A CRITICAL EVALUATION OF THE ANTI-DUST CAMPAIGN AND SUGGESTIONS FOR THE FUTURE

Record of the MVS Symposium held at Kelvin House on August 12th, 1969.

Discussion Leader and Editor of the Proceedings - D.G. Beadle

(Electronic copy prepared in April 2006 by D.W. Stanton, Chamber of Mines of South Africa (CM), from a poor copy with extensive handwritten changes (1970) and an abbreviated version (1971) with recommendations)

Present: Approximately 160 persons including a number of invited visitors, such as Mine Managers, Senior Production Officials, Mine Overseers, Shift Bosses, Training Officials.

Notes: (i) To encourage constructive criticisms, members and visitors were told that their names would not be published. The only exception to this is those persons who were specifically invited to prepare introductory statements to various sections of the discussion.

(ii) Many speakers used Afrikaans, but to make their views available to overseas readers of this Journal, these contributions have been translated into English.

(iii) Introductory remarks in calling on speakers expressions of thanks, and repetitive or irrelevant remarks have generally been excluded in this record.

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1. WELCOME BY THE MVS PRESIDENT (MR. H.M.W. ESCHENBURG)

I would like to welcome all of you here this morning to this Symposium. I think it is an absolutely fantastic turnout. There are two apologies, one from the Technical Adviser of the Chamber of Mines, and the other from the Assistant Technical Adviser. These two gentlemen have to go to another meeting, but they will be coming here later on. This is going to be a long meeting so I will hand over right away to Mr. Beadle who has accepted the position of Discussion Leader.

2. INTRODUCTION BY THE DISCUSSION LEADER (MR. D.G. BEADLE)

I think you all know the background to this Symposium. The Chamber of Mines appointed an Anti-Dust Campaign Committee some years ago. It has been organising this very important job of getting across to all levels of miner a greater awareness of the danger of dust in our mines. The Committee has now decided they want a critical review of the effectiveness to date of the campaign, and they want ideas for the future.

They approached the Mine Ventilation Society through Mr. Quilliam, who serves on both the Anti-Dust Campaign Committee and on the Council of our Society. He was asked to negotiate between the two. He successfully completed these negotiations, and the end result is today's meeting, called specifically at the request of the Chamber. I understand the Chamber does want frank and honest views. It does not want just platitudes. If we can give useful criticism, useful suggestions for the future, we will have met the objective. If we fail to come up with these, we could be blamed for not being sufficiently intelligent to think of what can be done. It is a challenge to our Society and one, I am sure, you will all help us to meet.

We do want discussion from you all. I would far rather have 50 people speaking for two minutes each than one person speaking for 100 minutes. I am sure you will agree with me that a cross-section of opinion is most important in a symposium like this, so that the more of you that speak, the more effective will be our contribution. We do not want long speeches, we want short contributions. If various people made a particular point two or three times, I do not think there is any point in someone else getting up and merely agreeing, but if you do not agree with what has been said, then please say so.

I propose to divide the discussion into three clear stages. We will start off with a historical review of how this scheme arose; how it was started. I have invited two guest speakers specifically to deal with this. Then we will come on to the second stage - the critical evaluation of the campaign to date. We have invited one speaker to introduce each aspect of the campaign. This man will briefly introduce that subject, then we will throw that particular subject open for discussion.

The third major stage will be to get your ideas and suggestions for the future.

Before calling on the various speakers, I must introduce a somewhat personal note. As far as I am aware, the first serious effort in recent decades to do something about educating miners on the dangers of dust was made by Rand Mines. By 'miners' I mean all levels right down from Mine Managers through the ranks of Production Personnel, down to the junior picannin, shovelling rock at the bottom of our deepest mines. All these people obviously need to know more about this potential hazard to their health.

I was asked to introduce such a scheme in 1961, soon after Rand Mines had formed their Training Centre. It was suggested by the then Principal, Mr. Alec Margo, that many of the men coming up for further training, such as production officials, did not know the full facts about dust and the disease it causes - Pneumoconiosis.

It was said to me that the older generation of miners, - the men who started mining in 1910, 1920 and thereabouts, knew all about the dangers of dust. They saw men suffering from what was then called 'miners phthisis'. Possibly their fathers had literally died of this disease, coughing their lungs out. If it was not their father, perhaps it was the man next door.

By and large, the men who joined the mines in those days realised that this was a definite hazard of mining and so they did not need special education on dust. But as a consequence of the fine work done then to reduce dust, the dramatic form of phthisis, the killing form of phthisis which used to exist, was gradually reduced and finally eliminated in our mines. There is nobody today, in South African gold mines, who dies <u>of</u> pneumoconiosis. They might die <u>with</u> pneumoconiosis - many people do, in fact, die <u>with</u> pneumoconiosis. So this awareness of the danger of dust, the possibility of contracting the disease caused by dust, gradually fell away in the minds of the miners who joined in 1940, 1950 and today. It was considered that these men were not really aware of the potential hazard still existing, and so it was suggested that I should start giving specialised lectures to production officials and to learner officials at our Training Centre.

I did this on a small scale in 1961 and 1962. At the end of 1962 the effectiveness of what we had been saying was reviewed by that great humanitarian, Dr. F.G. Hill, who has always been keen to make the mines a better place to work in from many points of view, - heat and ventilation, rock bursts and dust. If he could not get action by the whole industry, at least he could initiate action in the Group to which he was then Technical Adviser.

Dr. Hill reviewed the small-scale efforts we had made to date and obtained Rand Mines' authority that we should institute a full Anti-Dust Campaign in the mines of our Group; that decision led to the appointment of a full time anti-dust lecturer within my team, to the expansion of our own research facilities on dust in Rand Mines, and to a general campaign to make our miners aware of the dust problem.

In 1964 the Chamber of Mines decided it must also follow along similar lines, and that led to the introduction of this industry-wide campaign, which has been running since 1965.

To underline the prevalence of pneumoconiosis in our gold mines today, let me again repeat, it does not kill people, but it can make them sick men. As a result, each year a number of them lose their red tickets and have to give up underground work - perhaps you will not all agree that it is a lucrative career underground, but generally the pay on our gold mines is very good. When men have to give up working underground because they have reached a certain stage of pneumoconiosis, they lose their well paid underground jobs, and by and large these men do not find equally well-paying employment on the surface. They also get a pension. It is small compared with their underground rates of pay, and they undoubtedly suffer financial hardship. About 100 Europeans per year lose their red tickets at the present time.

I have brought along two sets of data to put in perspective the amount of pneumoconiosis in our mines today. The first (see table) simply shows the number of people who have been certified each year. I must stress that the data apply to all South African mine, not only the gold mines, because today the Miners' Medical Bureau does not separate in its reports, those who have worked on gold mines from those who worked on asbestos mines, on coal mines etc. However, it is common Knowledge that the greater majority of certifications result from work on the gold mines.

This table lists the number of Europeans certified for the first time. Generally, of course - they are certified in the first stage - 20 to 50 per cent disability - but occasionally the Bureau finds a man who is found, to have over 75 per cent disability at the time of first certification. But that is very rare. These data include men who are certified on post mortem examination, - who have no signs of the disease when they are alive, but when they die, their lungs are examined and signs of pneumoconiosis are found; their widows then get compensation. The table includes Bantu cases - there are more certifications amongst them because there are more of them working underground. Finally, the third column shows reclassifications, - men who on their further examination by the Bureau, go up from the 20 to 50 per cent disability level to the 50 to 75 per cent level or the over 75 percent level. As you can see, the numbers are higher than anybody likes to see.

The second table, again referring to all miners examined by the Bureau, gives firstly the average years of service needed to get to the first certifiable stage. The last figure available, from the most recent issue of the Bureau's report, is 24.6 years of service. Many years ago, in about 1910, it took only three or four years for the average man to show signs of the disease and in those days the first signs usually meant that the man was very sick.

Some other facts I have extracted from recent Bureau reports may be of interest. The average age at which men were found to have various stages were that men found to have 20 to 50 per cent disability - average age 52. The next state average age 56, and over 75 per cent - their average age is just under 60.

The number of people actually receiving pneumoconiosis pensions in South Africa last year was 6,700 men who are still alive, and 5,660 dependants, widows or children, who still get a pneumoconiosis pension because their husbands had this disease.

Table I : CERTIFICATION - EUROPEANS

Year	New Cases	Reclassification
63/64	784	181
64/65	410	143
65/66	474	115
66/67	414	96
67/68	423	86

TABLE II : YEARS TO CERTIFICATION

Year	Average Years of Service
1957	20.5
1958	19.7
1959	20.2
1960	22.5
1961	22.5
1962	25.0
1963	23.7
1964	24.4
1965	24.0
1966	24.6

3. THE TRAINING OF ANTI-DUST CAMPAIGN LECTURERS

3.1 Discussion Leader

I have explained to you already how Rand Mines in 1963 made the decision to extend the Anti-Dust Campaign in its own Group, and, the first step was to find a suitable man to go around and give lectures to all our miners on the basic facts of dust and pneumoconiosis. We picked a man whom our experience confirmed was ideal for the job. He had the Advanced Ventilation Certificate; he also held a Mine Manager's Certificate; he had experience both on production and dust and ventilation work; and he turned out to be an exceedingly good lecturer. He proved such a good lecturer that he has now left the mining industry and become a full-time lecturer at one of our mining colleges. I would like to call on this gentleman, Mr. Lou Vieira, to tell you how he set about this lecturing campaign in the Rand Mines Group.

3.2 Mr. L. Vieira

When the enlarged Anti-Dust Campaign started, I was with Rand Mines and very closely associated with Mr. Beadle, whose project this was. Nothing like this had been undertaken by the Industry before, so we were starting right from scratch. We had no precedent from which to work, so we put our heads together and started on this campaign. What we had to decide first was, what form would the campaign take? This being completely new, we decided that the first phase should be a lecture, to tell people about pneumoconiosis and dust and the lecture should last somewhere around half an hour.

To whom would we lecture? It was felt that if the campaign was to have any measure of success at all, we would have to start right from the top - from top management, work our way down the lines of supervision to cover every underground employee, including engineering and service departments.

This we did, and the lecture on each mine was first given to the General Manager and his Senior Staff.

It was important from our point of view, to include the senior staff because they would then know what we were going to tell their miners. It would have been pointless our stressing certain aspects of the Anti-Dust Campaign when it did not concern that particular mine. For example, if we were going to discuss dust in high-speed development, it was pointless stressing this point on a mine that was not doing high-speed development. Therefore, at the lecture to top management, we listened to their criticism, we listened to their suggestions, and we stressed the points which they were having difficulty with as far as dust control was concerned.

What would we tell people? - From the word 'Go', it was decided we would tell people the absolute truth as we knew it. We would, tell them about the main sources of dust, about the dangers of pneumoconiosis and how it would affect them, and finally what they could do about it, what they could do about reducing dust underground and reducing the incidence of the disease in their mine.

When it had been decided what form the campaign would take, the next phase was that I had to be trained. I had to find out as much about dust and pneumoconiosis as possible. This I did by reading all the available literature on dust I could find, published both locally and overseas. I spent time at the Pneumoconiosis Research Unit with Dr. Webster and his team, finding out what the medical people were doing about the disease. I also spent time at the Miners' Medical Bureau, the Chamber of Mines Research Laboratories and, of course, I was completely in the picture as to what Corner House Laboratories were doing as far as dust research and dust suppression on the mines was concerned.

To get the lecture across to the people, we used many aids. It is extremely difficult to visualise a particle size of one micron. To talk to miners who had no conception of what a micron was, we photographed the point of a needle and magnified this 150 times. Superimposed on this photograph, we had dust particles also magnified 150 times. This now gave some comparison, a comparison between the needle with which everybody is familiar and particle size. They could see how many thousands of particles of dust you could fit on to the point of a needle, and this was some comparison. People, we hoped, now realised how fine the dust was when we spoke about fine, dust being dangerous.

Also, to speak about particles per cubic centimetre when a lot of people do not know how big a cubic centimetre is, was meaningless. We had lots of plastic cubes cut and we used to pass these around at the lecture so that people knew exactly the size of a cubic centimetre.

We also had a bottle of dust. This contained all the dust removed from the lungs of a miner who had actually died of pneumoconiosis many years ago. By weight it was one-twelfth of an ounce, and it gave people some idea of how little dust was necessary to kill a man.

The best gimmick of all was the showing of lung sections. We had three of them preserved in formalin. The first one was of a normal, healthy lung showing no pneumoconiosis. The miner had died of some other cause; although he had spent something like 30 years underground he had not contracted pneumoconiosis. This proved to people that one could work underground for virtually a lifetime and not get pneumoconiosis. The old story - if you work underground you will get pneumoconiosis - is not true. The second lung was one of second stage and the third, one of fourth stage. These certifications, of course, were pre-1962 - before the Act was changed.

These aids were not only useful for demonstrations purposes, but to get people to discuss the subject and to ask questions after the lecture, because there is no doubt that if people ask questions, it shows they have taken an interest. In turn we hoped they would become more dust conscious. If they became dust conscious, they would reduce dust underground and reduce the incidence of pneumoconiosis. This was our objective.

3.3 Discussion Leader

After Rand Mines had been running their intensified campaign for over a year, we had a meeting with the Managers of our mines and they said that Mr. Vieira's lectures were getting across effectively. They made constructive suggestions for further action, which were implemented. It was about this time that the Chamber of Mines decided to introduce an Anti-Dust Campaign in the whole gold mining industry.

