Annual General Meeting of the Institute

The Annual General Meeting of the Institute was held in Kelvin House, Johannesburg, on Wednesday, 25th August, 1971, at 4.15 p.m.

Mr V. C. Robinson (President) was in the Chair.

There were also present fifty one Fellows, twenty one Members, two Associates, two Students and fourteen Visitors, making a total of ninety one.

The President declared the meeting open at 4.15 p.m.

OBITUARIES

The President: 'It is my sad duty to announce the death of the following members of the institute:

H. J. G. C. Arndt, Life Member, joined 1933, passed away 11th May, 1971.

J. H. A. Diering, Fellow, joined 1921, passed away 24th June, 1971.

L. O. W. Leimer, Fellow, joined 1960, passed away 25th June, 1971.

E. A. Meltzer, Fellow, joined 1941, passed away April, 1971.

As a mark of respect to the memory of the deceased and in sympathy with the bereaved, I would ask you to rise and observe a few moments silence.'

MINUTES

The President: 'May we confirm the minutes of the General Meeting held on 17th March, 1971, as published in the July, 1971 issue of the Journal?' Agreed.

WELCOME TO VISITORS

The President: In welcoming you here, ladies and gentlemen, it gives me great pleasure to see so many of our office bearers—our important honorary office bearers—and particularly I would like to welcome our Honorary President, who is, as you know, the President of the Chamber of Mines, Mr John Shilling, and we are privileged also to have with us two of our Honorary Vice-Presidents. One in particular I am very pleased to welcome here, and that is Mr G. F. van L. Froneman, who is the Administrator of the Orange Free State, and we extend a very hearty welcome to him, because he is a long way from home.

Then we have another Honorary Vice-President, Mr Tommy Gibbs, the Government Mining Engineer, and there are many distinguished guests, whose names I want to give you, so that you will know who they are. We are happy to have present:

Mr R. C. J. Goode, Member of Council, I.M.M. London; Mr E. Boden, Manager, A.S. & T.S. of S.A.; Mr G. A. P. Louw, The President, The Associated Scientific and Technical Societies of S.A.; Mr I. R. G. Stephen, The President, The South African Institution of Electrical Engineers; Mr A. S. Robinson, The President, The South African Institution of Civil Engineers; Mr C. F. J. Schneider, The President, The Institute of Land Surveyors of the Transvaal; Mr R. J. Vermaak, The President, The South African Institute of Assayers & Analysts; Prof J. P. F. Sellschop, The President, Joint Council of S.A. Scientific Societies; Mr T. C. Watermeyer, The President, The Federation of Societies of Professional Engineers; Mr G. A. MacWhirther, The President, S.E.I.F.S.A.; Mr C. G. Hinds, The President, The Mine Managers Association; Mr J. F. Aldersley, The President, The South African Institute of Foundrymen; Dr H. O. Reisener, The President, The Institute of Welding; Dr F. P. A. Robinson, The President, S.A. Corrosion Council; Mr A. Bain, The Chairman, Witbank-Middelburg Branch; Prof D. J. Schoeman, The Chairman, The S.A. Institution of Chemical Engineers; Dr N. P. Finkelstein, The Chairman, The South African Chemical Institute (S.Tvl Section); Mr J. M. Meyer, Chairman, O.F.S. Branch.

To all these guests and their ladies, I extend a most cordial welcome, and hope that you are going to enjoy the afternoon.

MEMBERSHIP

The President: 'I have pleasure in announcing that the names of the following candidates having been published in accordance with By-Law 5.2.2., Council has elected them to membership in the following grades:

Fellows: Richard Lloyd Blandy, Byron J. Haley.

Members: Brian Roger Borton, Frederick Brian Peacock, Peter John Stacey, Kenneth Niles Thanstrom.

Students: Peter Boesley James, Kenneth Brian Perel.

TRANSFERS

From Member to Fellow: Cecil Eugene Fivaz, Peter Edwards.

I wish to welcome the new members to the Institute and to congratulate those members who have been transferred to a higher grade.

ANNUAL REPORT OF THE COUNCIL AND ACCOUNTS FOR THE YEAR ENDED 30TH JUNE 1971

THE PRESIDENT:

We now come, ladies and gentlemen, to the annual report of the Council of the Institute—and our accounts for the year ended 30th June, 1971, and these documents are on your chairs; I know you probably haven't had time to study them yet, but I would like to highlight some of the things which I think are worth mentioning.

I would ask you to take, first of all, ladies and gentlemen, the report of the Council as being read, and before moving adoption, however, there are certain salient points I wish to touch on, and I will leave the financial side of this entirely to our very competent and worthy, Honorary Treasurer, Mr Denis Maxwell.

Last year, Mr Douglas, you will recall, drew attention to the rising membership of this Institute, and I have to report, fortunately, that the membership for the year ending June 1971, has gone up by some 43 members. We are, as you well know, a small institute, and it is gratifying to be able to note an increase year by year. I would like all of you who are members, to think of the size of the Institute, to think of those in our own sphere of business, and in our profession, who are eligible for membership, and who are not members, and I would like you to go out like the shepherds of old, and drive these wayward sheep into the fold. Your Institute can only be strong if it is fully representative of all those who work in our industries, the mining and metallurgical industries, and without this sort of support, no learned institute can easily survive and become a viable, useful thing.

There is no hesitation on my part in describing your Institute as an important part of the South African scientific and engineering scene. It is the only body which represents as an institute of this nature, the technologists in the mining and metallurgical industries in South Africa. It is, through its Journal, the only organisation which can adequately disseminate the results of research carried on in the groups on the mines, in works and by the Chamber. This Journal goes far and wide and unless we get the support of all the people who work in these two industries as members of this Institute—as long as we are unable to get the support for our Journal—then a lot of this very necessary dissemination of thoughts and ideas, can't take place.

