Proceedings, 103rd Annual General Meeting, 2000

The 103rd Annual General Meeting of The South African Institute of Mining and Metallurgy was held in the Gold Room, Transvaal Automobile Club, 60 5th Street, Lower Houghton, Johannesburg on Wednesday, 16th August, 2000.

Welcome

The President extended a special welcome to the guests and representatives of our sister institutes and other associations. Also to recipients of awards, senior members of industry, Honorary Life Fellows, Past Presidents, our Members and other guests, among them the following:

Reinie Meyer, President, The Geological Society of South Africa

Dr Nielen van der Merwe, Chairman, The South African Institute of Rock Engineering

Chris Fourie, President, Institute of Mine Surveyors of South Africa

Obituaries

The President announced the death, during the year, of the following members:

Honorary Life Fellow
J.F. Reid

Retired Fellows
A.R.C. Fowler, J. Hall, W.S. Rapson, A. Tennent, J.L. van Eyssen

Members
M.A.H. Harris, C.N. Louw, D.D.W. Mather, J.B. Mkandawire, T. Moolman

Retired Members
A.M. Guthrie, R.A. Mackellar

In memory of the deceased and in sympathy with the bereaved, all rose and observed a moment of silence.

Minutes

The Minutes of the previous Annual General Meeting, which were published in the September 1999 issue of the *Journal,* were confirmed.

Honorary Life Fellowship

Mr 'Rams' Ramokgopa (Junior Vice President): Honorary Life Fellowship is awarded by the 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 the Council has decided to award Honorary Life Fellowship to the following:

- **Dr N.A. Barcza,** for his unending commitment to the Institute and in particular to Infacon and his representation on the University of the Witwatersrand Council.
- **J.R. Dixon,** for his initiative and efforts in the establishment of SAMREC code for the reporting of mineral reserves and resources in South Africa.
- **R.P. Mohring** for championing the Institute's interests in Mining Engineering on the Engineering Council of South Africa for many years.

Brigadier Stokes Memorial Award

Mr Mike Rogers: 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, 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 2000 is to be made to Mr Alex Mokken.
Mr Bill Bateman read the citation:
Many of us have known Alex for a very long time.The fact that he is a very talented man is undeniable. His continued ability to use his brain with agility and keenness remains an admirable feature of his daily activities. I am not even sure how old he is. I believe he is at or near 83 . Perhaps, in his reply, he could share with us the secret of how to keep our brains working as well as his for so long.

In 1998, at the age of 83 and a member of the Institute for 64 years, he contributed yet another paper on gold extraction metallurgy. He already has received a gold medal (in 1976) and a certificate of merit in recognition of his work which has been reflected in the twenty or so papers he has published. He is revered as the expert by all those involved in comminution and the extraction metallurgy of gold. He is one of the first chemical engineering graduates from Wits (B.Sc. Eng. 1937, cum laude) to take up the metallurgy option. His working career was catalysed by the award of the first Nuffield Post-graduate Travelling Fellowship and culminated in his appointment in 1965 as consulting metallurgist, for Union Corporation. This career was characterised by quiet and modest leadership in creative but pragmatic and scientific innovative thinking. Not only in gold. He was awarded the Stainless Steel Medal in recognition of his innovative contributions. After his retirement in 1978 he continued a high level of technical activity as a consultant and lecturer locally and overseas. The CSIR, E L Bateman, Atomic Energy Commission, Chamber of Mines, SA Bureau of Standards, Vaal Reefs, Simmer and Jack, Egoli Mines, Wit Nigel, Randfontein Estates, Western Areas, Kloof, Elandsrand, South Roodepoort and Consolidated Modder

have all benefited from his experience and wisdom.

He has also been active in Australia and in the USA. He has been a lecturer to technical executives at Homestake Mining Company and to the Nevada Technical Institute. Alex Mokken has made many contributions to the mining industry in South Africa with impacts across the world. His interests covered a wide variety of minerals including unusual ones such as osmiridium and associated platinum group metals found in gold ore. Here he developed a recovery process that led to the establishment of Union Corporation's first PGM refinery.