The ball was set rolling by asking Dr. Hill to read a paper to the Association of Mine Managers, which he did. Those of you who have not read it should refer to it, published in 1964 in the proceedings of the Association. He described what had been done in Rand Mines and he gave his own views on the need for continuing efforts in this line. That was the beginning of the Industry campaign.

The work of organising the Industry campaign was supervised by a Committee called the Anti-Dust Campaign Committee of the Chamber, comprising members with a wide variety of interests. The undertaking of the day-to-day work fell largely on the Environmental Sciences Laboratory of the Chamber of Mines Research Laboratories under the late Mr. Solly Rabson. He did a lot to get this scheme going, but he relied very heavily on Mr. J.H. Quilliam to do much of the work. After Mr. Rabson became ill last year, the responsibility for the executive action of the Anti-Dust Campaign Committee fell on Mr. Quilliam's shoulders. I will now ask Mr. Quilliam to describe to you how the Chamber has proceeded in this matter.

4. THE ACTIVITIES OF THE ANTI-DUST CAMPAIGN COMMITTEE

4.1 Mr. J.H. Quilliam

Having previously attended symposia, I am well acquainted with the definition of the word 'symposium'. The dictionary states that it is 'An ancient, after-dinner party at which music and dancers will be present'. You might, therefore, be misled as to what is actually going to take place today. The Mine Ventilation Society, however, is quite justified in referring to this meeting as a symposium, because the definition goes on to say that 'At this party, intelligent conversation, whether it be critical or philosophical, is in fact allowed'.

The Executive Committee of the Chamber of Mines of South Africa has kept a constant watching brief on, and maintained a close contact with, dust conditions in gold mines. It has continuously supported efforts to improve conditions by financing research. As a result of extensive dust surveys carried out underground by research personnel several years ago, two very important conclusions were reached.

It was obvious that personnel were being exposed to undesirable concentrations of dust in certain working processes of most mines, even though on average the conditions appeared to be reasonably good. I can give you some common examples of these conditions. The Chamber undertook an intensive investigation of dust conditions in approximately 25 high-speed development ends, and established that crews were abusing the re-entry periods and entering on an average, seven-and-a-half minutes after the blast, and in doing so they were exposing themselves to high dust concentrations as well as gas, which was very undesirable.

Extensive research was undertaken in such ends, to increase the rate of decay of dust and fumes after blasting by making the best use of the available equipment and by implementing new ideas. By using these ideas it was felt that the dust and fumes could be removed more rapidly and any abuse of the re-entry period would result in exposure to very much lower concentrations of dust and gas, although it was pointed out that this illegal and dangerous practice should not, in fact, be condoned.

Another typical example of exposure of personnel to high dust concentrations was found in sinking shafts where, during the blowing-over period, extremely high dust concentrations exist. We appreciate that it is very difficult to implement adequate dust control measures in such cases, although this is under investigation at the moment. However, as this exposure is normally over short periods of time, personnel protective devices in the form of easy-to-wear respirators with reasonable efficiency, were advocated.

As a result of these dust surveys, it was concluded when comparing the results with the concentrations measured by the mine staff, that the results obtained from the mines were, in fact, to some extent suspect, and that generally they underestimated the true levels encountered in mines.

These aspects, gentlemen, brought home very forcibly the fact that a great deal could still be done to improve dust conditions underground, and to obtain more valid assessments of dust levels in our mines. These aspects gave rise to much discussion within the Chamber.

Having been presented with this information, the Executive Committee of the Chamber reacted in two ways, by taking the following actions. Firstly, in August, 1963, it approved the formation of a Chamber of Mines Dust Sampling Unit, to carry out independent and systematic dust surveys of all gold mines, using the konimeter as the dust-sampling instrument.

The primary objective of this sampling scheme to be carried out was to obtain, at regular intervals, a valid and objective assessment of dust conditions in the gold mines. Incidentally, I might mention that with the availability of a new type of improved dust-sampling instrument, the samples can be assessed rapidly and accurately. The whole question of new sampling techniques and strategy is receiving critical examination at the present time by the Chamber committees.

Now comes the important point gentlemen. The Executive Committee felt that, despite the continuing attention being given to new methods for suppressing dust in specific operations and the use of independent survey teams, the greatest dividends in dust control could be obtained from active propaganda among all classes of mine personnel. Propaganda, of course, can be defined as an organised scheme for the dissemination of information and advice based on established practice, in this case for the control and suppression of dust.

With this purpose in mind, the Chamber formed a special committee, - the Anti-Dust Campaign Sub-Committee. The Chamber representatives on this Committee are the Chief Technical Adviser, the Technical Adviser and the Assistant Technical Adviser, together with the Public Relations Adviser, the Chief of the Dust Division of the Physical Sciences Laboratory and a member of the Native Labour Organisation.

The Mines and Groups also have representation on this top committee; we have a colliery Mine Manager, a metalliferous Mine Manager, a Group Ventilation Engineer, a Group Training Officer and a Consulting Engineer, who represents the Technical Advisory Committee.

The secretarial and administrative work of this Committee is undertaken by two representatives of the Prevention of Accidents' Committee, who are very experienced in provision and issue of propaganda. The function of this Committee is the responsibility for conducting and advising the Chamber on the preparation and issue of anti-dust propaganda to mines. It was the intention that this Committee should operate in a manner very similar to that of the Prevention of Accidents' Committee which I think you will agree has achieved much success in reducing accidents and fatalities on our mines since its establishment many years ago.

In February, 1964, the campaign commenced with the appointment of anti-dust lecturers representing the various Groups. These lecturers attended an extensive training course, arranged and organised by the Chamber, where they were addressed by experts on how to lecture and how to motivate people. They were provided with simple explanations of the Pneumoconiosis Legislation, including the costs involved, fed with

material and gimmicks for lecture purposes, and provided with slides and relevant commentaries. In addition, lectures were provided on the organisation and functions of mine ventilation departments, on pneumoconiosis and its effects, and recent research, and advances in dust control.

These lecturers went on to the mines of their Groups and provided lectures, not only to attempt to make personnel dust conscious, but to stimulate their interest in dust control, to persuade then to actively participate in controlling dust wherever possible in their routine work underground.

The lecturing, campaign was followed in due course, by the issue of monthly posters, notice boards for displays at shafts, gramophone records, cards in explosives' boxes and a film, etc. of which you will hear more later during these proceedings.

During this period, since the campaign was inaugurated, the responsible committee has found it extremely difficult to assess if beneficial effects have resulted from the campaign. I think the work to use in this case is that it was, in fact, an 'intangible' problem. One cannot get to gripes with it. In addition the committee wished, as pointed out earlier by our discussion leader, to be advised as to how to conduct the campaign in the future by being provided with new ideas and suggestions. These, of course, are the two main reasons for arranging this symposium.

One aspect during; this period, gentlemen, has become quite, obvious. In order to achieve success in this campaign, it is felt vitally essential to obtain the sincere co-operation of all classes of personnel, from top management downwards. How to achieve this still remains very much of a problem. Your contribution to this symposium will, it is hoped, assist in the achievement of this main and important object.

4.2 Discussion Leader

That concludes Stage one - the historical background and how the Campaign started. Now we come to the detailed discussion of the various methods that have been used.

5. ANTI-DUST POSTERS

5.1 Mr. D.L.S. Gault

Coloured posters have been used extensively over the last five years in an attempt to make miners more dust conscious.The idea of using posters depicting anti-dust propaganda originated in the Rand Mines Group. This poster is one of the original ones first used.

The Chamber of Mines subsequently followed up this idea and in February, 1965 issued its first posters to the mines, using at first designs submitted by the Rand Mines Group.

Over the intervening years 82 posters have been designed and printed by the Chamber, at the present time the monthly issue is about 350 of each type. In September, 1965, a cleverly conceived cartoon character 'Stoffel Waterman' made his appearance smoking a pipe. The pipe was subsequently removed from his mouth when it was pointed out that smoking was forbidden in fiery mines. Recently several of the posters have appeared in comic-strip form, with 'Stoffel' as a central figure. I am sure you are all familiar with these.

The display of the various posters issued is left to the discretion of the mines themselves. From observation it would appear that shaft heads, underground stations, waiting places, shaft offices, change houses and training schools are the most popular venues for the displays. The total number of posters issued since February, 1965, is 28,000.

To supplement the posters, copies of the booklet, 'Dust is Dangerous' were widely distributed on the mines.

5.2 Mr. A. (Training Official)

I realise how difficult it is to get anything across to people. I think the posters, up to a certain level are effective, but eventually posters become so familiar that you are no longer aware of them. On the gold mines, the ratio between Bantu and European underground labour is very high. The Bantu are the dust-creating workers and they are the men, I feel, whom we should make conscious of the need to stop the dust. However, if they are not conscious of the fact that dust is dangerous they will continue to create dust, and it is the European supervisors who should see that they do not do so. We know that, but we want to get the propaganda across to the lowest worker, at the lowest level.

I feel that posters, to date, have been ineffective for the Bantu. I have picked this one out at random, just to show you. It would be quite differently interpreted by a Bantu and by a European. I feel that the type of poster must also get down to the Bantu level. The type of poster we are using is effective for the European - I am not belittling the work that has been done, - but I think we should consider some other method of getting propaganda across to the Bantu.

5.3 Mr. B. (Ventilation Official)

I agree with the previous speaker, that posters for Bantu should not be the same as posters for Europeans, but as the European is the supervisor, I think it is important that the supervisor becomes more dust conscious. I would like to say some thing in favour of posters. I think that the objective of posters is exaggerated, or one expects too much from them. One must not expect from poster that it will actually make people to jump into action straight away. It only appeals to the sub-conscious.

Can one actually talk of 'dust sub-consciousness'? I am sure that this is not what we really expect. We want dust consciousness, but it is, after all, the sub-conscious that feeds the conscious mind. But even in this limited range, I feel that posters can only be effective if they are of a better quality, and I feel strongly that the quality of present-day anti-dust posters produced by the Chamber of Mines is not of a very high standard generally. There are a few exceptions, I suppose.

I would like to read to you a description of what a poster should be, as it is given in the Encyclopaedia Britannica - 'The poster must combine immediate visual effectiveness, with concise communication of a message which is to be understood at a glance'. I have observed that some safety posters have been very much more effective than anti-dust posters. A reason for this may be that an anti-dust message is very much more difficult to put across. I have brought some examples of safety posters. For instance, this one I feel is an extremely effective poster because it is very simply conceived in form. This is what they mean by 'visual effectiveness', - the immediate effect calls for a simplicity of design, of strong contrast between black and white, and a figure that is immediately recognisable, using only very few colours. The message is put across very forcefully with this crippled man.

There are more examples. Here is, for example, an example of visual effectiveness. I feel that these eyes are very strong and piercing and that is why one looks at this poster, but unfortunately they do not help to put across the message in this case. This poster could be combined with a different slogan, for example 'Glass Eyes don't See'.

Here, in addition to the simple design, we have a play on words, which also helps, to put across the message, but these are safety posters.

Here are a few anti-dust posters, that have been used. I think that visually, this one is quite effective. The contrast is very strong, everything focuses on to the one person. I feel that this is one of the posters in the Anti-Dust Campaign that appeals to the emotions of people - of the miners - and that, I think is a very important aspect. But others are less and less effective. I think that this one is not effective at all, visually. It is not that it is badly drawn. That does not really matter, but there is no strong contrast, the writing is too small, and I don't think anybody would see it easily. The same goes for this one - the message is not put across clearly at all. I would like to point out to you something that is known amongst artists - these horizontal lines do not add drama to a poster. They are too

quiet. They make it a quiet poster.

I will, go on to something else now. Please, I do not want to be misunderstood here. I handed in some posters myself - I now and then design posters - and now and then the Anti-Dust Committee rejects them. That is fine. This one was rejected. I do not want to make a plea that it should have been accepted, but I just want to point out certain aspects of this poster.

In it I depicted a wall of striking miners - to extend strike walls in stopes is an aspect that has never been covered by posters, and it was my intention to cover this point. To make it effective, one has to do something - either make it visually more effective or with a play of words. Anyway, I decided on a play of words with the strike wall, and I suppose it was rejected because it referred to striking miners.

I feel that the Anti-Dust Campaign Committee is far too cautious. A poster being what it is - a soft way of approaching people to become more dust conscious or safety conscious, must use strong means, and I am sure that the miners would not walk out because they see this poster.

Another approach would be, perhaps, something slightly obscene, just to make miners look at the thing. This says 'Patch Leaks', referring to ventilation pipes, and is a play on words because his trousers also need a patch! This poster was rejected; - we are not given the reasons why these posters are rejected, but I suppose it was because it was too obscene. I feel that we are too careful not to tramp on somebody's toes. A poster must make an impact, either visually or by its words, or in some way.

5.4 Mr. C. (Senior Production Official)

I feel that the previous speaker, made very good points, particularly that we must have impact in the posters. He used the word 'effectiveness' but it must be 'impact'. I think that we try to get at the Bantu and to the European in one poster. This is a great mistake. The Bantu does not see perspective as the European does. If we are going to have posters, I think we must have separate types for each race.

The other point I should comment on is Stoffel Waterman - a lovable soul, but why did we have to have him? We had two characters who are widely known in the mining industry - Alf Wit and Willie Everlearn. Why did we not leave the job to them. In the War, the Air Force used Pilot Officer Prune, who was always the person who made mistakes. The Air Force learned from the mistakes he made. Surely we could learn all about dust suppression from Alf Wit and Willie Everlearn.

