

404. Will you explain to me what you mean by "experimenting"?—The ignitions which have taken place in this mine were accidental, and any one of the ignitions might have created a holocaust.

405. What has that to do with a holocaust?—I do not know what you are trying to get at.

406. Do you adhere to the statement that the management has been experimenting in the mine with a view to blowing it up?—No, these accidental ignitions might possibly have created a holocaust.

407. You say that you do not know the minimum quantity of gas that would be sufficient to generate an explosion with Taupiri coal. May we take it that if a mine contained the minimum quantity of gas which would generate an explosion, you would class that mine as dangerous?—Yes.

408. If you do not know what is the minimum quantity of gas required, how can you classify a mine as dangerous?—If I saw a gas-cap in a safety-lamp over a certain percentage I would regard that mine as dangerous under such conditions as obtained in this mine. If there were accumulations of gas perceptible which, in my opinion, when ignited would raise the dust, then I would say it is a dangerous mine.

409. Do you say, then, that it requires an accumulation of gas to raise the dust?—It may only require an accumulation of 2 ft. or 3 ft.—the exact capacity I cannot say.

410. An accumulation of 2 ft. or 3 ft. might possibly cause an explosion?—I think, under certain conditions even 2 ft. or 3 ft., if ignited in a confined space, of pure methane mixed with oxygen, from 18 ft. of air, might create a disastrous explosion.

411. Then, a mine containing 2 ft. or 3 ft. of pure methane in one confined space would be classed as dangerous?—If it occurred in this mine.

412. Or in any mine with similar coal?—Under the same conditions as Taupiri, yes.

413. How long would it take to exude 2 ft. or 3 ft. of gas from a bleed?—You may get the slightest emission or a huge volume.

414. It might be an outburst or a bleed?—An outburst or a breaking into a magazine of gas. It depends on the size of the cavity containing gas.

415. But 2 ft. or 3 ft. is a small quantity. You have told us that in all coal-mines there is gas—that you cannot get a mine without it?—In all mines there is gas given off, perhaps not perceptible except under the most careful analysis.

416. Would you consider a mine which generated 2 ft. of gas in one bleed in a few days an unsafe mine?—No, but if I found 2 cubic feet of pure firedamp in the roof in a confined space where there was inflammable dust I would say it was dangerous.

417. This point has not been brought out very distinctly before. When you referred to gas being present in dangerous quantities you meant quantities of 2 ft. or over?—In this dusty mine, yes. If the mine-gas is sufficient in quantity to raise the dust when ignited and throw a flame into that dust it is a dangerous mine.

418. If a mine generates 2 ft. of gas in one place you consider it dangerous?—I have said it three times—under certain conditions which I have already specified.

419. Would 2 ft. of gas remain stationary?—It has been suggested that gas remains stationary, is that so?—No, it does not remain stationary. The molecules of all gases are constantly moving.

420. You cannot tell us what gas is? Cannot you give us a short description of what it is?—No, I am unable to answer unless you state what gas you refer to.

421. Do you know how to answer? What is gas in general? Can you not give us a popular and short description of what gas is?—I would not attempt it unless you specify the name of the gas.

422. I will ask if you agree with this definition of it. I have a book here which says that gas consists of a number of rapidly moving particles: do you agree with that?—Yes, and the rate of diffusion of all gases varies inversely as the square root of their specific gravity or density.

423. Do you agree with the statement that gas can remain stationary?—Gas may lodge in the roof. There is diffusion taking place, but there is also perhaps a continuous admission of more gas, so that the quantity diffused might not be so great as the further quantity admitted.

424. There is a constant tendency to diffuse?—Yes. If a fixed quantity of gas is not increased it will gradually be diffused and become mixed with the atmosphere.

425. Is it not true that a large quantity of gas is really safer than a small quantity, so long as it is not mixed with oxygen?—It is true that it will not explode if over 16 per cent., but if it is between 5.6 per cent. and 16 per cent. it will explode; about 10 per cent. it is the most explosive mixture.

426. Do you know of any gas-explosions in mines which have happened where there was a strong current of air at the time?—No, but a mine may be well ventilated in one place and ill ventilated in another.

427. Do you know that explosions have occurred where there was no gas at all, and where there was a splendid current?—Yes, a blown-out shot may project the flame into the dust, and if it were inflammable an explosion would occur.

428. I am not referring to dust-explosions, but to gas-explosions?—You cannot often dissociate the two things in mines.

429. Have you read about the explosion at Silkstone?—I do not know the details of that disaster.

430. I think there was 40,000 cubic feet of air rushing past, but the explosion was so violent that the flames reached 120 ft. above the shaft-head?—What was the contents of the air rushing past?

431. It was pure air?—Was that stated in the report?

432. One writer on the subject says: "The more active the ventilation sometimes the more coal-dust will find its way into the returns, and therefore render the conditions more dangerous." So that ventilation is not a complete preventive?—No, you want intelligent management and so on.

433. In the case of the Silkstone explosion to which I referred there was from 40,000 to 50,000 cubic feet of air passing along the road which was the main intake. There were three shots fired. From the positions of the men it was believed that these were not fired simultaneously. Shot-firing