You know—all of you here who are guests of ours who represent the other institutes associated with Kelvin House — how hard we have all been hit by the constant esealation of printing costs. In a mood of almost fiendish exuberance, the printing trade decided they would raise wages every year for about five years, by something like four percent., and we are at the receiving end of this. Our Journals do not contain that titillating story of sex and so on, that so many other magazines have—they are sober, conscientious purveyors of scientific thought, and so they are not the most popular.

But this is an important point and in order to keep an institute like this going, and its most vital part is dissemination of the knowledge it gains as a means of passing through and on what we receive from others, we have to have a strong, viable, journal. It is because of this, and Mr Maxwell I know is going to talk about this later—that I want to say that your Council has had to take extraordinary steps—**extra**ordinary steps—to bring in enough money to make this whole Institute, and its appendage, its journal, a really viable and living thing.

You will have read in your Journal of the papers published, you will have studied them, and you will have seen the undoubted excellence of the standard of these papers. But this is not all that we do. At the beginning of my year of office, we started with a very successful symposium on the theoretical background to this planning of open-pit mines. This attracted a very large overseas' contingent, and those of you who were able and lucky enough to go to their meetings, will remember the excellence of the fare that was provided. These things don't just come about on their own, however,—they require an awful amount of hard work, and I would like here to pay tribute to the people in the background who did all this hard work, who got this symposium together, who got it off the ground, and who ensured that it would end up as an important and interesting symposium. And those of you who have been fortunate enough to receive—and I was going to say rich enough to buy—the proceedings in a very excellent volume, will know and appreciate the high standard of the work which was done, and I am sure you would agree that we owe an awful lot in the excellence of that volume, to Peter van Rensburg who was then the editor.

Then last year saw another big change. This is the conversion of our monthly meetings at which often we had as many as 13 people, into quarterly meetings where we have a whole day's colloquiam. These colloquia have been very successful. We've had two so far on steel making and coal mining. We are going to have two more on mine ventilation and ferro alloys. This is a big departure—these colloquia depend again for their presentation on a small devoted band of people who persuade authors to produce enough papers, and who then lay on enough contributors to make the thing a success. We had to battle through one or two teething troubles, but they have been an outstanding success, and you will recall that at the coal mining colloquia—we just hadn't enough room here for everyone to be comfortably seated—we couldn't feed them all here anyway. This I think will set a pattern for the future. It gives both sides of the Institute the mining and the metallurgists, a good chance to go and listen to material which is particularly theirs, and out of sheer loyalty then, instead of being one of the 13 who have to listen to a mixed bag of papers, they can be one of the 150 who listen to a bag of papers right up their alley, and no one else's.

Then in 1972 we plan to hold—and there is an extraordinarily active committee busy on this now—a symposium which will be the Tenth International Symposium on the Application of Computer Methods in the Mineral Industry. It's a big mouthful but it's the tenth of these which are being held, and I think South Africa is fortunate that it is being held here. It will be held at the Wanderers from the ninth to the 14th of April, and there will be a very strong overseas' and local contingent there. This is so necessary, ladies and gentlemen, in a country like this, where we are a little off the beaten path. We need the influence of overseas' minds and we need to cross-fertilise their minds with our ideas too. This is a very important colloquiam and I hope that members will support it very strongly.

Again I can only say with what appreciation the Council has viewed the dedication of the people who organise this and other colloquia and symposia.

I must draw your attention to something else in the annual report, and that is the Institute's awards. The gold medals,—we had hoped to be able to present them at this meeting, but (a) most of the recipients are missing, because they are overseas, and (b), we have had to re-strike our medals and they have only just arrived

back. I would like to draw to your attention the fact that the gold medals for the year go to Professor Plewman, and Mr Ortlepp, and the silver medal to Dr Finkelstein. In your published report you will see works—the important works which they produced, and which led to the granting of these medals. I am sure you would wish to congratulate these members on the awards made to them.

Then later on in the report, under the heading of 'Associated Scientific and Technical Societies', I want to draw your attention to the fact that the 1971 National Award of the A.S. and T.S., has been made to Dr M. D. G. Salamon, a member of Council, and to Dr Neville Cook of the Chamber of Mines Research Laboratories, for their work and the published papers on rock mechanics. The award brings, I think, great renown to the workers in the mining industry, in the technical field and I think that you would agree with me, that this is well merited.

We have been involved in the training of engineers through the Fifth Conference on Engineering Education, which was held in Pretoria at the beginning of this year, and three members of your Council attended that conference, which was interesting, and which has had quite an aftermath of inquiries, and work being done slowly and quietly in the background, by this Institute—among others—and by employers' organisations generally. I think this is an important field with which we must be involved, because education and training is one of the declared aims of our constitution.

Reference is also made in the report to the activities of our two branches, both of which have maintained a very healthy and busy year. I would like to thank the two Chairmen for the past year, that is Mr J. Meintjies of Witbank, and Mr J. N. Saunders at Welkom, and the Acting Chairman, who is now Chairman, Mr Meyer, for their work.

In conclusion, there are certain people that I must mention and thank. These are all the members of the retiring Council who have borne with me for a whole year. But I would particularly like to thank the two Vice-Presidents, Professor Howat and Dr Hugo for the support which they have given me. During the year the President is asked to go and eat dinner with most of the other institutes, and often he can't go because (a) he is on leave, or (b) he's doing something else, and so you have to fall back on your Vice-Presidents. With grim determination they have gone forward to eat other people's dinners, and drink their liquor. But joking apart, I don't want to minimise the enormous amount of work which has been done in this Institute, by your Council and its office bearers this year. Thank you very much, gentlemen, for your support.

