(Page1.)

July 1st. 1834

Report
on
Sydney Colliery
in the
Island of Cape Breton.

From the several Reports on this Colliery which I have perused, and the examination of the Plans of the Surface, and workings, which have been submitted to my inspection, I have been enabled, so far, to judge of its locality, and circumstance, as to enable me to submit my opinions of to the Board as to what I consider to be the most eligible system of opening out this extensive Mine, to the requisite extent contemplated by the Association; and also of conducting the future workings in, what I consider to be the most effectual and economical manner. I am encouraged to offer my suggestions and opinions on all matters relating to this important undertaking, with more freedom, as I feel that I am offering them to the consideration of skilful and intelligent persons on the spot, who are competent to appreciate them duly; and who will be able to adopt, modify, or reject them, as may seem most judicious, under the various changes of circumstances which may occur in the extension of the works.

There seems to be no doubt of the Sydney Colliery embracing a very extensive Field of Coal, and that it is comparatively very free from dislocations of the Strata or other Mining impediments, as only one Slip Dyke of any magnitude, is reported to exist in the Colliery; and that is so situated, as to be of little importance, or prejudice to the future working of the Mine, at least for a long time to come.

Three workable Seams of Coal are reported to have been found in this Colliery. The first crops out at Lloyds Cove, the second crops out at about a Mile and a half to

(2.)

the South-west of the First: And the third Crops out in Indian Cove at about half a Mile to the South-west of the second Seam.

The first and third Seams after having been partially worked at their Crops, some time ago, were relinquished, and the second only has been continued in work on account of its superior quality. This is called the “Main Vein” and constitutes the present Colliery. – vide Mr. Browns Report 24th. November 1832.

The Crop of this Seam has been worked to the extent of more than a Mile, by virtue of an Adit, or Day-level, from the Sea Shore. These workings have proved that no Slip Dykes, or dislocations of the Seam exist in the Line of Level, or Streatch of the Seam, for that extent at least; and the recent Winning by the Steam Engine at 290 Yards to the dip of the Day-level, proves the non existence of any dislocations, between the latter and the Engine Level, so that it may be safely inferred, that there is a clean and uninterrupted field of Coal, of better than eight Miles in length, and 240 yards in breadth, exclusive of the 50 yards Rib or Barrier to be left against the old workings, which may be drained by the present Engine. But this Seam of Coal is represented on the Plan, as extending from the Spanish River in the North Western direction to the great entrance to Bras d’or Lake, a distance of about 10 Miles with no interruption. But supposing it only to extend 8 miles or 14080 yards in length, and 240 yards in breadth, it is equal to an area of 700 Acres, exclusive of the Barrier or Rib, to be left, to prevent the Water from the old hollows of the Crop Workings from falling down to the Engine.

Mr. Brown states the mean thickness of the Seam to be 6 feet of workable Coal; it will therefore contain 6453, but say 6450 London Chaldrons per Acre; but this quantity there appear to be only about 57½ per Cent obtained by the first working, while 42½ per Cent is left in the Ribs or Pillars. That is to say the produce by the London Chaldrons

1st. Working – – – – – – – – – – – – – – – – – 3710

Bud-33

Left in Pillars – – – – – – – – – – 2740
¼th. of which may be lost, in working – deduct – – – 685
2055
Gross Produce – – – – 5765

(3.)

	London Chaldrons
Brought Forward – – – – –	5765
From which $^1/_3$rd. of Small, to be riddled out under-ground, or screened out at Bank, including waste by heaping the Coals in Winter, and for Colliery Consumption – – – – – – – – – –	1922
Produce P Acre of Merchantable Coals – – – – – – – –	3,843

say 3,850 Chaldrons P. Acre.

Then the whole probable extent to be drained by the present Level of Engine, viz 700 Acres as already stated, divided by 8 Miles, the length of the Stretch of Coal, gives 87½ Acres to a Mile in length of the Seam, to be obtained by the Engine Level.

If therefore the Annual Vend was increased to 100,000 Chas. the underground Workings would exhaust one Mile in length of the Breast of Coal in 3.368 years, and of course if the Annual Vend was extend to 200,000 Chaldrons, the Workings would exhaust in a Mile in length in 1.684 years, or say 1½ years. Thus it appears that at 100,000 Chaldrons of Annual Vend, the present Winning would afford that quantity for 26,944, or say 27 years, and at 200,000 Chaldrons Annual Vend it would last 13½ years.

It seems that in the 240 yards of yards of Breast drained by the Engine, that 22 Boards, or Working Stalls, can be worked which by driving both ways i.e. North-west and South-east will give 44 working places.

According to Mr. Joseph Smith's statement of the 23rd. January last, 72 Colliers working 3 in a Board or Room occupying 24 Rooms, at "full and constant work" produce 2,800 Chaldrons of Merchantable Coals in a Month, which is equal to $\frac{2800}{24}$ =116 $^2/_3$ Chaldrons P. Month from each Board. Consequently

(4.)

to render it capable of producing the full annual quantity of Coals, Contemplated by the Association, viz. 200,000 London Chaldrons. Consequently the most eligible mode of accomplishing this object, next presents itself for consideration.

Taking the produce of the Mine as already stated, at 3850 Chaldrons P. Acre, as a datum of calculation, it follows that to produce 200,000 Chaldrons annually, will exhaust $\frac{200000}{3850}$ = 53¼ Acres nearly. It appears that 52 Years of the Lease remains unexpired, consequently 2769 Acres will be required to supply the above annual Vend during the residue of the Lease, exclusive of Loss by Faults, Creep, Barriers or other unforeseen causes incidental to Coal Mining. It may not, therefore, probably be safe to estimate the requisite Field of Coal, at less than 3000 Acres.

Then assuming the whole length of the territory on the Line of Level to be eight Miles, it will require 1031 yards in breadth of the Seam to embrace that extent of Mine. But to this may be added 100 yards for two Ribs, or Barriers to be left between the present Crop and Engine Winning, and a subsequent Dip one – making the full width of the requisite Brest of Coal, below the Crop-level 1131 yards. As the Seam dips, one, in nine, the Engine drainage, to Win this tract of Coal must of course be made 126 yards deeper than the present Adit, and allowing 6 yards for the Engine Lodge – the full depth below the Level of the Adit will be 132 yards or 100 yards in round numbers below the present Engine Level.

Assuming the surface of the Ground, at the site of the new Engine Pit for this deep Winning, to be on a level with the top of the present Engine Pit, the full depth of the new Engine Pit, will be 160 yards, or 80 Fathoms, which is by no means immoderate.

The Diagram **No. 1** in the Appendix represents the Cross Section of the Seam of Coal, with the Adit, the present Engine

44 X 116 $^{2}/_{3}$ = 5133 Chaldrons P. month. And assuming 11½ Months, constant work in the year, the present opening only affords Pit-room for supplying 59,030 Chaldrons in the Year. Which cannot safely be reckoned more than equal to one half the Pit-room required for 100,000 Chaldrons a year, nor one quarter of what will be required for the full development of the Colliery, to render it capable of supplying 200,000 Chaldrons Annually. It therefore follows that the Colliery must be opened out to four times its present extent

drainage, and the contemplated deep Winning drainage.

We have next to consider the most eligible mode of proceeding for the laying open this extensive tract of Coal, so as gradually to gain the requisite extent of Pit-room, for the proposed Annual Vend.

We have already ascertained from the latest accounts, stated by M^{r}. Joseph Smith, that even with the advantage of the Colliers ridding the Coals underground, the present extent of Pit-room, is not equal to supplying, on a safe calculation, more than 50,000 Chaldrons Annually, consequently four-times the present breadth of

breadth of Wall or Breast will be required to produce the proposed quantity of 200,000 Chaldrons.

Various modes of obtaining an extension of Pit-room, and an increase of raisings, may be resorted to. The first expedient for effecting an immediate increase of out-put would be to set the present Pits to work “double Shift”, i.e. to work night and day. This method is not, however, eligible except in cases of emergency, as it is by no means so cheap, and satisfactory, as working by single Shift, or in the day time only.

The next plan id to sink the present Engine Pit, so as to drain any given breadth of Coal, below the present Level, as for example, assuming the Pumping Engine to be of sufficient power or to be capable of being increased sufficiently in power to work an additional stand of Pumps, to the depth of 27 yards, below the present depth, an additional Breast of 240 yards, would be gained to the dip of the present Level, which would double the present extent of the Pit-room, and increase the powers of supply to 100,000 Chaldrons Per Annum.

[Cross Section of Coal Seam]

This additional breadth of Coal might be worked by placing an Engine underground at **a**, to draw the Coals up the inclined Plane, in the Seam from **b**, to the bottom of the Pit, or by sinking the Pit **b,c**.

Another method of obtaining an increase of Pit-room on

provide Pit-room for raising an increased quantity of Coals, without waiting ‘till the Engine Level, can be driven up sufficiently in advance of the workings. the Diagram **N°. 2.** in the Appendix explains this mode of proceeding.

Considering the rapid manner in which this mode of working would extend the underground workings on the level line of the Colliery and which would require a corresponding extension of the Railway on the Surface, I feel disposed to prefer the sinking of the Engine Pit, and draining additional breadth of dip Coal, by a Cross-level Drift, as described in the former method – especially as the inclination of the Seam is favourable to the introduction of underground inclined Planes, either ascending or descending. This leads me to the consideration of the conveyance of the Coals from the face of the workings to the surface.

