Proceedings of the Annual General Meeting, 18th August, 1982

The Annual General Meeting of The South African Institute of Mining and Metallurgy was held in Kelvin House on Wednesday, 18th August, 1982.

Mr G. Y. Nisbet (President) was in the chair and declared the meeting open at 16h05.

Obituaries

President: It is my sad duty to announce the deaths of the following members of the Institute: Honorary Life Fellow J. A. Taylor; Life Fellows J. Watt and J. J. Cairns; Fellows J. H. Mortimer, R. R. M. Cousens, H. Clark, S. W. Hill, Dr A. Whillier, and Dr C. M. van H. van Staden; Members F. W. McElroy, V. J. Irsigler, B. J. R. Botha, and E. J. Jackson; and Associate B. V. Robertson.

As a mark of respect to the memory of the deceased and in sympathy with the bereaved, please rise and observe a few minutes of silence.

Confirmation of the Minutes

President: Die notules van verlede jaar se Algemene Vergadering, wat op 19de Augustus 1981 gehou was en in die September uitgawe van die *Joernaal* gepubliseer is, is bevestig.

Welcome

President: I extend a sincere welcome to you all, and especially to the following distinguished guests and their wives: Dr L. Alberts, Professor A. Ball, Mr K. T. Brightman, Mr P. H. Bosman, Mr W. F. Cronje, Dr J. W. L. de Villiers, J. W. Erasmus, Dr C. F. Garbers, J. C. R. Heydenrych, H. V. Hellyar, Dr F. G. Hill, L. H. James, F. Jooste, B. E. Protheroe, D. Sizer, C. Skeen, R. J. St Ledger, Dr D. A. Sykes, Dr V. van D. Boshoff, Mr W. W. Malan, Professor Van Biljon, the Presidents and representatives of other Institutes, the Honorary Life Fellows of the Institute, and the representatives of the media.

Membership

President: The names of the candidates who were admitted to membership since the last General Meeting have been tabled. I welcome the newly-elected members to the Institute and congratulate those who have been transferred to a higher grade.

Honorary Life Fellow

President: Honorary Life Fellowship is not bestowed lightly by the Council, and the qualification is that the recipient must have rendered outstanding services to the industry or to the Institute. This year we honour one of our Past Presidents, who has continued to give us dedicated and loyal service and, in addition, has just completed an outstanding job in chairing the Organizing Committee for the Twelfth Mining and Metallurgical Congress.

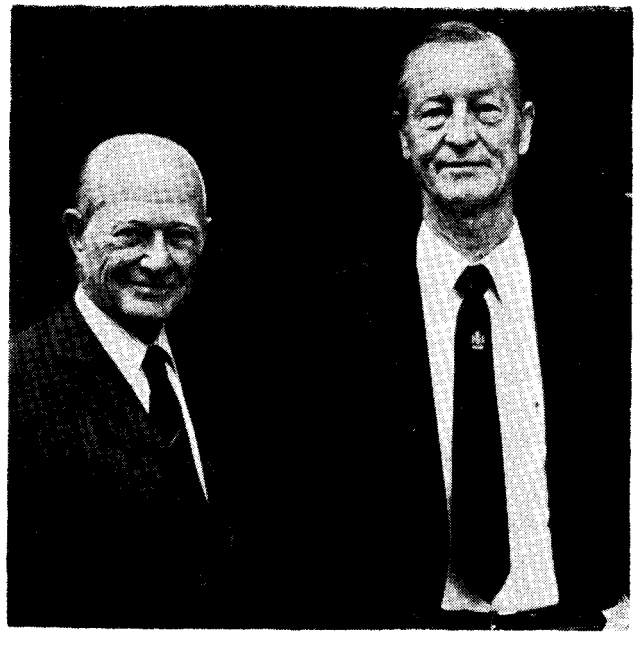
It gives me great pleasure to announce that Council has decided to honour Dr M. G. Atmore, and I ask him to come forward to receive his certificate.

Brigadier Stokes Memorial Award

President: In 1980, the Institute introduced a prestige award to commemorate the outstanding contribution made by Brigadier R. S. G. Stokes, an Honorary Life Fellow and a Past President of the Institute.

Council decided that the Brigadier Stokes Award would consist of a medal and a cash award, and would be made for the highest achievement and contribution by an individual in the field of mining and metallurgy in South Africa. The first recipient of this award was Mr Harry Oppenheimer, followed by Dr William Bleloch last year. All Corporate Members may submit nominations for this award.

