often been expressed about productivity in our country—in the coal-mining industry productivity expressed in tons mined per man-year has risen almost threefold, from 834 tons per man in 1973 to 2274 tons per man in 1989.

In addition to these important shifts in mining technology, there were significant changes in the destination of the Republic's coal: whereas in 1973 less than 2 million tons were exported, the equivalent figures in 1989 were just short of 47 million tons which, as you said earlier, earned about R3,6 billion in foreign exchange. Coal is now strongly established as the country's second-largest foreign-exchange earner after gold. In 1989, exports contributed 19 per cent of the Republic's total revenue from mineral sales.

This major expansion in exports was strongly assisted in the initial stages by a series of worldwide energy crises in the early seventies, and was made possible by close cooperation between the Government and the coal industry in the development of the new deepwater port of Richards Bay. As the President mentioned, it was established in three successive stages to the current export capacity of 46 million tons and, with the refurbishment programme that is currently under way and that will be completed next year, the capacity will rise to 53 million tons. The estimated replacement value of the terminal alone approaches some R2 billion. The coal line to Richards Bay represents engineering and management of the highest order, and the payload of trains down to the coast since

the start of exports has increased from 5624 tons per train to today's total of over 16 000 tons. In 1989, of the export total of 47 million, approximately 5 million tons were coking coal and anthracite, and the balance was steam coal.

The past 16 years have witnessed impressive developments in South Africa as well. In 1973, for example, Eskom's 2100-megawatt Arnot station—six sets of 350 megawatts each—was the largest station under construction. In the intervening 16 years, Arnot has been followed, firstly, by Kriel with a capacity of 3000 megawatts, and subsequently by no fewer than seven 3600 to 4000-megawatt stations. In addition, the Koeberg station of 1800 megawatts was fully commissioned in 1988.

The technique of dry-cooling has been developed to an advanced stage, particularly with the commissioning of the initial generating sets at Mitimba in the northern Transvaal. Another significant technological advance has been that today Eskom is able to successfully burn coal with a calorific value as low as 15 megajoules, compared with the Eskom average of 22,5 megajoules in 1973.

There have also been substantial strides in the recovery of oil from coal. In early 1973, the relatively small-scale Sasol I plant was consuming approximately 5,5 million tons of coal per annum. In October 1973 the spot price of oil leapt to \$17 a barrel, and in 1974 we saw the announcements of Sasol II and Sasol III at estimated capital costs of R5,6 billion. I remember at the time being quite horrified at the cost of Sasols II and III: R5,6 billion, we said, for only 100 000 barrels a day! Now, of course, we are looking at projects like Moss gas, which are probably going to cost at least twice as much as that for a quarter of the capacity. Of course, we do realize that there is a very great difference between 1990 money and 1973 money; nevertheless it demonstrates the great foresight, in my view, of the authorities in bringing about these two Sasols.

Exploitation of the economies of scale should be apparent to you from my description of the coal domestic and export markets. This is also to be found in the evolution of the various coal companies in South Africa. During this period, there was a strong tendency, through mergers and acquisitions, towards coal companies of significantly larger size and financial strength than was the case in 1973. Whereas in 1973 there were no fewer than 22 South African coal companies quoted on the Johannesburg Stock Exchange, by 1989 this number had been reduced to only 7, but, with the significant combined market capitalization of 3,9 billion, the comparable capitalization of the 22 companies in 1973 was 122 million. In fact, to blow the Amcoal trumpet (if you don't mind), my financial colleague told me on Friday that the market capitalization of Amcoal had achieved a level that day of \$1 billion. Somehow one feels that a billion dollars is a more striking achievement than the equivalent figure in rands.

The coal-mining industry has clearly left its Cinderella image of yesteryear far behind. New opportunities and challenges face it today. In the domestic market, assured of medium-term growth in capacity, it is already under way to meet further Eskom and Synfuel requirements. The positive political climate now emerging should restore

business and investment confidence, and further growth opportunities for the coal industry internationally. There is good reason to believe that many markets will not remain closed to South Africa for much longer, leading, in turn, to the prospect that the vital growth experienced in the coal-mining industry during the past two decades will be maintained well into the future.

**Presentation of Medals and Certificates**

*President:* Papers that were published in the *Journal* from March 1989 to February 1990 by members of the Institute were considered for medals. I am pleased to announce that four silver medals will be awarded this evening.

The first goes to Drs Ozbay and Ryder for their paper entitled 'The effect of foundation damage on the performance of stabilizing pillars', which was published in the February 1990 issue. Unfortunately neither author is present tonight, but Dr N.C. Joughin will receive the certificates on their behalf.