I agree with M^{r}. Brown that the Basket Corf is the most eligible vehicle for the carriage of the Coals to the surface. M^{r}. Brown’s plan of dividing the Breadth, or Breast into two equal portions, to relieve the Putting or Tram-work, is also judicious. In this disposition of the workings, M^{r}. Brown proposes to draw the Coals from the upper, or rise division of the Breast, by a rise Pit to be worked by the Machine on the deep Pit. I beg however, to suggest, that the sinking of this rise Pit may be dispensed with, by the application of inclined Planes, to lower the Coals from the upper division, to the Troll-way in the deep Pit, at which the whole of the Coals might be drawn, and at the same time embrace all the advantage contemplated by M^{r}. Brown, with the exception of the additional Pit-heap,

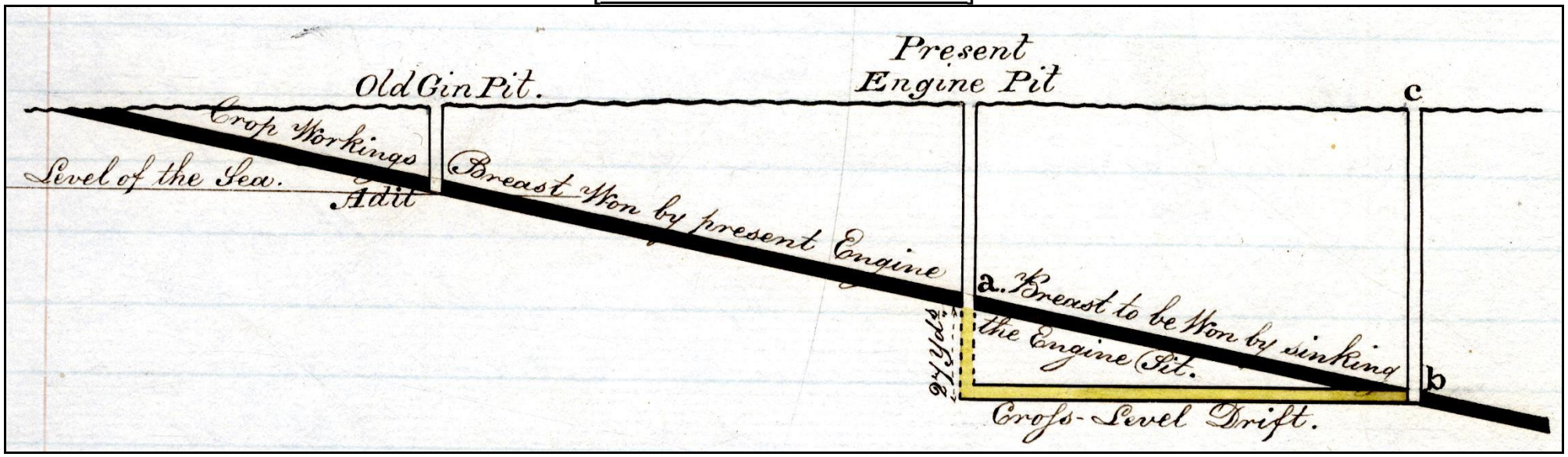
the present Breast of Coal, without sinking the Engine Pit any deeper, is by what may be called "fore-winning". This consists in the employment of a portable Pumping Engine erected on a Frame of Timber, so as to admit of being easily removed from one Pit to another – it is to be used for sinking Pits, on the line of Level from the present Engine, but in advance of the Level, so as to

Bud-33

a succedaneum for which will afterwards be pointed out. The Diagram **N°. 3** explains this mode of proceeding, which it may here be proper to observe is equally applicable to the working of the dip Breast of Coal, by running the Trollies down from the upper part of it to the lower Level, and then drawing them up by an underground Engine to the bottom of the Coal Pit.

Unless some considerable impediment, or insuperable objection, of which I am not aware, should stand in the way of obtaining this dip breast of Coal, to the present dip Coal Pit, as already described, I should advise the immediate adoption of the plan, as the most facile mode of doubling the present powers of Colliery. That is to say, to render it capable of yielding 100,000 Chaldrons P. Annum. This apperation if immediately set about and vigorously pursued, might be

[Cross Section of Coal Seam]



(7.)

accomplished in 18 Months to two Years. And it would be optional with the Association, whether to waite the full accomplishment of this operation, before the chief Winning of 80 Fathoms is commenced, or not.

(8.)

course of Thirlings open next the face of the Boards, except where it might be necessary to fix Inclinded Planes, for bringing the Coals from the rise breast of workings, and the Props might be taken out of the Back Boards, successively, as every new range of Thirlings

Having pointed out how the powers of the Colliery may be extended, I will next proceed to make my remarks and offer my options on the mode of carrying on the workings and various operations of the Colliery, above and below Ground, in their several details.

The Newcastle system of short rectangular work, with the oblong Pillars, as proposed by M^{r}. Brown, I consider to be decidedly superior in this case, to the oblique method – the only advantage of which, is, to lessen the slope of the Tram-roads, and make the Hawling or Putting easier. But with the Basket Corf of 6½ Cwt. the natural slope of the Mine, viz; one, in nine, or four Inches in the yard, is not more than can be worked by two strong Boys on an Iron Tram-way, with the Wheels locked. If necessary, however, an obliquity of 67½^{o} might be given to the Tram-way, which would reduce it to a fall of three Inches P. yard, without violating the principle, of the rectangular work, by holing the Thuirlings in Echelons – see Diagram **N°. 4.**

As the badness of the Roof occasions a great expense in Prop-wood, it is for consideration, whether the Boards might not be reduced in width from 6 to 4 or 4 yards, and the width of the Pillar to be 4 yards – the Thirlings to be holed at every 22 instead of 30 yards – 2 yards wide. By adopting the 4½ yard Boards, and holing the Thirlings at every 22 yards, the same produce within ½ per Cent would be obtained as by the present system, but I think it would be a better disposition of the excavation, and Pillar for the support of the Roof.

I should also think it would be beneficial to make every course of Thirlings into a Tram-road from the workings – one course being relinquished, as another is holed across by the face of the Boards, by which means, seldom more than 22 yards in length of the Roof in the range of Boards would have to be supported, from each course of Thirlings. And the Tram-way would be removed from one course of Thirlings, to another as they were successively holed across the advancing range of Boards.

In this case it would only be requisite to keep the last

was completed, and the Roof in the Back Board rooms might be allowed to fall without inconvenience – See Diagram **N°. 5.**

I observe that the proportion of small Coal produced in working this Colliery is very great, and that it must be an object of the utmost importance, to lessen it by any, or every means possible, and every change that can be devised in the mode of working with a view to accomplish this point ought to be tried.

The present mode of paying the Colliers by Cubical Measure is, I conceive objectionable in every point of view; as it holds out no inducement whatever to them, to take any pains in producing round Coals, as far as I can discover. And I should strongly recommend working by the Ton to be adopted, to separate, or riddle the Coal below Ground, and to pay the Collier for the round Coals only – or at any rate to pay a very moderate price for the Small. By this Plan it would become the Collier's interest to make all the round Coals he possibly could, and it would also enable the Proprietors, to reward him for doing so, by giving him an additional price on the round.

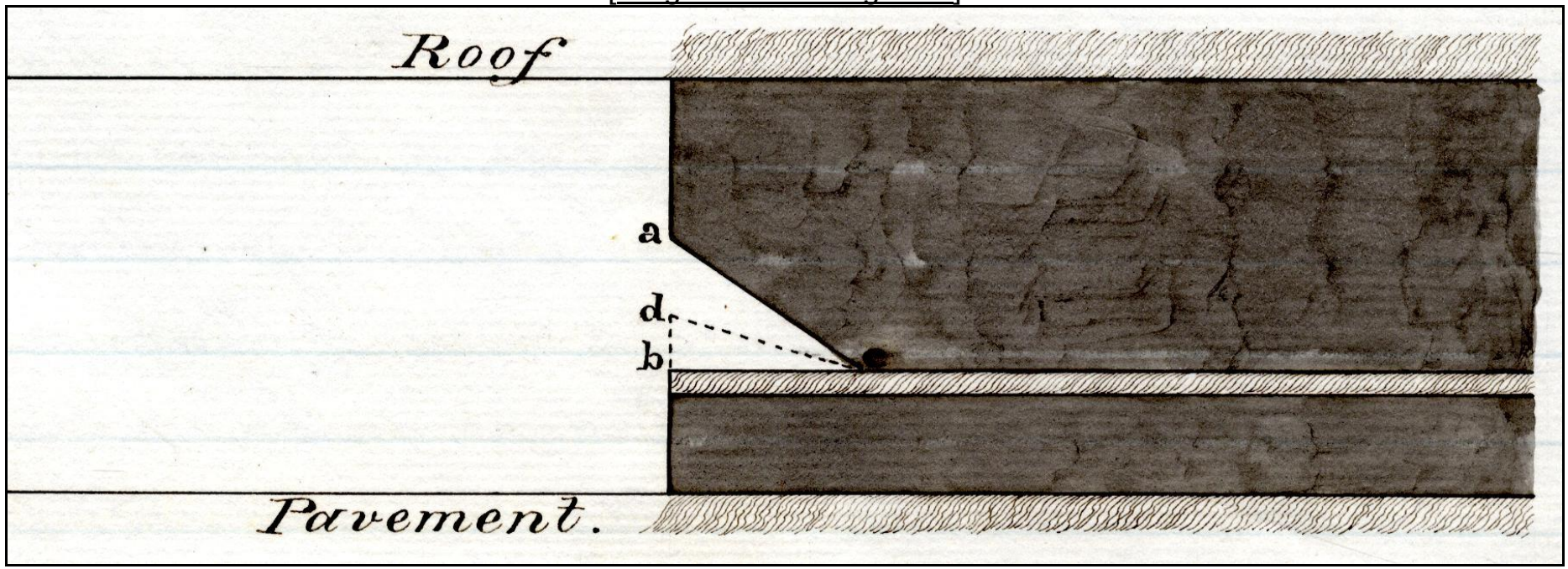
The Seam of Coal is stated to be 6 feet thick – but separated in the middle by a layer of soft Shale 4 Inches thick.

The present mode of getting the Coal is thus described by M^{r}. Brown.

"In getting the Coal, the Miner first cuts out about 2 feet of the lower part of the upper Bed – about 3 feet inwards, and 10 feet across. He then breaks down the remainder of the upper Bed by Wedges. When this is done the lower Bed is broken out by wedges driven vertically into the Coal". The following Diagram will explain more clearly this mode of working.

[Diagram of Getting Coal]

[Diagram of Getting Coal]



(9.)

The Triangle **a,b,c**, shews the cutting first made by the Collier the Coals from which, being all dug by the Pick must necessarily be mostly small. This cutting much exceeds in height, what is necessary, and ought not to be higher than what is represented by the dotted line **b,d,c**, viz 10 Inches, which would greatly diminish the quantity of the small produced in this operation. But if the 4 Inch layer of black Shale, in the middle of the Seam is sufficiently soft to admit of being dug out with large Jumpers Chissels – the best way would be to hole in it, which would leave the upper part of the Seam in one entire mass, to be broken down by Wedges, or Gunpowder, by which, a great saving in the quantity of Small Coals would be effected. I have occasionally practiced this mode of working with great advantage.

A certain quantity of Small will unavoidably be made, as little as possible should be sent to bank, beyond what is required for the Colliery consumption. It should therefore be separated, or riddled out by the Colliers and stowed underground,

(10.)

of self acting inclined Planes underground, in which case all the Coals will be drawn at one Pit, and of course the accumulation of resting Coals during the Winter will be very large – especially as I should not at present recommend the Association to erect Depots at the Wharf. The Tramming out of the Coals, on so large a heap, is undoubtedly expensive, but it may in some degree to obviate, by heaping the Coals thick – say 18 or 20 feet; and there are many-advantages in concentrating the business at one Pit to compensate the disadvantage of having so large a heap. The Coals thus heaped may be secured against spontaneous combustion, by placing Air Boxes in them. And when the Shipping season commences, the resting Coals should be filled into Corves, and drawn up an Apparatus attached to the Winding Engine, and teemed over the Screen into the Waggons. This greatly freshens the Coals, and makes them nearly as good as when newly worked.

A Plan and Elevation of a Screen suitable for this purpose accompanies this report.

by which the expence of underground conveyance, drawing, and screening out at the Surface would be saved.

