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NEW SOUTH WALES.



ROYAL COMMISSION ON COLLIERIES.

R E P O R T

ON THE ACCIDENTS AT

FERNDALE COLLIERY.

Presented to Parliament by Command.

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SCHEDULE.

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ROYAL COMMISSION ON COLLIERIES.

PROGRESS REPORT ON THE ACCIDENTS AT FERNDALE COLLIERY, NEWCASTLE DISTRICT, ON 18 MARCH, 1886.

To His Excellency the Right Honorable CHARLES ROBERT BARON CARRINGTON,
Knight Grand Cross of the Most Distinguished Order of Saint Michael and
Saint George, Governor and Commander-in-Chief of the Colony of New South
Wales and its Dependencies.

MAY IT PLEASE YOUR EXCELLENCY,—

The Commission appointed to make a diligent and full inquiry into the cause of the accident that recently occurred to the Ferndale Colliery, in the district of Newcastle, in this Colony, and also to report upon the condition of the Collieries adjacent thereto,—also to make an inquiry into the disasters that happened at the Lithgow Colliery, and to report upon the working and ventilation of the coal-seams, and more especially the thin coal-seams of the said Colony,—having presented their Report to Your Excellency on the accidents at the last-named colliery, assembled at Newcastle, and having examined all available witnesses touching upon the accident that occurred to Ferndale Colliery, on the 18th of March last, whereby one miner and the mining plant and works, as well as the adjacent small collieries, were inundated with sea-water and sand, and irretrievably lost—concluded their inquiry, and unanimously agreed upon the following remarks, illustrative and descriptive of the colliery operations, as well as their decision on the cause of the catastrophe on the date named. These, together with the documents detailed on the margin hereof, the Commission have the honor to present to Your Excellency.

For the purpose of thoroughly investigating all the circumstances that led up to the catastrophe to Ferndale and adjoining collieries, the Commission assembled at Newcastle, on Wednesday, the 26th May, and while considering their decision on the cause of the lamentable accidents at Lithgow, they, by advertisements inserted in the three local newspapers, and by placards distributed among the surrounding mining townships, invited any persons who could give evidence on the cause of the accident at Ferndale to appear before them for that purpose. To these invitations no response whatever was obtained. Nevertheless, the Commission pursued their investigations, and by the aid of the allotment or “Cavil” sheets of the colliery and otherwise succeeded in ascertaining the names of a number of witnesses who were duly summoned, appeared, and gave evidence.

After spending a day in examining the site of the accident, and receiving explanations from the colliery manager, and afterwards from the Government officials, all of whom gave willing and valuable assistance to the Commission, the examination of witnesses was begun on Monday, the 31st of May, and was concluded on Monday, the 7th of June, when, from lack of further evidence, the inquiry closed.

During

During the sittings thirty-five witnesses were examined. On the completion of the work of transcribing the shorthand-writers' notes, the Commission again assembled, at Newcastle, on Wednesday, the 30th of June, and having arranged the course to be pursued in inspecting and investigating, in a critical manner, the condition of the collieries adjacent to Ferndale, they proceeded to discuss the evidence given, and the salient and pertinent facts elicited, during the exhaustive inquiry bearing upon the serious accident at Ferndale.

In visiting and inspecting the collieries inundated by the accident of the 18th of March, whereby one miner, named John Jenkins, lost his life, and the lives of many others were imperilled, the Commission sat continuously (Sundays excepted) during eleven days, for an average of six hours daily, from the 26th day of May until the 7th day of June, both days included. The laborious work of summoning the witnesses, and of formulating the nature of the evidence to be elicited, being performed after the sitting for the day had terminated.

Ferndale is the name given to a colliery situated on the *top* of a conglomerate ridge, about $2\frac{1}{2}$ miles in a straight line to the *north* and west of Newcastle. The property is owned by Mr. Charles Sweetland, banker, Mr. Henry Law, banker, Mr. C. F. Stokes, merchant, and The Honorable James Fletcher. This low ridge is known as Tighe's Hill. On it, and along its southern margin, numerous shallow collieries have worked out the coal-seam that was found to underlie the building allotments and the Maitland Road.

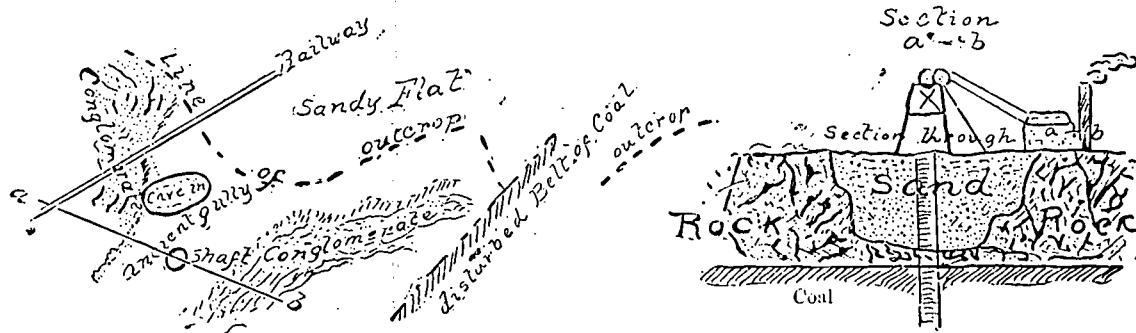
Tighe's Hill has a general trend to the north-west, and consists of conglomerate and sandstone rocks, that cover a bed of excellent coal, from 16 to 18 feet in thickness. This coal dipped gently towards the south-east. To the south the margin of the hill is swept by a tidal creek, which, with its ana-branches, is known as Tighe's Creek. Beyond this, to the south and west, the coal crops out into sand-covered flats, elevated a foot or two above high-water-mark.

Tighe's Hill may be considered to be an outlier of the Waratah ridges, the low-lying land between these points having been formed by the ceaseless action of shallow water, continued through long ages. This eroded the strata overlying the coal, then broke the continuity of the coal-bed, and afterwards laid down, during a period of local elevation, the littoral deposits of sand-pebbles, shells, and mud that are found to cover what remains of the carboniferous series of rocks on the flats or swamps that surround the harbour of Newcastle.

At the present moment the summit and sides of this ridge present a scene of confusion, caused by innumerable pit-falls, denoting where attempts have been made to remove the small-sized pillars of coal that supported the roof. The Maitland Road crosses the southern margin of Tighe's Hill. Under it the coal-seam measures 16 feet in thickness, and is found under the surface at a similar depth. The coal has been worked from under this road, but the thin pillars have not been removed, and these at present form its sole support. Towards the west (opposite Bevan's and Spennymoor) the coal crops out under the creek, and has been worked to within a few feet of its tidal waters. The pillars that maintained the integrity of the surface have subsequently been removed, and the water has obtained access to the workings, and rises and falls every tide.

An examination of the sides of the larger pit-falls shows how variable and capricious the character of the roof is. At one spot it is sandstone; a few yards away it is aluminous post; while within a few yards of the last named it is coarse pebbly conglomerate. As a rule the limits of these "caves-in" have been determined by the presence of defined fissures filled with white unctuous clay, known as "graybacks." These are seen to intersect each other and cut straight up through the strata, large pieces of rock dropping out between the lines of intersection. The presence of these fissures or "graybacks" are not always obvious to the workers of the coal. For the most part they are confined to the hard overlying strata, and do not at all times (although they sometimes do) descend into the coal. These, undoubtedly, constitute a special element of danger that must constantly be kept in view in the process of winning coal from under tidal swamps, fluvial deposits, or situations of whatever description requiring special care, skill, or circumspection.

By referring to plan No. 1 it will be seen that the drawing-shaft at Ferndale is situated on the crest of Tighe's Hill. The depth of this shaft is 49' 6" to the bottom or floor of the coal, or 31 feet to the top of the coal. In sinking this shaft no solid rock was passed through. The surface deposits extended from the grass to the coal. How erratic and uncertain in its distribution the overlying strata is may be judged when it is remarked that only a few yards to the west, and the same to the south or east, solid conglomerate approaches the surface, and covers the coal-seam. Ferndale shaft is, therefore, sunk on the site of an ancient bay or gully, from whence, in prehistoric times, the conglomerate has been removed from above the coal-seam, while the coal itself remains intact, as under noted.



To the south and east, and in close proximity to this shaft, three small collieries have worked the coal from under a number of building allotments, leaving no barriers. The proprietors of Ferndale having secured the coal under a number of these allotments to the south, No. 2 south headings were driven for winning the coal in this direction. The workings to the west of these "headings" approached the Maitland Road, and a spirited rivalry or competition seems to have existed among the conterminous small collieries as to which could work the greatest area of coal from under this important thoroughfare. No restrictions seem to have been imposed on the workers. In consequence, this road has been honeycombed with workings for a considerable distance, and is at present supported by pillars so thin as to be almost invisible. It is alleged by the owners of Ferndale that they left a sufficient barrier of solid coal around each of the small collieries shown on plan, No. 1 Appendix, but that this barrier, as well as the top-coal, and as many of the pillars as could be got at, were removed by these small owners; and in this manner—and by reason of their own thoughtless cupidity—the twenty small collieries, or thereabout, on this ridge have been communicated with each other. As a result of these inter-communications, when Ferndale was inundated the whole of these collieries were filled with water.

It

It appears that No. 2 south headings were commenced with the ulterior intention of working out a considerable area of coal owned by the Company south of Tighe's Terrace-street, and probably, also, of anticipating some of the small colliery owners referred to in working the coal from under the Maitland Road in the direction of the bridge across that creek.

This main heading, after crossing Bryant-street, struck a "roll" (really a down-throw fault) and a disturbed belt of coal, to be afterwards referred to, when operations in this direction ceased.

The westerly bords off this heading communicated with the workings from Robinson's colliery, marked (12) on plan No. 1; while other bords, reaching the Maitland Road at or by following the line of Elizabeth-street, opened out under that road east and west, and worked the coal for a considerable distance north and south of that point.

The colliery officials, on being interrogated on the point, affirmed that these bords, on reaching the western fence of the road, were stopped. Mr. Inspector Dixon, however, suspected that these bords had crossed the road, and had been driven towards or under the creek, which here forms a sharp elbow, and sweeps under an escarpment of conglomerate. On being called upon to do so, Mr. Mackenzie, Examiner of Coal-fields, produced a plan of older date than the one put into the hands of the Commission, in which the faces of the bords under review were shown to cross the road, and were stopped under the bed or channel of Tighe's Creek. This survey is shown on plan No. 1.

Tighe's Creek is a tidal stream, with muddy banks, that follows a tortuous course through the swamps contiguous to the bridge that conveys the Maitland Road across it. This stream divides into several channels that again coalesce to the west.

The flat land in the elbow referred to that bounds the creek to the west is composed of sand and silt, and is elevated not more than 3 or 4 feet above high-water-mark. It forms a portion of the A.A. Company's estate. After heavy rains this low-lying land is covered by flood-waters. The limit of inundation is determined to the west by a ridge of loose sand, on the top of which the Waratah railway to Port Waratah has been carried.

Upon this low-lying and flooded land, nearly opposite Bryant-street, and about 2 chains from the margin of the creek, a small colliery (now owned by Messrs Broughall & Griffiths) has been sunk.

The depth of the shaft is only 23 feet to the top of the coal-seam, and, like Ferndale, is entirely composed of fluviatile or estuarine deposits. Some bords worked from this colliery had been pushed under Tighe's Creek towards Ferndale workings; and one bord, shown on No. 1 plan, had reached within 10 or 11 yards of the advanced workings from the last-named colliery at the date of the inundation (18th March, 1886).

The uncertainty that existed as to the correctness of the underground plans, and the terrible nature of the catastrophe that had occurred to the adjoining collieries, presumably acted as an incentive to the Government officials to serve notices upon Messrs. Broughall & Griffiths to cease working; and, although the Law Officers of the Crown, probably with reason, did not see their way clear to place an injunction on these gentlemen to cease working, the action taken has had the good effect of preventing any further work in the bords approaching Ferndale from being prosecuted.

The

The coal-seam under this flat appears to lie directly under the surface deposits, no solid strata intervening. A depression contiguous to the shaft marks the site of some pillaring operations, and around this an embankment has been raised to prevent flood-waters from obtaining access. Further consideration of this colliery is deferred until the Commission have the honor of presenting to Your Excellency their report "on the Condition of Collieries adjacent to Ferndale."

The conglomerate ridge of Tighe's Hill extends for about half a mile towards the east, when it slopes off, and the conglomerate disappears below a broad expanse of muddy and mangrove-covered swamp, through which the channel of Throsby's Creek winds. The great expanse of these swamps is covered to a depth of about 2 feet with saltwater every spring-tide. Six bores put down to the east, and marked on plan No. 1, prove that the conglomerate must have come down by a series of ledges under the tidal swamps. These consist of estuarine deposits, consisting of sand, sea-shells, and clay.

It will be seen, by referring to the bores recorded in No. 13 Appendix, that the thickness of the estuarine silts or deposits, now covered by spring-tides, varies between 50 and 70 and 100 feet. These silts have, with the exception of the clay, no cohesion. The continual presence of sea-water must keep the sand in a state of semi-suspension.

The limit of high-water-mark to the east of Tighe's Hill is approximately shown on plan No. 1 by a bold dotted line.

The proprietors of Ferndale Colliery, having secured a large area of coal to the east, extending for half a mile or more under the swamps referred to, commenced a pair of dip-roads branching off No. 2 south headings. These followed the line of a street. At a distance of about 5 chains (110 yards) from the point where they commenced, these roads intersected the line or course of the "roll" or fault before referred to, by which the continuity of the coal-seam was broken, and was disturbed and thrown down to the east 8 feet. This faulty belt of coal entirely altered the character of the coal-seam.

It has been remarked that to the west the coal-seam varied from 16 to 18 feet in thickness, but on opening out the seam to the east it was found to be much altered. The conglomerate had come down, and cut off from 11 to 12 feet of the top part of the coal-seam. [See Sections, Appendix.] In addition to this, its dip or pitch was most irregular, and it began to give off a large quantity of salt-water. Over a length of 10 chains the coal-seam was found to be disturbed. From explanations given by the Manager, it appears to have been subjected to lateral pressure, which caused the seam to rise and fall in a series of waves or undulations, most expensive and difficult to follow, although, in the course of the dip-roads, it assumed a settled appearance, and enabled the headings to be pushed towards the east, and workings (known as No. 8 district) to be opened out. In following the seam to the dip the quantity of water given off increased. Under these untoward circumstances, the pumping-shaft at C (plan No. 1) was sunk at the base of the conglomerate ridge, and just on the margin of the tidal swamps.

This position was selected in the belief that it was to the dip of the available coal-field (the lowest part).

At a depth of 111 feet the coal-seam was reached, 2 feet 9 inches thick, and a westerly drive was commenced to meet the dip-roads referred to. (See evidence of Hon. Jas. Fletcher.)

Contrary

Contrary to expectation, the coal-seam, instead of *rising* in that direction (in the direction of the dip-roads), actually dipped, and as the amount of saltwater given off by the pebbly conglomerate roof and the coal-seam continued to increase, very great difficulty appears to have been experienced in joining the two drives and in unwatering the mine.

The coal-seam over the whole of this (No. 8) section formed "swallys" or hollows; out of these water was obliged to be removed or "bailed" at great expense. A few months before the accident as many as twenty-one water-bailers were required to keep the working-places and roads in a comfortable and passable condition. Considering the number and uncertainty of these "swallys," it does not appear that much improvement could have been made in this branch of the expenditure.

Two special steam-pumps were placed at the bottom of the pumping-shaft that forced about 16,000 gallons of water per hour to the surface. These pumping-engines were supplied with steam from boilers on the surface.

From the main dip-roads a large area of coal has been won by following the district system (with the exceptions to be referred to) of working 8-yard bords, and leaving pillars only 4 yards in thickness. These workings have, so far as the Commission have been able to ascertain, been laid out and carried on in a regular and methodical manner, creditable to the Manager, considering the many irregularities in the deposition of the coal-seam, and the numerous difficulties that required to be surmounted.

The "main dips" referred to appear to have been driven on the verge or line of demarcation between a part of the field where the coal was thin (2 feet 6 inches to 3 feet 6 inches), and unworkable to profit, and a part where the coal measured from 5 feet 6 inches to 6 feet in thickness. To the south of these dip-roads, and of the so-called levels from C on plan No. 1, the coal-seam was thin, on account of the top-coal checking out, and the "jerry" (a phrase or localism denoting a mixture of coal and shale) thickening and taking the place of the top-coal.

As the hewing price of the coal throughout this district is based upon a minimum standard thickness of 5 feet of coal, and rises 1d. per ton per inch for all coal under that standard, it follows that coal so thin as 2 feet 6 inches to 3 feet 6 inches thick is unworkable to profit.

Having satisfied himself by workings to the south of the main roads towards C that the coal thinned to the south and east, and was unworkable to profit by following district customs, the Manager withdrew the men from these workings, and confined his attention to opening up the thicker coal to the north.

The roof of the coal over No. 8 district was composed of conglomerate, which gave off from fissures much saltwater. In patches this firm roof receded, and wedges or layers of shaly post ("falling") intervened. This subsidiary roof varied in thickness from a few inches to 6 or 7 or even more feet. It was irregularly distributed. The percolation of water from the conglomerate softened this aluminous post, and it required to be supported by double sets of timber to prevent it injuring the workers.

Strict injunctions appear to have been given by one of the owners (Mr. Fletcher) to the Manager to protect the workmen from the falling of this shale or post,

post, and the men were empowered to erect double timber where required. For this work they were paid 1s. 6d. per set, in addition to the rates they received for hewing and yardage. Mr. Inspector Dixon and the whole of the witnesses concur in saying that no expense was spared, and every precaution was taken to support the roof.

For six years prior to the catastrophe of 18th March, Ferndale Colliery was under the sole management of Mr. John Powell, a man of long and varied experience in mining. Mr. Powell had long been known to Mr. Fletcher, and the other partners appear to have reposed confidence in his ability and judgment. Mr. Powell is known to some of the members of the Commission as a man possessing much energy and unflagging zeal, and he impressed the Commission favourably as to his solidity of character and natural intelligence. The extraordinary character of the difficulties encountered and overcome by Mr. Powell, and the systematic manner the colliery has been laid out and worked with the slender means at his disposal, is an evidence that the eulogium on his circumspection and management bestowed upon him by Mr. Inspector Dixon—himself a cautious and a thoughtful man—was well deserved. Of the four proprietors of this colliery, three (namely, Mr. Sweetland, Mr. Law, and Mr. Stokes) were commercial men, and possessed no intimate knowledge of mining. The other proprietor, on the other hand (Mr. Fletcher), possesses a particular knowledge of coal-mining, and has for the past thirty years been closely identified with coal-mining in this district.

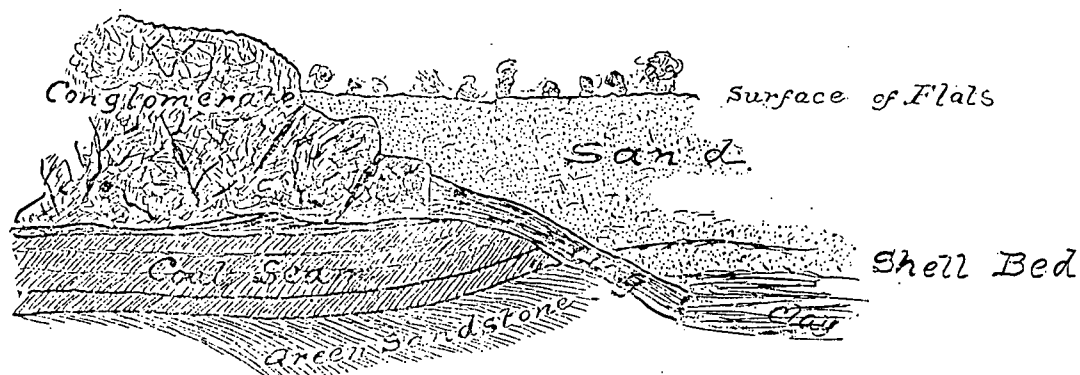
The public and other engagements of the last-named gentleman precluded him from taking any active interest, or, indeed, any part or control in any way of the colliery operations. He appears only to have been down the colliery on three occasions. Mr. Powell was, therefore (*vide* evidence of Messrs. Sweetland, Fletcher, and Jno. Powell), given the sole conduct of all operations above and below ground, and he was in the habit, at the monthly meetings of the Company, of reporting to them generally on the state of the works, &c. Although, from a concatenation of untoward and unexpected circumstances, the cost of raising coal from No. 8 workings was so great as at times almost to equal the price obtained for coal, the proprietors seem not to have doubted the integrity or management of Mr. Powell. From first to last he seems to have enjoyed their confidence and support.

Up to the date of the accident about 110 acres of the coal-seam had been worked over, leaving the superincumbent strata supported on pillars 4 yards in thickness.

In order that Your Excellency may grasp the position, the Commission consider it proper to explain the circumstances and condition of the "rise" or "crop," or north workings of this colliery.

West of the "roll," or the disturbed belt of coal referred to, that was with so much difficulty crossed by the "main dip" or engine-roads—and that separated No. 8, or the dip workings, from the thick coal-workings surrounding the drawing-shaft—the major portion of the coal was covered by a strong bed of pebbly conglomerate rock that reached to the surface. With this rock as a cover the limits of the coal-field were defined to the north, and followed the contour of the ridge. Below this the coal-seam was worked to a line where the conglomerate formed a ledge, and gave place to estuarine or surface deposits. After losing the protection

afforded by the conglomerate, these deposits of sand first rested upon, then descended and cut off, the coal-seam. The line of outcrop of the coal into the sand marks the margin of the shores of an ancient sea or tide-way, as shown by the rough hand-sketch below.



The explanation of this phenomenon is, that at a time, infinitely remote, when the physical aspect of Australia was very different to what it is—when the relative positions of land and sea were somewhat different—ocean currents were directed against the friable conglomerate beds—they entered fissures, loosened, then detached blocks, to roll and grind and erode and carry away large quantities of debris from the beds overlying the coal-seams—large portions of the coal-seams themselves were removed and carried away, channels were formed, and in the fulness of time—under different conditions—the currents, loaded with sand and mud, deposited their contents in the still depths of former valleys, or channels, or lagoons formed by rising or water-logged land. Slowly the denuded rocks approached the sea-level; the tops of undulations became islands, and against their shores or sides the ceaseless surges lashed and beat-up comminuted shells, and on a littoral shore formed the estuarine deposits that underlie the swamps that bound the valley of the Hunter. These deposits represent but a fractional part of the energy and forces that were at work in the distant past, while the world that is was being prepared for present existences. Thus, the sandy flats near Islington and Point Waratah, or the muddy mangrove swamps of Throsby's Creek, were formed, and slowly rose above the level of the sea.

The irregular line of crop, therefore, marks the shore or bank of an ancient channel, and this is delineated on plan No. 1.

It has been remarked before that the drawing-shaft was sunk in a gully or channel, and that silt and sand rested on the top of the coal-seam. This evidently marks the position of an old watercourse or arm of the sea, where the currents had removed the whole of the conglomerate, and had reached the top of the coal, when, from some cause, its further denudation was arrested, and the hollow or channel became filled up with detritus. In the same channel, a few chains to the north-west of the shaft, the thick coal was won by following the empirical district custom of working 8-yard "bords" or "stalls," and leaving 4-yard pillars to support the roof. Over the western portion of the field these pillars had been removed, bringing down the surface in a series of pit-falls. Incautiously removing the coal pillars under the channel referred to, the sand rushed down, and with it a flow of water that kept it running to such an extent that it was with difficulty prevented from reaching the bottom of the shaft.

Subsequent

Subsequent operations were carried on with more caution. Knowing that the sand and surface deposits contained water, care was taken to push narrow gate or exploring drifts in advance of the "bords," for the purpose of defining the position of the crop of the coal, and by this means of regulating the thickness of the barrier of coal the Manager had resolved to leave along the outcrop to protect the mine from being invaded with sand and water, which undoubtedly would have happened had the workings been extended up to the crop, and the pillars afterwards indiscriminately removed.

In No. 8 workings (east of the roll), when approaching the surface, patches of soft coal were found, and when these were pierced often gave place to excellent firm coal, and this, it may be remarked, is a peculiar and remarkable feature of some of the Colonial coal-seams. The best evidence that the real crop was being reached was the soft and rusty and useless character or quality of the seam, and the high angle of or pitch of the bed. When the ordinary working-faces approached coal possessing these characters a narrow road or coal-drift was commenced at intervals of a few chains, and was driven until the sand or clay was seen in the roof or face, or until the Manager was convinced of its proximity. The unmarketable coal was then left as a barrier or a protection against the inroads of the surface or of the soft silty deposits.

In this sensible manner the coal was worked, and the line of crop defined for a distance of about 30 chains east of the "roll" referred to. At I on plan No. 1 the line of crop approached the margin or limits of the tidal waters and entered the swamps. During spring-tides sea-water overflows the low banks of Throsby's Creek, converting the broad expanse of Mangrove Swamp into a great shallow lagoon. The Manager was *not* ignorant of this circumstance. The exploring drifts proved that the line of crop suddenly stretched further north. The same system of defining the line of crop and of working was pursued, with this exception, that whenever the nature of the roof demanded, or when the Manager was convinced of the contiguity of the crop, the width of the working-faces or bords was reduced from 8 yards to 6, and even to 4 yards wide, still leaving pillars of the uniform thickness of 4 yards. Close attention was evidently given to support the roof by means of timber. All the witnesses (workers), as well as Mr. Inspector Dixon, are unanimous in their statements as to the care of the management in this respect.

At the point marked J on plan No. 1 a pair of very narrow headings or drifts were driven on end for about 50 yards in advance of bords 4 and 6 yards wide. The narrowness of these headings, the circumstance that the upper bords were also worked narrow (thus involving a considerable increase on the cost of production), of so much care being bestowed on timbering, would seem to point, in the opinion of the Commission (notwithstanding the assurance of Mr. Powell to the contrary), to a state of uneasy uncertainty in the practical mind of the Manager that coal-mining under tidal swamps was attended with more than a usual amount of danger.

The narrow headings at J had just been driven (*vide* evidence of Jno. Powell, Jos. Powell, J. Pickavance, and R. Cotterill) when the miners, in going to their work one morning, discovered that a very large fall had occurred some yards back from the face, composed of clay, sand, and shells, with a little water. This fall spread for some yards down the headings, and, having a threatening aspect, the
Manager

Manager or Overman at once put in a strong timber barricade or dam, to prevent it from flowing into the lower workings. This is known throughout the evidence as the "Little Fall," and it occurred about fifteen months before the accident of the 18th of March, 1886. On the following morning it was found that the surface deposits had broken in afresh, and more effectual means were taken to stop the inflow of the sand, and secure the workings from danger. The measures so opportunely taken were successful. The fall choked itself, and appears to have been forgotten, and left no serious apprehensions in the mind of the Manager, Overman, Deputy, Check Inspectors, or the men who saw and knew of its occurrence.

The Commission were most particular in the examination of witnesses as to their knowledge of this "little fall." Several saw this "fall" in the workings, and although they observed shells among the sand, this circumstance does not seem to have raised any apprehension of danger in their minds. Other witnesses, who had not seen the fall, had heard of it. Some of the witnesses had suspicions that the workings were under tidal waters; while others, such as Joseph Jackaman and William Williams, positively asserted that they had frequently heard conversations among the workmen to the effect that they were working under circumstances so perilous that, if an accident occurred, the whole of the men would run a risk of losing their lives. These witnesses, on being pressed, could not remember or give the names of any of the workmen whom they had heard so express themselves. The witness Jackaman, particularly, incensed the Commission on account of his impertinent effrontery and contumacy; while William Williams, on being cross-questioned, would not, or could not, mention the names of the men whom he asserted he had frequently heard conversing on the subject, but, as Secretary to the Local Miners Union, affirmed that the Check Inspectors referred to danger in some of their periodical reports. The reports of the Check Inspectors are enclosed in the Appendix, and a perusal of these will show that no reference to special danger is referred to. The Commission are constrained to place no importance on the statements of these men. The Commission, likewise, regret that other witnesses, of whose intelligence and verity they had no doubt, displayed a taciturnity and unwillingness to give information that is far from creditable to them. In several instances the evidence given was obtained with difficulty, and almost under compulsion.

After the "little fall" at J heading had occurred, a deep depression appeared on the surface that the first high-tide filled with water, to be used afterwards by boys as a swimming-bath. This circumstance was known to Mr. Powell, the manager, and to some of his officials; it was likewise known to some of the workmen. It was *not* known to Mr. Inspector Dixon, or to Mr. Mackenzie, Examiner of Coal-fields, who, although he was acquainted with the geography of the tidal swamps, does not seem ever to have visited the mine or examined the position of the workings.

Mr. Inspector Dixon was aware of the character of the surface deposits over these flats, he having put down several bores in them; but he informed the Commission that he was unaware that they were covered with sea-water. He was also unaware that J heading had reached the sands, or of the occurrence of the "little fall"; but at once admitted that, if he had seen this fall, and had known its position on the surface, he would have considered it as a warning of great danger, and one that should not have been mistaken.

On this point the evidence given by the Manager, Mr. Powell, and that given by Mr. Dixon somewhat conflicts. The former, towards the close of a lengthy examination, admitted that he showed the fall underground to Mr. Dixon, who warned him of the danger he was running, but did not point out the danger. The Commission believe that Mr. Dixon may have cautioned Mr. Powell in a general way to exercise due care, and that probably his attention was not particularly called to this "fall," or that its position on the surface was explained to him. The evidence given by Mr. Dixon was given freely, and without any qualification or hesitation; he anticipated no danger, nor could he see evidence of actual danger, and that the precautions taken by Mr. Powell as to the leaving of crop-barriers, reducing the width of bords, and protecting the roof with timber, were, in his opinion, ample and sufficient.

After the occurrence of the "little fall" the whole of the working-bords approached, or had actually passed, within the limits of high-water-mark. This was known to the owners, and no concern or prominence was given to it. The Manager also was aware of the circumstance, but nothing in the state of the coal or roof excited the suspicion of himself, the Inspector, or Check Inspectors, or the men. Some bores put down on the confines, and some distance within the swamps, proved the thickness of the deposits to vary from 50 to 70 and 100 feet. The results of these borings were also known to the Manager, the Government officers, and the district experts.

About the beginning of 1885, after the occurrence of the "little fall," two of the owners (Messrs. Sweetland and Stokes) met Mr. Croudace, manager of Lambton Colliery, when the conversation turned upon the cost of producing coal. The high cost of getting Ferndale coal was referred to, when Mr. Croudace intimated that he could produce the coal several shillings per ton under the price they were paying. The owners were then given to understand that, if they entrusted the viewership to him (Mr. Croudace), this would be accomplished.

This statement, deliberately made by a gentleman occupying the position of Mr. Croudace, appealed with so much force to the non-practical minds of Messrs. Stokes and Sweetland that they communicated with Mr. Fletcher, the practical owner, on the subject of Mr. Croudace's representations.

On receipt of this letter by Mr. Fletcher, the latter, feeling that his compeer would find it difficult to accomplish the feat he had promised to Mr. Sweetland, yet unwilling to stand in the way of a successful issue to their enterprise, replied by letter, dated 21st January, 1885 (No. 9 Appendix), wherein he recounts the difficulties, but stating his willingness to give Mr. Croudace a trial, and proposed to allow him a margin of 3d. per ton on the price quoted by Mr. Croudace, and a salary of £150 to £200. per annum in excess of that stipulated by him, provided the efficiency of the mine was maintained (*vide* letter and evidence of J. Fletcher and C. Sweetland).

It was subsequently arranged that Mr. Croudace should visit the colliery. This he did, about the beginning of March, 1885. He appears to have made a most particular investigation, having examined and made excerpts from the colliery books, cost-sheets, examined the plans, inquired for and obtained journals or records of the swamp bores, the underground workings, ordered levels to be taken, and afterwards walked over the estate with Mr. Powell, and having satisfied himself

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on these points, he, on the 20th March, 1885, indited a report and sent it to the proprietors for their consideration (*vide* report 20th March, 1885, No. 10 Appendix). In August following (No. 11 Appendix) he again addressed the proprietors by letter, his proposed emoluments being then the theme of his communication.

The proprietors (*vide* evidence of C. Sweetland and J. Fletcher) having reconsidered Mr. Croudace's first statement as to his ability to produce coal several shillings under the then cost, in connection with the proposals suggested in his report, and the circumstance that not only had he failed to point out any feasible way of reducing the cost, or pointed out anything of a more serious character than a trifling defect in the pet-cocks of a steam-pump, but had actually proposed to incur a large expenditure for the purpose of working many acres of coal too thin to work to profit, and that had for this very reason been abandoned—and feeling, likewise, that the proposition of Mr. Croudace to dispense (without giving him a trial) with an old and tried Manager, and to substitute in his stead an irresponsible Overman, did not commend itself to their minds as means likely to lead to any diminution in the cost of production, but, on the contrary, would probably have led to the ruin of the proprietors, they decided not to entertain the proposal of Mr. Croudace, or to make any change in the management.

Mr. Croudace having satisfied himself by an inspection and by the perusal of bores, and expressed no doubts as to the security or otherwise of the mine, or of the bords approaching or that were already under the tidal waters, and having proposed an extension of these workings half a mile further into the swamp, probably had the effect of lulling the suspicions of Mr. Powell and others (if they had suspicions) to sleep, and to believe that no danger did exist, and the lesson of the "little fall" was forgotten.

From the point J the workings were continued eastwards; the two upper bords were driven 4 and 6 yards wide. Having proceeded eastward for about 100 yards, they were cut off by a main heading. Off this heading, Thos. Cunliff (*vide* evidence) commenced the bords opposite the fall of 18th March, 1886; they were 4 and 6 yards wide. Isaac Hadfield (*vide* evidence) turned off a bord a few yards below; it was 6 yards wide. Wm. Teasdale (*vide* evidence) worked in the bord next to that where the fall occurred; it was 6 yards wide—while three bords below, on No. 34 (No. 1 plan), was 4 yards wide. These witnesses, therefore, as well as Jas. Murray and others, concur with and corroborate the Manager (John Powell), the Overman (Joseph Powell), and the Deputy (John Smith), in their statements as to the width of the bords—that the roof to all appearance was sound and dry, that it was well-timbered and supported, and that they observed no evidence of fissures (flaws or joints) or "graybacks" in the roof.

The Commission feel that the evidence of these witnesses, all of whom could speak precisely and with decision, on the facts and circumstances within their knowledge is conclusive proof, and must override and exclude the unsupported assertion of Mr. Croudace, namely, that he was informed that the width of the bord where the fall took place in was 8 yards wide.

Upon the frail uninvestigated fabric of an alleged reply to a question that no one seems to have heard, he deemed it wise and prudent, subsequent to the accident, to indite a letter to the proprietors respecting Ferndale, and afterwards to
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the daily papers—*Newcastle Daily News*, March 25 and 30, and April 12, 1886—of a somewhat prophetic character, respecting “delta” collieries, which had the effect of creating a profound sensation in the district, and much apprehension and alarm in the minds of a large section of the community.

K headings (plan No. 1) were started, and were driven about 50 yards in advance of the highest bord. The width of K heading was only from 3 to 5 feet. The coal had a considerable pitch. These headings were continued until the surface deposits came down to form the roof of the coal. Before the headings reached the surface deposits the two highest bords had been stopped on account of the surface showing in the face. The line of crop had, from some cause, swerved suddenly round to the south, as follows :—



The soft nature of the roof, and the knowledge that the line of crop had (probably on account of the conglomerate forming a cliff or ledge) swerved down in front of the upper two bords, caused the Manager to erect a strong barricade across the K heading, marked ==. It would, however, appear that on account of the high pitch of the seam at that part the floor was not very favourable for such erections. This barricade was erected from no fear or suspicion of actual danger, but as a pure and proper measure of precaution where the workings above had proven the existence of surface deposits that on former occasions had given some trouble.

Mr. Inspector Dixon does not recollect inspecting K heading, or to have seen it or the barricade, or to have been in the two highest bords. This is not remarkable, considering that they may have been begun and finished between his visits. He did not go beyond the last working-bord during his last inspection. The barricades were put up openly—no means appear to have been taken to conceal the work from the workmen. They were open to the inspection of anyone who chose to visit them. They did not excite the suspicion or call for any remark from the Check Inspectors or from any of the men.

For many months prior to the catastrophe, about to be referred to, the whole output of coal from this colliery was obtained from bords that were covered by tidal swamps. The working-faces were approaching a “fault” (dislocation of the strata) that for many yards entirely broke the continuity of the coal-seam. The bore marked on plan No. 1, in advance of the leading heading from C, proved the thickness of the surface deposits to be 50 feet, and the coal itself to be 3 feet.

Mr. Dixon inspected this colliery on the 26th February, 1886, only three weeks before the accident. His inspection was of a thorough character, and doubtless strengthened him in his statement when examined, that he observed no defect nor sign of danger, but considered the colliery was ably conducted, and that every attention was paid to the security of the men. In his opinion it was the best-timbered colliery in the district. Mr. Dixon made no complaint to his chief (*vide* Report No. 7, Appendix).

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On the morning of Thursday, the 18th of March, the foreshift of men had just commenced work. Wm. Teasdale worked in the bord below that in which the fall occurred, Cornelius Peters about 60 yards below, Jno. Hargreaves about the same position, Wm. Williams and John Jenkins (deceased) three or four bords below the fall, and the other witnesses at various points of the eastern faces. About 7.30 a.m. the witnesses (John Powell, wheeler, and David Jones, horse-driver) were at the moment in the bord of John Jenkins (No. 34). The horse was coupled to the skip, when they heard an ominous noise, and one or both ran out the road in order to ascertain the cause. On their way toward the main heading these young men suddenly ran into a stream of sand and water rushing downward. With a strange instinct as to the cause they hurriedly returned, called out to John Jenkins to make his escape with all speed, as "the river had broken in." When last observed the poor man was looking for his stick (being a cripple), and preparing to put on his clothes. Powell and Jones abandoned their horse, and ran downwards through the "cut-throughs," warning each man of the calamity, and finally, in effecting their own escape, they all but lost their lives.

A tremendous volume of water and debris was observed rushing impetuously towards the lower workings. Across this torrent every man was obliged to pass. In some instances the force of the current carried them off their feet and swept them downwards. Many miraculous escapes were made. John Smith, the Deputy, had just left the rise workings, and had observed nothing wrong. He was proceeding to the shaft by the main road for breakfast, when he suddenly saw the lights of men emerging from the travelling-road into the dip-road in front of him. Not knowing the cause of so many men leaving off work from a district he had only a few minutes before left, he shouted to some of the men, and was informed of the catastrophe. Along with Isaac Hadfield, he at once returned, by way of the rise workings, and saw the extent of the calamity, but was unable at that time to ascertain from whence the water came.

Mr. Powell, the Manager, on being warned, at once proceeded down the colliery, and, with some of the men, rapidly made his way towards the foot of K. heading, but was unable, on account of the amount of water, to ascertain then where the "fall-in" had occurred.

On the surface a large hole appeared some distance out on the swamps, and down this an enormous rush of water (it being high spring-tide) was descending into the mine, carrying with it large masses of sand and silt.

Mr. Powell, having made particular inquiries, ascertained that two men, John Hargreaves and John Jenkins (a cripple), had not been observed to come out of the mine. He at once descended the shaft, and, with a party of men, made his way towards the seat of the accident. It does not appear that they were able on this occasion to ascertain the locality of the "fall-in," and the party returned to the surface.

Meantime, the tide having subsided, an anxious group of residents, men employed at the mine, the Manager, Mr. Inspector Dixon, Mr. Gardner, of Bullock Island Colliery, and others, were enabled to walk across the swamp and inspect the cavity formed by the rush of descending waters. Upwards of an acre of surface had been carried into the workings, and it was observed (*vide* evidence of Powell, Dixon and

and Gardner) that the surface deposits measured only 25 feet in thickness. The conglomerate rock on which the surface rested was exposed. In the centre was a hole of no great size at first. These witnesses descended and examined this hole, and, looking down, saw a large bell-mouthed cavity below where the post rock had fallen. Rough measurements were taken of the thickness of the strata superimposed upon the coal, and the following is the record given by these intelligent witnesses, which may be taken as approximately correct:—

						Feet.
Surface sand and silt	...	...	...	...	...	23
Clay...	...	...	...	...	...	2
Conglomerate	...	...	...	...	...	12
Post...	...	...	...	...	...	28

In all 65 feet. The size of the hole enlarged until it measured 5 feet x 4 feet; it had straight sides, and convinced these witnesses that a piece of rock had dropped down (under pressure of the sand and water—about 22 cwt. per square foot, or 22 tons on the area of the hole). The hole was defined by “graybacks,” or joints, or fissures, that are common in the roof of the Borehole or Newcastle coal-seam all over the district. A network of these treacherous “graybacks” had, unknown to the Manager or men, existed in the apparently sound roof. Water had, in all likelihood, gained access to these fissures, and, finding vent below, after the coal was worked, had gradually loosened the block of rocks referred to, and prepared it for yielding under the dead pressure of sand loosened by sea-water during the first high-tide. It is impossible in working coal to discover the presence of “graybacks”; and the knowledge that these may occur, and are not perceived, forms a special danger in working coal under tidal waters, of which this accident is a proof; and it is one that the Commission feel will be difficult to deal with.

When the tide fell in the adjoining creek the stream of water flowing into the mine diminished, and the Manager employed a large number of men to throw up a temporary embankment to stem back the return tide, as well as to place obstacles and close up the hole in the rock. While this was being done cries were heard ascending from the workings. The Manager, with the promptitude and fertility of resource that appears to be with him a second nature, procured ropes, and himself, for the fifth time, descended the shaft, and proceeded into the rise workings, and found that he could then reach the cavity and see the opening. Before he got there the man John Hargreaves had been drawn up (*vide* his evidence). He, however, inspected the fall, and ascertained its locality to be opposite to the second narrow bord (corroborated by Jno. Smith, J. Hadfield, and Jno. Hargreaves). The post had fallen, and extended along the bord for about 8 yards. The Manager and his party worked their way down the upper bords, looking for John Jenkins, but he was nowhere to be seen, and on returning to the surface they ascertained that John Hargreaves had been rescued. After the rescue of Hargreaves the work of closing the aperture was continued.

Hargreaves was working eight bords below the site of the fall. While leisurely making his escape he lost his light, and, stumbling in the dark, he was suddenly immersed in water that, but for his strength, would have swept him away. He struggled on the top of the rubbish that had been built against the sides, and at one time he felt the water gradually rising up his body, and when it had reached his neck it began to descend, and eventually receded so low as to enable him to reach

reach a point where he observed the sheen of daylight, and proceeding over the fall he called lustily, and was rescued in the manner narrated (*vide* his evidence). The unfortunate man John Jenkins was not observed by anyone in the fearful excitement that ensued after the announcement by the boys, John Powell and David Jones, of the occurrence of the accident.

The succeeding tide came up with great rapidity, and began to pour down the cavity in volumes. The cavity in the sand increased to over 2 acres, and trees and mangroves were carried down and disappeared into the workings. All hope of saving the mine was abandoned. On the following day the whole of the extensive workings were filled up, and the sea-water, flowing through the openings into the other small collieries already referred to, inundated them also. At the present moment an enormous pool marks the site of this unfortunate accident, and the tide rises and falls in the numerous shafts and workings around Tighe's Hill.

On Saturday, the 20th, the proprietors, anxious to ascertain whether any feasible means could be suggested to recover the body of the unfortunate man John Jenkins, hastily convened a meeting of colliery managers and others to meet at the colliery office. A representative meeting accordingly took place, and a lengthy discussion ensued. Some suggestions were made to stem back the waters by resorting to coffer-dams or iron cylinders, but these were dismissed as impracticable. It was but too evident that Jenkins was irrecoverably lost, and that to pump the workings dry after sealing them off from the sea, and to clear out the 70,000 or 80,000 tons of sand that had descended, would be a task that few firms could attempt. The colliery was practically worked out—only a few acres of coal remained to the west of the fault that had been proved in the level from C, and again by a heading bord above that road; while the thin coal to the east of that disturbance was known to be unworkable to profit, if paid for and worked at district rates and on the district system.

Prominent among the gentlemen assembled on the Saturday after the accident (20th March) was Mr. Thomas Croudace, of Lambton. He was elected chairman. On visiting the scene of the accident the tide was full, and it covered the swamps; nothing could be seen but a vast sheet of water, with the tops of scrub and bushes protruding through. Mr. Croudace suggested that the managers should take the somewhat extraordinary course of proceeding into the water, and ascertaining in this way the locality and the extent of the "cave-in." Finding that his colleagues preferred the more sensible plan of waiting until the tide had fallen, when they could to more purpose accomplish this end, he requested Mr. Powell to accompany him, and the two proceeded into the water.

It is difficult to see what good purpose could possibly be effected by such a proceeding. During this examination with poles Mr. Powell just escaped drowning.

Two days thereafter, considering it his duty to do so, he wrote a lengthy letter to the proprietors, dated 22nd March, 1886 (No. 12 Appendix), wherein he pointed out the excessive danger that had attended their operations by working the coal under the tidal swamps by means of 8-yard bords, and that, if they had entrusted him with the viewership, he never would have permitted such to be done, &c. Similar letters, condemnatory and enlarging on the danger of working the "delta collieries" he enumerated, subsequently appeared in the daily papers, the effect of which has naturally been to disturb the public mind, and raise grave fears for the safety of workmen engaged in the collieries referred to in Mr. Croudace's letters.

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The Commission look upon the letter of 22nd March, 1886, as equivalent to a charge of incompetence and of reckless management and neglect of ordinary precaution against the Manager, and probably the proprietors and Inspector of Collieries; and they desire, with the permission of Your Excellency, to discuss the points raised in this letter.

As already stated, Mr. Croudace, in the opinion of the Commission, appears to base his charge as to the width of the bords in which the fall took place on his own unsupported statement that Mr. Powell said so, in reply to a question from himself, before the other Managers, at the conference held on the 20th March. And, further, that when he and Mr. Powell were wading through the water, on what really appears to have been a purposeless errand, he looked round, and discovering to the west a separate depression and pool of water, he asked Powell what it meant, when the Manager replied that it was the site of another fall that had occurred there only a few weeks before. Mr. Croudace read this letter to the Commission; he had not, however, a copy of his report of a year before. The Commission have given this charge much consideration, and they have taken great pains to get to the bottom of the actual facts. They can come to no other conclusion than that the statement of Mr. Croudace as to the width of the bords where the fall occurred is founded on a palpable error, and is, moreover, unsupported by the testimony of any of the Managers who assembled with him at the colliery two days after the accident, all of whom assert (*vide* evidence of A. Ross, A. Gardner, J. Thomas) that the width stated to the conference by Mr. Powell was 6 yards.

Mr. Powell (recalled) distinctly denied ever having made any other statement, and states that Mr. Croudace expressed no surprise, as he asserted. The Commission consider that the evidence of the miners who actually turned off these identical bords, and who gave their evidence before it was determined to examine Mr. Croudace, must be taken as conclusive proof that the width was 6 yards only.

With regard to the statement that on observing the subsidence to the west of the great cave-in, and receiving Mr. Powell's explanation, considering that the flats at the moment were covered with a considerable depth of water, it is difficult for the Commission to see how any depression could have been perceived. Mr. Powell denied ever having made such a statement, or that the subject was ever referred to. It was conclusively proved in evidence that the "little fall" actually occurred about fourteen or fifteen months before the accident of 18th March.

With these circumstances before them, the Commission exceedingly regret that Mr. Croudace ever hazarded statements so calculated to damage the prospects and reputation of, so far as they can judge, a deserving Manager, and to disturb the confidence of the public in the collieries adjacent to Ferndale, in the development of which large sums of money have been spent. The premises of the letter of 22nd March being thus, in the opinion of the Commission, erroneous, it is not surprising that the conclusions were fallacious, and not altogether creditable to the perspicacity of a gentleman who, for so many years, has been Manager of an adjoining colliery. Furthermore, Mr. Croudace admits having inspected Ferndale underground workings; but explains that the object of his visit was not to critically examine the safety of the mine, but was undertaken solely for the purpose of satisfying himself whether he would or would not accept the position of Viewer. On the other hand, the evidence of C. Sweetland and J. Fletcher, and the letter (No. 9) referred

referred to, clearly explain the condition on which they would give him the appointment, viz. :—It was conditional on that gentleman being able to reduce the cost of production several shillings per ton, as he had suggested, *without interfering with the efficiency of the colliery.*

Mr. Croudace was conducted round the workings by Mr. Powell, who appears to have showed him everything. Mr. Croudace states in his evidence that he was not shown the “little fall” below ground. Mr. Powell affirms that he did show it to him. On coming to the surface, Mr. Croudace states in evidence that he did not view the surface position of the eastern workings he had inspected; but, from a point near to the drawing-shaft, he generally looked towards the swamps. Mr. Powell, on the other hand (when recalled), states, in the most emphatic manner, that not only did he take Mr. Croudace into the workings and there point out to him where the “little fall” took place, but, when they came to the surface, he took him down to the pumping-pit (at C, plan No. 1), and from thence walked along the brow of the ridge above the tidal limit, and at or about I on plan pointed out the actual depression in the swamps where the fall came to the surface, thus identifying the fall below and above ground. This Mr. Croudace does not admit; but the Commission, while willing to make allowance for the forgetfulness of any witness on such a point, would desire to bring under the observation of Your Excellency the following lines from the report No. 10, already referred to:—“Upon ascending the shaft or tunnel, I inspected the surface positions, and can only say I was strengthened in my opinion as regards the necessary work you should execute to assure more economical working.”