When we are talking about the Council, there is at least one other office bearer—in fact, two others you cannot do without. You can't do without an Honorary Treasurer like Dennis Maxwell. He is a tower of strength to the Council and to the President. He is the only one here, I think, who clearly understands the mathematics behind the losses we show on our Journal. And then the Honorary Editor—this, ladies and gentlemen, as all of you know, is a thankless task, and therefore, on your behalf, I want to underline the thanks which your Council owes to your Honorary Editor, Mr Carlisle. He is not here this afternoon, but I would like this to be conveyed to him.

Finally, we couldn't operate without the staff and the services which we get from Kelvin House, and I must pay tribute to the kindness and work which Mr Boden puts in on our behalf, and also to Mr Visser, our Secretary. Mr Visser—this is his last meeting here as he is going on promotion to one of the other societies. I want to thank him on behalf of the Council, and all the members of the Institute, for the hard and conscientious work which he has put into the job he has had here. Thank you very much.

Then I want to introduce to you Miss Warnock, who is going to take over from Don Visser. She is going to get what I know will be the full co-operation of the Council and the Institute. I think that this year's Council proceedings are going to be a lot quieter, and there will be not so many queer words which Don Visser can't spell. We'll have to bite those off, but she will probably exercise a most salutory damping down on the whole council.

I now ladies and gentlemen, have much pleasure in proposing the adoption of this annual report, which I have touched on, and I would like to ask the Honorary Treasurer, Mr Maxwell, to second the motion.

MR D. G. MAXWELL

Mr President, before formally carrying out the duty you have requested. I should like to make a few comments on the Institution's finances.

At the end of my first year in office as Treasurer I told the annual general meeting that I was somewhat embarrassed because I had to announce a rather large deficit for the year. Now, two years later, I am again a little embarrassed, but this time it is because I have to announce a surplus. I am embarrassed because it was not long ago that we sent a circular to members explaining why it was necessary to raise the subscriptions, and now, before we have had time to see any benefit from the higher subscriptions, we announce a surplus. However, I hasten to assure you that the increased subscriptions are going to be very necessary in the coming year. The surplus shown in the accounts is largely due to unexpected revenue from sales of publications and from symposia and colloquia. These same symposia and colloquia, which are now such an important part of the Institution's programme, are giving rise to considerably increased printing costs as a result of all the papers that have been forthcoming. These papers have been of a very good quality and it is our policy to publish any papers which meet our high standard.

However, the expected increase in expenditure is of such an extent that it will not be possible to subsidise the Journal indefinitely from the general revenue of the Institute. It is reported in the Annual Report that the previous arrangement for publishing the journal was terminated after a trial period of 18 months. Councils are now busy examining alternative arrangements for ensuring that the journal should become self-supporting.

In further justification of the increase in subscription, I would draw your attention to the "Finance" section

of the Annual Report. As pointed out there, we are in the process of making an appeal to industry for financial assistance on a regular basis. Your Council felt it was important to ensure that our house was in order before embarking on that appeal.

I have now succeeded in pursuading myself that there was no reason to be embarrassed and trust that I have been equally convincing to everyone else.

I should like to express to Mr Visser, our Secretary, and to the Kelvin House staff associated with him, my sincere appreciation of their hard work in connection with the Institute's financial affairs during the year. I particularly appreciate the lucid manner in which the figures are always presented to me for appraisal. Mr Visser, of course, has been promoted to other duties within the orbit of A.S. & T.S. I shall miss his quiet competence on the financial side very much.

Finally, Mr President, I should like to congratulate you on a very successful year. We are all extremely grateful for the exceptional amount of time that you have devoted to running the Institute's affairs and also for the telling wit and humour that you introduced into our usually rather dry deliberation.

I now have much pleasure, Mr President, in seconding the motion for the adoption of the Annual Report and Accounts.

MR PRESIDENT

Thank you, Mr Maxwell.

Is there any discussion on the report and accounts, ladies and gentlemen? If not, then may we adopt the annual report and statement of accounts for the last year? Agreed.

DECLARATION OF ELECTION OF OFFICE-BEARERS AND MEMBERS OF COUNCIL FOR THE YEAR 1971/1972 — INCLUDING THOSE PAST PRESIDENTS WHO HAVE SIGNIFIED THEIR WILLINGNESS TO SERVE ON THE COUNCIL FOR THE ENSUING YEAR

The President: I have pleasure in announcing that, in accordance with clause 3.3 of the Constitution, the retiring council has elected the following as office bearers for the ensuing year.

President:	Prof D. D. Howat
Vice-Presidents:	Dr J. P. Hugo,
	Mr P. W. J. Van Rensburg
Honorary Treasurer:	Mr D. G. Maxwell
Immediate Past President:	Mr V. C. Robinson.

The President: I shall now read a letter from the scrutineers declaring the election of Members of Council for the year 1971/1972.

'I have to report that we have inspected the nomination papers for members of Council for the 1971/1972 session, and found that the ballot papers sent out to corporate members of the Institute, were in order. There was a return of 483 ballot papers with four spoilt papers, representing a 40 per cent ballot. As a result of our scrutiny we find that the following members have been elected: Messrs H. P. Carlisle, R. C. Espley-Jones, G. H. Grange, Dr D. I. Legge, W. W. Malan, Professor R. P. Plewman, Dr R. E. Robinson, Dr M. D. G. Salamon, Mr L. W. P. van den Bosch, and Mr P. A. von Wielligh.'