Once again, we have a distinguished recipient, and I have great pleasure in announcing the name of Dr Francis George Hill.



Dr F. G. Hill, recipient of the Brigadier Stokes Award for 1982, and Mr G. Y. Nisbet, President of the Institute for 1981 – 1982.

Francis George Hill graduated in Mining Engineering at the University of the Witwatersrand in 1926, and was awarded the Chamber of Mines Research Scholarship and Gold Medal as the most distinguished graduate in the branch of Mining and Metallurgy. He was also awarded a Rhodes Scholarship, being the first Mining Engineer to win that distinguished and coveted award.

At Oxford, he obtained the degree of M.A. Jurisprudence, and so gave to his engineering background the clear thinking, logical, and analytical faculty that was to characterize his approach to all problems, particularly those in the field of research in mining.

His career in mining spanned the most important areas of the East and Central Rand and, later, the O.F.S. goldfields. Soon after he joined the mining industry, it began to feel the impact of his inquiring and innovative mind. This spirit of innovation enabled him to introduce many practices to the industry that today are standard procedures.

The first manifestations were to appear at ERPM, where heat and rock-burst problems dominated the difficulties of deep-level mining. It was not long before he appreciated that the magnitude and intensity of rock bursts, with their dreadful toll of human lives, which caused deep personal grief to a man of Hill's sensitivity and humanity, would require a wide and sophisticated approach.

The industry had only limited facilities, and no trained scientists, to undertake this type of research. Mr F. Hill, or Pinky as he is known throughout the profession, made the initial approach to the C S I R, and this led ultimately to the advanced analogue computer technology used by the Research Organization of the Chamber of Mines, as well as throughout the industry.

During his membership of the Council for Scientific and Industrial Research and of the Committee on Deep-Level Mining, he was able to give free rein to his wide-ranging ideas and beliefs relating to the necessity of a scientific approach to all technical problems. His energies were not confined to purely scientific matters. He became deeply concerned with the apparent superficiality of the approach by management to human problems on the mines, and was the first to advocate the formation of a personnel department — much to the scepticism of the old school and, I think, still many of the modern school.

At Durban Deep, he applied his mind to the problems of shaft-filler extraction, and it was at this mine that, for the first time in the industry, a shaft-filler was successfully extracted during its working life — a process to be repeated at Harmony.

In the industrial-metallurgical sphere, together with Dr Bleloch, a previous winner as I've already mentioned, he was instrumental in pioneering the development of the great South African ferrochromium industry, and it was Rand Mines that, under his leadership, became the first company to produce ferrochromium from chemical-grade chromium ore.

He seemed never to lose this keenness for a proper scientific approach to problems — probably stemming from his studies at the International Management Institute in Geneva and at various universities in America, where he familiarized himself with courses in Business Management.

He was responsible for the establishment of the Corner House Laboratories, where much valuable work was done by his team, Messrs Barkser and Beadle — both Gold Medal winners — on mine ventilation and dust suppression.

He played a leading role in the establishment of the Wits. Business School, encouraged by the successful careers of many of his subordinates after attending business schools overseas.

His active participation in research and the successes that were achieved under his able guidance and leadership were to obtain recognition at the highest level.

On two occasions he was awarded the Gold Medal of the South African Institute of Mining and Metallurgy, and once by the London Institute of Mining and Metallurgy. While the awards from the South African Institute were for individual papers, that from the I.M.M., in 1962, was more broadly based. Thus, the President of the I.M.M. in making the award said, *inter alia*, Mr Hill had gained eminence in a wide field of activities, but it was to such problems as underground safety and economy that his professional energies had been chiefly devoted.

'Since the first Rock-burst Commission in 1924, many other Rand engineers have contributed valuable papers, dealing with that important subject, in relation to their local conditions.

'Due primarily to Mr Hill's foresight and determination, research was first organised some ten years ago, upon a wider and more scientific basis, with the assured continuity of effort essential to success.

'He formed the research team, composed of mining engineers from the Central Mining and Rand Mines Group, and of scientists from the South African Council for Scientific and Industrial Research. That research work was subsequently taken over by the Transvaal and Orange Free State Chamber of Mines, and today the research into problems of rock mechanics is under the guidance of the industry, with assistance from all the mining groups, together with the Council for Scientific and Industrial Research, the Bernard Price Institute of Geophysical Research, and the University of the Witwatersrand.'