In all my observations on the working of the Sydney Colliery, I contemplate the introduction of the Basket Corf, according to the Newcastle System, as being in every way best suited to the circumstances of the Colliery. The size of Corf I should recommend is what is called, a 20 Peck Corf, and will carry 6½ Cwt* of Coals. This is a size which may be managed on the slope of the Mine by two strong Boys, and may be drawn up the Pit single, double, or even tribble if necessary. These Corfs are brought from the face of the workings on Trams, to the horizontal Trolly-roads, where they are lifted by a Crane, and placed upon the Trollies to be drawn to the bottom of the Pit by Horses. One Trolly carries two, or three Corves, and as many Trollies are chained together into Sets, as a Horse can draw. One a well laid edge Rail-way upon a Level, a good Horse can draw 12 Corves – viz 4 or 6 Trollies chained together in a Set – the ordinary load is 8 or 10 Corves.

I have already stated Page that I conceive the sinking of rise Pits may be dispensed with, by the introduction

* 3 Corves will carry a Ton – and 4 a Sydney Chaldron.

Bud-33

I had proceeded thus far with my report, when I received from M^{r}. Duval, an extract from M^{r}. Brown's Letter of 25th. March last, in which he urges the necessity of recommencing the drainage of a greater breadth of Coal, to the dip of the present Engine Pit, by a more powerful Engine without delay. In this M^{r}. Brown anticipates my suggestion, in the former part of this report, as to the mode of accomplishing an effectual drainage of the Colliery. The only difference being, the less depth, at which M^{r}. Brown proposes to make the Winning. In this he appears to be governed in a considerable degree, by the nature of the surface; but it is not of material importance, as if at any future period a greater breadth to the dip of the Seam should be found necessary, it may be obtained by sinking the Engine Pit, and driving a Cross-level Drift as represent at Page 5.

The Board having sanctioned this deep Winning, with a Steam Engine of adequate power, it is not necessary that I should say more on the subject, than recommend it's immediate commencement, and that it should be pursued with all convenient dispatch, according to the Plan which I handed to the Board on the 7th. May last, and agreeably to the suggestions contained in my Memoranda of the 19th. of that month.

The Board having decided to carry this effectual Plan

(11.)

of draining and laying the Colliery open into operation will all convenient speed, the partial modes by sinking the present Engine Pit or by ore-winning, as stated in the former part of this Report, will not of course be resorted to, as although no quite so expensive, they would require nearly as long a time for their accomplishment. But they may as well stand in the Report to shew what might have been done, and probably to furnish hints, which may be of use on some future occasion.

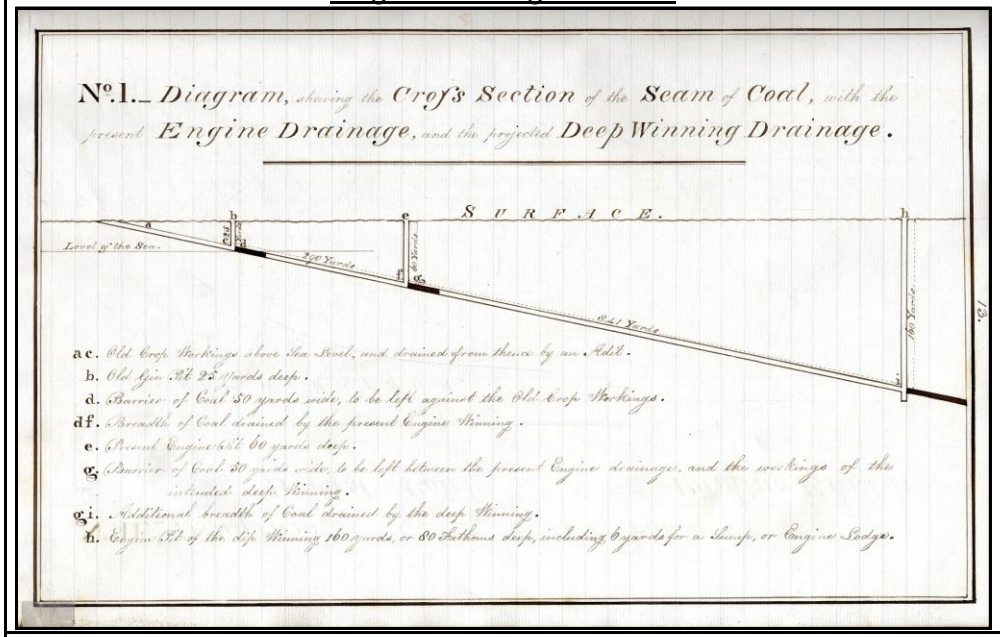
John Buddle.

[Bud-33]

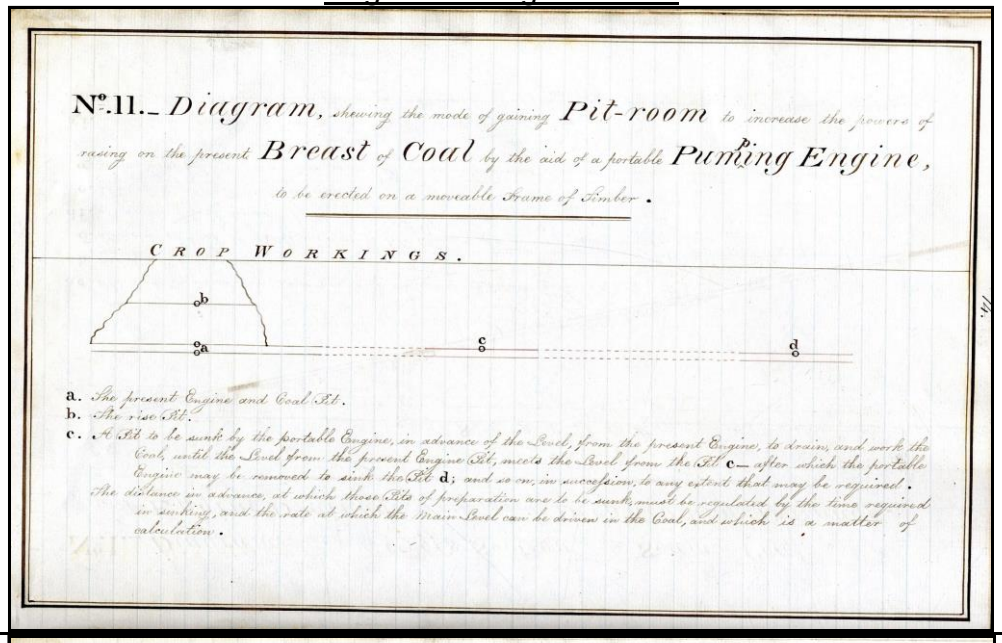
(12.)

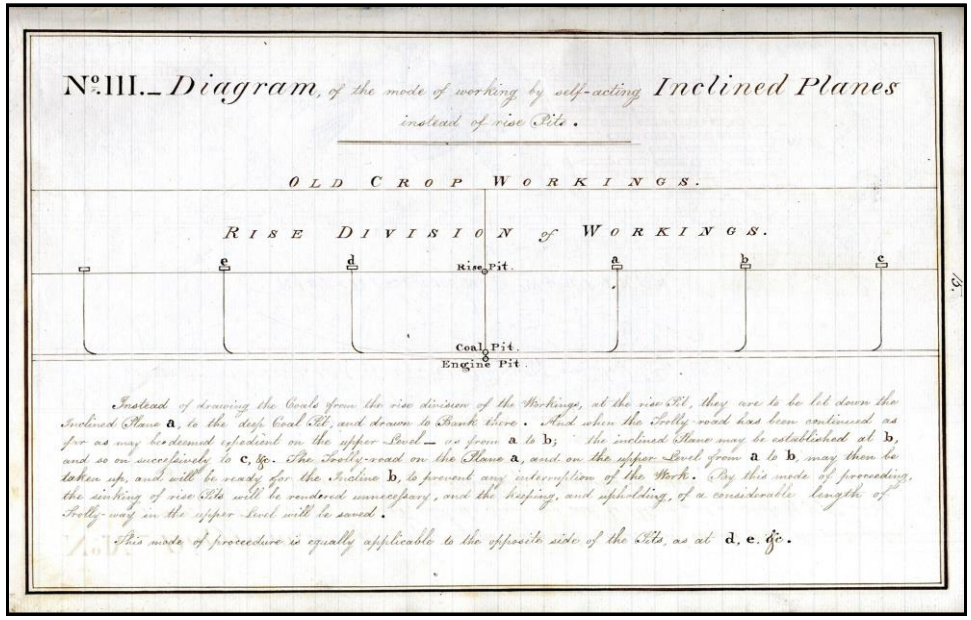
APPENDIX.

Page 13 - Diagram No.I.

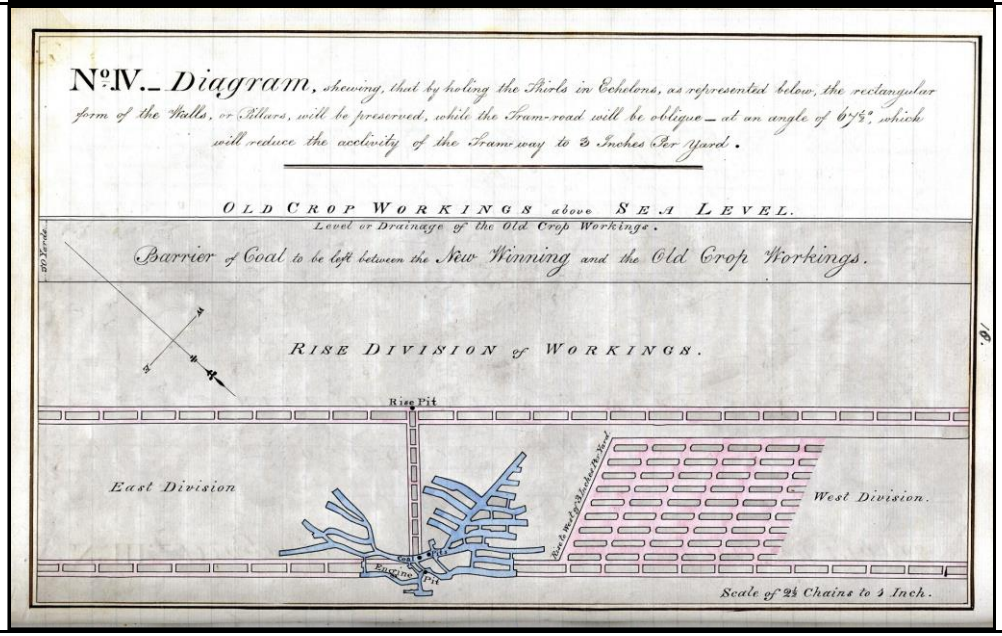


Page 14 - Diagram No.II.





Page 15 - Diagram No.III.



Page 16 - Diagram No.IV.

13.

