

## MY VISIT TO AN ENGLISH COAL-PIT.

(CONCLUDED FROM NO. 86.)

"That door and the others like it," explained our guide, "shut off certain passages as part of the plan of ventilation. You find no difficulty in breathing, though you are seventeen hundred feet or more below the outside air, and nearly three miles from the 'down-cast.'"

"Where, then, is the source of fresh air? There are three hundred men at work in this pit day and night, from week's end to week's end, Sundays excepted, year in and year out. That alone is enough to poison the air of the pit, to say nothing of the gases that are now and then set free by the working."

"That used to be the state of pits in old times, and then colliers died in the prime of life of asthma, heart disease, consumption, and what not; but since the Hartley accident in 1862, the government won't have it. There used to be but one opening in the pit's, the 'down-cast,' and though in the best pits that was divided through its length by a brattice, in order to make an inlet and an outlet, it was not enough, and two hundred and five men and lads died in the Hartley pit for want of fresh air, besides those killed. Now you see we have the 'down-cast' shaft, and at the other end of the pit as it were—two miles in a straight line across the fields in this pit, as you know, or nearly so—is the 'up-cast' shaft. We will go and see just now. (We were all leaning against the coal wall irrespective of dust or drip, for we couldn't sit down on the damp clay.) Well, from the 'down-cast' to the 'up-cast' the air is made by means of these doors, or 'stoppings,' as they are called, to pass along the workings in a regular and orderly manner, at the rate of a hundred thousand cubic feet a minute, and so a constant supply of fresh air is secured."

"Well," said one of us, "I don't see how it's done. Air won't suck or tumble down a shaft and pursue its way along extended underground passages itself, neither cold nor hot, and you haven't any big bellows up above to force it down that I saw, besides which, if you had, you couldn't make it travel far."

"Quite right. Yet it is the simplest thing in the world—when you know how. But come, the ladies would like to handle a collier's pick, I daresay, and have a bit of Durham coal to take home with them."

"Yes, indeed!" we cried, and we followed our guide into another cutting, where loose coal, the first we had seen in the pit, was lying about. A pick was found and handed to us. For my part I found it heavy and awkward, but I meant to get a piece of coal. I tried to pick into the black wall before me, but somehow the point always missed; then I tried the broad side, amid the rather audible smiles of my companions, but I might as well have tried to crack the side of a granite rock."

"Try here, ma'am, try here," kindly interposed our guide, and he indicated the sharp corner of the cutting, which I had not ventured to attack lest I should mar the symmetry of the collier's 'face.' I tried, and off came a piece as big as a walnut. I tried again, and yet another as large as my fist. With this I was fain to be satisfied, for 'hewing coal' was hard work. Others having provided themselves with specimens of coal, we turned back, and, after a sharp walk along a broad cutting, became conscious of a light, and that evidently the light of a fire. Was the pit on fire? But no! it was not likely our guide would have remained so unmoved had there been danger. Suddenly he turned into another cutting and all was dark as before. After a while he stopped before another low door—I have not said that these doors were of pine, two inches thick and strongly barred—taking a key out of his pocket he unlocked it and bade us look in. We did so, and saw nothing but a cavern some ten feet in depth—its width and height uncertain, and its floor heaped with great lumps of coal and some 'rock.'

"That," said our guide, "is the beginning of a new cutting. How should you like to be shut in there by an accident and know you could never get out?"

"Awful!" we all cried. "But why have a door there and locked?"

"It's part of the ventilation-plan of the mine, and it don't do to play with scientific rules. Ah! many's the poor lad that's been buried alive in his own cutting by an accident."

Closing and locking the door with a gentleness evidently born of sad memories, our guide preceded us—all thinking solemn thoughts—to the glare-lighted road. We soon perceived that the warm red glow proceeded from an immense furnace of fire, some twenty feet across, on which a man was shovelling very small coal, or, as it is termed, "screenings," from a great hill of the same that lay before it. The combustion of this immense mass—which, to make a rough guess, comprised three or four tons—was perfect. It was a dense ruddy glow from bottom to top, and it awoke a wonder in our minds how the man who shovelled on the coals could stand the heat of it. But we perceived that, after having thrown on a few shovelfuls, he would retire beyond the range of great heat, and after a while throw on more. The quantity he threw on seemed, compared with the mass of fire before him, to be so insignificant that the question was asked why he did not make the fire up very high once for all and so save himself the frequent exposure to the heat.

"Well, ma'am, that's one of the secrets of proper ventilation. That furnace heats a certain quantity of air up to a fixed temperature, thus rarefying it so that it ascends the stack of the 'up-cast' shaft, which I will show you. But

sit down, ladies; here is a bench."