Mr. Croudace recollects the workings east of the pumping-shaft; he afterwards visited that shaft on the surface. From his knowledge of the district he was acquainted with the limits and character of the swamps. Some years before he had experience of sinking a shaft through similar deposits, near to Stockton, east of the harbour, and when at the pumping-pit could not avoid observing that the tidal water laved the debris that surrounded it. The Commission have, therefore, good reason to believe that this witness knew the full import of the sentence quoted above, referring to the “surface positions.” These written words the Commission accept as corroborating the statement of John Powell, the Manager, and go to show that when the report in question was written Mr. Croudace was aware of the position of the workings, but did not apprehend danger.

Having examined the ground, taken levels, and studied bores put down in the swamps, he recommended the proprietors to commence a new sinking half a mile further east, at a spot where the tidal waters are deepest, contiguous to a bridge across Tighe's Creek, marked with a circle on the plan, and where the sand was much thicker than near the site of the fall of 18th March. Mr. Croudace, when he recommended this situation, ought to have known, and probably did know, that the coal in that position was too thin to be worked to profit; and from this point he proposed to work a very large area of unprofitably thin coal, in order that he might the more effectually unwater the small area of thicker coal that remained unworked west of the fault. This, with some reference to the condition of cocks upon pumps, was the scheme he put before the owners in order that the working cost of their coal should be reduced. The Commission look upon the report referred to as proof that Mr. Croudace had all the circumstances of this colliery in view in March, 1885; and that not only did he *not* perceive or anticipate danger, but proposed an extensive scheme of working coal under a large area, and under the very worst part of the

the swamp, much greater than Mr. Powell probably contemplated; and this, too, by a system of working in no essential point differing from the practice followed by Mr. Powell. The consideration of these documents has given the Commission considerable pain, and they never would have been referred to but for the publicity given to the opinions enunciated by the author himself. It is much to be regretted, that after inditing his report of March, 1885, this engineer condescended (on data that he could readily have assured himself were erroneous) to write his letter of 22nd March, 1886, or his subsequent letters to the daily papers, calling public attention to the dangerous condition of other collieries he refers to. It is easy to be wise and prophetic *after* the event. This engineer appears to have meditated long and deeply on the special dangers attending the working of collieries he calls "delta collieries," and it is just, yet scarcely, possible that in the case of Ferndale he had suspicions of danger, but awaited his appointment as Viewer to point them out. This engineer had an opportunity afforded to few others of forming an opinion on these eastern workings, and if the slightest suspicion of danger did really lurk in his mind it was his clear and bounden duty, as an engineer, then and there, and without waiting for an accident to happen, and regardless of pecuniary consequences to himself, to have solemnly warned the proprietors of the danger attending a pursuance of their operations—giving them intelligible reasons for his apprehensions.

The Commission, having long and anxiously considered the evidence given, together with the plans and documents handed in by the parties examined, have unanimously come to the following conclusions:—

First.—That the unfortunate accident that occurred at Ferndale Colliery on the morning of Thursday, the 18th of March last, by which one man—John Jenkins—lost his life, and the colliery workings and underground plant of this and adjoining collieries have been lost, was caused by the sudden and unexpected fall of a rectangular piece of conglomerate rock and of sandstone post—defined by a network or segregation of open joints or fissures, known as "graybacks," that are common in the roof of the Newcastle coal-seam. That the separation or fracture of this piece of rock was probably induced by the dead-weight exerted upon it of 25 feet of wet sand, and the superadded weight of the water during an exceptionally high tide.

Second.—That the position of this fall was opposite to or over a narrow bord 6 yards (six yards) in width, and in the locality near to E on plan No. 1. And that up to the time of the accident the roof near to this site gave no evidence of weakness; but, on the contrary, appeared to be sound, and was supported or strengthened by an ample amount of timber.

Third.—That the accident was not foreseen, nor could it have been anticipated to occur where it did, and for this reason could not have been prevented.

Fourth.—That the deceased, John Jenkins, miner, met his death by drowning, being in all probability swept away (by the impetuosity of the stream of water that was passing his road) while attempting to escape. He was of diminutive stature (about 5 feet in height), and a cripple; so that, unaided, he could scarcely be expected to buffet his way successfully through such a torrent to a place of safety.

Fifth.

Fifth.—That John Powell was vested with the full control and management of Ferndale Colliery by the proprietors, and that (so far as the Commission are able to judge) he carried on his underground operations in a regular and systematic manner. The irregularities in the occurrence and in the deposition of the coal-seam, and the difficulties that were encountered in the course of working, were numerous, and in surmounting these and providing for the general safety he exercised care and judgment.

Sixth.—For reasons already given, and from the evidence adduced, the Commission can attach no blame to the Manager, officials, or owners for the accident of 18th March ultimo, whereby one man lost his life, and much valuable property was inundated beyond hope of recovery.

The Commission having arrived at the above conclusions, desire to express, *in the light of subsequent events*, their views on the following points:—

They believe Mr. Powell to be an active, careful, and prudent Manager, who dealt with difficulties in a creditable manner. His ability as a Manager is attested by the regularity of the workings delineated on the plan; his care and solicitude for the safety of the men, by the large amount of timber he permitted them to use. This involved a heavy expenditure, which the owners do not appear to have grudged. Ferndale was a small colliery, and the limited area of coal to work did not justify any extravagant expenditure on machinery or expensive cutting to unwater the numerous hollows from which the coal had to be removed. Notwithstanding his asseverations to the contrary, the Commission are inclined to look upon the formation of narrow bords, especially near the crop, the excessive amount of timber, the formation of crop barriers of coal, the driving of very narrow drifts up to the surface deposits, and the erection of strong barricades (although precautionary measures of the right kind) as indicative of a feeling of insecurity in Mr. Powell's mind.

The Commission do not see that he could have taken more effectual means of securing the safety of the mine, unless he had caused a series of surface bores to have been put down at short intervals to guide him in his work.

It is somewhat remarkable that the surface deposits did not break down in the face of these exploring drifts, where there was no solid strata to resist their weight, but broke down through a thickness of rock believed to be solid, and almost double the thickness of the sand and silt. The reason for this has already been given, but it is a point which the Commission feel is of the utmost moment, and deserves the dispassionate and calm consideration of all those who work minerals under similar conditions. The fact that at Ferndale 25 feet of sand and water broke through 40 or 42 feet of rock, while the surface deposits in the face of drifts a few yards to the north remain sound, is a serious point that cannot well be overlooked when considering the limits within which coal-mining can safely be carried on under estuarine deposits or bodies of water.

Where the fall occurred the roof was to all appearance sound; only two bords lower down, or to the south the conglomerate came down to the top of the coal. To drive bords narrower than the width that, for some reason, has been adopted as the district standard, viz., 8 yards, involves the payment to the miners of yardage rates, in addition to the ordinary cost of hewing, that materially adds

to

to the expense of winning the coal, and when to this is added the heavy outlay for sets of timber, placed every 18 inches or 2 feet apart, the winning of coal becomes unprofitable. The Commission are satisfied that, with the experience gained by the occurrence of this catastrophe, it is probable that a fall such as that which took place at J headings will not in future be disregarded by thoughtful managers, but that a wide berth—ample marginal security—will be given to silty deposits overlying shallow coal-workings. It is obvious that no very great reliance can be placed on the soundness or cohesion of a roof rock directly exposed to the decomposing influences of sand and water, that may be intersected with fissures or “gray-backs” that do not always betray their presence to the men engaged at coal-getting.

The Commission believe that from the regular and thorough manner Mr. Inspector Dixon inspected this colliery a dangerous condition of the roof or of the workings was unlikely to escape his notice. It was with some regret that they were informed that the Examiner of Coal-fields had not seen the underground workings of No. 8 section of this colliery; and that, unless on receipt of an alarming report from one of the Inspectors of Collieries, he did not, from a sense of duty, examine the underground workings of any coal-mine. This seems to betray an inactivity and a want of interest in the great industry which renders his office necessary. It is quite possible, from his multifarious duties, that he can ill spare the time necessary to inspect extensive colliery workings. Still, in the case of collieries such as Ferndale, contiguous to his residence, which he knew was surrounded by tidal swamps, his occasional presence in the workings might have led to representations as to working so near to tidal waters, and, possibly, to a modification of the mode of working that might have averted the evil day.

The cost of producing coal from Ferndale Colliery was high, and occasionally amounted very nearly to the price obtained for the coal. Such a discouraging result is not anticipated when capital is embarked in an industry that is doing so much to develop the resources of the Colony. Surrounded, as Ferndale is, by collieries working the same bed of coal, but under conditions so favourable as to ensure large dividends as a reward for the enterprise and the invested capital of the proprietors, the continuance of this colliery must have been somewhat disheartening to the owners, notwithstanding the outlays on yardage, for narrow bords, for water-bailing, and for timber to ensure the safety and comfort of the workmen. It is to the credit of the owners that they at no time attempted to curtail the expenditure on these items, or were tempted to work their mine in a niggardly or cheeseparing manner, but considered the safety of the workmen and “the efficiency of the mine” their first anxiety and object. And this may now afford them some consolation for the loss they have sustained by the inundation of their mine.

In investigating into the cause of this colliery disaster, by which one poor man was lost, and the lives of many others were for a time placed in extreme peril, the Commission feel it to be a pleasure to place upon record the gallant and self-sacrificing conduct of the two young lads, John Powell and David Jones, who, at the imminent risk of their own lives, instantly warned the miners working in the lower bords of the occurrence of the accident, thereby averting a loss of life fearful to contemplate. The promptitude of John Smith (the Deputy), of Isaac Hadfield, and others in returning to the scene of the accident, and especially of the ceaseless and fearless intrepidity and activity of the Manager during the anxious hours

hours that preceded the rescue of John Hargreaves, is deserving of special commendation. To a man of the practical mind, and so anxious for the safety of his workmen, as Mr. John Powell is, as well as to the intelligent and observant Managers and men engaged at the surrounding collieries, the Commission feel every confidence that the calamity that unexpectedly befel Ferndale Colliery on the 18th of March last will be useful and bear good fruit, it may be, in emancipating the industry from the fetters of withering and empirical customs, and enunciating thoughtful and practicable schemes for winning and working coal-seams under conditions that may, forsooth, involve in some cases modifications, and in others a departure from existing systems, but calculated to facilitate the getting and increase the safety of the workmen and the security of the mines.

We have the honor to be,

Your Excellency's most obedient servants,

JAMES R. M. ROBERTSON, President.

W. DAVIES.

J. Y. NEILSON.

WILLIAM TURNBULL.

JOHN JONES.

ARCHIBALD DURIE.

JOHN USHER.

JOHN THOMAS.

JAMES CURLEY.

JAS. SWINBURN.

Newcastle, 21st July, 1886.

MONDAY, 31 MAY, 1886.

Present:—

J. R. M. ROBERTSON, Esq., M.D., F.R.S., C.E., PRESIDENT.

Mr. J. USHER.

Mr. J. THOMAS.

Mr. J. Y. NEILSON.

Mr. W. TURNBULL.

Mr. J. SWINBURN.

Mr. JAS. CURLEY.

Mr. JOHN JONES.

Mr. WM. DAVIES.

Mr. A. DURIE.

John Powell sworn and examined:—

1. *President.*] We understand you were manager of the Ferndale Colliery, Mr. Powell? Yes, I was manager of the Ferndale Colliery.
2. What experience have you had as a manager? My experience has been confined to Newcastle, in which district I have been employed thirty-two years, off and on.
3. How long were you manager of the Ferndale Colliery? Six years. I had been working there as over-man since the pit started.
4. Who appointed you as manager? Mr. Alexander Brown.
5. Who were the owners of the Ferndale Colliery at that time? Messrs. Bingle, White, Harper, and Bevan.
6. Who are the present owners of the colliery? Messrs. Law, Sweetland, Fletcher, and Stokes.
7. Was the whole control of the colliery operations entrusted to you? Yes.
8. Did Mr. Brown hand over to you the entire control of the mine? Yes.
9. Had you any previous experience in the management of collieries? I never managed a colliery before, but I have had both pit and tunnel experience.
10. Have you got a working plan of the colliery? Yes. [Mr. Powell lodges the principal colliery plan of the Ferndale mine and tracing thereof.]
11. *President.*] Has this plan been kept up regularly since the opening of the colliery? Yes.
12. Were surveys of the colliery taken at regular periods? Yes.
13. What interval of time would elapse between the taking of each survey? Sometimes a month, sometimes less.
14. I do not observe that the dates of these surveys have been marked on the plan—have you anything to say in respect to that? Simply that it never has been done, either before or since I became manager.
15. Who made the surveys? I made the surveys after Mr. Simpson left; that is six years ago.
16. When were operations in the colliery commenced? It had been working for nine years.
17. That is, it commenced in the year 1877? Yes, in the beginning of 1877.
18. Who commenced it? Mr. Harper. He was manager and part proprietor.
19. Then Messrs. Harper, White, Bingle, and Bevan were owners at this time? Yes.
20. What is the depth of the drawing shaft? 49 feet 6 inches.
21. You say Mr. Harper first managed the colliery; who was your predecessor in the management? Mr. Simpson.
22. Can you give us the date upon which you were appointed manager of the colliery? I do not remember the exact date; it is about six years ago.
23. Was the Ferndale Colliery sunk on a freehold estate? Yes; it was ground purchased by the Company—an 11-acre block.
24. Was that the entire area? Yes.
25. Did the owners secure any land, on leasehold or otherwise, adjoining this block, subsequently? Yes; they bought forty-four allotments on Pepper Town.
26. Was this freehold? Yes; and they bought 15 acres from Mr. Winship.
27. Have they acquired any leasehold land? Yes, from the inhabitants of Tighe's Hill and Peppertown.
28. And this was taken at a royalty per ton? Yes; some nine-pence, some six-pence, and some one shilling.
29. Do you know the area of the land leased? I cannot tell; there was some at Wickham, in different blocks. We had worked somewhere about 100 acres, and about 100 acres remained in pillars.
30. Did the leases you have referred to contain any provision as to the mode of working the colliery? I cannot tell you; I never saw them.
31. Did they contain any provision as to the removal of the pillars? No.
32. Ferndale is, I think, an easterly extension of Tighe's Hill? Yes, it runs east and west.
33. And Tighe's Hill is a low ridge of conglomerate, that has a northward and south-east trend? Yes.
34. And to the south, the ridge is bounded by a creek? Yes, we call it Tighe's Hill; a branch of Throsby's Creek.
35. Is this creek of any depth? Well, no; except when the tide is up, some of it is without water.
36. It is then a tidal stream? Yes.
37. With a muddy or rocky bottom? With mud, and rock in parts.
38. What is the nature of the country next to Ferndale? Next to Ferndale, to the south, it is conglomerate, and when you come to the east it is conglomerate till you come down to the flat, when there is about 60 feet of sand above the conglomerate.
39. To the north and east of Tighe's Hill there is a gradual fall into low-lying and swampy land? Yes.
40. And that is covered by mangroves, and is subject to tidal influence? Yes.
41. To the west, does the coal worked at Ferndale underlie this ridge of Tighe's Hill—that is, Peppertown? Yes.
42. What coal-seam did you work at Ferndale? The Borehole seam—the same seam as is worked in other collieries in Newcastle.
43. What is the nature of the roof to the south? So far as we have been, it is mostly conglomerate.
44. What is the nature of it in the low swampy ground south of the creek? Going towards Maryvale it is sand and clay.

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45. Is this expanse of plain covered by alluvial deposits? Yes; it consists of clay, sand, and shelly substance.
46. Does the Borehole seam underlie these alluvial deposits? Yes; it slopes off into the creek, and crops in the creek towards the south-west.
47. Then the Borehole seam does not underlie the valley beyond, to the north-west? No, it crops before then.
48. Going across the hollow again, does the Borehole seam re-appear? Yes.
49. At Waratah? No, not at Waratah, but further towards Hamilton; it does not re-appear till it goes into the hill, and under that hill the Waratah Company work the same coal-seam.
50. Is the Borehole seam subject to "faults" west of Ferndale shaft? No; there has been no fault at all west of the shaft.
51. What is its dip or pitch? Sometimes it makes rolls, but is of uniform thickness, about 60 yards to the east of the shaft, with a regular thickness to the crop.
52. What is the thickness? From 16 to 17 feet.
53. And lies at a low angle, undisturbed by faults? Yes.
54. And then dips to the south and south-east? Yes.
55. And from Waratah the outcrop follows a long sweep, by Lambton and the A. A. Company? Yes.
56. And across, under the harbour, by Bullock Island and Maryvale, and joins the Ferndale dip coal? Yes.
57. Then in that case Tighe's Hill is an outlyer of the Waratah Ranges? Yes.
58. And is surrounded by swamps? Yes.
59. And in these the coal crops out? Yes.
60. And these swamps to the south, south-east, east, and north-east, and north, are more or less under tidal influence? Yes, the greater portion of them.
61. What is the natural dip of the coal-seam at Ferndale, west of the shaft? To the west of the shaft it is from 17 to 18 feet.
62. I asked what is the dip? It is to the rise.
63. What is the course of the dip—the direction? South-east; that is, extreme to the south and gradually to the east.
64. What formed your south-western boundary in the western section of the coal-field? The Maitland Road was our boundary.
65. You have worked the coal under the Maitland Road, I believe? Yes.
66. What depth is the coal from the surface under that road? It is about 15 feet from the surface down to the roof of the coal.
67. Of what rock is the roof composed? Soft post.
68. And to the south-west of the Maitland Road, what is the depth of the coal? It crops out just beyond the Maitland Road.
69. In that swampy hollow formed by the elbow of Tighe's Creek, is the coal found? Yes, it is found in the swampy hollow at Tighe's Creek.
70. Then, between the Ferndale workings and the outcrops to the south-west of the Maitland Road, has the coal been worked by other parties? It has been worked by Mr. Bevan, and by Chas. Austin, and several small owners.
71. Are the workings of these small collieries connected with those of Ferndale? Yes.
72. Were any barriers left between them? I left a barrier of coal between Tighe's Hill and Peppertown.
73. But in these little collieries that you have spoken of, do you know what was the nature of the surface deposits above the coal-seam? It was clay and conglomerate, and in the crop it would be mostly composed of this rotten post, with a body of clay on the top of it.
74. Do you know whether these surface deposits gave these owners any trouble? I do not think so.
75. Was the surface of the crop-workings covered by the tide in that position? No.
76. Have the pillars in these collieries been taken out? We took out all the pillars in Peppertown.
77. But I am now speaking of these little collieries? Yes, the pillars were taken out.
78. Did they take them out to the very crop? Yes; they took all they could.
79. Then these collieries, being connected with Ferndale, will now be drowned out? Yes; every one of them.
80. In the western workings of Ferndale the coal-workings appear to have been remarkably regular,—were they as regular in reality as they are on the plan? Yes.
81. The mode of working has, I see, been that of pillar and stall; Yes; 8-yard bords and 4-yard pillars.
82. Do the managers of other collieries in the district follow the same rule as to width of bords and size of pillars? Yes; that is the district rule wherever I have been working.
83. Is this rule followed irrespective of depth? Yes.
84. Can you assign the reason of following such an arbitrary rule? Well, I always worked 8-yard bords when the covering was supposed to be strong enough, and if it was thought the covering was not strong enough they would be worked from 4 to 6 yards.
85. Why should all collieries, irrespective of depth or position, work their coal with 8-yard bords? Can you give any reason for that? No, except that it is customary in all parts of the world where I have been.
86. On looking at your tracing of the plan, the coal-workings are represented to terminate abruptly, and follow a curved line,—does this curved line indicate the position of the outcrop? Yes.
87. That is where the coal has become lost in the level deposits? Yes.
88. Does the coal rise rapidly coming towards the crop? When it comes near the crop it rises very rapidly.
89. And this crop follows the margin of the low ridge called Tighe's Hill? Yes.
90. What was the roof of the coal composed of in this section—the western section? Principally of conglomerate.
91. And did the surface come down and cut out the conglomerate? Yes.
92. Then in that case what was in front of the coal-seams? Sand and clay.
93. Can you give us a section by word of mouth? It is clay in the first place, and just on the edge of where the rock is beginning to form it is rotten post and clay. I did not sink it myself.

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94. It was not a hard strata of even coal? No; 10 yards from the drawing-pit it is a strong roof to the south.
95. Then Ferndale shaft has just been sunk in a sort of gutter? Yes.
96. Towards the crop, did the conglomerate give place to sand suddenly or gradually? Sometimes there would be a portion of post in it. Some places it would be 6 or 7 inches, and in others as high as a foot, and cut out the conglomerate.
97. When you struck the surface deposits to the north-west and north, did these deposits give you any trouble? Only in one portion of the mine.
98. Have you taken out the whole of the pillars in this section? No, not one; I have not taken out the pillars to the east of Ferndale drawing-shaft anywhere.
99. But I mean that section to the west? We have taken out all pillars to the west of Waratah Railway, excepting under the Maitland Road.
100. Did you experience any difficulty from the surface in doing so? No.
101. What measures did you take to prevent it filling up the workings? We took no measures at all. We took the pillars out and let it fall.
102. Was there any surface-water? None whatever.
103. Contiguous to the shaft I believe you experienced some difficulty from a "cave-in"—did it give you some trouble? Yes.
104. Would you tell us about it? In the flat of Tighe's Hill, in four different places, the roof fell in, and worked out to the crop, so that there was no covering to support the crop, and we had to construct a dam to keep the water back.
105. Did any water come in along with the sand? Yes; a considerable quantity came in, but we made these dams, and kept it back.
106. I understand this part of the workings is above tidal influence? Yes; but there is a great body of water in the sand, down about 15 feet.
107. To the south of the pit and towards the Maitland Road we understand these straight headings are called No. 2 headings—is that so? Yes.
108. Then do these blanks (shown on the plan) in this direction represent the position of the private collieries referred to? Yes.
- [Marked "12" within a circle.]
109. What is the depth to the coal-seam worked there? About 35 feet to 38 feet.
110. West of this ("12") a few bords from Ferndale have undermined the Maitland Road. Are all your workings in this part shown on the plan? Yes.
111. How far have these bords gone? Just across to the boundary.
112. You observe that the creek approaches the road at this point? Yes.
113. Have any of your workings gone under the creek? No.
114. Then your workings are limited to the boundary of the Maitland Road? Yes.
115. Are you perfectly sure? I am.
116. What depth is the coal from the bed of the creek? I should say it would be about 28 or 30 feet to the top of the coal.
117. Immediately beyond the creek there is a small coal-shaft—to whom does that belong? To Messrs. Broughall & Griffiths; it formerly belonged to Mr. Green.
118. Do you know anything about the nature of the roof in that pit? I do not.
119. Had you any considerable growth of water from the Ferndale workings? Yes.
120. Where did the water come from? From a flat in the old workings to the west of Ferndale shaft.
121. How much water did you get? We were pumping in No. 8 16,000 gals. an hour.
122. Did you pump to the surface? Yes—that is, in the eastern workings.
123. Had the amount of water increased since you were appointed manager? Yes.
124. Did any portion of this water come out of the surface deposits? No, none.
125. Did any come from the crop workings? No.
126. Did any sand come in with the water? No.
127. From Ferndale shaft the heading has been driven due south? Yes—called No. 2.
128. To the east of that heading (would you look at the plan, please?) blank spaces marked 10, 11, and 12, within circles, are shown,—do these spaces represent the sizes of the private collieries? Yes.
129. And are the workings of these collieries and those of Ferndale colliery connected? Yes.
130. Does the same remark apply to coal-workings marked 15 and 16? Yes.
131. Is Bevan's colliery—marked 14, within a circle—drowned out? Yes.
132. Do the workings join with those of 15 and 16? They join with Hurstville and with Ferndale.
133. Then, from a point that I have marked B on No. 2 south heading, you have driven along the dip road due east? Yes.
134. How many chains have you driven these dip bords? About 30 chains.
135. About 5 chains down this dip road, from B, you seem to have struck a roll? Yes.
136. Was the coal very irregular under this roll? Yes, very irregular.
137. Is the direction of the roll N.E. and S.W.? Yes, somewhere about that.
138. Crossing that roll, was the coal-seam of a wavy character? Yes; unmarketable.
139. The direction of the roll leaves a considerable area of ground to the east of the winning shaft? Yes.
140. And to the north of Millar's shaft, marked 10 on the plan,—was that area of ground faulty or troubled? No; it was clean coal.
141. What was the thickness of the coal in that part west of the roll? From 17 to 18 feet.
142. In winning it, had you to strip the west side of the roll? No.
143. Did you work the coal up to the roll? Yes.
144. Did you get any water from it? No; it was quite dry.
145. Working the coal towards the north of that same area, did you reach the surface deposits? Yes.
146. What did you get at the face? Sand and clay.
147. And you traced this surface or crop as far eastward as the roll would permit? Yes.
148. Did any water come from the surface at the crop? No.
149. What description of roof did you have in this area? Sandstone and post—a strong roof.
150. And as you approached the surface did this roof disappear? Yes.

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151. Before it gave out, was it rotten or treacherous? It would become rotten at once as the coal died out.
152. In approaching the crop, did you require to use extra timber to support the roof? No; as soon as we got the clay we stopped.
153. Did you reduce the size of the bords? No; not in that portion.
154. Did this roll, where it crossed the dip road, in any way alter the character of the coal-seam? It went from 13 feet to 6 feet in thickness.
155. How did the coal become reduced—was it the bottom coal that checked out? No, it was the top coal; the bottom continued and the jerry continued.
156. A portion of the roof coal seemed to be displaced by conglomerate? Yes.
157. Have you prepared a section of the coal-seam? Yes. (Two sections produced.)
Dictated by President.] Mr. Powell explains that at the top of one of the waves the coal thickened, and, when it formed a hollow, the conglomerate came down and cut out the top coal.
158. *President.]* What thickness was this troubled coal? 10 chains.
159. Then to the east of that roll, roughly speaking, the conglomerate seems to have cut off about 11 or 12 feet of the top coal from the thickness of the coal? Yes.
160. What thickness of coal had you in the dip roads to the east of the roll? From about 5 feet 6 inches to 6 feet.
161. To the south of the dip roads, coming towards the creek, you have not worked a large area of coal? The top coal is cut out altogether.
162. With what? With sandstone and conglomerate.
163. What is the thickness of the coal-seam to the dip of the dip roads? From 2 feet 6 inches to 3 feet; it runs as high as 3 feet 3 inches in some places.
164. Is that 3 feet 3 inches bottom coal? Yes.
165. At C on the tracing, your dip road seems to have terminated—contiguous to that point the position is shown of a pumping-pit 111 feet deep? Yes.
166. Is that the last part of your workings? No.
Dictated by President.] Mr. Powell explains that the levels driven from C fall about 9 feet.
167. And you have told us that you pumped 16,000 gallons an hour from that pit—was the water fresh or salt? It was salt water.
168. Where did it come from? Principally from the hard roof of conglomerate.
Dictated by President.] Mr. Powell explains that where the conglomerate came down in the dips to the bottom coal the quantity of water increased.
169. From this water-pit your levels extend to the north-east about 16 chains? Yes.
170. What stopped your working in that direction towards the east? A "fault."
171. Is that fault of any size? I have driven into it 30 yards without getting any signs of the coal. I believe it is about 50 yards wide. We put a bore 58 yards the other side, and cut coal. The further we went into the fault the less water we got.
172. The bulk of your workings in this direction seems to have been to the north or rise of the dip roads in that level? Yes.
173. What thickness of cover or roof had you in the bulk of that area? From 109 to 148 feet.
174. Did you leave any pillars thicker than 4 yards? Yes; in some places they would be 6 yards; but the average pillars were 4 yards.
175. Did you take any pillars out of this area? No, none whatever.
176. To the north of these dip roads on the plan you seem to have worked the coal up to the surface? We have worked it out to the crop.
177. And exposed it for fully half a mile? Yes; here and there we have worked it right through.
178. This line of crop follows the contour of the north ridge—what does it consist of? Vegetable matter, black silt, and sand, extending to the scrub or mangrove.
179. Did you prove the thickness along that line? Only when we drove through to the crop.
180. You did not put down bores to ascertain its consistency? No; not on that side at all.
181. Without this knowledge you continued to work your section up to the crop and under the tidal swamps—did you consider that a safe proceeding? I did.
182. Is the crop flooded east of the letter H on the tracing? It is.
183. At the point, letter I on the tracing, is the crop covered by the flood-water? No, it is not.
184. How far off the high-water-mark is it? I should say about 2 or 3 chains.
185. And not knowing the thickness of the clay or sand, with the tidal waters covering the coal-crop, you continued to work the coal up to the crop? Yes, so long as the coal was marketable.
186. And you considered that safe? Yes, I did.
187. Did you take any special precautions for strengthening the crop bords? I did. I timbered them wherever I thought it was required.
188. The plan shows bords of 8 yards driven in a line with the crop—is that correct? Yes; but in some places we reduced the width.
189. I want to direct your attention to these bords not going up on end to the crop, but driven along the line of crop. Yes.
190. Well, do you consider that safe? Yes.
191. What kind of roof did you trace along the crop at that part? It was post along the crop.
192. Did it require extra timbering? All these bords were double timbered. The reason was that the nature of the roof was treacherous.
193. Then was it the fact that you worked some of the bords narrow and timbered with double timber, because you saw evidence of danger? It was an evidence of danger for the men only, but not for the roof to come in; the post ran from 2 to 3 feet up to the conglomerate, which, carrying water, was calculated to soften what was below it.
194. Then this double timber was to keep up the strata below the conglomerate and above the coal? Yes.
195. Then, looking at the plan again, and at the point marked E, towards the dip to the level, the bords were approaching the "fault" referred to,—how many of these bords had been worked forward to the fault? Two.
196. And the bords to the north of this were approaching the line of this fault? Yes; the tenth bord above the level had been driven in advance of the other workings up to the line of the "fault."
- 197.

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197. How many bords above that have reached the fault? None.
198. When was the last survey taken of these places? On the 14th March.
199. That was four days before the accident? Yes.
200. It was from the bords approaching the fault that your output was derived? Yes.
201. And these bords could not long have continued? No.
202. Then if you look towards the top line from "I" on the plan, the line of high-water is projected some chains to the north, and at "J" the line of crop strikes due east to "K,"—did you work the coal till you struck the surface deposits in this part? No.
203. Did you work the coal up to the surface deposits at "J"? No.
- Dictated by President:* Mr. Powell explains that at "J" two narrow headings were driven in advance of the workings until they struck the surface deposits; and at "K" another narrow heading had been driven in advance of the workings until it also struck the surface deposits. The face of these roads were about 24 yards in advance of the bords.
204. To the south of "K" two bords, about 30 yards back, down the heading, seem to have been stopped? Yes.
205. Why were they stopped? Owing to the crop here in the coal getting soft.
- NOTE.*—Mr. Powell hands in a section referred to as a section in a north and south line from No. 2 bord of the workings to the dip of the levels to point "C" on tracing.
206. What was the condition of the face of the third bord below "K"? It was good.
207. Were these bords holed into each other? No.
208. What width were they driven? 8 yards.
209. Were the two uppermost driven 8 yards until stopped at the crop? Yes; the next was 6 yards, and the next was 4 yards.
210. Did they come upon any water? No.
211. From the point marked "I" on the plan to "J" and "K" the coal is covered by sea-water from Throsby Creek, is it not? No, not exactly; "I" is not covered. Two chains from the east of "I" to "K" and "J" the top of the coal is covered by sea-water from Throsby Creek.
212. When you worked the coal, were you aware that they were covered with this tidal water? Yes, I was aware.
213. And did this not raise any suspicion of danger in your mind? No, it did not.
214. Then again, in the neighbourhood of "I" an irregular pencil line sweeps round from the workings until it approaches the water-pit at "C,"—what does it represent? It represents high-water-mark.
215. Does it fairly represent the extent or limit of the tidal waters? Yes.
216. If this is so, it would appear that the whole of the coal you were raising months before the accident was taken from under tidal swamps bordering on Throsby Creek? Yes.
217. You had worked out upwards of 10 acres of coal from under these swamps? Yes.
218. And you did not apprehend danger? No, none whatever.
219. In conducting the workings here, did you use extra timber? Yes; all the bords were double timbered.
220. Why? Owing to the bad nature of the stone up to the "post" under the conglomerate.
221. But not from any feeling of insecurity as to the surface? None whatever; we did it because when this post broke down we should come to the conglomerate, and it was soft.
222. From the point "F" where the fall took place, a narrow heading was driven to "K"—a distance of how many yards? 54 yards.
223. Why did you stop that heading? Because it went into clay and sand.
224. Did you see clay and sand in front? Yes.
225. What width was this narrow heading driven? It was about 2 feet 6 inches high; about as small as a man could follow it there and travel back.
226. Was extra timber used to secure it? No timber was used here at all.
227. Was the roof rotten? Yes.
228. When the heading reached the crop, did they come upon any estuarine deposits, or any water? None whatever.
229. Did you erect any barricade across the heading? I did. (Mr. Powell marks on the plan the position of this barricade—X.)
230. Why did you erect a barricade there? In case it would collapse inside.
231. Why did you anticipate a collapse? Owing to the nature of the soil—the clay and sand.
232. Then a pair of headings were driven up to the point "J" on the plan,—were these places driven up to the surface deposits? Yes, they were driven up to the clay.
233. What was the nature of the roof? Black clay.
234. Were these headings extra timbered? Yes; double timbers were used up to the small drive of about half a chain.
235. Did any fall take place when these headings were driven? Yes; we were driving to ascertain where the crop was, and when the men, having knocked off, came back next morning the place was closed with black clay and a little sand. It fell through the night.
236. Were there any shells? No, and there was no water.
237. Did this not frighten you? No, it did not frighten me at all.
238. When did the fall take place that drowned out the Ferndale Colliery? On the 18th March last.
239. Were all the men in the pit? No; it was about ten minutes to 8 in the morning.
240. At what spot did the fall take place? The mark "I" on the plan represents the exact spot where the fall took place.
241. Was the roof tender in this place? No; from what we had seen of it the roof was good.
242. Beyond that, was it rotten? Beyond that the roof was getting softer and becoming rotten.
243. Had water been dripping from this roof? No; there was no water at all.
244. How do you account for a fall taking place where the roof was good? Well, where this fall took place a lot of what we call gray facings were present—a heap of them together, or "gray-backs," that is how I account for the fall; they cut straight upward.
245. Had you not any evidence of this in the workings? None until I saw it take place; the sides of the "fall-in" being as clean as the sides of a house.

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John Powell,
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246. Where were you at the time the accident happened? I was having my breakfast at the time.
247. Well, what did you do when you heard of it? I went down to the pit as quickly as I could.
248. Did you not consider that the workings under these estuarine deposits of unknown thickness imperilled the safety of the mine and the lives of the workmen? No; I believed they were all safe, and did not apprehend any danger whatever.
249. At any time did you in conversation with your owners, or any one of them, refer to the coal-workings under these swamps? No.
250. Did they ever express any anxiety on the subject to you? No.
251. Did you meet them regularly? Yes.
252. Was not this subject a theme of conversation? No; not any more than to ask if we were working in the tidal workings, and I would say yes.
253. Then it was a theme of conversation? No; I simply informed them as I have said.
254. Did the men appoint Check Inspectors to examine the colliery? Yes.
255. How often did they examine the workings? They examined them every month until lately, when they examined them every three months. The Check Inspectors examined in October and in the latter part of February, or beginning of March—two or three weeks before the accident took place.
256. Did they complain of any portion of the mine? No.
257. Have you a copy of their report? No; they never entered the last examination; in fact one of the Inspectors died three or four days after that.
258. Did the Inspectors ever complain to you about these rise-bords? No.
259. Did they ever suggest to you that you were taking an improper course in working the mine? No.
260. Do you know of any boreholes to the north-east of your workings? I do. [The witness pointed out position on plan, marked "M."]
261. What depth was that bore? 107 feet.
262. How many feet do the surface deposits measure? I believe from 50 to 60 feet.
263. Who put it down—that is, the borehole? Mr. Henderson.
264. Were any other parts of the swamp tested? Yes; there is a bore here to the east, in a line with the dip levels (marked "N" on the plan), about a chain beyond the fall.
265. What depth is the bore? 119 feet, and 61 feet to the sand, the remainder being conglomerate and post.
266. You have mentioned one fall that took place along the crop-line at "K,"—do you know of any other falls along that line? No.
267. Did it not occur to you that it would have been a safe and necessary precaution to have left broad pillars of coal along this crop to protect the surface? Well, I left as much as I thought was necessary for safety.
268. How much have you left? About 26 yards.
269. Do you know Mr. Croudace? I do.
270. Have you had any conversation with him as to the nature of the operations at Ferndale? No.
271. Was he ever down your colliery? Yes.
272. When was that? I should say about twelve months ago.
273. For what purpose was he there? To report on the mine.
274. For whom was he to report? For the Company.
275. Did he do so? I believe he did.
276. Did he examine all the working-places? Yes; all the working-places at that time, but we were then a considerable distance from the place where the fall-in occurred.
277. Did he warn you of your danger in working under the tidal waters? No, he did not.
278. Have you ever seen his report? No.
279. Have you ever asked to see it? No.
280. Has he expressed any opinion to you since? No; the only expression he made to me was that it was a most difficult mine to work—the most difficult he had seen in the district.
281. Did you measure the thickness of the surface at the site of the accident? Yes.
282. What was the thickness of the seam there? The coal-seam, where the fall took place, was 5 feet 6 inches.
283. What was the thickness of the rock? There was 30 feet of post, and 10 feet of conglomerate above that.
284. Was the rock firm? Yes.
285. In working these bords up to the crop, did you consider the pressure that was on each? No, I did not.
286. You say there were how many feet of sand? 23 feet of sand and 2 feet of clay.
287. Then at the face of these bords that reached the surface you would have about 65 feet of surface? Somewhere about that.
288. That was equal to about 2 or 3 tons pressure per square foot, or 45 lbs. pressure per square inch,—do not you consider that forms an element of danger? No; I could not see any danger.
289. How do you account for 40 ft. thickness of rock falling in? I account for the "fall in" by those narrow facings and the softening of the coal and roof.
290. Did you examine the surface deposits after the previous fall? No; naturally, during that time, we were trying to stop the water from coming in. There was 2 feet of clay on the top of the conglomerate and the rest was drift-sand.
291. Then in the space of 50 yards you seem to have lost almost 40 feet of rock cover? Yes. When it does come down it comes down as straight as the wall of this room.
292. When you put in that barricade at the foot of "K" (drift), did you not fear that an accident might eventually happen? No, I did not.
293. How many acres have disappeared on the surface in consequence of the late accident at Ferndale? About 3½. Nearly 100,000 cubic yards of sand disappeared into the workings in consequence of the fall on the 18th March.
294. Did you see the fall that took place from the workings? Yes; I was in a dozen times at the bottom of it. We had to work our way through the whole of the workings. The water had choked the travelling roads; the mangroves had closed them, and we had to go over the falls.

295. Did you go down to save the lives of any of the men? Yes; I was down five hours after the accident happened. I was down all the time. We could not get to the bords where Jenkins and Hargraves were supposed to be. Just as we were coming to the surface a report came that there were voices heard in the "fall-in." Hardie and some other men were there, and I got ropes and took some men with me and endeavoured to get to the bottom of the fall-in. I had been within 30 yards of it a dozen times. We had to work round the stoppings, and I rushed through, and was in 10 yards when I was told that the man Hargraves had been pulled up before we got there. I then fetched the rest of the men along with me to seek for the last man in the pit, and we worked ourselves round the face workings, that is, Nos. 3, 4, and 5 bords; and when we came to No. 6, a cut-through between 5 and 6 was filled up to the roof with sand.

296. Is it not known whether Jenkins had left his own bord? No; he had his clothes on it appears when the boys called him last. He was in for the last skip, and they were going to take the skip into him when the fall-in occurred. Jenkins was an elderly man and a cripple. He was not the man to stick in his bord and not make a struggle to go from there under the circumstances.

297. Is not this a lesson or argument of the danger of approaching tidal swamps in underground workings? It would be a lesson no doubt, but I never saw anything approaching danger at all; if I had, I should have stopped it at once.

298. *Mr. Neilson.* As to the Check Inspectors, do you and your officers and others consult as to the complaints entered in the Check Inspectors' books? The books speak for themselves, and there was no complaint whatever. They could always be seen.

299. *Mr. Jones.* Did you consider the barrier you have mentioned sufficient in case of a fall of water? Yes.

300. *Mr. Davies.* Who were the Check Inspectors? Hopkins and Morrer.

301. Is the Check Inspectors' book lying in the office? Yes.

302. *President.* Can you produce it? Yes.

303. *Mr. Davies.* Is Morrer in the district? Yes; he is stopping at Islington.

304. You say that the proprietors never warned you, and that you never warned the proprietors, as to any danger in connection with your operations? Not specially. The proprietors were aware of it.

305. But if there had been any danger it was your duty to inform them? Oh, yes; and anybody else. I had full charge of the place, and took all the precautions I possibly could. If there was immediate danger apprehended in any direction the foreman and deputy could call anyone they wanted to make everything secure.

306. Did you make out in writing an official periodical report? Oh, yes; I reported generally once a month.

307. Did you at any time, in making out this report, mention the fact of these tidal waters coming over the strata of your property? No, I did not; but they knew as well as I did that we were working under the tidal waters.

308. Did the Check Inspectors have every facility for carrying out their duties? Yes. There was nobody to interfere with them. The foreman was always there to instruct them how they were to go, and where to go. The Inspectors were in the habit of going into the back workings, which I have never seen in any other pit in the district.

309. In putting in these small drives to prove the crop, do you not think it would have been a better plan to put down bores? No, I do not think it would have been, and the other way was certainly better on the score of expense. We were driving as small as a man could go. I have known instances where the coal would become just like "smut," and you would think the coal had given out, and after that we have met with really excellent coal further on.

310. Did the Inspector of Collieries at any time draw your attention to the fact that these tidal waters would be a source of danger to the mine? He drew my attention to the fact, but never pointed out any danger. He also asked what precautions I had taken, and I told him precisely what I have told you. He was there pretty often. He has gone through a portion of the old workings. The last time he was there he was through a portion of the old workings, close to where this accident took place. I asked him if he thought it was safe, and he said, "So far as timber is concerned it is as safe as being on the surface."

311. Did he see the barricades you had erected? He was not up to them the last time he was in.

312. Are you aware whether he had ever been over the surface, and seen this surface fall you have referred to in your evidence? He has seen that.

313. But previous to this accident? Not to my knowledge.

314. Then you did not report it to him? No. In fact, there were not half-a-dozen men in the pit knew about it till the late disaster happened. If the late fall had taken place when the tide was out, and had it not been spring tide, the thing would have choked itself, and nobody would have been much the wiser.

315. *President.* That is your own supposition? Yes.

316. *Mr. Davies.* Was this fact of the surface fall having taken place kept back from the men? No.

317. Had the men known that the fall had taken place, would they have worked there do you think? Some of the men who worked there did know of it.

318. Was not a portion of your workings drowned out some time previous? Yes; but not in the same direction, and it came from the best roof we had.

319. *Mr. Jones.* As a matter of fact, you had in no way attempted to conceal this fall from the men? No.

320. It has been stated in evidence elsewhere that a number of the men in the mine knew of that fact? They might, but I think not. If I had been out of the mine an hour sooner I could have stopped that water from coming into the pit. I have stopped the water there in falls previously.

321. *President.* Do you mean tidal water? No; but in the present case, if the tide had not come back on me so soon I would have stopped the flow with sand, which would have stopped it as long as I could go down with a staff of men, and put up a dam that would have effectually prevented it from coming in.

322. *Mr. Curley.* You did not attempt to dam it up with bags of clay and so on, did you? It was no use. The water was driving everything before it. In fact, it was carrying trees down 40 and 50 feet high. The hole is open now, and the tide is rising and falling in the little pits all through the district.

323. *Mr. Usher.* When Inspector Dixon expressed his opinion as to the safety of the workings in that particular part of the mine, did he take particular notice of the thickness of the pillars and the width of the bords? Yes.

324. *Mr. Curley.* What number of water-balers had you? I had twenty-one.

The witness withdrew.

Joseph

Mr.
John Powell.
31 May, 1886.

Joseph Powell sworn and examined :—

Mr.
Joseph Powell
31 May, 1886.

325. *President.*] What is your occupation? I am a miner, and was overman at Ferndale.
326. How long have you occupied that position? For three years.
327. Before that, in what capacity were you engaged? I was coal-mining at Ferndale.
328. Have you worked in any of the adjoining collieries? I have worked at Wallsend.
329. What were your duties as overman? My duties were to look after the shifting of coal, to see that everything was safe, that there was plenty of timber, and that the bords were of a certain width, whatever was determined upon.
330. Since you became overman at Ferndale, have you been in the west workings towards the Maitland Road? Not since I have been overman. I was working there myself.
331. Have you also been in the bords of No. 2 heading towards the creek to the west? Yes, I worked one bord there.
332. It was from that heading that the dip started? Yes.
333. And as overman you are acquainted with the dip roads and the large body of workings of the dip roads? Yes, down the incline.
334. Throughout the whole of these bords that I have mentioned, were the bords driven of the same width? Not always.
335. What was the usual width? Eight-yard bords generally, unless we were coming to the crop; then they were 6 yards, and some would be 4 yards.
336. What thickness of pillars did you leave? Four yards.
337. Were they left of the same size irrespective of depth from the surface? Yes, they were marked off all the same.
338. Were the bords driven 8 yards irrespective of the depth? Yes, except where they approached the crop.
339. And did you reduce the width of the bords in the case of a bad roof? Yes, always where there was a bad roof.
340. Close to the winning-shaft, had you any solid strata above the coal? I cannot tell you; I did not work at sinking the shaft.
341. Have you ever observed any falls of the surface into your workings near the shaft? Yes, there have been a few near the shaft.
342. When these falls took place, did any solid strata come down? I cannot tell you, as I was not there when they did come down.
343. How do you know that they did fall? Because I could see them on the surface.
344. Are you aware whether any quantity of sand ran into your workings from some of these falls near to the shaft? Not that I am aware of. I never saw it.
345. Have you heard of anything of the kind? No, not since I have been there.
346. Have you seen any other part of the mine where the surface caved into the workings? Yes, about Pepper Town, where the high coal was. That can be seen every day in passing.
347. Only in Pepper Town? And some down in Robinson's ground.
348. In the rise workings of the dip roads, has any surface fallen there? I have never seen any surface fallen in anywhere down the dip workings, with the exception of the late big fall, and another little one alongside of it.
349. What distance away was that other—the little fall? It may be 60 or 80 yards away from the other.
350. What came down there? Clay came down there.
351. Did no sand come down? No, not when it came down then. It choked itself.
352. Did any water come? No. It fell a second time in the evening, and a little sand came then.
353. Was a dam put in? We put in stoppings before it ran a second time.
354. Was there a dam or barricade across the heading where this last accident took place. Yes, there were two or three there.
355. Do you know the reason why these dams were put in? They were not dams; they were stoppings built of timber.
356. They were barricades, then? Yes, with sleepers 4 feet thick.
357. Why did you put in such strong barricades? Well, we were working close to the crop, and if we did not fill the place up something might run from the crop, and we did not want it to come on to the roads.
358. Did it occur to you that there was any danger in working up towards the crop in that situation? No, or else I should not have gone there so often by myself, and through the old workings, and everywhere, alone.
359. You say you reduced the width of the bords when you reached the crop? Yes; to 6 yards and 4 yards.
360. Do you know the plan? No, I do not know the plan.
361. You are aware that a long line of crop has been followed to where the fall took place—that a half mile of crop coal has been worked? Yes.
362. Is it worked into the surface? Not quite.
363. And all along that crop you say the bords are only 4 to 6 yards wide? Yes, where they say the water has broken down they were 4 and 6 yards, and all back to the left the bords were 6 yards.
364. As you approached the crop, was the roof tender? Yes, it was rather tender.
365. Did you lose the roof—that is the conglomerate roof, in any portions? Well, it is very seldom you see conglomerate there.
366. What intervenes between the conglomerate and the coal? I cannot tell you what thickness.
367. But what does it consist of? It is a sort of shale—a hard roof.
368. And does it become tender towards the roof? Yes.
369. Is it difficult to keep up? No.
370. Did you use extra timber? We used double timber in all the places where we were working 6-yard bords.
371. What distance apart were the sets? Two feet apart.
372. Then you have been very careful in timbering these workings? Yes, very careful indeed.