N^{o}. I. – Diagram, shewing the **Cross Section** of the **Seam** of **Coal**. with the present **Engine Drainage**, and the projected **Deep Winning Drainage**.

[Diagram]

ac. Old Crop Workings above Sea Level, and draining from thence by an Adit.
b. Old Gin Pit 25 Yards deep.
d. Barrier of Coal 50 yards wide, to be left against the Old Crop Workings.
df. Breadth of Coal drained by the present Engine Winning.
e. Present Engine Pit 60 years deep.
g. Barrier of Coal 50 yards wide, to be left between the present Engine drainage, and the workings of the intended deep Winning.
gi. Additional breadth of Coal drained by the deep Winning.
h. Engine Pit of the dip Winning 160 yards, or 80 Fathoms deep, including 6 yards for a Sump, or Engine Lodge.

[Bud-33]

14.

N°. II. – Diagram, shewing the mode of gaining **Pit-room** to increase the powers of Rasing on the present **Breast** of **Coal** by the aid of a portable **Pumping Engine,** to be erected on a moveable Frame of Timber.

[Diagram]

a. The present Engine and Coal Pit.
b. The rise Pit
c. A Pit to be sunk by the portable Engine, in advance of the Level, from the present Engine, to drain, and work the Coal, until the Level from the present Engine Pit, meets the Level from the Pit **c** – after the portable Engine may be moved to sink the Pit **d**; and so on, in succession, to any extent that may be required
The distance in advance, at which those Pits of preparation are to be sunk, must be regulated by the time required. in sinking, and the rate at which the Main Level can be driven in the Coal, and which is a matter of calculation.

[Bud-33]

15.

N°. III. – Diagram, of the mode of working by self-acting **Inclined Planes** instead of rise Pits.

[Diagram]

Instead of drawing the Coals from the rise division of the Workings, at the rise Pit, they are to be let down the Inclined Plane a, to the deep Coal Pit, and drawn to Bank there. And when the Trolly-road has been continued as far as may be deemed expedient on the upper Level – as from **a** to **b**; the inclined Plane may be established at **b**, and so on successively to **c**, &c. The Trolly-road on the Plane **a**, and on the upper Level from **a** to **b**, may be taken up, and will be ready for the Incline b, to prevent any interruption of the Work. By this mode of proceeding, the sinking of rise Pits will be rendered unnecessary, and the keeping, and upholding, of a considerable length of Trolly-way in the upper Level will be saved.

This mode of procedure is equally applicable to the opposite side of the Pits, as at **d,e**, &c.

calculation.

[Bud-33]

16.

N°. IV. – Diagram, shews, that by holing the Thirls in Echelons, as represented below, the rectangular form of the Walls, or Pillars, will be preserved, while the Tram-road will be oblique – at an angle of 67½^{o}, which will reduce the acclivity of the Tram-way to 3 Inches Per Yard.

[Diagram]

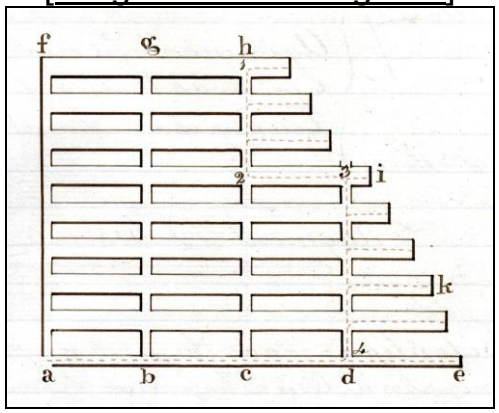
Instead of drawing the Coals from the rise division of the Workings, at the rise Pit, they are to be let down the Inclined Plane a, to the deep Coal Pit, and drawn to Bank there. And when the Trolly-road has been continued as far as may be deemed expedient on the upper Level – as from **a** to **b**; the inclined Plane may be established at b, and so on successively to **c**, &c. The Trolly-road on the Plane **a**, and on the upper Level from **a** to **b**, may be taken up, and will be ready for the Incline b, to prevent any interruption of the Work. By this mode of proceeding, the sinking of rise Pits will be rendered unnecessary, and the keeping, and upholding, of a considerable length of Trolly-way in the upper Level will be saved.

This mode of procedure is equally applicable to the opposite side of the Pits, as at **d,e**, &c.

calculation.

[Bud-33]

[Diagram No.V. Page 17]



17.

N^{o}. V. – Diagram, shewing the mode of shifting the **Tram Way Planes** in rectangular **Work.**

[Diagram]

The space from a to f represents the breadth of Coal to the rise of the Level **a,b,c,d,e**; The spaces between which Letters, are called Pillars, so that the extent of the district of workings here represented, by saying that it is 8 is described Boards in breadth, to the rise of the Level, and 4 Pillars long.

The stock of Tram Plates required for carrying on this breadth of work, is a sufficient quantity, to lay the two Headways Courses, or Thirls **af**, and **bg**, and this Level and the 8 Boards the full length of the Pillar **ab**, **fg**.

The course of the Thirls af, is first laid, and all the Boards in the Pillar **ab**, **fg**, as they gradually advance in the course of working 'till the holing of the course of Thirls **bg** commences, when the Tram-way in these new holed Thirls is laid out of the stock of Plates already provided. But the Tramplates which have been used in the Pillars of Boards **ab** – **fg**, are taken out, and relaid
in the advancing Pillar of Boards **bg** – **ch**, and so on successively. But it generally happens that the innermost, or rise Boards cannot be kept up, with the out-by Boards, and take the position **h,i,k,e**,. In which case the Trams from the rise Boards, take the course represented by the red dotted lines **1,2,3,4**, to the bottom of the Pit or Crane, on the Trolly-way at **a**.

[18]

(N.B. on a 7/- Stamp)

Dated 1st. March 1796.

Messrs. Watt & Boulton
and
W^{m}. Russell Esqr. And others.

Agreement for erecting a Steam Engine at Wallsend Colliery in the County of Northumberland.

Payment £615..0..0.

This Indenture made the first day of March in the Year of our Lord One Thousand Seven Hundred and ninty Six and, in the Thirty Sixth Year of the Reign of our Sovereign Lord George the Third by the Grace of God of Great Britain, France and Ireland King, Defender of the Faith and so forth Between James Watt of Soho in the County of Stafford Engineer and Matthew Boulton of the same place Engineer of the one part and William Russell of Newbottle in the County of Duham Esqr. For himself and all others the Proprietors and Partners of and in a certain Colliery

called Wallsend Colliery in the County of Northumberland of the other part **Whereas** the said William Russell and the said other proprietors and partners being about to erect a Steam Engine at Wallsend Colliery aforesaid and being desirous to avail themselves as well of the

By this mode of proceeding, it will be seen that the Roof of the Board Rooms will not require to be supported longer than the time required for driving them Pillar – say 22 yards in length, when the Props may be drawn out of them, by which a great saving of Timber will be effected.

[Bud-33]

Skill and experience of the said James Watt and Matthew Boulton in constructing such Engines and in applying them properly to the work wanted to be performed as of the savings in Fuel which are effected by the said James Wall's Invention whereby Steam Engines have been made more useful several of which Inventions are described mentioned or referred to in divers Letters Patent granted by the King to the said James Watt

[19]

and in the Specifications enrolled in Chancery in pursuance thereof and in a certain Act of Parliament passed in the Fifteenth Year of the Reign of his present Majesty entitled "An Act for the vesting in James Watt Engineer His Executors Administrators and Assigns the sole use and property of certain Steam Engines commonly called Fire Engines of his invention described in the said Act throughout his Majesty's Dominions for a limited time and of other advantages appertaining thereto have desired the said James Watt and Matthew Boulton to contract with them for the Concurrence and assistance of them the said James Watt and Matthew Boulton in and towards the said William Russell and the said other proprietors and Partners fitting up erecting completing and finishing at their Own Cost and Charge at Wallsend Colliery aforesaid a Steam Engine of the improved construction according the said James Watt's Invention as aforesaid and of the dimensions following that is to say the Cylinder of the said Engine to be 24 Inches in Diameter and Five Feet long in the Stroke, and the Piston thereof to be acted upon by the force of Steam both in it's ascent and descent with a rotative motion and sundry other inventions of his the said James Watt's applied thereto such Engine to be employed in turning

[20]

and Erection of the said Steam Engine and as a Reward and Compensation for the same and also for the materials to be found and provided by them as hereinafter mentioned and for the benefit to be received by the said William Russell and the said other Proprietors and Partners thereby and otherwise as aforesaid **Now this Indenture Witnesseth** that the said William Russell for himself and all others the said proprietors and Partners and for his and their several and respective Heirs, Executors, and Administrators dothe hereby Covenant promise and Agree to and with the said James Watt and Matth^{w}. Boulton their Executors Administrators and assigns that they the said William Russell and the said other Proprietors and Partners shall and will with all convenient speed at their own proper cost and charge set up erect complete and finish at Wallsend Colliery aforesaid a Steam Engine with the said Rotative motion and other Inventions applied thereto of the dimensions herein before recited and according to the Plans Directions and Materials to be finished by the said James Watt and Matthew Boulton their Executors Administrators & Assigns as hereinafter mentioned **And** in order to give and make to the said James Watt and Matthew Boulton a Compensation and satisfaction as aforesaid the said William Rus-

Machinery for the purpose of raising Coals from the said
Colliery and to be maintained and kept in order and
Repair at the expence of them the said William Russell
and the said other proprietors and Partners and the
said James Watt and William Boulton have for the
considerations and upon Terms and under and
subject to the provisoes Conditions and Restrictions and
Limitations hereinafter mentioned conscribed and agreed
to contract with the said William Russell, and the said other
proprietors and partners accordingly **And** the said
William Russell and the said other proprietors and
Partners have agreed to pay to the said James Watt
and Matthew Boulton the Sum hereinafter mentioned for
and in consideration of their Skill Care and Attention
and assistance in and about the construction ~~of the~~
[Bud-33]

sell for himself and all others the said Proprietors and Partners
and for his and their several and respective Heirs Executors
and Administrators doth hereby further Covenant promise
and agree to and with the said James Watt and Matthew
Boulton their Executors Administrators and Assign that
they the said William Russell and the said other Proprietors
and Partners their Executors Administrators or Assigns
or some of them shall and will well and truly pay or
cause to be paid unto the said James Watt and Matthew
Boulton their Executors Administrators or Assigns at the
expiration of Three Calendar Months next after the day
on which the Materials hereinafter mentioned or referred
to shall by the said James Watt and Matthew Boulton
their Executors Administrators or Assigns be delivered
to the order of them the said William Russell and the