We sat down rather thankfully, for we were growing tired. Our guide went on:

"You see that if a quantity of air is rarefied by the heat so that it ascends out of the mine, the cooler air that has been guided by the 'stoppings' throughout the workings moves in to take its place, and so a regular and complete circulation of the atmosphere that descends at the 'down-cast' takes place. But it is necessary to be careful that the air is not over-heated, or else its expansion becomes too great—it will not ascend, and thus the ventilation of the mine is impeded. That is why the man only throws on so much fuel at a time, and that at intervals. A good deal of variation in the speed of the circulation of the air through the mine used to be caused by the variations in the temperature outside. For instance, if it were very cold when the air is condensed, or very hot when it is expanded, or if a gale were blowing when it becomes regular, all these difficulties are to a great extent scientifically met, yet not so completely that the inspector finds his important office a sinecure, and he often has to spend a good many hours in his dismal den here taking observations and making up his reports." And our guide indicated an opening in the black diamond wall, which we had not noticed. By the light of his lantern we looked in and saw a good-sized closet—dismal enough in its unoccupied state—in which was a chair, a desk, a cupboard, a somewhat elaborate arrangement after the style of a thermometer on the wall, and a recess blocked by a strong door.

"And does the inspector get his records from the man who feeds the fire?"

"No, no; something more accurate than a pit-lad tells the inspector all he wants to know. That thermometer you see has an automatic connection that registers its own variations. There is another arrangement that tells whether the air of the mine is pure or laden with gas or other exhalations. In that cupboard is a register connected with the fan-wheel you saw on the wall just behind where you were standing, and that tells whether the fire has been kept up to the right point by the resolutions it records. You see the wheel is so placed in connection with the heated air that it revolves at a certain rate all the time if the ventilation is perfect, and thus by referring to the register in his cupboard, the inspector can check off the man's work. I can't show you the register for the inspector carries the key, and thus any dishonest tampering with the record by the stoker is prevented."

"Well, as you said, Mr. Johnson, it all seems very easy 'when you know how,' but there is a good deal of science about getting a lump of coal after all."

"Aye, ma'am; a good deal more than some folks think."

"And does the stoker, as you call him, spend the whole of his eight-hour shift down here by himself, with no one to speak to?"

"Oh, yes, mostly; but he doesn't mind it. He amuses himself by looking out for the inspector, who is liable to call upon him any time of the day or night, and sometimes a man brings his Tommy along and eats it by the furnace light as more cheerful than his 'cutting.'"

"Eats his Tommy!" repeated some one in a shocked tone.

"Oh, that's his baggage—his lunch. Pit slang, you know."

"And how would the poor man get out if there were an accident? By the 'up-cast'?"

"Oh dear, no. Come and see it?"

We went across the great square space before the furnace of fire, and at the side of the glowing mass we found a kind of cupola, up which we were bidden to look. It seemed as though we were gazing from the bottom of a deep narrow well. The sides—straight as an arrow and polished by the continuous passage upward of dust-laden damp air—shone as bright as a newly-blacked boot when the light fell on it, and, as it seemed to us, a mile or so above our heads appeared a circle of white light as big as a cheese plate,—in fact the opening was several feet across. This was the 'up-cast' shaft, and any hope of escape for an imprisoned man that way died away as we gazed. Over the fire is built an immense chimney-stack that continually belches forth the smoke and steam formed by the combustion of the coal, which in all the northern coal fields is soft, or bituminous, though not so soft as our own. Again we realized what a solemn thing it must be to be shut in the depths of a coal-pit without hope of rescue.

"Well, I think you've now seen all I can show you, ladies and gentlemen," said our guide, "and so if you please we'll start on our way home."

"I should like to speak to the stoker and cheer him up a bit, if you have no objection, Mr. Johnston," said our minister, "and then we'll go. It would seem cruel to leave him without a word, that is, if it's not breaking rules."

"Not a bit. Here, Jack!"

The man came, looking hot and red through the coal dust that covered him from head to foot.

"Why, Jack Boddy, is that you?"

"Uts may, Mester Blank," replied the man grinning, but somewhat bashful in the presence of ladies.

"This is our infant class teacher at New Chapel, Mr. Boddy," said our clergyman in introduction of our new acquaintance, whereat Jack bowed a not ungraceful salutation, and a few words were exchanged with him by most of the party as to his work, his loneliness, his responsibility, and similar topics.