Mr. Joseph
Powell.
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373. Did this extreme care in timbering foreshadow danger? No. So far as I could see the only reason for doing it was because we were nearing the crop.
374. Were you aware that a large portion of these workings was covered by spring tides? I was aware that the spring tides covered a portion of the workings.
375. You were aware that the bords as they proceeded upwards reached the crop, and that the clay was covered at spring tides by salt water? Yes.
376. And you say you did not apprehend danger? No; I did not apprehend danger.
377. But you took care to double timber the bords? Yes.
378. If you considered there was no danger, why double timber the bords? Well, in those bords there used to be 6 inches of soft roof under the hard, and if we did not well timber it the soft would keep on falling on the horses and men.
379. Why not cut down the 6 inches and get the hard roof? The men have done it in some places, and would not put up timber.
380. Do you know some small collieries to the west of Ferndale? Yes.
381. Are the workings of these collieries connected with Ferndale? Wylie's and Vivian's are.
382. Are they filled with sea-water now? They are filled with water.
383. To the south of the drawing-shaft in No. 2 heading, some of the coal has been worked from under the Maitland Road from Ferndale? So far as I know, yes.
384. Do you know all these bords to the right of No. 2 heading? I only worked in one of them.
385. Do you know if the coal was worked from under the creek? Not that I am aware of.
386. Do you know the character of the roof above these bords? I do not; I did not sink the shaft. I know that there was coal left where I was working.
387. Why was that? I cannot tell you.
388. Did it ever come down? No; there were tops above that.
389. Were the bords in that direction 8 yards wide? I believe they were 8 yards, but some were 6 yards. I never worked under the Maitland Road.
390. Then did the bord you were working in stop when it reached the boundary, or did it go further? It stopped, so far as I am aware.
391. Were any pillars taken out in this neighbourhood? Not that I am aware of.
392. Do you know Green's colliery, on the other side of the creek? Yes.
393. Do you know the depth of that colliery? No.
394. Do you know the cover of the roof? No.
395. Do you know whether Green's colliery is worked with the usual width of bords? No; I never inquired.
396. Then you repeat that in the rise workings of the dip roads, the deposits did not break into the workings? They have not, so far as I know, since I have been overman.
397. And you did not consider the crop workings were a source of danger? I did not.
398. Were you aware that the workings of No. 8 heading were under the swamps? Yes.
399. And were covered by tidal waters? Yes, at spring tides.
400. And that the rise workings in that heading had cut the crop? Yes.
401. What did you get in the face? It was a sort of clay and sandstone mixed.
402. And knowing that you were under swamps that were covered by high tides, you still say that you did not consider these workings unsafe? I did not think they were unsafe.
403. And that, considering it safe, you took the precaution to put double barricades in that heading, and double strapped, at great expense, to strengthen the dip bords? Yes.
404. Why did you drive these crop headings and bords so narrow—what was the reason? In order to keep the roof up, as it was such a tender roof, and so near the top.
405. You say that 50 or 60 yards to the west of where this fall took place, a fall had taken place before? Yes.
406. And that you stopped it during the day, and it came down during the night again? Yes.
407. What came down? Clay came down first, and the second time sand.
408. How did you notice that fall—it was in a part of the disused workings? It was in a heading where it came and crushed a pillar. We had put a hole in the top, and cut through to the other end, and were putting up timber, and when it came we had to stop. We then put a good stopping in, and filled up the place.
409. To the right of No. 8 heading—that is, where the last fall took place—did the crop suddenly swerve round and come down the walls? No; we did not cut the crop the last two bords. We had the crop in one.
410. The one immediately below is marked stopped also? We were coming near to the crop, and thought it was well to keep away from it.
411. Then I am right in saying that the crop did swerve round? Yes, it did swerve.
412. To the south? Yes.
413. Were these places secured with extra timber? Yes.
414. Was No. 3 bord working when the disaster occurred? Yes.
415. Was much water coming out of the face of these bords—Nos. 1, 2, and 3? No; none at all.
416. Was the roof in No. 3 bord a good roof? Yes.
417. Was this bord also approaching the surface? It would reach the surface after going a considerable distance.
418. Who worked in No. 3 bord? The two Williams brothers—Charles Williams and William Williams.
419. And who worked in the others? In the next bord to them (No. 4) there were four working—two in each shift. There were Cornelius Peters and William Johns, and Morgan and Thomas Cummings.
420. And the fifth bord, who worked in it? James Murray and George Spencer; that was the next bord to Jenkins'.
421. What object had you in carrying No. 4 bord on with four men? Because it was behind the other bords, and the object was to bring it in, so as to get through right.
422. Then the condition of the working in Nos. 1, 2, 3, 4, and 5 bords raised no doubts in your mind as to the safety of the men? None whatever, sir.
423. Were you aware of the depth of these bords from the surface? No, I was not.

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424. But you were aware they were under the swamps? Yes.
425. And still, with that knowledge, you had no fear for the safety of the workings? No, I had not.
426. Did any of the men know that they were working under the swamp? I believe some of them did know. They had all the same chance as myself.
427. Have you ever heard them discuss the matter? No; I never heard any discussion. I have heard a passing remark that we were working underneath the swamp.
428. Why was that remark passed? I cannot tell you.
429. Did the men appoint Check Inspectors? They did.
430. Did they know the position of the workings? Yes, they all knew.
431. Did they regularly inspect the colliery workings? Yes; I know they did.
432. Did they ever report unfavourably of these workings? No; not to me.
433. When did they last inspect and report? I cannot tell you that now, but it is some time since.
434. How long before the accident? A considerable time before the accident. The Inspectors' book may tell you; they always come to the office, and give the book in there.
435. On what date did the accident take place? I believe on the 18th March. I was in Sydney at the time.
436. When were you apprised of the accident? The same evening, about 6 o'clock.
437. Then you can state nothing about the accident of your own knowledge? Nothing at all.
438. *Mr. Neilson.*] You speak of the soft nature of the roof under the conglomerate. If a fall of this soft roof took place, would it not carry the timber away? Yes, the timber would fall down, certainly.
439. *Mr. Jones.*] You say that when the first fall took place it considerably crushed one of the pillars? That was in the far end where we cut this clay; we followed it to see what it was. Behind that, about 15 yards or so, there was a splendid bit of coal making in, and as we went in the clay started to come upon us.
440. Did the probability of water coming in never occur to your mind? No, it did not.
441. You say that the men in some cases neglected or refused to put up double timber? Very often we could not get the men to do it back of the present workings.
442. Why? Because it was too much work.
443. But you were prepared to pay them? Oh, yes. The double timber was put in the crop workings; but away back the miners would not do it because they had to get the timber.
444. *Mr. Davies.*] Was it only in places coming to the crop you say that double timber was put in? No; in several parts of the pit, and where the roof looked bad it was double timbered in the roads; sometimes posts and bars in both ribs.
445. Would you have us believe that these posts and bars were put in to keep up 6 inches of roof? The men would do it themselves; they would not pull the soft down. In No. 3 bord there was air coming down, and I said you had better put up timber.
446. Was it generally known to the men that a fall had taken place previous to the last one which flooded the mine? Yes; they could see it on top also.
NOTE.—The little fall referred to is marked on the plan "J."
447. *President.*] And that little fall appeared on the surface? Yes.
448. *Mr. Thomas.*] Did the tide cover that portion? Yes.
449. *Mr. Curley.*] Was this a cut-through that came in your heading that you have spoken of at the little fall? It was a cut-through in the clay. We had the bords marked off, and were going to use this as an air-way.
450. Knowing that you were so near the crop, did it not occur to you that to put an air-current through your cut-through was a source of danger? No, not when we were driving through 4-yard pillars; it was a narrow place just to convey the air alone.
451. Can you tell us who drove this cut-through in the heading? I would not be sure whether it was a man named Brown, and Abrahams, or Pickavance and Miller.
452. Were not miners working with you when forming this barricade, and saw the fall-in? Yes.
453. Who were the men? Joseph Jackerman was one I took there to barricade the place up.
454. Was he the only one who was along with you? I cannot be sure whether Richard Cotterill was there. Yes, I remember now, there was John Williams; he put one up. He is now in Queensland. I had Williams and William Davies putting up another one.
455. *Mr. Thomas.*] Did you ever hear any of the men complain as to danger in working at Ferndale? No, never.
456. *President.*] How long ago is it since this little fall took place? I should think it was about fifteen months.
457. And it appeared on the surface? Yes.
458. And the water is lying in a hollow there caused by the fall? Yes.
459. *Mr. Jones.*] About what area was the little fall on the surface? I cannot say, as it is covered with water; but I should say it is not bigger than this room.
460. *Mr. Curley.*] Did ever a consultation take place between the manager, yourself, and the deputy as to the probability of danger in these workings? Not that I can remember.
461. *Mr. Usher.*] Have you had any experience in other mining-fields? I have been twenty-three years underground.
462. Have you been on the gold-fields? Yes, in Victoria.

The witness withdrew.

John Powell, junr., sworn and examined:—

Mr.
J. Powell, jun.
31 May, 1886.

463. *President.*] What is your occupation? I am a wheeler.
464. Are we to understand you are the son of the manager? Yes.
465. How long have you been employed at Ferndale as a wheeler? About three years.
466. In what districts of the colliery have you worked? Down in the lower part, No. 8, where the water came in.
467. Have you only worked in No. 8 workings? That is all, sir.
468. Were the workings in this district wet? Yes.
469. Where did the water come from? It came away from the soft coal.
470. Did it come out of the roof or the floor? It came out of the bottom.
470½. Was the water salt? Yes; in No. 8 it was salt.

Mr.
J. Powell, jun.
31 May, 1886.

471. Did it ever occur to you that that salt water had any connection with the sea? No, sir, it did not.
 472. You never thought of that? No.
 473. Have you been up in the north workings towards the fall? Yes; I was there when the water came in.
 474. Have you been in any of the bords in that district that reached the surface crop? No.
 475. I mean where the coal runs into the surface? No, I have not noticed that; I was back of this heading at that time.
 476. Have you observed any falls of the roof-rock in this district? Yes, a few; it fell up to the conglomerate, no surface coming down.
 477. Have you ever heard of any surface coming down in any falls? No.
 478. Was the roof tender towards the rise in No. 8? No, it was not.
 479. Was there not an extra quantity of timber required? Yes, there was plenty of timber.
 480. What was the reason of this extra quantity of timber being used? I do not know.
 481. Do you know the spot where the accident took place? I do not.
 482. At any time, have you heard the men conversing about the condition of the roof towards the position of the fall? No, I have not.
 483. Where were you when the accident occurred? I was in William Owen's bord.
 484. What bord was that? Just below Jenkins'.
 485. Do you know the plan? No.
 486. On what date did this accident occur? On the 18th of the month (March).
 487. How were you apprised of the accident? I was in William Owen's bord, and was coming out to see where my driver was, and when I got to his bord I could see the water coming. I went up to the mouth of Jenkins' bord, and sang out that there was some water coming in.
 488. Did you know where the water came from? No.
 489. When you saw the water running at the face of William Owen's bord, did you suspect that something materially wrong had taken place? I cannot tell you what I thought then. I knew there was water from somewhere, and it was up to my knees.
 490. Was it rushing past with a force? Down lower it was. I sang out to Jenkins, "Come out." My driver replied; he was in the bord at the time. His skip was ready, and he sang out for me to give him a lift. I said "No." I was going to see where the water was coming from, and I went down to the other workings.
 491. How many men did you warn? There was Owen, and Wilkinson, and Abrahams, and Stanford, and Williams; that was a double bord—four men in that bord.
 492. Well? And there was Chas. Woollett.
 493. Then you warned these men of their danger? Yes, and they followed me.
 494. And you made your escape? Yes.
 495. How? Well, I escaped pretty rough. I came on the top of the pit-water coming out towards my flat. It was coming down to the main heading then.
 496. How far from Jenkins' bord was your flat? I cannot exactly tell you.
 497. Who warned the workmen in the lower bords? My brother.
 498. His name? David Powell.
 499. What was his occupation? He was foreman over the wheelers.
 500. And by the time you got down to Charles Woollett's bord you felt the water rise—what depth was it then? About 3½ feet.
 501. Was it running with considerable force? Yes; it knocked me down six times, and Charles Woollett pulled me out by the hair of my head.
 502. How did you get out of the stream of the water eventually? He pulled me on to dry land, and I then ran as fast as I could till I got on high ground coming up to the pit.
 503. Did the men in these bords whom you warned escape in the same way? Yes, they followed me.
 504. Is that all you can say about this accident? Yes.
 505. Were you down in the pit again after that? No, I was not.
 506. *Mr. Jones.*] Were these bords driven wide on that side? No; 6-yard bords; but I'm not quite sure.
 507. *Mr. Swinburn.*] How long was it after the fall took place when you were up to your waist in water? About five minutes.
 508. *Mr. Davies.*] You state that you warned several men when the water was up to your knees—did you think there was something dangerous then? I have answered that I cannot tell.

The witness withdrew.

John Smith sworn and examined:—

509. *President.*] Your occupation, Mr. Smith? Deputy at the Ferndale Colliery.
 510. Before being appointed as Deputy at Ferndale Colliery, what occupation did you follow? That of a coal-miner.
 511. In what part? At Waratah.
 512. At any other place? I was at the A.A. Company, but no other place in this Colony.
 513. In what other country have you been engaged in mining? In South Wales.
 514. How long have you been Deputy at Ferndale? About nine years.
 515. As Deputy, what were your duties? My duties were to do what was required on the roads, and to see that the roads were safe for men and horses.
 516. You had charge over the men? Yes.
 517. You have been in the workings to the west of the winding-shaft? Yes.
 518. That is, to the south of No. 2 heading, as it is called? Yes.
 519. And also in the body of workings to the north? Yes; I have been all through the colliery—used to travel it every morning.
 520. What rule did you follow as to width of bords? The general rule was 8-yards, and 4-yard pillars.
 521. And were the pillars left of the same thickness, irrespective of the depth of the overlying strata? Yes; we followed the general rule of the district.
 522. Did you ever reduce the width of the bords? Yes, where required.
 523. What would induce you to reduce the width of the bords? Well, the softness of the roof sometimes caused it to be done.

Mr. J. Smith.
31 May, 1886.

- Mr. J. Smith. 524. You reduced the bords in consequence of close proximity to the surface? Yes.
525. When the shaft was sunk, was there any solid strata above the coal? Yes, about 12 feet down it was broken clay and stone.
526. Do you consider that solid strata? Well, it was good enough to stand.
527. But I mean solid rock? No, there was not.
528. Then you had sand for 12 feet, and broken clay and stone down to the coal? Yes.
529. What depth is the shaft? 50 feet.
530. At the west workings, is there any solid rock above the coal? Yes, there was solid rock there from one end to the other. It was very thick from the surface to the coal there. The hill was all rock nearly.
531. Have you observed any falls of the surface into your workings to the west? It is all falls together.
532. Did any quantity of sand run into your workings? No.
533. Consider for a moment. Did not a considerable quantity of sand run in from a fall close to the shaft? Yes, a little sand did run in, but not to cause any danger to the workings.
534. How did you stop it? We stopped it with timber.
535. Did any water come with it? Yes, there was a quantity of water.
536. Did any sand and water get into your workings in any other part of this western district? Not to my knowledge. There were falls, but not to interfere with anybody.
537. Did any water come down? No, not to hurt us; it choked itself before it could do any harm.
538. When did the fall take place you have referred to, when a good deal of sand and water came into the workings? I cannot remember the time exactly.
539. Did this fall take place in an 8-yard place? Yes.
540. Did that not raise suspicions in your mind as to the danger of 8-yard bords? We did not know the sand was so near.
541. If there were no solid strata at the shaft, what guarantee had you that there would be solid strata to the rise? There were no 8-yard bords on the flat.
542. Do you say this fall took place where 8-yard bords were being driven? Yes, but that was years ago.
543. I do not care when it was; it was in an 8-yard bord, and now you say there were no 8-yard bords? Not in that part. In one place there was. We did not know anything about this fall until it had happened.
544. Then this caused you to alter your system of working? Yes.
545. When did this occur? I cannot tell you the date; it was about five or six years ago.
546. Have you ever seen any other parts of the mine where the surface caved-in to the workings? I have seen caves-in, but not to the surface.
547. In the abandoned parts, did they take place? Yes; they would not take place when we were at work.
548. Do you know the various small collieries to the west of Ferndale? Yes.
549. Are the workings of these collieries connected with Ferndale? Yes.
550. Do you know the cover of the roof in them? No.
551. Or where they are worked? No; I know nothing about it; I never inquired.
552. In the dip workings from No. 2 heading, east of the roll, was the coal worked on the same principle—that is 8-yard bords, and leaving 4-yard pillars? Yes; we worked 8-yard bords when the roof was solid, or when we expected it to be solid.
553. And working these bords to the north, you came to the crop of the surface. When did you stop—did you stop when the roof became tender or when the clay came down before the coal? As we approached the crop the width of the bords was reduced to 6 yards.
554. Did the surface deposits come down on some of you? We did not go that far.
555. Then when did you stop? When the coal became soft and was not fit to be sent to market.
556. Then, as you approached the crop, do I understand you to say that the roof altered in character? Yes.
557. And became soft and rotten? Yes.
558. Did you see a tendency in the roof to fall in this treacherous part? Yes.
559. Did it give off any water? Nothing to speak of any more than other bords. It was generally drier round the crops than where the roof was solid.
560. Did you use a greater quantity of timber when approaching the crop? Yes.
561. Why did you do so? To protect the workings.
562. Did you consider the workings in this colliery safe? Yes.
563. Did any of the men converse with you at any time regarding these crop-workings? No, not to my knowledge.
564. Have any of them ever expressed doubts as to the wisdom or safety of following the coal so close to the crop? I never heard them.
565. Have any heavy falls taken place close to these crop-workings? No.
566. None at all? None.
567. Are you perfectly certain? Well, there may have been a hundred yards away.
568. Then no falls have taken place nearer than 100 yards? No, not to any extent. There was a fall about 40 yards back, but this did no harm.
569. What came down at this fall? Conglomerate and blue stone, or shale.
570. Do you know the character and thickness of the surface deposits along the crop? No; I do not.
571. Did it ever occur to you that this knowledge would be useful? No; I never thought it would be useful.
572. Or highly necessary? No, I am sure I did not.
573. Did it never occur to you that this knowledge was essential before exposing this long line of surface? Well, I never thought of having to answer any question about it.
574. Were you aware that the line of this crop extended under the tidal swamp? Well, I knew a part of it did; but was not aware that it extended any distance.
575. Well, knowing this, did it not cause you to ponder on the wisdom of proceeding in that direction? I always exercised care for the safety of the men.
576. Knowing that you were exposing yard after yard of this surface, and that it was covered by water at spring tide, did you never entertain serious doubts as to the wisdom of these operations? Well, I did not know that we had gone so far up until the day of the accident.
577. I understood you to say that you were aware that these workings were under the tidal swamp? I knew

- knew that we were under a part of it, but not half as much as we really were. My business was below. Mr. J. Smith.
578. In the light of subsequent events, do you not think that the mode of working was rather reckless? No, I cannot say I do. There is conglomerated rock in the second bord from where this water came through; and when I see conglomerated rock I am not frightened of anything. 31 May, 1886.
579. Looking at the plan, there is no doubt that the face of the heading went into the clay? Yes.
580. Very well; did you think that this mode of working was safe? It was a narrow heading.
581. No doubt; but it went into the clay, and only a few bords were under the conglomerate; did not that increase the danger. Did it not raise doubts in your mind as to the wisdom of your proceeding? No.
582. The plan clearly shows that about 40 yards back in that heading from the position where you cut the clay you broke off Nos. 1 and 2 bords, which were stopped, and these bords had also reached the surface; still you say that it was not a warning to you? No; we thought this was as safe as could be.
583. Was the water salt that you pumped from the mine? Yes.
584. Where did you think it came from? From the sea.
585. Did not this circumstance cause you to reflect on your position, and consider the advisability of taking precautions? No, because the water came down from the solid rock.
586. The points J, F, K, on the plan, are to the extreme north-east, and mark the position of narrow headings; these narrow headings are in advance of two bords which are driven up to the surface. Why were these headings driven narrow? Because the roof was soft.
587. Was the roof good about 50 yards back, where they were started? Yes, it was good there.
588. Did a fall take place at letter J a short time before the disaster? It was nine months before.
589. How was this fall discovered, seeing that it was in an abandoned part of the workings? Well, we had not got the rails up.
590. What did that fall consist of? Of clay, sand, and shells.
591. How was it stopped? It stopped itself.
592. Did not that circumstance raise doubts in your mind as to the security of these workings? It did not. I had no fear whatever.
593. Did that fall show itself on the surface? Yes.
594. You stated a few minutes ago that you were not aware that the site of this disaster was so far under the tidal water? Yes.
595. Do you adhere to that statement? Certainly.
596. Then you say that the fall which took place at J appeared on the surface? I was told so; I never saw it.
597. But you were informed of the position that it occupied? Not particularly.
598. Were you not aware that that fall caused a considerable cave-in on the surface—that water continually lay there, and that it was used as a swimming-pond for the boys? I never heard that.
599. Did this fall let water into the mine? Nothing more than before. It was as dry as this room all along the top of the workings.
600. Would you look at the plan again (pointing to F). These two upper bords, Nos. 1 and 2, were stopped? Yes.
601. Why were they stopped? Because the coal was not fit for market.
602. Did you prove the surface in those bords? No; I told you that the coal was not fit for market.
603. But they are marked on the plan "crop." Does not that signify that they have reached the crop? Yes, I suppose so.
604. Was the roof good here? No; it was soft.
605. Had these bords all the appearance of approaching the crop? Yes.
606. Were they secured with double timber? Yes; they were doubly secured.
607. Was No. 3 bord working when the disaster occurred? Yes; and No. 4 and No. 5 also.
608. Who worked in No. 3 bord? Williams.
609. Was the roof in that bord good? Yes, pretty good.
610. Was that bord also in your opinion approaching the crop? Yes; that is, it would have to go about 60 yards further.
611. Were these bords wet? No; there was a little water naturally, but the roof was quite dry.
612. And the condition of No. 3 bord raised no doubt as to the safety of the working? No; we always put a stopping up where the soft coal appeared, in case of accident.
613. But if you were absolutely sure there was no danger, why put yourself to the trouble of barricading? For the sake of assurance.
614. In that case, would it not have been well to have thick solid pillars in going near the crop? That is my superior's business.
615. Were you aware of the depth of the surface above these bords? No; I was not.
616. But you were aware they were under the tidal swamps? Yes, in places, but I did not know much about it.
617. Are you aware whether any of the men knew the position of these bords? No.
618. Did you ever hear them discuss the subject? No.
619. Did the men appoint Check Inspectors? Yes.
620. How often did they inspect the colliery? Once a month generally.
621. Do you know whether they ever reported unfavourably of the rise workings? No, I do not.
622. Before the accident, when did they last inspect the workings, and report thereon—approximately? I cannot say. I think it was about a fortnight or three weeks before the accident occurred.
623. And so far as you know, the Check Inspectors made no complaint about these rise workings? Not to my knowledge.
624. Then the accident, we have heard, took place on the 18th of March: about what time in the morning? It was about a quarter or ten minutes to 8 o'clock. I had visited the places twice that morning. I went round first thing that morning and saw no danger anywhere.
625. Were you on the look-out for danger? I had to go round to see that all was right in the usual course. That is a part of my duty. If in my rounds I saw anything that appeared dangerous I had to secure it. I was not stinted for men. Was in Jenkins's bord ten minutes before the accident happened. He was in No. 6 bord. I was up towards the back. When I saw the men coming out ahead of me, they having taken a
near

- Mr. J. Smith. near cut to the rise of the dip roads, I asked them what was wrong, and remonstrated with them for running away.
 81 May, 1886.
626. Did you then return? Yes; I took five or six men with me and returned the same way that they had come as far as we could get, but the water stopped us.
627. Where did you meet the water? At No. 8 heading. (*Explanation dictated by the President.*)
 The witness went with several men to a point on the special heading, marked "2," and seeing the water and finding that he could do no good, returned up to the pit.
628. When did you go again? I went three times to the water along with the men. The manager was down in the other direction.
629. Where had the water accumulated at this time? It was on the flat, and some of the workings had filled up.
630. Just behind the face there was a barricade put up—was that swept away? Yes.
631. Do you know the object the management had in erecting that barricade? It was put up in case any accident should occur.
632. Did you apprehend any danger at all? No; we never dreamt of the likelihood of an accident, or I would not have been there myself.
633. Then it was just a precautionary measure? Yes.
634. What size was the hole when you first saw it? It was a large hole; you could see the daylight. The men were pulled up to the surface. That was the third time I was there.
635. On the former occasion when you were there, did you see Hargraves? No; I shouted, but could not make anyone hear.
636. Who was the man lost through this accident? John Jenkins.
637. Was he warned of the accident? I cannot say. The lads told me they had shouted for him, and that he replied that he would come as quickly as he could.
638. Have you any idea how he was lost? I should think he was making to go out when the water came past his bord.
639. What depth was the rush of water, do you know? I cannot tell. It was after the tide had fallen that we went there again. When I got to the top end of his bord it was completely closed up from the surface and full of mangroves. It looked as if this might have been worked a hundred years ago.
640. Mr. Thomas.] In the neighbourhood of where this fall took place, what was the nature of the roof? Conglomerate.
641. Did you consider that a sufficient protection—that you could work there with safety? Yes.
642. Mr. Curley.] When you were erecting these barricades, the manager would be there, I suppose. Was there no conversation between you to the effect that danger might be apprehended ahead of you? No; as I have said before, we did not think so. The barricade was put up by way of general precaution.
643. You erected these barricades, and yet you mean to tell us that neither you nor the manager apprehended any danger, or had the slightest thought of it? Yes.
644. With the knowledge that the water had come over the surface, and that a fall had already taken place, did you, in your position as deputy, point out to the manager that danger might be apprehended in connection with these workings? No; I did not see any danger to point out.
645. Mr. Davies.] You say that a portion of the coal was unmarketable—was it red or greasy? It was greasy.
646. Is not that an indication of the coal being near the surface? Yes; but it was quite dry there.
647. Mr. Swinburn.] Is the conglomerate rock 200 yards back from the face of the old workings? Yes.
648. That is the rising ground? Yes.
649. Can you see the ledge of the rock there? Yes.
650. And beyond that, do you think it still carries out the conglomerate to the face of the workings? Very possibly.
651. Did it ever occur to you that that would be a "wash-out" ground? Yes. No doubt when the coal gets washed out and unmarketable it is an indication that the roof gets soft; but that is 100 yards back.
652. What was the width of Hargraves' bord? Six yards.
653. How often did you measure the bords? About twice a week.
654. How far was the water up from the face when this fall took place? Between the two cut-throughs, about 15 yards from the heading.
655. I suppose you did not take much time to examine the rock that came down? Well, I did take notice; it was as good a roof as any we have worked under, and better than one-half of the places in the pit.
656. Mr. Usher.] How thick was it? About 40 feet, with fine facings going up through it. That was where the water came down. I had daylight for it, and could see.
657. Mr. Jones.] You state, Mr. Smith, that the greater part of this water in the Ferndale Colliery came from where you had the best roof? Yes.
658. Did the water come from the bottom or the top? From the top.
659. You say you had power to put in barricades where you thought necessary? Yes.
660. What were they chiefly composed of? Timber.
661. What was the special object of putting them in? To be prepared for any accident that might occur.
662. Were they supposed to be sufficient to keep back the water? We thought so.
663. Did there appear to be much "crush" upon the pillars near the scene of the accident? No, nothing to speak of.
664. President.] Had the pillars given at all? Nothing more than usual. Pillars will give in a new pit or an old one.
665. Mr. Usher.] What do you call "usual"? Well, peeling of the sides is a common occurrence in every mine.
666. Mr. Davies.] Have you had any conversation with anyone as to the evidence you were to give here to-day? No.

The witness withdrew.

TUESDAY,

TUESDAY, 1 JUNE, 1886.

Present:

J. R. M. ROBERTSON, Esq., PRESIDENT.

MR. USHER,
MR. THOMAS,
MR. NEILSON,
MR. TURNBULL,MR. SWINBURN,
MR. CURLEY,
MR. JONES,
MR. DAVIES,

MR. DURIE.

Mr. J.
Mackenzie,
F.G.S.

1 June, 1886.

John Mackenzie, F.G.S., Examiner of Coal-fields, sworn and examined:—

667. *President.*] In your official capacity, Mr. Mackenzie, have you frequently examined the Ferndale Colliery? Yes; I have been there rather more frequently than other places, on account of the roads and other matters.

668. What bords have you principally examined? Well, I have been down as far as the water-pit and other places.

669. Have you inspected the workings under the Maitland Road, off No. 2 heading? Yes.

670. Do these workings extend further west than the Maitland Road? I think they do extend a little further.

671. Do you know whether they are worked up to Tighe's Creek? I never was there. When I went in that direction they were full of water, but I think they were just at the boundary of Tighe's Creek. However, there is a plan showing this.

671½. Across Tighe's Creek, from the position you have been pointing to, there is a small colliery known as "Broughall and Griffiths"? Yes.

672. What depth is that colliery? Well, I forget, but I think about 30 or 40 feet.

673. Do you know whether the coal in that pit has any solid strata above it? It has very little.

674. Do you know whether the coal-seam in that colliery dips to the creek? Yes, it does.

675. Do you consider there is any danger of the colliery being inundated from Ferndale? Yes, we considered there was danger, and the Inspector gave them notice to that effect.

676. When was this notice given? Just after the flooding of Ferndale. We thought the water might break through there.

677. Could you supply the Commission with a section of Griffiths's pit? They are not compelled to send in a section under the Act, and I have not got one.

678. Have you a record of the workings of that colliery? Yes.

679. Can you produce that? Yes; also the notice served on Mr. Garrick, solicitor to Messrs. Broughall and Griffiths, and correspondence with the Attorney-General, whose opinion was sought as to what should be considered dangerous.

680. Will you lodge all these papers with your evidence? Yes.

681. You are aware that a number of small collieries have been drowned out from Ferndale? Yes.

682. Do you know Robinson's colliery? Yes.

683. Do you know whether that colliery worked the coal under the Maitland Road? Yes, they did; but the colliery was not always worked by the same proprietors.

684. Do you know whether the workings from that colliery extend towards the creek? These are the workings (witness points to the tracing).

685. The workings of this colliery and those of Ferndale have become connected? Yes.

686. And going towards the creek? Yes.

687. Then you are still of the same opinion that you do not consider Griffiths's colliery at the present moment safe? I think so myself. I think there is danger.

688. Is the ground round Griffiths's colliery covered with flood-waters? I have not seen it myself; some of it doubtless will be, but I cannot speak from my own knowledge.

689. *Mr. Davies.*] Does Tighe's Creek overflow its banks at high tide? I really do not know myself; as far as I am concerned, I have not seen it.

690. *President.*] Have you examined the workings of Ferndale to the dip of the engine-plane—a body of workings in a line going towards the east? No; I have not been in there.

691. Are you aware that the rise bords have in some places been driven up towards the surface deposits? No, I am not.

692. Have you seen a plan of the colliery? Yes, this is the plan.

693. Looking at the plan, can you say whether that is so; in other words, were you aware that the Ferndale workings were advancing under the tidal swamps of Throsby's Creek? Yes.

694. Did Inspector Dixon himself not report to you on the subject? Inspector Dixon reports to me every two months in respect to this and other collieries, but he has never made any special reference to these workings in any way.

695. Still you were aware that the workings were advancing under the tidal swamps? Yes.

696. Did the knowledge of this raise any suspicion of danger in your mind? No.

697. You knew the uncertain and erratic character of the surface deposits? I know the roof of that coal is very irregular.

698. And you knew the position of the swamps, and that these consisted of uncertain thicknesses of mud and sand? I know a portion of the swamp is, but I may say this, that there is 40 feet of rock at the point you mention.

699. We knew that from subsequent events? We never supposed but that there was rock there.

700. Have these surface deposits filled up hollows and gullies in the underlying rock? I cannot say; I have never seen it.

701. Then you do not know from experience whether that is the case? I do not know whether there are any hollows there.

702. Going from the known to the unknown, and from a full knowledge that the rock was covered by swamps, would it be reasonable to suppose that the same fissures exist under the swamps that are seen where the rock is uncovered? Fissures are cleavages formed by the contraction of the rock at the time of its formation.

Mr.
J. Mackenzie,
F.G.S.
1 June, 1886.

703. Well, whatever your experience as to hollows and gullies may be, it is quite evident that such exist in the Newcastle District; is it therefore reasonable to suppose that the same exist under these swamps? There would doubtless be a certain undulation.

704. Is there a considerable amount of uncertainty as to the depths of the deposits—the surface or swamp deposits? The borings have proved it here.

NOTE (President).—By here, Mr. Mackenzie refers to the bore in front of point E on the plan.

705. Do you consider there was any danger attending the carrying out of these workings under the tidal swamps? There is danger in all places of that kind.

706. Do you consider that any special provisions are required to insure the safety of a mine the workings of which are covered by tidal swamps? Well, I really do not know in what way it is to be done.

707. In the meantime, it is a general question, and demands a general answer. Therefore, in a general way, do you consider that any provisions of the kind are required? There are no provisions at all in the Act.

708. We know that; but as to special provisions, with an eye to the future? Well, I do not know what special provisions could be made; it would be taking it out of the hands of the colliery owners.

709. Considering the liability of these surface or fluviatile deposits to vary in depths by following any inequalities of the rocky floor, is there any provision you would desire to suggest for the protection of life and property? I think the Government might suggest this connection, that certain things ought to be done, and then it would remain for the colliery proprietors to carry those suggestions into effect. We take the responsibility if we once make special rules, or say, "Go and do so and so."

710. I may say this is in view of future legislation, Mr. Mackenzie? Well, it is a very difficult question, and comes upon me rather suddenly. It is a very important question.

711. It is an important question, and because it is so I have put it to no other witness; and I put it to you because you are an important witness, and most likely to think over such a question? Well, no, I have not thought over it, because I had no idea that it was to be raised.

712. Have you observed the plan of Ferndale Colliery? Yes.

713. Have you seen that the north-east workings stretch several chains under high-water-mark? No; I have not noticed it. I have not looked at it particularly for anything of that kind. Mr. Dixon reports to me regularly.

714. Would you look at a narrow drift (K) at the north-east corner, that has been driven in advance of the bords—do you know whether a barricade of strong timber had been put in at the foot of that heading? No; it was never reported to me.

715. Do you know whether Nos. 1 and 2 bords had been stopped by coming in contact with surface deposits? No.

716. Look a little to the left of K to the letter J—do you know whether a heavy fall of clay and sand occurred at these headings about a year before the late accident? No; I may say that falls occur in many collieries that I am not likely to hear of.

717. But this was a special fall which formed a pool of salt water in the swamp. Did not the fact that these workings had reached the clay under high-water-mark induce you to make a personal inspection? I was not informed of it.

718. Then you were not aware that they were working under high-water-mark? No, I was not.

719. What power do you possess to stop the workings of a colliery under conditions that you deem to be dangerous? Upon that point the opinion of the Attorney-General has been sent for. The Act says we must find it to be dangerous. We cannot anticipate any danger; we have no power under the existing law to stop workings unless we see danger (clause of the Act read, 25 sec., page 9).

720. Had you been informed that at the fall I have alluded to at "J" on the plan, a very large quantity of sand and mud and sea-shells had come down and closed up some of the underground workings, and that a quantity of sea-water had covered the hollow formed by the subsidence thus formed on the surface, would you have apprehended danger? Well, I should have gone and seen for myself if it had broken into the workings.

721. We have evidence that it did break in, and formed a hollow which to the present day is covered up at high tide, and has formed a pond or permanent pool which is used by boys as a swimming-bath? If I had seen that I certainly should have considered it dangerous.

722. Do you consider that such an accident should have been reported to you? Well, you see, so far as the Coal-mining Regulation Act is concerned, colliery proprietors are only compelled in case of actual accident to report.

723. Suppose this occurrence had come to your knowledge before the late accident, would you have remonstrated with the management for not reporting such a circumstance to you? I very probably might have done so, but I have no authority through the Act to compel them to report it. I may refer you to this, "Notice of Accident" (clause 28 of the Act), "Loss of life or serious injury to any person."

724. If you had seen this state of matters on the surface, and knowing that these coal-workings had for many chains proved the outcrop of mud and sand along the coal-faces, would you have anticipated danger? Most certainly I should.

725. In which case, what course could you have adopted under the present Act? I could only have served them with notice under the 25th section of the Act. We have no power to go further. I have sent for the Attorney-General's opinion upon it.

726. Do you consider that coal-mining under these tidal swamps in any way imperils the safety of the men? I should say there is danger, yes.

727. Is there special danger? Certainly there is more danger than in other places.

728. Do you know of any other collieries working under similar conditions to Ferndale? Yes; there are Maryville, Bullock Island, and Stockton. We have served all of them with notices to keep boring ahead of their workings. I may give you a letter I wrote to Mr. Dixon, Inspector of Collieries, on the subject. We felt great responsibility, and special letters were sent to all of them.

729. Can you put those letters in? Yes; I can bring them to-morrow.

730. Have you a copy of the Check Inspectors' reports of Ferndale? No; they will be with the manager.

731. Have you a copy of your Inspectors' report? Yes.

732. Have you any records of bores put down in the vicinity of Ferndale? Yes; these were given to me by Mr. Fletcher (referring to document in his hand).

733. I am reminded by Mr. Usher that some sections of surface bores have been published in the Annual Year Book of the Department—have you copies of these? I expect I have; I will look up everything, and bring them with me to-morrow.

- Mr. Inspector 774. Of what thickness is this band? It is from 3 to 4 or 5 feet thick. There is a pretty good band of
Dixon. 2 ft. 6 in.; the rest is of a softer nature of coal.
June, 1886. 775. Is it on low-lying ground? Yes.
776. Is the land about that covered with water during floods? Yes, at high tide.
777. Have the workings of this colliery extended under the creek? To the extent of two bords, but they are not right across the creek; they have been driven under the creek for some distance, and under a branch of the creek.
778. Do you consider there is any danger of this colliery being inundated from Ferndale? No.
779. Have you had any reason to report as to the dangerous condition of this colliery? Yes.
780. What section of the Act did you base it on? The 25th section.
781. And what reason did you assign—what was the nature of your report? Simply that they were under the creek, and I considered it dangerous to undermine the creek with a cover of only about 29 feet between them and the water.
782. That is, I suppose, a cover composed only of surface deposits? Yes; a small portion of sand, and the rest clay.
783. Is that clay impervious to water, or does it contain a little sand? No; I think it is good puddle-clay.
784. Have you power under the Act to close up a colliery when you apprehend danger? No, I have not.
785. Have you ever tested this point? I have. I tested it with that same colliery. I notified them in March last, under the 25th section of the Act, that no one was allowed to go under the creek, and I called upon the manager to withdraw the men at once, and to keep them out henceforth and for ever. I put it like that. The consequence was that they withdrew the men for one day and then consulted a lawyer. The solicitor, Mr. Gorrick, wrote a lawyer's letter to the Minister for Mines, which was sent back to me for explanation. I did explain. When I went below the place was as safe as I sit here, as far as that goes; but my impression was that, owing to the peculiar situation of the colliery, if a flood came at any time the place might fill, and the twenty-three men would never get out alive.
786. You say that the colliery is on low-lying land? Yes.
787. And a few feet only above the level of the creek? Yes, that's all.
788. Do you know the depth of the creek? It is not deep. It has a silty bottom.
789. Then it is the bottom of silt that you estimate to be the top of the cover for the coal? Yes.
790. What depth of silt is there? I reckon there is about 4 or 5 feet of that silty stuff to the clay.
791. What depth of water is there? There was not much when I put a stick in.
792. Apparently this colliery has about 20 feet of cover? I reckoned they had 25 feet.
793. That is 30 feet to the coal-head at the shaft? Yes.
794. How many feet is the surface shaft above the level of the creek? I do not think it is more than a couple of feet.
795. And you considered that the circumstances warranted you to give the management of this colliery warning not to proceed? I did.
796. You informed them a few days after the disaster at Ferndale? Yes; I may say that the colliery did not stop—only for one day.
797. What reply came from the Minister for Mines? I got no reply at all.
798. Do you know what reply the owners received? No.
799. After giving the warning, did you consider that your duty ended? Yes. I consider that when my report goes to the Minister my duty ends. I am bound to do nothing but carry out my instructions.
800. How long have the dip workings in Ferndale Colliery been going? About four years in August of this year.
801. What is the general character of the roof over this section—is the coal-seam regular in this part? No, it is very irregular.
802. We have heard from Mr. Powell that in crossing a troubled belt of coal the conglomerate roof came down and cut off about 11 or 12 feet of top-coal? Yes, that is correct.
803. Was the system of working practised similar to that pursued in the district collieries? About the same.
804. Does this system seem to be in all cases advisable to follow? That is a question that might want some consideration.
805. Have you given it consideration? I have not.
806. But it is an arbitrary system that has for some reason or other taken root in the district? It was in vogue before I took office.
807. In Ferndale, were not some of the bords driven narrower than others? Yes.
808. Does any interference with the width of bords increase the rates for hewing? Yes, it does.
809. Approaching the rise of No. 8 workings (we have called them the dip workings)—what means did the manager adopt to prove the line of surface or out-crop? I have been up there several times, and I used to see him driving narrow places. But it was a very difficult matter to prove the out-crop in Ferndale, because in some places you would come on a patch of soft coal, which would naturally lead to the supposition that the end was reached, but after that it would very often occur that good coal would be come upon again.
810. Well, Mr. Dixon, did you ever apprehend any danger in connection with the working of this colliery? I will say once and for all that I never dreaded anything happening in Ferndale.
811. I understand you have had special opportunities of informing yourself as to the nature of the surface deposits in the neighbourhood? Well, down on that flat I do not know to this day the nature of the deposits, excepting as to the pitfall. I tried borings, but was not able to get them. I know the extent of the rock there, and the alluvial deposits, but I never knew that the tide came over as it did before that accident happened, and I was camped there for many months.
812. You are aware that large areas of these swamps are covered with sea-water at high-tide? I knew that they were lower down towards the smelting works.
813. Referring to the plan of the Ferndale workings, were you not aware from that plan that for some months the whole of the working-bords were under tidal water? I can tell they were beyond Robinson's Hill, but it is difficult in this colliery to find where the surface is; as a rule the tracing I have to go by only shows the underground working.

Mr. Inspector
Dixon.

1 June, 1886.

- S14. Then the surface deposits of these swamps were practically unknown? Yes, to me.
- S15. Did you consider the eastern bords safe? I never saw a safer place than Ferndale—never a better timbered place, or one in which greater attention was paid to all necessary details; I will give the manager credit for that.
- S16. You knew that for over half a mile the surface or outcrop had been proved? I knew that it had been proved for a long distance by Sweedwell and others.
- S17. In the dip workings? I knew that what was supposed to be the outcrop was proved further back.
- S18. Did you know that in the easterly workings the bords were driven right into the sand? I did not know that.
- S19. You made no further report to the Examiner on the condition of these eastern workings? No, I did not; in the position I am placed in, if I look after the safety of the men, so far as timber is concerned, I can make no special report. I cannot withdraw the men from a colliery.
- S20. That is, you made no special report as to the condition of these bords in your report to the Examiner? No.
- S21. Did Powell ever inform you that these workings were under the tidal waters? No, certainly not.
- S22. You see the N.E. workings and points marked H, I, J, K on the plan? Yes.
- S23. The bords from these headings appear to have been driven parallel with the line of the outcrop? Yes.
- S24. Was any coal left unworked between the upper bords and the crop? I have seen coal left there.
- S25. Barriers of coal? Yes.
- S26. Were these, in your opinion, of sufficient thickness? Yes.
- S27. Do you observe that the crop was proved by narrow bords driven in advance? Yes.
- S28. Have you inspected the pair of narrow headings at J? I did when they were further back.
- S29. Did Mr. Powell report to you what he found in the face? No; I do not remember that he did.
- S30. If he had told you that he had found sand there, would you have considered it safe to approach so near the crop? It would depend upon whether it was quicksand or dry sand.
- S31. Are you aware whether a large body of sand fell into the workings about the point J a year ago? I never saw that place until after the disaster.
- S32. Do you think that falls occurring in such a position should be reported to you? Well, I do not know.
- S33. Do you consider such a fall of sufficient importance to warrant you in making a special report upon it? Well, if I saw the place and found that it had choked itself, there would be an end of the matter. If, however, I saw it running, then I should consider it a matter of great importance.
- S34. Would you consider that such a fall should be taken in the light of a special warning, and a circumstance calculated to warn the manager as to the unsafe state or position of these workings. The manager admitted, and his men admitted, that they were well aware that these workings were within the line of high-water-mark? If I had charge of a place, and such a thing occurred as you describe, I should use extra care in approaching it again.
- S35. While the extra narrow heading K was being driven, Nos. 1 and 2 bords were also going on—did you inspect these bords? I do not remember ever being in those bords specially. I know I was as far up in this corner (pointing to the plan) as I could get, in February last.
- S36. That bord, after being driven a few yards, entered the soft coal, facing the surface deposit, and was accordingly stopped; did Mr. Powell inform you of that? Do you mean after the disaster took place?
- S37. Did he inform you before? I cannot recollect.
- S38. Mr. Jones.] Did you visit the mine between February and the date of the accident? No.
- S39. President.] Did you see the barricade at heading K? No; I did not see it until after the accident.
- S40. Look at the plan, Mr. Dixon. Are we correct in supposing that if the crop has been found at K and J, and again in Nos. 1 and 2 bords, 40 yards south of K, that it has taken a sudden sweep round to the dip? I suppose so.
- S41. Had you been manager of this colliery, would this circumstance have induced you to reflect on the probable danger of carrying on the work; in other words, would it have caused you to reflect upon your position? I certainly should have reflected if I had seen the falls as you describe them.
- S42. What inference would you draw from both these falls occurring a considerable distance down or back from the outcrop, and where there was a rocky roof? Well, the inference I would draw—I have formed an opinion about the fall, and do not think there is reason to be ashamed of it—is, that the roof must have given way owing to a network of small fissures.
- S43. The inference you draw is that the fall took place in a portion where the rock was reticulated with little fissures, and that no reliance ought to be placed on the soundness of the rock on which rests such a load of soft wet surface? Yes.
- S44. Then does all this knowledge impress you with the necessity of giving a wide berth to surface deposits in swampy land, especially where that swampy land is covered by tidal water? With the knowledge that has come before me now, I would say yes.
- S45. In other words, there must be a margin of mineral left in such cases to protect the lives of the workmen and the property? Yes.
- S46. From your experience, can much reliance be placed upon the soundness of the roof of the bore-hole coal where it is covered by such irregular strata? Yes. I have known cases where it has been covered by deposits of silt and you might stake your life on the roof; and where you have a hard bed of conglomerate, my experience is that it is almost impossible to fall.
- S47. But Mr. Powell spoke positively as to the soundness of the body of conglomerate, yet, in this case, sound as the rock was, it fell? Well, it has never been in my experience.
- S48. Did you inspect the hole in the rock caused by this underground fall? Yes, from the surface.
- S49. What appearance did it present? Just as if there had been a force through of a small crack. It was about 4 feet across. The water was covering it. My opinion is that the top of the hole was never larger than 4 feet.
- S50. Did the rock appear to be sound? A portion of it appeared to be very sound.
- S51. This comes to what I was saying a minute ago, as to the apparently good evidence of the soundness of the roof, where the two heavy falls of sand took place? Yes; but understand the conglomerate was only 10 feet thick at most—not so thick as what I am talking about.

Witness

Mr. Inspector
Dixon.

1 June, 1886.

Witness describes the strata as follows:—Sand, 20 feet, as near as he could ascertain; clay, 2 feet; conglomerate, 10 feet; rock underneath, 30 feet; what this was he could not say.

852. *President.*] How do you account for such a thickness of conglomerate rock falling in? The only way I can account for it is that there must have been a fissure in it. They are very common in this district.
853. That fissure would let down water and rot the rock? Yes.
854. Have you known any similar fall occurring under the dead pressure of quicksand? No, I cannot say that; I would not say that was the reason of the fall. I have known several falls where there has been quicksand.
855. What thickness of quicksand? Thirty feet.
856. And what thickness of rock? 100 feet of rock.
857. Were the crop roads and bords in Ferndale Colliery sufficiently timbered? Yes; they were sufficiently timbered for all purposes of safety. As I said before, I have never seen a better-timbered mine.
858. How do you account for the top roads being extra timbered? The timber was put up to protect the men from the roof, owing to the intervening 3 feet of shale below the hard conglomerate.
859. The extra timbering must have been a source of great expense? Yes; the men had one shilling and sixpence a set for couplings.
860. Did any man complain to you of the danger of the eastern workings in this colliery? I never received a complaint from any man in Ferndale.
861. You inspected the rise bords only a few weeks before the accident? Yes.
862. Were you satisfied that no danger existed? Yes.
863. You had no suspicion that a disaster was imminent? No.
864. You had not sufficient facts before you to justify you in formulating any complaint? No.
865. Mr. Powell did not inform you that the tidal waters covered these rise workings? No.
866. You did not expect that the workings extended so far? No.
867. And were you satisfied generally with the workings of Ferndale? Yes, and I reckoned Powell a thoroughly practical man.
868. Do you attribute any blame to the management for this accident? I do not; and when I say that I may also say that I have thought the matter out in every way.
869. Suppose you had had the curiosity to inquire as to the position of the north-east workings, and that you had discovered that the tidal waters, for many acres, covered these workings, and that falls of sand and sea-shells had taken place, and that then, suspecting danger, you had given orders for the men to cease working in the mine, and still no accident occurred, what position would you have been in? I should have been laughed at.
870. You would only have been exonerated if an accident occurred? Yes; otherwise I should have been held up to ridicule, even by the men. The miners in Green's pit themselves went and declared that the pit was quite safe.
871. *Mr. Neilson.*] In case of danger of this kind, what power has an Inspector under the Act? I have power under the 7th sub-section of section 12 to withdraw the men in case of fire-damp or other danger.
872. *President.*] It all turns upon the word danger? Yes. Here is the position I am placed in: I must be down below, and demonstrate to the men that the whole thing is going to tumble in and kill somebody.
873. *Mr. Neilson.*] The onus of proof rests upon you? Yes.
874. *Mr. Jones.*] You have stated that no complaint was ever made to you as to the probable danger of working under the tidal water; did you ever hear any men discuss the possibility of danger? No; I never did.
875. *President.*] Had Mr. Powell apprised you of the fact that the workings were under tidal water, what would you have done? I should have reported the matter certainly.
876. You consider the very fact of comparatively shallow workings proceeding under swamps, of unknown thickness of strata, an element of danger? Yes, by all means.
877. *Mr. Jones.*] And in the light of what has happened, do you consider a departure from the present mode of working would be required? Yes, I believe that.
878. *Mr. Swinburn.*] You are quite sure that provision ought to be made for working the different bords to suit the overlying strata? Yes.
879. *President.*] That is to say, there should not be an empirical system of coal-mining followed? No.
880. *Mr. Usher.*] Would your reports as to the danger in this or any other mine be published? No.
881. *President.*] Is there any reason why they should not be published? It is a matter out of my province altogether.
882. That is to say, in sending in your report, you have made your communication in fulfilment of the duties of your office, and it is then no longer your property? Yes.
883. *Mr. Usher.*] I only asked the question because I am of opinion that it ought to be published.
884. *Mr. Davies.*] When last you visited the Ferndale Colliery, before the accident, did you see the Check Inspectors' report? Yes.
885. Was there anything in these reports about apprehending danger? No, not a word. I always go over these reports to ascertain if there is any necessity for me to go and see anything.
886. None of the workmen called your attention to anything from which danger was to be apprehended? No. I would take just as much notice of a man in his bord as I would of the Board of Delegates, if he had any complaint to make.