[21]

said other Proprietors and Partners their Executors Admin-
istrators or Assigns the Sum of Six Hundred and Fif-
teen Pounds lawful money of Great Britain **And**
further that the said Engine so to be erected at Wallsend
Colliery as aforesaid or the Materials thereof or any
part thereof shall not previously to the Twenty Fourth
Day of June in the Tear One Thousand Eight Hundred
be removed out of the Kingdom of Great Britain to any
place beyond the Seas nor to any place more than Ten
Miles distant from the said place of Erection without
the consent of the said James Watt and Matthew Boulton
their Executors Administrators or Assigns in writing
under their hands for that purpose first had and
obtained **And** the said James Watt and Matthew
Boulton for the considerations aforesaid for themselves
and each of their Heirs Executors Administrators and
Assigns do and each of them doth covenant promise
and agree to and with the said William Russell and
the said other Proprietors and Partners their Executors
Administrators or Assigns ~~or their Agent or Deputy~~

[22]

And further that the said James Watt and Matthew Boulton
their Executors Administrators or Assigns shall and will
at the Cost and charges of the said William Russell and
of the said other Proprietors and Partners their Executors
Administrators or Assigns furnish and provide an ex-
perienced Workman to direct and assist in the Erection
of the said Engine **Provided** always and it is hereby
agreed and declared by and between the said parties
hereto for themselves respectively and their respective
Partners Executors Adm^{rs}. And Assigns and the true
intent and meaning of them and of these presents
is that the said Payment hereby agreed to be made
or any Sum or Sums of Money due for or on account
of Materials or Workmanship furnished provided or
ordered by the said James Watt or Matthew Boulton
for the use of the said Engine shall be in Arrears and
unpaid for the space of Three Calendar Months ^<next after> the
same shall respectively become due and payable
and be demanded that then and in such case the
said Engine and all the materials thereof shall be

that they the said James Watt and Matthew Boulton
or one of them, their or one of their Executors Adminis-
trators or Assigns shall or will from time to time
when thereunto required furnish and provide the
said William Russell and the said other Proprietors
and Partners their Executors Administrators or Assigns
or their Agent or Deputy with all necessary direction in
writing and with proper Plans and Drawings for the
erecting Completing Using and working the said Engine
in the most useful and beneficial manner according
to the improvements and Inventions aforesaid and
also shall and will at their own proper Costs and Charges
furnished and provided all such Materials requisite
for the Construction of the said Engine as are men-
tioned and expressed in the Schedule here unto
annexed or hereunder written and that the said
Engine when Completed and finished and in good
and proper order shall be equal to raising Sixty Six
Thousand Pounds Weight ten Feet high in one Minute
[Bud-33]

chargeable with and subject and liable
to Payment thereof **And** the said William Russell
and the said other Proprietors and Partners and their
Exec^{rs}. Adm^{rs}. & Assigns shall cease or forbear to use
work or exercise the said Engine and they or any
of them shall not use work or exercise the said Engine
until such payment and all Sums of Money due
for or on account of Materials or Workmanship
so in arrear or unpaid together with the lawful Interest
due thereon shall be fully paid and satisfied **And**
it is hereby further agreed by and between the said
parties to these presents for themselves respectively and
their respective Partners Exec^{rs}. Adm^{rs}. and Assigns
that it shall and may be lawful to and for the said
James Watt and Matthew Boulton or their Executors
Administrators and Assigns Deputies and Agents
from time to time and at all times until the Twenty
Fourth Day of June in the Year One Thousand Eight
Hundred to examine View and see the state and condition

[23]

of the said Engines so to be erected at Wallsend Colliery
aforesaid or at such other place the same may be
removed to with all other the appurtenances thereunto
belonging without any let hindrance molestation or
trouble by or from the said William Russell and the
said other Proprietors and Partners their Executors
Administrators or Assigns or any or either of them
In Witness whereof the parties first above named
have to these present indentures set their Hands and
Seals the Day and Year first above written. –

James (LS) Watt
Matthew (LS) Boulton

Sealed and delivered (being first
duly Stamped) by the within

[24]

(On a 2^{s} . 6^{d} Stamp.)

Schedule
Referred to in the annexed Agreement
being
A List of the Metal Materials to be furnished by
Boulton and Watt
To The Propietors of Wallsend Colliery.

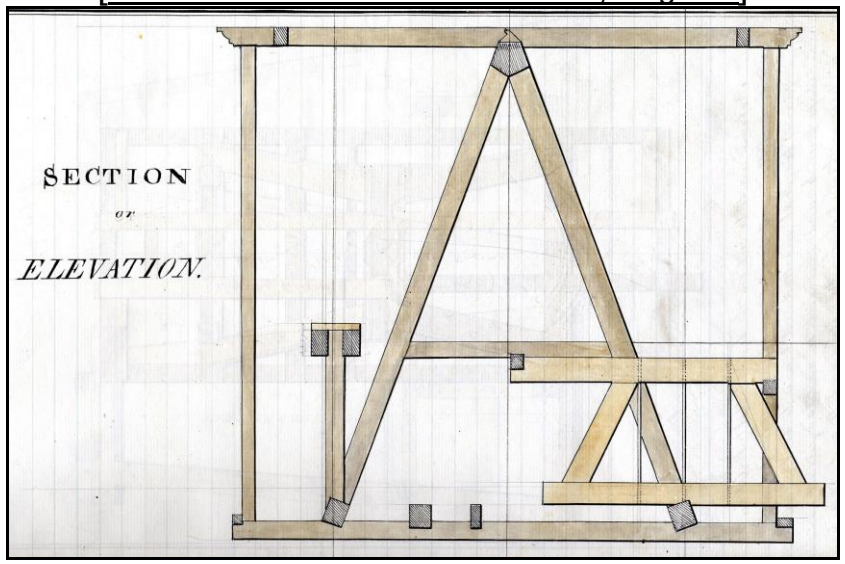
1. Cylinder; it's Top & Plates, its Bottom, Gland, Brasses &c. Complete
2. Bolts with their Nuts, Washers Plates, & Dog's for holding down the Cylinder
3. Piston, its Cover, bottom Plates, and Spanners Complete.
4. Nozzles Complete, with a spare set of Valves, Racks & Sectors.
5. Working Gear Complete.
6. Perpendicular Steam Pipe, and Eduction Pipe.
7. Condenser Vessell with Blow Pipe and Blowing Valve.

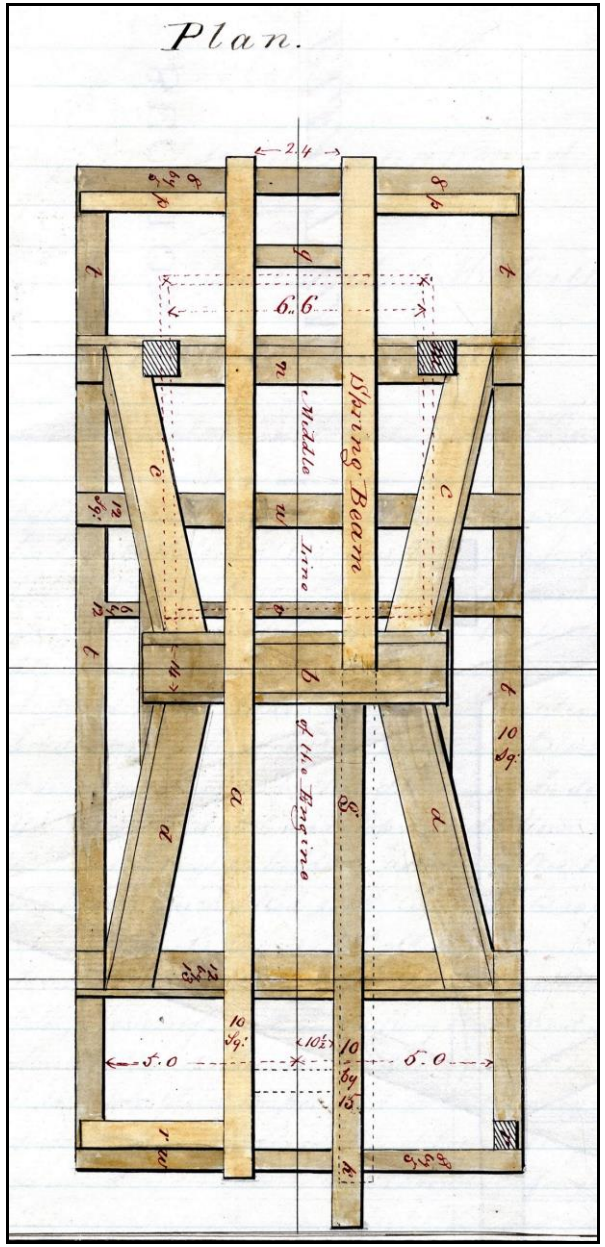
named James Watt and Matthew
Boulton in the Presence of
John Southern
Willm. Crighton.
(Note A see next Page)

[Bud-33]

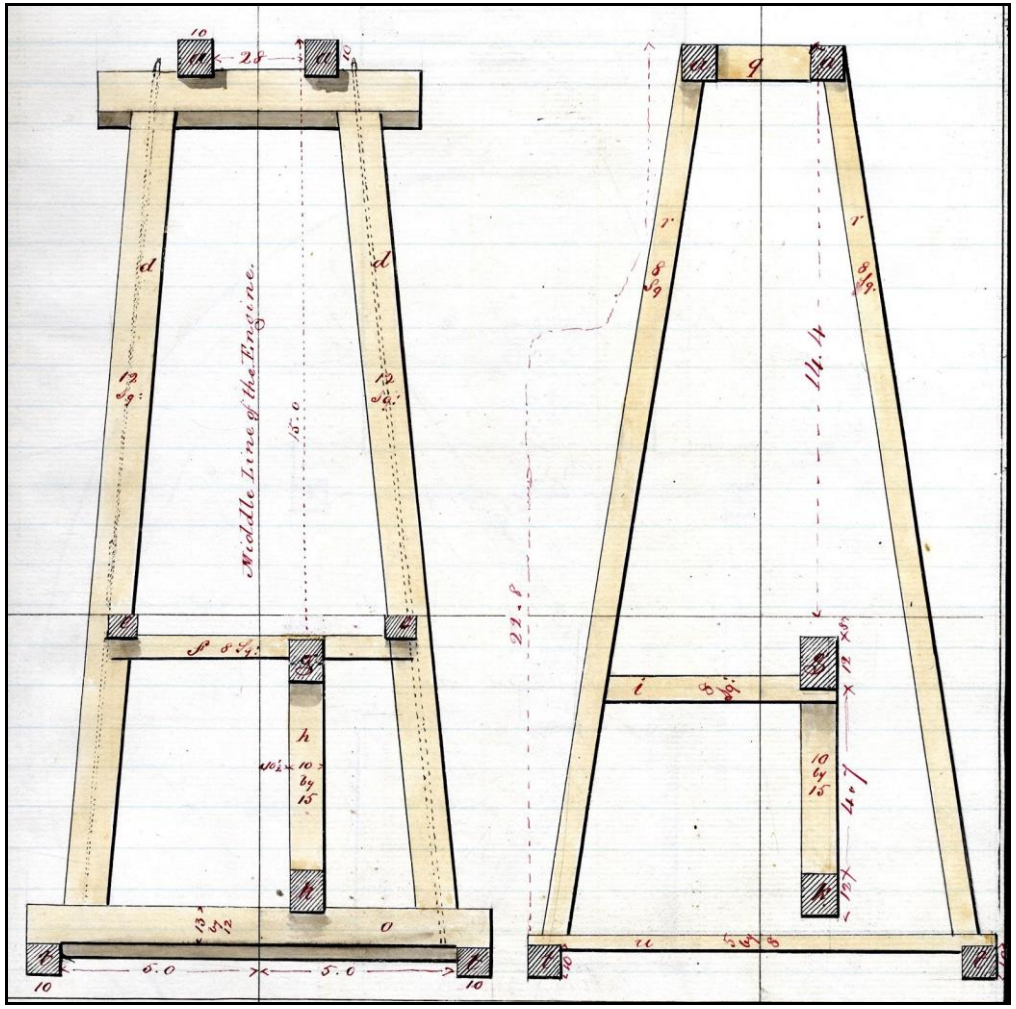
8. Injection – Cock, Rod, Handle and Index.
9. Air Pump, its Bucket and Top and Bottom Valves Complete.
10. Bolts and Dogs for holding down the Air Pump.
11. Air Pump Bucket Rod with Cap and Bracket.
12. Piston Rod, its Cap and Cutters.
13. Parallel Motion with Saddle Plates, Plummer Blocks, Brasses &c Complete
14. Bolts for fastening Ditto to the Working Beam and Spring Beams.
15. Main Gudgeon, its Plummers Blocks, Brasses, Bolts, Beam straps & Gland.
16. Saddle
17. Gudgeon, Hoops & Bolts for top of Connecting Rod.
18. Connecting Rod, Bolts, and turning Pin for it.
19. Rotative Shaft Plummers Blocks, Brasses and Bolts.
20. Throttle Pipe and Valve, and Governor.
21. Safety Valve and Pipes and Reverse Valve.
22. Gauge Pipes and Chocks, Feed Pipes, and Feed Apparatus.
23. Baromter Pipes, Cock & Seale, and Steam Gauge.
24. Valves for Cold Water Cistern.
25. Screws and Nuts for all the Joints.
26. Cement and a Box of pomatum.
27. Crank Pin and Brasses.
(Note A, last page)

