

Annual General Meeting of the Institute

The 86th Annual General Meeting of the South African Institute of Mining and Metallurgy was held in Kelvin House, Johannesburg, on Wednesday, 17th August, 1983.

Professor A. N. Brown (President) was in the chair, and declared the meeting open at 16h05.

This account of the proceedings includes only those matters that are not reported under the heading 'Annual report and accounts' elsewhere in this issue.

Obituaries

President: My first duty, a sad one, is to announce the death of the following members of the Institute during the past year: *Honorary Life Fellow:* R. J. Adamson, who was the President of this Institute in 1959/1960 and the Honorary Treasurer from 1963 to 1964; *Life Fellow:* H. E. Carlisle, who was the Assistant Honorary

Editor in 1969/1970 and the Honorary Editor in 1971 and 1972; *Fellows:* W. W. S. Lorimer, G. D. Giles, A. E. Pugsley, P. M. C. Nelson, F. P. Bath, I. E. W. Sander, and J. M. Bromley-Gans; *Members:* F. C. Jackson, O. A. Richter, and G. T. de Kock; *Student:* S. J. Nkwane.

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

Notules

Die notules van verlede jaar se Algemene Jaarvergadering wat op 18 Augustus 1982 plaasgevind het is in die September uitgawe van die Instituut se *Joernaal* gepubliseer. Die notules is bevestig.

Welcome

President: It is my privilege to welcome Mr C. T. Fenton,



Charles Macphail (right) receiving his certificate of Honorary Life Fellowship from Professor Brown, President

President of the Chamber of Mines; Mr P. Bosman, General Manager of the Chamber of Mines; Dr Lou Alberts, President of Mintek, and Mrs Alberts; Mrs Whillier, her son and daughter, and Mr Whillier Senior; Mr and Mrs Strydom; Mr and Mrs Magri, Mr and Mrs Schutte; Dr and Mrs Kielblock; a large number of our Past Presidents, and the Presidents and representatives of our sister societies; and the representatives of the press, radio, and television.

I extend a cordial welcome to all present, and trust that you will all enjoy this evening's proceedings.

Membership

President: The names of the candidates who were admitted to membership since the last Annual 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 of our Institute is not conferred lightly by the Council. It requires that the recipient must have rendered outstanding service to the industry, or to the Institute. This year we honour Charles Macphail, a Fellow of the Institute, whose membership extends back to 1960. In his capacity as the Congress Manager, he performed the onerous task of organizing the Twelfth Congress of the Council of Mining and Metallurgical Institutions, with great distinction. When the three handsome volumes of the transactions had been distributed, his task had been completed. I have, now, much pleasure in asking Charles Macphail to come forward to receive his certificate.

Brigadier Stokes Memorial Award

President: This is the fourth occasion on which the Brigadier Stokes Memorial Award is made. It commemorates the outstanding and unique contribution made to the industry over a period of many years by Brigadier R. S. G. Stokes, Honorary Life Fellow and Past President of the Institute. The award is made for the very highest achievement in the South African mining and metallurgical industry, and is not necessarily based on technical considerations.

This year's award is a rather special one, being made posthumously to Dr Austin Whillier.

In his presidential address to the South African Institution of Mechanical Engineers in 1974, Dr Whillier mentioned what a great pleasure it was for him that Dr F. G. Hill had agreed to propose the vote of thanks. He explained that this was because it was Dr Hill who had played a leading part, some twenty years previously, in convincing the mining industry—a most practical and very down-to-earth engineering activity—that mining could benefit from an academic approach to its problems. It is appropriate to recall that remark on this occasion. Not only was Dr Hill the previous recipient of this award—for the very reason mentioned by Dr Whillier—but, indeed, it was Austin Whillier who played an outstanding role in helping to solve the environmental problems facing the mining industry through a fundamental scientific approach.

In his work in the Chamber of Mines Research Organization, Dr Whillier not only achieved major scientific success of immediate benefit to the mining industry, which rapidly earned him a very high reputation, but he also set an inspiring example to his colleagues, and to the whole South African engineering profession, which he served with such great distinction.

In his vote of thanks to Dr Whillier's AS & TS presidential address in 1979, Mr Lynn van den Bosch referred to the fact that Dr Whillier had started his profession as a mechanical engineer, but had subsequently turned to environmental engineering and had acquired perhaps the greatest honour in finally being known throughout South Africa as a mining engineer. In fact, Dr Whillier's association with the mining industry started in earnest in 1965, at the age of 38, when he took up an appointment in the Chamber of Mines Research Organization, and ended in 1981 with his untimely death in office as the Director of the Environmental Engineering Laboratory of that Organization.