But by far his most profound work was in the field of comminution. His first improvement related to stamp mills in which bending of stems remained a chronic weakness. This bending was known to result in severe injuries to hands and arms by stems slipping through holding clamps during servicing. As a young recruit on the now defunct Geduld Mine he identified the cause of bending and offered a solution which was initially ignored. Its adoption at a later stage proved him to be correct. Bending and accompanying safety hazard were eliminated.

He was also responsible for initiating single stage milling of crushed ore that eventually led to the adoption of single stage milling of run-of-mine ore. Thereafter Union corporation, under the direction of Alex Mokken, became the leaders in this highly significant development.

Alex regularly used E L Batemen's laboratory facilities. His colleagues there speak highly of his continued contributions to, amongst other innovations, the award-winning roller supported mills. He is always ready to share his knowledge, generally remembering things other people have forgotten. Apparent new ideas in comminution are often shown to be updates of his experiments of years gone by.

One of the legends surrounding Alex is his leather-backed data book. The sight of Alex producing this book out of his briefcase and delving into it for obscure milling design information never ceases to amaze younger colleagues. In it he keeps detailed records of milling design data going all the way back in his career and he consults it whenever comparisons are required for new mill designs. This was especially useful during the expansion of the platinum industry in the 70s and 80s, when published information was practically non existent.

Alex is never adverse to getting his hands dirty whether it is to obtain autogenous milling data by dropping rocks onto the laboratory floor for sampling mill slurries, nothing deters him. His later experiments were in pursuance of higher milling efficiencies obtained by improving discharge arrangements on grinding mills, systems adopted by inter alia Vaal Reefs and referred to in his 1998 paper. The pursuance of this concept merits further investigation.

Alex was recently appointed a member of the advisory council of the Royal Bafokeng Administration with the brief to assist and advise them on the development of their chromite and accompanying PGM resources to the benefit of the Bafokeng nation.

To end the citation, the following quotation is appropriate to a most worthy recipient of the Brigadier Stokes Memorial Award for the year 2000.

'... age appeared to be best in four things:
Old wood best to burn; Old wine to drink;
Old friends to trust; and Old authors to read'
'Quotation' Frances Bacon.

Thank you very much.

Mr Mokken: Mr President, ladies and gentlemen.

It is my pleasure to thank Mr Bill Bateman for his complimentary cross-section of my career.

It is a few years ago now that my wife and I went to Egypt on holiday. Having been involved with the handling of rocks virtually throughout my career and well aware of their characteristics, I was intrigued by the way these ancient Egyptians could sculpture and polish rocks to achieve their life-like objectives. What I particularly wished to know were the tools that the ancients used to execute their work. But no one seemed to know. To me this was a great disappointment. In view of this I felt that I should not disappoint you by not telling you the tools I used to elevate me to this honourable position and make me the recipient of this prestigious award. I have used a number of tools. However I feel it would suffice if I give you the four major ones. Here they are:

1. The most powerful tool—the ability to give credit where credit is due.
2. The second tool originated from a visit underground in a mine for the purpose of seeing where the rock came from, from which we extracted gold. When I became aware of the conditions under which the miners had to work—confined spaces, heat, high humidity and always the chance of injury from slight to fatal, I vowed, in due respect to those workers that, whenever I would be responsible for the extraction of gold from that mined rock, I guarantee that not the slightest piece of gold would be allowed to go to waste through inefficiency, ignorance, disinterest or any other negative attribute and I kept that vow throughout my career.
3. The third tool originated in the mid-Atlantic on a cargo boat on its way from Cape Town to New York. Having been awarded a Nuffield Post Graduate Scholarship my plans were to study the process of flotation which I would first do on a mine in Mexico where copper, lead and zinc were recovered by flotation and after that, visited mines in the USA and Canada to see the application of flotation in the recovery of various minerals, oven soluble halita and sylvitn. But I had one major worry. I was afraid that I did not have sufficient money to complete that tour and I had no father to fall back on for financial help. When I discussed this with one of the passengers he advised that I heed the words of a Chinese philosopher who said, 'He who watches the wind will never sow. He who watches the clouds will never reap. Risk all who would all gain and blindly be it so'. He advised me to go to Mexico and pursue my objective with all diligence and forget about the money, that would take care of itself. It was a tall order but he was right. It cost me little to live on the mine and after completing my task the mine graciously lent me a car to do my touring. When I handed the car back at El Paso in Texas, I had sufficient money left to fly back home. I did this via Holland to see the Dutch State Mines heavy medium cyclone which had just been developed.
   In my career I applied this third tool only once. On the now defunct Geduld Mine osmiridium was being recovered from a concentrate collected from behind grinding mill liners. In my opinion the process used was very inefficient and as consultant to the mine, I felt obliged to improve the process and had in mind the use of mercury. On proposing this to my boss in written form he forbade me to make any change and to leave well alone. This directive however clashed with my vow and placed me in an invidious