[Section of Elevation of Frame, Page 25]





Notches are to be cut in the long Sills **t t** to let in the Cross Sills **n** and **o** and in for the same purpose. The



The Fly Wheel Framing **g,h,k,** has Three Bolts through it as Drawn, the sizes are writ upon them – The piece marked **f** cannot be seen in the Plan, because the Cape Piece **b** covers it. – The sides and Ends of the Condenser Cistern to be made of 3 Inch Deal Planks & the bottom 4 Inches – to be firmly Bolted with ¾ Inch Bolts as per

Main Diagonal marked **c,c,d,d** are to be bolted to the Cape Piece **b** and their Sills **n** and **o** with $8^1/_8$ In. Bolts passing through the Centres from end to end as represented by dotted lines, the Screwed part of the Ends to be $1^3/_8$ Diam:

The pieces **e** are bolted to **c** and **d** in the same manner.

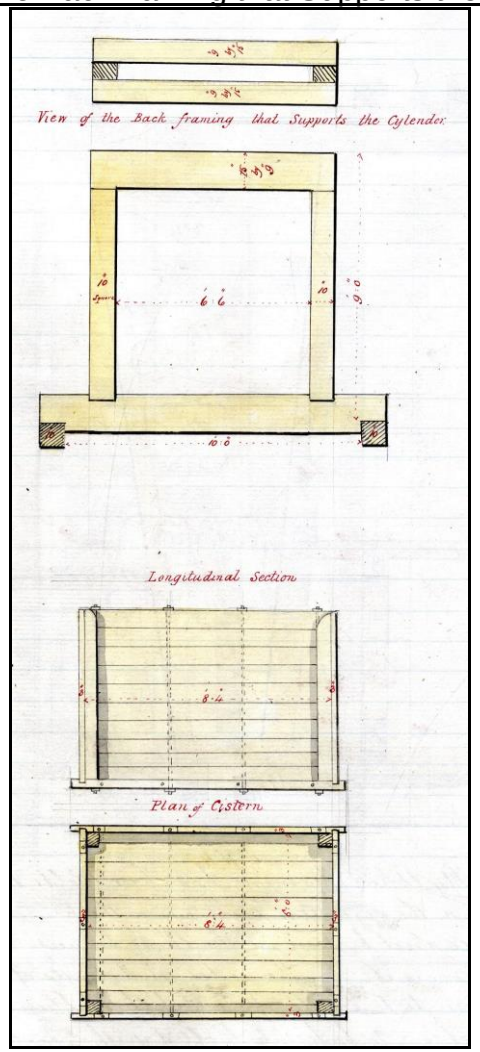
[Bud-33]

dotted lines. Plates of Iron 5 Inches Long by 3 Broad and ½ Inches thick should be put under the Heads & Nuts to prevent them from sinking into the Wood.

The Working Beam to be made of young straight grained Oak 22½ In. Deep, 16 thick and 18 Feet long.

[28]

View of the Back framing that Supports the Cylinder



[Bud-33]

[page 30 is Blank]

[pages 31 to 38 are Colour Engineering Drawings]

[39]

May 6 .. 1822

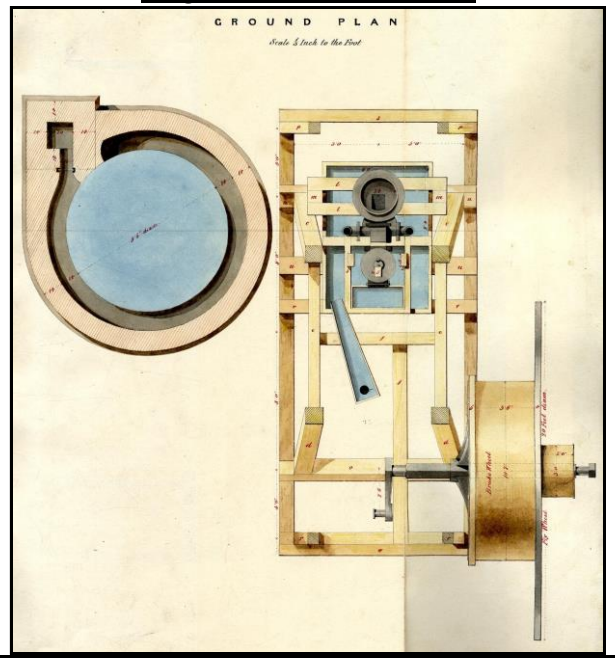
A Boulton and Watt Steam Engine, 24 Inch Cylinder
20 Horse power for Drawing Coals and Water, will
Cost fitted up including water Beam £. s. d.
Pullies &c. – – – – – – – – – – – – – 600 .. 0..0
Boilers Sixty five hundred Weight – 97 ..10..0
£697 ..10..0

A High Pressure Steam Engine 17 Inch Cylinder
20 Horse power for Drawing Coals and Water
including Beam for Pumping Water. £. s. d.
Pullies &c. – – – – – – – – – – – – – 560 .. 0..0
Boilers Seventy hundred Weight – 105 .. 0..0
£665 .. 0..0

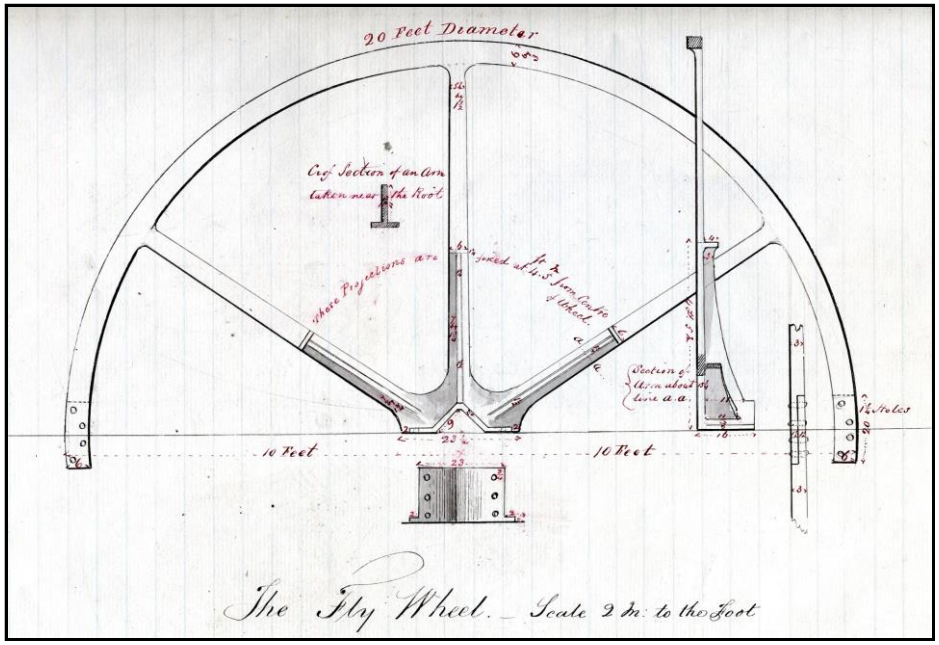
[Diagrams of above Engine]

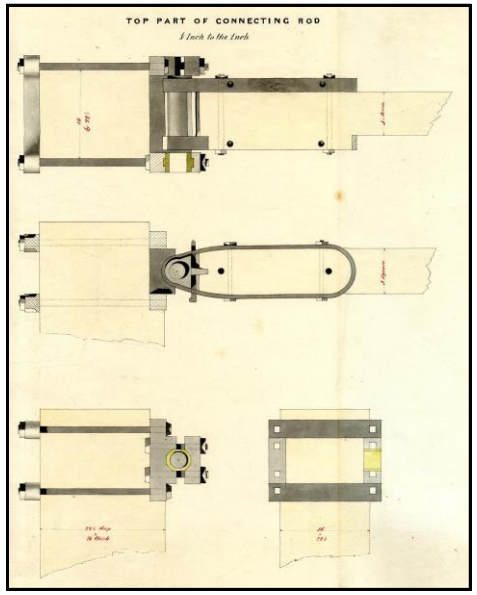
[Diagrams of Boulton & Watt, and High Pressure Engines]