(By the President.)

NOTE.—The last report is dated October 25th, and is entirely taken up with a report of the number of men and boys in certain districts, the amount of air supplied to those districts, and the timbering, and winds up by stating that each place is well supplied with timber.

The witness withdrew.

William Henderson sworn and examined:—

Mr. W.
Henderson.

1 June, 1886.

887. *President.*] What is your occupation? I am a mineral-borer; I have been occupied as such about forty years.
888. Following your occupation as a mineral-borer, you have put down a considerable number of bores in the locality of Ferndale? Yes.
- 889.

889. Have you a record of those bores with you? Yes (record produced).
 890. No. 1 bore—where was this put down? At the pumping-pit.
 891. No. 2 bore? Round the hill, a slight way from that; just at the margin of the spring-tide, not far above high-water-mark.
 892. No. 3 bore? At Spark's slaughter-house, nearly to Tighe's Bridge, south of Robinson's Colliery.
 893. And No. 4, where is it? Out of the bounds altogether.
 894. Where is No. 7? A long way to the east of the pumping-pit. It is not in swampy ground; it is on the side of the road across Tighe's Creek. This bore shows a thickness of 118 feet of surface deposits.
 895. No. 9, where is it? That is further along on the same side of the creek, along the Smelting Road, further north, in the centre of the swampy land.
 896. What is the depth there? The depth of the bore is 148 feet. It gives 51 feet of alluvial deposits, 22 feet of conglomerate, and 3 feet 9 inches of coal.
 897. No. 10, where is that? That is away to the westward again. It is about 107 feet deep under the swamp, and marked M on the plan. It shows 52 feet of loose sand.
 898. No. 11? No. 11 is 111 feet deep, and is situated south of the pumping-shaft, and marked O on the plan. It gives 20 feet of loose sand.
 899. No. 12? Is 119 feet, right in the centre of the flat, to the north of the pumping-pit, and gives 67 feet of loose sand.
 900. No. 13? Is at Honeysuckle Point, at the junction of the Maitland and Wickham Roads, on Dangar's land. It gives 108 feet of surface, and 8 feet of rotten rock.
 901. Have you put down bores in other parts of this locality? I put one down at the fall-in on Ferndale. The witness lodges a record of the boring put down by him in the district.
 The witness withdrew.

Mr. W.
Henderson.
1 June, 1886.

David Jones sworn and examined:—

902. *President.*] What is your age? I am sixteen years of age.
 903. Were you working at Ferndale? Yes.
 904. How were you employed at Ferndale? I was driving a horse.
 905. How long were you employed there? For nearly two years.
 906. Were you employed in the eastern workings up towards the rise? Yes.
 907. What bords did you drive from? From Bill Owen's, John Jenkins', and Bill Abrahams'.
 908. How many bords? Four of them.
 909. Where were you working on the 18th March when the water broke in? I was in Jenkins' bord. That is the fourth bord. I was in the face hooking the horse on. He told me to go out and ascertain what was making the row. I went out and found it was the water.
 910. Was the bord driven far off the heading? Yes, it was a good way off.
 911. How far? I cannot tell you how far; but it is over 20 yards.
 912. Well, you saw the water, and what did you do then? I went half-way down the bord, and told Jenkins the river had broken in. I told him twice; the water was then over my knees.
 913. Did you know that you were working under the river? No.
 914. Previous to this, did you know whether the coal places were under the swamps? No.
 915. Why did you think the river had broken in? By the rush of water. It was coming in strong.
 916. What did Jenkins do? He was going about trying to get his stick.
 917. Was he lame? Yes. I sang out twice, and he replied, "All right." I then ran out in front of the horse, and when the water came up to my chest I thought it was time to go. As I was coming past the flat the water was reaching to my shoulders.
 918. How did you get out? I had to swim on my back until I got to the travelling road on the right-hand side.
 919. Were there many men there? Yes, a good few.
 920. And you did not see Jenkins again? No.
 921. You say he was looking for his stick at the time you left? Yes, I believe so; he was feeling about for his stick.
 922. Had he his clothes on at the time? I believe he had commenced to put them on. I know he was going to the place where his clothes lay, but I did not actually see him get them.
 923. Did you never hear the men talk about these workings being under the swamps? No.
 924. Where did you think you were working? I did not know exactly—somewhere down the road going to Wickham from Tighe's Hill.
 925. Did you know that the salt water rose over these swamps? No; I was never down there till the fall-in occurred.
 926. Is that all you know about Jenkins? Yes.
 927. *Mr. Usher.*] Do you know anything about a fall-in at the surface which became filled with water and formed a bathing-place? No.

Mr. D. Jones.
1 June, 1886.

The witness withdrew.

Henry Hargraves sworn and examined:—

928. *President.*] Were you working at Ferndale in March last? Yes.
 929. In what capacity? As a miner.
 930. How long had you worked in Ferndale? I was there very nearly eighteen months.
 931. In what positions did you work in that mine? The last quarter I and my mate were working what they call the soft coal towards the crop.
 932. At what part? It was about ten bords away from the crop.
 933. What bord were you working in? I believe it was No. 21 or No. 22.
 934. That was ten or twelve bords down from the scene of the accident? What was the number of your bord? It was cavilled again the same day as the fall occurred. I think it was No. 10.
 935. Where were you working in this section when you struck the crop? I never struck the crop.
 936. You said you were working the soft coal? Yes; but they call all that soft coal because it was going towards the crop.

Mr. H.
Hargraves.
1 June, 1886.

Mr.
H. Hargraves.
1 June, 1886.

937. Did you know that these workings were going towards the crop? Of course I did.
938. Did you know that they were working under the swamps? Well, I did not know for certain, but I supposed they did.
939. Did you know? Well, I could give an idea the same as the rest of them.
940. Be good enough to answer the question direct. Did you know? No; I did not know that we were working under the swamps. I only knew that we were working under the flat by the water-shaft.
941. That is the swamp. Did you know that the tide covered that flat? Yes; I knew it came up sometimes.
942. Then you and the men knew that you were working under these swamps? Yes.
943. Did you ever work higher up towards the rise than the bord you last worked in? No.
944. Was there any water coming off the coal in your bord? Yes; we had a feeder coming out of our bord.
945. What part of it? It came in at the top side and went straight across the bord, coming out of the "jerry."
946. Was it salt water? Yes; it was the same as the water usually was down in the pit.
947. Quite salt? Yes.
948. How long was this feeder in your bord? About a fortnight.
949. Did you strike it suddenly? Yes; on the left-hand side.
950. Was there much water? Yes, a good stream. They did not have it in the bord above us.
951. Did it bring any sand with it? No; it was clear water.
952. Did that not raise any doubt in your mind as to the direction you were working in? No, it never did.
953. Did you see any bords in Ferndale that had reached the crop? No; I was never up to the crop in Ferndale.
954. You had no idea of danger in your mind? None at all.
955. Where were you at the time of the accident? I was working in my bord.
956. How did you become aware of it? A boy came and sang out. I did not know what it was at the time. I thought it was like the sound of water that came in once before.
957. When was that? About eight or nine months since. It came through a bord just above where I was working at the time, and swamped the bord out for four or five days.
958. Where did it come from? Through the roof.
959. Did it come suddenly? I cannot say. It was the bord above me.
960. Did you hear the men say anything about it? They spoke about it, but I cannot say anything for them.
961. In what manner did the water come down? It came down like a shower.
962. Did it stop itself? Yes; and they worked the bord afterwards. I thought this last break-in was something of the same kind when first I heard it.
963. Did this water you speak of come from a fissure in the roof? No, I do not think so. As I say, it was like a shower. They very often let down water in working the coal.
964. Did it run for several days? Yes; but they started again before the week was out.
965. Well, coming to the morning of the accident, you say that one of the boys warned you? Yes; the boy called out to me, and I filled a skip and sat down. When the water came into the bord, I jumped up to see where it was coming from, and I saw a horse standing between my bord and the next, and a light was hanging in the face. The water then was coming in very strong. I ran along until the lights went out, and then I did not know where I got; presently my lamp jumped out of my hat. When I got to the force of the stream I sat down, because I could not cross it. I sat there till I heard the fall. It came with a rush, and, as it brought me back, I commenced to swim.
966. You sat there for some time? Yes, a good while.
967. Did the force of the stream not last? No; not till the next fall—that's where the main pressure came.
968. *Mr. Thomas.*] How far did you work from John Jenkins? I was about 5 yards below him.
969. *President.*] You say you were seated on the side of the main road, and the water accumulated up to your neck? Yes.
970. How long did you remain in that position? As I was sitting down between the prop and the rib I could feel the water coming up. I was fixed fast by the rubbish that came down with the water. I managed to wrench my arms out, and then I began to swim, my idea being that if I got to the top side I would stand a better chance.
971. And you got to dry land at last? Yes.
972. Was the first fall that you speak of a large fall? It was a fall of rock. I went up till I could feel the cool air coming, and when I came to the first fall the water was up to my waist.
973. Was there any current in the water there? No, not then.
974. The fall would choke it, I suppose? Yes. When I got further down I saw the daylight, and then there was a strong current—that is nearer the rise. I should not have gone that road if I had had my light with me, because I should naturally have taken the main road, and if I had done so I could never have got out.
975. Was the fall below the hole? No; it was at the right-hand side of the hole.
976. When you came to the hole, could you see daylight? I could just see a glimmering of it, because I was round the corner. I was there for an hour and a half before I could attempt to cross the stream.
977. Then the water went down? Yes, as the tide went out. The first fall was about 11 feet high, which I climbed over. I think it was on the main road, but I cannot say, as I had not been working up there for twelve months. I had been working down at the lower side of the pit.
978. When the water diminished, did you go under the hole, and did you see daylight then? Yes.
979. Did you see the people above? No; I did not see anybody. I sang out, and then sat down again, when I heard someone call out, "Halloa," and a rope was sent down to me, but it was too short. A longer rope was got, however, and by this means I was pulled out of the pit.
980. What time was it when you were drawn up? I believe it was close upon 1 o'clock.
981. Then you were battling with this water in the mine for about three or four hours? Yes, quite that.
982. You saw nothing of Jenkins? No.
983. You must have passed his bord, too? Yes; from what I have been told since, I must have gone right past his bord, as there was no other road out.

984. *Mr. Jones*] What distance was your bord from the road? It was about 20 or 30 yards from the road.
985. *Mr. Davies*] Were your bords extra timbered, as compared with others? Yes, I believe they were.
986. Was double timber used? It was in some places. The same timbering was employed nearly all over the pit.
987. Did you never have a conversation with any of the men about working under these swamps? No; I never used to think about it. Perhaps my mate would say to me, "Where do you think we are working," or make some remark like that, but I never thought anything about the matter.
988. And you never thought of any danger? None whatever. The only danger that ever I thought of was the possible falling of a piece of rotten roof.
989. Did you see on the surface a fall that took place some considerable time before the accident? Yes; I went there one Sunday.
990. And did that never give you any reason to doubt the wisdom of working under the tidal waters? I never thought there was any danger, because when we got this 6 inches of stuff down there was hard conglomerate above.
991. And did you put in timber to keep up this 6 inches of stuff? Yes.
992. *Mr. Jones*] But sometimes it was much thicker, was it not? Yes; sometimes it was 4 or 5 feet thick. The fall I went over was very high.
993. *Mr. Davies*] And you think every precaution was taken for your safety? Yes. But I believe there were some men who were suspicious of this place.
994. Can you tell their names? No, I cannot.
995. Were they strangers to you? No; they were men who have been working with me.
996. Then surely you can recollect their names, can't you? No; I have a bad memory. I only heard it in a public-house, where I met them; and they, or some of them there, said that they knew this would happen. Pickavance was the only one who spoke to me in the pit.
997. *President*] Was it since the accident that these men spoke about the accident, saying they knew that it would happen? Yes, since the accident.
998. *Mr. Davies*] Did you ever hear Cornelius Peters say anything? I have heard Cornelius Peters or John Johns say something, but I cannot recollect.
999. *Mr. Jones*] Do you believe everything was done for the safety of the men in working the mine? Yes.
1000. *Mr. Turnbull*] Do you know if men were ever discharged for working the bords too wide? No.
1001. *Mr. Jones*] Did you ever know the men object to putting in timber? No; not where they were paid for it.
1002. *Mr. Neilson*] How far were the sets apart? About 2 feet 6 inches; in some places they were not so far, and in others they were farther apart.
1003. *Mr. Jones*] Had you any special reason for disregarding the warning given by the fall? I thought it was only a bord broken in. I did not know that the boy was singing out to me.

The witness withdrew.

James Pickavance sworn and examined:—

1004. *President*] What are you by occupation? I am a miner.
1005. Have you been employed at Ferndale Colliery? Yes; I worked there for six years and six months.
1006. Have you worked in all the dip workings of this colliery? I have been at the rise and at the dip.
1007. Have you worked in any of the bords that have gone into the surface? No, I have not.
1008. Have you seen any of the crop places? Yes.
1009. Where? This one in the heading.
1010. Was it you that drove that heading where the fall occurred? Yes.
1011. Where did you go to in the face? We left it at the coal.
1012. Did you go to the surface? No.
1013. What width was driven? About 5 or 6 yards.
1014. What was the object of driving there? Just to prove the coal; it was driven about 10 yards.
1015. You know where the fall took place? Yes.
1016. Where? In the two headings where we were; it was close against the crop-coal.
1017. You do not refer to the fall of the 18th March last? No; I know nothing about that.
- Dictated by the President:—The headings that the witness refers to are driven up to letter J on the tracing.
1018. Did this fall take place at the face of the heading, or some distance back? It was close to where we left off in the narrow passage.
1019. Just opposite one of the cut-throughs? Yes, just about there.
1020. Did it give you much warning? It came down through the night, and in the morning I found clay and a little sand there; there was not much; it was quite dry.
1021. What did you do? We turned the bords away further back.
1022. Did you barricade it up in any way? I do not know whether the master did or not.
1023. *Mr. Jones*] Do you know whether it was done or not? I believe it was stopped.
1024. *President*] Did you ever see the result of that fall on the surface? Not to my knowledge.
1025. Do you know the position on the surface where it took place? No; I am not a surveyor, and I cannot speak as to that.
1026. Did you know whether the workings were covered by salt water at high tide? No, I did not.
1027. Had you any conversation with your mates on the subject? No; I knew the heading that we were in was on the rise of the seam of coal. It was quite dry.
1028. Were you aware that the face of the workings was under the swamps? I was not; I did not know where it was exactly.
1029. Did you tell any of your mates that you apprehended danger from the salt water coming in? No.
1030. Are you perfectly sure that you never told any of your mates that you were afraid of an accident happening? I never said so that I am aware of.

- Mr. J. Pickavance
1 June, 1886.
1031. Will you repeat that you never had such a conversation? I repeat that I never told anybody I was frightened.
1032. Did you not state to some of your fellow-workmen that you were afraid an accident was about to happen? Not to my knowledge.
1033. Did you not know that these workings were under the tidal swamps? No, I did not.
1034. Do you know the heading where this fall has taken place? I cannot tell you where the fall is, whether it is a heading or a bord. I am a stranger to those workings where the fall occurred. The heading that I was in was a long way further back.
1035. Coming back to that fall, you know a great deal more than you are disposed to tell us, and we know what you know? You say you do not know what was done to prevent another fall occurring there. I am going to tell you that you do know, and that you do know about the stoppings and barricades; and the reason is that you put them up, and that you were paid for putting them up. I wish you to remember that you have taken an oath to tell the whole truth, and nothing but the truth? I never was paid to put up barricades.
1036. Did you not work with Cotterill putting up barricades? No; I never worked with such a man, and I never was engaged in putting up barricades.
1037. *Mr. Usher.*] Who was your mate? I was working with a man named Miller.
1038. *Mr. Swinburn.*] We have heard that you were putting up these barricades, and were paid for it? We put a dam back into a little hole that was put in there.
1039. How long did you work at that? We were there a shift.
1040. Did you see it the next shift? No; next night we got the fall, and some sand came away. When we put this sand in we came to blue clay. We ran the top-coal out, and came on to the "jerry"; it was quite dry.
1041. *President.*] Where were you working at the time of the last accident? I was working down below, a long way off.
1042. How were you apprised of the accident—who gave you notice? The boys came down the cut-through by my place and said the water was in the pit. I at once ran away, and when we got out on the main horse-road we met the water. I followed it into the travelling road with the others—about fourteen of us—till we got on to the engine-road.
1043. The water was going strong down the hill? Yes, very strong when I came through it.
1044. How deep was it? It was about up to my waist.
1045. Then, of course, you made your way to the pit bottom. Did you go down again? No; we made our way to the engine-road, and were drawn up.
1046. And you did not go down again? No.
1047. Then are you satisfied now, after what has happened, that the working of the coal-seams under these swamps is attended with some danger? I do not think there is much danger where there is plenty of rock overhead. On the other hand, I would not like to work where there was no top.
1048. Where there was no top the roof has not come down, but where this serious fall happened it appears there was nearly 40 feet of rock. Do you now think there is some little danger in working in such a place? I certainly think there is danger where there is no roof above the coal.
1049. But here a fall takes place through 40 feet of rock-cover? There is nothing impossible in that, because in coal-mines you often fall in with a "fault" in the rock.
1050. *Mr. Jones.*] Referring to the previous fall you speak of, you have said that you found it had come in next morning. Was it securely timbered when you left it? Oh, yes, it was securely timbered.
1051. Did the employers, in your opinion, do all in their power to secure the general safety of the men? So far as I know. When I was in the pit there was always plenty of timber there.
1052. Then, viewing the whole of the circumstances, and having visited the scene of the fall, are you of opinion that any special care should be taken in working seams of that character, where the tidal waters flow over the top? That is a general question I cannot answer very well.
1053. *Mr. Turnbull.*] Would it not be better to work the bords narrower? These bords that we were driving were narrow—6 yards.
1054. *Mr. Jones.*] Was the manager very particular in seeing that the width of the bords did not exceed the rule laid down? Yes.
1055. *Mr. Usher.*] Did you ever see any 4-yard bords there? I never worked them, but I have heard it said there were 4-yard bords.
1056. *Mr. Turnbull.*] What was the width of the cut-through that you drove in that portion of the workings where the fall took place? About 5 feet.
1057. *Mr. Davies.*] At the fall you speak of, when the sand and clay came down, did you see any shells? I believe I saw a few shells.
1058. Did that not lead you to believe that you must be working under the tidal swamps? I could not tell where they came from.
1059. You did not think they grew below, did you? There must have been a wash there some time or other.
1060. Did you see shells there next morning? I saw something like shells.
1061. I suppose you know what shells are. Did you see shells? Yes.
1062. Was this a subject of conversation between you and your mates as to the safety of working in this part of the mine? We might talk about it perhaps, as we could not tell exactly where we were. As for anything that might occur, of course I could not tell.
1063. *President.*] If you had any doubt as to where you were, why did you not ask Mr. Powell, the manager? Well, a man does not think about such things.
1064. *Mr. Jones.*] I suppose there was not sufficient doubt? No.
1065. *Mr. Davies.*] You did not work with any fear? No, or I should not have been there.
1066. And no one expressed any fear as to the safety of the mine? I never heard anyone.
- The witness withdrew.

William

William Thomas Owen sworn and examined:—

Mr. W. T.
Owen.

1 June, 1886.

1067. *President.*] What is your calling? I am a miner.
1068. How long have you worked at Ferndale? I have worked there on and off for five years.
1069. Have you worked in the rise bords of the dip workings? Yes.
1070. Have you worked in any of the bords that went towards the surface? No.
1071. What bord were you working in at the time of the accident? In the next bord to the man that was drowned. The one below him; No. 5 or No. 6.
1072. Were these bords driven narrow or of the full width? When we started we drove 6 yards wide, and when we had driven 20 yards we increased the width to 8 yards, by the manager's direction.
1073. Were the bords above and below you 8 yards wide? The one above me was 6 yards wide.
1074. Was your bord secured by timber? Yes, secured by timber.
1075. Why was that? We always had plenty of timber.
1076. But was there extra timber in these bords? Not in mine.
1077. Was the roof secured by sets of double timber? No; we did not need it where I was.
1078. Did they use it in the other bords? Down below me they did not need double timber.
1079. Did you ever see double timber in Ferndale? I have seen it.
1080. What was it put in for? It was to secure the roof, which was occasionally bad there.
1081. Was there much soft coal where you were working last? No, there was not much. It was pretty hard as a rule.
1082. Do you know anything about some falls that took place further up some months ago? I was not aware when the fall took place, but I was told of it afterwards.
1083. How came you to hear of it? I heard some men talk about it. I forget who they were.
1084. Were you told it was a heavy fall? No; I did not know that it came to the surface.
1085. But do you know now? I have been told that the fall choked itself.
1086. Did they tell you what it consisted of? I was told it consisted of sand.
1087. Did you know that where you were working you were under the swamp? No; I did not know exactly.
1088. Did you never have the curiosity to ask where you were working? No; I did not give it a thought.
1089. When you heard your mates talking about sand coming down at the falls, did it not arouse your curiosity? Not in the least.
1090. When did you hear that that fall came to the surface? I was told that the fall choked itself before it came to the surface.
1091. Who told you so? I cannot recollect.
1092. Did you ever go over to ascertain? No.
1093. Have you ever gone over to see the cave-in that occurred a month or six weeks ago? Yes.
1094. Did you look to the left of that and see a depression near the swamp? No.
1095. Was there any water coming out of the face of the bord that you were working in last? No; it was a dry bord.
1096. And was the roof good? Yes.
1097. How did you become aware of the accident of the 18th March? The wheelers gave us the alarm.
1098. And did you act upon the alarm at once? Yes.
1099. Tell us what you did? Well, as soon as we heard about it we ran for a place of safety; and when we were coming out we had to pass through a considerable stream of water which was coming down the heading. It was up to my middle when I went through it.
1100. Were you working in your bord below Jenkins? Yes.
1101. Who was the wheeler? John Powell.
1102. Did you hear young Powell warning Jenkins? No.
1103. He warned you, I believe? Yes; he sang out in the heading.
1104. By the time you got out into the heading the water was 3 or 4 feet deep? Yes, it was all that.
1105. Were there any men along with you? Yes, there were a lot of us together, and we crossed the water and got into the travelling road, and out of the water.
1106. *Mr. Usher.*] When you came away from the fall, did you call out to Jenkins? No; we all ran for it.
1107. Did you know about the existence of these tidal swamps, to the east of Ferndale, that surround Throsby's Creek? Yes; I knew there was a flat there.
1108. Did you know that you were working under the flat? No.
1109. But you knew the roads were going down in that direction? Yes, but I did not know we were nearly so far down as we were.
1110. Who told you that this fall choked itself up? I cannot say.
1111. You have a poor memory? Yes.
1112. *Mr. Jones.*] Having heard that a fall took place on a previous occasion, and brought down the sand, did it not occur to you that there was some danger to be apprehended? No; it did not frighten me at all.
1113. Did it not occur to you that what had already happened might happen again; and in that light, did it occur to you that there was any danger? I did not consider there was any danger in my bord, or anywhere else, for that matter.
1114. But does not a circumstance like that point to the conclusion that there is danger? Of course, as there is water over it there must be a certain amount of danger, but I had no idea of where I was working.
1115. *Mr. Swinburn.*] You have been five years about Ferndale you say? Yes.
1116. And you never observed anything of this kind? I knew that if ever a fall came, and the water was up high, it would come through.
1117. *President.*] Why could you not answer me candidly, when I asked you the question, that you knew these workings were under the tidal swamps? We have come here to perform a public duty—you are here to second that purpose—why not tell us the truth at once? It is this way, sir; I did not know exactly where I was working, but I knew that if the workings were underneath this flat, and if a fall took place to the surface, the water would come in.
1118. You had evidently been pondering over this, and you could have arrived at an understanding by speaking

Mr.
W. T. Owen.
1 June, 1886.

speaking to your working manager? Well, of course he might have told us, but I would not think it to be my duty to ask the manager where I was working.

1119. You now tell us, at the very last moment, that you were aware that if a fall took place it would flood the mine, which clearly implies that you knew you were working under the tidal workings. It would have looked better had you been more straightforward? I had no wish to be anything but straightforward.

1120. *Mr. Davies.*] You have been in the habit of attending miners' meetings, have you not, Owen? Yes, 1121. And have you never heard this made the subject of discussion, as to the working of these bords under the swamps? Well, so far as my recollection carries me, I never recollect anything being brought up in the meetings about it.

The witness withdrew.

WEDNESDAY, 2 JUNE, 1886.

Present:—

J. R. M. ROBERTSON, Esq., PRESIDENT.

Mr. USHER.

Mr. THOMAS.

Mr. NEILSON.

Mr. TURNBULL.

Mr. SWINBURN.

Mr. CURLEY.

Mr. JONES.

Mr. DAVIES.

Mr. DURIE.

Mr. John Mackenzie, F.G.S., recalled:—

Mr. J.
Mackenzie,
F.G.S.
2 June, 1886.

Mr. Mackenzie lodges a tracing of the old plan of Ferndale, showing the workings under Maitland Road and towards Tighe's Creek, marked "No. 2" within a circle: also a plan of a colliery started on the A.A. Company's property, Tighe's Hill (Broughall and Griffiths), showing colliery workings under Tighe's Creek, and approaching the workings of Ferndale Colliery towards the said creek. Having lodged these plans, marked "No. 2" and "No. 3" within circles, Mr. Mackenzie kindly offers his record tracings for the use of the Commission *pro tem.*, and to have true tracings of the workings prepared and lodged with the Commission.

Mr. Mackenzie also lodges sheets of correspondence between the Inspector of Collieries and the Examiner of Coal-fields and Messrs. Broughall and Griffiths (through Mr. Gorriek, solicitor) and the Mines Department; and the Inspector's reports *re* the undermining of creeks from Broughall and Griffiths's colliery.

Also opinion of Attorney-General *re* 25 Vict. No. 39.

Also reports of Inspector Dixon on Ferndale Colliery, from 17 January, 1885, to 27 February, 1886.

Also a list of bores at Ferndale, furnished by Mr. James Fletcher, junior.

Also a plan of Ferndale Colliery, showing the position of the several bores put down.

1122. *Mr. Jones:* Mr. Gorriek, in his letter to the Minister, states that the safety of Broughall and Griffiths's colliery had been tested by the miners. How was that information obtained—in writing or only verbally, do you know? No, I do not. But it seems strange to me that any body of men should fail to report to the Inspector any survey made as to the safety of the mine.

The witness withdrew.

(Mr. John Usher in the Chair.)

William Teasdale sworn and examined:—

Mr. W.
Teasdale.
2 June, 1886.

1123. *Chairman.*] What is your occupation? I am a miner.

1124. How long have you been a miner, and how long have you been in this Colony? I have been engaged in mining about thirty-four years, and I have been two years in this Colony.

1125. How long have you been engaged at Ferndale? About eighteen months.

1126. In what part of the mine were you employed? Up in the soft coal—the part where this accident occurred.

1127. Were you employed there during the whole time since you went to Ferndale? Yes.

1128. In what particular bords were you working? In No. 34 and No. 37.

1129. Is that near the last fall-in? Yes.

1130. Can you point them out on the plans? I do not understand the plan.

1131. How far was your bord from the fall-in? The fall-in took place at No. 37 bord.

1132. What width were these bords? Six yards. No. 37 and No. 34 were 4 yards.

1133. What made them reduce the width of the bords from 6 to 4 yards? I cannot say that.

1134. Did you ever hear the manager or the overman state any reason? No; I never heard anything.

1135. What is your opinion about it? I cannot say what might be the reason of it.

1136. Was the roof good? It seemed middling good where we were working. I was in the thirty-seventh bord just before the accident happened, and I never saw any danger. There was plenty of timber.

1137. What kind of roof was there? It was a kind of black stone? There was no clay or sand.

1138. Was it shale? Yes.

1139. Did you see any conglomerate anywhere over the roof of the coal? No; not in that part.

1140. How was your place timbered? We had plenty of timber.

1141. Was it what they call double timbered? Yes.

1142. I believe you are paid extra for double timbering? Yes.

1143. Were you aware that these two bords you have spoken of were under the tidal swamps? No; or I would not have been there.

1144. Did you never make any inquiry as to where you were working? Yes; but I could never get any idea.

1145. Who did you ask? I asked the men working next to me, but they did not know.

1146.

1146. Did you ask the overman or the manager? No.
1147. Did you have any conversation on the subject, or did you hear any conversation taking place between any of the men underground or on the surface? No.
1148. Did you ever hear anyone say that it was unsafe to work there, or that they thought so? No.
1149. Then you did not anticipate any danger? No.
1150. Were you aware that a fall took place in another part of these crop workings about a year or fifteen months ago? Yes; I believe there was a slight fall, where some sand came down further up.
1151. How far was it from the present fall? I cannot say how many yards.
1152. Do you know what was done after that fall? No, I do not.
1153. Do you know whether any stoppings or barricades were put in? No; I never went up in that direction.
1154. Do you know whether it fell to the surface? I know nothing but what I have been told.
1155. When did you know about this fall that took place fifteen months ago? I cannot say when I heard it.
1156. Was it since the late disaster or before it? Oh, it was before the accident.
1157. How long before? About a month, I daresay.
1158. When you did ascertain the fact, did it raise any fears in your mind as to the safety of the working? No; I did not see any danger where I was working.
1159. Was any water coming from the roof or from the foot of those two bords you worked in? None whatever; they were perfectly dry.
1160. You never worked in any bords that went out to the crop? No.
1161. How far was it from where you were working that the sand came down? I cannot say.
1162. You must have some idea—was it in the locality at all? No; it was higher up.
1163. How many places back? I cannot say how far.
1164. When you were informed of the fall, did your informants not mention the locality where it occurred? No; they did not mention exactly where it was.
1165. What was this part of the pit where you were working called? We used to call it the soft coal.
1166. Did this fall take place in the soft coal? Yes.
1167. I suppose it was not far away from where you were working? It is not a great distance, but I cannot say how many yards.
1168. Why did you ask your mates where you were working as to the surface? I had no conversation about it.
1169. You distinctly stated in the early part of your evidence that you asked your mates the question? I do not remember.
- [The shorthand writer read that portion of the witness's evidence referred to.]
1170. Why did you put that question—was it from curiosity or a sense of danger? I never thought there was any danger.
1171. Then you say you never visited the first fall? No.
1172. Did you hear it reported that shells came down with the first fall? Yes.
1173. Did it not strike you then that there was some danger of the water coming in? No, it never struck me.
1174. In fact you had no curiosity in the matter? No.
1175. Where are you working now? At Waratah.
1176. Has anyone spoken to you at all as to the evidence you were to give here to-day? No.
1177. Nor at any time? No.
1178. *Mr. Swinburn.* You have been mining for thirty-four years? Yes.
1179. How many pillars was your working place away from the fall-in that took place fifteen months ago? I cannot say how many pillars were between the two places.
1180. How many bords were you from the last fall? I was working in the next bord.
- The witness withdrew.

Mr. W.
Tennadale,
2 June, 1886.

Wm. Williams sworn and examined:—

1181. *Chairman.* Are you a miner? Yes, a coal-miner.
1182. How long have you been engaged in coal-mining? About eleven years.
1183. In what particular districts have you worked in Newcastle? The New Lambton, Minmi, and Ferndale.
1184. How long were you employed at Ferndale? About three years.
1185. In what particular districts in the colliery did you work? Well, I worked in No. 8, No. 4, No. 3, and No. 1 bords.
1186. That is in what they call the dip workings? Yes.
1187. Not far from where the fall took place? The last place where I worked was close to the fall-in.
1188. In what bord was that? No. 31.
1189. How far is that from the fall-in? Well, I do not know the place exactly, but, as far as I can understand, it fell in just opposite my bord. (Position described on the plan.)
- [The witness handed in a cavel sheet of the last cavel that was worked in the mine.]
1190. What was the width of the bord you were working in? Eight yards.
1191. What kind of roof had you there? Very soft.
1192. What was the nature of the strata? It was a kind of sandy clay and coal with a little hard stuff mixed with it,—a shaly kind of stone.
1193. What thickness was it? It was about a foot, coming down from the rock.
1194. Did it require timbering? Yes; we put sets in the middle and single side-sets.
1195. Were you paid extra for putting in that timber? Yes, for the centre one.
1196. Was there any water coming from the bottom or roof? Not in my place; it flowed into my place from a place above.
1197. Where did it come from in that place? From the roof.
1198. Was it much? It was sufficient to keep me from work for a couple of days on one occasion.
1199. Was the water salt? Yes.
1200. How long did it run from that bord? Well, there was a small stream running for a long time. For a week or two, or more perhaps, I cannot say exactly.
- 1201.

Mr.
W. Williams.
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1201. Did it cease running from the adjoining bord? No, it ran into my bord through defective drainage. Instead of running down the gutter it ran into my place.
1202. Did you consider it was safe to work there with the timbering you had? At that time I considered it was safe.
1203. Was there any limit to the quantity of timber? No; we always had plenty.
1204. You put it in at your own discretion, and were paid for it? Yes.
1205. Did you anticipate danger from any source whatever in the working of Ferndale Colliery? Not in my place.
1206. In any other place? Yes; I thought those working behind would have a fall.
1207. You were aware that they were under the tidal swamps? No; I did know for certain where they were.
1208. And going on that thought you calculated that there was danger. From what source did you apprehend danger? The roof was so soft on the top of the timber that the timber had no hold on it, and it kept crumbling away.
1209. Do you think that that crumbling away was sufficient to warrant you in coming to the conclusion that the roof would fall right up to the surface? No; I had no idea how far the surface was from the coal, nor what there was above.
1210. You did not know whether there was conglomerate above or not? No.
1211. Were you aware of a fall having taken place some twelve or fifteen months before the last fall? Yes.
1212. Did you see whether they had driven up to the crop then? No, I did not see it; I knew of the fall from hearsay only.
1213. *Mr. Jones.*] Had you no desire to see it? I did not consider it very important to myself, and therefore I did not desire to see it at the time. Had I known it was so close to the creek and the tidal waters it would have occurred to me to go down perhaps.
1214. *Mr. Thomas.*] Then you never anticipated any danger there? No.
1215. Did you ever hear, either inside or out of the mine, any opinion expressed on the subject? Yes; they said it would very likely be flooded.
1216. Who did you hear say that? I have heard the manager himself express a fear—that is Mr. Joseph Powell.
1217. That is the overman? Yes; it was he told me when the fall-in took place. I can tell you how he happened to make the remark. The bord I was working in was making a lot of water, and Mr. Powell said he did not know how he would be able to keep the water down; that's how he came to tell me about it.
1218. Was no complaint made to the manager about the conversation you speak of? No.
1219. How was it that such a matter was not mentioned to the manager by someone amongst you? I do not know, I am sure. The manager was doing all he could to make things safe.
1220. At the same time you were conscious of working in great danger? I did not say so; I had no idea at all that the mine was likely to fall in with the water.
1221. *Chairman.*] Was there anyone present when the conversation took place between you and the overman? I do not remember.
1222. Try to remember where it was, under what circumstances, and whether anybody was present or not. Was it in the mine? Yes; it was in my own bord.
1223. Did a like conversation take place in any other part, or on any other occasion? I do not remember.
1224. Do you remember the names of any of the miners who said there was danger? No, I do not.
1225. Not one? No, not one.
1226. I understood you to say that several men had made the remark to you? Yes, but I do not remember them; I never thought I should be asked the question.
1227. You are not a stranger in the Colony? I was born here—at Four-mile Creek.
1228. You know your fellow-miners well? Yes.
1229. And yet you cannot point out one of them who made this important remark to you? No, I could not do it. I might think of one, and I might turn out to be wrong.
1230. *Mr. Swinburn.*] Can you not take time to consider, and give us the names afterwards? No.
1231. Why not? Because my memory is not good enough.
1232. *Chairman.*] Is it not a fact that you are an unwilling witness, and do not wish to give the names? No, it is not. I would give you the names if I could recollect them.
1233. *Mr. Neilson.*] You have been a long time at the colliery, and are, I suppose, perfectly acquainted with every man there. If I were asked that question about the 700 or 800 men I have at Wallsend I could not answer more indefinitely than you have as to twenty men out of whom you are asked to recollect one who made this remark to you. You must know that you are only evading the question? I deny that I know them.
1234. I simply don't believe you? I think it is very unfair for you to say that.
1235. *Mr. Curley.*] Do I understand that you may know some of these men? Yes; I know them all, but do not remember their names.
1236. And for fear of fixing on the wrong individuals you hesitate to name them—is that your position? Yes, that is my position.
1237. *Chairman.*] If after leaving us now you ascertain the names of any of those individuals with whom you had a conversation as to the unsafety of the mine, will you communicate with the Commission? I will.
1238. *Mr. Curley.*] Do you know whether the Check Inspectors at Ferndale carried out their duties regularly previous to this accident? No; they did not.
1239. Do you know the names of the Check Inspectors; if so, mention them? The last two Check Inspectors were George Moorhouse and the late David Hopkins.
1240. Have you any idea whether the Check Inspectors at all times were afforded proper facilities for carrying out their duties? I cannot say anything as to that.
1241. *Chairman.*] Do you know if at any time any obstruction was thrown in their way? I never heard of any objection being taken to their going round the workings and making their reports.
1242. *Mr. Davies.*] You were secretary to the miners of that colliery? Yes.
1243. And you were acquainted with the men? Yes.
1244. I suppose you consider it your duty to give us all the information you can in this matter? Yes, I do.
- 1245.

1245. Do you not think it is reasonable for us to assume that you can remember the names of the men who you say raised a doubt as to the safety of the mine? No.
1246. Do you not think it strange that you should not remember? No, I do not.
1247. You have been at all the miners meetings, being Secretary, I suppose. How long did you hold the position of Secretary? About nine months.
1248. Was not this question of danger incurred in the workings at Ferndale ever brought up at any of these miners' meetings? I have heard of danger being spoken of in the reports.
1249. Was it ever discussed in connection with the reports? Yes, it has been discussed.
1250. *Chairman.*] What kind of danger was referred in the report? The fact of there being a bad roof, and insufficient timber in the bords.
1251. *Mr. Davies.*] My question was as to the danger of the mine being flooded? You put a general question, as I understood it.
1252. Do you say that a discussion took place at any of these miners' meetings as to the danger of working under these swamps? No; I never meant you to understand that.
1253. Nothing was said about sand and clay coming down in this first fall? I have heard that spoken of, but cannot remember where.
1254. Where are the Check Inspectors' reports now, do you know? No; I sent them on to the General Secretary.
1255. *Mr. Durie.*] Do you know if any men left the colliery some time previous to the accident for fear of something of this kind happening? No.
1256. *Mr. Jones.*] Do you know whether any special care was taken to protect the lives of the men in consequence of that first fall having taken place? No; I cannot say that I do.
1257. Do you know of a barricade being erected there? There was a stopping put up, but I could not say for what purpose.
1258. You are aware that stoppings were put up in that particular locality? Yes.
1259. And you never inquired as to the cause or reason? No.
1260. Do you think that in driving the bords special care was taken on the part of the manager? Yes; it looked as if special care was taken to drive the dip bords 4 yards.
1261. *Mr. Curley.*] Who was entrusted with the Check Inspectors' reports that you speak about? I sent them wrapped up in an envelope to the General Secretary.
1262. How long was that ago? Some time ago; about the time of the co-operative case.
1263. Has there been any report since then? Yes, there was one taken since then, but it was not adopted.
1264. *Mr. Davies.*] Why was it not adopted? The principal reason was, that it was not considered a fair report, as an accident had occurred and broken down one of the doors; and the miners took into consideration that the door was broken down through an accident, and it was not considered a report fair to the management.
- 1265-6. Was it signed by the Inspectors? Yes.
1267. Is this book not kept in the Company's office? Yes.
1268. Has it been taken out of the Company's office at all? I do not know.
1269. Is the one sent to the district officer the same as that kept in the Company's office? Yes.
1270. Is this (produced) the book you refer to? Yes.
1271. Are these the actual signatures of the Inspectors? Yes; those are the original reports. I may say that the reason of the report not being taken right was on account of the water being down in the lower part of the pit, and the Inspectors could not get there. That was down close to the fall—what they call the main heading. I was working there myself.
1272. *Chairman.*] Where did the water come from? From the roof. It was raining down from every part. That is the reason the reports were not taken.
1273. I suppose where it rained in was at or about the extremity of the workings? Yes.
1274. That is not an unusual thing? No.

The witness withdrew.

Thomas Cunliff sworn and examined:—

1275. *Chairman.*] You are a miner? Yes, a coal-miner.
1276. How long have you been engaged in mining? About forty years.
1277. How long were you employed at Ferndale? Scarcely two years before the water came in.
1278. In what portion of the colliery have you worked? Well, I have worked in the greater part of it. I never worked back of where this fall took place.
1279. Did you work in the locality where this disaster occurred? So far as I can ascertain, yes.
1280. At the time of the fall-in, how far were you working from it? About 200 or 300 yards.
1281. In what direction? I was down at the bottom end of the workings at the time when the water came in.
1282. Down near the engine-shaft? Further down than that.
1283. When you worked down near the fall, what was the width of the bords there? I drove one 6 yards and one 4 yards.
1284. What was the general width? 8 yards.
1285. Why were these bords driven so narrow? I cannot tell. The top was a little soft next to the coal.
1286. Did you ever hear the manager or the overman express an opinion on the subject, or give a reason why the bords were driven so narrow? No; I simply got my orders.
1287. Did you form any opinion of your own as to why these bords should be driven 6 yards and 4 yards? No more than what I have said—that there was some soft stuff on top of the coal.
1288. How much of this soft stuff was there on the top of the coal? About 6 or 7 inches.
- 1288a. And do you think that would be a sufficient reason for working the bords so narrow, simply because there was 6 inches of soft stuff on the top of the coal. I am speaking to you as an old miner. Do you think that a sufficient reason? We were going near the crop, and I suppose it was thought that was as near as we ought to work them.

1289.

Mr.
W. Williams.
2 June, 1886.

Mr.
T. Cunliff.
2 June, 1886.]

Mr.
T. Cunliff.
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1289. Do you know what was overlying this 6 inches of soft stuff? Some of it seemed to be pretty hard, a kind of solid roof such as you would find in all the mines.
1290. Was there much timber put in? We had as much timber as we wanted.
1291. Was it single or double timbering? We put both single and double timber in.
1292. And did you put double timber in to keep up this 6 inches of soft stuff? That would very often come down with the coal.
1293. Did you require timber above that? It all required timbering.
1294. Were you paid for putting in timber? Yes, on the road—1s. 6d. a set.
1295. Then it would pay you to put timber in? Well, for my part I would rather have done without it.
1296. Could you put the timber in where you liked? Yes; it was to keep us safe.
1297. Did the deputy have anything to say in it? The deputy would order timber to be put in if there was evidence of a want of safety.
1298. I suppose for the most part you would exercise your own discretion? Yes.
1299. Was there any water in the 6-yard and 4-yard bords that you worked in? No.
1300. Did you drive to the crop? No.
1301. Did you in any instance drive to the sand or clay, that is, to the outcrop? No.
1302. Were you aware when you were working in that 8-yard bord near the fall that you were under the tidal swamps? No. I thought we were going in that direction; but I did not know exactly where we were.
1303. Did you anticipate any danger as likely to arise from working under these swamps? No.
1304. Have you ever heard anyone either in or out of the mine express an opinion that there was danger? No.
1305. You are quite sure about that? Yes.
1306. Do you know that a fall took place about twelve or fifteen months ago, a few chains away from the scene of the accident? I believe that was before I went to Ferndale, but I have heard it spoken about.
1307. Did you see the hole in the surface? Yes, after the late fall-in, but not before.
1308. You never saw any heading that had been driven to the outcrop? No.
1309. *Mr. Curley.*] How much of that 6-yard bord did you drive? About 18 or 20 yards.
1310. What was the width of the bord when you turned it away? Six yards.
1311. What was the nature of the facings in that bord after working the coal? We generally got thin facings, about 18 inches or 2 feet.
1312. Did you ever meet with a grayback going up that bord? No; I never saw a grayback.
1313. Did you ever meet with any unusual facings? No; not different from any other coal.
1314. *Chairman.*] Were the facings any different there from what they were back towards the winding-shaft? No.
1315. *Mr. Davies.*] Were there any cracks in the roof going up? Yes, sometimes there would be a bit of a crack.
1316. Nothing unusual? No.
1317. *Mr. Jones.*] Then do you think every care for the safety of the men was taken by the manager? Yes, all due care was taken while I was there.
1318. *Mr. Turnbull.*] Did you ever travel in any of the back places where the soft stuff had fallen, so as to see the hard rock? Yes, I have seen it.
1319. Did you ever see any open places in the rock? No.
1320. Did you ever see any water coming out of the bottom in the hard rock? No.
1321. *Chairman.*] What part of the world were you engaged in mining previous to your coming to this Colony? In Lancashire.

• The witness withdrew. •

Isaac Hadfield sworn and examined.

Mr.
I. Hadfield.
2 June, 1886.

1322. *Chairman.*] Have you been engaged in coal-mining? Yes.
1323. For how long? For sixteen years.
1324. In what parts? In Durham and Lancashire (England) and in this Colony.
1325. How long were you working in Ferndale Colliery? For three or four months.
1326. In what parts of Ferndale have you worked? Pretty well all over the colliery.
1327. Were you engaged near the fall-in that took place on the 18th of March last? Not at the time it did fall in.
1328. Did you at any time? I turned a bord there about two bords away from the fall. I had just turned it away when the caving was up.
1329. What width was the bord? It was 4 yards, and I laid it out to 6 yards.
1330. Was there any water coming through the top? No, it was quite dry.
1331. What kind of a roof had you? Well, next to the coal it was like coal and jerry mixed; a kind of soft stuff. There was about half a yard of black stone lying on the coal.
1332. What did it fall to? A harder kind of stuff, or yellow stone.
1333. Was it rock post? No.
1334. Did it require timbering? Yes, in places.
1335. Did you put in any double timber? Yes.
1336. Who directed you to do that? The boss, Mr. Powell. The overman has been in and ordered it. It was the customary thing in that colliery to do so.
1337. Did you think it was necessary? Of course. I was not compelled to put them in unless I thought it was necessary.
1338. You were paid for it of course? Yes.
1339. When you were down in that quarter where you turned away the bord, did you consider that you were working under those swamps where the tide swept over? No.
1340. Did you ever hear anyone say anything about it? No.
1341. Not at that time or up to the date of the disaster? No.
1342. Either in the mine or out of it? No, never.
1343. *Mr. Davies.*] Had you colliery rules at Ferndale? Yes.

1344.

1344. Were they given out to the men? I had a copy given to me; I can only speak for myself.

1345. *Mr. Turnbull.*] You say you were at Ferndale Colliery for three years? Yes.

1346. Have you ever been in the back places where that soft stuff fell down? Yes.

1347. Did you ever notice whether there were any open faces going through the hard stuff at any time? No. 2 June, 1886.

1348. Did you ever notice any water coming from the bottom? No; I never saw any.

1349. *Mr. Neilson.*] Then you knew nothing about the strata until the day of the accident, and then you were in such a hurried state that you could not take notice? Yes. A man who has to work hard in the pit has not much time to take notice of these things.

1350. *Mr. Curley.*] Did you, after the accident had occurred, go to where the fall-in had taken place? Yes.