Austin Whillier was born in Vrede, in the Orange Free State, grew up in Germiston, and matriculated at the Johannesburg Technical High and Trade School – now the John Orr Technical High School. He then studied mechanical engineering at the University of the Witwatersrand, graduating with distinction and being awarded the Bernard Price Prize as the top graduate in his class.

He subsequently entered the Massachusetts Institute of Technology (MIT), gaining there the degrees of M.Sc. and D.Sc. in Mechanical Engineering. The significance of his doctoral thesis, on solar collector performance, is indicated by the fact that it was recently re-published, nearly twenty years after it had been written. It is worth mentioning that he maintained his interest in solar energy, and was elected posthumously to the Solar Hall of Fame, in Washington, during 1982.

He was also very active at MIT in student affairs, and became a lecturer at that distinguished institution. While in America, he met his future wife, Mary, his ever-faithful supporter in the years that lay ahead.

Returning to South Africa, he joined the National Mechanical Engineering Research Institute of the CSIR, where he worked for seven years before becoming an Associate Professor at McGill University, being stationed in Barbados and working on the development of equipment to utilize solar and wind energy.

His final appointment before joining the Chamber of Mines Research Organization was as a Senior Lecturer in Mechanical Engineering at the University of the Witwatersrand.

Austin Whillier's responsibilities as Director of the Environmental Engineering Laboratory included research into the cooling of mines, the prevention of mine fires, the layout of water services, and other mechanical-engineering problems. In leading his work over fifteen years, he made significant advances over a wide spectrum of subjects, including thermometric methods for the testing of high-head pumps and water turbines, the whip on hoist ropes, the protection against fire of timber used in mines, the prediction of underground heat pick-up,

the design and performance of cooling towers, and the development of strategies for the cooling of mines.

He fully appreciated the necessity of communicating his laboratory's research results timeously to the industry, and was a prolific writer, being the author or co-author of some seventy papers, review articles, and research reports during that period.

Some of his most significant work was recognized by various professional societies through the award of prizes and medals. He was awarded, sometimes together with his co-authors, three prizes by the South African Institute of Mechanical Engineers, a prize by the Association of Mine Managers, a gold medal by the Ventilation Society of South Africa, and a silver medal by this Institute. In accepting the silver medal for a paper on gravity-fed water systems in mines, Austin said: 'We have found much satisfaction in applying theory to find solutions to those practical problems and, in fact, the award might be thought of as a re-affirmation by the Institute that theory and practice in mining are essential bed-fellows'.

These words typify the man's approach. He was also honoured in 1977 with the AS & TS National Award, in recognition of the major advance made in the cooling of deep-level mines by the introduction of the chilling of mine surface water.

Austin Whillier had an outstanding record of dedication and service to the engineering profession in South Africa. He served as the President of the Mine Ventilation Society of South Africa in 1971 and 1972, of the South African Institution of Mechanical Engineers in 1974/1975, and of the Associated Scientific and Technical Societies of South Africa in 1978 and 1979. He was a Fellow of this Institute and a registered Professional Engineer, and also a member of various other local and overseas societies. He maintained his contact with the University of the Witwatersrand, and served as an external lecturer in the Department of Mining Engineering, and an external examiner in the School of Mechanical Engineering. He represented the Chamber of Mines, and indeed South Africa, at numerous international conferences, and proved to be an outstanding ambassador.

When Harry Oppenheimer was honoured by the first Brigadier Stokes Memorial Award, he singled out two fields in which the South African Institute of Mining and Metallurgy had rendered very special service. These were the vital, basic fields of safety and health in mines on the one hand, and technical training on the other.

It can equally be said of Austin Whillier that he rendered very special service in these two fields. As far as the field of safety and health is concerned, he was one of those in the forefront of the struggle to improve underground environmental conditions, and he made a major contribution to the very great changes that were instituted in deep-mine cooling practices over the past decade.

He made reference to the very small difference between heaven and hell underground, those extremes being defined by the wet-bulb temperatures of 28 and 32°C respectively, and he pioneered some of the roads leading away from hell.

His activities in giving lectures of renowned clarity to groups of ventilation and mining students, and in writing papers of equal clarity aimed not only at his scientific peers but also at the engineering staff on the mines, undoubtedly contributed greatly to raising the general technical level in his discipline. He had the rare gift of being able to explain advanced scientific concepts in a simple but practical manner.

Perhaps not the least of his legacy to us lies in his establishment of the strong team in the Environmental Engineering Laboratory, which has been able to carry on effectively without him on a number of important projects. His dedication to his work remains an inspiration to those who were privileged to be his colleagues. His dedication was never shown more clearly than in the writing of his last paper, that for the Twelfth CMMI Congress, which he drafted when he was already too ill to come into his office.