I would like to congratulate those members who have been re-elected, and particularly to welcome the new members on the Council.

In terms of Clause 3.2.8 of the constitution, Mr Alec Bain in his capacity as Chairman of the Witbank/Middelburg Branch, and Mr John Meyer, Chairman of the Orange Free State Branch, will also serve on Council.

Then, ladies and gentlemen, I have to announce that the following past Presidents have also signified their willingness to serve on the Council for this comingyear:

Messrs R. J. Adamson, M. Barcza, H. Britten, H. E. Cross, J. K. E. Douglas, R. C. J. Goode, P. Lambooy, Professor J. de V. Lambrechts, Dr J. T. McIntyre, Mr J. F. Reid, and Mr H. Simon. . .

I would like to express Council's appreciation of the services of Dr M. G. Atmore, who served on the Council during the past year. I would also like to thank the past Presidents who have borne the heat and dust of the day, and are still prepared to go on. Thank you very much, gentlemen.

INDUCTION OF PRESIDENT (PROFESSOR D. D. HOWAT):

THE PRESIDENT

Now we come to the important part of this programme, and that is to induct a new President, who will work for you this coming year, and will take off my shoulders the responsibilities which I had, and I present to you Dr David Howat—David Dickie Howat. Dr Howat was born on the 27th of March, 1907, and in a place which I am confidently informed revolves regularly every Saturday night—he was born in Glasgow. Of course people are born in Glasgow—someone has to be born there, and whether it revolves or not, it does'nt seem to radically affect the birth rate.

David calls himself a British subject by birth—I don't know whether he is a Scottish Nationalist or what, but that is what he says he is,—he can't get away from this. He went to Allan Glen's School in Glasgow up to 1925, and to the University there from 1925 to 1929. He had a distinguished career at university—academically I mean. He got a first class honours B.Sc. in pure science, majoring in physical chemistry in '29, and then he went on and in 1934 received his Ph.D. for research done in metallurgy. Since that time he has stuck to the metallurgical world, a world which in this Institute has been extraordinarily well represented by some very eminent metallurgists.

He was a research assistant and lecturer in metallurgy at the Royal Technical College in Glasgow, '29 to '37 which is quite a long time. Then he was senior lecturer in metallurgy at the Royal Technical College from '37 to '40, and during the War he went down to Wales, where another good crowd of metallurgists and miners live, and he worked in the Royal Ordinance Factories in Newport, Monmouth, and Cardiff, '40 to '46, turning

out the metals which the armies of the world needed at that time, to contain the biggest war in history.

He was then appointed as senior lecturer in metallurgy, again at the Royal Technical College in Glasgow, from '46 to '55. Whether he saw the light or decided to dodge the fogs, or whatever it was, David came out to South Africa, and worked for the Anglo-American Corporation for some time. He was the director of their Central Metallurgical Laboratory, and in 1963 the Chamber of Mines was able to pry him loose from the Anglo empire, and put him into the University as Professor of Metallurgy, where he has been ever since. His office is in the new building there—the building which seems to have no start and no finish; if you go in on one floor, you're already on the third floor; if you go in somewhere else, you're in the basement—you never know quite where you are, but if you follow the arrows, you go to his office. And as often as not, in his office you'll find Mrs Howat—and here gentlemen, we have to be very careful how we tread—Mrs Howat doing his typing and his secretarial work. This means that he is under pretty good control. I am happy to say that my wife doesn't type.

David is a Fellow of the Royal Institute of Chemistry, to which he was elected in '42, a Fellow of the Institute of Metallurgists from '51, and a Fellow of this Institute since 1956 when he came out to South Africa. The first thing he did was to join the Institute.

Ladies and gentlemen, I commend this to your attention, and for you to draw to the attention of others in the industry.

He has done a lot of travelling overseas, visiting metallurgical plants and giving of his wide knowledge of this subject. He has recently come back from a trip to Israel. This would be right up his alley, I think, because David has a very detailed and wide knowledge of the more tricky parts of St Paul's gospels. He challenged my belief that it was St Paul who said that one should take a little wine for the glory of God and the comfort of the stomach. He said no, that didn't occur in any gospel or epistle that he knew and, of course, he was probably right. He didn't stop me drinking.

He's a member of the Prime Minister's Scientific Advisory Council. I believe the advice tendered by these gentlemen is extraordinarily good—whether it is always accepted, is another matter.

Since 1962 only—David has contributed eight papers to this Institute, together with papers to other journals such as the Journal of Scientific Instruments, the Journal of the Iron and Steel Institute, the Transactions, British Ceramic Society, and many others.

But what of David himself? Well, you only have to look at him, he's a well set-up handsome figure of a Professor. He's not really a terror to his students—I'm told he's too kind for them, but perhaps he's made a mistake here, perhaps he should be a little harder on some of them. He's a very, very hard worker, this I can assure you of, and it is on this ground chiefly that I recommend him to you as your President. I have never yet been to a Council meeting when there was a question of the refereeing of any rather difficult journal, or difficult paper, where David hasn't said, 'Leave it to me, I'll do it, and he has done it. He has taken a major part, with others—many others—in the organisation of these colloquia. This takes a lot of doing—he and Dr Robinson and Mr Keith Douglas, I think were really the driving force behind these at the beginning, and they produced the people necessary to start us off with the colloquiam on steel.

I can't tell you much about his sporting activities—I am told by his wife that she does persuade him occasionally, or drive him into doing a little gardening. He used to play hockey, I believe—representative hockey, and in Scotland, of course, he had to play golf—you either play golf there or you come to South Africa. He did play golf there and then he came to South Africa, so I presume he hasn't played golf in the interim, but if he does ever have any spare money to dish out, and he would like to renew his golf, I am a retired man and I am prepared to assist him.

