

responds with No. 61 seam, marked on No. 1 section of the Crow's Nest Pass coal field made by Mr. J. McEvoy.*

Three levels have been driven straight into the mountain-side, two of these serving as intake-airways, and the middle one as the return-airway to the fan. The lower level, the main haulage-road, entered about 20 feet above Morrissey creek and extended westwards for a distance of about 2,200 feet. It was cut in the top part of the seam, and had a rock-roof and a coal-floor. The ventilation of the mine was maintained by a fan, producing at the time of the outbursts about 60,000 cubic feet of air per minute, at a water-gauge of 0.75 inch. Three shifts of colliers were employed, and, although little or no gas was found in the mine, all the underground employees used Wolf safety lamps.

Outbursts.—(1).—On August 6th, 1903, about 2.30 p.m., and whilst work was proceeding as usual, the coal at the face of the main level commenced to emit sounds as if the mine would close up. It was deemed advisable to withdraw the men; but, before they were all out of the mine, an outburst of gas and coal occurred, which very quickly filled the whole mine with gas. So great was the force exerted by the pent-up and escaping gas, that small coal and dust were blown out of the mine, across the creek, and the ventilation was reversed. It was noticed that the water-gauge in the fan engine-house remained unaltered. No entrance could be effected into the mine, until four days after the outburst, although the fan was kept running at its highest speed. About 1,456 tons of small coal were loaded out of the main level, and 174 tons out of the parallel level before the faces were reached. For a distance of 150 feet outbye from the face, the main level was completely filled with dust and small coal and not a setting of timber remained standing in that length. About half of the coal-pillar, on the higher side of the level, was removed for a distance of 100 feet outbye from the face (Fig. 2, Plate III.): D being the portion of the pillar that was blown off, and E a cavity, 8 to 10 ft. wide and 110 ft. long, that was blown out at the same time.

(2).—After this outburst, the greatest precautions were taken to guard against a possible recurrence, but, despite these, another outburst took place on October 14th, 1903; and although it displaced only about eight hundred tons of coal, and the gas was smaller in volume, yet it was more disastrous, because four men were smothered by the fine dust and gas. It was evident from the position in which the bodies were found, two hours after the outburst, that they had some premonition of danger, and had moved away from their working places. The quick recovery of the bodies was due to the reversal of the fan, which, as is usual in this district, could be quickly converted from an exhausting to a blowing fan by mechanical arrangements placed within the engine-house of the fan. This provision for changing the direction of the ventilating current may seem a little strange, but it is sometimes resorted to in the winter months, to assist in clearing away accumulations of ice from the main intake-airways.

Several outbursts of gas of small volume had, previous to that of August, 1903, occurred in the winning headings, but none had occurred in any other part of the mine.

The inspector of mines, in his annual report for 1903, wrote in reference to this mine, which he inspected every month:—"Notwithstanding the repeated outbursts of gas I am bound to say that this mine could scarcely be put in better order. They are working, in the first place, about ten feet of

the top. Ventilation is very good here; there are three connections with the outside, and they are making another near the face, where most of the men work, so that in case of an accident or outburst of gas the men in the upper workings will be almost outside. After one of these blowers has come away, it is quite a time before gas can be found in the mine."

(3).—An important precaution, which the management adopted, was to reduce the number of shifts worked to one in every 24 hours, so as to allow for gas-drainage, and for the following 13 months this appeared to have operated successfully; but, immediately after these notes were drafted, even this provision was found to be ineffective, and on November 18th, 1904, about 11.50 a.m., another huge outburst occurred, causing the deaths of 4 Englishmen, 10 foreigners and 2 mules.

The overman of the mine had just returned to the surface, after inspecting every working-place in the mine, and had found everything in its usual condition and not a trace of gas showing anywhere.

Only one man escaped from the mine: he was working at A, about four hundred feet inbye on the main level, when suddenly his lamp flared up and was extinguished, but this did not seem to have alarmed him, as he heard no unusual noise; he, however, felt as if something was catching his breath, and walked out of the mine to get his lamp relighted. Not until he saw a cloud of dust issue from the tunnel-mouth did he seem to have realized that anything was wrong. The dust found in the mine was as fine as flour, and that blown out of the mine with the gas was so fine that the men who saw it reported it as smoke.

For thirty-five minutes after the outburst occurred, it was impossible to approach any of the three entrances to the mine, although the fan was speeded to its utmost capacity; but after this interval the fan commenced to gain the ascendancy, and the rescue-party were able to move slowly along the main tunnel. The first body recovered, that of a brattice-man, was found about five hundred feet from the entrance. This man was on his way into the mine, and had put down his lamp upright on the floor, a little farther inbye. It is supposed, therefore, that after his lamp was extinguished by the gas, he had put it down and attempted to escape. No. 2 was a miner, who was on his way out of the mine before the outburst occurred, he had, in fact, just finished a cut-through at the level-face near Brindach's place. Nos. 3 and 4 were drivers with a mule, and they did not appear to have made any effort to escape, as the body of the mule was between them and heading into the mine. No. 5 was another driver, who appeared to have suspected that something was wrong, and had left his mule near where No. 12 body was found. Nos. 6, 7, 8, 9, 10, 11 and 12 appeared to have left their working places all together, and made an ineffectual attempt to escape. Inbye from No. 12 body, the level was practically filled up with dust, there being only an open space of 6 to 8 inches near the roof. All these men were carrying their lamps, but from the position of some of them it was assumed that they were walking in the dark, and had all come from working places near the face of the upper level. No. 14 was the only man who was fully dressed, and had his lunch bucket with him. No. 13 was the body of Greenman, who was working in the main level, and it was his duty, if anything went wrong, to see that all men were out, and then to close the safety-doors, B and C, situated near No. 7 body. These safety-doors were hung on strong frames, and were held open by strings, so that, in case of danger, the last man could close them behind him, and thus prevent gas and dust from overtaking him before he reached the outside of the mine.

It is quite clear that the first warnings of an outburst were not so definite in character as on previous occasions, and that

* "Summary Report on the Operations of the Geological Survey for the Year 1900," by Dr. G. M. Dawson. *Annual Report of the Geological Survey of Canada*, 1900, vol. xiii., section A, pages 84 and 95; "Summary Report on the Operations of the Geological Survey for the Year 1901," by Dr. G. M. Dawson, *Ibid.*, 1901, vol. xiv., section A, Nos. 759 and 767, maps.—Trans. Institution of Mining Engineers.