5.5 Mr. D. (Shift Boss)

I am a shift boss so perhaps I am a bit closer to the problem than a lot of people here are. Before coming here I did a quick sample survey among my miners, as to what they felt. The general impression was that they like Stoffel Waterman. Also, they felt that initially the impact was good, but then people got used to it. They are now used to Stoffel Waterman. Something I think we could do to get another kick into this is, perhaps, to introduce Stoffel Waterman's daughter, Dusty Waterman.

We are all men, the men down underground also like a nice figure around. They don't see too many women underground.

5.6 Discussion Leader

Thank you. I'm not sure if you're, hinting that your idea of Stoffel Waterman's daughter should be combined with Mr. B's idea of a little more obcenity! That, I sure, would be very popular with the miners.

5.7 Mr. E. (Research Official)

I like the idea that the posters should have more impact. I think that is absolutely essential. The difficulty is that you want to give an answer to the question 'why must we stop dust?' Obviously, we want to stop it because it causes pneumoconiosis.

I wonder whether the committee is still in the stage that the Department of Mines was in some years ago. The Department made a film on dust. Impact was wanted and the suggestion was made that it should show the horror of pneumoconiosis; this was turned down because the industry felt that they did not want to draw attention to the horror, because people might say, 'I am not going to work in the mines because look at what is going to become of me'.

Now I think we will have to get beyond this stage. We will have to grow up in this respect. We have to be prepared to show the horror of pneumoconiosis. I am thinking of the picture that Mr. B showed us, of the man without a leg. Obviously it knocked you - the idea was there, that you can lose your leg. It is so simple to have an impact in accident prevention, because you can lose your leg, your arm, and it's easy to show that. It's not so easy to show what happens with pneumoconiosis, and I think we will have to get some posters or some representation of what happens with dust. I can remember, as a child, I saw some pictures of what happens to your teeth - of little men running up your teeth and knocking a hole in the teeth if you are not careful with them. We must be brave enough to show the horror of pneumoconiosis. We must also show that we can mine without getting pneumoconiosis, provided we do what the posters tell us to do.

5.8 Mr. F. (Senior Production Official)

I rather like Stoffel Waterman. I think Stoffel, when first introduced him, was most stimulating. I would also like to appeal for a better type of poster for the Bantu. Just thinking about what the last speaker said, I think that if we now depict an old Bantu at his home, coughing his lungs out, with bits of blood dripping out, this should be most realistic.

5.9 Mr. G. (Training Official)

I feel that the posters are not effective because they did not have a distinct objective. They have a very broad objective - that is to put across an anti-dust propaganda, but it doesn't say to whom they want to put it across. I feel that different posters should be used for different levels of production personnel. I feel we are sadly lacking in getting our propaganda across to the Bantu. For the European, probably they are quite effective, but I certain they are not for Bantu workers.

5.10 Mr. H. (Chief Ventilation Officer)

As far as the Anti-Dust Campaign is concerned, many slogans seem to have originated on the mines, and I would like to put forward one or two slogans to these people who design posters. The punch line, I feel, must be in the wording, and perhaps they could, add a picture of sorts, which would also add to this punch line. One that we evolved on our mine is 'Nothing grows without water except phthisis'. I think that if the sketch showed a lung hardening in the desert somewhere, just showing that it is the only thing and the rest is just desolation, I think we will have something with an impact.

The other slogan that I find most amusing, is the slogan 'Nat of Sap, gooi nat'.

5.11 Mr. I. (Chief Ventilation Officer)

A number of these posters have originated on the mines. Some originated on a certain mine. There were advertised prizes for good posters, and I know that a number of people have felt very, very sore indeed, that their posters were used in the campaign and they did not even get a thank you for them. I think there has been criticism that ideas for posters are not coming in from the mines any more, and I think part of the reason for that is precisely this statement I have just made.

5.12 Discussion Leader

That complaint has already been drawn to the Chamber's attention, but I can support what the last speaker said, there still has been no recognition from the Chamber. In fact, the gentleman who sent in ideas for posters happened to see the particular posters for the first time on a visit to my office. He did not even know they had been accepted. He has never had a 'thank you' or the reward from the Chamber.

Summary of Comments on the Posters

1. Posters issued are lacking in getting messages across and will only be effective for European workers if they are of a very high standard and have an impact.
2. Posters must combine immediate visual effectiveness with concise communication of message which can be understood at a glance and possible appeal to the emotions of the reader.
3. Separate posters should be made available for Bantu workers who undertake many operations which produce dust and who cannot see perspective as well as the European.
4. It was not necessary to introduce "Stoffel Waterman" as the industry had already available two well-known cartoon characters in Willie Everlearn and Alf Witt, and dust propaganda could have been provided by them.
5. Stoffel Waterman's daughter "Dusty" could be introduced to convey propaganda messages with a feminine touch.
6. Different posters should be provided for different levels of production personnel.
7. It is important to have suitable punch lines on posters.

6. AUDIO-VISUAL AIDS

6.1 Discussion Leader

Soon after the Chamber's campaign started, there arose amongst the lecturers, a man with a fresh approach, which later became widely accepted. He is Mr. Bernard Turner, who introduced the use of colour transparencies in the form of a slide series together with a tape recording to put across the necessary message. I know the Anti-Dust Lecturers found these extremely useful. I will now ask Mr. Turner to speak to you on audio-visual aids.

6.2 Mr. B.L. Turner

In order to assist lecturers in the Anti-Dust Campaign, numerous visual and audio-visual aids have been used, some of which are displayed before us here this morning. Charts are used to explain the functions of the respiratory system, with drawings to illustrate any particular point, such as the death of a scavenger cell when attacked by dust. Graphs may be used such as the average time before certification at different periods; and here is one on dust conditions in development ends after blasting. Enlarged photographs - here they are - have been reproduced to emphasis and prove how small dust really is, and what a single dust particle looks like under the electron microscope. I think that one, in particular, had a very good impact on the men.

Lung specimens of various degrees of the disease have been used to impress what lungs actually look like when attacked by dust. As mentioned by Mr. Vieira, what I feel gave great impact in lecturing to the men was the little bottle containing the dust residue taken from the lungs of a man who died from the disease.

Most of these visual aids have been issued by the Chamber of Mines. Others have been added at the discretion of the lecturers. In the audio-visual aid section, films have been made, such as 'Dust is Dangerous', depicting Stoffel Waterman in cartoon form, and 'Pasop Lo Tuli' - a film intended for Bantu audiences. I feel this had great effect. There have also been slide series productions accompanied by a tape commentary, one of which was accepted for general distribution by the Chamber of Mines Anti-Dust Campaign Sub-Committee. The importance of using visual and audio-visual aids to assist lecturers cannot be over emphasised, and when we have learned to talk less and illustrate more, we have taken the advice of the well-known proverb, 'A picture is worth more than a thousand words'

6.3 Discussion Leader

Another use of audio-visual aids, was the very large and costly effort that the Chamber put into making an animated film to show the miners. I presume you have all seen the film 'Dust is Dangerous'.

After it had been screened on all mines, the Anti-Dust Campaign Committee invited views from the Mining Groups, as to the effectiveness of that film. To summarise the replies, I have arranged with Mr. Quilliam, who has had access to the reports to sum up what was said on the effectiveness of the film.

6.4 Mr. J.H. Quilliam

The Group Ventilation Engineers were asked to obtain the comments on the films reception by European mine employees, both officials and miners. The Group Ventilation Engineers, in committee, felt that the film had had a good impact and that it had drawn attention to the dangers of excessive dust. However, in general, the responses from the mine indicated that the film had, in fact, received a very mixed reception.

Senior Officials, in general, regarded the problem of dust control as too serious a matter to be handled in cartoon fashion. In the case of the miner, it was in certain instances well received and in other cases they were extremely critical.

In preparing these notes, I was rather hesitant to lay emphasis on the critical aspects, but I think I am covered by the title of this symposium, which is a critical review. Let me provide you with typical unfavourable comments from miners. These appear in the form of actual quotes, except for the blasphemous adjectives; which I have omitted for very good reasons. In many cases the same sort of opinion was repeated.

Typical of these comments, is that, 'The film was aimed at too low a level and presentation was elementary and over-simple'; 'It lacked punch', supported by the statement that, 'If propaganda on mines is to be effective, it must he couched in the language mining people understand, because they like their meat raw'; 'Something, more dramatic would have been preferred, something in the line of shock treatment'.

A comment heard after a showing was as follows, 'Although a lot of money is being spent by the Chamber, it will not amount to much because time is money, and as long as the pay cheque at the end of the month is big, the minutes stolen at the re-entry period are worthwhile'.

Officials, members of a Technical Services' Department, considered the film 'over-simple and it taught them nothing new'. The opinion of many captive audiences - they were forced to attend the showing of the film. - was 'the sooner the film was over, the better'.

Comment from study officials was that, 'Had the main points been emphasised by recapping at the end of the film, it would have had a greater impact'.

Going on to miner's opinions - 'Do they think we are children, to show us a comedy? A cowboy film would have been much better'. Other comments included: 'It was a waste of time'; 'The idea of using a watering can was childish'; 'In one word, a washout'; 'It says that a person must water down more than once. This is impossible, there is a shortage of labour and hoses'; a stoper said, 'Why should I worry about dust? Look at the dust in the shaft and on the station when a conveyance is passing, and the dust created by locos. This is why I say the film is of no use'; 'Film not suitable for an Anti-Dust Campaign, where high impact is necessary'; 'Some of the antics of Stoffel did not conform to accepted standard procedures'; 'Lighthearted, did not stress the seriousness of the dust problem'; 'Puerile and childish. By showing the film, intelligence

underestimated. Suitable for children up to the age of 10 only'; 'Would have preferred active, underground films of a more practical nature'; 'Better results would have been obtained by shocking personnel with slides of sufferers, supplemented by a visit to the Institute of Medical Research, to view diseased lungs'; 'In order to water down effectively and more than once, miners should, be provided with special watering-down boys with their own hoses. They could also be used for watering down worked out areas'.

Some comments on the more favourable side included - 'Interesting, impressive and brought out facts not generally known'; 'Shown in association with methane refresher courses, the film was of benefit'; 'Showing, a film preceded by a brief lecture on prevention of dust and statistical facts depicting dangers proved effective'; 'Film had the required impact'; 'It put over the anti-dust propaganda in an effective, yet simple way'; 'Showing of the film led, to much discussion'; 'Well received. The medium of films is one of the best ways of conveying an anti-dust message, and much superior to a formal lecture'; 'More films should be prepared to follow the present one'; 'Have become more dust conscious as a result of this film'; 'More use should be made of slides showing lung sections'; 'Unaware that dust in the atmosphere was so fine', but in the opinion of this particular individual, 'once it was in the atmosphere, obviously nothing can be done about controlling it'; 'It scares a person to think what is going to happen if he is not a Stoffel Waterman supporter'; 'Technique of showing enlarged dust slides excellent. More use should have been made of this technique in indicating the health hazard of silica'; 'Worthwhile and had the effect of reminding miners of the importance of watering down'; 'To make watering down effective, extra hoses and additional watering boys would be required'.

In summarising the comments on the film, I think you will agree that, in general, the reaction was very mixed, with favourable comments occurring side by side with unfavourable comments. Under the circumstances, it is extremely difficult to obtain a valid, overall opinion of the film.

By showing the film, I feel that attention has, in fact, been drawn to the dangers of dust, and to some extent advice has been given on how to control it. Whether the majority of viewers have appreciated the film, or not, I think it is relatively unimportant. I would say that because of this film, the subject of dust and its control has been brought to the direct attention of mine employees, discussion has taken place and because of this, in my opinion, its showing, from a propaganda point of view, was justified.

6.5 Discussion Leader

Thank you for giving us a constructive summary of the very conflicting views. I saw some of these views and it was very difficult to draw a line as to where the average opinion fell. We would like to hear from the floor, what were your reactions when you saw this Stoffel Waterman film?

6.6 Mr. J. (Ventilation Official)

My reaction, can be summed up in one word, 'puerile'. I think that anybody who has seen the film for Bantu, 'Pasop Lo Tuli, you will agree that it makes a far greater impact than 'Dust is Dangerous'.

6.7 Mr. I. (Chief Ventilation Officer)

I don't know whether any of you have seen the Russian film on dust. This film was lent to our mine by Corner House Laboratories and quite genuinely, I think that the impact on ordinary run-of-the-mine officials of this Russian film was considerably better than the impact of the Chamber of Mines film.

As far as the Chamber of Mines film was concerned, I was left in doubt as to what exactly they were trying to achieve. Did they try to shock people into talking about the lousy film, and that way having dust discussed, or did they genuinely think that that was the way to put across this particular subject?

The general opinion of my staff and myself was that certain sections of the film could have been left out. They were absolutely useless and completely irrelevant, but there were some short sections of the film itself which, I think, were put across rather well - how dust gets into the lungs, for instance. Generally speaking, from discussions I have had with various people, this particular film would have been much better accepted if it had been a combination, let us say, of the animated type, showing how dust gets into the lungs and so forth and together with that, actual mining operations underground, how they are done, how water should be applied, how filter units should be run, things of that order, and then possibly gone a little bit further and shown actual pictures of people who were suffering from phthisis.