Dr Austin Whillier will be remembered with great affection by those of us who were privileged to have known him, for he was highly respected as a person, a teacher, a scientist, and an engineer. He left the indelible stamp of his remarkable personality on the South African mining industry and, indeed, on deep-level mining technology throughout the world, and it is indeed fitting that his memory should be honoured by the Brigadier Stokes



Mrs Mary Whillier addressing the meeting after receiving the Brigadier Stokes Memorial Award, which was awarded posthumously to her husband, Austin Whillier

Memorial Award.

I am indebted to Mr John Sheer, his successor at the Chamber's Environmental Engineering Laboratory, for help in the preparation of this citation.

I now have much pleasure in asking Mrs Mary Whillier to come forward and receive the Brigadier Stokes Memorial Award.

Mrs Whillier: The award created by the South African Institute of Mining and Metallurgy to honour the memory of the pioneer in mining Brigadier Ralph Stokes is given for the highest achievements in the fields of mining and metallurgy in South Africa. The recipients since its inception in 1980 have been pioneers in these fields, and it is indeed a great honour for my late husband, Austin Whillier, to join the ranks of these distinguished men.

I am deeply touched by the citation accompanying the award. It reminds me of his first citation, when he was awarded the Carl Taylor-Compton prize as a post-graduate at MIT, in 1954. It will remain a permanent memorial to Austin's outstanding ability in the field of human relations.

Researchers in the South African mining and metallurgical industry are in the enviable position of being world leaders in their fields of research. As a result, the industry attracts men of high capability, and Austin was fortunate in having men of this outstanding calibre as his associates. This award is also a reflection of their loyalty and commendable achievements.

Austin came to the mining industry as a mechanical engineer, specifically to tackle the problem of heat underground. It is interesting to note in reading through his publications that many other aspects of mining also became his specialties—such as mine fires, the vibration of ropes, pump efficiencies, cooling towers, to mention a few—an indication of the diverse applications of a sound engineering background.

Austin loved his work and his associations in the mining industry. Every problem was a challenge that crystallized his thoughts and renewed his energy. From the extraction of heat in the depths of the mines to the attraction and utilization of the sun's rays indicates the fascinating range of his engineering endeavours. I was fortunate to know of these endeavours, because his infectious enthusiasm stimulated my interest, and he could talk of them in very simple terms.

In the field of education, Austin's humility made him approachable and encouraged communication. This interest extended at post-graduate level, with his support of the engineering institutions of Kelvin House. For many years, Kelvin House was like a second home to him. I attended with him many of the annual general meetings of the Institution of Mechanical Engineers and of the Associated Scientific and Technical Societies, and I shared his pride in the accomplishments of these institutions.

Brigadier Ralph Stokes was an exponent of technical progress to ensure the stability of the mining industry. In recent years, mining has reaped the benefit of this foresight in the achievement of better working conditions for its workers underground. Not only have the South

African mines benefited from the Chamber's research efforts but also the many thousands of workers in mines throughout the world. The example set by our pioneering research in mining will continue to encourage future progress.

On behalf of the Whillier family—and I would like especially to mention that Austin's father is with us this afternoon—I thank the South African Institution of Mining and Metallurgy for awarding, posthumously, the Brigadier Stokes Memorial Award to Austin. May the efforts of the mining and metallurgical industry in South Africa continue to grow from strength to strength.

Presentation of Medals

President: Medals are awarded for outstanding papers presented to the Institute and published in the *Journal*. This year, the Council has decided to award two Gold Medals.

The first of these is awarded to Mr E. J. Magri for his paper 'Calculations of Grade and Tonnage for Two Co-products from a Projected South African Gold Mine'. The paper dealt with the estimation of likely grade and tonnage for a new mining property that is to be exploited by selective mining of two metals that have substantial contributions to make to the total revenue.

The second award is made for the paper 'Evaluation of Heat-acclimatization Procedures at Wet-bulb Temperatures below 31,7°C', written jointly by Dr N. B. Strydom, Dr A. J. Kielblock, and Mr P. C. Schutte. A Gold Medal is awarded posthumously to Dr N. B. Strydom, not only for the part that he played in this particular paper, but for the great contribution he made in the field of heat physiology over a period of many years.

Dr Nick Strydom was an internationally renowned physiologist, who was able to apply his research findings with great success. He spent some thirty-one years with the Chamber of Mines, working in the field of heat stress and heat acclimatization. He was the author of no fewer than 94 papers, and co-author of another 110, which were published in local and international journals.

Under his direction, vitamin C supplementation was introduced as a standard in heat-acclimatization procedures, which resulted in a significant reduction of unproductive shifts spent on heat acclimatization. A further noteworthy achievement was the development of the heat tolerance test, which has allowed vast numbers of subjects to bypass the heat-acclimatization procedure, with enormous savings to the industry.

Perhaps the pinnacle of his achievement was the introduction of microclimate acclimatization, a procedure that virtually eliminates the unpopular conventional acclimatization methods in climatic chambers. By adopting these methods, mines have gained more than a million productive working shifts per annum, while heat injuries have decreased significantly.