1351. What did it look like? Well, it had broken straight down; it was bigger at the bottom than at the top; and about 20 feet up there was a piece hanging about 6 or 7 feet thick; the hole at the top was about 4 feet by 5. My calculation was that the stone was between 20 and 30 feet thick. The fall took place in the inward bord.

1352. Which way did it fall—across the bord? It fell all the way across the bord, from the commencement up to the centre, and broke down both sides of the bord.

1353. How many yards? It would be 8 yards from the heading to the far end of the fall.

1354. And the roof had fallen all that distance? Yes.

1355. *Mr. Davies.*] Have you any complaint to make as to neglect of the management for the safety of the men? No.

1356. Do you think due attention was paid by the management to secure the safety of the miners? Yes.

1357. And you have no complaint to make in any way? No.

1358. *Mr. Jones.*] Are you aware of barricades being erected in that locality to prevent the inflow of alluvial deposits or water? No.

1359. Would that indicate to your mind the nature of the fall? I do not understand the question.

1360. *Chairman.*] Supposing a barricade or stopping to be put in, of solid timber—say 12 inches thick—do you think that would be sufficient to prevent water, from such a fall, coming down, as that which occurred in March last? No, I do not.

1361. That is to say, it might have stopped a running of clay or sand, but that water coming in would force it away? Yes.

1362. *Mr. Jones.*] Are you aware of any dams having been put in? No; I am not aware of any dams having been put in.

The witness withdrew.

James Murray sworn and examined:—

1363. *Chairman.*] You are a coal-miner? Yes.

1364. How long have you been engaged in coal-mining? For thirteen years.

1365. In what collieries have you worked? In the A.A. Company's and Ferndale.

1366. How long did you work at Ferndale? About three years.

1367. In what portions of Ferndale Colliery did you work? Somewhere about where the fall-in took place.

1368. In what particular bord or bords did you work? I think it was No. 33, but I do not exactly remember the number of the bord.

1369. What was the width of your bord? 8 yards.

1370. What kind of roof was there? It was a black kind of "bandy" stone.

1371. What thickness was it? I cannot tell exactly, as none of it came down when I was there.

1372. Did you ever see any rock or conglomerate in any part of it? No.

1373. Was there any water from the roof or thill? There was a little in the bottom, but none in the roof.

1374. Did it require much timbering? Not a great extent, but we timbered up very well.

1375. What do you mean. Did you consider it safe to work in that way in that part of the mine? Yes; I considered it safe.

1376. Were you aware that that part of the mine was made a tidal swamp? No, I was not.

1377. Did you ever hear any conversation pass between any of the miners as to the position of the workings there, either in the mine or out of it? No.

1378. You do not know that any of the miners anticipated danger? No; I did not anticipate any whatever.

1379. And you never heard any expression of opinion on the matter? No.

1380. Did you know that a fall had taken place about twelve or fifteen months ago a short distance from the last fall? I did not know until the last fall took place.

1381. Did you ever work in any of the bords or headings that were driven up to or near the outcrop? On one occasion we drove towards the crop. It was bad coal, and we were stopped. We did not have the privilege of driving to the crop.

1382. I suppose you mean it would have been a privilege on account of the coal being soft? Yes; but the coal would not have been marketable, and so we were stopped.

1383. Did you ever see any stoppings or barricades put in in any part towards the crop? No, not to my knowledge.

1384. You never saw any timber barricades or dams erected with the view of stopping water or sand from running down? No; I never saw anything of the kind.

1385. Did you consider it a safe mine to work in? I did, in all respects.

1386. *Mr. Turnbull.*] Did you ever, in travelling the back places which had been worked, notice any fissures in the rock at the top or bottom? No.

1387. No joints or open places, I mean? No.

1388. *Mr. Curley.*] Were the facings very free and open in the coal that you worked in that locality? No.

1389. Did you ever meet with any "gray-backs" there? No, only slips here and there in the coal.

The witness withdrew.

Mr.
I. Hadfield.

Mr. J. Murray.

2 June, 1886.

George Spencer sworn and examined:—

Mr. G. Spencer

2 June, 1886.

1390. *Chairman.*] You are a coal-miner? Yes.
 1391. How long have you been a coal-miner? I have been engaged in coal-mining about twelve months.
 1392. Where? Were you working at Ferndale? I was working near the fall—in No. 33 bord.
 1393. What width did you drive your bord? Eight yards wide.
 1394. At what width did you turn it away? I never turned it away.
 1395. What sort of a roof is it? A kind of shale.
 1396. What thickness was it? About a foot; and above that was a kind of gray stuff.
 1397. Was it hard? No; it was neither hard nor soft.
 1398. Would it stand with timber? No.
 1399. Did you double-timber your bord? Yes.
 1400. Were you paid extra for double timbering? Yes.
 1401. Was there any water in your bord from the roof or the thill? No; it was quite a dry bord?
 1402. Did you consider it was altogether safe? Yes.
 1403. Have you been in any of the bords near that in which you worked? Yes.
 1404. Were you aware that this bord of yours was under the tidal swamps? No.
 1405. You know what I mean? Yes, I know what you mean. But I never heard that I was working under the tidal swamp.
 1406. Did you ever hear anyone make any remarks about the workings of Ferndale being under the tidal swamps? No.
 1407. Then, had you known that you were working under the tidal swamps, would it have raised any doubts in your mind as to the safety or otherwise of your position? I thought I was quite safe myself.
 1408. Did you know of that fall that occurred about twelve or fifteen months ago a few chains from the last fall-in? No; I was not in the district at that time.
 1409. And you never heard about it? No, not until lately.
 1410. Supposing that you had known of the fall that took place twelve or fifteen months ago, would it have raised any doubts in your mind as to the safety or otherwise of this particular part of the mine? No, I do not think it would. Where I was working I considered it perfectly safe.
 1411. Did you ever hear anyone make a remark as to that portion of the mine not being perfectly safe? No.
 1412. Did you ever work to the outcrop in those workings? No.
 1413. How far from the outcrop did you work? I cannot say.
 1414. Did you ever see any place that had been driven to the outcrop? No, never.
 1415. Did you ever see barricades, stoppings, or anything of that kind put into the headings? No.
 1416. Did you ever hear anyone say they had seen anything of that kind? No.
 1417. Did you ever see any water coming from the top or thill in the places where you worked in Ferndale? No.
 1418. Did you ever see any water coming from the coal? Just a little, that's all.
 1419. Just "bleeding"? Yes.
 1420. *Mr. Neilson.*] The water that you saw coming from the bord was nothing more than you might expect to meet with in connection with any mining operations? No. There was nothing to suggest danger to my mind.
 1421. Did you have plenty of timber? Yes; we were securely timbered, and always had a good supply.
 1422. *Mr. Jones.*] Was the width of the bords confined usually to 8 yards? Yes, those that I worked in were.
 1423. *Mr. Curley.*] Do you know what width the bord you worked in was turned away from the heading? I cannot say.

The witness withdrew.

Thomas Perry sworn and examined:—

Mr. T. Perry.

2 June, 1886.

1424. *Chairman.*] You are a coal-miner? Yes, a shifter.
 1425. How long have you been following that occupation? For over forty years.
 1426. How long did you work at Ferndale? About five months, and I then left to better myself. I went to work at Stockton.
 1427. Where were you working in Ferndale? I was working in various directions.
 1428. Were you working near where the fall-in took place? Yes.
 1429. Did you anticipate any danger in connection with those workings? No, not in the slightest whilst I was there.
 1430. Did you know that many bords in the headings were under the tidal swamps? Yes.
 1431. Did you express an opinion at any time, as to there being danger through working under those tidal swamps? No, I did not.
 1432. Not to anyone? No.
 1433. Did you ever hear anyone express an opinion to that effect? No.
 1434. Did you ever hear any conversation on the matter? No.
 1435. What was the nature of the roof in the immediate proximity of the fall? It was a kind of mixture—a sort of bastard rock.
 1436. About what thickness? About 18 inches of soft stuff was there.
 1437. What was above that? This bastard rock was above that.
 1438. Did it require timbering? Yes, we used to put in single and double sets of timber.
 1439. Did you think it was necessary? Well, yes; I thought it was as well to put in extra timber.
 1440. But it was not on account of the extra weight of the stuff? No, not particularly.
 1441. *Mr. Thomas.*] You put it in to prevent it starting at all? Yes.
 1442. Did any water come from the roof or the pavement of the coal? No; there might be drops here and there, but nothing considerable.
 1443. Knowing what has occurred down in the vicinity of the fall-in, and as a practical miner, would you consider it safe mining to work in the manner that they were working the coal in that direction? Well, I did not consider there was any danger there at all. The bords were only driven 6 yards wide.
 1444. Were there any bords driven less than 6 yards wide? Yes, there was one bord of 4 yards in width.
 1445. But were there not some driven 8 yards? Yes, there were, further down the workings.

1446.

1446. Did you ever see any of them more than 8 yards wide? No, I did not.

1447. You have been, as a shifter, in some of the old bords, from which the timber has been taken? I have not travelled in the back workings.

1448. *Mr. Turnbull.*] Did you ever notice the hard rock coming down close to the coal? No.

1449. *Mr. Jones.*] You state that you saw little drops of water coming from the roof in the neighbourhood of where the fall-in took place? No, not in that direction, but further down.

1450. Did it never occur to your mind that that was an indication of a probable fall to the surface? No.

1451. And you never anticipated any danger? No.

1452. *Mr. Davies.*] How long had you been away from Ferndale when the fall took place? About two months.

1453. Are you quite sure that you never stated to anyone at Stockton that the reason why you left Ferndale was that you thought there was danger there? No. If any man has stated that bring him to me.

1454. Did you ever make this statement to Henry Jones? No. I did speak to him, but told him that the best colliery I ever worked in for timber was Ferndale, and I always gave a good name to Powell.

1455. Never mind that. Did you not make a statement to one Jones that the cause of your leaving Ferndale was that you were afraid of your life? No.

1456. You never expressed any fear of danger there? No, and I never spoke to anyone excepting Jones.

1457. You are quite sure? I am perfectly sure.

1458. Then you state decidedly that you never saw any danger, so far as your experience went, in this mine? Yes; I never saw any danger.

1459. Did you hear of any dams being erected in Ferndale? No, not while I was there.

The witness withdrew.

Joseph Jackerman sworn and examined:—

1460. *Chairman.*] Are you a coal-miner? Yes.

1461. How long have you been thus engaged? About three years.

1462. You were working at Ferndale Colliery? Yes.

1463. In what capacity were you engaged there? I was last working there as a road-man.

1464. What were your duties as a road-man? Mostly keeping the roads clear, and occasionally helping the lads on with the skips.

1465. Did you ever assist in putting in any barricades or stoppings? Yes.

1466. In what part? Well, there were two headings working up together—that is, in the same place, and we put a stopping in there.

1467. What was the nature of the stuff that fell there? It was a kind of a mixture.

1468. Was there any sand or shells there? No, not where I put the stopping.

1469. What kind of a stopping was it? We put in props and sleepers, and filled in stuff behind it.

1470. What did you put in behind the sleepers? We put in the blue clay.

1471. For what purpose was the stopping put in? I believe it was supposed to be in a sort of swamp, and they were fearful lest it should go back and stop the other workings.

1472. Did you hear the manager, or the overman, or the deputy, say that it was put in to prevent the water coming in? No, I did not; at least, I do not think so.

1473. Was there a barricade erected on the other side, and if so, what kind of a barricade was it? It was an ordinary stopping. Sand came down there.

1474. Did much sand come down? Yes, there was a good bit, and also shells.

1475. Was there any clay? No.

1476. Do you know of any other stopping that was put up in that direction? No.

1477. Was there any stopping further down from them? Yes; a stopping was put up further down.

1478. What was the object of putting it up? It was done with the object of regulating the air-course.

1479. *Mr. Curley.*] Who was engaged with you in putting up this stopping? Richard Cotterill.

1480. *Chairman.*] Do you know where he is now? He is working, I believe, at a small colliery at Waratah.

1481. Who gave you instructions to build these stoppings? The manager's son, Mr. Joseph Powell.

1482. Did he explain why you were to put them in? Yes; he told me what I have stated to you—it was to prevent the fall going back any further.

1483. *Mr. Curley.*] Did you notice any water coming in at these stoppings? Yes, I noticed a little water coming through.

1484. *Chairman.*] Did you ever hear anyone express an opinion that it was dangerous to work under those swamps? Yes, many a man has said so.

1485. What did they say? They said it was a dangerous place to work in.

1486. Who were they? Well, if I were to start and write them down I do not know when I should finish.

1487. We will not trouble you to write them—all you have got to do is to tell us their names? Well, there was the man I worked with, Cotterill.

1488. We cannot allow you to make statements of a general character like that—you must mention their names? I have mentioned one; I cannot name any more. You can put it down to a mistake, if you like. I know that I have heard men say it was dangerous. I recollect Cotterill speaking to me, because I was always working with him.

1489. *Mr. Neilson.*] Surely you must recollect some of the men who spoke to you about this matter, and with whom you were in daily communication? I cannot think of any of those that spoke to me about it except the one I have mentioned.

1490. *Chairman.*] Are you on friendly terms with Cotterill? I believe I was when I worked with him.

1491. But are you on friendly terms with him now? So far as I am concerned, yes.

1492. Have you never had a quarrel? No.

The witness then withdrew, having been reprimanded by the President for his evident unwillingness to give straightforward evidence.

Mr. T. Perry.

2 June, 1886.

M. J.
Jackerman.

2 June, 1886.

Cornelius Peters sworn and examined :—

- Mr. C. Peters.** 1493. *Chairman.*] What is your occupation? I am a coal-miner.
1494. How long have you been engaged in that occupation? About forty-five years.
- 2 June, 1886. 1495. Where have you been employed during the time you mention? In Wales mostly; since I came to the Colony I have been employed in the Newcastle District.
1496. How long were you employed in Ferndale? Three years.
1497. In what portion of the mine did you work? In different bords, wherever we were cavelled.
1498. At the time of the late disaster, where were you working? In what they call the soft coal.
1499. In what particular bord or heading? The twenty-ninth bord was the last I was cavelled into.
1500. How far was that from the fall-in? Not far; I do not exactly know where the fall-in is; I was told by the deputy afterwards.
1501. What distance do you think your working place was from where the deputy told you the fall-in took place? I suppose it would be about 60 yards.
1502. What was the width of the bord you were working in? Six yards.
1503. Was that the usual width of the bords in that colliery? In that particular part it was.
1504. What was the width of the bords in other parts of the colliery? Eight yards.
1505. Why were you driving 6-yard bords in that locality? I suppose it was because the roof was bad.
1506. You suppose; but you know, as a matter of fact, that it was bad? I know the roof was bad; as a matter of fact, the roof was bad nearly all over Ferndale.
1507. What was the nature of the roof where you were working? It was of a mixed character.
1508. Was it shale, or rock, or what? It was a kind of mullocky stuff.
1509. Do you know what thickness it was? No.
1510. Did you ever see any conglomerate where you were working, or near there? No, not where we worked.
1511. Did it fall up to the rock or post? Sometimes it would fall a little, and there would be some solid above it.
1512. Did you put in more timber there than in other parts of the colliery? All the men did not timber the same; some of them put in extra timber. Every man was supposed to secure himself.
1513. Did you put in any extra timber? Yes.
1514. Double timber? Yes. We timbered our bord in a different style to the regular run of the miners.
1515. Did you consider the bords safe with the amount of timber you used to put in? Yes, perfectly safe.
1516. Was there any water coming in your bord? I never saw any in that particular part of the mine.
1517. It was quite dry? Yes.
1518. Were you aware that you were working under what is called the tidal swamps, that is, the salt water? Well, I was aware that the tide came up over where we were working, but I was not aware of any creek being there; I thought we were under the tidal swamps by the distance we went underground.
1519. Did you anticipate any danger from that knowledge? No, not in the least.
1520. Did you ever hear anyone express any fear of there being any danger? No; and I never felt safer in any colliery in my life.
1521. Did you know about a fall that took place about fifteen months ago? No; but I heard about it since the late accident.
1522. Did you work in any heading that struck the crop? Yes; I worked one heading as far as it went; the manager stopped it.
1523. What heading was that? It was in this crop coal.
1524. What was the name of the heading? I cannot tell you that.
1525. Had you a mate? Yes; he was in the fourth bord at the time; I was working in the heading.
1526. When you drove to the crop, what did you meet with? We did not work out the coal; it was soft coal to the crop, and the manager stopped us.
1527. *Mr. Thomas.*] Is it customary to double-timber the stalls? It was customary in that mine, where the roof was bad; in a considerable portion of the mine they used to double-timber across the road.
1528. Did you not consider that you were running a risk of some kind? Not at all. That was done to keep the men safe. In some places it was not necessary to double-timber; it was left to the men.
1529. *Mr. Turnbull.*] Was it customary, when you came to soft coal, to stop the places up? Yes.
1530. What width were the bords driven in the soft coal? I never saw one go more than 6 yards.
1531. Did you ever see one driven into the sand? No.
1532. Or into the soft coal? Not that I am aware of. They were stopped before we went right through. I never saw them go through anything that was not marketable.
1533. *Mr. Curley.*] Was there any conversation between you and any of the workmen, or did you hear any conversation among the workmen, with reference to any danger to be apprehended from working under the tidal water? I never heard any of the men express an opinion on the subject; I never had any fear of working in Ferndale at all.
1534. Were you in the mine when the accident happened? Yes.
1535. What was your impression when you heard the water was in the mine? I knew where the water came from when I saw the direction from which it was coming.
1536. You thought it was coming from the tidal waters? Yes. Until then I never had a suspicion that there was danger in Ferndale.
1537. Have you ever noticed any other falls in this mine? Well, I have seen bords fall in, but nothing to cause any alarm.
1538. Did you ever see any water come from those falls? No.
1539. Were you aware that the mine was making a large quantity of water? Yes; but it did not come from the roof, it came from the floor.
1540. Although you knew you were working under the tidal waters, and that the mine was making a large accumulation of water, this was in no way a source of alarm to you? It was not making water to a large extent in that portion of the mine where I was working.
1541. But you knew that the mine was making water, and that you were working under these tidal swamps, and yet you apprehended no danger? None whatever.

1542. *Mr. Davies.*] I place great reliance upon your testimony, Mr. Peters, as I know you are an old Mr. O. Peters and experienced pitman; do you really mean to say that you apprehended no danger in Ferndale? None whatever. 2 June, 1886

1543. And you think every care was taken by the manager for your safety? Yes, every care was taken.
1544. Did any conversation take place between you and the other men as to the danger of working under these swamps? No.

1545. *Mr. Thomas.*] You were constantly supplied with all the timber you required? Yes.

1546. *Mr. Davies.*] Were you paid for putting up this extra timber? Yes.

1547. And you were never stinted by the manager as to timber? No. The men got so much a set for every set put up, and it was left to the men's own option.

1548. Did you consider the payment sufficient? Yes.

1549. *Mr. Jones.*] Was the rule as to the width of the bords—6 yards or 8 yards, as the case might be—strictly enforced? Yes.

1550. What would happen if a man exceeded 8 yards? He was reprimanded, and his bord chalked off.

1551. Then this double timber was to support the roof above the coal and below the conglomerate? Yes.

1552. Did you ever know water to issue from the jerry or coal in the bord, and stop the working places for some considerable time? I have heard that certain headings had to be stopped for lack of sufficient pumping, and the men could not work in them for some time.

1553. How long is it since you heard of the last of such cases? There was a pair of special headings put in there some time ago, and it was said that they were stopped for want of pumping, and they got a new pump, and started again.

1554. With the knowledge and belief that you were working under tidal water, and with such an amount of water in the mine, did you not apprehend any danger? I never saw water in my bord. That which I have spoken of was more to the dip workings.

The witness withdrew.

THURSDAY, 3 JUNE, 1886.

Present:—

J. M. R. ROBERTSON, Esq., PRESIDENT.

MR. USHER,
MR. THOMAS,
MR. NEILSON,
MR. TURNBULL,

MR. SWINBURN,
MR. CURLEY,
MR. JONES,
MR. DAVIES,

MR. DURIE.

Chas. Sweetland sworn and examined:—

1555. *President.*] I believe you are Manager of the Commercial Banking Company here? Yes.

1556. Are you part owner of the Ferndale Colliery? Yes, I am one of the proprietors.

1557. Did you take any active part in the management of your colliery? No; I only took a commercial interest in the business. Mr. C. Sweetland 3 June, 1886

1558. To whom did you relegate the practical management of the colliery? To Mr. Powell, the manager.

1559. Did you exercise any control over him with regard to his management of the mine? No.

1560. Did Mr. Fletcher, the Minister for Mines, take any active part in the management of Ferndale Colliery? No, he did not.

1561. Did any of the proprietors of Ferndale Colliery visit the workings of that mine? No, not to my knowledge.

1562. Some time ago, had you a conversation with Mr. Croudace with respect to the workings of Ferndale? Yes.

1563. To what purpose was that conversation? I thought that the getting price of the coal was too much, and I spoke to him with respect to it.

1564. Did you suggest anything of this kind to Mr. Fletcher? It was known to Mr. Fletcher.

1565. Did you consult him (Mr. Croudace)? Well, I asked him to have a look at the mine, and give us some idea as to what was best to be done to keep down the getting price of the coal.

1566. And accordingly, did he visit Ferndale? Yes.

1567. And did he report to you? Yes.

1568. Have you got that report? Yes.

1569. Can you produce it? Yes.

[Report produced.]

1570. Before visiting Ferndale, did Mr. Croudace indicate to you any price at which you ought to produce the coal? Yes, he did.

1571. What price did he say you ought to pay? He said we ought to be able to get the coal to market for 9s. per ton.

1572. You stated a price, I suppose. Did he fully understand the price you paid for cost of working and traction? Yes.

1573. And having that information, he came to the conclusion that you ought not to pay more than 9s. a ton? Yes.

1574. Were you of the same opinion? Well, I only hoped we should be able to do it.

1575. And receiving such an opinion from Mr. Croudace, you considered it your duty to ask him to visit the mine? Yes.

1576.

Mr. 1576. And he accordingly did visit the mine, and produced the report addressed to the proprietor of the
C. Sweetland. Ferndale Colliery dated March, the 25th? Yes.

[Report read.]

8 June, 1886.

1577. Did any other communication pass between you and Mr. Croudace on this matter? Yes; we had some verbal communication on the matter.

1578. To what purport? With respect to his taking the consulting management of the mine.

1579. Well, on receiving his report, did you understand that he could still reduce the working expenses to the sum you have mentioned? Yes.

1580. And acting upon that belief, you entered into negotiations as to Mr. Croudace taking the consulting managership? Yes; he undertook to do what was necessary for £5 a week.

[Letter from Mr. Croudace, dated August 3rd, was here read.]

1581. Did Mr. Croudace explain to you how he proposed to carry on the colliery with an overman, or how an overman would be sufficient for his purposes? No.

1582. Well, on receipt of this letter, did you entertain the proposals made by Mr. Croudace? No; we did not see that Mr. Croudace could attend to the colliery as he proposed, without some responsible man always on the spot, and we did not see our way to give him £5 a week for occasional visits to the mine.

1583. Did you or any of your partners have any conversation with Mr. Croudace as to the manner in which he proposed to reduce the working expenses? Only in the direction which he indicates himself.

1584. Do you know whether Mr. Fletcher and Mr. Croudace consulted on this matter? I do not; but they may have done.

1585. Mr. Fletcher is, of course, a gentleman of experience in coal-mining. Do you know whether he considered that Mr. Croudace would be likely to materially reduce the working expenses of Ferndale? I can hardly say that; he never expressed himself to that effect in my presence.

1586. At all events the proprietors satisfied themselves that Mr. Croudace could not reduce the working expenses to the extent indicated by him? Well, I suppose that is what it amounts to. We did not think it worth while to give him £5 per week, which is what he stipulated to receive.

1587. Were you aware that the north and the south-east portions of the Ferndale property were under and approaching the tidal swamps? I was aware that they were under the low-lying land.

1588. That is to say that the workings were covered by the high water? No; I did not know that; I was not aware that the workings were covered by the high water, except when the accident happened.

1589. Do you think Mr. Croudace was aware of it, he having inspected the underground workings? Yes, I should think so, certainly.

1590. And did you gather from this that Mr. Croudace did not anticipate any danger through prosecuting these workings? Yes, certainly.

1591. And knowing that these workings were comparatively shallow, as they were, he proposed to do away with a responsible manager, and carry on these workings with an overman; do you think, in the light of subsequent events, that Mr. Croudace fully understood the force of such a proposal? Yes, I think he did.

1592. And that he knew exactly the position of these workings, being under a tidal swamp? Yes.

1593. Did you in any way stint your manager, Mr. Powell, as to his expenditure for materials to carry on the work of the colliery? No; not in any way whatever.

1594. You are aware that the expenditure for timber was unusually high? Yes.

1595. Did Mr. Powell explain to you the reason why this was so? I remember him saying that the nature of the ground was such as to require extra timbering.

1596. And you were perfectly satisfied with his management? Yes; he did what he liked. Mr. Fletcher had perfect confidence in him.

1597. Having considered this communication from Mr. Croudace, and with the knowledge you possessed of your manager, you preferred to retain the services of the man you knew to the man you had not tried? Yes.

1598. Mr. Neilson.] Did Mr. Croudace not report to you about Ferndale working under the tidal water? No.

1599. In your private conversations, did he not mention it? No.

1600. Did Mr. Croudace never, in conversation, refer to the danger of working under these tidal swamps? No; and I was not aware that we were working under the tidal waters.

1601. Mr. Usher.] Had you any further report from Mr. Croudace? No; he sent a report unasked by the Company; but that is since the accident.

1602. Mr. Davies.] How often did your Board meet? Once a week.

1603. And the reports from your manager were presented in due course? Yes.

1604. Can you furnish the Commission with the copies? Yes.

1605. What part did Mr. James Fletcher, junior, take in connection with the mine? He went round occasionally, I believe, and advised Mr. Powell.

1606. Did Mr. Fletcher, senior, have anything to do with the operations of the mine? No; he took no active part in it at all.

1607. Mr. Curley.] Was Mr. Powell present at your Board meetings? Occasionally; he was called in when we wanted some practical information.

1608. Did he ever refer to the tidal water going over a certain portion of the workings of the mine? No; he did not.

1609. Supposing he has made an admission that the owners of the colliery had a knowledge of this fact, is it correct? Personally I have no knowledge of it. It was not said at any of the Board meetings.

1610. President.] Did Mr. Croudace, in any conversation with the proprietors, suggest any special mode of winning the coal at Ferndale, to the south-east and east? He suggested that we ought to sink a shaft to the dip.

1611. Mr. Usher.] Can you tell the Commission the total value of the property underground—the iron rails, skips, timber, &c., in the mine? I believe it has been put down at £1,000; but I am not acquainted with the cost of these things.

1612. Mr. Curley.] When this accident occurred, I suppose Mr. Powell at once communicated with the owners? I suppose he did; I was in New Zealand at the time.

The witness withdrew.

Archibald Gardiner sworn and examined :—

Mr. A.
Gardiner.

3 June, 1860.

1613. *President.*] You are the manager of the Wickham and Bullock Island Colliery? Yes.
 1614. Have you had any opportunity of specially inspecting the Ferndale Colliery? No.
 1615. Do you know Ferndale? Yes.
 1616. Did you visit Ferndale before the accident took place? Yes; that is, I was on the pit-head.
 1617. Did you know the position of the workings at that time? No; but I have seen a plan of the workings since.
 1618. Did you know where the working places were? I had an idea that they were working towards Throsby's Creek.
 1619. You knew that it was a shallow colliery? Yes.
 1620. Did you know that any danger was to be apprehended in working in those shallow places under the swamps? I do not know that it ever occurred to me that there was any danger in Ferndale particularly.
 1621. Did you never make any inquiry on the subject? No; I never made any enquiry about Ferndale at all. It was not in my way.
 1622. When did you visit Ferndale? I went on the day of the accident, at about 10 or 11 o'clock; it was about three hours after the accident. The aperture was about 8 feet by 5. I stood at the top, and assisted to pull Hargraves up.
 1623. What was the roof composed of? It was a sort of conglomerate.
 1624. Did it occur to you how such an accident could happen in that locality? I do not know that I formed any opinion at the time.
 1625. But I suppose it did occur to you that the rock had given way, and that the water and sand had descended? Well, the only conclusion I could come to was that there was a weakness in the roof where it fell, and when it came to the surface it might be influenced by the tide.
 1626. The water would mingle with the sand, and thus form a dead weight? Yes.
 1627. Did you know the thickness of the rock that gave way? No; not exactly.
 1628. Was it a considerable thickness? Yes; I should judge that it was from about 36 feet to 40 feet.
 1629. Did you see the fall? No; Hargraves told me he had climbed up it.
 1630. Then a fall having taken place through 36 or 40 feet of rock, did the fact convey any practical lesson to you, as a coal-miner, with regard to working coal under swamps? Yes; I think we should be more careful in working under swamps.
 1631. Does it convey any lesson to you as to the manner in which the coal should be won? Yes; I think that you cannot be too particular in leaving large pillars.
 1632. And what width of bords? I work 6-yard bords.
 1633. Are there any conditions under which you would work less than 6-yard bords? I consider the width of bords should be regulated by the overlying strata.
 1634. But in this case we have definite information that the bords were driven only 6 yards; would you consider that narrower bords should be driven under the circumstances? Before passing an opinion upon that I should like to make myself acquainted with the overlying strata.
 1635. Then you must taken into consideration certain possible contingencies in working the coal in such localities before coming to a conclusion as to the mode in which you would work a colliery—considering the value of the property, and the lives of the miners to be at a stake? Yes, you are quite right there.
 1636. *Mr. Neilson.*] Are you compelled to work on a certain system? Yes; by the association.
 1637. *Mr. Usher.*] What thickness of pillars do you leave? We leave 8-yard pillars—that is double the ordinary width.
 1638. *Mr. Turnbull.*] Are you driving any bords 6 yards wide? Yes.
 1639. *Mr. Jones.*] You state that the mode of working at your colliery was the result of the price determined upon by the Miners' Association. Are you sure that that is the result of the Miners' Association determining, or the result of the ruling wages for coal-getting in the Colony? Well, I can scarcely say. I only know that a certain code of prices was put to me, and that there was a good deal of wrangling on the subject.
 1640. *Mr. Thomas.*] Are your headings in advance of your bords? Yes, as far as possible.
 1641. *Mr. Davies.*] Have you ever been a practical coal-miner? Yes.
 1642. Can a man get more coal in an 8-yard bord than in a 6-yard bord? That is a vague question.
 1643. As a practical miner, can you say whether a man could get as much coal in a given time in a 6-yard bord as in an 8-yard bord? All circumstances being equal, yes.
 1644. And that is your opinion? That is not only my opinion, but my experience.
 The witness withdrew.

Joseph Hardie sworn and examined :—

1645. *President.*] What is your profession, Mr. Hardie? I am a mining engineer and colliery manager. *Mr. J. Hardie*
 1646. Where have you practised your profession in New South Wales? In Illawarra and in Stockton. 3 June, 1860
 1647. Have you practised your profession in any other part of the world? Yes, in England.
 1648. Are you a certificated colliery manager? Yes.
 1649. In what district? In South Durham.
 1650. And as such, you have had some experience in coal-mining? Yes; I have had sixteen years' experience.
 1651. You are the manager of Stockton, I believe? I am the late manager.
 1652. Have you studied the surface deposits round Newcastle? Yes.
 1653. Do you know the Ferndale Colliery? Yes.
 1654. Have you visited it? Yes.
 1655. When did you visit the Ferndale Colliery? The day after the accident.
 1656. Did you know before the accident at this colliery that the workings of Ferndale were approaching the low-lying tidal swamps? No.
 1657. Did you see the scene of the disaster? I saw the fall.
 1658. What thickness of surface was there at that part? I cannot say; I did not take the measurement.
 1659. Did you see the rock? Yes.
 1660. Did you make yourself acquainted with the thickness of the rock? No.

1661.

- Mr. J. Hardie.** 1661. What size was the fall there? It was about 4 feet to 6 feet at the top.
 1662. Were the sides of the fall straight or irregular? They were irregular.
3 June, 1886. 1663. Did you form any opinion as to how the accident occurred? In my opinion, there must have been some fissures in the rock.
 1664. You have made some study of the surface deposits round Newcastle? Yes.
 1665. Have you formed any opinion as to the safety or otherwise of working coal under these surface deposits; and if so, what opinion have you formed? Well, I think that 4-yard bords and 8-yard pillars are quite sufficient to work the coal under the existing difficulties of surrounding water and bad cover.
 1666. Have you heard of the thickness of the rock that caved in at Ferndale? No.
 1667. If you were told that the rock was 40 feet thick, and that the working places were only 6 yards wide, what inference would you draw? I think, if there was sufficient timbering, it ought to be safe enough, unless something in the way of fissures occurred in the rock.
 1668. But timber does not last for ever. Have you formed any specific opinion as to the mode in which shallow coal workings should be carried on under tidal swamps? Well, as I have stated, it would depend upon the overlying strata. I do not think there ought to be any difficulty where there is a good roof. I have seen a place of 60 fathoms fall as well as 20. In my opinion, it entirely depends upon the nature of the strata.
 1669. Have you known it to fall in 4 and 6 yard bords? No; I cannot say that I have.
 1670. Then do you think that by following a rule such as you have suggested, 4-yard bords and 8-yard pillars are sufficiently safe for working coal under tidal swamps with any difficulties as to roof? Yes; but the character and thickness of the overlying strata would have to be taken into account. Four-yard bords would be safer than 6-yard bords under the same circumstances.
 1671. And with 4-yard bords you would have no hesitation in working up to the stone? Certainly not.
 1672. And you would depend upon timbering for the security of the roof? Yes.
 1673. Would that be in the belief that the timber would last for ever? No; I would renew the timber, or if the roof was bad, I would stow up the waste places with rubbish.
 1674. Where would the rubbish come from? Well, if I could not get it inside I would get it outside.
 1675. Would that pay? I am not considering that.
 1676. Would it not be better to abandon the workings? Well, if it was a question of cost, it might be.
 1677. *Mr. Thomas.*] Have you thought of the possibility of working 4-yard bords and 8-yard pillars without danger to the proprietors of a colliery? That is simply a question as to safety.
 1678. *Mr. Turnbull.*] Is there not a possibility of adopting some other course? I know of no other means, save what I have stated; working 2-yard bords would not pay.
 1679. *Mr. Curley.*] In working these seams, do you think it would be advisable to leave the top-coal in the roof—that is, where it could be left in working? Yes; it would form a rock of itself then.
 1680. And in that way strengthen the workings? Yes, it would strengthen the workings.
 1681. *President.*] Have you given this subject of working the Newcastle coal under this difficult surface some consideration? Yes.
 1682. And the views you have enunciated are the result of your deliberations? Yes.
 The witness withdrew.

Thomas Croudace sworn and examined:—

- Mr. T. Croudace.** 1683. *President.*] Have you had frequent opportunities of inspecting the underground workings of the Ferndale Colliery? I think I have been down three times.
3 June, 1886. 1684. Have you been down any of the adjoining small collieries? I have only been down one; I think that belonged to Mr. Bevan.
 1685. Have you inspected the eastern, or dip, workings of Ferndale Colliery? Yes; I was pretty well through them about six months back.
 1686. On what date did you last visit these? I think it must be about nine or ten months ago since I was down those workings last.
 1687. Were you aware of the situation of those workings with respect to the tidal swamps? No; I did not know that they were actually under the swamps, although I knew, of course, that they were going in that direction.
 1688. Do you consider there is any danger in working this coal under tidal swamps? Yes; in working the wide-bord system, certainly.
 1689. Had you any conversation with the manager as to the position of the eastern workings with respect to these swamps? After the accident I had.
 1690. Had you not any conversation with him on the subject before that? No; I do not know that I had.
 1691. Did you observe the nature of the roof in the eastern workings? Yes; I saw one or two places that had fallen there.
 1692. What was the nature of the roof? It was rather soft, flaky, argillaceous shale.
 1693. The argillaceous shale was between the conglomerate above and the roof beneath? Yes.
 1694. Was much timber used in the bords? Yes, they were well timbered.
 1695. Was there an unusual amount of timber used? Not more than was necessary.
 1696. Was there more timber used than was customary in the district? I do not think so, to any extent, considering the soft nature of the roof.
 1697. Can you assign a reason for so much timber being used? Yes; it was on account of the stone over head being so soft. That I know from what the manager stated to me.
 1698. And also from what you saw? Yes; but the manager told me that they had to keep timbering closely with cap or crown-pieces, owing to the soft nature of the stone.
 1699. Did you observe any of the rise bords that had reached the crop to the north and east? Yes, I saw some of them, and I saw some falls that had come to the surface.
 1700. Did you see the falls in the underground workings? Yes; I saw where sand had actually come down from the surface.
 1701. Could you point out the position on the plan? Yes.
 Dictated by the Chairman: Mr. Croudace refers, in his remarks concerning these falls, to positions in the "J" headings.

Mr. T.
Croudace.

3 June, 1886.

1702. *The witness.*] Along the whole line of this northern outcrop there were two or three falls where the water came in.
1703. Did you see any material that came from that fall? I saw some of it which was of a soft, rotten character—some of it sand and mud.
1704. Did you see any shells? No, I did not notice any.
1705. Had you any conversation with the manager as to any of these falls? Yes. I told him to be very careful along there.
1706. Were these narrow headings? Yes; about 5 to 7 feet.
1707. They were for exploring purposes? Yes.
1708. Were you surprised to see a fall in that direction? Well, one would scarcely look for a fall in such a narrow place, but we knew that the strata overhead was very rotten.
1709. Did you see any other place where a fall had occurred in that part of the mine? I saw one near the surface where the fall-in occurred that flooded the colliery.
1710. Did you inquire, or were you given to understand, that the fall-in you refer to made its appearance on the surface? Yes.
1711. You understood it at that time? Yes.
1712. Did you walk over the surface along the margin of the tidal swamps, with the manager, on the occasion referred to? No; we just looked at it from a distance. I did not make any surface examination.
1713. You did not go up towards the swamps? No.
1714. In conversation with the manager, did you form any opinion as to the probable influence of these swamps on the working of the coal in that colliery? I told him that I considered it would be very dangerous to go so near the outcrop.
1715. Were you, from your knowledge of the Newcastle District, aware of the thickness of these swampy deposits? I had a general knowledge derived from the bore-holes that had been put down. (The witness here points to positions in the plan to indicate the direction of the bore-holes referred to.)
1716. Did you see the scene of the late accident? Yes.
1717. And did you hear what was the thickness of the surface deposits there, and the hard rock beneath? Yes; I heard Mr. Powell give it as nearly as he could state.
1718. Then how would you account for an accident occurring when the coal is covered by about 40 feet of rock? Well, the rock itself was rotten, and had not sufficient cohesive quality about it, and the weight of the mass broke the timber put in to support it.
1719. You are aware, I suppose, that the heading opposite to where the accident occurred was driven very narrow? Yes, I suppose it was a narrow heading.
1720. And that the bords in that position, and for some distance, were driven narrow, that is to say about 6 yards? I was not aware of that. I understood Mr. Powell to say 8 yards. A meeting was held to see what could be done under the circumstances, and, if I mistake not, Mr. Powell, in answer to a question which Mr. Neilson put to him, said that the bords were driven 8 yards wide.
1721. You are aware that the fall took place through about 40 feet of solid rock, and that the heading through which that fall took place was driven about 40 or 50 yards further to the rise and into the sand. Can you account for a fall taking place through that amount of solid rock, and in the face of that heading under the sand remaining, so far as we know, perfectly sound? Only in this way, that one portion of the roof is found at all times to be softer and not so tenacious as other portions.
1722. But it appears there was no roof at all in this particular heading I am speaking of. It was driven into the clay and sand? I was not aware of that. Of course we know that a narrow place with only a foot of covering may support a certain amount of weight better than a wide place when the cover has no tenacity.
1723. But here we have a narrow heading driven from the point where the accident took place, about 40 or 50 yards towards the rise, and the question I put is this—did you, as an engineer, draw from this accident at Ferndale any conclusion as to the safety or otherwise of working coal under the tidal swamps? I think, myself, it is very unsafe, and equally unwise, to attempt mining under such circumstances; but I know that where there has been a good cover, throughout the whole of workings I have seen, 4-yard bords have fallen when 8-yard bords have stood.
1724. That is frequently the case. Then, in your opinion, the coal should not in future be worked under these swamps, except under special conditions? No, certainly not, and I have advised the proprietors of Ferndale on the subject. I think it is altogether unwise to carry 8-yard bords. I would not do it for love or money for any Company.
1725. Then you are of opinion that some special precautions are required before the working of coal under these swamps should be attempted? I am.
1726. In working towards the rise in such a locality, with the object of finding the crop, do you think that any barriers should be left to protect the mining works and the lives of the men? I should say there ought to be some regulation of that kind, and a prudent manager would take care to have such proof of the outcrop that he would not go within the limits of possible danger.
1727. Then coming to what I was leading you to—you say you would approve of certain legislative enactments being introduced for the preservation of life and property in such workings. What form would you suggest that such legislation ought to take—would it be to leave barriers of coal near the crop, or to insist upon a maximum thickness of solid strata above the coal in the working of it? Well, that is a very difficult question to answer. Supposing you had the same conditions as are said to exist in Ferndale—in one direction a cover of rotten stone, and in another 40 feet of hard and solid conglomerate—I do not think the same measures would apply in both instances.
1728. So far as we know the conglomerate was of a hard and solid character for about 40 feet in thickness, and yet this accident occurred? Yes; but part of the conglomerate was of a rotten character.
1729. So far as we know that is not the case? Would you require time to consider that question? Yes, I should require to consider the circumstances.
1730. Who requested you to investigate Ferndale Colliery on the occasion you have referred to? The proprietors, through Mr. Hewison, their secretary.
1731. And did you supply the owners with any report? Yes, I did.
1732. And a plan and section? I am not sure whether I sent in a plan or section.
1733. Did you enter into certain negotiations with reference to taking the position of consulting viewer or manager? Yes, on certain conditions.

Dictated

Mr.
T. Croudace.
3 June, 1886

Dictated by the President:—Mr. Croudace explains that he advised the owners to abandon certain workings, to the dip of the water-shaft, on account of the influx of water and the thinness of the coal.

1734. Did you suggest to the owners at that time that by agreeing with you to take the consulting managership at Ferndale it would only need an overman to carry on the work of the mine? I do not know exactly that I put it in that way. I said I would require some change in the management, because from what I saw there, I had not confidence in the system of working.

1735. If you did make such a suggestion, do you think that it would be a safe mode of conducting the operations of a coal-mine—I mean under the guidance of an overman only? Yes, I thought so, decidedly.

1736. Then would you place more reliance upon an overman than on an experienced manager? No, I would not. I must tell you that one reason was the cost that they were labouring under. The limited field and the expense of working the coal did not warrant very much outlay. It was not like an extensive colliery.

1737. Did you suggest that they should prosecute work in the main engine-plane from the time of your visit? From the water-shaft, yes. I knew that the engine-plane had not been continued well down to the dip, and that they could deal with the water if it came in.

1738. You were aware that the “jerry” was thick, and the coal thin? Yes.

1739. In other words, the coal from the dip would not be profitable to work? Quite so; but it is desirable that the shaft should be as far to the dip as possible. I am thinking more of the question of drainage. But the main object was to lessen the cost of production.

1740. But to lessen the cost you had to incur a large and uncertain expenditure in sinking a shaft, and working a large area of coal unprofitable to work.

Dictated by the President:—Mr. Croudace explains on the plan the purport of his suggestion in respect to sinking to the dip of the coal-field.

1741. Then did you, in reporting to the owners, express your fears as to the danger of working under these swamps? No, I did not at the time.

1742. Have you since expressed decided views on the matter? Yes, and it arose in this way. When I heard that these bords were carried 8 yards wide under these swamps, and within a short distance of another fall that occurred a few weeks back, I was astounded that any manager should have attempted to carry on those workings.

1743. You say that a fall took place within a few weeks of the last accident, and within I suppose about 40 or 50 yards or thereabout? Yes, as near as I can tell.

1744. How did you ascertain that? I was with Mr. Powell, the manager, on the Saturday following the accident. We were going to see the site of the fall-in, and, looking towards a depression, about 30 or 40 or perhaps 50 yards away, Mr. Powell said—“That is the place that fell in two or three weeks ago.”

1745. Was anyone else present when Mr. Powell said this to you? No.

1746. We have evidence on that point, which goes to show that the fall you speak of took place nine or ten months before the accident (at “J” headings on the plan)? Well, I am quite positive that Mr. Powell told me what I have stated, that is, about a fall that had taken place six or seven weeks before the accident of March last. I said to him, “Is this the same heading as where the fall-in took place?” and he replied in the affirmative. I made no further remark; but it struck me as being very peculiar. I think it was referred to in evidence on the Saturday when the different managers were examining Mr. Powell.

1747. Would you be good enough to read the letter you subsequently wrote to the owners? Yes; I have a copy of it with me.

[Letter of March 22nd, 1886, from Mr. Croudace to the proprietors of the Ferndale Colliery, was then read.]

1748. Then, Mr. Croudace, during your first visit of inspection to Ferndale, you visited the eastern and north-eastern workings, and you were aware that they were proceeding towards, or were actually at that time considerably under, the swamps, and you have told us, in evidence, that you recommended further operations which would have extended the workings still further under the swamps. You have now read a letter which you sent to the proprietors after the accident took place, which letter contains a warning on this subject—do you not think that letter or warning you have just read would have been sounded to better purpose on the occasion of your first visit to Ferndale? Yes, had I been asked to report fully upon the mine, and as to whether it was carried on under a proper system, no doubt it would have been better; but I was not then asked to report on the management. It was simply a question of expense. They showed me their expenses, which were practically as much as they were getting for the coal. I said then I must see the mine and ascertain what was best to be done to cope with the heavy expense of production. I did not think it was any business of mine to discuss the question of where they were working.

1749. I understood you to say that you were asked by the proprietors, through their secretary, to inspect the property and report to the owners? It was principally as to whether I should take the management of it.

1750. Then, under the circumstances, did you think it possible that you could secure safety in the working and yet curtail the expense of production? The great expense arose from the peculiar undulation of the mine, and the water, and having to drag the coal up hill.

1751. Were you aware at that time that Ferndale had only a limited quantity of coal to work to the south-east—that in point of fact Ferndale was almost a worked-out colliery? Yes; I believe that it is to a large extent. I am quite aware that the Ferndale seam is very thin for a certain distance, but increases in thickness as it goes eastward; but whether it thickens in the property is another thing.

1752. We have evidence that it does not. Then to secure safety, would you advocate driving narrow bords? Yes; also, I would have had a system of chocking them, and I would have had a series of bores put down.

1753. Would the system you suggest not entail greater expense than the system which was then pursued? Well, so far as the mere working of the coal goes, the method employed at Ferndale was the least expensive, but it lost them their colliery in the end.

1754. What do you suppose the main deterrent would be in working narrow bords? It is entirely a question of price, and the cost of getting the coal.

1755. *Mr. Swinburn.*] Driving narrow bords would increase the expense? Yes.

1756. *Mr. Neilson.*] Are you aware that bores have been put down in all directions along the estate? The bores that I wanted principally were those contiguous to the workings.

1757. *Mr. Turnbull.*] When you were down in Ferndale, did you notice in the back places any of the narrow rock? Yes; I saw where it had broken down in two or three places.

1758. Did you ever notice any open faces in the rock? Well, there was one place where it was bleeding through an open fissure. It was raining down to the extent of about half the size of this room, and faster than the men could bail out.

1759. *Mr. Usher.*] I should like you to fix that spot where you say Mr. Powell told you there had been a fall.

Dictated by the President:—In explanation, and on reference to the plan, the witness refers the fall to heading J.

1760. *Mr. Usher.*] And he told you that that fall had taken place only a few weeks before the last accident? Yes; and he told me he had got it filled up when the tide was out.

1761. After what has occurred, are you very glad that the owners did not agree with you to carry on the operations with only an overman there? Well, no owners, nor any living man, would have induced me to take wide bords under that swamp. My conscience would not have allowed me to do it.

1762. Did you make any statement of that kind to Mr. Powell when you were with him underground? I do not think so. I did not go there with a view of discussing that matter. My object was more to see whether I would take the management or not.

1763. Did you see any narrow bords of 6 or 4 yards there? Yes, I daresay I did. I saw the sand coming down in some places to the west of the fall-in.

1764. Is it still your opinion that in the event of your having taken the management, and reduced the width of the bords, and put in timber chocks, you could have effected a saving in the working expenses of the colliery? I would like to ask whether you mean if the workings were carried on under those swamps?

1765. I mean anywhere? I may tell you that I do not think the owners could have induced me to carry the workings under that swamp with such a cover overhead.

1766. What other portions of the estate could you have worked except in the swampy ground? I told the owners that the colliery was nearly worked out. I pointed out that it was on its last legs.

1767. *Mr. Jones.*] Do I understand you to be of opinion that coal-mining operations should be carried on with due regard to the safety of the men irrespective of the cost? Undoubtedly, because the cost of losing a man's life is a very heavy cost.

1768. *Mr. Davies.*] How long was it before this accident that you made a report to the proprietors? I cannot say the time.

1769. When you made that report, were you aware that the colliery was under tidal waters, with a shallow roof? No, I did not know.