This, ladies and gentlemen, is the man that I would like to offer to you as President. Your Council has the greatest possible confidence in his ability to run this Institute in the way it ought to be. They have the greatest possible confidence in his inquiring mind, and the amount of thought which he gives to new things in the Institute. We for years have been hearing of a Dr Obst from Germany. The visit from this gentlemen was on and it was off, it was off and it was on, and finally he came out suddenly without anyone really knowing about it, except David here, who nailed down the whole of Iscor, got them to run a special little seminar, provided translation services, and gave us a most entertaining day over there. He also persuaded Iscor—don't ask me how—to lay on lashings of gin and good food for lunch. This was quite a performance done at very short notice, and Dr Obst was finally pinned down and delivered of the very best of his mind.

David, I ask you with some thankfulness to take over this chair. Thank you very much.

PROFESSOR HOWAT:

As a much smaller man than our immediate past President, the first thing I have to do is to pull down the microphone.

I trust you will take these remarks of our immediate past President with the proverbial grain of salt.

I needn't say that I am honoured by the election to the office of President of this Institute. I am not only honoured, but I'm extremely humbled in thinking of my own inadequacy for the job. But there are some compensations, I think, for the Institute and for me. We've just heard of the election of a strong and vigorous Council—new names, new ideas. We have an impressive list of past Presidents who've agreed to serve, and who can contribute from their vast experience. I am particularly glad that I have two young and very able Vice-Presidents, and I am quite sure that they will more than compensate for my age, and my extreme Scottish caution—that's one characteristic that the President didn't mention.

My two Vice-Presidents are both Afrikaans, and you know I have always had a shrewd suspicion that this strong affinity, which I think has always existed between the Afrikaners and the Scots, is based on the fact that both races are extremely careful about money. In fact,

the English put it very bluntly, they just say the Scots are plain mean. So I am quite sure that Mr Maxwell can have an easier mind from now onwards.

I needn't say that I am more than delighted that Mr H. P. Carlisle has agreed to carry on the difficult and arduous job of Editor. You have no idea the amount of twisting of arms that has to go on, to get anybody to take up this thankless job.

Finally, Mr Maxwell also remains the Treasurer—a thankless, a very unpopular job, but one of the key jobs of the Institute. Our renewed thanks, Mr Maxwell.

As for our immediate past President, I think a little reflection will show that Vic Robinson has been one of the outstanding Presidents of this Institute. He began in a really big way by giving a presidential address that hit banner headlines in the daily press, and I am quite sure that has happened only on very rare ocasions.

Then he followed that up by giving to our Institute a completely new image—this is a word I believe beloved by our rising young executives, you must have an image of everything now-a-days—and the image he gave to this Institute, was quite a remarkable one. He took over, as he told us today, with monthly meetings attended by perhaps two percent. of the membership, if we were lucky, and instead of that he wiped the slate clean and started these colloquia. This has injected completely new zeal and enthusiasm into the Institute. Hindsight, of course, is a wonderful thing, and everything has gone very well, but, nevertheless, we have to pay a very real tribute to the President who saw the possibilities of this new approach, and implemented that scheme with vigour and with courage, because one thing I have learnt in my years of association with this Institute, that it certainly is a very conservative body.

Then, during his term of office, the financial affairs of the Institute, which had been really worrying us for quite a number of years, reached a crisis, and again great courage was needed. First of all, as Mr Maxwell told us, subscriptions had to be raised, and that always makes a council very popular with the members. But then our President at that time took a terrific step by saying, 'Look boys, I'll go, cap in hand, to the industry and ask for some financial support on a really big scale.' Even if you know the people concerned very well, and even if you know them on first-name terms, it takes a lot of courage to beard the lions of the mining industry in their offices—not their dens—and this Vic Robinson did, and we have every confidence that as a result of that, a real substantial benefit will accrue to our Institute.

As though these achievements weren't enough to distinguish his tenure of office, he proved to be an orator, a raconteur, a humorist, an administrator, and an organiser. One might say whatever qualities you wish in a President, you name them, he has them. Even in the routine matter of chairing Council meetings, he manifested skills which, I am sure, amazed the past Presidents, and certainly made a great deal of envy in the hearts of those of us who realised that we would one day be in that same hot seat.

The senate of a university, I believe, is the most awkward body in the world to handle, but there are moments when our Council runs a senate a very close second, and it was absolutely wonderful to watch Vic's technique. If some person had been carrying on beyond what Vic thought was a reasonable time, he would put his head down on his hand. I never quite understood whether this was a genuine part of the technique, or whether it was a gimmick just thrown in for good measure, but he would put his head down on his hand and make some absolutely outrageous remark on a subject which was completely and totally unrelated to the matter before the Council—the net result was that the Council dissolved into absolutely helpless laughter, and you could say that must have lasted at least a full minute, and then when the poor character who had been holding the floor, was ready to resume, he suddenly became aware that by some completely unexplained mechanism, the Council had moved to the next item on the agenda. Ladies and gentlemen, believe me, I sat spellbound—except when I was laughing—studying this technique, and it never failed.

That's the man who has just vacated office as President, and our Institute owes him a great debt. We have Life Members, we have Honorary Life Members, and really I don't see the slightest reason why we couldn't have a Life President, and I don't know anyone who could fill the bill so completely and so adequately, as Vic Robinson. In the meantime, until our Council makes up its mind on this proposal, I have to try to follow him in this demanding job. It is a demanding job at any time, but to expect lesser mortals like me to follow Vic Robinson, is asking for the impossible—it's just not fair to incoming Presidents, but I'll do my best. Thank you.