position. I had to make a decision, one way or another...I decided to continue, knowing that I would risk all, my reputation and my career. I started experimenting, found the problem and discovered coated gold, later identified to be impregnated gold that was not amenable to dissolution in cyanide nor amalgamation. The impregnation was attributed to the milling process during which hard particles such as stool, tungsten carbide, pyrite and quartz were driven into the softer gold particles and which, in turn, were forced into liner cavities. Further tests showed that nitric acid could dissolve the impregnated impurities. After this treatment gold would amalgamate readily and, in that form, could be separated from osmiridium.
This discovery resulted in osmiridium recovery that had averaged about 100 ounces per year, for many years past, increasing to 800 ounces per year from the same source. Instead of losing my job and my reputation I was actually promoted. In that position I had the opportunity to introduce the system to Union Corporation's four mines in Evander where high concentrations of osmiridium were known to exist in the Kimberley reef. As a result of this millions were made from osmiridium recovery and additional gold that otherwise would have gone to the slime dams.

4. The fourth tool is one I have used for many years. It is the belief that, whatever we do, there is inevitably a better way of doing it. I learnt it as a child. I had difficulty subtracting. If the teacher asked me to subtract 5 from 16 I would count 15, 14, 13, 12, 11 as five and, taken away from 16, would leave then, ten, which was wrong. In desperation I asked my father to help me. Listening to my reasoning he told me that I was doing it the difficult way. There was a much easier way. One never subtracts, only add. Doing an addition one would start at the top and add downwards. In subtraction one would start at the bottom and add upwards.Since that day I have never subtracted. In my career, with the help of my staff and applying the fourth tool, we have made many improvements. I will not burden you with them because most of them have been published in the *Journal* of our Institute. But there are three I would like to mention.

Single stage milling
As an assistant plant manager, many years ago, I studied single stage and multi stage milling and came to the conclusion that single stage milling of crushed ore would be the more economical and simpler. To prove my point I had to wait until my boss went on leave when I took over and could experiment without interference and of course take all responsibility. In this way I was able to confirm my prediction. This discovery lay dormant for many years until it was revived as the adopted system for Union Corporation's first mine in Evander in which even the crushing step was eliminated and run-of-mine ore was milled directly in a single stage circuit.

Stopping of mills on Sundays
According to a 1911 law milling of ore by gold mines was not permitted on Sundays. This restriction was dogmatically followed by all gold mines till about 1972 when, realising the loss to the mines of equipment lying idle for 24 hours per week, I studied the Act very closely and found that, because of changes in technology, the Act did no longer apply. My proposals to the authorities, to start milling on Sundays, were at first received with a measure of scepticism but were soon adopted when the benefits were realised.

Peripheral or end-discharge mills
This development resulted from a study of slurry flow through grinding mills. From mathematical analyses it was evident that the conventional lifter behind the screen or grid in a mill has its limitation in effectively removing slurry from the mills and this limitation increased with increased speed of rotation. To solve the problem the only way out was to eliminate the lifter and go for peripheral or end discharge. We adopted end discharge and designed a prototype mill which became the forerunner of similar mills adopted by Anglo American and Goldfields. I appreciated their confidence in the system but was sorry that they did not consult me on the length-to-diameter ratio of the mills they adopted. You have probably heard of the saying that failure is an orphan but success has many fathers and I think they went to the wrong father to advise them on length-to-diameter ratios.