Dr Strydom's research enabled him to assist many sportsmen and defence-force servicemen, who, like mine workers, are often engaged in physical exertion in hot conditions. He emphasized the necessity of maintaining an optimum state of hydration during exercise, exploded the fallacy that salt supplementation wards

off muscle cramps, and advocated vitamin C for sportsmen exercising in hot conditions.

Mev. Strydom: Ek wil my opregte dank uitspreek teenoor Die Instituut vir Mynbou en Metallurgie, wat hierdie toekenning aan Nick Strydom maak vir sy bydrae tot die industrie.

Thank you for this honour, which I am sure Nick would have been very proud to accept. I am positive that he would have thanked his colleagues at the Industrial Hygiene Division for the part they played in his receiving this high honour. A team effort, he would have called it, although I am sure that it was his energy, drive, and initiative, and also his insight in practical matters, that made him the leader he was. He had critics aplenty, but I am sure that everybody who was associated with him respected him for the firm stand and righteousness he took in matters. Nick never worked for himself but put in everything for the mining industry. Thank you for making the memories of Nick and his achievements even more memorable to me and our children. Baie dankie. *President:* Dr A. J. Kielblock and Mr P. C. Schutte, who were joint authors of the paper with Dr Strydom, are not members of the Institute, but are to receive Certificates of Merit. I now ask them to come forward to receive their certificates.

Presentation of Student Prizes

President: Daar word jaarliks toekennings gemaak aan



Mrs Strydom, widow of Dr Nick Strydom, who was posthumously awarded the Institute's Gold Medal for a paper written jointly with A. J. Kielblock and P. C. Schutte

studente vir die beste skripsies wat deur vierdejaar studente geskryf is aan die verskillende universiteite op die gebied van mynbou en metallurgie. Vanjaar word daar drie sulke toekennings gemaak.

Die eerste is aan mnr. J. B. Raath, Universiteit van Pretoria, vir sy skripsie 'Skietwerk – die Gebruik van Elektrisiteit'.

Die tweede ontvanger is mnr. J. P. Vermeulen, ook van die Universiteit van Pretoria, vir sy skripsie 'Die Optimale Subvlakstorting Uitleg'.

Die derde toekenning word aan mnr. G. R. Weineck, van die Universiteit van die Witwatersrand, gemaak vir sy skripsie 'Industrial Relations Trends in the Mining Industry, and the Wiehann Commission'.

Dit is jammer dat al drie die ontvangers, weens hul huidige omstandighede, dit onmoontlik gevind het om vandag se verrigtinge by te woon. Ons wens hulle baie geluk toe, en die pryse sal aan hulle gestuur word.

Office Bearers and Members of Council for 1983/1984

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:* Professor R. P. King; *Vice Presidents:* J. D. Austin and H. E. James; *Honorary Treasurer:* Professor D. G. Krige; and *Immediate Past President:* Professor A. N. Brown.

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 Members of Council for the 1983/1984 session, and have found that the ballot papers sent out to Corporate Members of the Institute were in order. There was a return of 424 papers, representing a ballot of 30,2 per cent. As a result of our scrutiny, we find that the following members have been elected: B. C. Alberts, N. J. Divine, Dr C. J. Fauconnier, P. T. Fewell, C. E. Fivaz, J. S. Freer, Professor G. G. Garrett, J. J. Geldenhuys, Dr A. K. Haines, Dr B. K. Loveday, Dr O. K. H. Steffen, G. C. Thompson, Dr H. Wagner, and Dr P. T. Wedepohl.

Dr Fauconnier: On behalf of the newly-elected Members of Council, I thank you for the honour that has been bestowed upon us in being elected to the Council of this Institute. We assure you of our support and cooperation in furthering the aims of the Institute in the next year.

Namens die nuwe lede wil ek ook graag al die lede van die Instituut baie hartlik bedank vir die vertroue wat hulle in ons gestel het met ons verkiesing tot die Raad. Dit is vir ons 'n groot eer, en ek kan u verseker dat ons een en almal ons bes sal doen om die belange van die Instituut te bevorder.

President: In terms of Clause 3.2.8. of the Constitution, Mr H. C. van Zyl, Chairman of the Witwatersrand/Middelburg Branch, and Mr D. A. Parfitt, Chairman of the Orange Free State/Klerksdorp Branch, will also serve on the Council.

The following Past Presidents have signified their willingness to serve on the Council for the ensuing year: Dr J. P. Hugo, P. W. J. van Rensburg, Professor R. P.

Plewman, Dr R. E. Robinson, Professor M. D. G. Salmon, P. A. von Wielligh, Dr M. G. Atmore, D. A. Viljoen, Dr P. R. Jochens, and G. Y Nisbet.