THE PRESIDENT (PROF HOWAT.)

I now ask Dr Hugo to take the seat on my right-hand side, and Mr van Rensburg, please will you take a seat on the rostrum.

MR P. W. J. VAN RENSBURG

Mnr die President, Ere gaste, Dames en Here,

Dit is vir my 'n besonder groot plesier en uiters aangename plig om vandag hier namens ons senior vise-president, Dr Jacques Hugo, en myself, ons dank en waardering uit te spreek vir die groot eer wat ons toegeken is deur u Raad wat ons tot die hoë poste in ons Instituut verkies het.

Die hoë gehalte van diensvervulling van ons voorgangers is wel bekend aan almal, en ek wil u verseker dat ons ons bes sal doen om daardie voorbeeld te handhaaf. Ons hoop julle verwagtings sal vervul word.

Your senior Vice-President Dr Hugo has served on your Council for many years having originally been elected as representative of the Base Metals Division. His clear thinking, wise counsel, and lucid exposition of ideas is admired by all on Council. During the past year he has done a particularly good job as chairman of the membership committee. In spite of the problems occasioned by his residence in a city some miles north of our concrete jungle, and working hours spent in a

senior capacity with the Atomic Energy Board at Pelindaba, which I can assure you keeps him extremely busy, he has been a most conscientious and hard working member of Council. He has set a standard which is going to create problems for me.

Our retiring President, Vic Robinson, has been a tonic. His straightforward, no nonsense approach has shaken up the Institute during the past year. After much soul searching and much talk over the years as to how we can make our Institute more attractive to members, Vic walked right in, brushed away red tape and the cobwebs, and as you know engendered a new spirit into our organisation. The image that our president has mentioned. The success of the colloquia which have taken the place of the monthly meetings has to a large extent been due to quiet but effective prodding by Vic of all concerned. We are also going to miss his rather effective methods of disposing of long agenda, and that fine turn of phrase that he always seems to conjure up from nowhere at the most appropriate moments, not to mention his fund of good stories and fine sense of humour, of which you have had further examples this afternoon. It has been a great pleasure to work under him and he leaves us with very pleasant memories of his term of office. We look forward to his wise counsel during this next year while he serves out his term as an office bearer in the more exalted position as Immediate Past President.

And now Mr President, may we express to you our sincere congratulations on your election to this most important position in our Institute. Both Dr Hugo and myself know the high standards that you expect of us. The particularly excellent job you have done during the past year as Publications Manager has resulted in an embarrassment of more high quality papers for our Journal than we can publish within the limits of our resources.

Gentlemen, this alone has shown that your choice of him as President has been a good one. But on top of that, he is a most profile producer of excellent papers himself—we are not quite certain how he finds the time for all his activities.

We look forward, Mr President, to working under you and wish to assure you of our loyal support.

Thank you very much, ladies and gentlemen.

Dr D. I. Legge: Mr President, as one of the newly elected members of Council, I would like to assure you of our assistance and support.

The President: Thank you, Dr Legge.

APPOINTMENT OF AUDITORS AND HONORARY LEGAL ADVISERS FOR THE YEAR 1971/1972.

The President: Ladies and gentlemen, I propose that Messrs Alex, Aiken and Carter be appointed auditors, and Messrs Van Hulsteyn Feltham and Ford, be appointed honorary legal advisers to the Institute for the coming year. Is that agreed? Agreed.

The President: Thank you.

GENERAL BUSINESS.

The President: Is there anything that any member would like to raise under this heading?

If not, then, ladies and gentlemen, I will ask Dr Hugo to take the chair, while I deliver my presidential address.

PRESIDENTIAL ADDRESS

The President, Prof D. D. Howat, delivers his presidential address entitled 'The Electric Smelting Revolution'.

Dr Hugo: Thank you, Professor Howat. Ladies and gentlemen, I am sure you will all agree with me that Professor Howat's trepidation as expressed in his opening remarks, was completely unwarranted, and that his presidential address will greatly enhance the transactions of this Institute.

He has succinctly highlighted a most important and significant revolution, both as it affects the electric smelting impact over the entire world, and at the same time gives us a very clear indication of what lies ahead for South Africa. Our country, as we know, is blessed with an abundance of resources of many of the metallurgical raw materials, and fortunately also with relatively cheap power. It behoves us, therefore, to exploit these resources by the most economic means available, and the most efficient means, and Professor Howat and his research colleagues, are, may I say, in the assault unit of this operation.

He has also this evening highlighted some of the potential pitfalls which face the development of the metallurgical industry in this country.

With regard to the long-term stability of power costs, I personally share his optimism that the stability we have enjoyed to date, will be maintained in the future. Over and above the factors which he has mentioned, in favour of maintaining this stability, I personally feel that the fact that a national electricity grid will be established within a few years, will be yet a further stabilising factor.

He has pointed out the nagging problem of attracting sufficient young men to become metallurgists or metallurgical technicians, and our immediate past President shortly before that, also pointed out that that is a task which lies before this Institute.

I would now like to call on Mr H. R. Reid to propose a vote of thanks to Professor Howat.

Mr Reid: Mr Chairman, Professor Howat, Mrs Howat, ladies and gentlemen, it is a great honour to me to be called on to propose the vote of thanks to Professor Howat, for his excellent address. It's an honour for many reasons, the two foremost reasons being that, firstly, it is because it is Professor Howat, and secondly, because of the subject that he has chosen, The Electric Smelting Industry, and more particularly he has had quite a lot to say about ferro-alloys.