I know this possibly goes against the concepts of the Prevention of Accidents' Committee, but one should compare Prevention of Accidents' Committee posters with those from the National Occupational Safety Association which goes in for shock pictures. They show pictures of a man tripping over a loose piece of rope, with a steel bar going through the man's eye and coming out through the back of his head, - things of that order, - but those sort of posters and pictures are never used by the Prevention of Accidents' Committee. In certain instances shock - what a thing can do, what the results of dust are, - is the only way to get across to certain people, and human nature being what it is, I think this means the majority of people. If they can see a man pausing six times on the way up half a flight of stairs to try and catch his breath, I think it would have a greater impact than any sort of cartoon-type presentation.

6.8 Mr. K. (Training Official)

We found the series of slides prepared by Mr. Turner extremely useful and valuable when we had to deliver this 'message' on the dangers of dust, especially to the new European miners. One can only speak of it with praise, in view of the fact that it is not only effectively done, it brought in the difficult part, the shock programme was there, but he also went right back and actually concluded with the objectives of this Anti-Dust Campaign.

I thank him sincerely on behalf of myself and my staff for this wonderful attempt of his because it was really a masterpiece. Thank you, Mr. Turner.

6.9 Mr. L. (Mine Overseer)

As far as I am concerned, these audio-visual aids are completely ineffective. Whoever saw or heard them has completely forgotten them now. There has been absolutely no follow up with this whole programme of dust prevention. They have given the men, the officials, the initial injection and then forgotten about it.

One disadvantage of these audio-visual aids is that you have to have everyone together to give them, and this is difficult in a mining community. You can get officials together quite easily during working hours, but the people who are making dust - the miners - it is difficult to get them together. Only the Bantu, at the beginning of their course when they are being acclimatised can be lectured to, but during their 9 or 18 months on the mine, you do not really get them together for lectures or talks.

6.10 Mr. C. (Senior Production Official)

The visual aids we have seen here again were totally restricted to the European. We have found, on our mine, that for the Bantu we must go to simpler visual aids. For lungs we use a sponge. From pressing the sponge and letting it expand again, you can show to the Bantu, particularly the novices who have never been underground, a simulation of the action of the lungs; we used a harder sponge to show the effect of dust on a lung. Dust is difficult to show to the Bantu. With those little aluminium dust squeeze bottles you can show little particles floating in the air and try to simulate it. We used flexible rubber snakes and other aids. They are afraid of the snake - they can see it. Dust is a thing they can't see, but we try to put it across to them, it is just as dangerous as the snake. I think that these simpler visual aids are very good to get across to the Bantu worker as well.

6.11 Mr. M. (Group Ventilation Engineer)

I think we all realise that there is no single simple answer to the problem. If there had been one, then we would not be here today - it would not have been necessary. We know that dust causes phthisis, causes pneumoconiosis, and to a large extent we know how to prevent it, but people do not do it. There are other matters that are more important to them and the danger is too far in the future. Therefore, all that is necessary in such a propaganda campaign is to focus attention on the problem and this we are doing in various ways, by means of good as well as bad posters, and good as well as poor films.

I agree with most of the opinions expressed here in regard to the film - the opinions for and the opinions against, but I think both serve a purpose. The good points of the films have a direct effect, and the weak points cause discussion amongst people and this is what is wanted.

They discuss the problem of dust as a result of these films, as a result of these posters, as a result of the talks that we have held on the mines. As a result of a combination of all these things,

everybody on the mines today knows far more about dust than was the case five years ago, and they think far more about it and talk about it far more. I think we should use the criticism levelled at this film to make more and better films, but there must be more of them even if they are not better. Even if they are full of weak points, they do also have their effect.

6.12 Mr. N. (Training Official)

I agree with what the last speaker said. On our mine, after the film was shown to the senior officials they were asked to give their opinions, and it was generally agreed that it was not a very good film, and to some extent not worth showing to the miners at all. That was the opinion of the senior officials.

The film, however, was shown to all the miners and I agree that no matter how poor the film is, it had some effect and was some help towards the campaign. Even if it has influenced only one or two percent of the people, it has done some good in the mining industry.

6.13 Mr. O. (Chief Ventilation Officer)

I would like to express my opinion on this film, that it was very disappointing. The reason I say this is because I have never yet seen anybody make a joke out of the other dangers that are associated with the mining industry. I have never seen people use a cartoon to tell the miners that the hanging on the mine is very dangerous. We have never seen that on explosives. We know that if something is dangerous, we treat it accordingly I admit the film had the effect of making everybody speak about dust, but why use a cartoon? I think that dust on the mine is much too serious a matter to use a cartoon to bring it to the people's attention.

6.14 Mr. P. (Ventilation Official)

In general, it seems to be the opinion that the film was not good, but why did the Committee not find out when it was first shown, that it was not so good? Is there not some mechanism somewhere that could prevent bad posters and bad films from being issued instead of being criticised afterwards?

6.15 Mr. Q. (Training Official)

One of the criticisms of this film is that it is in cartoon form, but I cannot see anything wrong with that. The simpler you can make any training aid, the better. There should not be many distractions. If there are nice 'popsies' walking around in the film, the people would not have thought about the anti-dust propaganda, they would have been distracted. I think that is one of the reasons why the film was made in cartoon form. I think that it has, to a certain extent, brought home something about the danger of dust. It has made the people conscious of it and I feel that all we have to do is just to continue, continue, and then people will eventually accept our message. Every time we get a convert, it's one extra.

6.16 Discussion Leader

The thought was expressed a few minutes ago, that there should be more films on purely the technical aspects of dust control - for example, how to use the water blast effectively to stop dust, how to use drip feeds in scraper gulleys and so on. Do you agree that there is also a need for this sort of thing? I would like a show of hands. Would a series of very short films, perhaps only a minute or two on each subject, be worthwhile to the Industry?

I see there is a pretty general support for that idea. We will record that this meeting considers there is a need for this sort of film.

Summary of Comments on the Audio-visual Aids

1. Better results could be obtained by shocking personnel with slides of pneumoconiosis sufferers and supplemented by visits to the Institute for Medical Research to view diseased lungs.

2. Films acceptable if together with animated sections, such as how dust gets into the lungs; to depict actual mining operations underground and how dust can be reduced by the application of water, filters, etc.

3. Audio-visual aids of great benefit to new European miners. Simpler visual aids should be provided for the Bantu, e.g. use a sponge to simulate the action of the lung. Use of aluminium dust squeezer bottles to show how particles of dust float in an airstream. Use of flexible rubber snakes to give impact to the comparison of the danger of dust and of snakes.

4. More films should be prepared on purely the technical aspects of dust control.

7. PROPAGANDA DISPLAY BOARDS

7.1 Mr. J. van Schalkwyk

We used the display boards - we called them slogan boards - on our mine. I placed them at various shafts and in strategic positions - places where people would see them when they walked to the shaft and returned from the shaft to the change-rooms; they inevitably have seen the boards.

We made use of the Anti-Dust Campaign Committee's slogans and slogans of our own. The slogans were changed weekly; they were printed in colour - bright colours that were clearly visible.

We found that, of the various types we had, the humerous slogans were the most popular. I was late in changing the slogans around a few times, and then the mines were very quick to remind me. I appreciated this as it showed that people noticed them.

A few cases where we had ill luck with the slogans or the boards were - (i) in one instance I put the board too near the headgear itself and it was splashed with mud; when the mud was washed off, the paint and so on was naturally destroyed. (ii) In another instance we were not able to have the slogans under cover and consequently they were affected by wind, rain and weather and extensively damaged. A bit of paint etc. soon repaired the damage. (iii) The last difficulty we had was, that the frames were too light. The wind blew the boards over. I had more work picking up upright the slogan boards, than people had writing the slogans!

I must say, however, that the slogans served an excellent purpose.

8. THE GRAMOPHONE RECORD

8.1 Mr. A. Shaw

One idea conceived by the Anti-Dust Committee was the production of 5,000 gramophone records at a cost of R1,725. The title of the record was 'Memo to Miners' and on the other side 'n Wenk aan Workers'. The catchy lyric, with its anti-dust message, featured Stoffel Waterman as a hero, and was sung by Judy Page, a professional pop singer engaged for this purpose. Five to ten copies were sent to each mine to be played over public address systems at appropriate times. Three hundred records were dispatched as prizes in a competition arranged through 'The Reef' magazine. Any member of a mine employees' family would receive a copy of the record if an answer to a simple anti-dust question was provided. The remainder of these records were distributed to mines and certain personnel through anti-dust lecturers. It was intended that the tune would eventually become part and parcel of all underground employees, to be sung or whistled during their daily chores, thus continually reminding one of the hazard of dust.

8.2 Discussion Leader

Thank you, Mr. Shaw. I did hear it said that, further to that last point, that it would be sung by the miners, it was hoped the miners would put their own words to the tune, and knowing the ordinary miner, you can imagine what those words would have been, but I haven't heard of any words put to it by miners yet.

I believe Judy Page was paid more for singing the five minutes on each side of the record than I am paid for a month of hard work in the Laboratory, but that's just a measure of the success of pop singers and the underpayment of research scientists! Are there any other comments on the record - was it played on your mines? Did it come over changehouse loudspeakers, where you have them? Were you given copies to take home and if so, were your family interested in the record? Did it put the message across or did it leave you stone cold?

8.3 Mr. L. (Mine Overseer)

I think this was rather a waste of money. The normal mining person isn't very musical, so nothing is going to come out of this. The Bantu, on the other hand, are very musical. Something on this line for the Bantu would, I think, be appreciated by them and would go down well.

8.4 Mr. R. (Training Official)

I cannot imagine a more unlikely form of propaganda than trying to get a sweet young thing to croon anti-dust propaganda to a bunch of hard-bitten, horn-rimmed miners.

8.5 Discussion Leader

Is that a general view, shared by everybody? Who is going to defend the record? No advocate for the defence? Right, I think we must note that one down as an expensive effort that did not come off.

Summary of Comments on the Gramophone Record

1. Normal mining personnel are not musical and nothing worthwhile will emerge. Bantu, on the other hand, would appreciate this type of propaganda and something along this line should be developed further.

2. Unlikely to succeed as miners are a hard-bitten lot and would not appreciate propaganda being passed on by a crooning pop singer.

9. COMPLIMENTS CARDS

9.1 Mr. O.A. Huss

This idea originated on Vogelstruisbult mine, where the Manager used a card to send a personal message to a miner with good dust counts in his section. The Anti-Dust Campaign Committee thought this was a good idea so they went ahead and had these cards printed in English and Afrikaans, with a picture of Stoffel Waterman on the one side and a space for the message on the other.

The cards were distributed, to the mines, who ordered them. Although originally it was intended that the cards be used for congratulatory messages for low dust counts we thought we should go a little further and use them as messages to persons who were not practising anti-dust measures, particularly as regards watering down. In other words, they became an easy means of spreading anti-dust propaganda quickly, and of immediately highlighting any malpractices or any commendable action.

The cards were made out in the Ventilation Department, addressed to the person responsible, and were routed through the manager, who in turn would add his own personal, special message. The context of the messages gradually altered until all possible ventilation defects that could cause high dust counts were being recorded, and we were sending out far more derogatory messages than congratulatory.

These cards did have the effects of spurring the persons concerned into action and getting defects rectified as was evident from the many cards that were returned to us with various messages written on them, as to what they had done about this.

Fortunately there were also congratulatory messages which usually found their way to the walls in the mine captain's offices. However, the use of these cards to highlight defective or adverse conditions was a duplication of work and became onerous to the staff of the Ventilation Department, which was suffering an acute shortage, so the inevitable happened and they fell into disuse.

It would have perhaps been better to have limited the use of these cards to what they were intended for, and that is a congratulatory message from the manager to the miner. In any event, if it is intended to continue using these cards as we have been, a suggestion has been put forward, that we have them printed in different colours, one for good conditions and another for bad conditions, and it is also recommended that the picture be altered from time to time. This will perhaps get the recipients to look at the card and study the picture and slogan, because at present they are so accustomed to the picture that they do not give it a second glance.

9.2 Discussion Leader

Thank you, Mr. Huss, for the constructive suggestion. Perhaps the use of different cards could be coupled up with the suggestion made earlier, of introducing Stoffel Waterman's daughter and if she can be shown in various poses, it might make the people who get the cards, study at least the front side - the picture side - of the card, even if they don't study the back side, and there I am going back to Mr.

B's suggestion regarding, a little obscenity.

9.3 Mr. S. (Mine Manager)

The cards did not play a big part in the campaign as far as *we* were concerned. We felt in certain cases, that you should give a man a pat on the back, and we confined our use of these cards purely to that. We felt that to use the same card for trying to encourage a man to produce good work and to give him a rap over the knuckles was not quite the intention of the cards. We kept it to congratulatory messages.

Generally speaking, it has fallen by the wayside. We found it had a certain value but recently it has not been pursued to any great extent.

9.4 Mr. T. (Chief Ventilation Officer)

I think this was one of the items that we really could have used. It was only when there was a really deserving case that we sent the miner a short message, in his own language, of encouragement.

I can bear witness to the fact that we have had miners who have said to my men when they have visited his working place "Look, today I want a good report, because I would also like to have one of those cards". This was an indication that some people locked forward to receiving a card even if it was only so that they could brag amongst themselves as to who had got the largest number of this type of card. It is very difficult to judge with certainty just how far the man had gone out of his way to improve his working place.

9.5 Mr. I. (Chief Ventilation Officer)

Just one point in connection with these cards. An earlier speaker hit the nail on the head when he said these cards should only be used for congratulation and not for condemning. We have to be very, very careful with bad dust counts.

Our mine, for instance, works with long-wall systems and all you need is one poor miner at the bottom of a long-wall line and your whole long-wall line, from bottom to top, has high dust counts. Who gets the lousy cards? - Everybody?