Throughout his career he has retained a great interest in academic matters, and has served on the Council of the University of the Witwatersrand for 38 years, during which time he has been Chairman, and also Chairman of the Finance Committee.

His contribution to the minerals industry in South Africa can also be measured by his involvement in the technical and scientific institutes.

He is at present an Honorary Fellow of this Institute, having been President in 1948/1949. He was also President of AS & TS in 1953/1954. He served on the C S I R for 17 years, and the Scientific Advisory Council for 10 years. He was the first President of the South African Institute of Personnel Management, and is now an Honorary Fellow.

It is perhaps of interest to record that in the years 1938/1939 he was technical assistant under Brigadier Stokes and, in that capacity, was largely responsible for early layout and development of the Blyvooruitzicht Gold Mine.

His record of achievement in mining and metallurgy in South Africa is immense and immeasurable. His contribution to progress in mining in this country, and the practical benefits gained in the mining and metallurgical

field — an unusual combination resulting from his deepest belief in the scientific approach to research — qualify him as an outstanding nominee to receive the Brigadier Stokes Memorial Award.

Dr Hill: The previous two recipients of the Brigadier Stokes Award, namely Mr Harry Oppenheimer and Dr William Bleloch, paid due tribute to the man in whose honour the award was instituted. In doing so, they referred in general terms to the great contributions that Brigadier Stokes made during the 50 years that he served here on the Witwatersrand.

I do not propose to elaborate on these contributions, or deal at length with Brigadier Stokes's colourful and distinguished career, for the occasion is not appropriate. But, as stated by your President, I was his technical assistant for two years at Rand Mines, and, if I may be permitted to do so, I shall give some personal impressions of this outstanding man.

In what ways, it may be asked, was he a leader? The foundation of his leadership lay in his character, his energy, his drive, his intellectual ability. As a top executive in a large mining group, he had as the leading objective the life and strength of that group, but he was not concerned with one group only, he was concerned with the mining industry as a whole—as is borne out by two classic addresses that he gave—the first to this Institute in 1937, entitled 'Some Observations on the Economics of Rand Mining', and the second to the Institute of Mining and Metallurgy in London, entitled 'Recent Developments in Mining Practice on the Witwatersrand'.

In both, he stressed the need for technological progress. *Inter alia*, he stated that 'The national urgency of improving upon our present working costs'—I may say, in those days they averaged only R2 per ton — 'has been frequently stressed. It is difficult to exaggerate the importance of this objective, if we are to ensure the permanent stability of the mining industry'.

But, while Brigadier Stokes preached higher productivity as a goal, he saw clearly, too, the need for exploration. He actively encouraged the search for mineral deposits to replace those currently being exhausted. In terms of the possible exploitation of deposits, however, he was no gambler. He always wanted facts, and he was not satisfied with facts received at second-hand. He would read reports, go into the field, make voluminous and meticulous notes, and record these in his observations. He was not, however, conservative in his assessment of mining ventures. Once he had been given the relevant facts, he acted firmly on his reasoned convictions.

From this brief recital of Brigadier Stokes's philosophy in dealing with some of the main problems facing the mining world, it will be gathered—and rightly—that he was an inspiring leader, not only because of his perpetual intellectual vigour, but also because of his healthy optimism. He had the scientific approach of the engineer and the spirit of the entrepreneur. In pursuing objectives, he was persistently persistent, and this attribute resulted in his playing a major role, for example, in Rand Mines acquiring control of Harmony and Blyvooruitzicht.

It is pertinent to ask in what measure the gospel of increasing production was preached by Brigadier Stokes. To what extent does it prevail today? I think, in large measure. And this may be measured, perhaps in three ways.

The first is in training. During the past 20 years there has been a tremendous surge in training, from the lowest levels — from labourers — to top management. But, while improving the skills of labour is obviously highly desirable, it is even more important that these skills be well directed, and that is why training for management and supervision plays such an important part in any training programme.

The second way, of course, is in research. During Brigadier Stokes's career, I'm afraid that research was at a relatively low ebb, but it has improved enormously during the past 20 years. As I remember, in the early 1960s the research budget, for example the annual research budget of the Chamber of Mines, was of the order of hundreds of thousands of rand a year. Today it measures over R10 000 000. I think the figure is about R15 000 000. This is just an example of the tremendous effort that the industry is making in seeking new knowledge.

The third way lies in the utilization of our Black labour. The constant endeavours to make better use of the latent abilities of the industry's labour force are constant. This issue, of course, is largely political, and it is only to be hoped that in the future great advances will be made in utilizing this, as yet relatively untapped, source of human endeavour.