Annual Report and Accounts

(See pp. 211 to 221 of this issue of the *Journal*).

President: In keeping with past tradition, the *Journal* has maintained its high standard of technical excellence despite the difficulties associated with two changes of staff during the year. Professor R. P. King has devoted a great deal of his time and effort towards running the *Journal* to ensure its continued success.

The South African minerals industry has made steady progress towards a state of full maturity over the past few years. There is now a growing tendency towards the exportation of mineral products in refined or finished form. This tendency has naturally led to an increase in the scope of activity, and in the number of our members engaged in the discipline of physical metallurgy as distinct from extractive metallurgy.

It was in November 1979 that the Materials Engineering Specialist Division was formed in Pretoria, with Professor J. P. Hugo playing a leading role, to give particular attention to physical metallurgy. It has been clear for some time that the metallurgical discipline needs to be arranged in such a way as to give specialized attention to both extractive and physical metallurgy.

During the year, the Technical Programme Committee – Physical Metallurgy was established, and the working Group – Physical Metallurgy was formed. It is hoped that the programmes of our colloquia and schools can be extended into the discipline of physical metallurgy.

The organization of colloquia on mining and metallurgical topics continues to be rewarded by excellent attendances by members. Particular mention must be made of the joint two-day colloquium held in Welkom in May this year. Similarly, the schools have continued to be most successful, judging from the attendance, and there are clear indications that the Institute is fulfilling a valuable function.

There has been considerable debate regarding a revised constitution for FSPE. This particular institute differs somewhat from other member societies, which tend to cater for particular disciplines. The South African Institute of Mining and Metallurgy represents the minerals industry and, as such, caters for a wide range of disciplines. In particular, there are strong feelings that technician members and scientists must continue to be accommodated.

The institute continues to be represented also on ASRET and SAARET, which are bodies dealing with technicians and technologists.

The transactions of the 12th CMMI Congress, held in Johannesburg during May 1982, were completed and distributed. The three volumes, of which two contain technical information, will undoubtedly prove to be valuable reference texts.

An international conference on open-pit and strip mines is due to be held in Pretoria during April of 1984. It is being organized jointly by the Institute and the Alumini Society of Mining Engineers at the University of Pretoria, and promises to attract wide interest.

Many difficulties were experienced during the year in connection with staff in the office, and a complete change took place. Mrs Doris Gardner and her cheerful group of ladies have done a tremendous job in keeping the activities on an even keel while going through a difficult learning period. These efforts are most appreciated, and our thanks are also due to Mr John Erasmus, Manager of AS & TS, and to the staff of Kelvin House.

I had the honour of representing the Institute at many meetings and social functions of our sister institutes. I also had the pleasure of visiting the Far East to strengthen the bonds established by my predecessors, and in this regard our grateful thanks are extended to the Chamber of Mines for their generosity in making that particular visit possible.

My task as President was made relatively straightforward because the affairs of the Institute were in the hands of an extremely competent and hard-working group of Councillors and Past Presidents. To all of them, I express a sincere vote of thanks.

Mr Henry Britten, Mr D. G. Maxwell, and Professor D. D. Howat – old friends of ours – after many years service as Past Presidents of Council, decided this year to stand down. We thank them most sincerely for their wise counsel and the contributions they made over the years.

From last year's Council, Mr Denis Malan (after ten years of service), Mr P. N. Harris, and Dr J. Lurie have found it impossible to continue on the Council because of their private avocations. We wish them well, and thank them for their interest and hard work over the years.

I now call on Professor Krige to present the accounts and second the adoption of the Annual Report.

Professor Krige: At the end of June 1983, our net total assets, consisting mainly of investments and stocks of monographs (shown at cost in the accounts), totalled nearly half a million rand. At market-related prices for the investments and monographs, the total was in excess of this figure. This is not excessive in relation to our commitments to our members and to the industries we serve.

The *Journal* continues to be of major service to our members. Owing to somewhat higher costs and a lower income from advertising, the net shortfall on the *Journal* for the year was some R39 000 compared with R24 000 last year. This shortfall is, however, still well covered by members' subscriptions.

Two new monographs were produced, at a cost of some R40 000, of which R25 000 was underwritten by the Chamber of Mines. Sales of these and earlier publications almost covered costs, and the net deficit for the year was less than R6000.

The schools and colloquia continued on a very successful basis, and resulted in a net surplus of some R78 000—a very significant figure in our accounts. This was due to the high quality of the presentations, which, as in the past, ensured attendances in excess of expectations.

However, other costs of the Institute increased alarmingly, from just under R100 000 to over R135 000. The Education, Brigadier Stokes, and MacArthur-Forrest

Funds now stand at a total of R242 000. This means about half of our total assets, and represents a satisfactory increase of some 13 per cent over last year.

