Colloquium and General Meeting

A Colloquium and General Meeting were held at Kelvin House on 19th May, 1971, the theme being 'Modern trends in coal mining practice.'

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

The Colloquium was attended by 205 delegates and was opened by the President at 9 a.m.

OBITUARY

The President: 'It is my sad duty to announce the death of C. C. Cullen, Fellow, who joined the Institute in 1946 and passed away on 15th March, 1971.

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

ELECTION OF SCRUTINEERS

The President: 'In terms of Clause 9.4 of the By-Laws I now call for the nomination of seven Corporate Members to act as scrutineers of the ballot for Council'.

Messrs V. C. Robinson, Prof D. D. Howat, Dr J P Hugo, D. G. Maxwell, J. K. E. Douglas, R. J. Adamson and P. Lambooy were nominated by P. W. J. van Rensburg and seconded by P. A. von Wielligh.

The President: 'Are there any further nominations? If not I declare these gentlemen elected.'

MEMBERSHIP

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

Members: Douglas Edward King, Bryan Rudolph Scott, James Gregor Phimister, Anthony David Walters.

Graduates: Cornelius Johann Müller, Marthinus Stephanus Mulder.

Associates: John George Everson, Colin Robert Llewellyn Davies.

Students: Francois George Enslin Beetge, Ewald Boshoff, Christiaan J. Cloete, Christopher John Davies, Cameron George Elvin, Kenneth Eric Field, Johannes Louis Fourie, Hans Gert Gastrow, Peter John Ledger, James Robert William Lindsay, Kynaston Lloyd McDonald, Richard Peter Mohring, Arthur Leslie Painting, Matthias Arthur Pascall, Ian Neil Sinclair, Donald Allan James Ross-Watt.

MEMBERS TRANSFERRED TO A HIGHER GRADE

From Member to Fellow: Peter Norman Roberts.

From Associate to Graduate: Alfred Eric Walter Fletcher.

From Student to Graduate: Wilfried Pierre de Villiers, Edward Emile Eichenberger, William Alan Nairn, Lodewyk Johannes de Jager, Colin Henry Obray, John Grenig Rees.

COLLOQUIUM

The President opened the proceedings and introduced Mr N. W. S. Schumann as the overall chairman for the day.

The following papers and contributions were presented:

FIRST SESSION: Chairman R. C. J. GOODE.

Paper: 'Problems encountered in the operation of a new colliery' by P. M. C. Wilson and A. A. Oakes.

Contributors: D. J. Moloney, G. R. Canny, I. G. Evans, R. B. MacGillivray, Dr F. G. J. de Jager, M. J. Deats, and N. Zolezzi.

R. B. MacGillivray Mr President and gentlemen, I would like to congratulate the authors on presenting a most interesting paper on a very important subject.

After several attempts at finding suitable reserves to extend the life of Welgedacht Exploration Company's Utrecht Colliery a block of coal rights was acquired south west of the town of Utrecht. A study of these reserves showed that they would enable a satisfactory return on capital invested to be achieved. It was decided therefore to open up what is now called the Zimbutu section of Welgedacht Exploration Company, to produce 41 000 metric tons of coal per month.

The decision to open this section was taken in August, 1968 and due to certain allocation requirements it was necessary to bring it into production by the 1st of January, 1970. Fortunately a fair amount of statistical data had been collected prior to August, 1968 from the old Utrecht Colliery in anticipation of opening a mine and a fairly detailed rechnical report had been prepared. As a result the dead line was only missed by four days.

Main features of the Design

A feasibility study was carried out on three possible shaft positions and the final position was selected from these three on economic grounds. As the coal seam at the selected shaft position was only 21 metres below the surface it was decided to sink two twin incline shafts to enable rapid establishment of through ventilation and alternative hauling arrangements for quick development. This also allowed the final vertical ventilation shaft to be placed at some distance away to avoid the nuisance of fan noise. Second outlet requirements are also very well met by these twin inclines.