**Dr Noel Joughin receiving Silver Medals on behalf of Drs M.U. Ozbay and J.A. Ryder**

The second silver medal is awarded to Mr C.L. Workman-Davies for his paper entitled 'Noise and hearing in a trackless-mining environment', which was published in the July 1989 issue of the *Journal*.



**Mr C.L. Workman-Davies after receiving a Silver Medal from Dr Steffen**

The third silver medal goes to Dr M.A. Adams for his paper 'The chemical behaviour of cyanide in the extraction of gold'. Part 1 was published in the February 1990 issue and Part 2 in the March 1990 issue.



**Dr M.D. Adams receiving a Silver Medal**

Mr P.C. Pistorius and Professor R.F. Sandenbergh receive the fourth silver medal for their paper entitled 'The influence of galvanic corrosion tests of resistance in the metallic conduction path', published in the July 1989 issue.



**Mr P.C. Pistorius and Professor R.F. Sandenbergh, who received Silver Medals, with Dr Steffen (centre)**

**Presentation of Student Prizes**

*President:* The Institute is very proud of its association with the universities and technikons, and therefore also with the students.

Prizes are awarded to the following university students for the best dissertations in part fulfilment of their B.Sc. degrees.

**Mining:** Mr G.C. Roets of the University of Pretoria for his dissertation 'Beheerde skietwerk te Optimum steenkoolmyn'.



Mr G.C. Roets receiving his prize from Dr Steffen



Dr Steffen presenting a prize to Mr M.H. Fox



Mr A. van Bennekom being handed his prize by Dr Steffen



Mr M. Preece being congratulated by Dr Steffen on his receipt of a Student Prize

Metals technology: Mr A. van Bennekom of the University of the Witwatersrand for his dissertation 'The use of coatings for improving the wear and corrosion properties of 304L and 316L stainless steels'.

The other prizes made to students of the Universities of the Witwatersrand and Pretoria were presented at faculty prize-giving ceremonies held at the respective universities, and are featured in the Annual Report.

Of the prizes for Technikon students, Mr M.H. Fox of the Technikon Witwatersrand receives the award for the best student at the completion of the fifth year of the Masters Diploma in Technology, Metallurgical Engineering.

The prize for the final-year student who, throughout the course, maintained an aggregate of 80 per cent or more goes to Mr M. Preece for the Four-year Course for National Higher Diploma in Metalliferous Mining.

#### Annual Report and Accounts

The President presented the Annual Report highlighting a few events that he regarded as especially significant.

After Dr Wagner had presented a summary of the financial status of the Institute, the Annual Report and Accounts as given on pp. 221-242 of this issue were adopted.

#### Office Bearers and Members of Council for 1990/91

*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:	Mr H.G. Mosenthal
President Elect:	Mr R.D. Beck
Senior Vice President:	Mr J.P. Hoffman

Junior Vice President: Dr H. Scott-Russell  
Immediate Past President: Dr O.K.H. Steffen  
Honorary Treasurer: Dr H. Wagner.

In terms of the election of ordinary members of Council there is a letter from the scrutineers stating, 'We have to report that we have inspected the nomination papers for Council for the 1990/91 session, and have found that the ballot papers sent out to Corporate Members of the Institute were in order. There was a return of 513 papers, representing a return of 33,8 per cent. There were 11 spoilt papers. As a result of our scrutiny, we find that the following Members have been elected:

Dr N.A. Barcza, G.A. Brown, J.A. Cruise, Prof. R.J. Dippenaar, Dr G.A. Fourie, J.S. Freer, Dr B.K. Loveday, R.P. Mohring, Prof. H.R. Phillips, D.A.J. Ross-Watt, P.D.K. Robinson, P. Smith, P.C. van Aswegen, P.M.T. White. In addition, Dr J. Lurie and Mr D. Wilson were elected unopposed to represent non-corporate members of Council'.

In terms of Clause 3.2.8 of the Constitution, the Chairmen of the Branches will also serve on Council. These are as follows: Johannesburg Branch, Mr Peter Smith; the Orange Free State Branch, Mr D.R. Fleming; the Pretoria Branch, Prof. R.F. Sandenbergh; the Vaal Triangle Branch, Prof. M.D. Brayshaw; the Witbank/Middelburg Branch, Mr J.A.D. Britz; and the Western Cape Branch, Prof. C.T. O'Connor.

