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Safety in Mines.¹

IT is satisfactory to note from the Fifth Annual Report of the Safety in Mines Research Board, just issued, that researches of an important character are being actively pursued and especially that the Board appears to be taking a wider view of its duties than was at one time the case. It has been pointed out more than once that the tendency of the Research Board was to trust too implicitly to laboratory investigations, and that as an almost necessary consequence many of the researches were confined to chemical or physico-chemical problems. What is particularly needed to-day is investigation of mechanical problems. These are of such a nature that their proper investigation can be carried out only in the pit, and laboratory work can do little more than give an indication of the direction in which the researches would need to be prosecuted.

The most fertile cause of underground accidents is still, as it has been for many years, that occasioned by falls of ground; an investigation, sufficiently complete and searching to enable suitable remedies to be suggested, is necessarily a lengthy and wearisome one, and one which can only be carried out underground. It is, therefore, gratifying to observe that investigations of this type are being actively pursued. The results obtained by the dynamometer-prop, the object of which is to measure the actual roof pressures experienced in the mine, will be looked forward to with great interest, though every experienced miner knows that it is not the amount of pressure only which matters; a roof which weighs heavily, but can be so controlled as to take advantage of that very weighting for the purposes of coal getting, is likely to be a source of much less danger than the roof which presses less heavily, but is apt to break up without warning.

Among the reports of results of investigations issued during the course of the year was an exceedingly valuable one on the East Midland Coalfield, in which the results obtained by steel props were recorded and their more general adoption, at any rate on an experimental scale, was advocated. Such props are attracting considerable attention, and it is to be hoped that the Safety in Mines Research Board will continue to investigate the respective advantages and drawbacks of the different types of props which are being put on

¹ Mines Department. Fifth Annual Report of the Safety in Mines Research Board, including a Report of Matters dealt with by the Health Advisory Committee, 1926. Pp. 55. (London : H.M. Stationery Office.) 9d. net.

the market. It may be noted that the Board has had tests carried out on quartered props, which show that these props are as strong as round props of the same sectional area. It may be doubted whether it was worth while carrying out these tests, seeing that the subject has been fully dealt with in Germany, and the German reports show exactly the same conclusion as has been reached in Great Britain (see *Glückauf*, 1926, p. 1409). It is, however, some satisfaction to find that the results which have been obtained by the British and German investigators have led to identical conclusions.

Another subject on which the Safety in Mines Research Board is initiating an investigation, is wire ropes, and this may be described as an investigation of first-rate importance. It is true that colliery accidents due to the failure of wire ropes are exceedingly rare, and that they stand almost at the opposite end of the scale to that which accidents from falls of ground occupy. Nevertheless, it may fairly be said that there is no article in common everyday use about which our ignorance is so profound as is the case with the wire rope, and any information concerning wire ropes will be eagerly welcomed. No fault can be found with the objects of the wire rope committee, namely, to discover means of prolonging the life of the rope and of foretelling probabilities of failure; but the method which the committee proposes to adopt, namely, to examine samples cut off from the ends of winding ropes when re-capping takes place, is decidedly open to objection.

Whilst it is a fact that winding ropes very rarely fail at the cappings, it is nevertheless certain that the end of the rope where it enters the capping is liable to much more severe corrosion than any other part of the rope; where ropes are capped by running in white metal, local galvanic action may be expected, and, in any event, this is the point at which acid water, however produced, is most liable to accumulate. On the other hand, the end of the rope is never exposed to bending stresses, which affect every other portion of the rope as it passes over the pit-head pulleys and round the winding drum. These stresses, with the consequent alternation of stress, are bound to have a more or less injurious effect upon the rope, and this effect will be entirely missed by investigations confined to the end of the winding rope. There is no doubt that winding and haulage ropes constitute a vast field for investigation, and it is highly satisfactory to learn that a systematic

attack upon these problems has now been commenced.

Among other researches of importance is one upon the improvement of the lighting efficiency of safety lamps, both electric and flame lamps, and the report certainly suggests that a very considerable measure of success has already been attained. The publication of the full account of this work will be looked forward to with much interest. Researches upon coal dust and firedamp explosions and upon mining explosives are, of course, being steadily continued. Naturally, this aspect of the work is very closely connected with operations at the Buxton Research Station, the official opening of which took place only a few weeks ago. There is no doubt that the geographical position of this station is an immense improvement upon Eskmeals, and the experience gained by the latter station will no doubt have been fully utilised in the design of the new station, so that this may be fully equal to all the work required of it, both as a testing station and as a research station.

Important results may be expected from the electrical researches in progress, the ultimate object of which is to obtain electrical appliances which shall be absolutely safe for use in underground work even in fiery pits. Other subjects which are briefly dealt with in this report are researches on the spontaneous combustion of coal and the investigation of certain defects in mine rescue apparatus, which have been found in practice to cause inconvenience; the report indicates that remedies for these defects will in all probability be forthcoming as the result of these researches. There is a brief reference to the constitution and the work done by the Health Advisory Committee, which has now been brought into closer relationship with the Safety in Mines Research Board by the appointment of Sir Edward Troup as chairman of both.

The report contains two interesting appendices, one being a programme of the researches of the Board which are either in progress or under consideration, and the second a report on the co-operative researches that are being carried on jointly by the United States Bureau of Mines and the Safety in Mines Research Board. It is sincerely to be hoped that this scheme of co-operation will be further extended until it embraces all the researches carried on in all the coal-mining countries of the world upon objects identical with those of the British Safety in Mines Research Board.