Mr President, I thank you very warmly for the generous and over-kind remarks that you made in introducing me. This award stems basically from the fact that I was fortunate in choosing a career that plunged me into an environment brimming with problems, and also with opportunities—opportunities to meet the unending, and sometimes formidable, problems that face a mining engineer in this country. Helping to combat these problems has been exciting and stimulating. My role in the combat was recognized in the past by a number of awards given to me by different institutions, but no award has given me greater pleasure than that conferred on me this afternoon. I am a most proud recipient, and my sincere thanks go to the Institute for electing me to this signal honour.

Presentation of Medals

President: These medals are awarded for outstanding papers presented to the Institute or published in the *Journal*, or both, during the period March 1981 to February 1982.

This year, Council has decided to award Silver Medals to two papers: one to Professor A. Ball and B. Protheroe for the paper 'The Selection of Abrasion-Corrosion-resistant Materials for Gold-mining Equipment', written jointly with Dr C. Allen, who is not a member of the Institute and is not eligible for a medal but is to be awarded a Certificate of Merit; the other is awarded to Dr A. A. Hejja for the paper 'Archaeo-metallurgical Studies of Iron-smelting Slags from Prehistoric Sites in Southern Africa', written jointly with Dr H. M. Friede and Dr A. Koursaris, who are not members of the Institute and therefore qualify for Certificates of Merit.

The gold-mining environment is probably one of the

most, if not the most, severe in which equipment can be situated. This results in extremely high costs, resulting from the deterioration of equipment, the necessity for replacements and/or repairs, and down-time. One of the major problems is the time required to evaluate alternatives in the operating environment. This paper by Ball, Protheroe, and Allen describes the development of laboratory tests to simulate the underground conditions, thus obviating long and tedious experiments on site, and I am sure this is going to be of great value to the gold-mining industry.

The other paper details the smelting of slags from prehistoric sites in Southern Africa and their related cinder material. Twelve samples were taken from sites in the Transvaal, Swaziland, and Botswana, and these were related to the ores selected from the early Iron Age site at Broederstroom, which dates from between AD 350 and AD 600. It appears that the slags were smelted at temperatures below 1250 °C or, in some cases, at temperatures slightly higher than 1250 °C. No essential differences were found between the slag samples taken from the early Iron Age site and from the six later Iron Age sites in the Transvaal, Swaziland, and Botswana. This fact strengthened the concept that iron-smelting technology had remained basically unchanged during the whole period of the Southern African Iron Age — that is, between the 4th and 19th century AD.

Presentation of Student Prizes

President: These prizes are awarded for outstanding papers by fourth-year students in the fields of mining and metallurgy. Four such prizes are to be awarded this year — one in mining and three in metallurgy.

The mining prize is awarded to Mr J. Kriek, of the University of Pretoria, for his paper 'Die Voor- en Nadele van Voorspitsing by Stroopmynbou'.

The metallurgical prizes are awarded to two students from the University of the Witwatersrand and one from Pretoria: Mr J. M. Benson for his paper 'Development of a Crack-monitoring Technique for Use in a Corrosion Fatigue Study of SA 533-B Pressure Vessel Steel'; Mr P. Dean for his paper 'C.O.D. Toughness Testing of Medium Strength Steel as a Preliminary Development for Single Specimen J. Integral Toughness Tests of SA 533-B Steel'; and Mr De Lange for his paper 'Die Evaluering van Dolomiet as 'n Vuurvaste Materiaal'.

Annual Report and Accounts

[See pp. 245 to 256 of this issue of the Journal.]

President: I now call upon Professor Krige, the Honorary Treasurer, to give a brief review of the financial status of the Institute.

Professor Krige: At the end of June 1982, our total assets, mainly investments, less current liabilities, stood at over R400 000. Included in this figure is a nominal R1 value for our stocks of publications, mainly monographs. If these are included at market-related levels, the total value of our assets would be more than half a million rand. This sounds impressive, but is not excessive in relation to our commitments to members and to the mining and metallurgical industry.

Monograph Number Three was added to our series only towards the end of the year, with the net result that this activity showed a net deficit for the year of nearly R25 000. This should be seen as an essential contribution to the cost of the present stocks of monographs.

The efforts spent on the S.A.I.M.M. Schools and Colloquia were of necessity somewhat curtailed during the year because of the Institute's involvement with the highly successful 12th Congress of the Council of Mining and Metallurgical Institutions. Nevertheless, a net surplus of R51 000 was earned from this important facet of our activities owing to the fact that their quality ensured attendances in excess of budget expectations.