"Couldn't we have a little prayer meeting in commemo-

ration of our visit into the bowels of the earth?" said one. "Capital!" said everybody. "What hymn shall we have?"

"I would like that good old hymn, 'My God the Spring of all My Joys.' It seems so appropriate to our helpless position down here and so comforting."

And so we sang as many a Methodist collier has done under like circumstances:—

"My God, the spring of all my joys,  
The life of my delights,  
The glory of my brightest days,  
And comfort of my nights.

In darkest shades if Thou appear,  
My dawning is begun,  
Thou art my soul's bright Morning Star,  
And Thou my rising Sun.

With Thee conversing I forget  
All time, and toil, and care,  
Labour is rest, and pain is sweet,  
If Thou, my God, art there.

The opening heavens around me shine  
With beams of sacred bliss,  
If Jesus shows His mercy mine,  
And whispers I am His."

And then our clergyman prayed—for colliers and colliers' wives and colliers' children, for inspectors, viewers, fitters, weighers, 'lads'—meaning the pushers, drivers and trappers, who are the 'lads' of a pit—and lastly, for the stoker, the overseer and the engineers, who had been and were of our party that New Year's Day. On rising, we all shook hands with Jack Boddy, whose fire was asking for more coal, and turned our steps homewards. Through a perfect labyrinth of black and mostly narrow cuttings, we again took our way, until we found ourselves among trucks.

"Now, keep close to the 'face' on your right and don't be afraid, there's nothing to hurt you; but its very dark and a great many trucks are standing here. This is a kind of station, to which the full trucks are drawn by the hauling-engine you saw at the bottom of the 'down-cast.' Come on! this way."

It was no easy work. We had to push ourselves between the trucks and the "face," and suddenly there was a cry! *Some one had fallen.* A lamp had disappeared, too, and it was dark as pitch!

"Come back, Mr. Johnston!" "Who is it?" "Are you killed?" "Oh, do speak!" resounded through the dark vaults of the pit.

Our guide was soon back, and a voice began to be heard from depths below: "I'm not hurt, but I can't find my hat."

It was our clergyman! near to some of us and dear to all. He had tried to pass on the other side of the trucks in order to allow more room for others, and had fallen down a graded way, that was some seven feet deep at its end, near where he was. Fortunately he was not much hurt, though somewhat shaken up, and his cheerfulness reassured us sufficiently to reconcile us to the long time he took to "find his hat," which had rolled to the far end of this dismal Avernus, and was not easily found by the light of a dim "Davy" held over the abyss; his own had gone out in the fall.

At length we found ourselves clear of the trucks, a few among loose boards, stepping over which and up a few steps, we found ourselves in a small room, where there was a man with a lamp. Telling each gentleman to take a lady by the hand, our guide led us, two at a time, on to a small hand-bridge, beneath which yawned more abysses. But these were only the openings to another level, whence laden trucks were drawn on workdays, and none of our business. We were brought there to see two gigantic "reels," as much like cotton spools as possible. On these were coiled scores of feet of wire cable, and the reels were put in revolution by the hauling engine before spoken of. Of course they were at rest. The man with the lamp explained to us that these reels worked an endless cable, so that while drawing up one lot of full trucks, they were fetching back a lot of empty ones that had been up the "down-cast" shaft to be weighed and emptied.

"But how do you stop the winding when you wish? Have you any means of communication with the hauling engine?" we asked.

"Ah can do ut in a second bah pressun' thess little 'breuk' wi' ma thoomb," the man replied, pointing out a small piece of wood, or iron, at the edge of one of the reels. "Yeh say aal oor machanery hes to be laike the stars, mighty weel hoong, and than ets izzy meniged."

A proposition in high Northumbrian which carried its own proof. Bidding our friend "Good-bye and a Happy New Year," we followed our guide along a wide cutting and suddenly found ourselves at the door of the hauling-engine room. Here we found the engineer was gone home, and having picked up our wraps, we turned a corner and stood at the bottom of the "down-cast" ready for our ascent. Mr. Johnston's signal to the engineer of the winding-engine seventeen hundred feet above telling him we desired to ascend not being regarded, we began to feel rather blank, and to speculate on what would happen if the engineer had gone home and forgotten us. Some were for rapping hard on the bottom of the shaft, and were the first to laugh at the futility of the plan. Others thought we might do very well in the engine-room for a few hours, if only our lamps, of which only two remained alight, did not go out. Then somebody tried to create a diversion by asking Mr. Johnston why the flooring of the great vault where we stood coped so greatly instead of lying flat. Mr. Johnston explained that it was the immense weight of the heavily bricked walls and roof, together with the super-