Being my last contribution before retirement from the Industry and not being able therefore to follow up on the development I still sense a measure of incompleteness. If therefore any member of the younger generation would like to talk to me about it I would be too pleased to discuss it with him or, for that matter, with her. Actually I would prefer a 'her' because of a lesser bias towards new ideas.

Before closing Mr President I would like to say a few thank you's. My first thank you is to the late Jack Job, mechanical engineer par excellence, without whose help I would never have dared to continue with the development of the prototype end discharged mill.

My second thank you goes to Robbie Robinson, the man with progressive ideas, with whom I always enjoyed my discussions.

My third goes to Lee Schlagman, librarian at E L Bateman who, for the past twenty years, was always ready to help and find the information that I needed.

And finally to my wife Edwina, for her understanding, tolerance and encouragement over many years. Edwina's an excellent cook and I believe it is the nourishment that she has carefully provided over many years that has kept my body and soul in good condition that I am still enjoying today. Incidentally, this also answers Mr Bateman's question.

Presentation of Awards, Medals and Certificates.
Mr 'Rams' Ramokgopa announced that Council had decided to make a special award, ahead of the presentation of the traditional awards. The special award was to Prof. Robbie Robinson for his outstanding services to the Institute. Prof. Robinson has advised us that he will be unable to continue his excellent work for the Institute due to health reasons. The President was called upon to read the citation.
Mr Mike Rogers: As this was a special award being made to a very special person and was a special occasion for Prof. Robinson as well as for the Institute, he would also like to extend a welcome to those friends of Prof. Robinson who had made a special effort to attend the meeting to be with him.

To commemorate the outstanding contributions made by Prof. Robinson to the affairs of the Institute, Council have decided to present him with a special and unique certificate for meritorious service.

Prof. Robin Edmund Robinson, more familiarly known as Robbie, was born in Bloemfontein, and was educated at St Andrew's School in Bloemfontein, at St. John's College in Johannesburg, and at the University of the Witwatersrand.

In 1954, he joined the Central Metallurgical Laboratory of Anglo American Corporation as head of the Chemical Engineering Section. In 1961, he was appointed to the joint position of Head of the Extraction Metallurgy Division of the Atomic Energy Board, as well as Director of the Government Metallurgical Laboratory (GML). When the GML became the National Institute for Metallurgy (NIM) in 1966, he became its first Director. in 1976, Prof. Robinson joined Sentrachem Limited as General Manager of its Metallurgy Division. He was subsequently promoted to Senior General Manager and appointed as Director on the Sentrachem Board. Since his retirement from Sentrachem, he has been closely associated with the University of the Witwatersrand, and very active in running his consultancy business.

In dealing with the many problems and frustrations that face him during his very active working career, Prof. Robinson revealed those gifts of ability and character that are the necessary ingredients for outstanding achievement in his chosen specialised field of Research, Development and Technology Transfer.

Difficulties were met with clear objective logic, and in all situations he showed a willingness to apply novel and often ingenious solutions. He met frustrations and failures with great determination, demonstrating a keen mind and a quick, balanced judgement, together with enthusiasm and drive. No wonder that in his involvement with professional and learned societies he has made so many unique and lasting contributions. In 1965/1966, he was President of the South African Chemical Institute, and he has served our Institute on Council for 30 years and as President in 1975/1976. In 1985 Dr Robinson was awarded the Brigadier Stokes Memorial Platinum Medal, our Institute's highest award, for his outstanding contribution as Chief Executive Officer of NIM, now known as Mintek.