1770. Did you make any inquiries as to that? I did not go with that view. It arose in this way: The directors had a conversation amongst themselves with regard to seeing if something could not be done to work the colliery in a more economical manner, and I was communicated with.

1771. Where were the falls you saw? Along the line of the northern outcrop.

1772. Did not that suggest to you danger underground, in working under the tidal waters? Certainly.

1773. Did you not think that that was of sufficient importance to induce you to report to the proprietors? As to that, I have already said that I did not go to report upon the method and principle or plan of working the colliery.

1774. Did you form an opinion as to the danger of working in that direction? You must have known that they were working under the swamp? Not necessarily so. There is no swamp up in this direction (pointing to the plan.)

1775. Did you not know, when Mr. Powell pointed out this fall to you that there was some danger? Do you mean as to the tidal waters?

1776. Yes? No, I did not.

1777. In your opinion, was that accident caused through injudicious working of the mine? Yes; I think it was caused by working 8-yard bords under the tidal swamp.

1778. Were you not aware that the bords were driven only 6 yards where the accident occurred? I could not have been, when Mr. Powell told me himself that it fell in an 8-yard bord; that was in the presence of Mr. Neilson, who expressed surprise.

1779. *Mr. Curley.*] From what you noticed, did you come to the conclusion that the colliery was well laid out, from an economical point of view, as to the cost of working? It is rather a one-sided colliery at the best, but the principal fault I found with it was that they had not carried the engine-plane down to the south. Perhaps I might have laid it out differently.

1780. From what you have seen since of the mode of working these bords near the crop, do you think the manager has had a due regard for the safety of the men? I have already told you that I do not think he was justified in carrying 8-yard bords with such a cover.

1781. Supposing the owners had a full knowledge that the workings of the colliery were being carried on in that direction, do you consider that they would have been showing due caution for the safety of the men working there? I am doubtful as to the owners having a knowledge as to how the work was carried on; and it might have been done from a want of knowledge.

1782. Do you think that if the Inspector of Collieries had had a full knowledge of these falls previous to the accident taking place and of barricades being put up, he should have taken due precautions to warn the Company? I think he would have warned them had he had such knowledge. I have always found Mr. Dixon a very prudent and careful man, and one very ready to find fault.

1783. Do you think that in any report to the Examiner of Coal-fields by the Inspector special notice should be taken of such a matter? Yes; I certainly think he should have reported it if he had knowledge of a fall in the vicinity of the swamp.

1784. Assuming that this colliery had been worked at the very cheapest rate, so as to meet the wishes of the owners, do you think the mode of working could have been a safe one? With 8-yard bords and that cover, I distinctly say no.

1785. Have you seen the aperture of the fall-in? No; but I have seen the locality. I went over on the Saturday. A gentleman belonging to one of the banks first told me of it.

Mr.
T. Croudace:
3 June, 1886.

- Mr. T. Croudace. 1786. *Mr. Neilson.*] When you inspected the mine twelve months ago, were they not working under the swamps then? No, I think not.
- 3 June, 1886. 1787. *Mr. Jones.*] You saw sand coming down. I understand, on one of your visits of inspection to the colliery—did you draw Mr. Powell's attention to it? Yes.
1788. And did you tell him that special care should be taken? Yes.
1789. Did Mr. Powell speak of any special steps that had been taken? No, I think not; but, as I have already said, I did not pay much attention to the mode of working the colliery. I went there more to satisfy myself as to whether or not I should take the consulting management.
1790. Then you are quite sure that you were not up in that district when a previous fall took place about fifteen months ago? I should certainly say I was not.
1791. *Mr. Thomas.*] With reference to your reports recommending the extension of the easterly heading into the flat, did you not consider that by extending this heading into the boundary you would go into the lowest portion of the ground? Yes.
1792. Did you not consider that there was considerable danger in working in that direction? No; I unhesitatingly say that the cover was better there: it was a harder roof.
1793. *President.*] When you were looking at a fall that you saw in the rise workings, did you know that you were looking at the same fall that you had seen above ground? No.
1794. *Mr. Thomas.*] You never expressed yourself prior to the accident as to there being any danger in the workings at Ferndale? No.
1795. *Mr. Jones.*] Did you see the plan before you went into the mine? Yes.
1796. *President.*] Then you think that with 40 feet of cover it is dangerous to work the coal under those swamps? Yes; with such a cover as this I certainly think it is dangerous.
1797. In view of future legislation, would you recommend the adoption of a minimum cover? No; I think it would be an injustice to the proprietary, and it would lead to endless disputes.
- The witness withdrew.

Mr. John Powell, senior recalled:—

- Mr. J. Powell, sen. 1798. *President.*] Do you remember Mr. Croudace visiting Ferndale Colliery? Yes.
- 3 June, 1886. 1799. And accompanying him through the workings? Yes? I took him up to the rise as far as it went at the time.
1800. And did you show him a fall underground? No.
1801. Mr. Croudace informs us that going round the rise workings you showed him a fall? I showed him no fall; he was not in the old workings at all.
1802. Mr. Croudace distinctly informed us that you took him to a point of the workings where a fall had taken place, and that he saw the sand and mullock and stone that had come down? No. There was no such thing to be seen in the mine.
1803. The point he referred to is known as the site of the little fall in this part of the J headings, to the west of the heading that had fallen in now? Oh, yes; I took him up there, and told him that it fell to the surface.
1804. Did you tell him that you were working under the swamps at that time? No; I took him round the workings so that he could see everything before him.
1805. Did you tell Mr. Croudace that you had filled in that fall when the tide was out? No.
1806. Where did you go with Mr. Croudace? I accompanied him down to the pumping-pit, then around the hill to the north-east, and then along the crop towards the winding-shaft.
1807. And while you were on the brow of the hill you pointed out to Mr. Croudace this fall? Yes.
1808. And from the position in which you were standing, what you pointed out was well within the swamps? Yes; I am positive of that.
1809. And you told him about that fall-in on the surface? Yes.
1810. And underground you showed him the fall? Yes.
1811. That is to say you connected the one with the other? Yes.
1812. You have no doubt about this? None whatever. He was perfectly well aware that the fall underground was the same as the fall that he saw on the surface.
1813. Did you tell Mr. Croudace that there were other such falls—a dozen, for instance? No. As a matter of fact there are not a dozen such falls. The little fall and the fall that caused the disaster are the only ones.
1814. Did you tell Mr. Croudace on the Saturday after the disaster, when he pointed to a pool of water and called your attention to it—did you tell him that that was the site of a fall that occurred about six or seven weeks before? No; I am quite positive that nothing of the kind ever occurred.
1815. What did you say to Mr. Croudace? I said nothing to him.
1816. Did he call your attention to a fall or cave-in at all? He did not.
1817. Was it possible for you or Mr. Croudace to see a cave-in, seeing that the place was all covered with water? No; you could see nothing.
1818. Was it or was it not the case that the swamp was covered with water? It was.
1819. Then he could not possibly call your attention to a hole in that direction? No, of course he could not.
1820. What was the width of the bords at the last cave-in? 6 yards.
1821. Did you tell Mr. Croudace and other managers that the bords were 8 yards wide there? No.
1822. That is to say, at the meeting of colliery managers, which was held in the office, after the disaster occurred? No; I said that the bord where the fall-in took place was 6 yards wide, and the bord behind 4 yards wide.
1823. Did you, or did you not, repeat to the colliery managers that those bords under the fall were 8 yards wide? No, I did not.
1824. If you did say so, was it an error? I could not say so, and I am quite sure that I did not.
1825. Did you hear Mr. Neilson remark anything about an 8-yard bord in a tone of surprise? I do not remember; but I am quite sure that if he did so he could not have referred to these bords.
1826. What is the depth of water in the winding-shaft? It is 24 feet, and 24 feet 6 inches from the surface.
1827. Does the water rise and fall there? Yes; about 2 or 3 feet.

Mr. J. Powell, sen.

3 June, 1886.

1828. Did you point out to Mr. Croudace, when you were examining the underground workings, any part of the workings near the pumping-pit where several men were baling out of one bord? No.
1829. Do you know of any such bord? No.
1830. We have a statement from Mr. Croudace that in going round the workings he saw a place where there were several men baling, and where probably a few lengths of pipe to the engine suction would have answered the purpose. Is there any such place in the colliery? No; I showed him three different pumps that we had at the swallows, pumping the water back, and two Tangye's.
1831. Could you have levelled all these swallows so as to let the water run by gravitation into the pit? No; we had to carry the water back from one pump to another.
1832. Then, upon recollection, you adhere to your statement that you conducted Mr. Croudace through the whole of the underground workings, and directed his attention to the fall-in at this heading (J)? Yes; that was the only one.
1833. When taking him round on the surface, did you tell him that your workings had entered under the high-water-mark? I pointed out to him the position we were in. He asked me how far the water came up, and I told him. I showed him a point inside the high-water mark.
1834. When you directed his attention to the "little fall-in," did he make any remark to you as to the necessity for your being very careful in conducting your working? No; he never said a word about it.
1835. And do I understand that you left no doubt in his mind as to your working under the swamps? I am quite sure of it.
1836. Mr. Jones.] Did you incidentally refer to the matter as you did to the Commissioners on their visit to the locality? I told him that he was opposite the fall-in.
1837. President.] On the Saturday after the accident, when you and Mr. Croudace were walking over the ground with the object of inspecting the last cave-in, did you or did you not say to Mr. Croudace that the little fall occurred six or seven weeks before that date? No.
1838. Do you adhere to your statement that he did not warn you of your danger? Yes, I do. I asked him what he thought about the mine, and he said it was one of the most difficult mines to work in the district.
1839. Did Mr. Croudace explain to you how you could do away with the water-balers? No, he did not.
1840. Lest there should be any misapprehension, did Mr. Croudace, in calling your attention to this pool of water, in a tone of surprise, when you were on the surface, did you, or did you not, say to him that that was the site of the fall that had occurred about seven weeks previously? No; I never said anything of the kind.
1841. Are you perfectly positive, Mr. Powell, that Mr. Croudace when he left Ferndale on that occasion knew exactly the position of the workings? Yes.
1842. And that they were within the tidal mark? Yes, certainly.
1843. Mr. Usher.] Can you give us an idea of the value of the plant underground? About £7,000 to £8,000.

The witness withdrew.

FRIDAY, 4 JUNE, 1886.

Present:—

J. R. M. ROBERTSON, Esq., PRESIDENT.

MR. THOMAS,
MR. TURNBULL,
MR. CURLEY,
MR. DAVIES,

MR. USHER,
MR. NEILSON,
MR. SWINBURN,
MR. JONES,

MR. DURIE.

Charles Woollett sworn and examined:—

Mr. C. Woollett.
4 June, 1886.

1844. President.] What is your business or profession? I am a miner.
1845. Were you employed as a miner at Ferndale Colliery? Yes, for the last six months. Before that I was engaged as a water-baler. I was working at Ferndale close upon two years.
1846. In what part of the colliery were you employed? All over it, from the bottom flat.
1847. And your position enabled you to see all the different parts of the mine. Where you employed towards the rise of the mine, where a number of places were driven up to the surface? There were no places driven up to the surface to my knowledge. I knew of places being driven to the crop.
1848. What was the appearance of the coal in those places? The same as in other portions of the mine, excepting that there was no "jerry" in it.
1849. Do you remember a pair of narrow places being driven up in advance of the other bords, at the very rise of the workings? Yes; I knew of a pair of special headings.
1850. Do you recollect a fall having taken place? Yes.
1851. What was the nature of it? Well, what I saw of it was sand and water.
1852. Was there much water? No; there was not much water.
1853. Was the sand wet? Yes; if you took a shovelful out, it filled in again directly.
1854. Did you see any shells? Yes; it was sand and shells together, like the sea-beach.
1855. Did any rock come down? I did not see any.
1856. What was left on as a roof? I could not say.
1857. Do you know whether the fall took place suddenly, or did it give some warning? I cannot say; I was water-baling at the time.
1858. Did you not go to see the fall? Yes; I went up one breakfast time, out of curiosity. I had heard that it was coming in, and was filling up with sand.
1859. What did the men say about that—did they have any conversation about it? I never heard any.
1860. What did you think—were you apprehensive that any danger might arise from working in that direction? Yes, if it came when the tide was there.

1861.

Mr.
C. Woollett.
4 June, 1886.

1861. Did you know that you were working under the tide? I knew we must be very near in that direction, owing to the distance we were working from the winding-shaft.

1862. You had some little fear then as to the safety of the workings? You can call it fear if you like, but I thought we were right enough, so long as a fall did not take place when the tide was up—I mean the special spring-tides.

1863. Had you any fear as to the result, in the event of spring-tides covering a fall; or did you not look so long before you as that? Well, I did not think that the mine would cave in, so that we could not get out.

1864. Did you express your fears that it might cave in? No; I kept that to myself.

1865. Why did you keep it to yourself? Not being an experienced man, I thought it best not to express an opinion. I thought that if I did say anything Powell might tell me to mind my own business.

1866. Are you not aware that under the moral law that should govern humanity it was your duty, under the circumstances, to report to the manager? No.

1867. Supposing that having some doubts as to the safety of the mine, as you appear to have had, you left the colliery without saying anything, and that in a few days after your fears were realized, would you not have had a feeling that you did not act fairly and honestly with your fellow-men? No; I thought they ought to know the same as myself.

1868. But you went out of your way to inspect this fall, satisfied yourself that there was danger, and yet you said nothing to your fellow-workmen about it. Do you think that was right and proper, now that you come to think about it? Well, perhaps it was hardly right, but I did not look at it in that light before.

1869. I can quite understand that. When did this fall take place? About fifteen months ago.

1870. Did you think that it went to the surface? Yes.

1871. Did you satisfy yourself on that point by inspecting the surface? No; I heard other people say that.

1872. Who did you hear say that? I heard John Williams, a shift-man at the pit, say so. He has since gone to Queensland.

1873. Who else did you hear say so? Nobody.

1874. What was the purport of the conversation that you had with Williams? I heard him say that the heading had fallen up about 20 yards, near to the Waratah pumping-place.

NOTE.—The witness referred to a pump on the surface that supplies the Waratah Railway.

1875. Now think for a moment. Who else did you have a conversation with on this subject? I might have had a conversation with someone else, but I cannot recollect.

1876. Do you know the heading that this last accident happened in? No.

1877. Do you know the upper three or four bords towards the rise? No; I have never been up that way.

1878. What width of bord were you working in? It was supposed to be driven 8 yards wide.

1879. Did you drive it 8 yards wide? Well, as near as I could. I was under the superintendence of another man.

1880. What was the number of your bord? I think it was No. 27.

1881. That is counting from below upwards? Yes, from the lower flat.

1882. How many men were working in your bord? When the accident happened there was only one; before that there were two.

1883. Do you know a bord that was working with four men near to where you were working? Yes; it was the next bord to mine.

1884. Why were four men working in that bord? Because it was behind-hand.

1885. Was that an 8-yard bord also? It was supposed to be.

1886. Did you have occasion to put in extra strong timber? Not extra. I put in what I thought necessary.

1887. Was the roof good in your place? Not very good.

1888. What did you do when the roof was bad? I put up timber where I thought it was necessary.

1889. Were you paid for putting up that timber? No.

1890. Why were you not paid? Because the overman said it was not necessary.

1891. Did you put up double timber? Yes; that was what I was not paid for—putting up the crown pieces. The overman said the crown pieces were not necessary.

1892. Had he told you to put on crown pieces I suppose you would have been paid? Well, we were supposed to put in timber at our own discretion.

1893. How many sets did you put in? About thirty.

1894. And how many were you paid for? We were paid for all but seven.

1895. Did you consider the overman was right or wrong in his decision? I considered he was wrong.

1896. Was there any difference in the roof over these seven sets that you were not paid for? No; I am certain there was not much difference.

1897. Can you assign any reason why the overman did not pay you? Well, I suppose because it would affect the Company's pocket.

1898. How much did you get paid for the other twenty-three sets? 1s. 6d. per set.

1899. Are you aware whether the other workers were paid 1s. 6d. a set? Yes.

1900. Did you, after seeing the fall you have referred to in the rise headings, dismiss the matter from your mind? No; I thought there would be danger if it came in when the tide was up.

1901. But you knew that the tide would rise over the workings at spring-tide? Yes.

1902. Did you go down the mine daily after that? Yes.

1903. And you have said that you feared danger. Did you express that fear to any of your fellow-workmen? No; not to my knowledge.

1904. Did you see anything in any other parts of the mine to lead you to fear danger? No.

1905. It was seeing that fall that caused you to anticipate danger? Yes.

1906. But it seems strange that you did not mention your fears to your mate? Well, he had eyes as well as myself, and he ought to be able to judge for himself.

1907. But supposing he had no opportunity, how could he see over the mine? I cannot say.

1908. Did you see the site of this last accident? Yes.

1909. You saw that there was a rock cover there—that the fall went through a number of feet of rock? I only saw the rock on the surface.

1910.

Mr.
C. Woollott.
4 June, 1886.

1910. You saw rock under the sand? Yes.
1911. And a hole through the rock? Yes.
1912. And of course that implied that it had broken through the rock? Yes, if you call it rock.
1913. What do you call it? I should call it sandstone.
1914. Then can you assign any cause for the sand breaking through the sandstone, to give it your own designation, at that spot? No.
1915. Did you consider the inundation of Ferndale a preventable accident; that is, could it, in your estimation, have been prevented? I do not consider that I am competent to enter into that question.
1916. For what reason? Because I do not understand the nature of the rock or of the surface.
1917. I will put it in another way—were you ever up in these headings as far as the position where the fall came in? No; I was only up as far as where they started to drive.
1918. Were you ever up to the spot where a narrow heading was driven in advance of the bords? No; I was never there.
1919. Then you can give no opinion for the reason that you have had no opportunity of judging of the character of the roof? Yes, that is the reason.
1920. Can you assign any reason for the sand breaking down through 30 or 40 feet of rock instead of breaking in at this other place where no rock existed. You see this fall broke through a rock cover, and you have told us about these special headings being driven up to the crop where no roof existed? I did not say that no roof existed.
1921. Then if you were told that no roof existed on top of the coal at that spot, could you say why this fall should take place through the rock, instead of coming away where no roof existed? No; excepting, I suppose, that the timber gave way.
1922. Did you see any indication of danger in the bords where you worked? No.
1923. Did you hear any of the men express fear? No.
1924. Did you know that you were working under the swamps? Yes.
1925. How did you know that? I knew that from the distance we were from the shaft.
1926. Do you know that the other men had a knowledge that they were working under the swamps? No; I did not know that.
1927. But you were certain of it yourself? Yes.
1928. Did you have any conversation with the men as to the position where you were working? I may have had, but I cannot say.
1929. Then it has made no impression on your mind? No.
1930. You have no recollection of any particular conversation? No.
1931. Did you think that there was any danger attending the working of this coal-seam under these swamps, looking at the position generally, *i.e.*, the working of coal-seams with only a limited amount of cover above them? No.
1932. You do not think there was any danger there? No.
1933. And you formed that opinion without knowing the nature or thickness of the surface deposits? What I mean is that I did not think there would be any danger if the timbering was looked after properly.
1934. You did not take into consideration the uncertain thickness of the surface deposits? No; I always left that to the manager, believing that he would never attempt to take the men under a bad place.
1935. When you went up to that first place that fell in, what kind of timber had they there? They had sets of timber sometimes 6 inches and at others a foot apart. They were split, and driven in on top.
1936. The sand was loose? Yes.
1937. Was the top like that? No; from what I could see of it it was like rock.
1938. Was there any coal there? No; there was no coal; it was a kind of "jerry," or black flaky stuff like you see on the top of coal.
1939. *Mr. Turnbull.* Was the roof good or bad where you were standing? I thought it was pretty good.
1940. *Mr. Usher.* How did you ascertain that the spring-tides came up over the fall-in of fifteen months ago? I have seen the spring-tides over that flat before it occurred. I have seen the spring-tides all over that flat when I was working at the smelting works.
1941. Did you know whether the water found its way down into the workings? I knew it was all salt water that was coming into the workings.
1942. Did you see any quantity of water escaping from the bottom of this fall-in? No, nothing unusual there was always a stream of water there, *i.e.*, from where they were working.
1943. *Mr. Jones.* You have stated that the sand at the foot of the fall-in was of a running character. What steps were taken by the company to prevent encroachments of that kind? I cannot say.
1944. Were any special steps taken in the shape of erecting barricades? I have heard that stoppings were put in.
1945. *Mr. Thomas.* When these bords were stopped, did you timber them well up? I never was in a place where they put stoppings in.
1946. *Mr. Jones.* By whom were the stoppings put in that you have referred to? Jackerman told me that he put in one.
1947. *Mr. Curley.* After the fall you say you were apprehensive of danger from inundations in this locality at spring-tides? Yes.
1948. Did such fear ever occur to you before the fall? Not before the first fall.
1949. Having been employed for over two years in various parts of the mine, did you ever see water issuing from any of the working places? Yes.
1950. Was that sufficient to stop the operations? Yes; I have seen places stopped for as much as six weeks.
1951. And then, after the water was drained off, would the work be resumed? Yes.
1952. *Mr. Davies.* What experience had you as a coal-miner before working at Ferndale? I had no experience at all. That is the first mine in which I actually worked permanently below.
1953. In what district were you water-baling? I was baling all over the dip workings.
1954. Since the first fall-in, what part of the mine were you working? I was working up by the fall.
1955. And you say that you apprehended danger knowing that the spring-tides came over this flat? Yes.
1956. And yet you asked for work whilst apprehending this danger? Yes; what I wanted to get at was to learn to coal-mine, and it occurred to me that if other people could work there I could.
1957. About this timber—you have stated that the deputy refused to pay you for some of the sets you put in. Did you think that timber was needed there? Yes.

1958.

Mr.
C. Woollett.

4 June, 1886.

1958. Was your bord extra timbered as compared with others? No.
1959. Was your bord 8 yards wide? Yes.
1960. Have you ever heard a complaint about the manager refusing to pay other men for timbering? No; but I have heard from John Williams that they have complained that the timber was too close.
1961. Did they pay him? Yes; they reckoned I was too inexperienced; that was the reason they did not pay me. It was the manager who last refused to pay me. The overman told me he would "fetch the old man in." I did not see him, but my mate told me he had come, and said the timber was not necessary. The timber we had put in was not more than what we had been paid for previously. I considered that if we took the roof down and threw it back we should weaken the whole body.
1962. Was it in the form of a conversation amongst you and your fellow-workmen, when you sat down to breakfast or dinner, that someone mentioned that you were working under the tidal swamps, and that danger was to be apprehended from it? I cannot recollect; it might have been?
1963. Do you think that the manager took all necessary precautions to insure your safety? Yes, I do.
1964. *Mr. Curley.* Do you know if there were Check Inspectors at that colliery? Yes.
1965. Did you ever see them making any inspection? Yes; while I was water-baling, and also since I have been working on the coal.
1966. Who were they? One was Hopkins and the other Moorhouse.
1967. Do you know whether they had any knowledge of this first fall you speak about? No.
1968. Did you mention it to them? No.
1969. Are you aware whether any of the other miners did? No; but I think it was generally known in the pit.
1970. Were you ever at any meetings when the Check Inspectors read their reports? Only the last one.
1971. Did you ever know a remark to be made in one of the reports on the subject? No. The last report was only a fortnight before the fall took place.
1972. Did you ever make a remark yourself as to there being no mention in any of the reports concerning danger to be apprehended from working under these swamps? No; I was only a young member; and I should have been "sat upon."
1973. You have said something about working at the smelting works previous to your employment at Ferndale? Yes.
1974. Was it in going to and from the smelting works that you saw the waters coming over these flats? Yes, that is how I know it.
1975. Where do the principal portion of the miners reside? At Tighe's Hill.
1976. Did they have the same opportunity of knowing that the tide came up as you did? No, excepting they went up in that direction.
1977. From your knowledge of the waters coming over these swamps, did not you think it your duty to take some notice of it, and report it to the Check Inspectors? No; I thought the Check Inspectors would take notice of things like that.
1978. Do you not consider that it is the duty of every man to look after his personal safety and the safety of others? Yes; but seeing that I was not an experienced man, I should think that if I mentioned anything of that kind they would laugh at me.
1979. And simply because you thought people would laugh at you you would run the risk of going into dangerous places, and not mention the matter to the proper authorities? Yes.
1980. *President.* I do not commend your sentiments.

The witness withdrew.

Alexander Ross, jun., sworn and examined:—

Mr. A.
Ross, jun.

4 June, 1886.

1981. *President.* What are you by profession, Mr. Ross? I am manager of the Newcastle Colliery.
1982. Have you had any opportunity of inspecting the Ferndale Colliery? No.
1983. Do you know anything about the working of that colliery? No, with the exception of what I have seen on the plan of it.
1984. When did you see the plan? A day or two after the catastrophe occurred.
1985. That was on the Saturday? Yes, I think it was on Saturday morning.
1986. And you saw the cavity where the sand had fallen through? No; I cannot say that because the tide was up at the time.
1987. Was the nature of the fall explained to you? Yes.
1988. What explanation did you receive? I was told that it was a hole about 4 feet square, and that during the running of the water about an acre or two of sand had been carried down with it.
1989. Did you receive certain information from the manager in the colliery office as to the nature of the roof and character of the workings under this fall? I cannot say that I did exactly; I have a recollection of some question being put to him.
1990. That is to say that you did not put any question to him, but others did? Yes.
1991. Do you recollect any statement as to the width of the bords? Yes.
1992. What was stated to be the width of the bords under that fall? I heard him say that they were 6 yards wide.
1993. Did you hear the manager, Mr. Powell, make any statement as to previous falls? Yes; I heard him make one remark.
1994. As to what? As to one particular fall.
1995. Can you recollect the description he gave of this fall? Yes; he said that a fall had simply taken place, but it had choked itself. I am not prepared to say that he stated any time that had elapsed between that fall and the late catastrophe.
1996. Do you know whether he stated whether it was six or seven weeks or fifteen months? He did not state weeks, I am sure.
1997. Was it fifteen months? I cannot say as to that, but I understood it was a very considerable time before the last fall.
1998. Did you hear any explanation that Saturday morning as to the mode of conducting the coal-workings along the crop? Nothing particular, excepting as to their being 6-yard bords with ordinary pillars, and that extra care was taken as to timbering.

Mr.
A. Ross, jun.

4 June, 1886.

1999. Was it explained to you that certain narrow places were driven in the soft coal to define the line of the crop? I do not remember that.

2000. Have you seen the plan? Yes.

2001. Was the line of crop shown on the plan? That I cannot remember, but I do not think it was.

2002. Was it a finished plan or a tracing? It was a tracing.

2003. Would you look at that tracing and say whether it was the same that you saw? Yes, I think that is the same.

Dictated by the President:—Mr. Ross recognizes the special headings marked "J" on the tracing, as the place where Mr. Powell pointed to as the site of the fall that occurred some time before the catastrophe. Mr. Ross also recollects the site of the present fall as that marked on the plan.

2004. Then it was explained to you at the meeting on that Saturday that a considerable body of rock had fallen, and given access to the swamp waters? Well, I understood that a body of rock had fallen and made a cavity or hole about 4 feet square, and that round the mouth of that, in a bell shape, it had worked its way up through the action of the water, causing greater falls down below.

2005. As a matter of fact, it was explained to you that the surface deposits measured about 20 to 25 feet in thickness, and what had fallen down measured in thickness about 40 to 42 feet? I remember the depth stated by Mr. Powell was about 60 feet altogether.

2006. Did it occur to you that the weight of 25 feet of sand and water should be capable of bursting a hole of that size in such a thickness of rock? Well, it would be extraordinary in one way and yet not in another. In the event of the surface being composed of rotten rock it would not be very remarkable.

2007. But we have evidence that the rock that came away was composed of a considerable thickness of conglomerate, and that there was 9 or 10 feet of rock, such as you describe, at the bottom, which required to be supported by timber? I should think there was some flaw in the rock or fissure.

2008. Was it explained to you that the hole that had been formed was determined by lines and fissures? No, I do not remember that being explained.

2009. Did you form any opinion as to whether shallow coal-workings could with safety be continued under these tidal swamps? It has occurred to me that the greatest care should be taken in working under tidal swamps.

2010. In determining the amount of care that should be taken, would it be reasonable in your opinion to take into consideration the circumstances that 40 or 42 feet of solid strata had in this instance given way? Oh, yes, I think that should be taken into consideration.

2011. In other words, you consider that a very wide berth or margin should be given to the crop in these seams under tidal water? Yes, unless they have something very solid above them.

2012. And you are of opinion that care should be taken to ascertain that? Yes.

2013. And are you of opinion that considerable danger attends the indiscriminate working of coal under tidal swamps? Yes; I have formed an opinion that the greatest care should be taken.

2014. Do you mean to say that indiscriminate working is attended with considerable danger? I did not say there was any indiscriminate working there.

2015. You have stated already that the nature of the surface deposits and the strata ought to be ascertained? Yes.

2016. Well, if this were ascertained, would not that be indiscriminate working? I should consider it very injudicious to work under tidal waters without obtaining the fullest information as to what was above the coal.

2017. I understand you have no knowledge as to the underground workings of Ferndale? No; I was never down there.

2018. *Mr. Neilson.* At the meeting of colliery managers, I believe the whole matter was discussed carefully and deliberately? Yes, and we arrived at an unanimous conclusion as to the probability of finding the body of the man drowned in the pit.

2019. *Mr. Turnbull.* Did Mr. Powell say anything about certain bords being driven 4 yards wide? No; he did not mention that to my recollection.

2020. What width did he say the bords were driven in this particular part? 6 yards wide.

2021. *Mr. Davies.* What special care should be taken, in your opinion, in working a colliery under these circumstances? Well, I should put in very good sets of timber to prevent the slightest subsidence anywhere.

2022. Was this meeting that you spoke of composed entirely of colliery managers? No; there were some there who are not now colliery managers.

2023. *Mr. Carley.* When you were present at this meeting of colliery managers, in company with the manager of Ferndale Colliery, who was it that stated that the strata above these workings was composed of rotten rock? So far as my recollection goes, I think it was Mr. Powell, the manager of Ferndale, who made the statement.

2024. He stated that the rock was rotten? Yes, at that particular place.

2025. *President.* That is the impression he left on your mind? Yes.

2026. *Mr. Carley.* You have stated that great care should be exercised in working coal under these tidal waters. In what direction do you imply that remark—do you mean it to refer to the strata overhead, the width of bords, or what? Yes, it would embrace all that—the strata overhead, the width of the bords, and the timber to be used in the working.

2027. Has this idea occurred to you as a colliery manager, that a bord driven 6 yards wide could be narrowed at a certain distance in the workings and then widened out again? Oh, yes, that could be done.

2028. Has that idea ever struck you? No.

2029. *Mr. Thomas.* I suppose it has occurred to you that in driving narrow bords with a rotten roof it would be advisable to use double timber? Yes.

2030. Do you think it would be safe to carry on bords 6 yards wide in such a place where the road has to be double timbered at intervals? That would all depend upon the upper strata. If it was good rock above then it would be quite safe.

2031. *Mr. Jones.* You say that a sufficient amount of timber forms an element in the safe conducting of mines under such circumstances? Yes.

2032. But you could not depend upon the timber for more than a certain length of time? No; it would be for the safety of the men working there at the time.

2033. And would that not necessarily throw the weight of support back upon the pillars? Yes.

2034.

Mr. A. Ross, jun. 2034. *Mr. Swinburn.* Would it be judicious to work that coal at all under the tidal swamps with such a roof as now exists? That would depend entirely upon what information the management was in possession of as to the nature of the strata. I have already answered the question.

4 June, 1886. 2035. *President.* In determining future workings, the fact should be taken into consideration, and kept steadily in view, that 40 feet of rock under these circumstances gave way? Yes, I am quite of that opinion. The witness withdrew.

James Hunter sworn and examined:—

Mr. J. Hunter. 2036. *President.* What are you by profession? I am manager of Waratah Colliery.

4 June, 1886. 2037. Have you had special opportunities of inspecting the Ferndale Colliery? No.

2038. Have you been in the underground workings of Ferndale? No.

2039. Were you at a meeting of managers held on the Saturday after the accident? Yes.

2040. That meeting was convened by the proprietors, I presume? Yes, to consider the position.

2041. And you of course heard the explanations that were given by the manager in reply to the questions put by the gentlemen assembled? Yes.

2042. And you heard the thickness of the surface deposits? Yes.

2043. Was it explained to you that some of these workings were narrow places that had been driven up to the crop? Yes.

2044. And these narrow places that determined the line of the crop were under the tidal waters? Yes.

2045. Do you recollect whether it was explained to you that a fall-in had taken place in one of these narrow workings some months before? Some time before, yes.

2046. Do you recollect what was said about that fall, in explanation. Was it said that it choked itself with the stuff that fell? I did not hear that said.

2047. Was it explained to you that the fall came to the surface? I cannot say definitely.

2048. Was the position of that fall explained to you on the plan? Yes.

2049. Can you recognise that position on the plan? Yes, I recognize the position—at "J" heading.

2050. Do you recollect now whether it was explained to you that the fall came to the surface? I cannot recollect.

2051. But you were told that these workings were under the tidal swamps? Oh, yes.

2052. Did you form any impression as to the safety of working under these tidal swamps under such difficulties as existed here? Well, I thought they should be required to work under greater restrictions there.

2053. With respect to the fall that had taken place two days before this meeting took place, can you recollect whether the manager explained to you the width of the bords in which the fall-in took place? I understood that the bords were an average of 8 yards; but I cannot say as to this particular bord.

2054. Do you recollect definitely whether he explained to you that they were 8-yard bords? No; but that is the impression left on my mind.

2055. Did you put the question yourself? No.

2056. Did you not know that it was a question of vital importance in such an inquiry as to the width of the bords? I believe the question was put, and the impression was that they were driving an average of 8 yards.

2057. Do you know who put the question? No.

2058. Do you refer to the general system of working that was pursued in this colliery when you say that the bords were driven 8 yards wide, or do you mean to say you understood that 8-yard bords were driven in this particular locality where the inundation took place? I refer to the general system.

2059. But I am speaking of the bords under the fall-in at this particular point? I cannot speak as to the exact width of those particular bords.

2060. Then having formed an opinion as to the working of coal-seams under tidal swamps, can you tell us under what conditions, in your opinion, these coal-seams should be worked? Well, I should say that you ought to leave at least half of the coal on.

2061. I mean, what conditions as to the roof, or the depth of these surface deposits. Do you mean to say that leaving half the coal in the direction of this fall would have materially strengthened the roof? Yes, I think so.

2062. There was 30 feet of conglomerate and from 7 to 9 feet of shaly sandstone on top of the coal, and yet you think that leaving (say) 2½ feet of coal would have materially strengthened that roof? Yes, I think so.

2063. And that it would have rendered the position safe? Yes.

2064. Do you know the thickness of the coal that was worked in Ferndale? I believe it was about 4 feet.

2065. Then by leaving 2½ feet there would only be 18 inches to recover. Do you think it possible to work coal under such conditions? I am speaking as regards the size of the pillars—not the vertical depth of the coal.

2066. You mean to say that you would leave as much in pillars as you would take out, and that by this means you could safely work this coal under the swamps? I think it would be much safer.

2067. And that is without taking into consideration the width of bords or thickness of pillars? Oh, yes.

2068. What width of bords would you suggest? Not more than 5 yards, and the same size of pillars.

2069. *Mr. Davies.* Have you any experience of working coal under tidal influence? No.

2070. *Mr. Curley.* Had you known that in a narrow heading the roof had come in, would that alter your opinion about the bords being driven with safety at 5 yards? I understood that the fall had come in at the crop.

2071. *Mr. Swinburn.* Do you consider it would be wise to work with 5-yard pillars under all circumstances? Not if I had a knowledge of repeated falls-back from the crop.

2072. Well, with your experience as a manager, what would you do under the circumstances? I should do as I have said—that is, take half of the coal and leave half.

2073. And you are of opinion that you would be safe in doing so? Yes, I think so, unless there were any special indications to the contrary.

2074. If you had any idea that you were working under tidal roofs, and you did not know the nature of overlying strata, would you not endeavour to ascertain what was above the coal? Yes, I should, before working it.

The witness withdrew.

Richard

Richard Cotterill sworn and examined:—

Mr. R.
Cotterill.

4 June, 1886.

2075. *President.*] What is your occupation? I am a miner.
2076. And as a miner, were you employed at Ferndale Colliery? Yes; I went there as a shifter.
2077. Where did you work principally? All over the place; wherever I was sent.
2078. Have you had considerable experience as a miner, and if so, how long? I have been working underground for twenty-three years.
2079. Has your experience been in the Colony, or in other parts of the world? I have been working just round about Newcastle and the Maitland district.
2080. Was the safety of the men looked after in working the Ferndale Colliery? Yes; I believe the mine was safely conducted.
2081. What was the character of the roof over a great part of the workings? Conglomerate rock principally.
2082. Have you seen any place in Ferndale heavily timbered? Yes.
2083. Did you put sets of timber in where the conglomerate rock was? I was not called upon to put much timber in.
2084. What I want to know is, what the roof consisted of where the timber was put in? It was of a shaly nature.
2085. Was the timber put in simply to keep up the shaly roof? Yes; the men put it up to protect themselves.
2086. Did you know where the eastern workings were proceeding, or that they had already entered under the tidal swamps? Yes.
2087. You knew that the workings were under the swamps? Yes.
2088. And also that they were covered by water at spring-tides? Yes.
2089. And that your roof was covered at high-water? I knew that since the fall-in took place, but not before.
2090. Have you been in any of the workings approaching the crop of the seam? Yes; there was a fall there about twelve months last February. I helped to put a stopping in there.
2091. What did that stopping consist of? It consisted of timber.
2092. How did you proceed? We set in uprights and cross-bars, and then piled the sleepers on top of one another.
2093. To retain the transverse sleepers you put vertical props into the pavement? Yes.
2094. And did the fall choke itself against that? Yes.
2095. What did the fall consist of? Of sand and clay.
2096. Were there any shells? Yes.
2097. And water? Yes.
2098. Was there much water? Yes, there was a good deal.
2099. Where did you think it came from? It must have come from the surface. I believed it did.
2100. Was the water fresh or salt? I cannot say that.
2101. Then you saw sand and shells and a deal of water coming down. Did it occur to you that this came from the swamps above? It did not strike me.
2102. Did you know where the fall was on the surface? No; I did not know where it fell in.
2103. Did it occur to you that these workings were conducted under circumstances of danger when you saw the shells and sand coming down? No; I did not think there was any danger.
2104. Where did you suppose the sand and shells came from—did you suppose they came from the swamps? No; I never gave the matter a thought before.
2105. Did you consider that the fall indicated danger? No.
2106. You are sure of that? Yes.
2107. Did you ever consider there was any danger there? No.
2108. Do you recollect having a conversation with some of your fellow-workmen on the occasion of the fall? No.
2109. And you did not tell your fellow-workmen that you apprehended danger? No.
2110. Do you recollect one Jackerman? Yes.
2111. Did you not have a conversation with him on the subject? Not that I can recollect.
2112. Is it possible that you might have had a conversation with him on the subject? I might have had.
2113. Is it possible you might have expressed a fear that this fall would give some trouble? I do not recollect saying so.
2114. Did you think so? No.
2115. You are sure of that? Yes.
2116. Supposing that Jackerman said that you did say so, would you alter your opinion? I might have said so, but I do not recollect.
2117. If you had not entertained such a belief, how would you account for making such a statement to Jackerman. Were you not aware that the fall had come down twice? No.
2118. Was the barricade sufficiently strong that you put in there? I should think so—I do not know that it has given way to this day.
2119. And you considered that it was a strong and sufficient stopping? I did.
2120. Did you ever work in a narrow heading that went towards the crop further to the east? The only narrow heading that I knew of is where we put that stopping in.
2121. You do not know of another heading nearer to the east—I mean where Teasdale and Cunliff worked during the last cavi. You know those men? Yes.
2122. Well, they broke away two bords from the bottom of this heading? Yes, I know that place.
2123. Do you recollect what the width of the bords was in that direction? They were narrow bords.
2124. What width were they? 4 yards, I think.
2125. And the bord below that—what width was it? I cannot tell you, as I did not take any notice of it.
2126. You think the upper bords were narrow? Yes.
2127. Have you heard any reason assigned for driving those narrow bords? I do not know what Mr. Powell's intentions were in driving the bords narrow.
2128. Did you consider the management were looking sufficiently after the safety of the men in conducting those workings towards the east? Yes; he was careful in providing plenty of timber, and he stopped the bords when they were coming too near the crop. I believe he worked the mine with due care for the safety of the men.

- Mr. R. Cotterill. 2129. Then you have no cause to complain of the management? No; I never had any cause.
- 4 June, 1886. 2130. Were the men paid extra for putting up sets of timber? Yes.
2131. Were the men allowed to put up what timber they liked, or was any control exercised over them in that direction? I cannot say.
2132. What is the usual practice in such cases? Are the men allowed to put timber where they please without first consulting the overman? No; I do not think so.
2133. Have you worked in the eastern workings as a miner? No.
2134. Mr. Usher.] Do you know whether any fall took place between that first fall and the last one? No, I do not.
2135. Mr. Jones.] Were you supplied with a copy of the rules of the colliery? When I was working on the roads I was.
2136. Mr. Davies.] You are quite sure you never had any conversation with, or made any statement to, young Jackerman as to the safety or otherwise of working under these swamps? I have no recollection of it at all.
2137. And you say that you had no thought of any danger? No; I had no thought of any danger then.
2138. You have been all over the pit, I suppose? Yes.
2139. When you were putting up the barricade, and saw the sand and sea-shells, did you not think that they came from the tide? I did wonder where the sands and shells came from, and it certainly did strike me as to where they came from, but I did not say anything about it.
2140. In going about as a shift-man, you came frequently into contact with the miners? Yes.
2141. Was it not a theme of conversation amongst them that they were working under these tidal swamps? No, nothing of the kind.
2142. Mr. Curley.] Who gave you instructions to put that stopping up? I am not certain whether it was Mr. John Smith or Mr. Joseph Powell.
2143. Was he there when you started to put in the stopping, or did you go by yourselves? I think we went by ourselves.
2144. What instructions did you receive? We were told to choke the fall up as much as we could—to build the stopping up well.
2145. Had you much conversation about the fall with the overman at the time? No.
2146. Can you tell us in so many words the instructions you received? No; I cannot tell you what the actual words were.

The witness withdrew.

Mr. Joseph Powell recalled:—

- Mr. Joseph Powell. 2147. President.] In connection with this "little fall" that occurred at a part of J special heading, you are aware that it occurred about fifteen months ago. How did you become aware of it? I was sent for.
- 4 June, 1886. 2148. By whom were you sent for? By the wheelers.
2149. Did you send anybody to rectify the fall? Yes; I sent Joseph Jackerman and Richard Cotterill, to the best of my belief.
2150. Can you state the exact words you used in giving the instructions? I gave them orders to put in a stopping there, with the object of preventing any further roof from coming down. The work was done, and nothing ran from them from that time until the accident occurred.
2151. You gave orders generally as to the character of the stopping you wanted to be put in? Yes.
2152. And you told them how to do it? Yes.
2153. And did you visit them during the operations to see that they were carrying out your instructions? Yes, I did once.
2154. Had you any conversation with any of the men subsequently about this fall? No.
2155. Do you recollect a man named William Williams? Yes.
2156. Did he at any time express fears to you as to the safety of the mine? No. I do not think Williams was working near that place at all.
2157. I am asking whether, since the fall, William Williams had any conversation with you about it? Never; I do not think he ever saw the fall.
2158. But he might have heard about it and spoken to you on the subject? No, he did not.
2159. Did you ever state to any of the men that where the fall had occurred was a dangerous place, and that you ran a risk of being drowned out some day? No; I have no knowledge of having said anything of the kind.
2160. Did you ever give expression to such words? No, not that I am aware of. I do not see how I could.
2161. Did you state that the mine was in danger from this fall, and was likely to be drowned out? No; I cannot say that I did.
2162. Do you recollect speaking to William Williams? Not in connection with anything in the mine.
2163. Then had you any apprehension for the safety of the mine from this fall? I say the same now as I said before, that I never had any apprehension.
2164. Did you know that this fall occurred under the swamp? Some time after it occurred I did. I think I said that before.
2165. Had you suspected danger, I suppose you would not have concealed it from the proprietors? No.
2166. Do you know Woollett? Yes.
2167. Do you recollect the bord he was working in? Yes; I believe it was the 11th bord.
2168. Did it require timbering? Not much. He used to put timber in there when it was not required.
2169. And did you refuse to pay for seven sets? Yes; they were not necessary, and to make myself secure I took my father there. We sounded the roof; it was close on the conglomerate.
2170. I suppose some little supervision was necessary to control the men in the pit? Yes, in some places.
2171. Did the men often put in timber when and how they pleased? Yes.
2172. Mr. Thomas.] Did you find from this first fall that you were inconvenienced at all by the quantity of water? No. There was very little water indeed coming. Many of the bords were making ten times as much water. It did not inconvenience anyone.

2173. *Mr. Neilson.*] I understand you to say that the miners pretty well exercised their own judgment in the matter of timbering? Yes; they were told always to secure themselves, and not to stint themselves as to timber. In case of a dispute occurring I go to the manager and leave it with him.
2174. *Mr. Usher.*] Did you ever object to pay for any timber in any other portion of the mine? I do not think we did.
2175. Woollett says that this timbering which you refused to pay for extended over a fortnight. How was it that you did not stop him before? Well, it was in this way. I could not go round every day, and when I went round to take the numbers, which I used to do every fortnight, I could then see that the timber he was putting in was not necessary.
2176. *Mr. Jones.*] How long was Woollett working the coal? About five months. He had been water-baling, and he prayed the manager to put him on the coal.
2177. Would a miner of greater experience have put this timber in? No; he would not take the trouble.
2178. Do you think it was want of experience which led him to put this unnecessary timber in? Well, I cannot say as to that. He was only five months on the coal, but he may have been shrewd enough to put in a set in order to get the money for it.
2179. If the skips were a little bit slack he would find time to put the timber in? Yes.
2180. *Mr. Davies.*] Was there any rule as to the distances at which you would place the timber? No; it would depend very much on the nature of the roof.
2181. I suppose the manager or the overman would be the judge as to the necessity for it? Yes.
2182. Was it not the duty of the deputy to visit the working-places every day? Yes.
2183. Did he ever report to you as to this unnecessary timbering? Not as to that particular case, but he has often told me that there was no necessity for so much timber.
2184. Do you think that your action with regard to Woollett was calculated to make the men careless where there was real necessity for timbering? No, I do not, because where they saw there was a necessity for it they would do it for their own safety.
2185. *Mr. Curley.*] In passing round the mine at the time this fall-in took place, did you ever casually mention the subject? No, not to the workmen; they could see it themselves.
- The witness withdrew.

Mr.
Joseph Powell
4 June, 1886.

John Abrahams sworn and examined:—

Mr.
J. Abrahams.
4 June, 1886.

2186. *President.*] What is your occupation? I am a coal-miner.
2187. Were you employed as a miner in Ferndale? Yes.
2188. In what part of the colliery did you work? I was working for six weeks before the last fall up in the rise workings.
2189. While you were working in that part, did one of the bords go up towards the crop where the fall-in took place? Yes; I worked in that heading.
2190. Can you tell us what you got in the face? I can tell you that the place was safe.
2191. Did you drive up to the sand? I did not see any sand at all.
2192. What was the roof like? It was a shaly kind of sandstone.
2193. Was it a good roof? Yes.
2194. Did you see this little fall come in? Yes; about 20 yards of sand came in, and we could not get in to work; before we left at night I saw clay making in, and when we went in the next morning the fall had come in altogether.
2195. What did you see besides sand there? I saw oyster-shells.
2196. Was there much water? No, there was not much water.
2197. Where did you think that sand came from? I thought it came from the surface.
2198. Did you know where you were working at the time? No, not exactly.
2199. Did you not know that you were working under the swamps? Yes; towards the smelting works somewhere.
2200. Did you know that that heading you have spoken of was under the swamps? I believe it was.
2201. But did you know it at the time you were working that heading, that it was under the tidal swamps? I did not know until she fell in.
2202. Who told you that? I heard a man say so.
2203. Did you think there was any danger after you saw that fall-in? Well, no; I did not then, because it was stopped.
2204. But knowing that you were working the coal beyond the fall, did you not think you were incurring danger? No; I did not think of any danger then; I never worked there after that.
2205. Where did you work after that? In the next bord, below where we turned off a bord.
2206. What width did you turn that bord off? 4 yards.
2207. And, below you, were the bords worked? Yes.
2208. What width? 8 yards, I think.
2209. Your bord was 4 yards, you say? Yes, turning off the heading, and then widening out to 8 yards.
2210. Was it timbered? Yes; we timbered all the way.
2211. Had you ever any dispute about the timber? No; we were always paid for it.
2212. Was the roof bad there? No; it was as sound as a bell.
2213. What was the object of putting timber in such a roof? Just for safety.
2214. Does not a roof like a bell constitute safety? The timbers were a good distance from each other, and if the roof looked bad at any place we would then put them closer.
2215. Do you know of any other narrow bords being put in? No; I left for New Zealand then, and when I came back I worked for about seven weeks at the colliery before the big fall-in occurred.
2216. Where did you work during those seven weeks? Down in the lower workings; I did not know the place where the last fall-in took place.
2217. Do you think the mine was safely conducted? Yes; I considered it a safe mine.
2218. Did you apprehend danger of any kind from working at that colliery? No.
2219. Have you ever heard any of your fellow-workmen talk about possible danger in the mine? No; I never heard anyone speak of danger.
2220. On coming back to that fall next morning, you noticed that it had gone back about 20 yards; did you

Mr.
J. Abrahams.
4 June, 1886.

you think that you lived in a perfect state of safety there after you had seen that fall—did it not occur to you that you ran a little risk in working there? No, not at all.