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, Dr P.R. Jochens, G.Y. Nisbet, Prof. A.N. Brown, J.D. Austin, H.E. James, Dr H. Wagner, B.C. Alberts, C.E. Fivaz.

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

I would now like to ask Dr Barcza to say a few words.

*Dr Barcza:* On behalf of the newly elected members of Council, I would like to thank the members of this Institute for the confidence they have shown in us. We shall strive to serve the Institute to the very best of our ability.

#### **Induction of President**

*President:* Gordon Mosenthal was educated at Pretoria Boys' High School and the University of the Witwatersrand where, in 1951, he earned a B.Sc. Eng. degree in mining. In 1967 he obtained a GDE from the University of the Witwatersrand.

After serving in various positions in Canada concerned with the mining of nickel, copper, and gold, Gordon joined Selection Trust Limited in South Africa as an Exploration Engineer. This was followed in 1960 by his appointment as Assistant Manager at Bikito Minerals Limited in Zimbabwe. His duties there involved production, technical direction, supervision of quality, and the transportation and shipping of ores. The year 1962 marked the beginning of his career with Rand Mines Limited, where he worked at Head Office and was involved with industrial engineering. In 1964 he returned

to production mining, this time at Blyvooruitzicht and ERPM mines.

In 1973 he became Assistant General Manager at Durban Roodepoort Deep, a low-grade mine where cost control was very important. There his work also included experimentation on trackless mining, until he was appointed General Manager in 1976. During the period 1978/81, Gordon served as General Manager of Harmony Gold Mining Company, which at the time was milling 22 000 tons of ore a day and had 28 000 employees. In 1981 he was transferred to Rand Mines Limited as MD of their chrome operations. During the same year, he relinquished this post and was appointed MD of Durban Roodepoort Deep Limited and ERPM in the Group's Gold Division. Subsequently, he had spells looking after Barbrook, Blyvooruitzicht, and TGME. He was the Rand Mines' representative on the Technical Advisory Committee to the Chamber of Mines in 1984, and in 1988 until his retirement earlier this year.

Gordon's versatility is apparent from the many capacities and localities in which he worked during his mining career. The latter included South Africa, Zimbabwe, Namibia, Botswana, Zambia, and Canada. After a full and varied career, he retired from Rand Mines Limited in April of this year and is now self-employed as a mining consultant.

His association with The South African Institute of Mining and Metallurgy began in 1963, when he joined as an associate member; he became a member in 1970 and a Fellow in 1985. He was elected a member of Council in 1984/85 and President Elect in 1989. I would like to congratulate Gordon on his election and wish him a most successful year.

*Incoming President:* I thank Dr Steffen and all the members for the trust shown in electing me to this office. I congratulate the Incoming Council, and am pleased to see that it is a young Council because there is going to be a great deal of work in the year ahead.

I also congratulate Dr Steffen on a really splendid year in office. The highlights, I think, were the number of international conferences that were 'born' during the year, such as that in September, the CMMI conference in 1994, and the international conference on massive mining that is scheduled for 1992. The other great highlight is the way in which the branches have expanded during the past year or so—very largely due to Dr Steffen's efforts.

It gives me great pleasure to hand this plaque bearing the Institute's shield to Dr Steffen as a memento of his year of office.

*Incoming President:* I now ask Dr Hugh Scott-Russell to join us at the rostrum.

*Dr Scott-Russell:* I thank the members of Council for electing me as the Junior Vice-President. It is great honour, and I shall do my best to support the President and the Council during the ensuing year.

#### **Appointment of Auditors and Honorary Legal Advisors**

*President Elect:* I propose that Messrs Aiken & Peat be re-appointed as auditors for the coming year, and that Messrs Van Hulsteyn, Duthie & Saner be re-appointed as Honorary Legal Advisors. *Agreed.*



The President Elect, Mr Gordon Mosenthal, congratulating Dr Steffen on his successful year of office

### Presidential Address

Mr Beck then took the Chair while Mr Mosenthal delivered his Presidential Address entitled 'Stoping in Witwatersrand gold mines during the past forty years', which is reproduced on pp. 243 to 255 of this issue.

*Dr Scott-Russell:* It is a great honour for me to thank Mr Mosenthal, as Incoming President of The South African Institute of Mining and Metallurgy, for his stimulating address reviewing stoping methods in the gold mines of the Witwatersrand since the Second World War. The subject of the address was most appropriate, and I would like to make some comments in support of the technical advances he reviewed.