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

I now formally second the motion for the adoption of the Annual Report and Accounts for 1982/1983. Agreed.

Induction of President

President: It is now my pleasure to introduce your new President, Professor Ronald Peter King, who is a dedicated and accomplished academician, and a person of rare talent and ability.

Peter was born in Springs on the 12th of March, 1938, and grew up on Vogels, where he probably got the first taste of the minerals industry that he now serves. He was educated at Springs Boys' High School, and then proceeded to the University of the Witwatersrand, where he graduated with a B.Sc. degree in Chemical Engineering in 1958.

He stayed on in a teaching capacity continuing his studies, and graduated in 1962 with an M.Sc. degree in Engineering. He then travelled to the U.K., where in 1963 he was awarded the degree of Ph.D. by the University of Manchester. In 1965, he returned to South Africa to lecture in chemical engineering at Wits., and in 1966 he moved to Natal University, where he filled the post of Senior Lecturer in Chemical Engineering.

In 1968, he took over the leadership of the NIM Chemical Engineering Research Group at the University of Natal, and this is possibly where his deep interest in mineral processing began in earnest.

In 1973/1974 he spent a year at Manchester University as a temporary lecturer in the Department of Chemical Engineering. In 1974, he was briefly employed by NIM in South Africa as a Chief Scientist, but not long after that he moved back to the University of the Witwatersrand to fill the Chair of Minerals Process Engineering. In July 1976, he was appointed Chamber of Mines Professor of Extractive Metallurgy and Head of the Department of Metallurgy at the University of the Witwatersrand. During a sabbatical in 1980, he filled the post of a Visiting Fellow at the Camborne School of Mines.

Professor King has many professional qualifications. He is a Fellow of the South African Institute of Mining and Metallurgy, a Member of the Institution of Chemical Engineers, a Member of the South African Institution of Chemical Engineers, a Member of the Society for Industrial and Applied Mathematics, and, in his own right, a registered Professional Engineer.

His career has included many professional activities, probably the most significant being his membership for three years (1976 to 1979) of the Scientific Advisory Council of the Prime Minister. He also spent four years on the Research Advisory Committee of the Fuel Research Institute, and acted as Research Advisor to the Chemical Engineering Research Group of the Council of Scientific and Industrial Research.

During his career, he has had some rather interesting portfolios. He was, for a period of four years, the secre-

tary and treasurer of the Natal Branch of the South African Institution of Chemical Engineers. He also spent a year as the South African representative on Technical Committee Five, which was concerned with the application of the technology of the International Federation of Information Processing.

Professor Peter King is essentially a research scientist and has been engaged in research continuously throughout his professional career. His research activities have all dealt with various aspects of process engineering, and since 1967 these have been directed towards problems in mineral processing. His interest has been primarily in the application of quantitative mathematical techniques.

Although there has always been a large component of experimental work associated with his research efforts, this has always been directed towards a greater quantitative understanding of the systems involved, rather than towards the discovery and description of new physical phenomena. His earliest research work was in the field of optimization, and although this was a very fruitful field of research in the early 1960s, it became clear to him that this could, at best, be only an area of peripheral interest in process engineering.

The second phase of his research work dealt with problems associated with the testing of process equipment, which was essentially a support activity for his other research efforts. Until recently, the portion of his research work that has received the most attention in his publications is that dealing with the modelling of mineral-processing operations. He has been particularly concerned with the development of models for the flotation process, and this has been an ongoing activity since he took over the leadership of the NIM Group at the University of Natal in 1967.

At present he has an active interest in the study and modelling of coal flotation. His interest in the modelling of mineral-processing systems led to what was to become probably the most important area in which he has researched, namely the liberation phenomena during comminution. This is a most important process and is always a precursor to mineral-beneficiation operations.

His interest in this problem has led to an unplanned, but very important, piece of work in the field of particle-size measurement. During the early stages of his research on mineral liberation and its measurement by image analyser, he considered the problem of the characterization of the shape of irregular particles. In the immediate future, his intention is to continue researching very actively in the field of mineral liberation and related problems. He has a very well-equipped laboratory at the University for such work.

All these research activities have resulted in a steady stream of scientific publications from his pen, and he has become known as a prolific writer of scientific papers of the highest quality. He has had no fewer than 34 papers published in specialist journals and books, while another 37 have appeared in conference proceedings and other research reports.

Peter has travelled widely, and has attended nine international conferences and eight local conferences,

at most of which he has delivered papers or given talks. His travels have taken him to Europe on a number of occasions, the U.S.A., Canada, and South America.

Peter has served on the Council of the Institute since 1975, and has worked tirelessly for the many Institute activities that have come under his direction. He has shown particular interest in careers guidance, education, and training, and is preoccupied with the recruitment and training of young people, whom our industry needs so badly.

