

roof were once broken in this district, as would necessarily happen on the pillar work being started, the increased flow of water could scarcely be coped with; and this view has since proved to be correct. The pillars could, of course, have been left in; but the extraction of the pillars constitutes one-half of the work for which the mine is opened out, and is frequently the more profitable part of the working; so that a very heavy claim for damages would have resulted had the company been prevented from working the pillars out. As it was, there was no power to stop such work, neither would it have been desirable to do so.

Another consideration in working this fault-bound area of Coal-pit Heath was, that the faults might to some extent isolate this area with its heavy water from any subsequent workings in the further parts of the lease. At all events it would have been impracticable to work the latter area from the fault-locked portion of the lease. This further area, so far as is known, can be worked from the Brunner dip without the very expensive fault-cutting required from Coal-pit Heath; the only obstacle being the great depth from which the coal and water would require to be raised, and this is the same no matter from which lease it might be done. Further, had the pillars in this mine been left in, it would have served no purpose, as the increasing amount of displacement when the Brunner No. 1 fault is followed to the dip, would have rendered the work of fault-cutting so costly that it could not have been undertaken, and thus the fault-locked area would have had to be abandoned, with the loss of the whole of the pillars, instead of a small fraction of them, and no object attained.

Coal Lost.—In regard to the quantity of coal lost by the flooding of this mine, we have shown that the area over which the pillars extend is about $27\frac{3}{4}$ acres, but of this area there has to be deducted about $9\frac{1}{4}$ acres of pillars, which could not have been taken out under the face of the cliff without having a tendency to fracture the rock to such an extent that very large masses would probably have fallen from the face of the cliff from time to time. At the same time, giving due consideration to the position and pillars as left in the mine, we do not consider there is any likelihood of a slip taking place whereby the cliff might slide into the Grey River and block it up. Deducting the $9\frac{1}{4}$ acres of pillar-workings from their total area, it leaves 16 acres of pillars in which there is about 40 per cent. left of the solid coal. Assuming, therefore, that there are 10,207 tons per acre of marketable coal, the actual loss of coal in the pillar area which might have been extracted under the most favourable conditions would have been about 65,325 tons.

In dealing with this area it must be borne in mind that, in stating that the maximum amount of coal left in the pillars is 65,325 tons, it would be almost impossible to extract the whole of that, having regard to the safety of the workmen employed, because the pillars have been taken out in the rise workings, instead of commencing at the dip, and in all probability not more than 30,000 or 35,000 tons of coal could have been taken out with safety. There is also another element which must not be lost sight of, and that is, before the different mines were amalgamated and worked under one proprietary, the length of time that elapsed during which the former workings were carried on, allowed settlement to take place, and subsequent working has increased this, resulting in opening cracks and joints in the rock-covering of the coal, and allowing surface water to get into the workings; the influx of water became so great that the pumps were unable to keep it down to the bottom of the dip, more especially in wet weather, and this seems to have been the principal reason for commencing to work out the pillars at the rise.

At the time of our inspection the whole of the workings in the Coal-pit Heath Mine and the lower workings in the Brunner Mine to the eastward of the Brunner No. 1 fault were full up to the water-level channel which leads into the Grey River. The quantity of water flowing out of these workings would be about six hundred or seven hundred gallons per minute, and after heavy rain it would probably be nearer twelve hundred gallons.

Barrier.—There is a barrier of solid coal between the Brunner and Coal-pit Heath Mines, which the Committee appointed in 1890 recommended should be left in, and of which about six acres might have been taken out if the water had not risen. This would give about 60,000 tons of coal; but as the pumps have been withdrawn, and the rails lifted, it would not pay the proprietors to place the pumps again in position to recover this coal.

Brunner Colliery.—The old Brunner workings, forming the area north of the Coal-pit Heath lease, and east of the No. 1 fault-line, consist of partly worked-out pillars; and nothing has been done therein for a considerable time except working some fire-clay.

The No. 1 fault has been cut by the extension of the main level at a point where the amount of displacement is *nil*, as the faulting gradually disappears when the line is followed to the north. The main level has been further extended to the north-west, until, at a distance of 65 chains from the mine mouth, or 33 chains from the No. 1 fault, a thinning of the coal is reported to have been met with about six years ago. The area to the rise, or north-east of the level, has been formed into pillars up to a line roughly parallel with it and some 24 chains distant, where the coal is said to have been of unsaleable quality; and thence the pillars have been almost all extracted back to the level. The area to the dip has been opened out by an incline, which is 29 chains long, and from which the present workings are being carried on. At the face of this incline, which is the farthest point to the dip yet reached beyond the No. 1 Brunner fault, a thinning of the coal has been met with, the total thickness being 3ft., of which 1ft. was stony coal, quite unfit for use, leaving a thickness of only 2ft. of clean coal. Driving was continued in this some 80ft., and, as no improvement took place, it was concluded that this was the line of thinning met with in the main level, and nothing further was done towards opening up the back portion of the lease. It seems to be this thinning of the coal in the dip incline which disheartened the company, and caused them to abandon prospecting operations which previously had been contemplated by them. We are, however, of opinion that there is a fair probability of the coal thickening out again, as there is a roll met with coming down through the workings from the rise, and the incline crossing this at a very slight angle may account for the greater width of the thinning that has taken place.