I disagree with Mr Robinson on one point, and that is that he holds no terrors for his students, because I have been nursing a guilty conscience for two weeks, and this is 16 years after leaving Wits. About two weeks ago I attended a meeting at the National Institute of Metallurgy, I could find no parking in the area, so I surreptitiously parked my car in the basement that Mr Robinson mentioned, at the metallurgical block, and I still

have in the cubby hole a ticket saying, that I will be severely dealt with If I go to Room 502 and explain why I parked there, or else I can pay an admission-of-guilt fine of R2, which I will do.

If Professor Howat's address does not make the headlines, I will be very surprised—perhaps not the headlines, but at least the front page, because he has pointed out some very important things in the major world industry, and that is that the whole pyramid is balanced on a very weak foundation. However, I think he's given us the answer—we can make use of these lower-grade coals and reducing agents—we have an abundance of these in South Africa. However, we may not have an abundance of the type we need—we need the trace elements, the poisons to the steelmaker, to be low, namely, phosphorus and sulphur. We do not appear to have an abundance of these types of coal, and I think we must preserve these—we must not be allowed to export this type of coal, because we have a heritage in South Africa—Professor Howat has mentioned ferro-chromium, it is a well-known fact that South Africa, here in the Transvaal, has 75 percent of the world's chromium reserves. Rhodesia has approximately 20 percent.—it adds up to almost 95 percent in total in Southern Africa, the rest being in Russia, Turkey, the Phillipines, India, and so forth. When one realises this fact, and the fact that we have not gold and other precious metals to last us for ever, we must export this chromium. We can do so as ore or else we can turn it into a more valuable product, namely, ferro-chromium. We earn, perhaps, 15 times the foreign exchange if we convert it to ferro-chromium. It's not easy to do this, because we are substantially an export market. Other countries, our competitors, export perhaps a maximum of ten to fifteen percent of their production—just the surplus. We export 90 percent of our production, and so we are not very popular with the main industrial nations, who consume our ferro-alloys, not only ferro-chromium but other ferro-alloys as well.

We have to tread very warily. We cannot just carry on and install capacity, force our way into the market, because I think we will meet up with a tremendous amount of resistance. If we do things in the correct manner, I think we can turn this into a substantial export earner. Ferro-alloys, almost half-a-million tons per annum, valued at between 40 and 50 million rand per annum are at present being produced in South Africa. With the plans to install 300 megawatts of furnace capacity, this will almost double to a million tons of ferro-alloys per annum, and the substantial quantity of this increase, will be for export.

I think the time has been reached where, as individual producers, we have to just shelve our individual ambitions. We should all get together—perhaps a central-marketing organisation is called for. I am sure some common denominator can be found in the country, to put it on a rational basis, and help this industry to grow correctly.

Professor Howat in his address has mentioned power, he's mentioned coke, he's mentioned labour problems, he's mentioned the argon oxygen change—all of these things are highly important. The argon oxygen change in particular, has made a difference. However, most of the ferro-alloy plants in this country, are able at not too great a cost to change over and produce substantially more high carbon or charge chrome, at the expense of low-carbon ferro-chrome. It will mean the shutting down of equipment. However, the chromium units or chromium tons that are turned out, will be almost equal to the quantity before—perhaps of a slightly lesser value. The new installations will take care of this, because they are all planned for charge-chromium output.

In particular I would like to mention Professor Howat's role in the research with regard to ferro-alloys. It thrilled me when he said 'my colleagues in the ferro-alloy industry'—although he is not officially working for one of the ferro-alloy plants, or for anybody connected with ferro-alloys, he is indeed one of our colleagues. He has been perhaps—I wouldn't like to say the backbone, but perhaps that is the correct term—the backbone of the research team that has worked to produce in our opinion, a very sophisticated type of research. It's not in the clouds, it's down to earth—we can make use of the results that the team turns out. It is so often one of the complaints that is levelled against research, that one cannot make use of it because it is so 'high falutin,' if I may use that word, that it becomes impractical. They are practical in their outlook—everything that they have turned out thus far, makes our job easier.

I think I have just about taken up as much time as I may, and I would like to finish by proposing a vote of thanks to Professor Howat, for his excellent address.

Dr Hugo: Thank you, Mr Reid. I now call on Mr Selmer-Olsen to second the vote of thanks.

Mr Selmer-Olsen: Mr Chairman, Professor Howat, Mrs Howat, ladies and gentlemen, when Professor Howat asked me some time ago if I were prepared to second his presidential address, I said, of course, I'll do it with pleasure, but he told me, 'I don't want any patting on the shoulder, you say your opinion', and that I am very thankful for because I am always the bloke who disagrees.

First of all, I felt very young when Professor Howat mentioned his two big revolutions, the oxygen and the electric smelting, because I always claimed that I was born behind an electric steel furnace. This happening, however, took place more than twenty years ago. Of course, these were the exceptions. It was a small furnace, it was a 2,2 m.v.a. herolt furnace. It didn't come on to the world market, but still, there it was. It was based on cheap hydro-electric power, steel scrap and ferro-alloys, and the people who were brave enough at that time to go in for such an adventure, decided this round about 1907—when you were born—and the steel plant started in 1911. It took a few years before they got over to electric steel smelting.

Today we have the situation that there is a shortage of metallurgical coal—coke—all over the world, and because all these oil-fired power stations, nuclear power, and so on, it is understandable that the trend is towards electric smelting. In this country we also have the situation that there is a shortage of coke and coal, which has been mentioned. But there's one thing that

has not been mentioned, and I would like to inform you about this.