Special mention should be made of his part as the editor of one of our special publications, 'The Principles of Flotation'. This arose from a vacation school in which he played a leading role.

Technological progress and innovation generally depend on research effort. The industry is indeed fortunate in having a person of Professor King's ilk to assist it in the training of its young engineers for higher degrees. Peter must have devoted endless hours in his capacity as a mentor since no fewer than five Ph.D. degrees have been obtained under his guidance, and seven M.Sc. degrees. There are currently four Ph.D. and three M.Sc. students working under his direction.

Peter and his charming wife, Ellen, have three chil-

dren. Their two sons, Jeremy and Andrew, are both in their early years as students at the University of the Witwatersrand, while their daughter, Janet, will write the matriculation examination next year.

From what has been said, you will gather that Peter is an extremely busy person. I know that the support of his family will enable him to cope with his many time-consuming duties. There is no doubt that the Institute is fortunate in having a man of Peter's calibre for its 87th President, to guide its affairs during the coming year.

The new President, Professor King, then took the Chair and invited Mr James, the incoming Junior Vice President, to join him on the rostrum, together with Mr Austin, the incoming Senior Vice President.

Mr James: I take this opportunity of expressing my sincere thanks and appreciation to the Council for the honour accorded to me in being elected the incoming Junior Vice President. I assure you that I shall endeavour to maintain the high standards set by my predecessors.

President: As my first act as President, I am going to break with tradition. It is customary for members of Council to present a small, tangible memento to the Outgoing President in the form of the Institute's shield



Professor A. N. Brown (right, President 1982 - 1983) receiving the President's shield from Professor R. P. King (President 1983 - 1984)

suitably inscribed with the President's name and his year of office. This little shield is a rather attractive one, and graces the studies of many of our former Past Presidents. On behalf of Council, I ask Alf Brown to receive this memento.

Amendments to the Constitution

President: We have to consider some changes to the Constitution, and we must do this as the first formal activity of the new Council. The proposed changes were circulated with the notices of the meeting. These are changes to the Constitution, to the by-laws, and to the rules of conduct of the branches.

In recommending these changes, Council is aware that we have not succeeded in attracting members to Council who were elected specifically to represent the non-Corporate Members. We believe one of the reasons for this was that our Constitution required such representation to be made by non-corporate Members. Council has therefore, recommended that this item in the Constitution be changed, and that non-Corporate Members be permitted in future to elect Corporate Members to represent them on Council. The changes that were circulated are all associated with this particular item, and you will see from the changes to the rules of conduct of branches that such representation will be possible in the branches as well.

If there is no opposition to this change, this amendment to the Constitution will come into force from this particular meeting. Agreed.

Appointment of Auditors and Honorary Legal Advisers

President: I have pleasure in recommending that our auditors for the year should be Messrs Alex Aiken and Carter, and that our honorary legal advisers should be Messrs Van Hulsteyn, Duthie and Saner. Agreed.

Presidential Address

Professor King delivered his Presidential Address entitled 'A university and an industry – the relationship between Wits and the South African metallurgical industry' (see pp. 222–228 of this issue).

Mr Austin: Before calling on Denis Maxwell to propose a vote of thanks to Professor King for his very interesting and informative address, I should like to tell you something about my recent reading. I read three articles within a couple of days of one another.

The first was a draft copy of Professor King's Presidential Address, and one point that really caught my attention was that, when NIM moved to Randburg, it left the Department of Metallurgy in an extremely difficult position with little research or equipment.

The second was in the London *Sunday Telegraph* magazine of the 13th of March of this year, in which an article described how Trinity College, Cambridge, was successfully setting up a science park on ground owned by the College.

The third article was in *The Star*, and reported that the Department of Metallurgy at Wits, in cooperation with industry, had developed a welding rod for CR12,

which was an important step forwards in the practical use of this new alloy.

Yesterday, when I wrote these words, I was going to say that taking these three articles together led me to suggest that the University should consider establishing a science park at Frankenwald, and that this could provide the space for high-technology industries to be set up close to the University, enabling South African industry to capitalize on South African research ideas.

However, this afternoon I was shown an article in the latest *Wits Reporter* stating that the University is in the process of establishing a science park at Frankenwald, and I would like to congratulate them on this development, which is new for South Africa. I hope that this step will succeed in strengthening the ties between the University and industry, and lead to much productive research with benefits for all parties including the students.

Vote of Thanks

Mr Maxwell: I experienced a feeling of great privilege when I was invited to propose the vote of thanks to Professor King this afternoon, and that feeling expanded to include one of pleasurable anticipation when I read the address, which, of course, I have had the privilege of doing.

That anticipation has been more than fulfilled by Peter's brilliant presentation this afternoon. He has achieved something else quite special with this address, in that it covers a subject that has never before been the theme of a Presidential Address – something that, as we approach our centenary in eleven years' time, is becoming more and more difficult to achieve.

