

Panel Discussion

Chairman: Prof A. E. H. BLEKSLEY

Rapporteur: Prof J. ELBROND

Panel Members: Prof J. C. Griffiths, Prof T. E. Hawkins, Mr A. C. Langton, Mr M. Splaine, Mr A. Weiss

The reasons for failure of computer applications in the mineral industry and the direction of future developments.

The Chairman opened the discussion by elaborating on the disappointment felt by some authorities with the lack of progress in the application of computers in the mineral industry during the last ten years, and posed the question to the panel: 'Do you agree that the computer age has not come up to expectations?'

Mr Langton said that although there seemed to be a tremendous amount of brainpower applied to the theoretical side, he thought that the production men had not got all the help from computers that could have been given to them. The computer, said Prof Griffiths, is as yet a new tool which should not be used to do old things in old ways. To learn to use the computer will take time. After all, he said, it had taken 400 years after the introduction of the printing press to achieve general literacy, and perhaps it will take 40 years after the introduction of the computer to achieve 'numeracy'.

In Mr Weiss' view, the reason for the feeling of disappointment lay in the focussing of attention on the computer. The blame, if any, lay with the people surrounding the computer, that is, the analysts and programmers, to whom the emphasis should be shifted.

Prof Hawkins said that he thought that some applications of the computer in the mineral industry had been successful, such as, for example, the compilation of payrolls. Reasons for failures in other areas were to be sought in the fact that the people connected with computers had failed to realise that they were merely part of a system. They had not understood the power structure of the organization which their work tended to change, and were therefore not prepared for the inevitable conflict with the production men.

In Mr Splaine's view the production man had not received the assistance he could have had from the computer people because he may possibly not have allowed this to happen.

Prof Bleksley concluded from these opinions that the promise which computers had ten years ago had not been fulfilled and added that the opinions expressed by the panel had intruded on his next question which was: 'Is the reason for this that people are involved?'

Prof Hawkins elaborated on his previous theme, namely, that of computer people in relation to management. Computer people, he said, were trying to impose change on management but were not prepared to share the responsibility for these changes. In fact, they wanted their work to be distinct and separate, and, as far as management was concerned, changes would be made when management believed that these would be less agonizing than no change at all.

Mr Splaine thought that although huge benefits were to be expected from the use of computers, people were mostly

concerned with the great effort required to bring about these results. Prof Griffiths agreed that computer people were the problem. A change in attitude would come about, he said, when computers become integrated in the mineral industry to the same extent as man on the moon with his equipment. The present philosophy as regards computers, he added, was not in that direction.

Mr Weiss said that there was general agreement on the need for getting the user involved. This should be done by justifying the computer work for the user.

Mr Langton referred to the problem of the production man who is in a hurry and who has difficulty in absorbing the results produced by the computer. At the same time there was the other problem of lack of understanding on the part of the computer operator of the daily problems which arise in an underground mine. He agreed that the assistance of the computer people in the evaluation of investments in mines was of great value, but asked whether something could be done to improve communications between the computer man and the production man, as by the use, for example, of visual displays.

Prof Bleksley summed up this aspect of the discussion by saying that there was agreement that the computer has potential which was not being realised because of the attitudes of the people involved with the computers and with management. The solution to this may lie in education of these people. The Chairman therefore put to the panel the question: 'Do you think that computer people have all they need in this respect?'

Prof Hawkins dismissed the question which he regarded as unimportant. In his view it was more important to change management so that we are able to use all the available tools, of which the computer happens to be one. He went on to say that operations research and the applications of computers were not something separate and distinct, but had to be made an integral part of management. The idea of integration of computers with management was supported by Prof Griffiths. Mr Splaine thought that future managers would be influenced by high school curricula.

Prof Bleksley then asked how computers were to be made part of management. Was the computer to be moved into management, or *vice versa*? How, he asked, were these two interests to be got together, and was there a great gulf between the computer and the management people, or was there merely a wall?

In Mr Langton's view it should be possible, with very little effort, for the computer people to assist the production man in his daily work. For example, ordinary stope panels, of which there are 15 000 in the Witwatersrand gold fields, are rather similar, and it should be possible to put them on display by computer so as to make it possible for a manager

to get instant information about the state of the stopes in his mine and their sequences. Mr Splaine agreed that this could be done but said that he had found that production men wanted this sort of thing for nothing.

Prof Griffiths returned to the point that he had made earlier, namely, that in getting started with computers there was no use in using computers to do things as they are now being done by other means; this would merely cost more and produce more rapidly the mistakes that are being made at present. Man got to the moon, he said, by using new equipment, new technology and new ideas.

Mr Weiss suggested on-the-job training of production and management personnel by means of conferences at which all participated equally, and suggested further that these conferences be held three or four times a year.

Prof Hawkins said that he did not believe that mere education or workshops would solve the problem and repeated his view that there should be a fresh approach to organization. In his opinion computer men and management should solve the problem by working together; the effective operations research man was not only an adviser but also part of management and decision-making.

Prof Bleksley agreed that the team-work approach made sense and asked how one would set about getting the teams together.

One tactical method of getting operations research ideas forward was suggested by Mr Splaine. This was to assist the young manager who was already partly converted so that when he eventually became technical director the battle was won.

Prof Hawkins repeated his conviction that no change would be brought about by means of round tables, sales talk, and so on. Unless the management felt the need to change, he said, there would be no change. There must be an external pressure which must be recognised internally. Prof Hawkins went on to introduce the paradox arising out of Mr Splaine's tactical approach, of endeavouring to make changes through the old-timer and through the newcomer who understood the problem but who would not risk making the change. Mr Weiss replied to this by saying that the value of the round-table conference lay in the fact that old-timers were present at such gatherings.

From the comments of the panel Prof Bleksley concluded that getting-together was the fundamental problem. The panel had, however, not come to terms with the problem of

how this integration of computer and management men was to be brought about. One possibility was to wait until the opponents of computers were no longer present. Prof Bleksley then asked whether members of the panel could make any specific suggestions regarding the problem of teaching computer men and management to live together.

Prof Hawkins said that the only way of achieving integration was to start at the beginning with an organizational team comprising management and computer people. Such a team would develop, for example, a production record-keeping system and be able to implement it. In reply to Prof Bleksley's observation on this suggestion that the move would come from the top, Prof Hawkins said that the move could come from the bottom as well.

Mr Splaine agreed that there was a great need for motivation, a point included in Prof Hawkins' elaboration on the formation of the organizational team.

Mr Langton referred to the need to resolve the problem of language or communication between computer and mining people.

Summing up the discussion thus far, Prof Bleksley concluded that the panel agreed more or less that the computer had not done what it was capable of doing mainly because of lack of integration between computer men and management and that it was possible to get things done by forming teams of suitable people to do so. He asked, finally, 'Looking at the possible future development in computer technology, can any developments be foreseen that are likely to affect the mining man?'

Mr Weiss said that the chief need was graphic or visual display. Mr Langton agreed with this and gave an example from a manufacturing industry to illustrate his point; out of this Mr Weiss was led to emphasize the importance of time sharing.

Mr Griffiths said that interaction between man and computer would lead to advances, while Prof Hawkins said that too much time had been spent on making computers and systems better, and too little time on learning how to use them.

Prof Bleksley ended the discussion by saying that the panel agreed that the computer has potential which has not yet been used. One of the reasons for this was the difficulty or lack of communication between the people involved; computer technology could be developed further so as to assist the mining industry more.