In 1995 Dr Robinson volunteered to take over the responsibility for the SAIMM *Journal*. During the five years that he has been actively involved in this difficult task, the standard of the *Journal* has increased tremendously. Some of the notable changes that Robbie has brought about are the following:

- The introduction of reviewed, but unrefereed *'Journal'* papers in addition to fully refereed transaction papers. These *Journal* papers provide our members with information of practical and topical interest, resulting in a *Journal* which can satisfy both practical and high-level academic readers
- The regular and punctual *Journal*, with the result that more transaction papers are now being submitted
- A *Journal* that maintains its standing on the citation index for scientific papers
- Advertising in the *Journal* on an organized and co-ordinated basis, which has reduced its financial burden on the Institute
- The use of e-mail as a cost effective means of communicating with members
- The establishment of the Institute's Internet website, introducing *Journal* information into the website material, and management of the site until recently
- The introduction of an improved system of identifying suitable referees, to reduce the time taken for the processing of transaction papers.

The result of Robbie's management of the *Journal* is a high quality, highly regarded *Journal*, which is the 'beacon' of our Institute, of which all our members can be very proud. The *Journal* now fully satisfies one of the Institute's key objectives, namely the transfer of technical and scientific knowledge in the minerals and metals industry to its members.

On behalf of all the members of our Institute, I wish to convey our heartfelt thanks to Robbie, and to Diane, who has given so much support in recent years, for all they have done for the *Journal*. Their inputs and presence will be sorely missed.

As Prof. Robinson has already received every award that the Institute can bestow upon its members, Council has decided to present Prof. Robinson with a special certificate in recognition of his meritorious service. In addition Council has decided to name the Book Fund after Prof. Robinson and to dedicate one edition of the *Journal* to him.

Mr 'Rams' Ramokgopa announced the following awards, which were presented to the recipients by the President.

50-year Membership Awards

- B.E. Hersov, who was elected as a Member on 23 May, 1950 as a student
- B.H.L. Leach, who was elected as a Member on 10 November, 1950 as a student.
- M.J. Martinson, who was elected as a Member on 11 August, 1950 as a student.
- D.G. Maxwell, who was elected as a Member in February, 1950 as a student.
- R.P. Plasket, who was elected as an Associate on 9 June, 1950 as a student.
- N.C. Pope, who was elected as an Member on 27 September, 1950 as a student.
- W.R. Ruhmer, who was elected as an Associate on 11 August, 1950 as a student.
- T. Zadkin, who was elected as a Member on 23 August, 1950 as a student.

Papers published in the *Journal* from March 1999 to February 2000 by members of the Institute were considered for medals:

Gold Medals

No awards were made

Silver Medals

B.J. Venter, K.I. Afewu and G.O. Lewis for their paper published entitled

'Developing a methodology for estimating the performance of a series system of non-ideal CSTRs'.

M.F. Wells for his paper entitled

'Construction of a concrete plug in South Deep's main shaft to seal off a major water intersection'.

Presentation of Student Prizes

Mr Mike Rogers: Prizes are awarded to the following students for the best student dissertation in part fulfilment of the B.Sc. (Eng.) degree.

- *Mining:* W.C.S. Kotze, University of Pretoria, 'Haul road dust suppression'.
- *Extractive Metallurgy:* No award was made.
- *Metals Technology:* No award was made.

Other prizes awarded to students at the Universities of the Witwatersrand and Pretoria were presented at faculty prize-giving ceremonies held at the respective universities. The prizewinners were as follows:

University of the Witwatersrand

Prestige Prize:

Mining	D. Holm
Metallurgy	D. Nardini

Book Prize:

Mining	S. Newberry
Metallurgy	No Award

University of Pretoria

Prestige Prize:

Mining	W. Kuys
Metallurgy	T. Dry

Book Prize:

Mining	W. Kotze
Metallurgy	C.J. du Preez

Technikon Witwatersrand

Prestige Prize:

Metalliferous Mining	D. de Wet
Coal	J. Breytenbach

Atlas Copco Travel Grant for mining engineers

No award was made in 2000.

Outokumpu Travel Grant for metallurgists

No award was made in 2000.

Annual Report and Accounts

Subscriptions received showed an increase on the previous year, being Company Affiliates R193 997 (R175 751) and individual membership R687 359 (R452 111).

The substantial increase in the latter was due to the increase in the subscription rate to R400 p.a. (R250 p.a.).

Income from colloquia and schools decreased from the previous year to R353 337 (R428 579).