The *Journal* continues to offer members an increased technical coverage. Owing mainly to a higher revenue from advertising, it was possible to reduce the net shortfall on the *Journal* from R30 000 in the previous year to some R24 000, or about half of the amount received from members' subscriptions this year.

The other costs of running the Institute increased by an alarming 40 per cent, from R68 000 to R95 000,but it was balanced partly by an improvement of some R15 000 in other income, mainly from investments reflecting a higher interest rate.

After allowing for the transfer of some R20 000 to the Education and MacArthur-Forrest Funds, the Institute had a net deficit for the year of some R8000. For this reason, and in budgeting for the ever-increasing costs of providing for all its services, the Institute had no option but to raise subscriptions for 1982/1983, and members are well aware of that.

The education, Brigadier Stokes, and MacArthur-Forrest Funds are held in the form of investments accounting for more than half of the Institute's total investments referred to above. These three funds now stand at levels that should enable all relevant commitments for 1982/1983 to be met from the income earned from their investments.

A special word of thanks is due to Mr Trueman, our accountant, and also to our secretarial staff.

I now formal second the motion for the adoption of the Annual Report and Accounts.

Office Bearers and Members of Council for 1982/1983.

President: I have pleasure in announcing that, in accordance with Clause 3.3 of the Constitution, the retiring Council has elected the following office bearers for the ensuing year:

President: Professs A. N. Brown; Vice-Presidents: Professor P. R. King and Mr J. D. Austin; Honorary Treasurer: Professor D. G. Krige; Immediate Past President: Mr G. Y. Nisbet.

In terms of the election of the Ordinary Members of Council, there is a letter from the scrutineers stating, 'We have to report that we have inspected nomination papers for Members of Council for the 1982/1983 session, and have found that the ballot papers sent to Corporate Members of the Institute were in order. There was a return of 455 papers, representing a ballot of 34 per cent. As a result of our scrutiny, we find that the following Members have been elected: Messrs B. C. Alberts, R. H. English, P. T. Fewell, C. Fivaz, J. S. Freer, J. J. Geldenhuys, Dr A. K. Haines, Mr P. N. Harris, Dr B. K. Loveday, Dr J. Lurie, Mr G. G. Malan, Dr G. O. K. H. Steffen,

Professor A. N. Brown, President of the Institute for 1982 – 1983.

Mr G. C. Thompson, and Dr H. Wagner.

Dr Haines: On behalf of the newly-elected members, I wish to thank you for electing us, and assure the members of this Council that we shall do our duty to the best of our ability.

President: In terms of Clause 3.2.8 of the Constitution, Mr B. Lunt, Chairman of the Orange Free State-Klerksdorp Branch, and Mr H. C. van Zyl, Chairman of the Witbank-Middelburg Branch, will serve on Council, while Mr G. Pienaar will represent the Materials Engineering Specialist Division, which is based in Pretoria.

The following Past Presidents have signified their willingness to serve on Council for the ensuing year: Dr P. R. Jochens, Dr M. G. Atmore, Mr H. Britten, Professor D. D. Howat, Dr J. P. Hugo, Mr D. G. Maxwell, Professor R. P. Plewman, Dr R. E. Robinson, Professor M. D. G. Salamon, Mr P. W. J. van Rensburg, Mr D. A. Viljoen, and Mr P. A. von Wielligh.

Induction of President

President: It is my pleasure to introduce Professor Alfred Norgaard Brown as your incoming President.

Alf was born in Bloemfontein and grew up in Johannesburg, completing his schooling at the Forest High School in 1950. After matriculating, he started as a learner official at Crown Mines, and a year later, in 1952, he was awarded a Chamber of Mines bursary and commenced his studies at the University of the Witwatersrand, where he obtained a B.Sc. (Mining Engineering) in 1955.

He then returned to Crown Mines as a graduate-in-training. He was awarded a Chamber of Mines Research Scholarship and, after 14 months, was back at university studying for an M.Sc. Degree, which he obtained in 1960. His thesis was connected with a research project into the strata movement and ground control connected with the extraction of a shaft pillar at depth.

Once again he entered the service of Crown Mines as a graduate-in-training, followed by a spell in the Rand Mines' head office, where in 1964 he became involved with research into rock-breaking at Durban Roodepoort Deep.