Again on the basis of economics and also due to the uncertainty of roof conditions it was decided to use hand loading methods underground. However, to allow for future possible conversion to mechanised loading, should this become economical through rising wages, a conveyor belt was installed in the hauling shaft. This conveyor belt is fed from an endless rope haulage in the east companion by means of tipplers, a bin and a feeder. The main development heading was left clear for the future installation of a conveyor belt which would afford easy conversion to mechanisation.

Main Principles used in the Design

The main elements in the design of the mine which will be discussed here are the shaft conveyor system and the washing and screening plant.

It was realised from detailed tests at the old Utrecht Colliery that to design on average production figures would be dangerous and probably result in under design. The hourly tally figures from the old mine showed wide fluctuations and grading analyses also showed considerable variations in the various size fractions.

The main principles taken into account in the design were therefore:-

1. Fluctuations in hourly tonnage rates should be eliminated as early as possible in the circuit otherwise all equipment would be required to handle the maximum hourly tonnage plus grading variations.
2. Variations in grading of the coal could not be eliminated economically and therefore these variations would have to be taken into account.
3. Variations in the market demand.

The earliest point at which hourly variations in tonnage could have been ironed out was at the shaft bottom by the use of a surge bin. However, a surge bin large enough to iron out these variations would have entailed a deeper and longer shaft. It was decided therefore decided to eliminate these variations using some form of surface storage. Due to the necessity to keep capital expenditure within certain limits a stockpile was used for this purpose. Further to reduce segregation in the stockpile the feed and draw off points were staggered and the primary crusher was installed ahead of the stockpile. This arrangement meant that all equipment up to the stockpile had to be designed for the maximum hourly production. In addition, the 100 mm screen and picking belt ahead of the crusher had to be designed to handle the maximum variation in minus and plus 100 mm material respectively.

A feeder drawing the coal from the stockpile smooths the tonnage flow to the washing plant. However as mentioned previously it is not possible to eliminate the variations in size grading. Although, therefore, there is a uniform tonnage feed to the dry dross screens ahead of the washer the feed is not of a uniform size distribution. Consequently the dry dross screens were designed to

Table 1

Product	+100 mm %	Cobble +100 mm −60 mm %	L.N. −60 mm +30 mm %	I.N. −30 mm +18 mm %	P −18 mm +6 mm %	D −6 mm %	−3 mm in dross %
R.O.M. Ave.	23,7	11,9	19,4	7,4	16,1	21,5	56,2
S.D.	10,1	4,4	5,5	2,7	5,2	8,1	10,5
—95° CL. Max.	43,9	20,7	30,4	12,7	26,5	37,7	77,2
—10 mm after Crushing	—	38,0	26,0	15,0	13,0	8,0	—
Av. Feed to Dross Screen	—	20,9	25,6	10,9	19,2	23,4	—
Av. Feed to Wash Plant	—	27,3	33,4	14,2	25,1	—	—

TABLE II

Column	1	2	3	4	5
	Average Expected t.p.h.	Theoretical Max. t.p.h.	Theoretical Extra % $2-1/1\times100$	Actual Installed Max. Capacity	Actual Extra % $5-1/1\times100$
U/G Belt to Crusher	280	482	72	453	62
Primary Crusher	66	122	85	181	174
Belt to Stockpile	280	482	72	453	62
Dry Dross Screens	65	111	68	109	68
H.M. Washer	215	266	24	272	27

handle the maximum amount of dross in the feed to within 95% confidence limits. Table I shows the mean size gradings and standard deviations.

From this table it will be seen that the amount of −6 mm material in the feed varies considerably. In fact two standard deviations above the mean is nearly double the mean.

As the +6 mm material from the dross screens gravitates to the washery drum the washer was designed on the basis of the maximum amount of +6 mm material in the feed, i.e. when the minimum amount of −6 mm exists in the feed.

All circuits from the dross screens on were therefore designed to handle these maximum tonnages.

To allow for variations in the market demand a recrush circuit was installed capable of handling coal from all size fractions above 18 mm. This circuit draws coal from the final product bins which include a cobbles bin. The cobbles bin although not common on coal mines has proved most valuable and has given no trouble with regard to size grading of the loaded product. A vibrating 32 mm screen ahead of the cobbles boom loader extracts any undersize material made in the bin. This undersize material is delivered to the recrush circuit.