Page 31 – Ground Plan

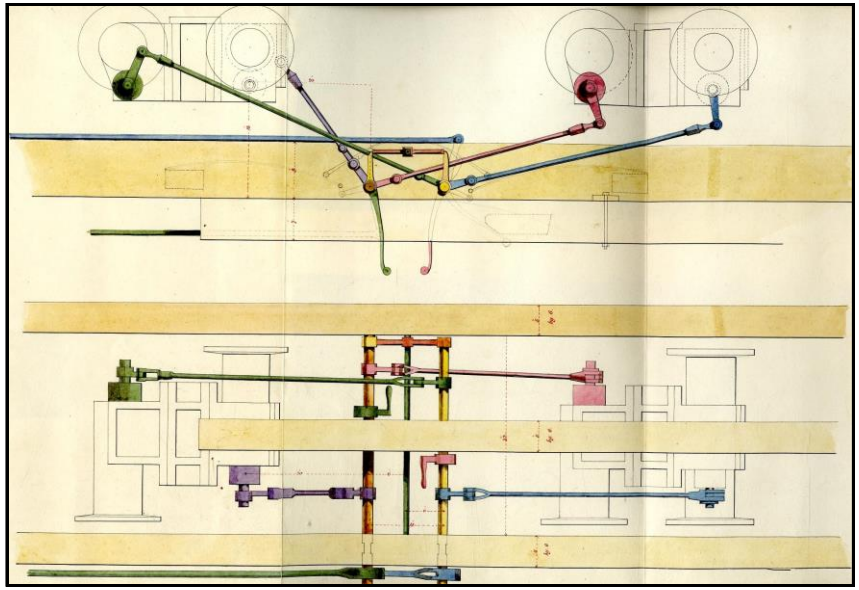


Page 29 – Fly Wheel





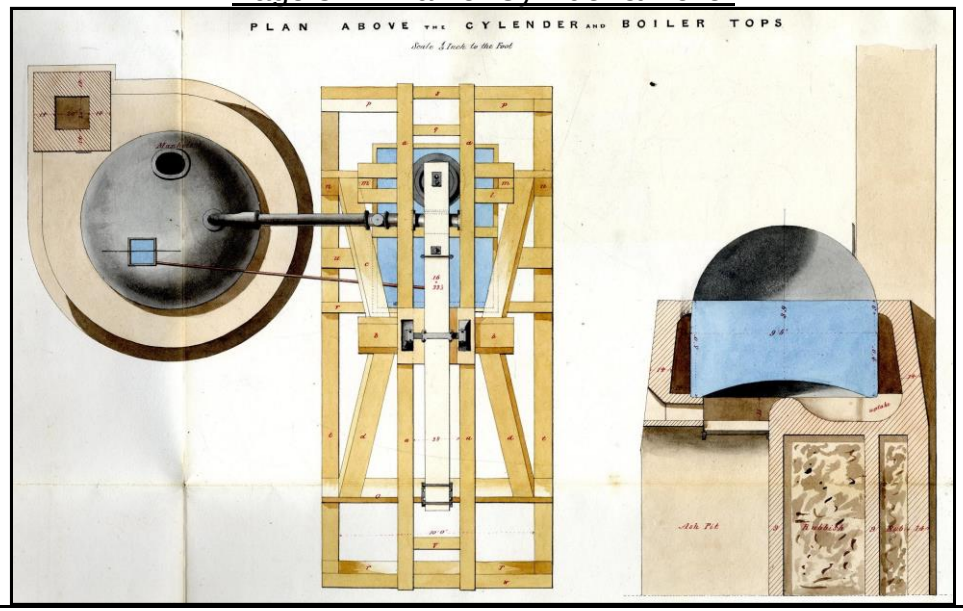
[Bud-33] Page 32 – Top Part of Connecting Rod



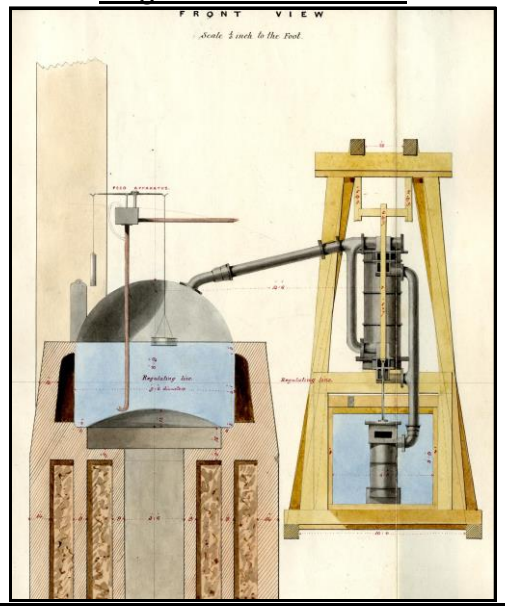
Page 33 – Working Gear sacle $^{1}/_{8}$ inch to the inch

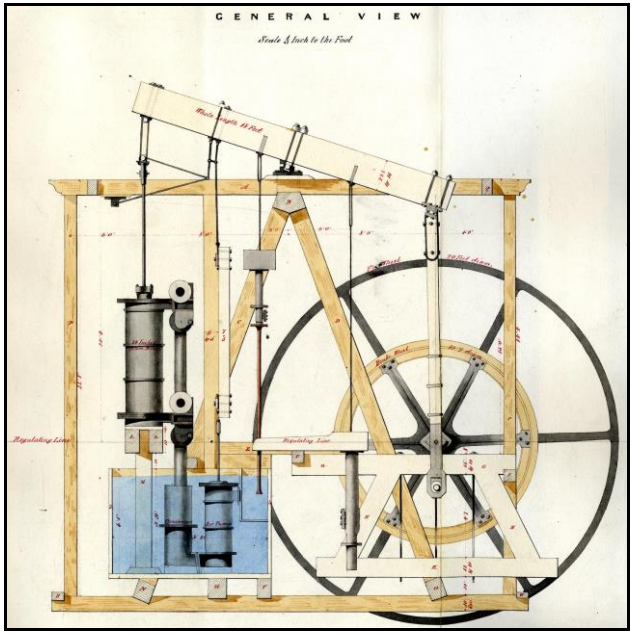
[Diagrams of Boulton & Watt, and High Pressure Engines cont.]

Page 34 – Plan of Cylinder & Boiler

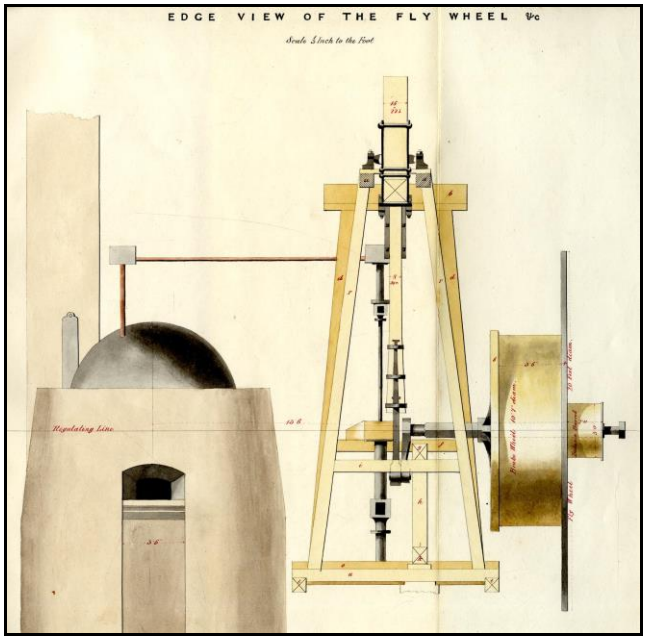


Page 35 – Front View





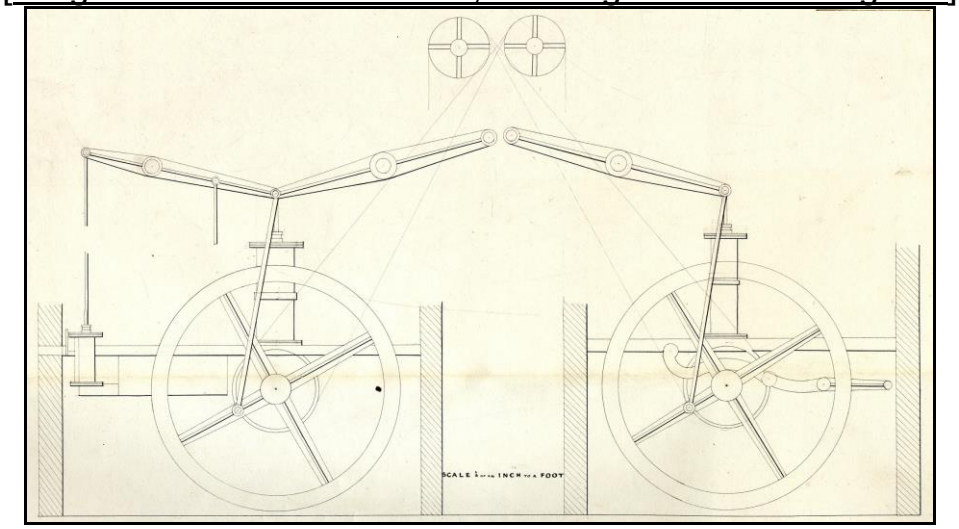
Page 36 – General View



Page 37 – Edge View of Fly Wheel

[Bud-33]

[Diagrams of Boulton & Watt, and High Pressure Engines]



[40]

June 17th. 1841

Specification for a 65 Horse Power High Pressure Leaver, winding Engine for the Owners of Tyne Main Colliery.

Diameter of Cylinder 32 Inches. Stroke in Cylinder 6 Feet. The Cylinder to be clean Bored out 32 Inches; Top $1^3/_8$ In: thick. Piston 8 In: in depth with 6 Bolts to screw the Ring down, 1¼ In: diameter, with Nuts to Correspond: – 2 Eye Bolts to lift the Piston Ring with, 1 In: pins and box Key for Piston Bolts. Nozzles to be fit up with a set of double Mitre Valves 6½ In: Diamr. – to be drifted & properly bored out: Diameter of Nozzles above Valves 9 Inches – thickness $1^1/_8$ In: Flanges 1¼ In: – Flanges between Nozzle & Cylinder $1^5/_8$: the whole to be fit up with double weight Bars and Leavers to lift the Valves, – eyes Steeled, and finished in the Best Workmanship style & left all bright.

Piston Rod 4¼ In: diameter when finished, Cross Head & Cap to Piston rod of Malleable Iron, and

[41]

with 8 Arms or Spokes, and nave to Correspond – Nave to have two Malleable Iron Hoops, 2 Inches square. The Fly Wheel to be cast in 2 Pieces, with Bolt holes to receive the Cleading, 1 Birch or Elm Crib on the Fly Wheel for the Brake 5 X 3 Inches, and 1 Malleable Iron Brake half round the wheel, with Weights, Leavers, Rods &c. to work the same

On pair Cast Iron Rope Rolls 10 Feet Diams. with 8 Arms to each, and nave to Correspond: Nave to have 2 Malleable Iron Hoops 1½ Ins: square to each Roll, – each Roll to be put together in 2 halves, with holes & Brackets wherever they may be required. Rope Roll Horns to be of Beech 3½ X 4 In: and such lengths as may be required, with a Malleable Iron Ring round each set of Horns 2½ X ½ In: (½) and screwed on with Bolts. Malleable Iron Fly Wheel Shaft 10 In: square – length as per Plan – Carriage and Brasses to correspond – Crank Pin to correspond with Shaft.

