

not altogether, marsh gas. The South Wilkes-Barre Colliery, Pennsylvania, U.S.A., is perhaps the most fiery colliery in the United States, as much as three and four per cent. of fire-damp being detected almost constantly in the fan drift by the Shaw gas tester, but there the problem is not a particularly difficult one, because there is no dangerous coal dust, no element not well understood.

By far the largest number of explosions on the American continent take place in dry and dusty bituminous coal mines, some of which gave off fire-damp, while in others that have exploded never a sign of fire damp has been seen on a safety lamp, yet the lives lost in each of these mines count up in hundreds. In many of them I am sceptical as to whether there was any gas given off. I trudged round the East mine of the South-west Virginia Improvement Co., Pocahontas, Va., and worked at the coal for over six months after the explosion there, in the vain hope that I would be able to find something that would indicate that there was some marsh gas present, but I never saw it. In the presence of several officials of the company and Andrew Roy, then the chief mine inspector of Ohio, I fired a heavy shot in a wide room where the coal was mined at least five feet deep. After such a shot a long tongue of red flame invariably shot out from twenty to thirty feet, and if the coal came down, flame at white heat played around behind the coal, in many cases dying out gradually, the last small flame presenting the blue cap. This only supported my idea of the distillation of the hydro-carbons in the coal dust. I have seen the same phenomena in most seams of a good coking quality. If marsh gas be present, forming a mechanical mixture with air, the phenomena will be intensified.

From the foregoing remarks it will be seen that I am not one of those who believe that it is necessary to have a percentage of marsh gas present before we can have a "coal dust explosion." But woe will surely betide the manager who has both coal dust and gas present if he does not carefully take care of both with the most advanced knowledge of the day. I would not think of being in charge of any dry and dusty mine without endeavouring to detect explosive gas with the most improved safety lamp or other detector known to the mining fraternity, even if in my mind I thought there was no possibility of gas being present: one can never tell.

Even if it be admitted that gas must be present before a "coal dust explosion" can take place, "the enquiry into the Seaham disaster in 1880 showed that the presence of two and one-half per cent. of fire-damp in a dry and dusty mine created an atmosphere which would in the presence of a blown-out shot, over-powdered shot, or a badly placed shot, bring about a fearful disaster." There are not so very many who can detect even three per cent. of fire-damp with the ordinary safety lamp. Of course there are lots who think they can, but can they?

Where gas, coal dust, or both are present in a mine it is the duty of the manager to know all that is knowable about the dangers connected with the same so that he may do the best to protect the lives of the men intrusted to his guidance and protect the company's valuable property from damage or destruction.

It is a well known fact that increased temperature reduces the temperature of ignition and that a low barometer reduces the violence of a gas explosion,

but these are factors of small moment where coal dust is one of the elements when looking into the mechanical effect of an explosion; but in the case of gas detection, increase in temperature and reduction of temperature (low barometer) may be of considerable importance.

Another point, I will mention in passing, is that the effect of coal dust on the flame of a testing lamp is not generally given the consideration it should have by the fire bosses and other officials in dry and dusty mines, on this continent. Here is another opportunity for the distillation of explosive gases on which I have laid so much stress. Coal dust in contact with the flame of a testing lamp is a condition that might well be made the subject of a scientific paper. Coal dust in the meshes of the gauze of an ordinary safety lamp becomes incandescent almost instantly and passes the flame to the mixture outside of the lamp.

Mr. Ashworth's lamp is simply an improvement on the Gray lamp, which had the good fortune to be highly recommended by the Royal Commission, and there is no doubt but it is a good lamp; however, it has not passed through its course without considerable objection being raised to it by many able mining engineers and mine managers in Great Britain. As recently as the years 1892-3 Mr. Stokes and Messrs. Ashworth and Clowes had considerable controversy as to the relative merits of the Stokes and the Ashworth lamps. From the discussion that followed I gathered that both lamps had about an equal number of supporters, but all seemed to be unanimously of the opinion that both lamps were good and capable of detecting equally small percentages of gas, but the Stokes lamp had the advantage of using alcohol instead of hydrogen gas used in the Ashworth lamp then under discussion. Both lamps use oil for testing for over two and one-half per cent. of gas.

Mr. Ashworth in his paper does not discuss the percentage of gas his lamp will detect, but satisfied himself with saying that "it will detect more readily and with greater certainty the presence of the blue cap than any Davy lamp which was ever made." This is definite, but not very informative, and presupposes a knowledge not had by all who will read his paper.

Mr. Ashworth's paper is a valuable one; if it will induce the mine managers and mining engineers in Canada and the United States to give safety lamps and other subjects in coal mining the thought they deserve, by giving the chase for cheap coal just a little less attention, it shall have served a good purpose.

MINING IN THE YUKON.

A CORRESPONDENT writes that shipments of boilers and steam plant from the Coast cities has now reached the large aggregate valuation of approximately five million dollars. The machinery is used in the process of thawing the frozen gold charged gravels, and hoisting, transferring and handling the precious earth. While one part of this immense equipment is engaged in the winter work extensively, another large portion is used only in summer. But there is still another classification to be added, namely those machines which work both summer and winter. It is probable that 1,000 to 1,500, and may be more, steam plants are in use in the Yukon alone.