One of the main objections to the introduction of mechanized mining methods was, and still is, the dilution of reef to the mill. The old saying was 'Don't break waste and, if you do, pack it underground'. In the initial stoping methods used, most waste broken in the stopes was packed underground and only reef hoisted to surface. As reefs became deeper and flatter, small vertically inclined shafts were employed, and they were used only for the hoisting of men, material, and sorted high-grade reef. The flatter reefs at depths were cleaned via shaker-plates, where only sorted reefs were loaded onto the plates for transport to the strike heading.

In the early 1930s, the first scrapers were introduced to the mines but were not fully utilized because they were operated behind the scatter-piles so that waste could be sorted and packed before the reef was scraped to the strike gully. However, the requirement for improved productivity forced mining engineers to make full use of the benefits of the scraper unit, and full face scraping was introduced with the precaution of installing waste-sorting belts on surface.

The need for improved productivity was recognized by Jerry Hind, when, in 1934, he recorded in a Mine Manager's Association paper that better face utilization

could be obtained by multi-blasting, the use of igniter cord, a reduction in manual labour and time spent on jobs such as waste-sorting and stone-walling, and, more importantly, designing a machine that could be moved up the centre gully from intertrack to intertrack with no increase in the size of the heading.

But in 1984 and 1985 there was a surge of innovative activity in the industry, which was very adequately covered in the Presidential Address. The following three significant papers, published between 1973 and 1982, summarized progress and guided the mechanization of stoping operations during the period:

- (1) 'The introduction of LHDs and stope-cleaning operations at Randfontein Estates', Nairn, 1975.
- (2) 'A method of stope-cleaning by means of front-end loaders', Collier, 1979.
- (3) 'The use of high-pressure water-jetting in mining operations', O'Bryne, 1982.

A further major advancement in mechanized mining was made in 1985, when, as mentioned, trackless mining was introduced at Randfontein Estates, and over the past five years, in narrow and in wide reefs, the mine has increased production from 385 000 to 625 000 tons per month, an improvement of 62 per cent with only a 5 per cent increase in labour. Furthermore, there has been no increase in fatalities or injuries; in fact, the converse has occurred. The fatality rate of 0,536 is some 38 per cent below the industry rate, and the reportable injury rate is 66 per cent below the industry rate.

Despite these impressive achievements, the response always is, 'Wonderful, but what about the dilution?' It is a problem. It can therefore be stated that fear of diluting the ore to the mill has retarded the introduction of existing rubber-tyred equipment to narrow-reef stoping operations and therefore has prevented, and will continue to prevent, any major improvements in productivity.

I believe there are two factors that will make it possible for the gold-mining industry to move away from the well-established, conventional scraper/shovel technology:

- (1) the mining houses should continue to work in close co-operation with the manufacturers of equipment to produce machines that can be used in narrow stopes without fear of increasing the size of the excavation;
- (2) mining engineers should be encouraged and supported to introduce totally original mining layouts with a new generation of cleaning and drilling equipment.

In closing, I thank Mr Mosenthal for an interesting and stimulating address, which has afforded us the opportunity to place some of the present problems in historical perspective. I congratulate Mr Mosenthal on his appointment to the high office of President of the Institute, a position that I believe he will fill with great distinction.

### Closure

*Mr Beck:* The way in which Dr Scott-Russell complemented Mr Mosenthal's presentation in outlining the challenges for the future leaves very little to be said. I therefore thank Dr Scott-Russell for his vote of thanks, and declare this meeting closed.

## At the cocktail party\* after the Annual General Meeting

Gordon and Dawn Mosenthal



Nic Barcza with Adelmo Megaco from Brazil

Merrill Ford, Tony Stephens, Peter van Rensburg, and Dave Grimsley



\* The accompanying photographs were taken by Jeremy Campion and read from left to right.