2221. Did it occur to you that another fall might take place, similar to the one you saw? No; I never thought about it.

2222. *Mr. Usher.*] What was the extent of the fall? About 20 yards; we guessed it pretty well.

2223. Could you get over the fall? Not right to the face.

2224. What was the drive there? About 8 feet.

2225. *Mr. Davies.*] When you saw those oyster-shells, did it occur to you that they were deposited by water? Yes; of course I knew that.

2226. And you had no thought of any danger? No.

2227. *Mr. Curley.*] Was there any timber in that heading? Yes, about 3 feet.

2228. Did the roof appear to be jointed? Yes, rather.

2229. Were there any slips in it—any graybacks? It was a little shaly.

2230. Did you see any hard rock there? No.

The witness withdrew.

James Thomas sworn and examined:—

Mr.
J. Thomas
4 June, 1886

2231. *President.*] What are you by profession? I am manager of the New Lambton Colliery.

2232. Have you inspected the Ferndale Colliery? I have not been down the pit.

2233. Did you, in answer to a circular letter, visit Ferndale after the water had broken in? Yes.

2234. And you heard some explanation as to the method of working at Ferndale? Yes.

2235. And as to the character of the strata that had fallen in? Yes.

2236. Was it explained to you that the principal workings had reached the crop? Yes.

2237. And you understood that they were under the tidal swamps? Yes.

2238. Did you hear anything of a fall that had taken place in one of these bords some time before? No, I did not.

2239. You did not hear Mr. Powell mention that? No.

2240. Did you hear Mr. Powell make any statement as to the width of the bords under the fall you were inspecting? Yes.

2241. What width of bords did he say were in that direction? He said they were driving 6-yard bords there.

2242. You have no doubt about that? None whatever.

2243. Did Mr. Powell explain to you that the bords required extra timbering? No. He explained that the headings required extra timbering on account of the softness of the roof.

2244. That is the headings approaching the crop? Yes.

2245. Have you had any experience of the cost of putting in these double sets of timber? Yes.

2246. Does it add considerably to the cost of working a colliery? Oh, yes, certainly.

2247. Does working these bords narrower involve extra expense? Yes.

2248. Do you consider 6-yard bords narrow bords? Yes; anything under 8 yards.

2249. It has been explained to you that about 40 feet of rock or conglomerate fell in, and that about 25 feet of sand and clay rested on that rock. Under these circumstances, what opinion did you form as to the cause of the accident? I thought it was through slants or joints in the ground underneath.

2250. Can you detect these slants or joints in the underground workings at all times? No; sometimes you can, and sometimes you cannot.

2251. And is there any means of knowing how far they may run up? No; not in my experience.

2252. As to the working of coal under the swamp, has this accident caused you to ponder over the mode of working the coal that should be adopted—has it not caused you to think that some special precautions should be adopted? Well, I thought they were taking precautions by working those bords only 6 yards wide. I think that ought to have been sufficient under ordinary circumstances.

2253. But here 40 feet of rock has fallen? No; that was on account of the broken strata. Of course if a man knew that he had fissures or joints in the roof above him he would take special precautions.

2254. Here are bords 6 yards wide. Here is 40 feet of rock lying between the sand and the coal, and yet the rock gave way, the colliery was flooded, and all the men had a narrow escape of death, while one poor fellow was drowned and buried in the mine. Under these circumstances, do I understand it to be clear to your mind that the bords must be driven narrower, or a greater thickness of rock must intervene between the surface deposits and the coal? Yes, that is my opinion.

2255. *Mr. Curley.*] Would you be good enough to look at the plan, Mr. Thomas, and tell us whether you had pointed out to you where the little fall took place some time previous to this accident? I cannot say whether it was explained at the meeting of managers? I was not aware of it.

2256. Supposing that you had been aware of that, and that 20 yards of sand had come down from this fall, would you have thought it wise to drive 6-yard bords here in the locality of the fall? It would all depend upon my knowledge of the coal.

The witness withdrew.

SATURDAY, 5 JUNE, 1886.

Present:

J. R. M. ROBERTSON, Esq., PRESIDENT.	
MR. USHER.	MR. SWINBURN.
MR. THOMAS.	MR. CURLEY.
MR. NEILSON.	MR. JONES.
MR. TURNBULL.	MR. DAVIES.

MR. DURIE.

The Hon. James Fletcher sworn and examined:—

2257. *President.*] I believe you are one of the proprietors of Ferndale Colliery? Yes.
2258. Have you taken an active part in the management of the colliery in any way? No, none whatever. I have only taken the interest in it of an ordinary proprietor. Perhaps, however, I should correct myself. Being myself a practical man, the manager, if he had any proposal to make, might consult me for my opinion on any subject. But beyond that I took no part whatever in connection with the management of the colliery.
2259. Did you frequently examine the underground workings? No; I think I have been once or twice in the pit since we bought it.
2260. To whom did you delegate the control of the underground workings? To Mr. Powell, the manager, who we looked upon as a thoroughly competent man.
2261. You had every confidence in Mr. Powell's ability? Yes, every confidence.
2262. Are you aware whether the underground workings were worked under difficult conditions? Yes; I am aware that it was worked under circumstances of greater difficulty than any colliery in the district.
2263. Are you aware that the eastern workings were under the tidal swamps? Well, to tell you the truth, I never paid any attention to it. I left the whole of those matters in the hands of Mr. Powell.
2264. Did Mr. Powell never inform you that the eastern workings had approached the tidal swamps? We called the whole of that the swamp—all the field to the left of the hill.
2265. Did Mr. Powell, in communicating with you, ever refer to some crop workings that he had driven? No; I do not think he ever said a word to me about crop workings. I think he mentioned to the Board of Directors something about not going beyond a certain point towards the rise workings, and I think he pointed to a place on the plan.
2266. Did he mention anything to you about a fall having taken place towards the rise fifteen months ago? I do not remember that. I believe we had several falls, but nothing of special importance.
2267. He did not specially refer to any particular fall? No.
2268. Are you aware that some of the working bords were extra timbered—that double sets of timber were put in? Yes; I have heard from the reports, and from what Mr. Powell told me in conversation, that between the overlying rock and the coal-seam there was some soft shaly substance that took a considerable quantity of timber to keep it up.
2269. Did you understand that the object of putting in this extra timber was to keep up this shaly rock underlying the conglomerate, and to resist any pressure there might be from the surface? Certainly not.
2270. Were you aware that the bords were driven narrow towards the rise? Yes; Mr. Powell informed me and the other proprietors that he thought it would be better to err on the safe side by driving 6-yard bords there instead of 8-yard bords. We have done something similar in the Co-operative Colliery.
2271. This course was not taken through anticipating danger from the surface deposits? No.
2272. Did Mr. Powell, in his conferences with the owners, ever state that he anticipated danger from these workings? No; and he is too good a man to have run into danger; had he anticipated there was danger he would have stopped at once.
2273. You are quite positive that he did not make any intimation as to anticipating danger there? Yes; I am perfectly sure of it.
2274. And you did not hear of any falls having taken place, and which came to the surface within the tidal waters before the last accident? No, I did not.
2275. Were you satisfied with the general arrangements that had been made by Mr. Powell for the practical working of the colliery? I was; I thought that under the circumstances he produced the coal exceptionally cheap.
2276. And, as a practical man, having long experience of working coal-seams in the Newcastle District, you had reason to feel perfectly satisfied with Mr. Powell's management? Yes, I was perfectly satisfied.
2277. You are aware that the coal was produced at a high price as compared with other collieries in the district? Yes.
2278. Notwithstanding the fact that you were paying a much higher price than other collieries, you considered that the circumstances warranted the increased amount paid? I did, indeed.
2279. Then you found Mr. Powell a thoughtful, economical, and careful manager? Yes; I knew him thirty odd years ago, and had worked in the next bord to him as a miner. My experience of him as a manager fully bore out my previous experience of his character and abilities.
2280. As to his integrity and honesty you have no doubt then? None whatever; I would trust my life to him.
2281. It comes to this—you have every confidence in the good judgment of Mr. Powell? I have.
2282. About the beginning of last year some of your partners in Ferndale formed a different opinion from you as to the cost of raising the coal? Yes, they did.
2283. Some of them had doubts in their minds as to whether the coal was raised in the most economical way? Yes.
2284. And some arrangement was entered into, and Mr. Croudace was consulted. Were you aware of the intention to call in Mr. Croudace's aid? I am aware of this, Mr. President: That they did not go out seeking for information as to the cost of our production, but Mr. Croudace did volunteer to give them his

The Hon.
J. Fletcher,
M.P.

5 June, 1886.

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M.P.
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his opinion on the subject of getting the coal at Ferndale. Mr. Sweetland told us of the circumstances that led up to it. Mr. Croudace, knowing the business connections, saw Mr. Sweetland, and reference was made to our cost of production. Mr. Croudace went out of his way, I thought, to hazard a statement that in his opinion, and knowing the circumstances, that the coal should be produced for 7s. per ton. Considering the difference between what the coal was really costing and Mr. Croudace's estimate, my co-partners thought that something ought to be done to give effect to what Mr. Croudace said he was able to perform, and they suggested the propriety of engaging Mr. Croudace as consulting viewer or engineer. They wrote to me accordingly on the subject, and I at once coincided with their views, but I added 3d. per ton over and above the sum that was mentioned, viz., 7s. I said I was quite prepared to give the extra 3d. to come and go upon, and made it a *sine qua non* that if he produced the coal for that amount that we should give him £100 or £150 a year instead of the sum that he had suggested. But it was to be on the distinct understanding that the coal was to be got out at the price stated. Then I was asked to see Mr. Croudace, which I did, but after he had seen the colliery he submitted proposals which would have cost £10,000 to give effect to. He proposed to sink a shaft to the dip, and start away a pair of winning-places, and work the coal to the rise. He also said that it might be necessary to depose Mr. Powell, and appoint a man of his own there. I told him that if he was prepared to carry on the colliery with the present appliances, with the object in view, and Mr. Powell would not act under his instructions, he would have to be removed, and some other person appointed in his place; but if he, in order to give effect to his voluntary promise to get the coal at 7s. per ton, must, in the first place, undertake works of such cost and magnitude, then, of course, Mr. Powell was equally capable of doing it himself.

2285. Did Mr. Croudace, in entering into any particulars with you, state how he proposed to work the coal? Yes; he wanted to drive a pair of winning-places away ahead in the thin coal, for half a mile or thereabouts. Then a shaft was to be sunk to the dip. To my mind, seeing that the water was as much as we could contend with, I thought it would cost considerably more to adopt Mr. Croudace's scheme.

2286. Were you aware that the thickness of the coal there was 2 feet 6 inches? No, I was not aware; but I know we had to pay extra to the miners working in that part.

2287. Then, from your experience of winning coal at Newcastle, do you think that it was possible to win the coal and effect economy with such thin coal as you had? Certainly not, and that is why I condemned his scheme. It was agreed by most of us to work from our present working-places, as far as we could, and then to go beyond and make fresh workings.

2288. Then Mr. Croudace did not satisfy you, in his personal explanation, that he was able to effect the economies he had indicated? No; but he did satisfy me that he wanted to interfere with the duties of those who know more than he did.

2289. From his proposition, did you understand that he was aware of the position of these eastern workings? He never said a word about danger being there.

2290. I did not ask you that, Mr. Fletcher. Did you understand that he was acquainted with the position of these workings? Yes.

2291. And that he was aware of the difficulties of the surface at the place where he proposed to sink the new shaft? Yes.

2292. Did he send a report to the owners after his visit? At that time he did.

2293. And knowing the positions that these workings held with respect to the surface, and knowing that they were well within the tidal waters, did he give you any advice as to the amount of caution that should be observed in the working of the coal under these swamps? No; he did not do so, either by direct communication or inference.

2294. Did he mention the word danger to you in connection with the workings? No.

2295. Neither then nor at any future time? Yes; he became a wise man after the fall had taken place.

2296. Mr. Croudace, you say, made a proposition to the proprietors, that on certain conditions, if he was appointed "viewer" or consulting engineer, he would be able to carry on the workings under these tidal swamps by means of sinking a shaft and other operations, &c.? Yes, that was the proposition he made to us.

2297. Did you consider these as safe propositions for a colliery manager to make? I did not, because I thought we could not get a better man than we had, nor, indeed, as good a one.

2298. Do you consider that it would be an advantage to Mr. Croudace, with all his experience and local knowledge, to have a good and tried manager to carry out his behests in preference to an overman? I certainly do; Mr. Croudace, when he was below, made a great point against the management about some trifling matter of steam coming out from a cylinder in connection with some of the pumping apparatus.

2299. We attach no importance to that? I think you are right, but I was only telling you.

2300. As a practical man, you were not to be taken in in that way? No, I was not.

2301. And with respect to Mr. Croudace's report, it was discussed by the proprietors, I suppose? Yes.

2302. Did you see Mr. Croudace thereafter? No. I think Mr. Sweetland was authorized to inform him that we were unanimously of opinion that, in consequence of the amount we would have to expend, as compared with the value of his professional services, we would do better to remain as we were.

2303. You did not estimate his anticipated savings at the amount of the salary he required? No. We decided that he could not effect the savings that he professed to be able to effect.

2304. With respect to the disaster that occurred at Ferndale in March last, did you visit the scene of the disaster? I did.

2305. And did you make inquiries as to the width of the places below the fall? I did.

2306. And what answer did you receive? I was told by Mr. Powell that the bords were driven 6 yards wide, and barely that.

2307. Did Mr. Powell assign any reason for such a thickness of rock breaking down? Yes; he did say that there must have been a rotten place in the rock, and that the water coming there had made the breach so much larger, and eventually caused the fall. I asked him particularly if he had thought there was any danger to be apprehended, and his reply was that he had seen none whatever, and that the men did not consider it unsafe.

2308. In working coal, you often have occasion to find joints or fissures in the roof? Yes.

2309. Can you always tell how far these joints extend upward? No; and I once experienced a difficulty from that cause myself, where a fall took place in a narrow bord, and the water came in from a creek, to cross which, in safety, every precaution had been taken.

Mr. J. Y. Neilson corroborated this statement.

The Hon.
J. Fletcher,
M.P.

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2310. And in working the coal there, had you no means of estimating the danger? No; everything appeared to be sound.

2311. Having examined Mr. Powell as to this late accident, what conclusion did you come to? I came to the conclusion that it was not brought about by any carelessness on the part of the management, because every precaution had been taken. In other words, I thought it was one of those unexpected events which no human eye can foresee.

2312. Did he mention to you at the time that a fall-in had taken place in the direction of a special heading? He showed me a subsidence.

2313. Do you consider the fact of such an accident occurring at Ferndale—where 40 feet of rock, under a pressure of 25 feet of sand and water, broke down—a sufficient reason why special precautions should be taken in working coal under tidal swamps for the future? I think it is a question well deserving the serious consideration of practical men. I think that I, in a manner, demonstrated this in the appointment of a Commission specially qualified to advise as to whether, in their opinion, in working coal under similar circumstances some alteration in the system ought to be made; and I should prefer to reserve my opinion until the Commission inquires into the matter, and advises the Government thereupon—in fact, until the Commission has performed its part of the duty.

2314. Did Mr. Croudace tender to the proprietary any other documentary communication than the report referred to? He reported after the accident occurred. He voluntarily sent a communication to my co-partners.

2315. In that report he gave you some opinion as to the workings at Ferndale. Do you not think that, as a practical man, he ought to have tendered that advice some months before? Certainly, if he knew of it. Either he was ignorant of the danger, or he was dishonest in withholding his knowledge of it.

2316. Did he explain to you how he proposed to work the thin coal to the dip with 6-yard bords with profit and timber them? I do not remember.

2317. If so, would that have effected your reception of his proposal? I do not think so.

2318. Can you point to any reason why Mr. Croudace was anxious to depose Mr. Powell? No.

2319. *Mr. Neilson.*] He never gave you to understand there was any danger? No.

2320. *Mr. Usher.*] Mr. Croudace proposes that the workings should extend to the east; do you see where it would go to. Yes.

[Position explained on the plan.]

2321. *Mr. Jones.*] And no pressure had been brought to bear upon the management which would impair the safety of the mine, notwithstanding the high cost of working the coal? Never. Instructions were given quite to the contrary. Mr. Sweetland has a copy of a communication on the subject, and I think it is only fair that you should know what my opinion was in that connection. I am very glad that the Commission appear to understand that the subsidence of the surface was in no way due to defective timbering of the roof.

2322. *Mr. Davies.*] Do you remember what instructions were given to Mr. Croudace as to what he was to report upon? All I know is what I have already told you, that he voluntarily told one of my co-partners that he was in a position to produce the coal at 7s. per ton, and he went to the colliery to examine it with a view to seeing what he could do to bring about the idea.

2323. Do you remember in any of Mr. Powell's reports whether he mentioned a fall having taken place in a portion of the mine near to the scene of the late accident, and that shells and sand and mud came down there? I never had any idea of it.

2324. Was there anything said as to excessive cost of timbering—that is, was there any objection to the cost incurred? Never. I knew it was better to bring timber than to clear away the falls. I always said, "Use your own judgment, Powell, and keep everything safe."

2325. You are quite sure that Mr. Croudace, before the accident, never pointed out to you or any of your co-partners the existence of any probable danger through working under these swamps? I am quite sure of it. The very idea of his proposing to go a considerable distance beyond the danger (as recently shown) incontestably proves that he could not have done so.

2326. *Mr. Curley.*] I understand that the Ferndale Company offered the consulting viewership to Mr. Croudace—is that so? Yes, on certain conditions.

2327. Did he make an offer to take the position at a certain figure? Yes. I think it was £4 or £5 per week; but I offered him £400 or £500 per annum, providing that he could give effect to the proposals which he had made to the Company.

2328. From your knowledge of coal-mining, did you consider that the offer made by the Company was a fair one? I think so.

2329. Had you a knowledge of a subsidence of the surface that took place fifteen months ago near the crop? I remember we had a fall near to the Waratah Company's railway.

2330. Was it in the vicinity of the late fall? No; I had no particular intimation as to the immediate vicinity.

2331. Suppose you had a special knowledge that in a heading well timbered, and with an apparently sound roof, a fall had taken place, and that sand had come down, would you not have considered it dangerous to work this particular part? That would depend upon circumstances. If I found it to be merely a pit-hole I should have paid very little attention to it, but if it appeared to be the result of a general absence of rock it would have made me very anxious indeed.

At this stage Mr. Croudace's report, of March 20, 1885, with letter attached, dated August 3, 1885, were produced and read.

2332. *President.*] Then, having received Mr. Croudace's suggestions, you considered they were of too trifling a character to entertain? Yes, that they were thoroughly impracticable.

2333. And would have made no appreciable reduction in the cost of the work? No.

The witness withdrew.

W. M. F. Tilley sworn and examined:—

2334. *President.*] I understand you are a reporter on the *Newcastle Morning Herald and Miners' Advocate*? I am.

2335. As a reporter, were you present at Ferndale after the accident? Yes.

Mr. W. M. F.
Tilley.

5 June, 1886.

2336.

- Mr. W. M. F. 2336. Did you hear certain questions put to Mr. Powell, the manager of Ferndale Colliery? I did.
 Tilley. 2337. And the replies given by Mr. Powell? Yes.
 5 June, 1886. 2338. Among the questions asked, do you recollect whether Mr. Powell was asked as to the width of bords under the fall, and if so, what reply did he give? He explained the plan of the pit, commencing from the working-shaft.
 2339. You have no knowledge of coal-mining? No.
 2340. The witness hands in paper, dated March 22, 1886, containing report of the meeting of managers at Ferndale, as referred to.

The witness withdrew.

MONDAY, 7 JUNE, 1886.

Present:—

J. R. M. ROBERTSON, Esq., PRESIDENT,	
Mr. USHER,	Mr. SWINBURN,
Mr. THOMAS,	Mr. CURLEY,
Mr. NELSON,	Mr. JONES,
Mr. TURNBULL,	Mr. DAVIES,
Mr. DURIE.	

James Fletcher, jun., sworn and examined:—

- Mr. J. 2341. *President.* You are manager of the Co-operative Colliery? Yes.
 Fletcher, jun. 2342. Have you had opportunities of inspecting the Ferndale Colliery? I have been there when I was asked by Mr. Powell to give friendly advice.
 7 June, 1886. 2343. Were you engaged as consulting manager? No.
 2344. How often have you been down the dip workings? I was never in the dip workings towards the east.
 2345. Had you ever been towards the swamps? I had nothing to do with the workings at all.
 2346. Then your connection with Ferndale was only as to advice? Yes; with reference to laying out the engine-plane, &c.
 2347. How long prior to the last accident was it that you visited the mine? It was about twelve months last January—say about fourteen months prior to the accident. Since that time I have been there on the surface, but not below. Mr. Powell never advised me as to the details of the workings.
 2348. Did you, at any of your visits to the colliery, think that under the circumstances it was being economically managed? Yes; I did as to the working.
 2349. Were there any special features connected with the working of this mine? Yes; as to the water and timbering. I thought Powell was doing as well as any man could do under the circumstances.
 2350. Have you known Mr. Powell for some time? Yes.
 2351. And as a colliery manager, did you consider him a capable man for the position he occupied? Yes; I considered him a first-class man—a good practical man.
 2352. That is one in whom you could repose perfect confidence? Certainly.

The witness withdrew.

APPENDIX.

FERNDAL COLLIERY.

Record of borings lodged by Wm. Henderson.

No. 1 BORE.

At pumping-shaft.

	ft.	in.
Sandy shale	9	0
Conglomerate	42	9
Brown clay	0	9
Coal	0	4
White shale	0	4
Conglomerate	2	5
Shaly sandstone	1	6
Conglomerate	20	6
Clay	0	6
Conglomerate	20	0
Dark shale	5	3
Coal	1	6
Brown clay	1	10
Soft coal	0	6
White clay	0	8
Coal	3	3
Grey sandstone	0	6
Total depth	111	7

BORE No. 2.

To N. and E. above high-water-mark.

	ft.	in.
Surface	1	0
Conglomerate	48	3
Shaly sandstone	5	0
Conglomerate	11	0
Shaly sandstone	22	8
Shaly clay	9	0
Coal	1	10
Coal and dirt	0	9
Coal	3	2
Grey sandstone	0	6
Total depth	103	0

No. 3 BORE.

Near Tighe's Bridge, South of Robinson's Colliery.

Depth of shaft	ft.	in.
.....	52	0
Bore commenced.		
Conglomerate	33	0
Shale	5	0
Soft coal	1	6
Coal	3	0
Shale with coal bands	3	0
Coal	2	7
Grey sandstone	0	6
Total depth	100	7

BORE No. 7.

Outside of road near bridge across Tighe's Creek, from Wickham to east of Pumping-pit—Site of shaft recommended by Mr. Croudace.

	ft.	in.
Loose sand	40	0
Clay	18	0
Silt	0	3
Sandy shale	59	7
Brown clay	0	3
Coal	118	1
Coal and clay	1	8
Coal	2	5
Coal	4	4
Shaly clay with coal pipes	5	3
Coal	2	4
Clay band	0	7
Coal	0	7
Clay band	1	4
Coal	3	8
Grey post	0	6
Total depth	140	9

ROYAL COMMISSION ON COLLIERIES—APPENDIX.

BORE No. 9.

In East Swamps, contiguous to road to Smelting Works.

	ft.	in.
Loose sand	48	0
Sandy shale.....	3	0
Conglomerate	22	0
Clays.....	0	3
Coal inferior.....	0	6
Coal and clay	0	11
Coal	3	2
Sandy shale.....	11	6
Conglomerate	3	0
Shaly clay with coal pipes	2	6
Shaly sandstone	33	8
Shale.....	5	0
Coal	3	9
Grey sandstone	0	9
Total depth.....	148	0

BORE No. 10.

In East Swamp, M on plan.

	ft.	in.
Loose sand	52	0
Conglomerate	48	6
Clay	0	2
Coal	1	0
Soft band.....	0	5
Coal	3	8
Grey sandstone	1	3
Total depth.....	107	0

BORE No. 11.

South of Pumping-shaft, marked O on plan.

	ft.	in.
Loose sand	20	0
Conglomerate	30	0
Clay bed	0	6
Conglomerate	25	0
Dark shale	4	0
Shaly sandstone	22	0
Shaly clay.....	6	0
Coal	3	3
Sandstone grey	0	7
Total depth.....	111	4

BORE No. 12.

In centre of flat, north-east of Pumping-pit.

	ft.	in.
Loose sand	61	0
Conglomerate	22	0
Soft bed with gravel	0	6
Shaly clay	14	6
Sandy shale.....	13	6
Coal	0	9
Clay band.....	1	3
Coal	0	8
Clay band.....	1	9
Coal	3	3
Grey sandstone	0	4
Total depth.....	119	6

Account of boring for the Waratah Coal Company, north of Waratah Co.'s line of Railway, and east of Ferndale Coal Co.'s working-shaft, 1864 and 5.

	ft.	in.
Dry sand	2	0
Quicksand	28	0
Blue clay	20	0
Soft conglomerate	16	0
Hard conglomerate.....	60	0
Post and metal mixed	13	6

The remainder of this line shows sections of post metal and shales to the depth of 362 feet 10 inches, but no coal found.

Reports by Mr. Inspector Dixon on Ferndale Colliery.

Sir,

Glebeland, 26 September, 1885.

I have the honor to report inspection of the above colliery on 8th inst., as follows:—

The total in-take current of air was about 17,000 cubic feet per minute for about 130 men, &c.

I was all through the working headings in the two splits, and found a good circulation of air in each heading, in fact upon the whole the ventilation in Ferndale on this occasion was better than ever I found it before.

The travelling roads were in good order, and a plentiful supply of timber on the various flats ready for use.

I have, &c.,

John Mackenzie, Esq.,
Examiner of Coal-fields,

JOHN DIXON,
Inspector of Collieries.

Sir,

Sir,

Globoiland, 27 February, 1886.

I have the honor to report inspection of the greater portion of the Ferndale Colliery workings, on Monday last, 22nd inst.

I may here state that owing to my being at the Stockton Colliery early on the same morning, investigating an accident, and having to go to Ferndale to investigate a very serious accident, by a fall of coal, to a young man named Banks, I did not take the anemometer with me, as I knew there would not be time to test the ventilation, in addition to the duties in connection with the two accidents.

However, when in the Ferndale Colliery workings I went through the principal headings and air-ways, and into some of the working bords.

I noticed that several of the bords at the lower end of No. 8 workings were getting near the lower fault, which was struck some time ago, and some of the bords in about the middle of the workings were being fore-won, owing to the heavy dip, and the consequent trouble with the water when being worked on the face. Since the lower fault was struck there seems to be more water in the lower part of the workings, and the pumps are kept pretty busy.

In every portion of the workings where I went I found the wheeling-roads and other places well timbered, and, so far as I could see, secure.

The main engine-brow was in good condition, and the various stations well supplied with timber ready for use.

John Mackenzie, Esq.,
Examiner of Coal-fields.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

FERNDALE COLLIERY CAVIL FOR DECEMBER, 1885.

No. 1 Heading.

Bords.	Names.	Bords.	Names.	Bords.	Names.
1	Williams (2).	16	Lewis and Bowen.	29	Abrams and Wardrobe.
2	Rees (2).	17	Harrison and Son.	30	Wilkinson and Smith.
3	Bythaway and Clark.	18	Douglas and Son.	31	Owen and Mulvey.
4	Cunliffe and Teasdale.	19	Thomas and Jones.	32	Jenkins and Williams.
5	Waterall and Forsyth.	20	Ayliffe and Hughes.	33	Murray and Spencer.
6	Bythaway and Jervies.	21	Eade and Baldwin, B.	34	
7	Davis and Jacobson.	22	Jones and Hall.	35	
8	Dunkae and Brown.	22	Jones and Owen.	36	
9	Fox and Arthurs.	23	Banks and Son.	37	
10	Lawson and Son.	23	Bowditch and York.	38	Fening and Kafors.
11	McLaughlan (2).	24	Davis and Jones.	39	Peters and Johns.
12	Moorhouse and Charlesworth.	25	Brown and Richmond.	40	Edwards and Ayliffe.
13	Williams and Louden.	26	Hargraves and Williams.	41	
14	Wright and Allsop.	27	McNeil and Woollett.		
15	Jones and Hadfield.	28	Williams and Stanford.		

No. 2 Heading.

1 | 2 | 3 |

No. 3 Heading.

1 | Arthurs and Andrews.

No. 4 Heading.

1 | Delanty and Son.

CAVIL Sheet for the quarter beginning December 28th, 1885.

Nos.	Names.	Heading.	Bord.	Nos.	Names.	Heading.	Bord.
4	Williams (2).....	1	1	34	Bowditch and York	1	23
28	Rees (2).....	1	2	39	Davis and Jones	1	24
48	Bytheway and Clark	1	3	3	Brown and Richmond	1	25
13	Cunliffe and Teasdale	1	4	42	Hargraves and Williams	1	26
15	Waterall and Forsyth	1	5	23	McNeil and Woollett	1	27
6	Bytheway and Jervis	1	6	20	Williams and Stanford	1	28
2	Davis and Jacobson	1	7	30	Abrams and Wardrobe	1	29
46	Dunkae and Brown.....	1	8	22	Wilkinson and Smith.....	1	30
21	Fox and Arthur	1	9	9	Owen and Mulvey	1	31
45	Lawson and Son	1	10	31	Jenkins and Williams	1	32
27	McLaughlans (2)	1	11	14	Murray and Spencer.....	1	33
12	Moorhouse and Charlesworth	1	12	26	Fennin and Kafors	1	38
38	Williams and Louden	1	13	1	Peters and Johns	1	39
11	Wright and Allsop.....	1	14	44	Edwards and Ayliffe.....	1	40
24	Jones and Hadfield.....	1	15	16	Arthur and Andrews	3	1
43	Lewis and Bowen	1	16	36	Delanty and Son	4	1
8	Harrison and Son	1	17	17	Eade and Lewis	3	...
32	Douglas and Son	1	18	10	Wilson and Dial	4	...
35	Thomas and Jones	1	19	47	Reed and Prosser
37	Ayliffe and Hughes	1	20	33	Sawers and Abrams
41	Eade and Baldwin	1	21	5	Edwards and M'Quillon.....	1	...
40	Jones and Hall.....	1	22	29	Miller and Pickavance	2	...
18	Banks and Son	1	23				

Reports by Mr. Croudace on Ferndale Colliery.

To the Proprietors of Ferndale Colliery, Newcastle,—
Gentlemen,

Lambton Colliery, 20 March, 1885.

In accordance with your wish I visited your colliery on Wednesday last.

After examining your working plan, which showed the ordinary district system as being pursued, namely, pillar and stall, also showing the coal as coming from the north-east, east, and south-east portions of your property, I went underground and inspected a great number of places, wherein the thickness of coal varied from 2 feet 9 inches to 5 feet 6 inches, with stone or jerry to remove varying from 3 feet in the first instance to 8 inches in the latter.

The general dip of the seam, so far as I could judge, is undoubtedly to the south-east, but it is subject to many undulations, more than I have seen elsewhere in this district.

Your workings are following, with few exceptions, the dip of the seam. This is obviously objectionable. Your winning-places are not carried sufficiently far ahead of your general working.

Your main engine-plane should have been carried straight on, viz., due east to near the end of your property, whereas it is diverted and interrupted by wide workings. Your coal-field has not been properly intersected for economical haulage,
Water

ROYAL COMMISSION ON COLLIERIES—APPENDIX.

Water is found in all parts of the mine, and, with the exception of the Blake and Tangye pumps, only primitive and crude appliances exist for dealing with it, which, I need scarcely say, are at all times the most expensive. Such may be and are daily resorted to as a temporary arrangement, but rarely where permanent water supplies are met with. You require better appliances and to make more use of gravitation; in fact, instead of working with nature—always an ally of man—you are working against her. Observing one or two self-evident facts, I asked your manager if he had any sections or levels of various parts of the mine, but to my astonishment he said, "No, not one," thus showing that the system pursued is what I may term the rule of thumb.

The Blake engine is in a dreadful state of oxidation. The Tangye I could not see for steam, and the manager could not get the pet-cocks to move either one way or the other. I might continue enumerating defects, but will briefly state there is ample room for improvement, which can only be effected by having sections and levels taken in various parts of the mine. Money expended—which, if judiciously expended two or three years ago, would now be saving you considerable outlay daily—and other little matters attended to and adopted, all of which I shall be willing to point out to you by personal interview or report.

Upon ascending the shaft or tunnel, I inspected the surface position, and can only say I was strengthened in my opinion as regards the necessary work you should execute to assure more economical working.

I further strengthened my opinion as regards your heaviest costs by examination briefly of your pay-sheet.

I sent to Newcastle for the sections of sundry boreholes, which were sent to me; these I left in charge of your clerk at the colliery.

I am, &c.,

THOS. CROUDACE.

To the Proprietors of Ferndale Colliery, near Newcastle,—
Gentlemen,

Lamhton Colliery, Lamhton, 3 August, 1885.

Mr. Fletcher, a few weeks ago, asked me to take the consulting managership of your colliery, at a salary of £200 per annum, or say £4 per week. Since then I have again visited your colliery, have had levels taken from the shaft to the fault last struck, have taken a summary of hands employed, and have come to the conclusion that I can by a comparatively moderate outlay considerably reduce your costs of working within a few months; but this will entail a change in your management which you may not consider desirable. As it is, I consider an overman quite sufficient to carry out my views. It will also necessitate a reduction in the number of hands employed; and as the work and thought required from me will be pretty heavy, at least for a time, I must ask you £5 per week.

Therefore, if you will take this statement into consideration, and weigh carefully the position, I am prepared to accept the result of your decision, whatever it may be; or should you wish to discuss the position with me, I am prepared to meet you at any time.

I am, &c.,

THOMAS CROUDACE.

Letter from Hon. Jas. Fletcher, re Mr. Croudace's proposals.

Messrs. Stokes and Sweetland, Newcastle,—

Newcastle, 21 January, 1885.

My dear sirs,

Your joint letter of the 16th instant, re "Ferndale matters" has had my very serious attention, and I can only say that I am equally anxious with yourselves to see the coal produced at the lowest possible cost with due regard to keeping up the efficiency of the colliery.

The working of the coal at the Ferndale Colliery is, and has been for some time past, of a very exceptional character indeed. The roof for the most part is of such a nature that it can only be kept up by an expensive system of timbering, even after the miner has performed his part of the work. What I mean is, that gangs of men have to be kept specially employed to go round the bords and set up extra timber. Not only has this expensive drawback to be contended with, but, in consequence of the uneven nature of the floor, water-baling is exceptionally heavy. These two items themselves add very considerably to the cost of production.

We sank, as you are aware, a shaft for pumping purposes on what we believed to be the deepest part of the field. The drive, as you will remember, going towards the water-shaft dips so heavily that a horse could only bring one skip from the face. Indeed, the dip was so great that we unanimously agreed to let it stand, and tap the workings from the water-pit when it was sunk. Instead, however, of the drive rising from the shaft at the face of the old workings, as we expected, it dipped for nearly the whole of the distance, and only rose from some 20 or 30 yards before the two drives met. Consequently, instead of the water, as we anticipated, running to the pumping-shaft, the water had to be pumped from the workings to it.

The same difficulty had to be encountered in driving to the eastward. It rose from the pit bottom for a very short distance, and then commenced to dip, so that all the water now made in the workings has either to be baled or pumped before it reaches the bottom of the water-shaft.

My son has paid frequent visits to the colliery, and conversed with Mr. Powell. He is of opinion that the latter is doing all that could be done under the circumstances. However, if Mr. Croudace can see his way clear to produce the coal at the figure named, 7s. per ton, I, for one, would say by all means let him be appointed at once. Nay, I would go further, and say if he can produce the coal to us at even 7s. 3d. per ton, I would be prepared, as one, to give him from £100 to £150 per annum, stipulating, of course, that the coal should not cost more than the sum named.

It is to the interest of all of us to have the coal got at the least possible cost, and if Mr. Croudace can do for us what we have been unable to do for ourselves, I shall certainly not stand in the way of his getting the chance. I therefore at once say that you have my full and complete concurrence to engage the services of Mr. Croudace on the lines that I have mentioned, and let him commence his duties without one moment's delay.

I am quite sure that Mr. Powell will be very glad to act under instructions from Mr. Croudace, especially if the coal is to be produced at a figure so much below what it now costs us; but even if he will not, that is no reason why Mr. Croudace should not be employed, and a gentleman put there who would be willing to carry out the orders of Mr. Croudace in every particular.

There are collieries and collieries, and whilst there may be some so similarly situated that the difference in the cost of production would be scarcely perceptible; yet there are others with local drawbacks which add very considerably to such cost, when compared with collieries more favourably situated. I believe that Ferndale Colliery is one of the latter kind; but I am only one, and there is no reason why my opinion should be taken in the face of the statement made by Mr. Croudace.

My desire is to have the liabilities of the colliery cleared off as soon as possible, and no feeling of mine will ever be allowed to stand in the way of any gentleman undertaking to do that which I myself may have failed to accomplish.

I am, &c.,

JAMES FLETCHER.

P.S.—Of course the efficiency of the colliery must be maintained whilst the economical system of working is carried out.

Letter from Mr. Croudace to Proprietors of Ferndale, subsequent to the catastrophe.

The Proprietors of the Ferndale Colliery, Newcastle,—
Gentlemen,

22 March, 1886.

On Saturday morning I received a letter from your secretary, asking me to meet your manager at the Ferndale Colliery office, in order to give my opinion as to the best means of coping with the recent disaster.

Setting other engagements aside, I at once started, and upon arrival at the office found Messrs. Mackenzie and Dixon, as also several other colliery managers, present.

I proceeded to the scene of the accident, which is situated on a mud flat, to the north-east of your working-shaft, and (say) a distance of half a mile. I found the bulk of this flat subject to the influence of the tidal waters. Accompanied by Mr. Powell, your resident manager, I went into the waters with the view of ascertaining the extent of the fall-in. We went round the whole of it; and I consider there is about 1½ acres of ground, more or less, affected by the original "fall-in," all of which surface, composed of sand and mud, seems to have been washed into the mine. I estimate it at about 36,000 cubic yards. I must

Mr. Fletcher explains this to be in addition to the sum named by Mr. Croudace.—
R.M.B.

men here mention that while examining the site of the present calamity I observed, quite close to it, that is, on the same mud flat, and subject to the same tidal influence, another depression, which Mr. Powell informed me was another "fall-in," that had taken place a few weeks previously, but which they had successfully filled up. I will later on specially refer to this, as a feature of great moment and vital importance in this sad accident.

The various managers and Government representatives met—say about 12 o'clock—in your colliery office. I was unanimously elected Chairman. We were then informed that we had been asked to meet to consider the best means of recovering the body of the man Jenkins. Some discussion ensued. I pointed out that the first action to be taken must be to ascertain from Mr. Powell the extent of the workings, their average thickness, the position of depth of the various shafts, the position of the water in these shafts, &c., &c. Mr. Powell told us the working-shaft, which is situated to the rise of the workings, and west of the property, is 49 feet deep, that the engine-plane runs easterly and south-easterly for about 48 to 50 chains, and is an incline from the shaft all the way. At a distance of about 30 chains due east from the working-shaft there is a water-shaft of 111 feet in depth. At a distance of about 25 chains, and in nearly a due north direction from this water-shaft, is the "fall-in," the scene of the accident. He stated the distance of the "fall-in" from the surface to the coal as being about 65 feet; from the surface to the stone-head there were about 25 feet of mud and sand, and 2 feet of clay next, leaving about 38 feet of stone, composed of shale and rotten conglomerate. During the after-discussion Mr. Powell frequently described the stone overhead as very soft and rotten. Several managers spoke of the softness and rottenness of the stone overhead, and when I suggested the use of cylinders at the site of the "fall-in" one manager said he did not believe the stone would bear them. We calculated from the plan that about 110 acres of land had been worked, but allowing for pillars, faults, falls, &c., only 55 acres of open space could be taken for the water to accumulate in. The average thickness of the seam we assumed at 6 feet—it varies from 2 feet 9 inches to (say) 12 feet—equal (say) to 89,842,500 gallons of water in the mine. One gentleman calculated it at 144,000,000. Having worked it out hurriedly, I admit I may be wrong.

I gave it as my opinion that it is quite possible, and not difficult, to stop the influx of water at the fall-in. It is also possible to pump out the water; but supposing this to be done, it must take many months, during which time the body of Jenkins is decomposing, and when got out could only be a sad and harrowing sight to his relatives. If his body is got out, then your mine is re-opened. Notwithstanding that, I am prepared to admit, and do submit, that it is quite possible to attain this end. There is one element, and a very important one, that prevents me from recommending any attempt to be made to accomplish such end, namely, the existence of the injudicious system of mining that you have pursued under such circumstances as exist at your mine. During your mining operations you have had more than one warning, and quite recently you had a warning of the loudest character. I now allude to the "fall-in" adjoining the scene of this, may I say, in one sense, most fortunate accident. I say "most fortunate," for I feel that for weeks past the whole of your men have been daily subject to most fearful danger. It appalls me—it astounds me—as to how your management dare to allow the mine to be worked after the first "fall-in" in the swamps took place. Had I been your consulting manager (which appointment, you will recollect, you offered me some time ago) I would not for any money have allowed these workings to proceed one inch from that date. Feeling and realizing all this, I cannot now recommend that the lives of good men should be jeopardized to obtain a dead body, or to give back to you your property, even if it were twice the value it is.

You have my fullest sympathy, and if in aught else I can in any way assist you I shall be very glad to do so. I notice in the papers a statement that you may sink other shafts on the property, and leave a barrier next to those drowned-out workings. Let me warn you to be very careful, and adopt some other principle of working, for, in my opinion, very great danger hangs over your heads.

I am, &c.,

THOMAS CROUDACE, M.E.

P.S.—As this sad accident has caused great public excitement and sympathy, so far as I am concerned, you are quite at liberty to publish this letter.—T. C.

Check Inspectors' Reports.

Ferndale Miners,

Ferndale Colliery, 11 March, 1885.

We, the undersigned, having examined the travelling-roads, workings, &c., &c., report as follows:—

In-take on engine-bank, 10,804 cubic feet per minute; thermometer, 68 degrees; air passing from engine-bank to No. 7 headings, 7,805 cubic feet per minute; thermometer, 73 degrees.

At the top part of No. 7 heading the anemometer gave 2,800 cubic feet per minute; thermometer, 74 degrees. There were sixteen men, two boys, and one horse employed here—the air being a fraction over 147 cubic feet per minute for each man, boy, and horse.

Middle part of No. 7 heading.—In-take from top narrow bord, 4,346 cubic feet per minute. There were nineteen men, four boys, and two horses employed here, having a little over 173 cubic feet per minute for each man, boy, and horse. Thermometer, 73 degrees. There has been a great improvement in the last sections since our last visit.

Lower part of No. 7 heading.—At the cut-through from Lawson's narrow bord, which supplies air to section, we could not get sufficient air to move the anemometer. Thermometer, 75 degrees. We tried in several places in this heading, but each time the anemometer would not work. There were twenty-six men, four boys, and two horses, and complaints were made by several of the bad state of the air, some of the bords being in as much as 50 or 60 yards. We are of opinion that a quantity of air that should come through this part goes back Lawson's narrow bord, and then finds its way into the heading at the bottom part, for, on passing into the No. 8 narrow bord from the heading last referred to, the anemometer registered 2,707 cubic feet per minute—that must have come through this heading.

We next visited No. 3 heading. At the cut-through from the narrow bord there was not sufficient air to move the anemometer. There were "cut-throughs" to the other bords, but they were nearly blocked up, and it was almost impossible to get through them. The men here complain very much about the bad state of the air. The thermometer registered 78 degrees. There were ten men, two boys, and one horse here.

No. 4 heading.—In-take in cut-through from narrow bord, 2,850 cubic feet per minute; nine men, two boys, and one horse. Thermometer, 74 degrees. Cut-through in No. 4 bord completely blocked up with dirt.

No. 5 heading.—In-take from engine-bank, 826 cubic feet per minute; for ten men, two boys, and one horse, giving 68½ cubic feet per minute for each man, boy, and horse. Thermometer, 75 degrees.

There were also fifteen men, two boys, and one horse in different parts of the mine, which have not been taken into the above account, that have a fair supply of air.

We measured the return air to the up-cast, and found 8,614 cubic feet per minute, but we were unable to take them all in consequence of the way it splits up here.

We noticed a fair supply of timber in each place.

WM. LLOYD,
JOSEPH BOWDITCH, } Check Inspectors.

Ferndale Colliery, 10 April, 1885.

We, the undersigned, having examined the several workings, air-ways, &c., of the Ferndale Colliery, report as follows:—
In-take of air on engine-bank, 9,250 feet per minute; thermometer, 68 degrees. In-take from old furnace-shaft, 1,800 cubic feet per minute; thermometer, 68 degrees.

Air passing from engine-bank to No. 7 heading, 4,600 cubic feet per minute. Air passing from old furnace-shaft to No. 7 heading, 1,800 cubic feet per minute.

Top part of No. 7 heading. Anemometer gave 2,550 cubic feet per minute for nineteen men, four boys, and two horses, being 102 cubic feet per minute for each man, boy, and horse; thermometer, 71 degrees.

Middle part of No. 7 heading.—Air passing cut-through from top narrow bord, 4,138 cubic feet per minute, for twenty-nine men, four boys, and two horses, being a fraction over 118 cubic feet per minute for each man, boy, and horse; thermometer, 71 degrees.

Lower part of No. 7 heading.—At cut-through from narrow bord the anemometer gave 2,844 cubic feet per minute; thermometer, 74 degrees. After passing seven bords, the anemometer registered 4,260 cubic feet per minute. There are twenty-two men, five boys, and two horses employed here. There is a very marked improvement in this part since our last inspection.

We next visited No. 3 heading; but at the cut-through from No. 8 narrow bord, the area being so large, there was not sufficient air to move the anemometer. The cut-throughs had been cleared, and there were no complaints about the air. There were eight men, two boys, and one horse working here; thermometer, 74 degrees.

No. 4 heading.—Two men, with a fair supply of air.

No. 5.

ROYAL COMMISSION ON COLLIERIES—APPENDIX.

No. 5 heading.—In-take from engine-bank, 575 cubic feet per minute. There were six men, two boys, and one horse employed here, giving each 64 cubic feet per minute; thermometer, 72 degrees.
Returns from No. 4 heading gave 3,032 cubic feet per minute. Return at main flat, 5,402 cubic feet per minute; but all returns cannot be taken here. Each place was well timbered.

WM. LLOYD,
JOSEPH BOWDITCH, } Check Inspectors.

Ferndale Colliery, 2 July, 1885.

We, the undersigned, having examined the several workings, air-ways, &c., &c., report as follows:—
In-take of air on engine-bank, 14,430 cubic feet per minute; thermometer, 61 degrees. In-take of air from old furnace-shaft, 1,800 cubic feet per minute; thermometer, 61 degrees. Air passing from engine-bank to No. 1 heading, 6,346 cubic feet per minute; thermometer, 68 degrees.

Top part of No. 1 heading.—The anemometer registered 4,070 cubic feet per minute; thermometer, 72 degrees. This gave 185 cubic feet per minute each for fifteen men, five boys, and two horses.
At the cut-through from No. 27 narrow bord the current had increased to 6,320 cubic feet per minute. At the two cut-throughs from No. 13 narrow bord the current had increased to 6,320 cubic feet per minute; thermometer, 71 degrees. At the two cut-throughs from No. 13 narrow bord the current had increased to 6,320 cubic feet per minute; thermometer, 71 degrees. This current of air has to supply fifty-seven men, thirteen boys, and four horses, giving each a fraction over 83 cubic feet per minute. There were twenty-nine men, eight boys, and four horses, from 27 to 13 bord inclusive, and twenty-three men, five boys, and two horses, from 12 to 7 bords, both inclusive, and four men in two bords in Nos. 3 and 4 headings, and one man pumping, making in all fifty-seven men, thirteen boys, and six horses supplied from the above current. In Nos. 1 and 2 bords the air was very slack, the thermometer registering 78 degrees. The bord in No. 3 heading is in nearly 60 yards without a cut-through; thermometer, 76 degrees in this bord. Our attention was drawn to the road of No. 19 bord being dangerous for the boys wheeling, but a cut-through, being nearly holed, will remedy that in a day or two.

At No. 5 heading the air passing from engine-bank through one cut-through is 744 cubic feet per minute. We were told the other cut-through was closed, but on passing next morning I found a large current of air passing through. Nine men, one boy, and one horse employed here.
Return from No. 4 heading, 3,485 cubic feet per minute; return at furnace-shaft, 10,030 cubic feet per minute; total returns, 13,515 cubic feet per minute. But in consequence of the way it splits up here we were unable to get all the returns correctly. There was a plentiful supply of timber in the headings.