I think we have to be very careful. When we look at dust counts, who is responsible for the high dust counts? Is it the man whose working place, is being sampled? Very often it isn't.

I have been underground in working places where I have taken samples myself, and I was shaken at how high the samples were, although that particular working place was very well watered down indeed.

We have not made great use of these cards - hardly any use at all, for the simple reason that it is so very difficult to pin it down to the person who is actually responsible for the high counts. It is far easier to pick out the men who have done something good.

9.6 Discussion Leader

That is a valid point, with which I thoroughly agree. In our Laboratory, we are working at the moment on using a computer to analyse in more detail, many aspects of dust counts, and one of the aims will be to determine, not the actual level of dust in the miner's place, but the dust production in his place. Today we have to think of using computers more widely than ventilation staff are doing at the moment. It is the modern trend. Computers can rapidly, accurately and more correctly extract facts from a mass of data than can possibly be done economically and rapidly with clerical methods. I hope in due course we will have a rapid computer service to extract this very important fact, - who is causing the dust - and this is the man who should get the critical card, not the man who is suffering at the top of the long-wall system.

9.7 Mr. L. (Mine Overseer)

We want to know who is creating the dust. The best man to tell you who is creating the dust is the miner himself, so if he is accused of creating it, he will find the source, but I feel the flow of cards starts from the wrong side. It goes first to the top, nasty remarks are passed all the way down, whereas if it started at the bottom - started with the miner - he would indicate where the dust is coming from, and then possibly he could make a suggestion as to how it could be stopped, and then it would come upwards from the miner, the shift boss, mine captain, which might mean that a change of design of the card is required.

9.8 Mr. U. (Chief Ventilation Officer)

I would like to let you know the original object of these cards. The intention was for complimentary purposes only. If you want a critical card, you can send one as well. We felt that in many instances miners are criticised from the beginning of the shift to the end of the shift, and in terms of propaganda we felt it was very good, just for once, to change that. Give him just that little congratulation occasionally. In other words, instead of kicking him in the pants so often, pat him a little bit higher, as Mr. Beadle said, two feet higher.

The original intention of this card was not actually to be posted to the miner or the person concerned. The mine captain was to congratulate him personally, after the manager had put his remarks and signature on it. I feel that all men think a lot of the manager's signature. They look up to him, at least they should do, and any complimentary remarks will be taken in very good spirit.

The idea of this card was that it should he displayed, either in the change houses or on the notice board, behind glass so that they could not be interfered with, with possibly rude or derogatory remarks added!

It gave a little form of competition so that others would like to get their names on that notice board as well. The whole idea, was to make it in the form of congratulatory remarks for the men, to try to put them on to a higher level, and to bring in good, healthy competition. By seeing a man's name displayed on a notice board might encourage

others.

9.9 Mr. N. (Training Official)

On our mine) these were used for congratulatory purposes only, which we did appreciate. To see their manager's signature on the card does mean a lot to the production officials.

One day I went underground and I passed a miner's box, and at the back of the box he had three of these cards stuck up. He was very proud of these cards. He showed them to all his buddies who passed along his drive, and I heard the other men teasing him and congratulating him. We all made a fuss of this chap, and he was very proud of the cards indeed; I think these cards should be continued to be used because they do put the miner on a higher level, and he likes to be praised instead of criticised all the time.

Summary of Comments on the Compliments Cards

1. Confine the use of these cards to conveying congratulatory messages in deserving cases, in both official languages, signed by the manager. Found to be effective.

2. Difficult to assess whether a miner is providing good housekeeping in producing low dust concentrations. High counts can be obtained in working places where excellent control measures were being implemented due to dust conveyed from other working places. Difficult to pin-point persons who are responsible for high counts.

3. Computers can be used to analyse in more detail many aspects of dust counts, and one of the aims will be to determine, not the actual level of dust in the miner's place, but the dust production in his place. Computers can rapidly, accurately and more correctly extract facts from a mass of data than can possibly be done economically and rapidly with clerical methods.

10. THE VINTAGE CAR CARD SERIES

10.1 Mr. J.C. Naylor

One of the means of focusing the attention of the miner on the Anti-Dust Campaign was the introduction of the Vintage Car Card Series and competition. This was introduced in July, 1968.

Cards depicting in full colour, a series of 32 vintage cars and veteran motor cars are packed into the explosive containers supplied to the mines. An album is obtainable, into which the cards can be pasted, and a competition based on these cards and album was initiated. The competition offers prizes ranging from a first prize to the value of R145 to 50 consolation prizes of R5 each. An anti-dust slogan is printed on the back of each of these cards with the intention of making the miner a little bit more dust conscious. It might be of interest to note that cases have been reported where the explosive boxes have been broken into en route to their destination and the cards removed.

10.2 Mr. V. (Mine Overseer)

I think the use of these cards in explosives' boxes has some practical value, albeit in a roundabout way. The miner takes these cards home, gives them to his kiddie, the kiddie says "Daddy, why must you use water?" "Why does Uncle Stoffel carry that watering can?". This is propaganda in an insidious manner, coming from behind. It makes the miner think. It makes him realise that he has a duty to his family to become and remain dust conscious.

10.3 Mr. F. (Senior Production Official)

The first time I heard about these cards was the other morning, when we were getting a lambasting from our General Manager for using too much explosive. One of the men then had the excuse that he thought the fellows were using a lot of explosives because they were collecting these cards.

The other thing that has also happened is that we find now that some of the boxes are broken into before they reach the working place because somebody is pilfering the cards, so to us it has really been detrimental.

The distribution of the vintage car cards must be given another thought, as to how we are going to distribute them, because the explosives' boxes are definitely being robbed, and this is not a good thing.

10.4 Mr. Y. (University Lecturer)

We have been listening to some pretty half-baked gimmicks. I wonder if the representatives of the Mining Industry are now going to show whether the principle object of this exercise - that is, the reduction of dust underground - has been realised through the medium of this campaign?

11. GIVE-AWAY GIMMICKS

11.1 Mr. A. Viljoen

'Give-Away' aids are used in the Anti-Dust campaign to create an awareness and possible motivation amongst people who work in the mines. The first one is the book of paper matches. This has the Stoffel Waterman emblem on the front and on the back a slogan "Dust that is wet is the safest bet". We found that when we distributed these books of matches that there was a tremendous demand for them in view of the fact that children are regularly subject to crazes. At the time there was a craze to collect these different books of matches, and enough of them were distributed on the mines to provide for everyone's needs.

The second one is the key case, reasonably effective and reasonably strongly constructed. On the back we have Stoffel with another slogan. We were provided with a smaller number of these, and we used these to really motivate people. For example, to quote one instance, immediately after the showing of the film of Stoffel Waterman, we asked people questions about the film and those who came with the answers immediately received one of these.

The last aid is a large ashtray on which is mounted Stoffel Waterman - fairly heavy and on this is the slogan 'A Salute to the Dust Conscious Man'. These were given only to mine managers and senior staff. We accept that all the mine managers are dust conscious men. The feeling is naturally that the people who shared in the fight against dust were a bit hard done by.

11.2 Mr. W. (Shift Boss)

The Anti-Dust Campaign Committee has always tried to reward the people who prevent dust with these keyrings, ashtrays and other useful things, which make a lot of people think about dust.

Why can't the Anti-Dust Campaign Committee devise a system of reimbursing financially the man whom we are all asking to make a special effort to prevent dust? Why can't a system be devised to give him the hard cash? That is what he is down there for in any case.

We show him slides and films. We tell him 'Water down' and he in turn says 'Yes, I would like to have a water boy, and water hose'. But the best thing, I feel is, we all like to see the cash for the special efforts which are being asked of us, so why can't something like this be devised? I know it's a difficult problem to reimburse him financially, in hard cash, like an efficiency bonus, but you must give the man some sort of incentive to make this special effort to allay dust which we are asking of him in this Anti-Dust Campaign.

11.3 Mr. V. (Mine Overseer)

I would like to reply to the last speaker. He said, why shouldn't we reimburse the miners financially. Gentlemen, we do not reimburse him financially, - he reimburses himself financially if he obeys his anti-dust regulations. He reimburses himself in the fact that he has a longer life - a longer working life, therefore he has the ability to earn more money over a longer period.

11.4 Mr. I. (Chief Ventilation Officer)

Why do men go back into development ends early? Why do they remove rock when it is dry? We - by 'we' I mean the Mining Industry - make it financially worthwhile for the man underground to break regulations in order to earn more money. We mine with multi-blast development ends, we push multi-blast development ends through, we want to get three blasts, four blasts, five blasts a shift. - We pride ourselves, we break records. How do we break the records? - By people pinching minutes, by going in early. In other words, in our bonus system for mining, we make it worth the man's while to break regulations in order to earn additional money. I think a bonus system for a man who works safely, for a man who has low dust counts, has definitely a lot more merit than any of these anti-dust campaigns we are trying to push at the moment.

If we think about it very carefully, the man who scrapes dry, does so because there is no water available, or because he has no water hose. Why does he scrape dry? - Because he wants his pay, he wants his money for the rock he produces. In other words, he is interested in financial gain and if his health suffers as a result of it, he couldn't care a damn.

Our shaft sinkers break world records in shaft sinking. How? - By going in very quickly after the blast, by cleaning very quickly. These shaft sinkers earn very high salaries over a very short working life, and after 10, 12, 15 years they often end up with second or third-stage pneumoconiosis because they break regulations, because we - the Mining Industry - make it worth their while to break regulations and damage their health in the process.

11.5 Mr. E. (Research Worker)

I feel that we have come to the vital point and this is, we should view dust in terms of money. It would be valuable if we can one day work out what it costs the mining industry if we have, for example, an average dust concentration today of, say 200 units, and we can reduce that average to say 150 units, what does this mean in the long run to the industry in terms of money? First, naturally is the reduction in compensation, but secondly is also the number of working lives that you can lengthen; men who can work fruitfully in the industry for a longer period.

I, therefore, agree with the speaker who spoke in favour of the idea that a man should receive financial benefit if he can reduce the dust in his working place.

It has been mentioned that the man, if he keeps his dust count low, should obtain the benefit therefrom, but on the other hand you have also heard an earlier speaker say that the person who makes dust is not always the person who suffers thereby. He makes the dust and someone else breathes it. We must also keep this in mind, and therefore I think this is another strong point in favour of giving a man a bonus if he has controlled the dust.

12. THE ANTI-DUST LECTURES

Mr. P.A. Roos

During the latter part of 1964, an appeal was made for various people willing to give lectures on the Anti-Dust Campaign of the Chamber of Mines. At the beginning there were 16 people and they attended a 3-day course here in Johannesburg, where they were well trained to carry out this task. Of the original volunteers, there are very few of us left, but in the meanwhile the number has increased to approximately 30 at this stage.

Our job was to go out to the various mines and put across the ideas of the Anti-Dust Campaign to all mineworkers, European as well as non-European. We were not professional lecturers when we left here, but we returned to the mines, as I have said, well trained, and we put these ideas across to the best of our ability.

Time and again we returned to further meetings where we exchanged ideas and got new ideas which we could use in the future. All well and good, but the time came when these thoughts and ideas became fewer and fewer - at a certain stage so few that the Anti-Dust Campaign almost came to a dead stop on some mines.

Now we asked ourselves the question: what are we going to do in the future? Has the time not come perhaps when we must think of something else which is of more importance to the industry than the Anti-Dust Campaign, and could all the money being spent today on the Anti-Dust Campaign not be spent on something more important and of greater benefit to the mining industry?

This is perhaps one reason why we are together here today, to get ideas - must we carry on with this Anti-Dust Campaign or has it come to the end now? We should very much like to know from the audience here today, we, as people who are busy every day giving lectures again and again, what is your opinion of these Anti-Dust lectures of the Chamber of Mines, which was launched during 1965?

(There was regrettably, no discussion forthcoming on this subject).

13. THE PNEUMOCONIOSIS RISK COMMITTEE

13.1 At the suggestion of the Discussion Leader, a member described the work of this Committee.

He said -

The 1962 Act prescribed that this Committee should be appointed. It is the intended function of the Risk Committee to determine the risk for every controlled mine. This risk will then be used by the Pneumoconiosis Compensation Commissioner as a financial index. In other words, a mine with a risk index of 100, for example, - the scale runs from 100 to 1 - will pay 100 money units for every shift worked in dusty conditions, while a mine with a risk index of 50 will pay only half the number of units per shift. So there is a direct financial benefit to be gained if a mine can lower its risk.

The Act also states that the Risk Committee can estimate the risk in a mine according to any criterion that the Risk Committee deems fit. I do not believe that there is anyone who will argue that it is not dust that causes pneumoconiosis. If it is accepted that dust causes pneumoconiosis, it must be accepted that if you can reduce the level of dust you will reduce the risk. This relationship is applied today and the dust level in a mine is used to determine its risk.

In this connection, if a specific dust concentration exists, then it can be accepted that, on an average, it will take a certain time to get pneumoconiosis. There is, therefore, a certain time in which to accumulate money to pay for pneumoconiosis. If the dust level can now be reduced then it is logical to reason that it will take longer to get pneumoconiosis. There will, therefore, be a longer time in which to collect the money to pay compensation.