A surplus on the sale of investments of R166 732 (R292 638) was recorded for the year. Interest and dividends received were lower than the previous year at R13 344 (R32 997).

The result of the above showed an increase in total income received of R1 374 944 (R1 243 183).

The total expenditure for the year decreased to R1 497 292 (R1 511 421). This is mainly due to a reduction in *Journal* expenses to R558 755 (R603 023) and an increase in advertising to R173 916 (151 718) giving a net *Journal* expense over income of R360 995 (R448 525). Provision for doubtful debts decreased to R18 966 (R35 000) and subscriptions written off amounted to R70 583 (R50 926). An exceptional expense item was incurred during the year being that of the cost of the release of our lease and the subsequent move to our new rent-free offices in the Chamber of Mines Building—an expense of R144 514 this year which should provide a cost saving benefit of some R180 000 p.a. for the foreseeable future.

Our investments in the equity market decreased in value by some 15% over the year. During the year we have changed our investment advisors from Quyn Martin to RAD AFC. Our cash position at the bank improved to positive R638 509 (negative R178 806). This was due to a special effort being put into the timeous collecting of debts. As such, the improved cash flow towards the end of the year, has ensured that we are no longer dependant on the sale of investments for the day to day running of the Institute.

In last year's financial report, I stated that to make ends meet, we would have to double our subscriptions over two years. This would have meant a subscription rate of R500 p.a. for this year. I am pleased to report that, due to the cost savings achieved during the year and the improved cash flow, we have been able to limit the increase in subscriptions to 10% this year i.e. to R440 p.a.

Finally, our thanks go to our secretariat for containing the costs and to our accountant Mr André Schoeman for his efforts in streamlining our accounting system.

Office Bearers and Members of Council for 2000/2001

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	Dr L.A. Cramer
President Elect	A.A.B. Douglas
Senior Vice President	S.J. Ramokgopa
Junior Vice President	F.M.G. Egerton
Immediate Past President	M.H. Rogers
Honorary Treasurer	J.A. Cruise.

In terms of the election of ordinary members of Council, there is a letter from the scrutineers stating 'We have to report that we inspected the nomination papers for members of Council for the 2000/2001 session, and have found that the ballot papers sent out to Corporate Members of the Institute were in order. As a result of our scrutiny, we find that the following members have been elected (in alphabetical order):

Dr L.A. Cornish	C.M. Rule
Prof. R.M. Falcon	Prof. R.F. Sandenbergh
K.J.R. Ford	Dr T.R. Stacey
R. Graham	D.J. van Niekerk
A. MacFarlane	H.G. Waldeck
N.M. O'Brien	J.N. Wallington
R.G.B. Pickering	R.P.H. Willis

In addition, Dr A. Mulaba and P.J. Knottenbelt were elected to represent non-corporate Members of Council.

In terms of Clause 3.2.8 of the Constitution, the Chairmen of the Branches are as follows:

Johannesburg	A.S. MacFarlane
Pretoria	Prof. R.F. Sandenbergh
Free State	F.P. Guilherme
Mpumalanga	R.C.D. Phillis
Western Cape	J.J. Eksteen
Bushveld	C.A.F. Sweet
Zululand	I.J. Walton

These Chairmen will serve on Council.

The following Past Presidents have signified their willingness to serve on Council for the ensuing year:

G.Y. Nisbet	Dr H. Scott-Russell
Prof. A.N. Brown	J.A. Cruise
H.E. James	D.A.J. Ross-Watt
B.C. Alberts	Dr N.A. Barcza
C.E. Fivaz	R.P. Mohring
R.D. Beck	J.R. Dixon
J.P. Hoffman	

I would like to record our thanks to the Past Presidents, namely Prof. Plewman, Prof. Robinson, Dr Steffen and Mr Mosenthal, who have indicated that they wish to retire from Council for the next year, for all their time, effort and dedication in the past. In particular I would like to mention Prof. Bob Plewman who has been a Council Member for the past 35 years. Finally I would like to record Council's thanks to the serving Past Presidents for their continued support and wise guidance, and thank those who have agreed to serve another term of office and also to congratulate all those members who have been elected to Council.