In 1965 he returned to the university as a Research Fellow, and continued research into rock-drilling, explosives' usage, and rock-breaking. It was at this time that controlled blasting techniques were being developed and implemented in the South African mining industry.

In 1969 he became interested in rock-boring, and moved across to manage Raise and Tunnel Boring (Proprietary) Limited, a subsidiary of Shaft Sinkers (Proprietary) Limited. This company was the first contract raise-boring enterprise in the Republic, and valuable experience and developments were made during this period.

Alf then decided to go it alone, and went into private practice as a consultant, and also as a director of a number of companies. His basic philosophy was the development and application of new techniques within the industry.

In 1976 he rejoined the industry as an assistant consulting engineer to Gold Fields, being more directly responsible for mechanization within the group, particularly rock-boring operations. He was appointed a consulting engineer in 1977, and remained there until he accepted the post of Professor of Mining at Pretoria University in March 1981.

During his career he served on numerous committees, and was a member of the Research Advisory Committee of the Chamber of Mines for a number of years.

Alf has published a number of papers, mainly related to ground movement, rock blasting, and rock boring. Since 1980, he has represented the Institute on FSPE, as well as being an alternate on SACPE. Alf was responsible for an important function in the Institute in that he initiated, and followed through, the design and production of the new ties and cuff links of the Institute.

Alf has been a member of the Committee of the Mining Engineers' Society at the University of the Witwatersrand since 1955, and is currently its Chairman.

Alf and his wife, Joyce, have three children — two daughters, Glyn and Hazel, and a son, Kevin.

Alf thoroughly enjoyed his rugby and cricket in his younger years, but his sporting activities are now limited to social golf.

I note that, to ensure there are sufficient people here to clap when he takes over, he brought all his mining engineering students across from Pretoria with him. We welcome them and are pleased they could come.

We are fortunate in having a man of this calibre to guide our affairs during the coming year. Living in Pretoria is going to add to his burden as President, but

I am sure that he will cope more than adequately even under these conditions.

President Elect: Thank you very much Mr President for your kind remarks. I am deeply conscious of the high honour that has been bestowed on me this afternoon. The high standards set by my predecessors are a formidable challenge, but I pledge myself to endeavour to maintain those standards.

The activities of the Institute continue to expand. In the climate of rapid technological change, it is important to provide avenues for the exchange of technical information. Important problems concerned with manpower shortages demand urgent attention. The recessionary situation, which has the world economy firmly in its grip, presents particular problems to the minerals industry, and this Institute has a positive contribution to make in addressing some of those problems.

Through its various sub-committees and representation on other bodies, the Institute faces a busy year, and we are fortunate to have such a fine body of capable, enthusiastic, and dedicated men on the Council to continue to give those problems their attention.

It is a particular pleasure for me to record our sincere appreciation to Mr George Nisbet for his service to the Institute as its President during the past busy year. With his quiet, unassuming manner, he was ideally suited to lead this Institute through the 12th CMMI Congress. A number of overseas trips, during which he visited most of our sister institutions abroad, placed additional demands on his time.

As the Immediate Past President, he remains an Office Bearer, and we look forward to his counsel and assistance during the coming year.

I would now like to tell you something about the team that is to lead this Institute through the coming year.

Professor Peter King and Mr John Austin have made very valuable contributions to the affairs of the Institute over past years. I am indeed fortunate to have two such able and enthusiastic stalwarts as Vice-Presidents, who will certainly make my task much easier.

A large number of Past Presidents have again indicated their willingness to serve on the Council. The guidance and the assistance, based on the wisdom and experience of those long-serving members of Council, is a valuable asset and is deeply appreciated.

I congratulate the ten re-elected members of Council, and Dr Haines and Messrs Steffen, English, and Freer, the four newly-elected members. We're indeed fortunate to have men of such stature and calibre, who are prepared to give up their valuable time to serve this Institute.

Professor Danie Krige has managed the financial affairs in his usual quiet, efficient manner, and we are deeply indebted to him for his services, and are indeed fortunate to have someone of his ability in whom to place this important trust.

The Institute's *Journal* is highly regarded, and the standard is maintained through the conscientious efforts of our Honorary Editor, Dr Helen Glen. The manner in which she has managed to cope with the Congress publications as an additional workload is quite remarkable, and I wish to record the Institute's sincere appreciation for her services.

Miss Eunice van den Berg is now responsible for the production of the *Journal*, and is steadily gaining experience. We thank her for all the hard work she has put in.