If the miner has a wife and children, they must be compensated if he has been certified and later dies. At some stage he dies and later his widow dies. However, the time up to when she dies has nothing to do with his degree of pneumoconiosis. In other words the time interval from the beginning of the husbands exposure to dust up to the end of compensation to his widow is a fixed period. Thus, if the time up to when the husband is certified can be delayed, then there is a gain on both sides i.e. there is a longer period to gather money from the mine to pay for pneumoconiosis and there is a shorter period in which compensation has to be paid. Therefore, if dust can be reduced there is a double gain on the financial side.

In fact, it would appear that the compensation sum is roughly proportional to the square of the dust level. Thus, if a mine can halve its dust risk then that mine would reduce its levy per shift by a factor of four. There are all sorts of complicating factors that enter the picture, but it would appear that one could apply this simple relationship.

I should like to take this opportunity to mention a small point. I hear contributors speaking of silicosis. Let us rather speak of pneumoconiosis. Perhaps we have stopped silicosis (i.e. the disease caused by free silica to a large degree). The pathologists say that these days our men do not get silicosis in the classic form which occurred in earlier days anymore. Pneumoconiosis, as you know, is the

general term for disease of the lungs caused by dust. So I think that we are more concerned with the broad or general condition pneumoconiosis rather than with the specific condition of silicosis. Perhaps the term is a bit difficult to understand, but it is really very simple. "Pneumo", is the Greek word for air or lung. "Konos', is the Greek word for dust and the suffix "osis" means an incurable disease. In other words, Pneumoconiosis means: incurable disease due to dust in the lungs.

13.2 Mr. I. (Chief Ventilation Officer)

I want to thank the last speaker for telling us about this. There is one thing that it brings out immediately; if this risk payment of the various mines is to be based on the dust levels in the mines, it is frightfully important that the dust sampling on the mines will, in that case, definitely be done by an outside organisation, completely divorced from the mines themselves. It reminds me very forcefully of the true story of a Mine Manager, who, to test his ventilation officer, took the mine's konimeters and stuck them in his desk. At the end of the month he still had his returns of 120/125 particles per c.c. This Manager called his ventilation officer in and said, "Look, how can you have these dust counts? Here are your konimeters". The Ventilation officer replied, "Well, I knew that you liked low dust counts, so I just filled them in" I'm afraid that that sort of thing is going on right now, on quite a number of mines.

The Chamber of Mines has given us count frequency distributions based on the returns filled in every month by each mine. I think it is reasonably clear from these distributions, that certain mines are not returning their high dust counts. If this risk is going to be based on the counts taken by the mines themselves - by the mine staff - it is going to put the people, who take these dust samples and count them, under such heavy pressure from management and from the Board of Directors to have low dust counts, that I think we will not get anywhere. The dust sampling will have to be absolutely independent of any mine staff at all, if this risk factor is to be applied correctly and fairly.

13.3 Mr. L. (Mine Overseer)

I understood the speaker on the Risk Committee to say that there is no classical silicosis on our mines today. I believe the Miners Medical Bureau have published a statement that 60 percent of the men certified today do not have X-ray evidence of the disease, but have other chest diseases. If this is so, do we really have to be so dust conscious if there is no silicosis?

13.4 Discussion Leader

That is a very challenging statement. I have quite a lot of information on this subject but this is not the place and the time to discuss it in detail. However, the fact is that most of the Europeans today are not certified with classical silicosis. These figures are available in the reports of the Miners' Medical Bureau. Over 60 per cent of the Europeans are certified on the grounds of chronic bronchitis, emphysema and other diseases of the chest, but the Bantu is certified only on radiological evidence of the disease. Not one single Bantu was certified last year on the grounds of chronic

bronchitis. So a real dust disease exists in about 40 per cent of the Europeans and 100 per cent of the Bantu. Those are the facts reported by the Bureau in its annual report.

14. SUGGESTIONS FOR THE FUTURE

14.1 Mr. X. (Group Ventilation Engineer)

I think this campaign is to a large extent, tied up with human nature. After all, we have lots of accidents on mines, and there is a very big Prevention of Accidents' Committee run by the Chamber, and dust diseases are very much mining accidents, one could say. If a dust disease was as rapid and as obvious as, say, an accident due to a rockfall, there would not be any need for an anti-dust campaign, or it could be tied up with the normal prevention of accidents' campaign that has been running so successfully for so many years.

But, gentlemen, these dust diseases are insidious. They take a long time to develop. A man can breathe in dust for many years and the effects only become evident after say 25 years, - so it means that a campaign such as the Anti-Dust Campaign becomes necessary.

We have heard a lot of criticism this morning, - a lot of it very valid and a lot of it very stimulating - of the things that have been done. There has been talk of 'half-baked gimmicks', which is no doubt very true, but have we had any suggestions for anything better? We are hoping for suggestions for something better from this meeting today.

Just what do you do? The material is all well-known. We all know that you must avoid dust. We all know you must avoid going into multi-blast ends before the re-entry period has expired. We all know about watering down, but it is necessary to keep this constantly before the eyes of the men on the job, and that is why, gentlemen, we are faced with these posters, this film - 'this lousy film', as somebody said, - and this record which, frankly, had no appeal whatsoever to me. But you have, in some way, to keep the necessity for this campaign in the eyes of the multitude, and gentlemen, what we are looking for from this meeting is some constructive criticisms, some constructive suggestions as to what can be done to keep this campaign alive, to keep the necessity for anti-dust measures in front of the miner, the production man, all the time.

We must realise that we have a constant turnover in production personnel. As Mr. Roos said a few minutes ago, he started as an anti-dust lecturer five years ago and very few of the old guard are left. Very much the same thing applies to the production people. A lot of the production people who heard the first anti-dust lectures are no longer on production, so these anti-dust lectures could well be put forward again, but the main point of this whole meeting here today is to produce better ideas for the future, and we would be very glad to hear them.

14.2 Mr. F. (Senior Production Official)

We have heard people talk today about phthisis, silicosis, pneumoconiosis. I must tell them that we old miners - fellows like myself, who have been on the mine for over 30 years, we know it still as phthisis, and phthisis means dust.

Our mine thinks that this Anti-Dust Campaign is an excellent idea, we vigorously tackled the problem. The lectures that were given by Mr.

Vieira and our Bantu lecturers on the mine were honestly given and well-received. We are continuing with these lectures on the Bantu side, even today, as we have taught our boss boys to make 'Tuli' almost synonymous with safety. Unfortunately, to a certain extent, we put the cart before the horse, we rushed at the stopes, we put in water hoses, washed half the tally away, we put in fog nozzles and what have you, all over the show, and then we took stock of what we were doing, and then to our surprise, there was not really a result.

To our horror, we found that the very people who are making the dust are the senior managers - in the portions of the mine that we are in charge of. We then started to look at things; we found our banks and stations were filthy, full of dust. Our skips and cages are wonderful dust producers; just the drippings from the side of a skip coming up in our high-velocity shafts cause excessive dust. The hoppers in our haulages cause dust. In our haulages we have velocities of up to 1,500 feet per minute. The drippings from these hoppers are a real source of dust.

Therefore, we decided we were going to tackle this problem, right from the headgears downwards. We now wash our cages and skips beautifully. Our skips are washed every morning. The dust is scraped off - because we oil them. We have a cheap type of oil that we buy, we scrape them and we wash them off. In our haulages, we oil the footwall because dust is hell, and we also oil and shower our hoppers.

We do exactly the same with our material cars. We shower them on the journey up and shower them on the journey down. On our subverticals, where dust is really a problem, and it is a problem again from the skips, here we ultimately introduced nozzles on the various main splits, because honestly, some days when you walked along the haulage, the dust virtually knocked you in the eye.

I would like to mention that we feel that we should spend money on trying to develop a simple filter for bulk filtration of air. Surely *we* have some brains in the Industry to develop a hopper that does not drip after it has been in operation for only two or three weeks.

I feel that, with the leadership the Chamber has set, this is our chance, gentlemen. We must do something about it. We cannot leave it to junior ventilation officials. We - the management - have to set an example. It is fellows like myself - from my level downwards - this is where one wants leadership to combat dust.

Finally too, if I may criticise a little bit, we would like to have some constructive ways forwarded to us, on how we should prevent dust.

14.3 Mr. Z. (Senior Production Official)

I would like to look at it slightly differently, being very conscious that we are talking at the moment to an audience which consists of ventilation officials, senior mining officials and junior mining officials. The objective of this symposium, as I understand it, is to decide whether in fact this anti-dust campaign was successful. We have heard many views expressed this morning as to whether it was successful and how the various gimmicks were applied on various mines - some very successful and others perhaps not so successful. This I would say was due primarily to the impetus given by the management. I would say that generally a campaign such as this with all the

paraphernalia that we have here must assist. It does help in making every man conscious of the hazards of the dust. But in fact have we been successful? Did we reduce the dust levels? On some mines perhaps we have, on others perhaps we have not. I am not in possession of any information regarding this to be able to say whether this campaign has in fact had the effect. We spent a lot of money on it - have we had any returns? I think that the campaign is making every man conscious of the hazards of dust is correct, every man should be very conscious of all these hazards, but does he do anything about it? It's fair enough to have ventilation departments, let them gather information for us; do we use that information? This is important. Does Mine Management use it? All the information gathered by ventilation departments, all the propaganda put out by them, I am afraid can be - nullified by the approach of management. First of all, management has to enforce the Mines and Works' Regulations and in fact if we did that we would achieve what we are after. We can use the campaigns, we can use the various gimmicks, but nothing will replace good management and good line discipline. This in fact is what has to be stressed in my opinion. We are very grateful to the Chamber for giving us various lines on which to tackle the problems that we face but I think only the sincerity of management in really trying to do something about it will achieve the aim, otherwise I am afraid we will not get anywhere at all.

What is necessary - and I think even more than we have had so far - is to publish facts. To make more facts known through these campaigns, through ventilation departments, through management, on exactly how many people are certified and we must widely publicise this. We as Line Management cannot only pay "lip service" to campaigns like this. We cannot push everybody and hammer everybody and say, "You have to water down, you have to do this, you have to do that", unless you provide a system, a mining system which lends itself to it, and unless you are prepared to provide the tools, enough watering down hoses, enough water, and all the other facilities that are required.

Some of the gimmicks used are very nice, but whether or not they really aided the campaign I am not sure. It is nice to have a key case, but I do not think anybody ever notices the slogan on the back. It is very nice to have these little match books, children use them to start grass fires around the mine, that is about all. I think that quite a lot of money has been channelled into this type of campaign.

Some research on controlling dust is being done, but is it being channelled in the right directions? We suppress dust by watering down. We use filtration. Are we using the right tools? Should we be spending more money in research on making water more wettable? Can this be done? Can we inject our water every day with some substance which will make it more wettable?

What are the other hazards? I am a smoker. Have we let everybody know just what this does to you? Every time one goes up to the Medical Bureau, the Doctor says, "You smoke too much". Have we ever taken this up? Should we as an industry perhaps do something to prevent people from smoking? Even if it is only to prevent them smoking underground. I hazard a guess that perhaps more damage is done by this than by the dust underground. We keep on hammering about dust and getting dust levels lower. Should we spend more money on reducing the other hazards as far as the chest is concerned. I don't know, I merely pose the

question. I can only at this stage say again that I think that we should rationalize a bit more and not merely push dust. I am not saying at this stage that we should not have our campaigns against dust and continue to suppress dust, this must always be done, but have we reached that level at which no matter how much more effort we put into it we will not really reduce the dust any further. Should we at this stage put our efforts into something else whereby we can perhaps get a greater benefit?

14.4 Mr. Y. (University Lecturer)

When this campaign was first announced by the Chamber of Mines, it was recorded that the object of the campaign should be to reduce the level of dust concentrations in mines. The title of today's symposium is 'A critical evaluation of the anti-dust campaign and suggestions for the future'. Now, evaluation is a means to find a numerical expression for a quantity; critical means censorious fault finding. The question I put to the meeting now, is whether our deliberations today have been sufficiently critical or whether they have attempted to evaluate the situation. I am somewhat of a bystander on this topic, but I propose to try at least to take this critical evaluation a little bit further along the line. To begin with I am going to show you a slide which I showed at the 1969 International Pneumoconiosis Conference here in Johannesburg. This is data taken from the Government Mining Engineer's Annual Report from the years 1942 to 1967. This gives average dust counts at six selected localities. The 1968 data simply accentuate the trend which is shown by at least five of these curves. First, second, third and fourth degree polynomials have been fitted to this data and the curves shown are in fact the second degree polynomials which seem to fit the data best of all. The characteristic here is the dip round about 1950. It looks as though dust conditions reached some sort of lower level round about 1950 and then they commenced to climb.

Apparently as far as one can see from this data, which I must emphasise is subject to all sorts of reservations, it certainly looks as though dust conditions have been getting worse since 1950 and the important thing is that the trend does not appear to have been affected by the anti-dust campaign instituted in 1965. At least prima facie there is a deterioration in conditions and I would ask the question why is this? Now there are numerous factors which may contribute to this position; in 1950 for instance, the Orange Free State goldfields came into production with somewhat hotter conditions and possibly less experienced mining personnel. That is one possible explanation, another possible explanation is that the ratio of whites to non-whites working underground between 1950 and 1968 has widened from one in about 8.5 in 1950 to about one in 14 in 1968. There is at least an indication that supervision may have suffered as a result.