We are the firm, AMCOR that's using a hundred percent coal in our electric manganese furnaces. This we have done for years, even though every other ferro-alloy plant in the world, claimed it was impossible. We are going to build two new big 48 m.v.a. furnaces, and we also want to base this on coal, and in this connection we had people over from Norway, to have a look at our processes because they were going to deliver the furnaces. So they were very interested in getting samples of this coal over to Norway, to test it for particular things, and this happened to be this Number Two Seam coal from the Witbank area, which can only be used for making electric power, and fill Johannesburg with smoke during the winter. This useless coal was shock carbonised at 900, 1 000 and 1 100 degrees centrigade, and they were tested. The abrasion index of all these three was in the order of 85 similar to good metallurgical coke. The reactivity towards carbon dioxide was 0,16, corresponding to low temperature coke. Unfortunately, shatter indexes were not carried out.

This situation was completely unknown to our research centres in this country. Similar tests will now be carried out on coal from other collieries in the Witbank area, and it will all be Number Two Seam coal.

Surely a char like this could be used in blast furnaces. Why not? Until it has been proved to me that this was an exception and not the rule, I am not prepared to accept that blast furnaces cannot be used in the future in this country. I am sorry, but this is my opinion.

Secondly, in the United States anthracite has been used as fuel in blast furnaces, and I dare say that down in Zululand there are millions of tons of semi-anthracite which are untouched and untried.

I now come to the production of ferro-manganese, the choice between electric-furnace and blast-furnace operation. AMCOR is producing both in blast furnaces and in electric furnaces. We had the situation that when we buy electric furnaces, these are designed particularly for ferro-manganese production, but I also daresay that there isn't a single blast furnace in this world designed for ferro-manganese. They are all designed for pig iron, and when they are not economical any more on pig iron, they run them a bit longer on ferro-manganese. But the major percentage of manganese ore in this country, which is the braunitic calcictic type, is in my opinion more suitable for blast-furnace operation, than for electric-furnace operation. If this situation combined with some sort of suitable char and so on, I can't see that there couldn't be a good future for blast-furnace operation, for ferro-manganese.

Of course, we all hope that sometime in the future we shall be the biggest producers of ferro-alloys, but all the raw materials are different from the raw materials in other places in the world, and quite a few of us burned our fingers by trying to copy processes from overseas —I'm one—and we, therefore, have to go our own ways if we shall be the leaders, and I fully agree with Mr Reid, that I'm very thankful for this work being done up at Wits., under the leadership, as we know, of Professor Howat, and up to now all the efforts have been concentrated on chrome, and I must admit I am one of those with experience but not with the knowledge, for one reason—quite simply—that there isn't any knowledge—there's very little one can find about it. What is actually taking place in the furnace? What's happening to the chrome? What's the deduction mechanism, and so on? These things are being investigated at Wits. So, for instance, does the carbon monoxide from the reaction, pre-reduce the iron in the chars higher up? This was one of the first tests which were carried out, and the conclusion was, there's no reaction whatsoever. This is most unusual but, of course, the next step was to try carbon instead, and it reacted at quite a low temperature, 1 000—1 100 degrees centigrade—it reacted, then the chrome was still solid and, of course, the carbon was also solid. What was going on?

So, to try to be absolutely certain that there wasn't a carbon monoxide reaction, high-carbon ferro-chrome and chrome ore were mixed together, and it came as a shock to all of us that the ferro-chrome ore reduced the chrometite. If the ferro-chrome reduced the chrome ore, you can say it the other way round, the chrome ore refined the ferro-chrome, when the ferro-chrome was still solid. To be absolutely certain about this, it was done in bigger crucibles and so on, and so on, and I say the proof is in the pudding. This is in a joke only, but never have I read anything about a solid-state refining process. This is a new principle inside metallurgy, and it comes from Wits. It's my honest opinion that the process must be protected by some preliminary patent, because this must be investigated further. The amazing thing is that the process also takes place quite rapidly.

Now to come back to this 20 years of electric steel smelting, I have a funny feeling that Professor Howat referred to me personally when he said, 'Mankind has used pyrometallurgical processes for production of metals and alloys, from very primitive times', and this was not so very far back. To show you that we were not so very primitive, and also to show my personal appreciation for the work which is carried out in your department, I would like to present you with a little present. This is a little ash tray of stainless steel—eighteen-eight steel—and it's made from steel from that herolt furnace where I was born. I can't guarantee that it was the very first batch, because I don't quite remember, because at that time I was a very little boy.

Dr Hugo: Thank you, Mr Selmer-Olsen. Professor Howat, would you like to reply?

The President: Ladies and gentlemen, I am delighted that my two colleagues have both emphasised that our research work at Wits., is of a very empirical nature. I suppose to the real academics, there could be no more awful criticism made about research work than that it was empirical and practical, but that's the kind of work we do.

My colleague, Mr Selmer-Olsen, says he was born behind a herolt furnace. I think he must have made it his ambition to grow high enough to look over it, but the thing is that the herolt furnaces have grown so fast, that although he did very well, he hadn't a hope really. I want to thank him for the remarks he has made

about our research work at Wits. He has done a very, shall I say, dangerous thing this afternoon, by giving the President a gift following his address—these are always very dangerous precedents, but I think for me it is a good thing that he gave me the gift now, because if he had waited until the end of my year of office, he might have given me a wooden spoon, and in Scotland that was the prize for the bloke who came in last in the race. But to have been given this very valuable historic souvenir of stainless steel, made such a long time ago, is a very generous gesture, and I'll treasure this long after you have forgotten this occasion. Thank you.

In concluding the proceedings, ladies and gentlemen, I want to thank Dr Hugo for holding the fort.

Thank you very much.

The meeting closed at 6.35 p.m.