Mr Austin: On behalf of Professor King and myself, I offer our congratulations to Professor Brown on his assumption of the position of President, and wish him a successful and rewarding year of office.

Professor King and I are very conscious of the honour awarded to us, and I can assure the President and members of this Institute that we shall carry out our responsibilities to the best of our ability.

President Elect: It would be remiss if I did not make a particular announcement tonight. In this very busy Congress year, I was appointed Chairman of the Publications Committee and, with the assumption of new duties in Pretoria, it became apparent that I was going to have a tremendous job managing it. While I was gasping for air, Mr Henry James came along and filled the very important post of Chairman of the Publications Committee. I thank him most sincerely for making such a wonderful job of the technical side of the Congress.

Election of Auditors and Honorary Legal Advisers

President Elect: I propose that Messrs Alex Aiken and Carter be appointed auditors, and that Messrs Van Hulsteyn, Duthie and Saner be appointed legal advisers to the Institute for the coming year. *Agreed.*

Presidential Address

Professor Brown delivered his Presidential Address, entitled 'The Future Supply of Engineers for the Mining Industry' (given in full on pp. 257 to 268 of this issue of the *Journal*).

Vote of Thanks

Mr Peter van Rensburg: I propose a vote of thanks to Professor Alf Brown, the newly-elected President of the South African Institute of Mining and Metallurgy. His address covered a wide field, and concentrated on an aspect of concern to the mining and metallurgical industries, to which he, in his present academic post, is devoting much attention.

From the wide-ranging resumé of Professor Brown's career given by the Outgoing President, you know that he is a man of wide experience and great ability, and that he has the background to speak with authority on the subject of his Presidential Address.

I have known Alf Brown for some 25 years, from the days when he was working as a Research Fellow in Rock Mechanics at the University of the Witwatersrand on a project for the Chamber of Mines. The work for the thesis that earned him his Master's Degree involved very accurate levelling from behind the sub-outcrop of the Main Reef series in the centre of Johannesburg, down Eloff Street Extension, to the Third Shaft of Robinson Deep Limited, where the shaft pillar was being removed at a depth of some 1300 metres, as well as many underground measurements in the stopes around the shaft.

Alf can tell many stories of night-shift surveying down Eloff Street.

It was fairly arduous work, under difficult circumstances, and is a great credit to him that it was carried out meticulously. This has been the hallmark of Alf's work throughout his career. The results of that work, which examined the effects of pillar removal on surface subsidence, and resultant bursts, was a valuable early investigation into aspects of this subject that have since become of major importance in rock mechanics research. The paper covering these subjects in the records of the Association of Mine Managers was of an extremely high standard.

It will come as no surprise to those present that the driving force behind that work was none other than the distinguished recipient of the Brigadier Stokes Memorial Award tonight. We know much of Dr Hill's work in these fields, and Alf carried on much of that work.

It is also, of course, no surprise that Alf's early career came under the influence of Dr Hill, and the research work in which Alf became involved and his inquiring mind, I am sure, can also be related to the influence of Dr Hill in his early days.

Later, we came to know Alf for his excellent work and accurate, smooth blasting in large excavations, subsequently in regard to raise boring—all things that have been referred to this evening.

In his address, which I had the privilege of reading in advance of today's meeting, Professor Brown reviewed the importance of our great industry to the well-being of the country. In particular, he touched on various aspects of changes over the past 21 years, which was also the theme of the recent Mining and Metallurgical Congress held here in Johannesburg.

He expressed his confidence in the future of our industry, and painted a picture of many exciting projects — views with which we all concur. But that future depends on a number of important factors, the most important perhaps being the discovery of new deposits, and the cessary manpower to operate both existing and new mines and the mineral industries.

It was some ten years ago from this same platform that I commented on the pessimism of learned members of the Club of Rome, and made the statement that the waste rock of today would become the ore of tomorrow.

The many advances in exploration techniques, mining methods, and metallurgical extraction processes in recent years have been rapid, and are all contributions to the well-being of the mining industries of many countries. However, it needs engineers to meet this challenge, and it is remarkable that so much has been achieved when one considers the shortage of engineers as referred to by Professor Brown in his address. The shortage of technicians in our rapidly advancing world of technology is perhaps even more critical, with the result that engineers are having to do much of the technicians' work as well.