Perhaps the most important factor of all is that although the total quantity of air downcasting in the Witwatersrand gold mines has increased quite appreciably in this period, at the same time there has been a very significant increase in the number of drills and scrapers at work underground. The number of drills has increased from say, 9,400 to nearly 17,000 and, - this is the most significant feature - the number of scrapers and loaders has increased from about 4,000 to about 22,500. I think that it is generally recognised that scrapers are an extremely serious source of dust production. If we look in the literature, we find, if we want to evaluate the position of scraper dust, that in 1964 the first mention is made of research into the dust

was caused by scrapers. We find for year after year similar reports of research into dust produced by scrapers. The Pneumoconiosis Research Unit has sponsored research into the dust produced by scrapers. Rand Mines Laboratories has done work on behalf of the P.R.U. Union Corporation has done work on behalf of the P.R.U. However, if we look for the results of this work, - it is about a quarter of a century of work - I think we will look in vain for any published results on this topic. In other words, the results of 25 years work have perished for lack of publication. We are not dealing here with research into nuclear weapons, we are, in fact, dealing here with the research into the health of mine workers.

The data used for calculating the curves I showed were taken from the Department of Mines results. The Department of Mines takes on average about 25,000 konimeter samples a year; the industry we understand takes about half a million samples per year - this is a fantastic sampling effort, and one must examine its validity.

Firstly in both cases, for both the Department of Mines and the Industry, the routine sampling instrument has up to the present, since 1916, been the konimeter. The konimeter is a complete and utter anachronism in this day and age. It was an ingenious gadget in 1916 when this was introduced but in this year of 'Man on the Moon', it is a complete paradox. It has been criticised on countless occasions, but it is still in regular use. Secondly a comment on the strategy used for sampling. Both the Department of Mines and the Industry still persist in sampling localities (although it has been proved beyond any doubt that there is no correlation between this type of sampling and exposure) rather than exposure of workers to dust. There is no correlation between the type of sampling that the Industry and the Department of Mines employs and exposure sampling. It must surely be obvious by now that the total exposure of workers over the whole shift - over the whole time that they are underground - is the only meaningful measurement, the only meaningful dust measurement that can be considered at the present time. I quote here "One important requirement for a successful programme for industrial control of a potentially hazardous physical or chemical agent is that there be available a systematic quantative statement of the relationship between magnitude of exposure to the stress agent and the kind and degree of response in a population exposed to that agent. A well developed exposure/response relationship provides the essential information from which to start and without it, no amount of wisdom and judgment will ensure a correct answer". Now those are the words of Professor Hatch quoted by Mr. Beadle at the 1969 Pneumoconiosis Conference. What information have we on dust exposure in our mines. To the best of my knowledge the most meaningful exposure data that we have available to us in this country is the work of Beadle, reported on page 483 of 'Inhaled Particles and Vapours', published in England in 1966. This paper presents the results of a very elegant piece of work. It is however, unfortunate that it was carried out some considerable time ago and that it has possibly not been kept up to date; anyway the main feature that I want to illustrate here is the average dust level of one occupational group is 3360, while for another occupational group the average dust level is 390. There is an order of magnitude difference between the two exposures. The average dust level I might say is the product of the average thermal precipitator number count for the shift times the number of hours. Now this is the sort of thing on which some sort of meaningful analysis can proceed, although a pretty limited number of people was

sampled and they were all Europeans. But it certainly illustrates the sort of exposure measurement which Hatch no doubt had in mind when he wrote the words that I quoted earlier. These comments lead up to the crux of the problem as I see it, and that is that as far as the dust problem is concerned in this country, we have no rational design criteria for ventilating our Witwatersrand mines.

This is, as I see it, the tragedy of our situation, that we do not know what we are doing, we do not know why we are doing it. It is invidious to pick on particular examples of this. A paper presented by Professor Lambrechts, for whom I have the highest regard, deals with the design of ventilation for one of our most important mines - Western Deep Levels - and you will see here the level of thinking, ten years ago, on this question of a rational engineering design for ventilating our mines. I must stress that I have reservations about presenting this, but I feel that I cannot make the argument without presenting this sort of example. This is just an example of how this sort of irrational design, how irrational design criteria can be handed down and can he handed across. There is a maxim in the mines to the effect that the reason why pneumoconiosis still occurs so frequently is that ventilation is not as cheap as compensation. There are two elements here: The cost of ventilation and the cost of compensation. I have not seen anybody put a figure to the cost of ventilation for the Industry; we know the cube law, however, and we can ourselves, from our own experience, probably attach some sort of figure of ventilation cost to the industry. Compensation cost on the other hand is fairly easily determined. If we look at the reports of the Pneumoconiosis Compensation Commissioner for the year ending 31st March, 1968, we see that the latest levy for schedule 'A' mines, that is the larger gold mines, is 1.6 million rands. It was an exceptionally low figure, the previous year it was about 3.8 and the previous year just above 4, but the point is that for an industry in the particular year 1967, the total working profits of the industry were something like three hundred and eight million rand, dividends were one hundred and twenty-six million rand, lease payments thirty-five million rand, tax ninety seven million rand, total salaries two hundred and eighteen million rand. And then we put against it 1.6 million rand for compensation. I think that this is the nub here. I think that it would cost considerable sums of money to improve ventilation appreciably and I think that we must consider whether this rate of compensation is not something that we can live with for the life of the mine. We can, however, provide a rather more rational approach.

There is some basis for arriving at a rational answer to the problem in the work which Mr. Beadle published at the last Pneumoconiosis Conference. He presented the sort of data which should form the basis of a rational engineering approach to the ventilation of South African mines.

Quite frankly, I believe that this Anti-Dust Campaign is very important from the point of view of maintaining good housekeeping in the mines. I think that one has to have a campaign such as this, but it is never going to make any material difference to the dust concentration underground.

This, of course, is my personal opinion. It is one which, no doubt, some people will disagree with, but I maintain that the only way that

one can make a significant improvement in dust conditions underground, is to put more air underground and to use it less frequently - in other words to reject it at an earlier stage than in present practice. We can enforce the use of dust respirators, we can enforce more stringent dust regulations, but quite frankly the Anti-Dust Campaign, or good housekeeping, as such, will in my opinion, of course, never make more than a marginal difference one way or the other

14.5 Discussion Leader

I think the last speaker's points were valid, well worth drawing attention to. He mentioned the need to take shift-long dust exposure records. I quite agree with him that this is the most important measurement that can be made. It does not really matter if a man breathes say a thousand particles per c.c. for five minutes, it is the average he breathes over the whole shift that is important. As I thought this point might crop up today, I have brought along two instruments which can he attached, to a man which will, measure how much dust that man has breathed through his working shift. The methods of assessing, these samples are very rapid. If we could arrange that these are carried by a large number of miners every day, we would then know a great deal more about dust levels. Of these two instruments I prefer the one called a simpeds; the main mechanism is fitted to the top of a cap lamp battery, forming an extension about an inch high on the lid of the battery. This is connected, by means of a rubber tube running parallel to the electrical connection to the cap lamp, to the actual dust collector carried on the helmet. It adds four ounces to the weight on the wearer's head and another eight ounces on his cap lamp battery. It samples only the respirable dust - the dust that will enter the lungs. The coarse dust is thrown out by a small cyclone, built into the collector. The dust is collected on a filter paper. It is still a prototype experimental apparatus, but I am sure more is going to be heard of it. If the Mining Industry would adopt an instrument of this type in South Africa, it would give us some of the facts which the last speaker has pleaded for.

These instruments correspond to the film badge. People exposed to excessive X-Rays are liable to get cancer; persons in a hospital or atomic research centre working with radiation, wear on their lapels film badges which tell whether they have been exposed to excessive X-Rays, enough to be dangerous. If only we could do the same on dust, I think we would really get the information we need to stop this disease.

14.6 Mr. H. (Chief Ventilation Officer)

I have prepared a contribution which I call "I say what I think about dust, or in other words I stick my neck out". The Anti-Dust Campaign as such can be regarded as a success, as mines and personnel concerned did what was required of them in the terms of reference of the Anti-Dust Campaign Committee. All underground persons were indoctrinated as to the dangers of dust and were instructed to water down thoroughly and frequently. All this led to development of improved spray nozzles, mist nozzles, and drip sprays. All these improvements increased the effectiveness of watering down, and made underground men more dust conscious. Now here I would like to say that in insisting that these men water down frequently, we ran into the problem of not having sufficient hoses for drilling purposes? But for all the time, labour

know-how and money spent on this campaign I do think that the dust counts have not been reduced to the levels anticipated, if they have been reduced at all? In my opinion too, the impact of the Anti-Dust Campaign is not there.

There are many of you who smoke - is smoking good for you? You couldn't care less, you smoke. But in years to come you will find that it has had a harmful effect on you. The same human aspect is carried over to the miner. The place is dry, if you don't wet down, you're not going to feel sick tomorrow or tonight, or the next week; the effect is only very much later on, so the punch line that we need here is to show them what harmful effects dust could have, but the effect is not today or tomorrow, the effect is much later on.

Now for a critical analysis of dust suppression and the detection technique that is carried out in the gold mining industry. In comparing, dust technique with travel, we find that as far as dust detection and assessment are concerned, our dust astronauts have landed on Mars, but as far as the prevention side is concerned, our dust Voortrekker is battling to cross the Orange River with his ox wagon. Now to back up this statement, our dust research departments have two of the best dust laboratories in the world. They have done much work and have obtained many high academic degrees, medals and society awards in the detection and assessment of dust. They have made remarkable progress from the old sugar tube to the modern D.I.S.A. dust assessor. (Diffraction size frequency analyser). They can tell you the chemical composition of the dust, the piezo-electric charge, the size and shape of the dust, the refractive index, the surface area - the list can go on and on.

In sampling instruments they have improved on the gravimetric samplers like the sugar tube by inventing the Kotze konimeter, which developed into the Rand konimeter as we know it today. Even this instrument is being improved by the addition of a pre-impinger. They have developed the thermal precipitator from the bulky instrument using batteries and water tanks to the modern compact modified T.P. which can take 15 samples on one slide instead of one sample on two slides. On the assessing side the microscope technique has improved from the old one hundred and fifty magnification. Where a slide reading say two hundred particles per c.c. would become three or four hundred particles if examined under the high power microscope and the same sample under the electron microscope could become many thousand particles per c.c. All these developments, what do they do - they just scare us! Now there is a still newer technique, that is measuring the respirable surface area (R.S.A.) of dust in a sample, which is assessed by D.I.S.A. - a remarkable technique, thought out by some of the best brains in the country, but still on the detection side. Many of us mining folk do not understand what R.S.A. means, but we are scared nevertheless as the sample figures are higher than those expressed as p.p.c.c. for the same condition.

In showing up the weakness of early dust techniques, we asked the boffins what the solution was? The reply is, water down. Hence Stoffel Waterman. This is the only effective means they know of combating dust. Yet in the same breath they tell you that the dust in the Free State mines contains a high percentage of pyrdphyllite which cannot be wetted. Now we go back to the dust control comparison to the dust Voortrekker trying to cross the Orange River. In 1910 it was made law that water had to be used underground for drilling and before rock was

moved; working places had to be watered down at the commencement of a shift and blasting had to be done at fixed times. All this is still the same today. In the Anti-Dust Campaign a graph was shown to the audience which gave the time it took to get certified at different periods. What does this graph mean? In the year 1910 there was no water insisted on underground, blasting was done indiscriminately and hence the high incidence of pneumoconiosis. The working life underground before a man contracted pneumoconiosis was about six years. Then the law was promulgated which stated that water had to be used as mentioned then we got an increase of the life span before a man contracted pneumoconiosis and then suddenly in 1950 the graph flattened out. Now why did the graph flatten out? We find that we have fully exploited the use of water and good ventilation and no matter what we do in that particular regard I consider that the graph will still remain flat; that is my own personal opinion. You can put two rocks in a bucket of water and leave them there for as long as you wish and when you take them out and strike them together, in spite of their still dripping with water, you will still get dust; so in my opinion we have not reached what I consider to be the effective answer to dust control.

On the suppression side I do not know of any person - there may be one - who has written a thesis for a degree, received a Society Medal for work done on suppression of dust in stopes and development ends, or at tips and loading boxes. I feel that with the large store of know-how and brilliant brains that should these be channelled in the right direction, an answer to the dust control problem may be found. I also feel that the powers that be, who control our two leading dust laboratories should curb research into the detection and assessment of dust and channel both the finance and brains into the prevention side. These boffins should do personal research at the working places where dust is created. I do not feel that work on simulated models in dust laboratories for dust suppression is of any avail.

The problem as I see it is fourfold, in order to reduce or eliminate dust underground and hence pneumoconiosis. Firstly, prevent the dust being made at the source. Now here I visualise we should use something like dry-ducters, we should use wetting agents - as has been mentioned by an earlier speaker - and also think of using foam as they do in flotation work where the dust cannot escape through a film of foam. Secondly, if one cannot remove the dust from the atmosphere before it is breathed in, stope filters are being developed, but the result I cannot tell you, I have no further information. If one and two cannot be achieved to prevent the dust from entering the lungs, I think of dust respirators which are easy to work with. Further, we should visualise working in 'air bubbles' by means of which people work in a bowl of fresh and un-contaminated air. The fourth point is if both one, two and three cannot be affected, then the dust must be removed from the lungs before it has its harmful effect. Now here they have been doing quite a lot of work on the prophylaxis of dust. I think, quite a lot is being done, or has been done with aluminium dust which they say does prevent the silicotic nodules forming in the lungs; I think too that these gentlemen should turn their thoughts in that particular direction and think of something that could be breathed in by men underground so that when they do breathe this dust in underground, there is a chance of it being breathed out again; in other words, you have some sort of prophylaxis.

