

ORANGE FREE STATE BRANCH

Proceedings of the Annual General Meeting

The Annual General Meeting of the Branch was held in the St. Helena Club on Tuesday, 3rd October, 1972 at 8.00 p.m.

Mr J. M. Meyer was in the chair.

There were also present: Prof D. D. Howat — Immediate Past President of the SAIMM. Messrs. E. J. Dunstan, J. R. F. Handley, C. J. Isaac, G. C. P. Labuschagne, A. T. Lewis, J. Lorenzen, J. D. McMorran, P. L. Nathan, D. Rankin, D. A. Smith, S. L. S. Swart and E. T. Wilson (Fellows); R. Campbell, G. W. Fitcher and C. L. Workman-Davies (Members); A. E. Hall, J. McLuskie, N. Meyer and M. H. Smith (Graduates); R. M. Erasmus, A. E. Hooper, A. Paschalides, C. F. K. Poulton, R. Solms, W. M. Todd and P. J. van der Bank (Associates); D. I. Watson and C. Simms (Students) and twenty-seven visitors making a total attendance of fifty-seven.

MINUTES OF THE PREVIOUS ANNUAL GENERAL MEETING

The minutes of the Annual General Meeting held on the 4th August, 1971 were taken as read. Their adoption, which was proposed by Mr D. A. Smith and seconded by Mr C. J. Isaac, was carried unanimously.

There were no matters arising from these minutes.

At Mr Meyer's request Prof D. D. Howat took the chair during the presentation of the Chairman's Annual Report.

CHAIRMAN'S ANNUAL REPORT 1971/72

1971/72 Committee

Office Bearers

Chairman	J. M. Meyer
Vice Chairman	C. J. Isaac
Immediate Past Chairman	N. A. Honnet

Committee Members

Messrs C. Mostert, D. A. Smith, I. G. Thomas, E. Wilson and G. C. Young.

General meetings

Three General Meetings were held during the year, as follows:

Annual General Meeting — 4th August, 1971 — Present 27.

General Meeting — 18th November, 1971 — Present 41.

General Meeting — 9th February, 1972 — Present 37.

Average attendance at meetings has shown an improvement over last year's figures and it would appear that the new form of meeting is far more successful than the old.

Presentations

The following talks/demonstrations were given during the year:

"The Institute of Mining and Metallurgy" — Mr V. C. Robinson.

"Hydraulic Press for Testing Timber Packs" — Mr J. Wilson.

"Comminutions Rock Mechanics" — Mr G. Emere.

"Computer Analogue" — Mr H. Miller.

"Solvent Extraction Process" by Messrs R. Cross, A. McDonald, L. van Tonder, J. L. Weesen and W. L. Owens.

Visits

The following visits took place:

15th March, 1972 — Local visit to O.F.S. Goldfields to see innovations at Loraine, St. Helena and Western Holdings. Number of members who participated — 145.

27th June, 1972 — Koffyfontein Mine. Number of members who participated — 32.

I must thank Mine Managers and senior personnel at the mines in the district for reacting to my appeal at the last Annual General Meeting. Both the visits were most informative and of great use to those who attended. I hope that during the forthcoming year, the support for these visits will be maintained and even improved.

Committee meetings

Two Committee Meetings were held during the year, and I want to thank Committee Members for their help on these occasions.

Membership

The total membership of the O.F.S. Branch, as at the 15th July, 1972 was 124, a decrease of 12 against the previous year, made up as follows:

Fellows	29
Members	39
Associates	29
Graduates	12
Students	15
	—
	124
	—

Finance

This Branch had no expenses during the year and it has been decided to close our local bank account and to transfer these funds to Johannesburg.

DECLARATION OF OFFICE BEARERS AND COMMITTEE MEMBERS FOR THE YEAR 1972/1973

The Chairman announced that the outgoing committee had elected the following office bearers for the coming year:

Chairman C. J. Isaac
Vice Chairman E. T. Wilson
Immediate Past Chairman J. M. Meyer

The Chairman then announced that Messrs C. Mostert, P. L. Nathan, D. Rankin, D. A. Smith, R. B. Sutherland and G. C. J. Young had been elected committee members for the ensuing year.