JOSEPH BOWDITCH, } Check Inspectors.
C. WILLIAMS,

Ferndale Colliery, 28 October, 1885.

We, the undersigned, having examined the several workings, air-ways, &c., of the above colliery, report as follows:—
In-take at engine-bank, 12,060 cubic feet of air per minute; thermometer, 68 degrees. In-take from the old furnace-shaft, 2,812 cubic feet per minute. Air passing from engine-bank to No. 1 heading, 5,964 cubic feet per minute.
Top part of No. 1 heading. Anemometer registered 4,890 cubic feet per minute for twenty-seven men, six boys, and four horses, being a fraction over 132 cubic feet per minute for each man, boy, and horse; thermometer, 72 degrees.
At the cut-through at the top "gannon-bord" the anemometer registered 4,050 cubic feet per minute for eighteen men, four boys, and two horses, being 168½ cubic feet per minute for each man, boy, and horse; thermometer, 75 degrees.
At the cut-through in No. 17 bord the anemometer registered 2,450 cubic feet per minute for fifteen men, four boys, and two horses, being 116½ cubic feet per minute for each man, boy, and horse; thermometer, 78 degrees.
At the cut-through at the lower "gannon-bord" the anemometer registered 3,870 cubic feet per minute for twenty-two men, six boys, and three horses, a fraction over 124½ cubic feet per minute for each man, boy, and horse; thermometer, 75 degrees.

There were two men working off the right-hand of No. 8 heading, but the area being too large there was not sufficient air to move the anemometer.

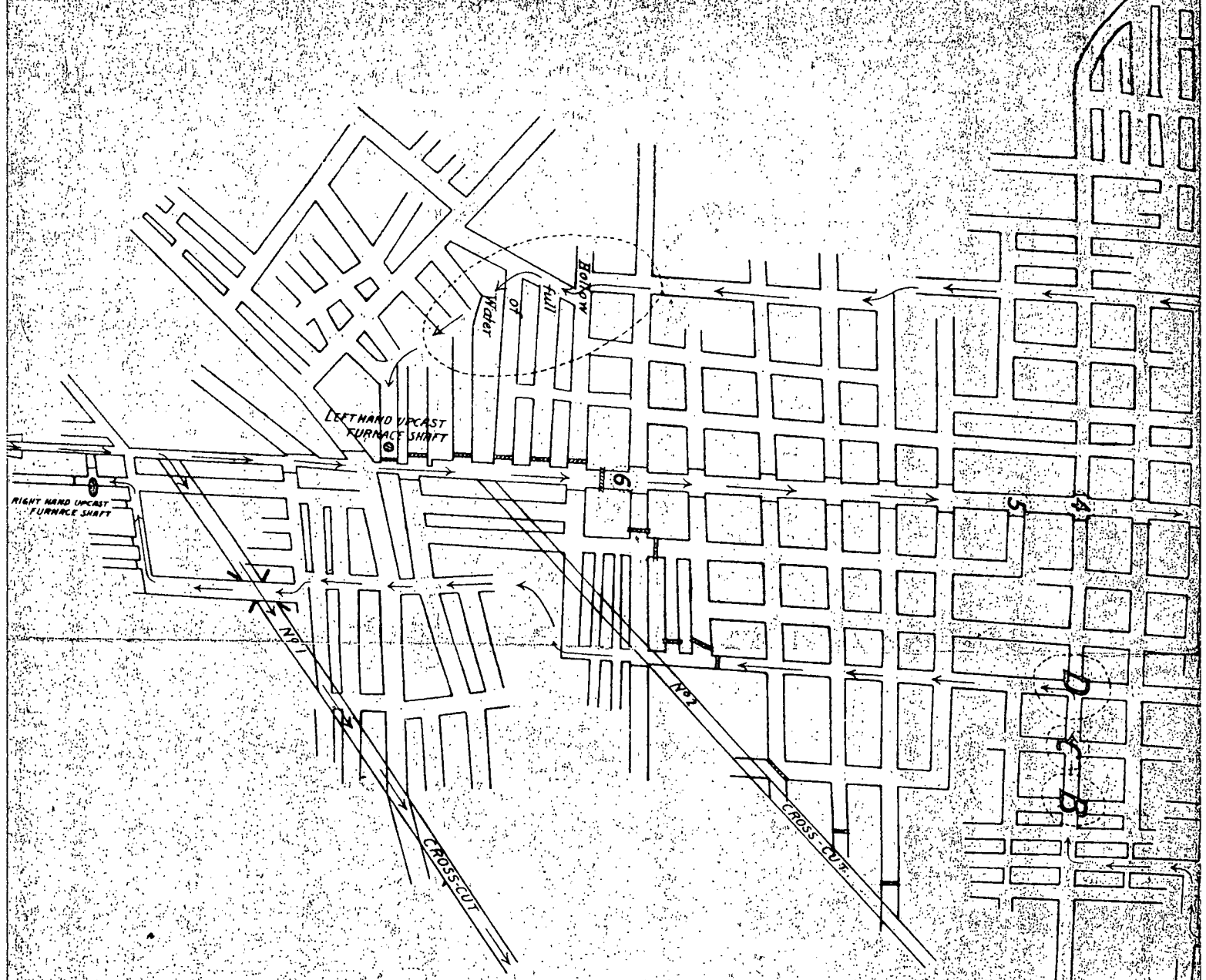
No. 5 heading.—In-take from engine-bank, 1,633 cubic feet per minute for eight men, two boys, and one horse, giving a fraction over 148½ cubic feet per minute for each man, boy, and horse; thermometer, 72 degrees.
Returns from No. 4 heading, 2,940 cubic feet per minute; thermometer, 75 degrees. But all the returns cannot be taken here.

Each place was well supplied with timber.

WM. LLOYD,
DAVID HOPKINS, } Check Inspectors.

[Three Plans.]





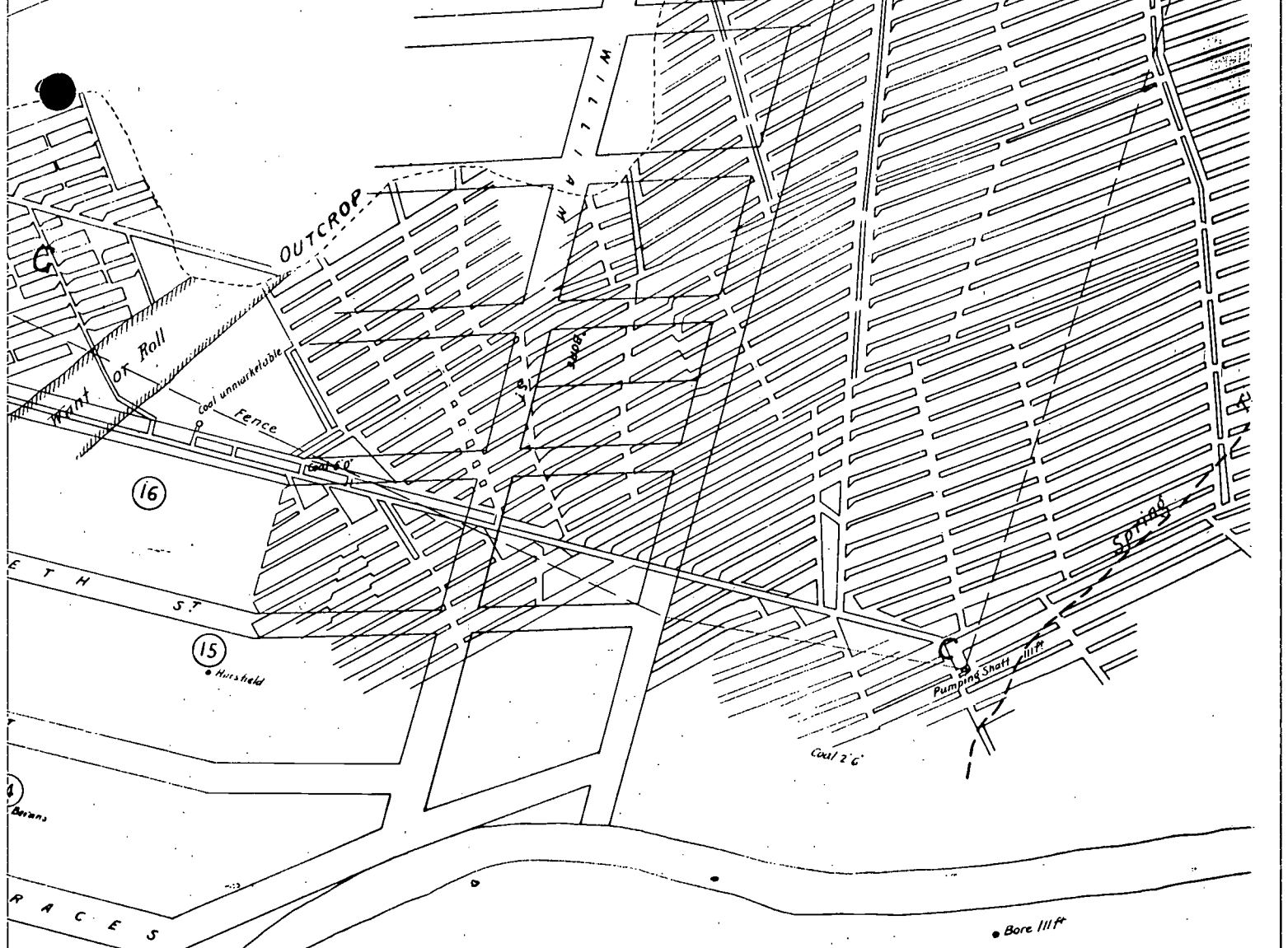
PLAN OF THE LITHGOW VALLEY COLLIERY

LITHGOW VALLEY
 COLLIERY COY. PTY. LTD

No. 3.

- Reference.*
- A Where Dogs, Younger & Rowe were found according to Turnbull
 - B d^o d^o Hall
 - C d^o d^o Tait
 - D d^o d^o Martin
 - E Position of Smoke when Agreement was come to by Men to reopen
 - F Supposed confines of fire
 - G Position of Smoke when Darius arrived
 - H d^o Pump used by Men
 - I J. Rowe (Miner) [Byrd (Miner)]
 - 4 S. Allison & J. Manville (Miners) Where the Bodies were found at time of 2nd Accident
 - 5 Bussie (Miner)
 - 6 Direction of Air Currents
 - Stopplings
 - Brick Stopplings put in since last (?) Accident

Scale of Chains.



Nº1
PLAN
of the
FERNDALE CO

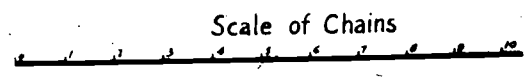
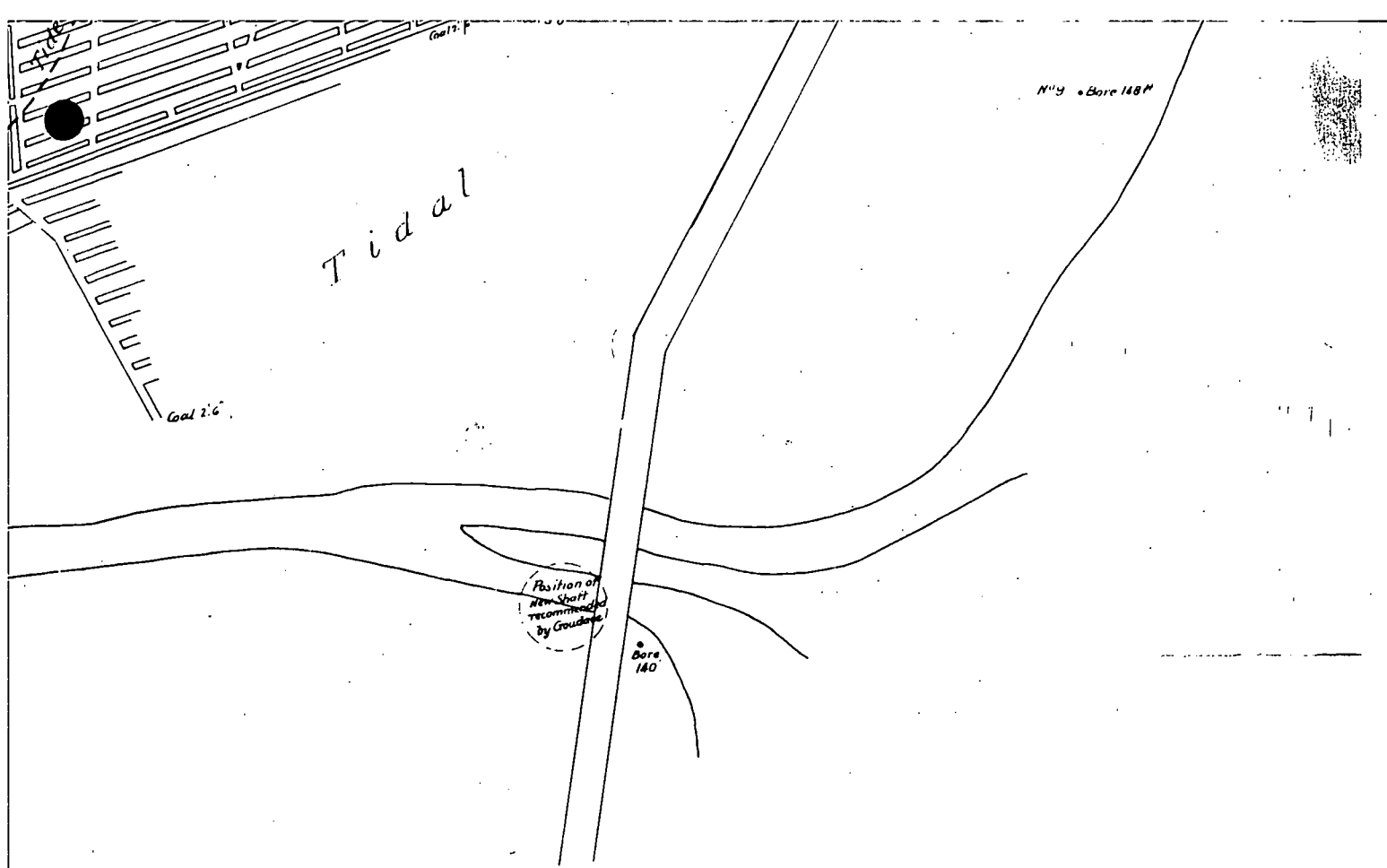
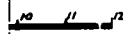
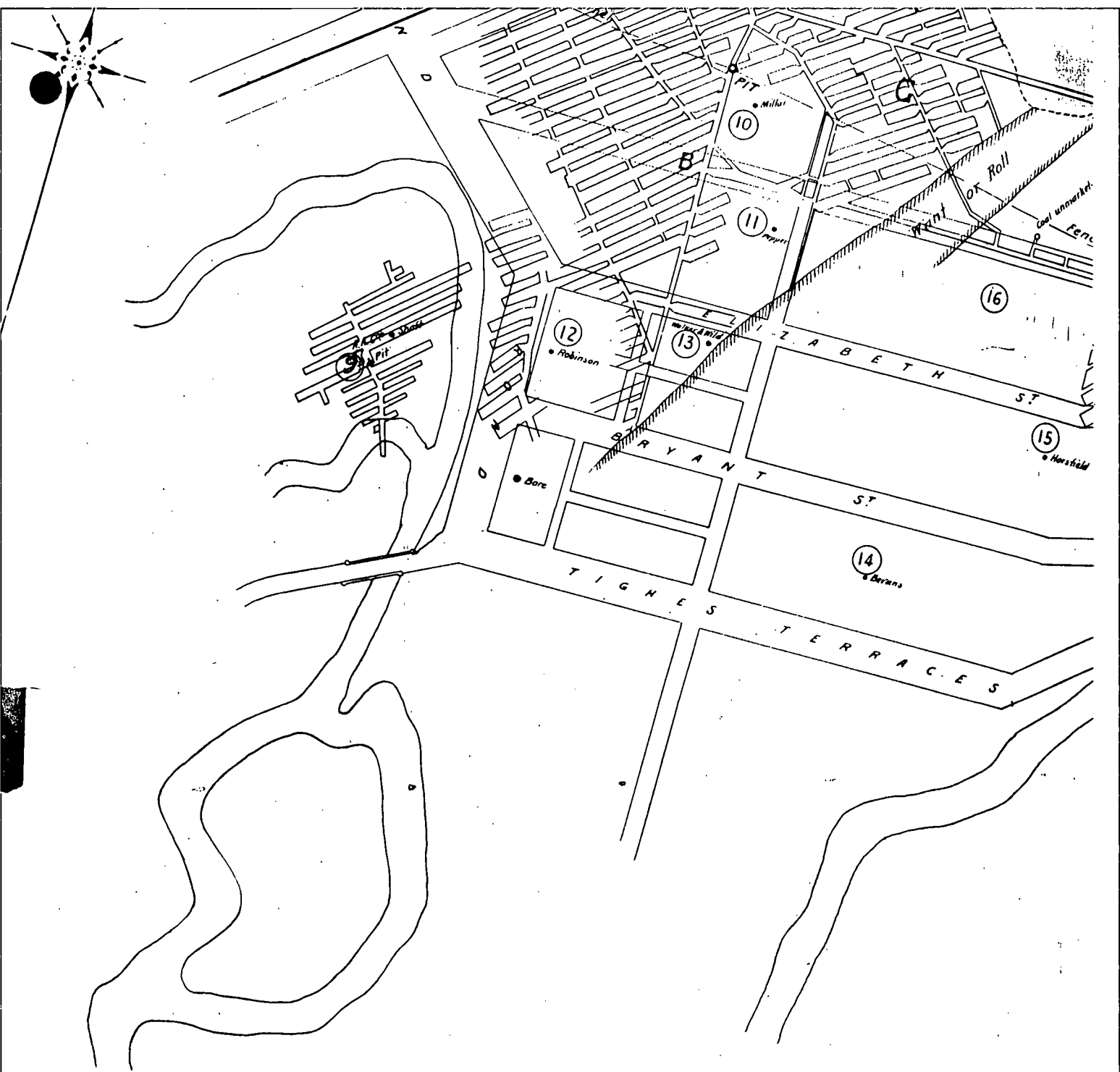


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

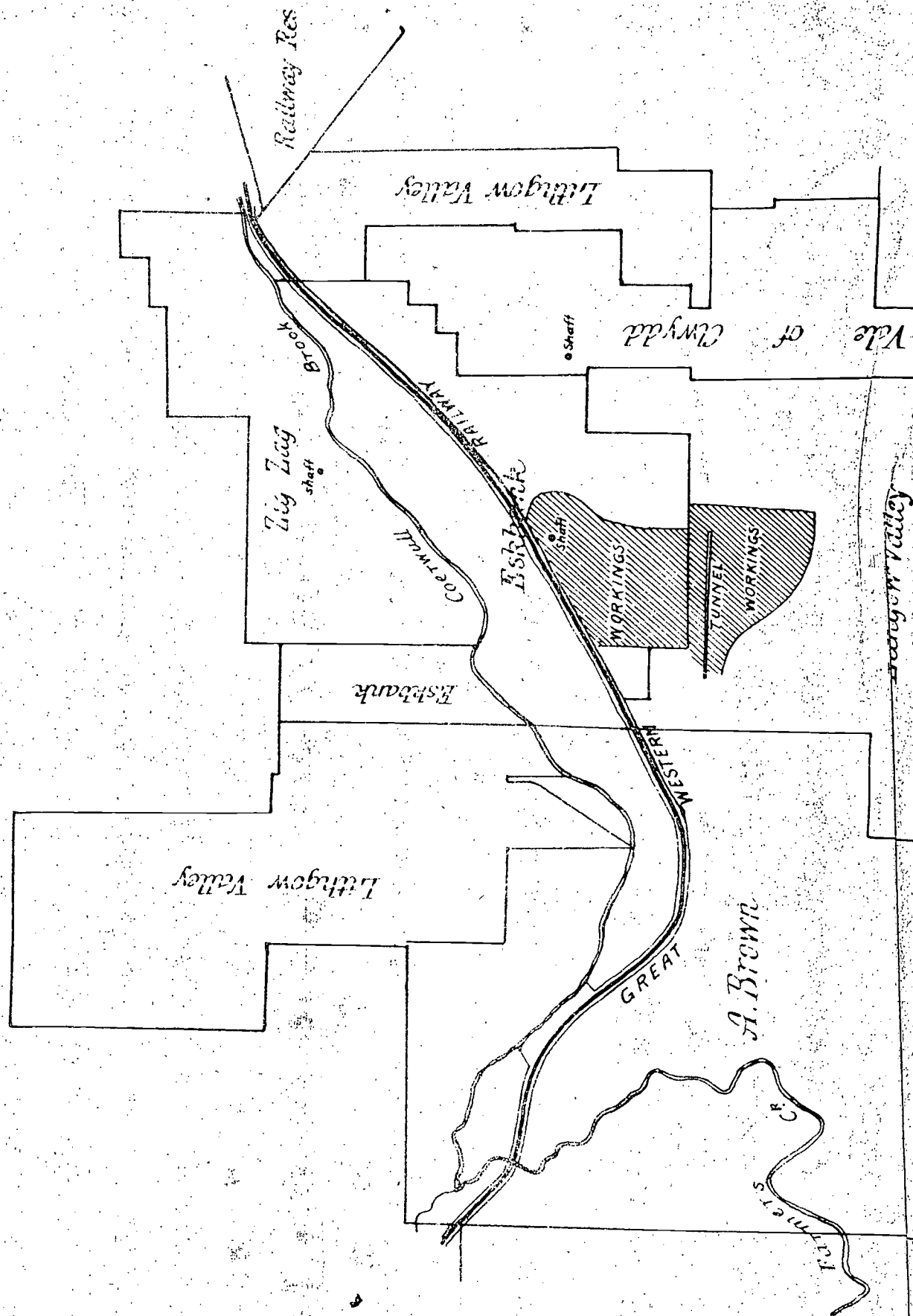


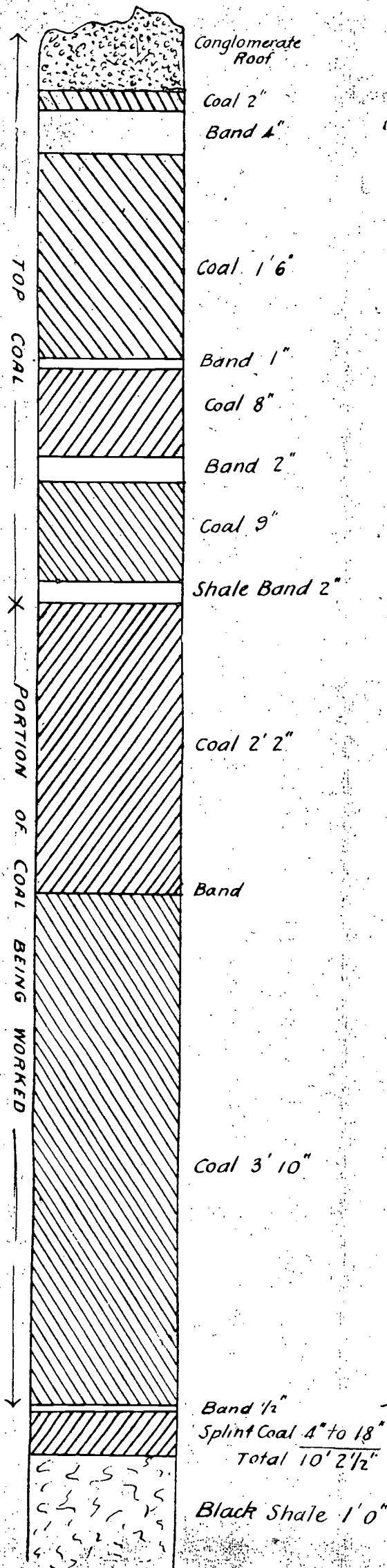
OLLIERY





(671-)





*Section
of the Lithgow Valley Colliery Coy's
Coal Seam
measured at 40 yards from the Entrance
to the Tunnel by James Rowan*

LITHGOW VALLEY
COLLIERY COY. PTY. LTD.

Coal worked

FLHIV
of part of the

Lithgow Valley Colliery

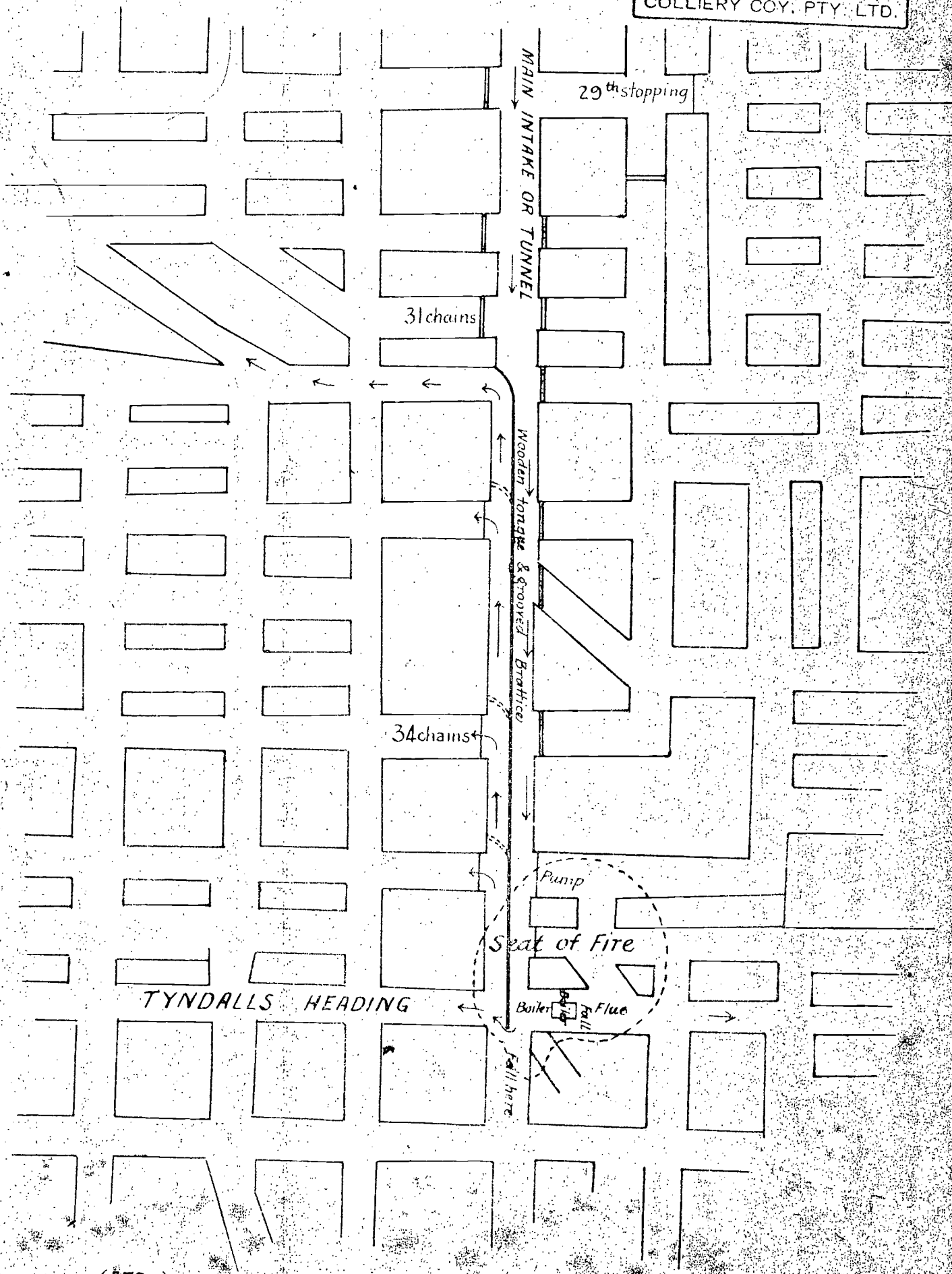
showing mode adopted for carrying down Bratticing

to get at Seat of Fire

Scale one chain to an Inch

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE
SYDNEY, NEW SOUTH WALES.

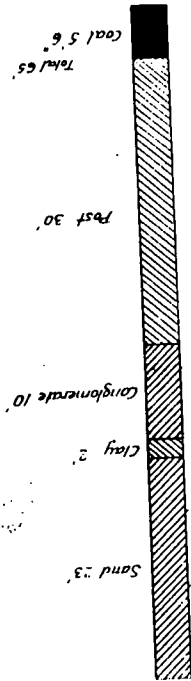
LITHGOW VALLEY
COLLIERY COY. PTY. LTD.



No 4

Section of Shale at Fall

Scale of feet



Coal 5.6'

Post 30'

Conglomerate 10'

Clay 2'

Sand 23'

Total 65'

Coal 5.6'

Post 30'

Conglomerate 10'

Clay 2'

Sand 23'

Total 65'

Coal 5.6'

Post 30'

Conglomerate 10'

Clay 2'

Sand 23'

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Coal 5.6'

Post 30'

Conglomerate 10'

Clay 2'

Sand 23'

Total 65'

Coal 5.6'

Post 30'

Conglomerate 10'

Estbank

Boundary Line

Estbank
Fence
Fence

Colliery

Siding of S.W. 2nd

Pillars
taken
out

Barrier

Flow
of
water

C

H

31 chains

34 chains

ROULET

TINDALES

HEADING

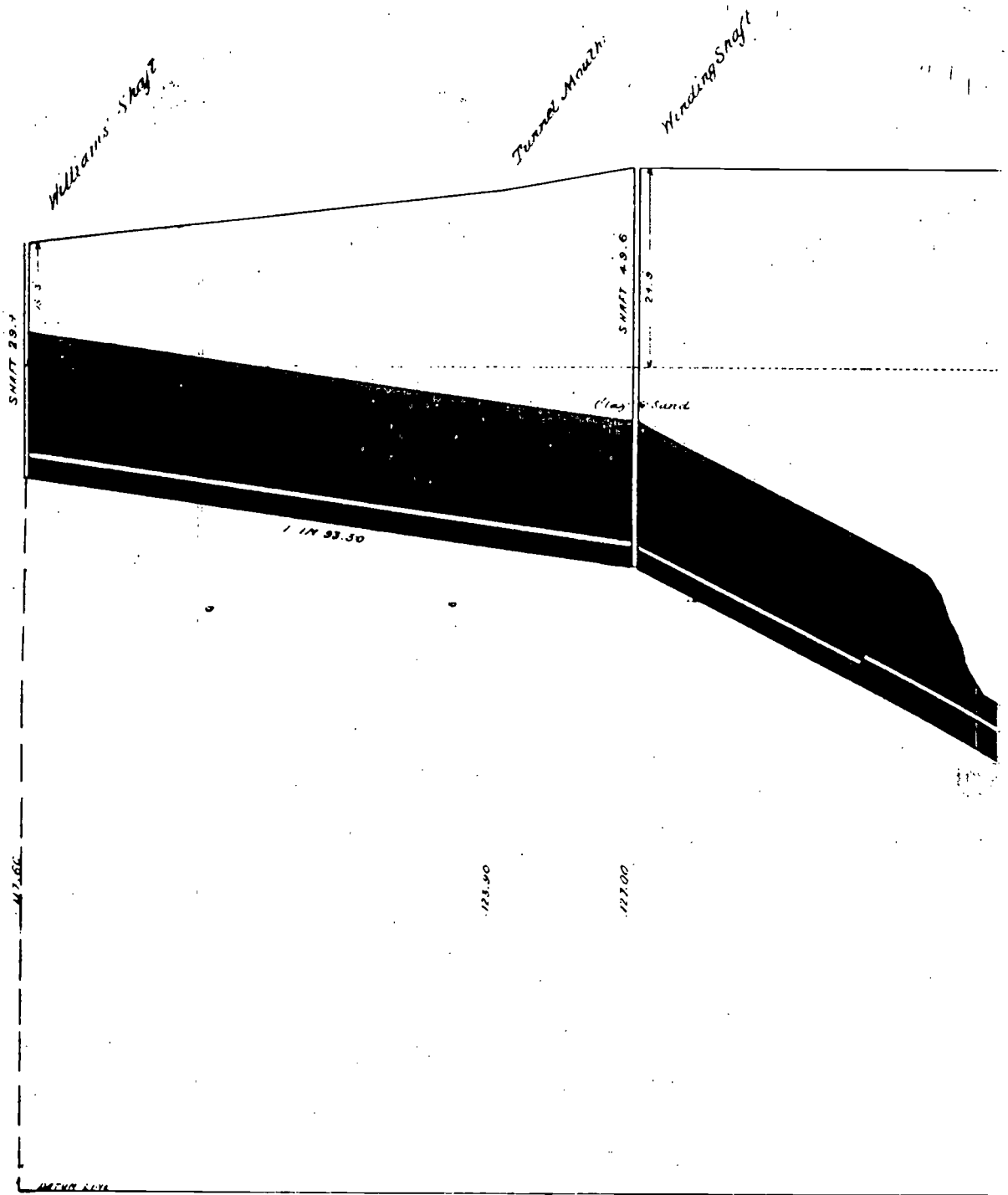
1893



Nº 2

SECTION FROM WILLIAMS' PIT TO F/ FERNDALE COLLIERY

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.



47.50

1 IN 33.30

123.90

127.00

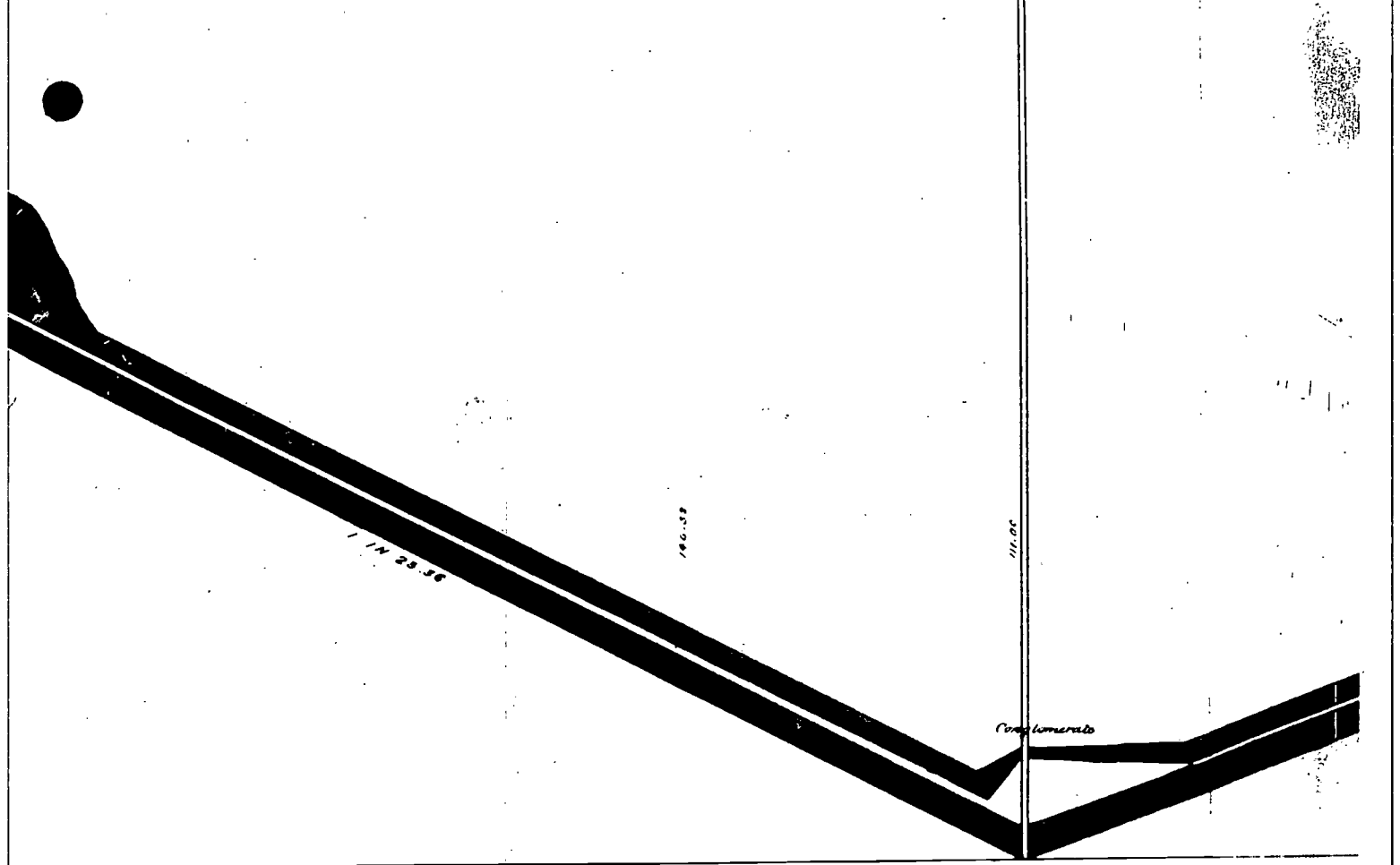
MEAS 4.14

(671-)

COAL 2.6"

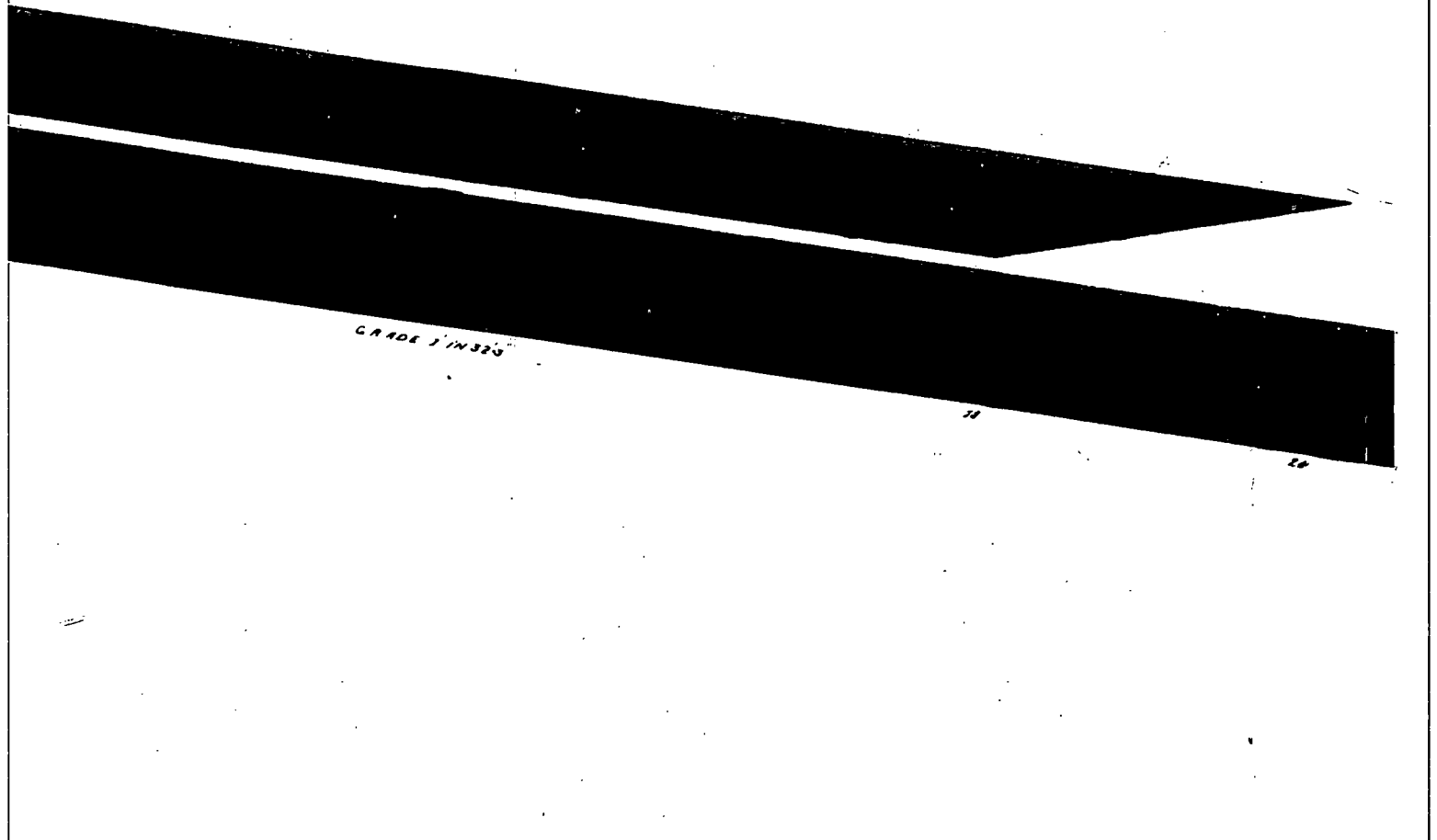
JERRY 4"

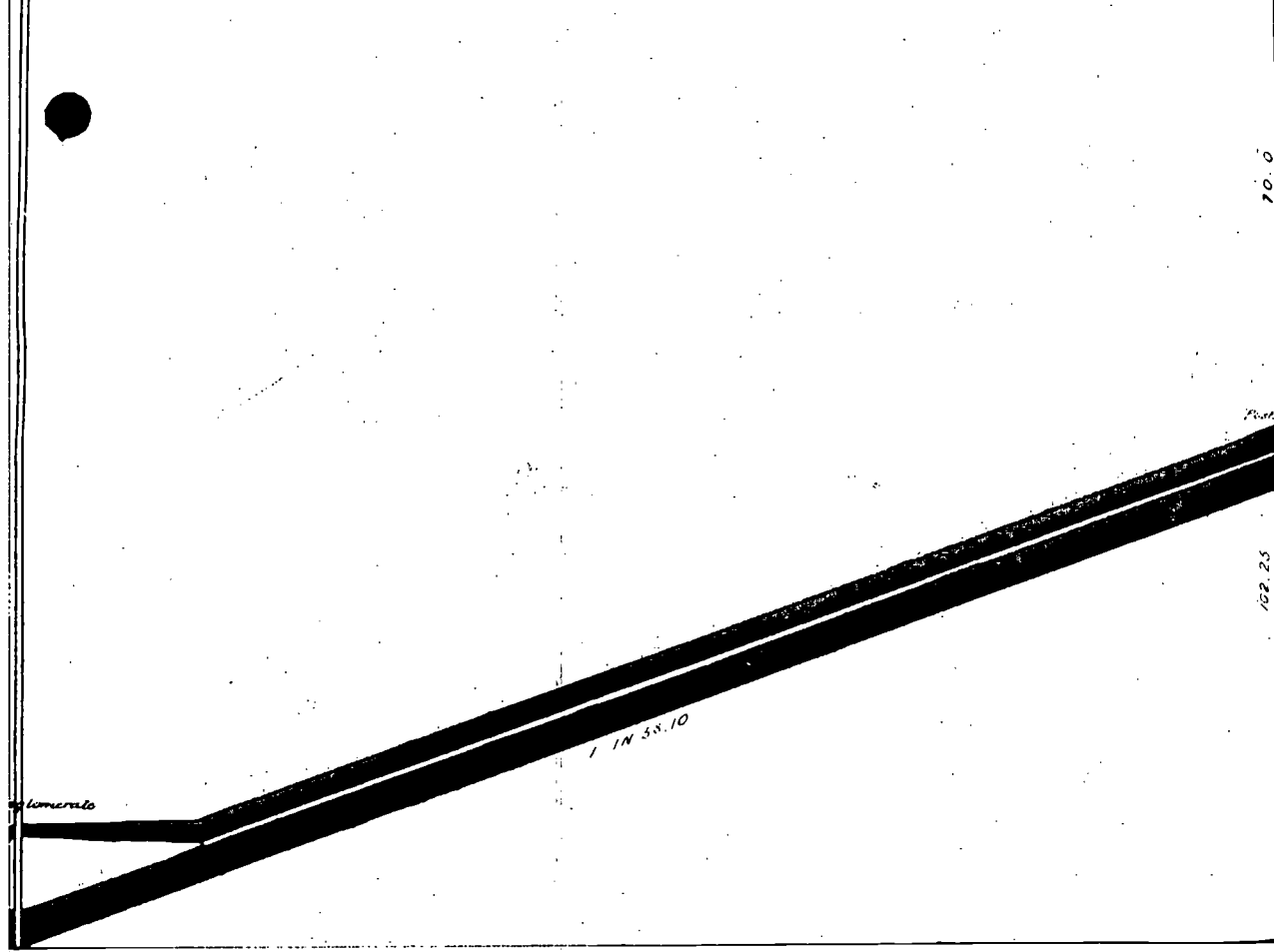
COAL 3.3"



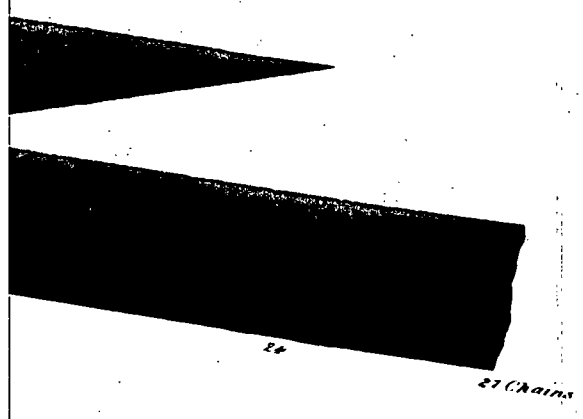
Nº 3
SECTION
FROM Nº 2 BORD TO Nº 3 HEADING
FERNDALE COLLIERY

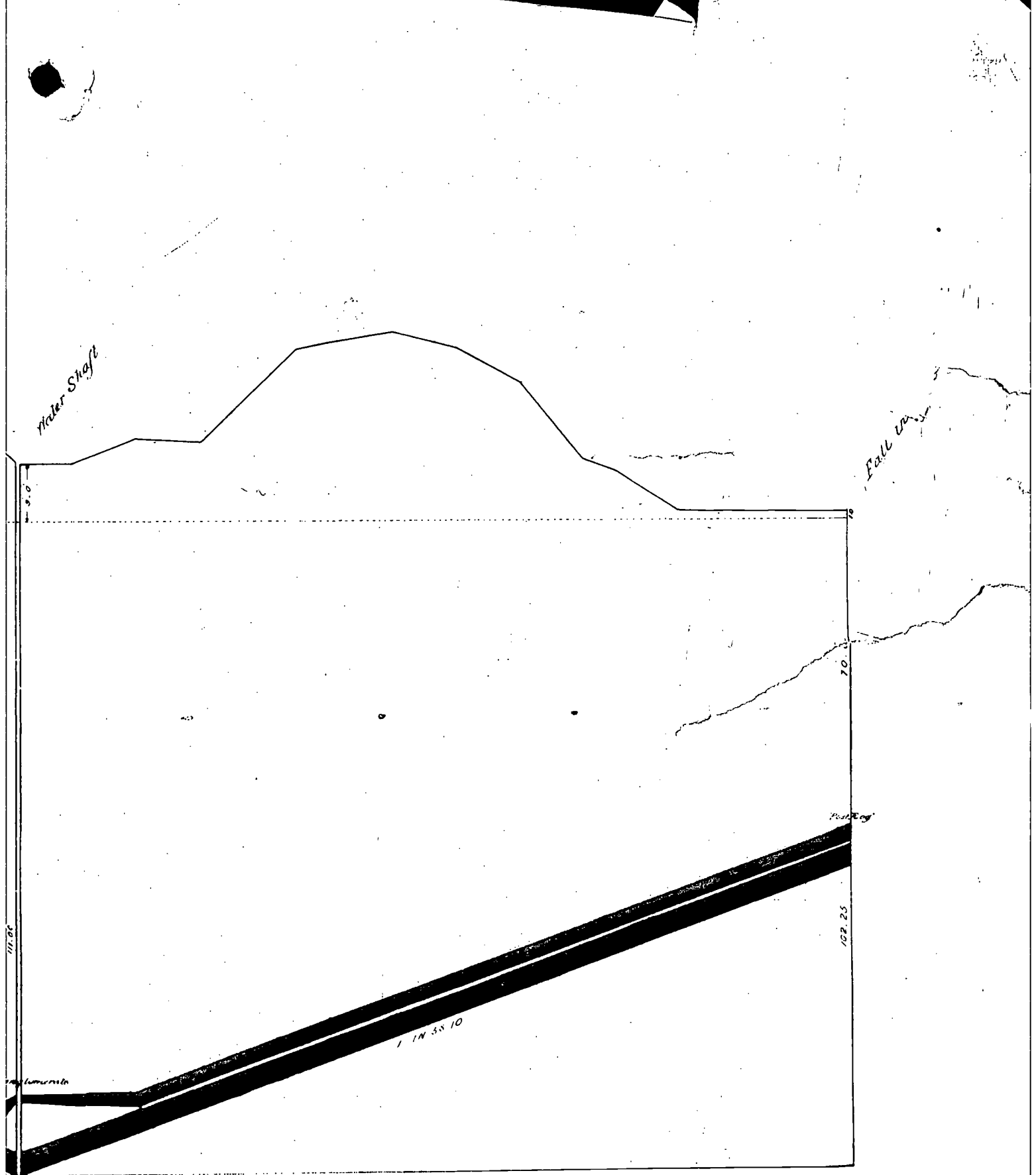
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READING





LEADING