On previous occasions, certain Presidents touched on some of the individual aspects covered by Peter, but no previous President chose the relationship between a university and an industry as his main theme.

In 1907, Professor John Yates was the first university man, the first professor, to be President of this Institute, and also, incidentally, was the first mining man to be President of this Institute—of this Society, as it was then. It had just changed its name, in fact, from the Chemical and Metallurgical Society to the Chemical, Metallurgical and Mining Society—note the order there.

Professor John Yates, in 1907, referred to the fact that the duties of the Society as an educational factor had largely passed to the College—did I mention that Professor John Yates came from the Transvaal University College—and went on to say that the Society should be looked on as a finishing school, where all who cared to might come and hear discussed the problems of our great industry. I believe that is a very apt turn of phrase, and describes exactly the way the Institute is operating today—as a finishing school.

Professor Yates also entered the debate between educators and trainers, saying—and I quote—'I cannot emphasize too much the importance of the rising generation being taught the practical application of theory and principles, before they are turned out onto the world to do battle for themselves'—the same pragmatic approach that, Peter tells us, is adopted by Wits today.

Many years later, a Tukkies professor in the person of Professor Alf Brown—our immediate—very, very immediate Past President—and also Professor R. P. Plewman (in 1974) dealt with the need to create awareness and engender interest among school children in the exciting challenges of the minerals industry, and thereby lent support to Professor King's plea for an enormous effort to be maintained in this sphere.

Peter has chosen three excellent examples to illustrate the innovative approach of the academics of Wits, and the important results that these had for industry. He has also emphasized the vital role played by research, not only in the educational sphere but also in determining the relationship between industry and the university.

He has demonstrated on many occasions—and these have been detailed quite comprehensively by Professor Brown—his own special ability in this field, and he is very well qualified to lead this research effort. I have no doubt that there will be many more important innova-

tions coming out of the Wits. Metallurgy Department in the coming years.

One has only to listen to Peter talking about his students, and his students talking about him, to know that there is in his department a wealth of mutual respect and admiration. Furthermore, he has put a tremendous effort—I mean tremendous effort—into furthering the cause of the Institute since his election to Council. He is doing a magnificent job in tertiary education at Wits, and also in the finishing school of the Institute, and I cannot imagine anyone better qualified to promote and improve the already cordial relationship between Wits and the South African metallurgical industry.

Professor King has done us all a very great favour this afternoon in so expertly highlighting the many important aspects of this relationship, and calling attention to areas where action is needed.

Conclusion

The meeting ended at 18h10.

SASSDA conference

The second Stainless Steel Industry Conference organized by The Southern African Stainless Steel Development Association and held at the beginning of August in Swaziland, was attended by over 125 delegates. The overall theme was individual company marketing, presentations being made by Professor Andrews, Dean of the Graduate School of Business, University of the Witwatersrand, and Michael Prior of MD & P. Other topics covered included 'The Money Market' and also 'Benefits and Effects of Trade Unions'.

The continuation of individual company presentations took place with an award being made to Mr Brian Harrison of Falcon Engineering. The 1983 Industry Award was made to Bert Fiander for services rendered to the industry over the years.

A banquet was held on the final evening at

which Mr John Hall, Chairman, Middelburg Steel & Alloys, addressed the delegates and spoke very positively about the future of stainless steel, an industry that can work in harmony and have a very positive future.

The sincere interest shown in the various papers presented also highlights the importance of an industry pulling together without individual companies losing their identity or competitiveness.

Mr David Tweddell, Marketing Director of SASSDA, said that, because of the members' interest in good marketing, the Association had developed and planned a three-day industrial-marketing management seminar. The programme had been specifically designed for the stainless-steel industry, which was perhaps a first in the field of executive education for a specific industry.

Metallography

Establishing a suitable method in the preparation of metallographic specimens is often something of an art, especially where the metallographer has no previous experience of the materials involved, where it is a question of obtaining a better quality of specimen, or where a laboratory has to prepare an increasing number of specimens and a method has to be found by which it can cope with the growing work-load.

In such situations, Struers' new laboratory in Copenhagen is ready to offer its assistance in the form of suggested methods specially worked out for various materials. Over the years, the Danish company has built up a fund of know-how on specimen preparation (it has

more than 1000 proven specific preparation recipes), making it well-equipped to find the correct solution.

This service is free, and all interested parties need do is to send their specimens, enclosing a description of the problem, type of examination, etc., to Struers' local agent Optolabor, who will forward them to Denmark. The specimens will then be prepared and returned, together with a report on the preparation method and any useful hints. Needless to say, all such matters will be treated as confidential.

The address of the agent is Optolabor (Pty) Ltd, P.O. Box 50426, Randburg 2125. Telephone (011) 793-1145.