INDUCTION OF CHAIRMAN

The Chairman introduced Mr C. J. Isaac to the meeting by briefly and humourously outlining his career and, after congratulating him on his election, called on him to take the chair.

Mr Isaac, after thanking Mr Meyer for his kind introduction, expressed his gratitude to the committee for electing him to the office of Chairman. Mr Isaac stated that he would endeavour to maintain the high standard that had been set by his predecessors and moved a vote of thanks and appreciation for Mr Meyer's efforts. This was carried unanimously.

GENERAL BUSINESS

There was nothing to discuss.

ADDRESS BY PROF D. D. HOWAT

The Chairman called on Prof D. D. Howat to deliver his address entitled "Metallurgists and Computers". The presentation of this talk, which was most interesting and entertaining, was received with applause from all present.

The Chairman proposed a vote of thanks to Prof Howat on behalf of all members of the O.F.S. Branch.

CLOSURE

After thanking all present for their attendance, the Chairman declared the meeting closed at 9.05 p.m.

METALLURGISTS AND COMPUTERS

An address delivered at the Annual General Meeting of the O.F.S. Branch by Prof D. D. Howat.

Most men who remain in mining and metallurgy like their jobs. There are many times when you say to yourself or to your wife — 'Anybody can have my job — if they want it'. You feel so fed up and frustrated — everything that could go wrong has gone wrong. A man you thought you could absolutely and completely depend upon has let you down with a bang and there you sit in the dust and smoke — holding nothing but the 'can'. And you know *you* have to carry it, no matter how much the other man has done — or more probably has not done. Yet when the dust has settled and the smoke has blown away you think again that it's not such a bad job after all. It has a challenge and it has problems and difficulties but you feel a man when you have to confront these things and battle through.

Well, if most of us feel like that about our jobs where are all the young fellows that should be following up close behind? Where are the graduates in mining and metallurgy who should be receiving their degrees, entering on their professions and training to be the managers of to-morrow?

I am not quite so familiar with the mining aspect, although I do know it is very far from satisfactory. On the metallurgical side the position is if anything

worse. When we consider that the future development of this country must be seen primarily in the light of the exploitation of our natural mineral resources then there is an element of tragedy in the paucity of metallurgically trained men.

Of course there are the *new men* of to-day 'the computer experts'. There can be little doubt that the computer has proved of immense benefit in expediting calculations and elucidating situations where there are far more variables than the human brain can manage at one time. In these circumstances there must be the men who can compile the programmes and feed into the computer the available data so that some guidance becomes available as to the best course of action or, as it might be phrased, the choice of the lesser of many evils. This is now an accepted part of the mining and metallurgical world. The Apcom Conference held earlier this year under the auspices of our Institute gave us some idea of the vast ramifications of the application of Computer methods not only in mining but in mineral processing. On the metallurgical side there is no sizeable steel plant or non-ferrous smelter which does not have its own computer. There can be little doubt that this new technique has made life a bit easier for the mining engineer and the metallurgist.

Inevitably in such a situation there exists a dichotomy — a divided struggle. On the one side are the men who have devoted their lives and training to assessing practical situations and making things work — whether by mining the ore, working the furnaces or rolling and shaping the metals; on the other hand the men who take the data and the accumulated experience from many years operation and feed this into the computer which theoretically tells you how to proceed to the next step. The question one must instinctively ask is — 'What about my knowledge, my experience, yes, even my 'hunches' which have often proved to be right? Am I to be denied the exercise of these qualities of judgment and experience, am I no longer going to be faced with the challenge of deciding in my own mind — Where do I go from here? Do I sit back passively and let the computer make the decision based on the data that I have collected, without taking into account my experience, my judgment, yes, even my hunches, because that used to be the greatest challenge of all. If this is so — if this is the situation that I must accept: then two things follow: (a) Am I now denied one of the greatest and most exciting challenges that I had at one time to face? (b) Which is to be the boss — the chap who knows the computers and how they work and how to get the best out of them or I, the practical man, trained to do a job in the mine or the smelter or the rolling mill who believed that I had accumulated that kind of experience and knowledge that constituted the best basis for making a decision? I know this is a gross oversimplification; that things are not nearly so complete and separate as that — that there must remain areas of grey among the white and black. I know that the board of a large company will probably say: 'Well, old so-and-so has had a lot of experience but we cannot afford to make mistakes of the magnitude that we might make if we accepted his advice and turned down the findings of the