To control the amount of −3 mm material to the maximum of 22% allowed by Escom in mixed smalls, 3 mm screens were installed. Due to the difficulty of screening −3 mm material the suppliers warned that a large screening area would be necessary and then no guarantees of efficiency could be given. The screening of −3 mm material is in fact proving difficult and efforts are being made to achieve better screening results.

Table II shows a few of the main designed tonnages to demonstrate the average, theoretical maxima and actual figures used.

The above approach to the design allowed the mine to come into production without experiencing any real teething troubles.

SECOND SESSION: Chairman P. A. VON WIELLIGH

Paper: 'A follow-up report on longwall coal mining at Durban Navigation Collieries (Pty) Ltd by M. J. Deats.
Contributors: R. T. Naude, Dr M. D. G. Salamon, P. du P. Kruger, R. B. MacGillivray.
Paper: 'Onlangse Produktiwiteitsverbeteringe op Blinkpan Koolmyne Beperk' deur A. C. Coetzee.
Bydraers: S. P. Ellis, G. Edwards, J. D. Flint, N. P. J. Coetzee, A. D. Vos, D. J. Moloney, Dr M. D. G. Salamon, C. J. Beukes.

THIRD SESSION: Chairman DR M. D. G. SALAMON

Paper: 'The Application of Continuous Mining Machines at Coalbrook Collieries' by R. E. Burnton and J. G. Ferguson. (R. E. Burnton to present).
Contributors: D. J. Moloney, R. E. Cowley, F. E. Kirstein, J. D. Flint, R. B. MacGillivray.

Chairman's summary

A. W. S. Schumann The first reason for todays success lies in the very high standard which was set by our speakers today and I think that we owe a very special vote of thanks to Messrs P. M. C. Wilson, A. A. Oakes, M. J. Deats, A. C. Coetzee, R. E. Burnton and J. G. Ferguson.

This, however, cannot account for the fact that there was a tremendous response even before anyone knew who was going to speak or what they were going to speak about.

I suggest that the response was enthusiastic because people expected a more informal gathering with a greater opportunity for feedback, for an exchange of views and for questions and answers. The very popularity of the idea has defeated its own ends to some extent. This gathering is too big and many people must have been left with questions unanswered. Possibly one should arrange for a number of meeting places—there are many in the Chamber and the surrounding mining houses—and then have separate meetings in the morning with joint reporting session in the afternoon. Alternatively, we could have a symposium after the colloquium, using Webster's definition of a symposium as as 'a drinking party of merry fellows'. We all know that it is easy to discuss mining into the small hours.

Obviously one cannot summarise todays papers and discussions, but I would like to make a few comments on technical matters and after that I would like to speak for a moment about what I see as major trends or tendencies which arise from discussions of this nature.

Regarding the question of placing a village on a mine or away from a mine, I would mention that there is quite a body of literature on the adverse sociological effects on the development of children in any community in which the great majority of parents share the same occupation. It is something to be avoided if possible.

We discussed the concept of the moving stockpile. If this is proved to be successful, it could save a considerable amount of money for Escom who could then avoid the construction of very large and costly staithes which are now regarded as parts of power stations. One does not see why both a moving stockpile and a staith should be necessary. By the way, speaking of Escom, I see that Mr Bob Scott is here; he has stopped pulling my leg by saying that we sell stone to Escom; perhaps someone has told him that if this is true, it must be the cheapest stone you can buy in this country.

My next point relates to the use of epidiascope. It struck me again that this instrument which provides a visual image to accompany your message, can be very effective if it is properly used. These papers speak of a great deal of hard work which went into their preparation, and one really feels that the authors should have taken a few minutes more to prepare their drawings specifically for the epidiascope. There should be nothing on the drawing which is not necessary to illustrate a particular point and there should be nothing on the drawing which is not visible from the back of the hall. In particular, if one cannot read the figures along the sides, then one