**Peter Radcliffe, Orrie Fenn, Noel Joughin, and David Boydell**

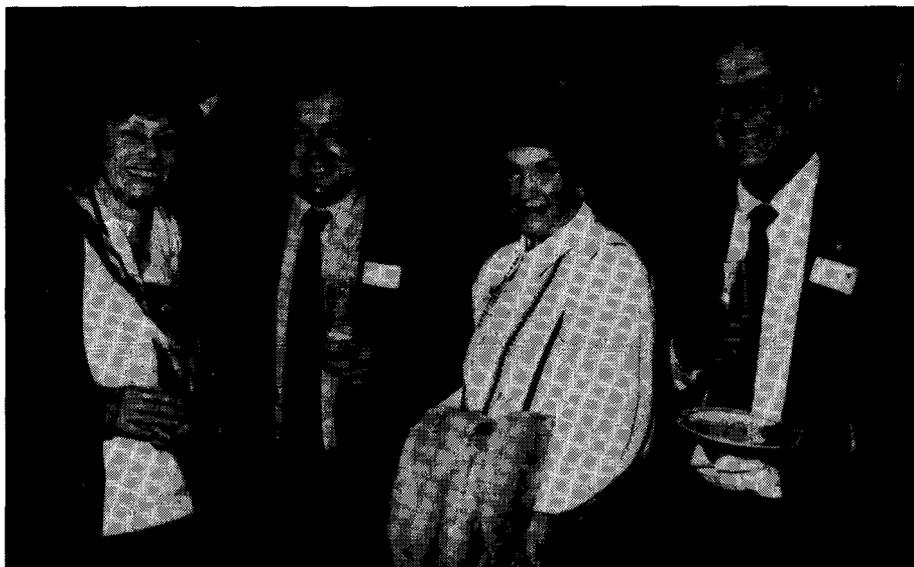


**Buster Fowler, Gordon Mosenthal, and Rodney Still**



**Karl van Gessel, Les Amos, John Luckman, and Norman Brown**

**Joan Phillips, Hugh Phillips, Ansie Krige, and Danie Krige**



**Chris Pistorius, Rian Dippenaar, and Ludi Nel**

**Henry James, Joan James, Marge Steffen, and Peter Janisch**



# INFACON 6

The 6th International Ferroalloys Congress is to be held in Cape Town from 8th to 11th March, 1992. The Congress is being organized by Mintek in association with the Ferro Alloy Producers' Association and The South African Institute of Mining and Metallurgy.

## *Theme and Scope*

INFACON 6, as in previous Infacon Congresses, will provide a meeting that will bring together theoreticians, engineers, scientists, and managers who are concerned with the future of the ferroalloy industry.

The theme of the Congress will be 'Meeting the Challenge'. Emphasis will be placed on the challenges of the 21st century and how the ferroalloy industry will react to innovations, new technologies, and new products. The technical sessions will cover a wide range of topics in ferroalloy technology, e.g. chromium, manganese, silicon, and minor ferroalloys. As part of the programme, ferroalloy producers and consumers will highlight the changes in their respective technologies to meet their needs in the 21st century.

## *Call for Papers*

Interested persons are invited to submit, to the Congress Secretary, by no later than the end of September 1990, titles and abstracts of not more than 500 words on any relevant topics. Papers, which must be technically oriented, can cover theoretical developments, practical applications, new technologies, economics and marketing, and education and training.

Some topics that have been identified are set out below as a guide.

- *Raw materials* (e.g. chromite, manganese, vanadium, quartz)
- *Burden preparation*
- *Pre-treatment processes*
- *Energy resources*
- *Environmental* (including pollution, solutions, and legal)
- *New/novel processes*
- *Electric-smelting technology*
- *Automation* (simulation, modelling, control)
- *Fundamentals* (e.g. kinetics and thermodynamics)
- *Economics and marketing*
- *Education and training.*

Authors will be advised by November 1990 whether their titles and abstracts have been provisionally accepted, and will receive detailed instructions on the preparation of papers.

Draft papers must be submitted before the end of May 1991, and authors will be notified of the final acceptance of papers by the end of July 1991.

## *Proceedings*

Accepted papers will be published in a special Congress publication which will be available to all delegates on registration at the Congress.

## *Language*

The language of the Congress will be English and all papers are to be submitted in English.

## *Final Circular*

The Final Circular, which will be mailed during May 1991, will contain detailed information on the Congress, as well as the registration forms.

## *Excursions*

The organizers envisage the following post-Congress technical excursions:

- 1-day tour to Mintek and Gold Reef City
- 2-day tour to relevant ferroalloy plants
- 5-day extended tour, including a weekend of game-viewing and visits to mines and ferroalloy plants.

An extended sight-seeing tour is being planned to give visitors the opportunity of seeing something of the country's beauty.

## *Social Programme*

An interesting and varied social programme is being arranged. This will also include some of the areas of interest in the Cape.

Cape Town has a great deal to offer and the programme for accompanying persons is something that should not be missed by visitors to South Africa.

## *Correspondence and Enquiries*

All correspondence should be addressed to:

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Telex: 4-24867 SA.

## *International Chromium Steel and Alloys Congress*

The International Chromium Steel and Alloys Congress will be running in parallel with Infacon 6, probably on 11th and 12th March. Over the two days, papers on the physical metallurgy of, research into, production of, and applications of chromium steel and alloys will be presented.

For further information, contact

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