computer'. Modern management cannot afford these kinds of mistakes. In effect, therefore, the great challenge of 'decision making' may in fact be in process of moving from the engineer or the metallurgist through the computer to the board. But surely again *the final 'decision making' is done by men* — in this case, the top level management. The management *may* now — I only say *may* — have better advice or more extensive advice from the computer but men — and in this case often non-technical men — have still to make the decision. I have the horrible feeling that if my diagnosis is any way correct the technical man may be relegated to a place further down the ladder, while all the time we have been arguing and reasoning that he should be further up the ladder — in the upper regions of the 'decision making' sphere.

Does this state of affairs constitute one of the reasons for the poor recruitment of able young men into the mining and metallurgical professions? Is it easier to study business management, accounting and finance, which appear to many young people to provide the quickest and easiest way to the top or to grind at the mathematics and physics and the hard practical aspects and tests of engineering whether it be mining or metallurgy? Are the present developments in computer application taking much of the challenge out of our professions and making it more difficult for the technical men to climb the ladder? Is the great challenge of to-day to get to the top by the relatively easier way of the B.Comm. and the M.B.A.? You do so knowing that the technical men — 'those lower forms of life' — will always be able to provide the data to be fed into the voracious maw of the computer while the top management sits in the air-conditioned offices with clean hands and cleared desks waiting for the computer to send in the stuff.

Is there anything that we can do about it? Well, there is the *one* way of 'climbing on to the computer band wagon'. In this case the technical man acquires the skills necessary to enter the realm of the computer boys — I suppose on the principle that 'if you can't beat them — join them'. You have to be relatively young to do this sort of switch. Everybody knows that you can't teach an old dog new tricks. Or is the crying need for miners and metallurgists to become *more creative* in our thinking? Let's face it, this is not a quality that comes easily to engineers — especially in the conservative mining and metallurgical branches. We know 'this process works' and there is an inbuilt tendency in all of us to say — 'Well, just let us go ahead with the process we know. Let us make it bigger and better but don't let us upset the well known principle'. But new developments and innovations based on research, development work, new ideas, new hunches are the distinguishing marks of the real engineers. These are the qualities and characteristics that no computer can generate. The computer can help in the calculations and the assessments and the cross-checks — but *it cannot generate new ideas* — these are the *exclusive function of the human mind*. These are the aspects in which the man remains infinitely superior to the machine. I am convinced that in the realm of ideas the mining engineer

and the metallurgist can still make their most important contributions.

If this is so — as I am convinced it is — then we must more energetically support the research and development boys — not only support them but keep closely in touch with them. *Research and development work in industry cannot be done in a vacuum*. There are areas on the very frontiers of knowledge where the back-room boys in a University or similar institutions can work largely insulated from the outside world — places where people still live in ivory towers. In industrial R & D the position is quite different for here the work must be seen in its industrial setting. For real development to occur the R & D man and the mining and metallurgical engineer must be complementary to one another. Each must be aware of what the other is doing and why, where are the areas in which real development work is needed and where it could pay the largest dividends. These sort of decisions can only be made by the collaboration of the mining and metallurgical engineers with the R & D people. Now I have been in the R & D side of mining industry and I know that this collaboration is not easily achieved. The engineer and the manager find it very easy to believe that R & D is a bit of a side-line. It is something about which a big firm has to put up a show — *go on view in public as doing something in R & D* — but does it really make any difference and *who pays for it anyhow?* Let's face it — R & D is expensive — it costs a lot of money and frequently the better it is the more it will cost. Who pays for it — the mine, the smelter, *the areas in which the goods are produced?* It looks as if R & D is a constant drain on the profits of a company — and it is the profits which please the board and the shareholders, so why fritter these profits away on research and development work. All very understandable and quite realistic — but is it right? Well, if some of the big American firms have developed new processes, *let's buy the know-how and negotiate the rights to use it*. Unfortunately the minerals and the gangue and many other factors are not the same here as in the United States and a process which appeared to work extremely well over there may give endless problems if it is applied by *rule of thumb* in the particular conditions in our country. All of us know that these fears have become a nightmare reality in actual cases in this country. Nobody would even suggest that we should always start from scratch in our R & D work here but a process tried and proven in the United States or Europe may require a lot of development work before it can be applied profitably under our local conditions.