Election of Auditors and Honorary Legal Advisors for 2000/2001

President: I propose that the appointment of auditors for the coming year be left to Council. Office bearers have identified the need to appoint new auditors who will best serve the growing and changing needs of the Institute and will make recommendations to Council.
I propose that Messrs van Hulsteyn Attorneys, be re-appointed as Honorary Legal Advisors. Agreed.

Induction of President

President: It is my pleasant duty to introduce your new President, Dr Larry Cramer.
Mr 'Rams' Ramokgopa: Larry was born in the United States in October 1948 and completed his Bachelors Degree in Metallurgical Engineering at the Colorado School of Mines. In 1971, he left the USA to study for his Masters Degree (Chemical Engineering) at the University of Natal, Durban Campus. The Masters Degree in Modelling the Froth Phase of Flotation was awarded in 1974 followed by a PhD in Chemical Engineering on the 'Industrial Application of Flotation Models' in 1976.

Larry joined Johannesburg Consolidated Investment Co. in 1972, and with the exception of two years with Kennecott Minerals Corporation Research Center in Salt Lake City, has remained with JCI and what is now Anglo American Platinum Corporation. His career focus has been production management and he has served in various capacities with Rustenburg Platinum Mines, Randfontein Estates gold mine, Consolidated Murchison and Precious Metals Refiners. In recent years Larry has worked in various Head Office consulting functions.

Larry joined the SAIMM in 1978 and was elected to Council in 1993. Whilst in Rustenburg at the Precious Metals Refiners he served as Chairman of the Bushveld Branch.
Larry is married to Nesta and they have two sons. Scott completed his BSc in Civil Engineering at Stellenbosch University at the end of 1999. He leaves in August to do a Masters of Engineering Degree at Cornell University in New York. Matthew is in his third year of Chemical Engineering (Minerals Processing Option) at Stellenbosch University.
In his leisure time Larry has pursued his hobby of economics and philosophy by way of a UNISA BA Degree which he was awarded in 1992. He is also an avid aerobics disciple, cycles 'The Argus' and enjoys 4x4 excursions.

Presidential Address

Dr Cramer then presented his Presidential Address entitled 'Platinum perspectives', which is reproduced elsewhere in this edition of the *Journal.*

Vote of thanks

Mr Noel O'Brien: Ladies and Gentlemen and President Cramer. In proposing a vote of thanks to Larry I'd like to say 'well done on a well-researched, informative, refreshingly realistic summary of the current status of the Platinum Industry'. I'm sure that not many people have need to dwell on the strategic, commercial and social importance of the Platinum Industry nor on its importance to the development of the future wellbeing of South Africa. However, in proposing a Vote of Thanks I would like to add my voice and those of many of us here, I'm sure, to his, in his call for greater South African resources to be devoted to focused research in mining and metallurgy to ensure the long-term competitiveness and survival, not only of the platinum industry but to all the mineral industries in which members here are involved. Such research should, in my opinion, not be limited to technical advances only, because as we've heard, we are all extremely aware of the total dependency of our endeavours on a well-trained, healthy and motivated work force, and this is highlighted, I think, very aptly in Larry's address. Clearly, much greater emphasis is being focused on people and people-related matters in the mining industry. Perhaps consideration should now be given to incorporating such topics in engineering undergraduate courses in our technikons and our universities, to produce a new breed of industry manager who is schooled in all the relevant issues likely to confront them throughout their mining careers. By way of example, a recent survey by the Mine Metallurgical Managers Association revealed that Metallurgical Managers spend about eight per cent of their working time these days on labour-related matters. When they go to university they probably spend ninety per cent of their time on technical matters. I think there's a message here and I think these facts speak for themselves. But, in conclusion I'm sure that now we would all like to wish Larry and Nesta—because bear in mind that being President of the Institute these days is a team effort—a very happy and successful 2000/2001 term of office, and I'm sure that the Institute will only progress and prosper under Larry's guidance and stewardship and I would like you all to express your appreciation in the traditional way.

Closure

The meeting closed at 18:17. ◆