lington and one at Nanaimo; that in Wellington in '84 was, in his opinion, caused by a fire-boss who, having found gas in a heading worked by Mr. Fear, had allowed him to go in with a safety lamp in his hand and a naked light on his head. The disaster in January, 1888 in No. 5 Wellington, he believed, was caused by a Chinaman leaving a trap door open and allowing gas to accumulate inside. Witness believed that trades unions were a decided benefit to miners and owners.

Mr. Thomas Russell, a mine manager with an experience of nearly thirty years, would ventilate mines so that the air would be as near as possible like that on the surface. Watering should be compulsory, and any dispute as to its necessity would leave to the inspector or arbitration. The inspector should have power to close down the mine if thought dangerous until dispute was settled. In mines giving off any gas black powder should be prohibited. A mine might be dusty with no gas present. Had made experiments with dust headed to a 150 degrees Fah. and always exploded in coming in contact with flames. Considered dust worse than gas and the cause of many explosions. Too much attention has been taken to gas while dust has been neglected. Comparing with the flame from a shot from a cannon, the witness gave the result of experiments approximating a blown-out hole with different explosives; in some cases the flame extended 60 feet and a per cent. of gas in the air always ignited. Legislation prohibiting tamping with coal should be passed to guard against the action of careless men. All explosives should have government inspection and marking and firemen should have a lamp with re-lighting apparatus or carry two lamps. Firemen probably carried matches: the place for a man who carried matches in a mine was in jail.

Where air in the return shown one and a half per cent. of gas even in the main intake, no electrical apparatus should be permitted. Old workings should be walled off. High velocity of air should be considered dangerous. Two shifts, with sufficient time for cooling, could be worked without particular danger. The Germans had a theory that a mine was safe if air was increased in ratio to the amount of coal hoisted. The mining law should provide that some men with each shift should be familiar with the geography of the mine, and all should Lo able to read and write English. Would exclude without exception men of every nationality who could not read the special rules and understand orders given them. Three hours should be the outside limit between examination and men going in. It should be compulsory that every one examining should make a report, including the inspector, and that he should examine report books of mines. Government should supply inspectors with gas tester to test air in return at least once a month. The furnishing of permitted powders to miners at cost by the Government, he thought was a political question and would not add to safety. Overmen and managers should have five years' experience underground and examination not too theoretical.

The certificates of all alike should be cancelled for certain offences. Encouraged miners to examine mines; it added largely to safety. Here there was examination and reports monthly. While at Union it was only once taken advantage of; there was no union there nor agent; organization meant safety. The coming into force of the Workmen's Compensation Act would lessen the danger in mines, would make discipline better and the management would be more accurate in rigid discipline; as far as witness knew, discipline was as good here as in England. Referring to some remarks which had fallen from Mr. Hawthornthwaite, the witness stated that they were very unfair. Mr. Dunsmuir had never given him any indication that he wanted to restrict expenses at the expense of the safety of the mine, and he considered such statements without truth, foolish and unfair.

After a statement from Mr. Morgan, inspector of mines. as to the discharge of two miners from Wellington mine who had reported violations to him, in which it appeared they had addressed a letter to him to show to the management as they were going to leave, the Commissioners declared the sittings of the Commission closed.

SAFETY LAMPS AND COLLIERY EXPLO-SIONS.*

(By William Blakemore, Montreal.)

T HERE can be no doubt that the subject of safety lamps is of the greatest importance in connection with coal mining; possibly of

greater importance than the regulation of blasting, with which it divides the attention and interest of mining men.

The result of thirty years' experience, during which time I have tested every safety lamp which has been put on the market, leads me to the conclusion that the best result which can be obtained is only a certain percentage of safety, and of the lamps which approximate the closest to this standard I would specify the improved Hepplewhite Gray for testing processes, and the Mueseler. The former will, in my judgment, detect the presence of a smaller percentage of fire damp in the air than any other lamp, certainly than any other oil and wick lamp; and as long as this is the method of illumination I do not see how it is possible to construct a lamp mechanically more perfect than this. The fact that the only inlet is by way of the vertical tubes which admit air and gas at the top of the lamp and deliver them direct to the flame seems to me to give the maximum efficiency in this particular. I commenced to use the Hepplewhite Gray for testing purposes when it was first invented, and have continued its use ever since; the only objection which has developed with experience is its liability to become extinguished by a sudden jerk, but this is a defect which it has in common with the best lamps, and can hardly be considered an element of danger. I have always found the fingerholes and slides upon the tubes of great value for testing purposes, and the proper manipulation of

*Proceedings Canadian Mining Institute.