What of our own particular natural resources — under what conditions can we develop new methods for their use? What particular local advantages do we possess in comparison with other countries? In this connection our local ferro-alloy industry is an enlightening example. For the production of ferro-chrome and ferro-manganese we have the great advantage of relatively cheap electrical power from stations built on top of our remarkable coal reserves. On the other hand although we have wonderful reserves of chromite ore — 75 per cent of the known world resources — our ores are very far away

from being the best available. With a Cr/Fe ratio of 1,6 to 1,8 we have to produce ferro-chrome which will be competitive in overseas markets with similar alloys made from ores in which the Cr/Fe ratio is 3 to 1. This was not an easy hurdle to surmount and an awful lot of toil and sweat and money was spent in learning the 'hard way' — *particularly in making low-carbon ferro-chrome*. Just when we had become reasonably confident in the process, we discovered that Union Carbide in the U.S.A. had developed a process for the manufacture of stainless steel that needed only a fraction of the low carbon ferro-chrome alloy that we had laboured so hard to learn to produce. That is the way with R & D work — the crest of the wave and the trough of despond — the bright ideas that seem so good until nearly the end of the road and then they fade into the night. *If one in ten of your ideas pays off you are a lucky man — but all ten have cost a lot of money and the tenth lucky one has to pay.*

Yet that, I believe, is the challenge that faces the mining and particularly the metallurgical world in South Africa — the challenge of development, of *exploiting the mineral resources we have*. Doing something which no computer can do and very very few computer experts know anything about. *Is this the challenge to the young men of the present* — the challenge not only to do the jobs and to face the problems we have faced but to see new horizons and new visions of what is possible in this land? Then perhaps we will again attract into our professions the able young men we so badly need.

VISIT TO HENDRINA POWER STATION AND OPTIMUM COLLIERY

A visit to Hendrina Power Station and the Optimum Colliery, contractually committed to supply the coal for the power station, took place on the 20th September, 1972.

In all fifty members of the Institute took advantage of the opportunity to be shown something of these projects.

A luxury S.A.R. bus provided transport from Johannesburg for 26 of the visitors, the remaining 24 made their own transport arrangements.

The visit to the Power Station took place during the morning. The Superintendent of the power station, Mr Kincade, welcomed the guests on behalf of the

Electricity Supply Commission, whereafter a conducted tour of the Power Station followed.

The size of the equipment and the capacities of the various installations were found to be quite overwhelming. A brochure containing some very interesting statistics was handed to each of the visitors.

Mr V. C. Robinson thanked the Superintendent and his staff for an enjoyable and interesting morning.

After an excellent luncheon provided by the Management of Optimum Collieries at the local staff mess, the open cast workings of the Colliery was visited.

The Colliery tour was conducted by Mr J. E. Robinson, the mine Manager, ably assisted by senior members of his staff.

The open-cast pit was very interesting especially with regard to the stripping of the overburden to expose the three coal seams to be mined. The Marion 8000 type walking dragline, although not working at the time of the visit, was nevertheless very impressive. Visitors were afforded the opportunity to have a close-up view of this machine which took 14 months to erect. The cost, including original purchase price, shipping cost and erection charges was R3 500 000. The completed weight is 2 240 tons. It can move 764 554 cubic metres of overburden per month working 24 hours per day. There is a cycle timing of 42 cubic metres per second with power peaking at 8,7 megawatts.

The machine is equipped with a 42 cubic metre bucket which can dig and cast 72,6 tons per bite.

The total weight of the bucket and its load is 129,7 tons.

On behalf of the visitors, Mr P. W. J. van Rensburg thanked the Mine Manager and his staff for their hospitality.

INTERNATIONAL IRON AND STEEL CONGRESS

This congress will be held in Düsseldorf from May 23rd to 30th, 1974. The main theme is "Metallurgical Technology of Iron and Steelmaking".

For particulars, please write to:

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