Now I am sure that by investigating the above, some effective means

will be discovered by means of which we will be able to prolong the average of 24 years underground before contracting pneumoconiosis to retirement without pneumoconiosis. What I would have done to make the Anti-Dust Campaign more effective apart from lecturing and propaganda, is to introduce more rapid methods of pin pointing high dust counts. It is only realised that the working place underground is dangerously dusty once the dust slide has been assessed. This cannot be determined on the spot but at the soonest, that afternoon. By D.I.S.A. assessment (at a centralised laboratory) the soonest is about 24 hours and could be as long as six days after sampling. Thus any follow up on a bad report does not reveal the same conditions as previously, as conditions are continually changing even over short spaces of time. In order to overcome this problem it is suggested that the Sartorius konimeter be used by means of which a dust sample could be assessed on the spot and any high dust concentration could be back-traced against the ventilating current to its source. Now gentlemen, here I have - by kind permission of Corner House Laboratories - a Sartorius konimeter which simply is a combination of a microscope and a konimeter. By depressing this trigger, you take a sample the same way as with our standard konimeter. You can then move this spot under the microscope, hold your cap lamp underneath this condenser lens and you can assess the amount of dust in the air at that particular spot. Now if you get an abnormally high dust count, all you do is walk against the ventilation current, keep taking samples until eventually you might find there is a sudden drop in dust count, then you must know you have passed the source of the dust. By so doing I feel that you can trace the source of dust and once you have traced the source of dust you can do something about it. You cannot do something about this dust source once you are on surface and have only then analysed your dust sample. By the next day, the conditions may have changed.

I am pleased to note that there are several types of stope filters being developed, but these only after 50 years and after much criticism of work done on detection taking precedence over the suppression side of dust. This I regard as a step in the right direction and should do much to reduce the amount of airborne dust. I have spoken my mind, and. to my critics I would say 'judge this talk in the spirit in which it is given and not in the letter'.

14.7 Mr. V. (Chief Ventilation Officer)

I have suggestions for the future. In all walks of life the success of any propaganda campaign seeking to convey a message depends mainly on the vehicle chosen to convey that message. If the main vehicle chosen for the Anti-Dust Campaign is a lecture, then it is essential if this campaign is to succeed, that lecturers should be experts in that field, not only in the subject matter but in knowing how to influence people to accept and carry out certain principles. It is quite unrealistic to expect certain, ventilation or training officers to become skilled lecturers and propagandists on such a contentious and delicate subject in addition to the normal duties required of them. Difficulty has been experienced on the mines, in the past, finding the appropriate time to lecture to miners. Economically it cannot be done during normal working hours. If carried out after working hours, it has nuisance value and cannot be appreciated by those concerned. If this propaganda campaign is to continue, new ideas and concepts must be tried. We have done our best under the circumstances on the mines, now it is time that the Miners' Medical Bureau should do something about it.

Every European who works in a dusty occupation has to attend the Bureau at least once in every 12 months. Men who have to attend sit around for fairly long periods, waiting to be examined - we have all experienced this. This idle time could be profitably used to put across anti-dust propaganda by an expert dust consultant who could speak or converse to the men and find out also if they have problems concerning dust, and issue literature or pamphlets on the subject. This suggestion has of course been brought up before. It appears the new spacious building at the Miners' Medical Bureau has adequate room for this project.

Discussion Leader

That suggestion has been raised on numerous occasions before and I must say that it surprises me that no action has been taken to use this wonderful opportunity of talking to men where they are coming up for the very purpose of the propaganda, to see if they have kept clear of pneumoconiosis - the authorities do not seem to use the opportunity that exists.

14.8 Mr. D. (Chief Ventilation Officer)

I have two suggestions, two thoughts that I would like to give you to think about. I feel that the main approach lies in education. Everybody on the mine should be educated and every mine should have its own expert in anti-dust lecturing. The second thought is that I feel that the actual causes and the effect of dust on the human being should be part and parcel of the syllabus for the certificates that we write in the mining industry. For blasting certificates and even mine overseer certificates, I feel that much more emphasis should be put on the effects of the dust on the human lung.

14.9 Mr. I. (Chief Ventilation Officer)

The mining industry takes five hundred thousand konimeter spots during a year. We take one hundred thousand spots in a year on our own mine. That is just one mine, which means that we are responsible for a fifth of the total industry dust samples. It was said that the konimeter was not any use. Well, if 50 mines take only five hundred thousand spots during a year, the konimeter, is no use.But if the konimeter is used often enough and you take sufficient samples it will give you exactly the same sort of picture as any of the other dust instruments, although not necessarily the some values. We have ample evidence to back this up. I would suggest that the dust levels in the various mines be published in 'The Reef' magazine, to see which mines are the dusty ones. Put them down in order of merit, make it a competition and award prizes for the least dusty mine. The fight to bring dust levels down is an unending task for management because they are facing all sorts of stumbling blocks that are very difficult to overcome. One of these is that there are certain men who want to get pneumoconiosis. First stage - not second-stage - but they want that compensation.As long as you hang out the carrot, that if you get pneumoconiosis, you get compensation, you will get some silly clot who will say, "I want phthisis". And as long as you have these types around, then you are fighting an uphill battle to try and get dust down. In other words, if we want to reduce our dust counts underground, let us change the legislation. By all means give the man who gets pneumoconiosis compensation, but give that man who does not get it, a nice fat bonus when he retires.

As a last point I say let us have a change of emphasis on mining underground. At the moment the practice is to give a nice fat bonus to the man who gets the maximum face advance. I say give the fat bonus to the man with the good housekeeping.

14.10 Mr. G. (Training Officer)

The problem appears to be human and engineering. I would like to talk on the human aspect presuming that we maintain our present campaign. I think we are neglecting the very important person in dust and this is the European mine worker. In my younger days I was associated with an industry where you were having to deal with very militant trade unions. An occasion that comes to mind is - I was on a ship once that was loading asbestos in East Africa, and we were taking it to Europe. The workers in East Africa stayed in the hold of the ship for eight hours a day, when they came off they were white, white with asbestos dust. I am quite certain that these people had a very short life. When we arrived in London and this Asbestos had to be offloaded, the London dockworkers said 'Not me Charley - we'll work only two hours a shift there', and the Union Officials made certain that these men worked only two hours a shift in this dusty environment.

The shaft steward is a man to be respected and feared. I feel that although it has complications, which I know nothing about, the use of the Mine Workers' Union, the use of the shaft stewards to prevent persons working in areas where dust conditions are known to be bad, will I am sure help to alleviate the bad conditions which do exist. One wonders, although I am sure it has lot; of complications, if we cannot get the Mine Workers' Union on our side, in combating this serious danger of dust.

14.11 Mr. P. (Ventilation Official)

Most of what I wanted to say has been said already, but in general. I feel that the Chamber of Mines, instead of having 30 dust lecturers, should have four or five expert dust lecturers who go to the mines and just tell the miners what fools they are, financially and from the health point of view, to get pneumoconiosis. Then give them the option of having a day's lecture where they are taught ventilation principles, ventilation control and dust control. That would be the first step.

As a second step, if the Chamber of Mines is prepared to spend the money, get 100 dust samplers plus 50 or 60 microscopists, if necessary, and do independent surveys on the mines properly. The 100 samplers should also be trained as lecturers and let them do on-the-spot lecturing. When they see a miner scrape dry rock, tell him there and then why it is dangerous?

14.12 Mr. J. (Ventilation Official)

Basically, I do not agree that a campaign like this will ever have any marked success? I think we might, however, eventually accomplish some sort of breakthrough in lowering our dust levels if the mines would appoint dust control officers - possibly a separate dust department within the framework of the ventilation department - but preferably divorced from that department.

As a ventilation officer, on a certain mine, many a time I looked firstly at the heat problem; the dust problem was very secondary, I think that this is true, not only of that ventilation department but of many other departments. I think our breakthrough will come when we can do really practical dust suppression as a separate department on the mine.

14.13 Discussion Leader

To underline what has just been said, the National Coal Board in Great Britain does not use the Ventilation Department to take dust samples. They have a completely separate department for this purpose. It is called the Scientific Department. They do the dust sampling, they report results to Management, they have nothing to do with dust control or ventilation. They are an independent measuring body. Their results are listened to with great respect by Management. If they put in a bad report, action is taken. I agree entirely with the last speaker, and I have been saying this for many, many years, until the mines divorce dust sampling from ventilation departments, they will not make adequate progress. It is one of the key things that can and should be done in this industry.

15. CONCLUSION

The Discussion Leader thanked all those who had taken part in the symposium, particularly those that had contributed to the discussion. There had been over 30 speakers, which was probably a record at a Society meeting. He thought all contributors had spoken sincerely, constructively and intelligently. He felt it was a fine achievement for the Society to have arranged a Symposium of this type, to have attracted such a large audience and to have obtained some positive views and recommendations.

Mr. Beadle also thanked the Chamber of Mines who had provided the funds to hold the Symposium, including the costs of all the refreshments which had been supplied, and the costs of making a verbatim record of the proceedings and for other purposes.

He then handed the chair back to the President, Mr. H.M.W. Eschenburg, who also thanked all who had attended and participated in the discussions.

Johannesburg 9th April, 1970

16. SUMMARY OF SYMPOSIUM SUGGESTIONS FOR THE FUTURE

1. Keep the campaign alive by constantly reminding production personnel of the necessity for anti-dust measures.
2. Best method of conveying anti-dust propaganda is by way of lectures:
   (i) Lecturers should be experts in the field of dust control and should be able to motivate people in carrying out ideas and principles.
   (ii) As difficulty is experienced in finding time to provide various grades of personnel with lectures on the mines, facilities should be made available at the Miners' Medical Bureau in some form, supplemented with the issue of anti-dust propaganda. Opportunity should be taken of the fact that miners visit the Bureau for the very purpose of the propaganda, i.e. to see if they are keeping clear of pneumoconiosis.
   (iii) Every mine should have an anti-dust lecturer.
   (iv) The Chamber should provide a team of expert lecturers to provide lectures to all grades of personnel on all mines at regular intervals.
3. Effect of dust on the human lung should be a part of the syllabus for examinations in mine ventilation (Chamber), blasting certificates and mine overseers certificates.
4. Publish dust levels from the various mines in "The Reef" magazine, placing mines in order of merit. Use the information on a competitive basis and award prizes to the best mines.
5. Provide a "dust" bonus to miners for good housekeeping, i.e. by reducing dust concentrations to a minimum. (The dust production in any working place could be determined by computer).
6. Use the influence of the Mine Workers' Union through Shaft Stewards to prevent persons working in areas where conditions are bad.
7. Compensation for pneumoconiosis encourages many to ignore any dust control measures - this attitude must be changed to obtain any measure of success in an anti-dust campaign.
8. Provide compensation for various stages of pneumoconiosis but also provide a bonus for mining personnel who, on retirement, do not have any radiological signs of the disease.
9. Use shock tactics by displaying slides of pneumoconiosis sufferers and pay visits to the S.A. Institute for Medical Research to view diseased lungs.
10. More short films on purely the technical aspects of dust control should be prepared, i.e. effective use of water blasts, fog nozzles, polyurethane foam filters, etc.
11. Cards used at the present time only for passing congratulatory messages, should in future be printed in two colours, one for application to good conditions and one for drawing attention to poor dust conditions.
12. Computers could be used to ascertain very rapidly the <u>dust production</u> of any working place, and this could be used to reward miners in some form for good housekeeping.

17. SUGGESTIONS MADE FOR THE FUTURE CONTROL OF DUST UNDERGROUND

1. The Chamber should provide teams to undertake independent dust surveys of all mines, with the samplers providing on-the-spot lectures on the inadequacy of control measures, if necessary, and advising on methods of control.
2. Each mine to provide dust control officers - i.e. separate dust sampling from other ventilation measurements. On hot and fiery mines the main objects of the ventilation department is the control of heat and gases. The National Coal Board in Britain have a separate department for dust sampling and, when this independent sampling body report undesirable concentrations of dust, immediate action is taken by the management.
3. By continuing to use the konimeter and taking a larger number of samples, a good representative figure of dust conditions can be obtained without introducing costlier and more elaborate instruments.
4. Regular cleaning of skips, cages and hoppers with water and spraying with a cheap fine oil.
5. Bulk filtration of air should be undertaken.
6. Better use should be made by mine managements on dust data collected by ventilation departments.
7. Channel future dust research in the right direction, preferably on the control of dust rather than development of new sampling instruments.
8. Improve the wettability of water.
9. Invest money on reducing hazards responsible for bronchitis and emphysema (e.g. a campaign against smoking).
10. Sampling must be undertaken over the whole shift in order to obtain a representative picture of dust conditions.
11. Industry should introduce some form of personnel samplers.
12. Research should be directed to provide an effective answer to dust control:
    - (i) Use dryductors on rockdrills.
    - (ii) Introduce wetting agents.
    - (iii) Extend use of respirators.
    - (iv) Work in air bubbles.
13. Develop and introduce methods of pin-pointing undesirable dust concentrations - to reveal poor dust conditions, i.e. on-the-spot measurements to enable immediate remedial action to be taken. (Use of Sartorious Konimeter).
14. In order to be able to water down effectively, each miner should be provided with special watering down boys with their own hoses. Worked out areas should also be watered down.

Notes: The abbreviated version of this symposium was not published in the MVS Journal. It may, however, have been distributed to mine managers and the anti-dust lecturers. No copy of the full record of the symposium or the abbreviated version could be located at the MVS offices. The Symposium Record Editor, Derrick G. Beadle died in 1970.