The need for advances in the techniques used in the deep-level mining for gold, and for high extraction rates in both open-cast and underground collieries, are two of the more obvious shorter-term priorities, but Professor Brown highlighted the need for improvements related to power generation, synthetic fuels, smelting of iron, steel, and other metals, and the expanded production of many minerals. The technical challenges to both mining and metallurgical engineers are vast.

Many speakers over the years have drawn attention, at this same forum, for the need for more trained engineers. Many suggestions have been made for ways and means of attracting more suitable candidates to our industry. Professor Brown has shown in his address that we have had no real success, although there has been an upward trend in the past few years.

Of those people who have been trained, many have been drawn to the service industries, which after all also need them, leaving the mines and mineral industries rather under-supplied.

Our speaker pointed out that careers in the mineral industry are challenging and fulfilling. The position for students is made attractive, but the number coming forward is still woefully inadequate.

He highlighted the problems created by National Service, but these seem unavoidable in the present circumstances. It seems obvious that the supply of suitable candidates will always be far less than the demand if we are to rely on present resources. The country, after all, also needs doctors, accountants, scientists, and a host of other technically-trained personnel, as well as many well-trained persons for non-technical fields. All the minerals industry can strive for is its fair share of those available from traditional sources.

The conclusion reached by Professor Brown that the only way to satisfy future demand will be to draw on the resources of other race groups is fairly obvious. However, in spite of the efforts already being made by various organizations to draw such people into technical fields, it is clear that it will be many years before anything like an adequate number will reach the necessary standards. The report of the De Lange Commission highlighted the shortcomings of the educational facilities of the country, and the vast gap to be filled before adequate numbers of persons from other race groups with a suitable background will be ready for advanced professional training.

It is a matter of urgency that every effort should be made to improve the training of these people as far as possible. More needs to be done by all employers, both in regard to quantity and standard, to ensure that these people are advanced up the ladder from their present levels. In time, more and more will reach the higher levels where we are experiencing the greatest skill shortages. Nobody can imagine that this will be easy, and a major effort is required.

In the interval, it is clear that our existing institutions must intensify their efforts to raise the numbers and standards of trained engineers and technicians. Here, we know Professor Brown has already made a considerable impact in the short period he has been at the University of Pretoria.

Whatever Alf has tackled, on the sportsfield, in the classroom, and in his professional career, he has done with enthusiasm and highly successfully. In the course of his career he has become an expert on a number of aspects in the field of mining, as we have heard today, but he also has a wide knowledge of all the other aspects of

mining. He showed his ability to impart knowledge to others at an early stage of his career, in the Mining Department at Wits., whilst with Gold Fields he made his mark as a clear thinker with the ability of lucid expression, as we have seen here again today, and as an engineer of great ability.

Gold Fields was indeed sorry to lose his services. However, the importance of training new mining engineers is so great that Gold Fields was happy to see him take up his post as Professor of Mining at the University of Pretoria. We believe he will, in his position in the academic field, make his mark on the South African mining industry.

With those attributes, we are also certain that he will fill his post as President of our Institute with distinction, thus maintaining the highest tradition of that office. We know also that he will be ably supported during his year of office by his wife, Joyce. We wish him a successful year at the helm of our Institute's affairs.

Conclusion

The meeting ended at 18h30.

Mine ventilation

The Institution of Mining and Metallurgy and the Institution of Mining Engineers will hold the Third International Mine Ventilation Congress in Harrogate, England, from 13th to 19th June, 1984. The first congress was held in Johannesburg, South Africa, in 1975 and the second in Reno, Nevada, U.S.A., in 1979.

The recent rapid changes in technology and a greater appreciation of the effects of hazardous substances reinforce the need to provide a forum for the exchange of information. The Congress will provide this forum and will encompass the broad spectrum of activities associated with mine environmental engineering. Emphasis will be placed on the practical applications of design principles, and justification of design parameters, and operating systems.

Congress will deal with the following topics:

Air flow

Aspects of air flow, including the design and selection of fans, estimation of the duty requirements of fans by establishing pressure losses, and the application of computers to networks in standard and crisis situations.

Gases and fires

Recent advances in the monitoring and control of the principal gas emissions (radon and methane) and the gases in diesel exhaust, experience in combating fires, explosions, and spontaneous combustion.

Dust

The monitoring of dust levels, and justification of and experience in new methods.

Heat

The establishment of the heat load in a mine, and the reaction of personnel to adverse thermal environmental conditions.

Systems

The planning and control of ventilation and refrigeration systems in deep mines, and the cost, practical applications, and limitations of recent innovations.

Further information is obtainable from The Conference Office, Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England.