Balance Chain Plane to be cast in 2

in proportion to the Rod; – Links to Parallel Motion, Bolts 1¾ In: when turned, with Brass Cods and Plates to plan. – back links 1¼ In: with Nuts & Pillars to Plan, and correspond with the Motion. – Diam^{s}. of Pins in the Motion 3½ In: – lengths of Bearings 11½ Inches. – Radius Bars of Parallel Motion 1½ In: with Straps, Keys &c. Malleable Iron Connecting Rods with Straps and Brasses at each end. Diam^{s}. of Rod at each end 4½ In: and 5 In in the Middle – length of Rod about 11 Feet – 2 Pair Cast Iron Leavers, 11 ft. Centre & Centre, with Malleable Iron Pins & Gudgeons.

Fly wheel Axle Carriages to stand on a Cast Iron bed Plate 4 Feet long, 20 In: broad, & 2 In: thick – one at each end of the Axle. Diam^{s}. of Fly Wheel 20 Feet – depth of Rim 9 In: 4½ In thick,

[Bud-33]

Pieces, and to be put on out-end of Main Shaft – inner Diam^{s}. 20 Inches, Outside Diam^{s}. 6 ft. 4½ In: between planes.

Working Gear. This Engine to have a complete set of Hand or Working Gear, all bright, well fitted with Hands screwed to the side Pipes, weigh bars 2¼ In: Diam^{s}. with handles, Eyes, Striking Spanners, rods, leavers, Catches &c. for working the Valves &c.

Boiler and Steam Pipes. Two Cylindrical Boilers 30 feet long – 6 Feet Diameter, made of the best $^{3}/_{8}$ In: Crown Boiler Plate; each Boiler to have 1 Leaver safety Valve 3 Inches Diam^{s}. and one Valve enclosed within a Box, 5 Inches Diam^{s}. for each Boiler, loaded with weights sufficient for a Pressure of 30 lbs on each Square Inch: and be made so that the Pressure can either be increased or diminished as may be required: – with Pipes to Convey the escape Steam to Chimney: – 1 Stop Steam Valve for each Boiler. – 1 Throttle Valve between

[42]

the Nozzles and Boiler. One Stop Cock of Valve to each Boiler to regulate the Feed: – Hot Water Pipes pumps to with Pipes 4 Inches Diameter, and to work 18 Inches or 2 Feet Stroke. Hot Water Pumps for feeding Boilers to have a safety Valve on it 3 In: Diam^{s}. with Levers eyes & Weights, to be fed from the top of Boiler. Pipes to be all Flange jointed – 1 Cistern for heating the water with a branch from exhaustion Pipe with a Brass Cock

Hot Water Cistern 3 Feet long, 2 Feet broad & 3 F^{t}. deep & $^{5}/_{8}$ Inch thick, with Feed Pumps screwed to Cistern 1 Brass Cock 4 Inches Diam^{r}. between Feed Pump and Boilers, – 1 – 3 In. ch Brass Cock, and 6 Pipes to join Pond Pipes for supplying Hot Well with Water.

Steam Pipes $^{7}/_{8}$ In: thick – & 7 Inches Diameter – Flanges $1^{1}/_{8}$ In: – Exhaust Pipes to be carried to Chimney ¾ In: thick, & 7½ In: Diam^{r}. One Float to each Boiler, with sheaves, stands, Chains, Weights &c. –

[43]

Sunday Memoranda relative to the valuation of M^{r}. Thos. Barnes' share of Cramlington Colliery

M^{r}. Buddle for the Company
M^{r}. N. Wood for M^{r}. Barnes
M^{r}. Thos. Forster Umpire.

Agreement for the valuation made between the Owners & M^{r}. Barnes, dated 25th. July 1840, and Signed by

Jos: Lamb
H.G. Potter
Rd: Potter
A.G. Potter
W^{m}. Scott
Jno. Straker
Thos. Barnes

One unplugging Pipe on the under side of each Boiler
with One Brass Cock to each Pipe 2½ Inches Diameter,
and Pipes to Drift between Boilers 3 Inches Diameter, with
Red from each Cock to Fire-hole. One Pair of Doors to
each Boiler – One Pair of Grate & Bearing Bars.
4 slab Plates to each Boiler, 5½ Feet long & 2 In: thick,
2 of them 18 Inches Broad, and 2 – 12 In Broad – 2 Dampers
and two frames properly hung.

The Owners will provide the House and wood
Framing, ready to receive the Machinery. The Con-
tractor to provide & Erect the Machine and any omission
in this Specification to be supplied by the Contractor
of a proper size & strength, in proportion to the Above.

In short the Machine must to be made & completed
ready for drawing Coals &c., and to the satisfaction
of the superintendant of the Works.

(Wallsend Decr. 1st. 1841.)

[Bud-33]

Submission Deed. dated as above. Stamp £1.

Articles of Agreement made the Twenty Fifth day
of July in the Year of our Lord One Thousand Eight
Hundred & Forty Between Joseph Lamb of the Town
and County of Newcastle upon Tyne Esqr. of the first
part Archibald Gilchrist Potter of Walbottle in
the said County of Northumberland Colliery Agent
Edward Potter of South Hetton in the County of Dur-
ham Viewer of Collieries and Henry Glassford Potter
of Newcastle upon Tyne aforesaid Surgeon Executors
named in the last Will and Testament of William
Potter late of Walbottle in the County of Northum-
berland Esquire deceased of the second part William
Scott of the said Town and County of Newcastle upon
Tyne ^<Esquire> of the third part John Straker of Cramlington
in the said County of Northumberland Viewer of
Collieries of the fourth part and Thomas Barnes
of Whitburn in the County of Durham Esquire

[44a] [loose sheet]

Seaton Delaval Colliery, Borehole May 19th. to June 26th. 1843

	Fath	Yd^{s}	Foot	In^{s}
Strong blue clay with Sand partings and Water	5	1	1	–
Gray Mettle with Post Girdles	4	–	1	9
Foul Coal with water	–	–	–	3
Grey Mettle with post Girdles	7	1	1	–
Dark Grey Mettle	1	1	–	–
Coal	–	–	–	6
Grey and dark Mettle with Scars of Coal	2	–	2	10
Coal with Water	–	–	2	1
Dark Grey Mettle mixed with Coal	–	1	1	6
Strong grey Mettle with Whin girdles & Water	9	1	–	5
Bored into grey post with Mettle partings & Water	3	1	2	6

[44]

of the fifth part Whereas the said several persons parties
to hereto carry on together in Copartnership a certain
Colliery in the County of Northumberland under the style
or firm of “The Owners of Cramlington Colliery” And
Whereas the said Thomas Barnes is possessed of One
Eighth part of and in the Property and effects of the
said Copartnership And Whereas by the Deed or Arti-
cle of Copartnership entered into by the said Joseph
Lamb, William Potter since deceased William Scott
John Straker and Thomas Barnes it was agreed that
no one or more of them the said persons parties thereto
should at any time during the Copartnership assign
or otherwise dispose of all or any part of his or their
respective Interest in the said Copartnership Effects
to any person or persons whomsoever without giving
to the others or other of them Six Calender Months
Previous notice in writing of his or their intention

[Bud-33]

so to do And further that if either any or all of the
others of the said Copartners should at the expiration
of the last mentioned space of Six Calender Months
render to the party or parties so desirous of disposing
of his or their share or shares the Sum at which at
their immediate preceding Annual Settlement of
Accounts between the said Partners in furtherance
of the Agreement in that respect thereinafter contained
the share or shares of the Partner or Partners so desirous
of disposing of his or their share or shares was or were
Valued at together which the Sum at which the like
share or shares of the Lease of the said Colliery and such
other Copartnership Property if any should not be
included in such Annual account should be Valued
at in the manner therein and next hereinafter
mentioned That then and in such case if all the
other Parties should Concur in making such Tender
they should be entitled to the share or shared of the
Partner or Partners so wishing to dispose thereof
as aforesaid in proportion to their original shares
And further that in the event of one or more of the
said Parties giving such notice to the other or

[45]

other of them of his or their intention to dispose of his or
their share or shares of the said Copartnership Property
as above mentioned **Then** and in such case the
Value of the share or shares therein of and in the then
existing Lease of the said Colliery and of other property
and source of Emolument whatsoever belonging
to the said Partners in respect of the said Copartner-
ship Business not included in the said Annual
Accounts should be ascertained of two indifferent
Persons one of them to be appointed by the Partner
or Partners wishing to dispose of his or their share
or shares therein and the other of them by the con-
tinuing Partner or Partners such persons to be

[46]

appointed by them previous to their entering upon Busi-
ness of their intended Valuation to determine the Value
of the Share of the said Thomas Barnes of and in the
existing Lease of the said Colliery and of other Property
and sourse of Emolument whatsoever belonging to the
said Persons Parties hereto in respect to the said Co-
partnership business not included in the Annual
Appraisement and Accounts And it is hereby agreed
that the Value to be ascertained as aforesaid shall be
deemed and considered as the true and real Value
of the said Premises to be Valued as aforesaid and
shall not be ~~interfered with~~ impeached or Cont[roverted]
by any of the said persons parties hereto have respectively set

appointed within ten days next after the expiration of any such notice as aforesaid and in case such two persons could not agree upon such Value then the same should be ascertained by one indifferent person to be nominated by the said two persons and the Value stated in such Valuation should be the estimated Value of such Property at the time of making such Valuation And Whereas the said Thomas Barnes has given to the said parties hereto Notice in writing of his intention to dispose of his said One Eighth Part or Share of and in the said Copartnership Property and effects And they the said parties hereto are desirous of purchasing the said part or share pensuant to the power given to them for such purpose in and by the said Deed or Article of Copartnership Now these Articles Witness and it is hereby declared and agreed between and by the said Parties hereto that it shall be referred to Nicholas Wood of Killingworth in the County of Northhumberland Colliery Viewer a person named by the said Thomas Barnes and John Buddle of Wallsend in the same County Colliery Viewer a person named by the said other persons Parties hereto and in case they the said Nicholas Wood and John Buddle cannot agree then to such third person as shall be named and

[Bud-33]

their hands the day and Year first above written.

Joseph Lamb
A.G. Potter
Edwd. Potter
H.G. Potter
William Scott
John Straker
Thos. Barnes

Witness to the signing hereof by the said Joseph Lamb, Archibald Gilchrist Potter, Henry Glassford Potter Edward Potter, William Scott, and Thomas Barnes
Signed N. Hindhaugh
Witness to the signing hereof by the said John Straker
Signed W^{m}. E. Trotter.

We Nicholas Wood and John Buddle the Arbitrators within named by this memorandum in writing under our hands made before the entering upon the within mentioned Arbitration do hereby nominate and appoint Thomas Forster of Haswell Colliery in the County of Durham Colliery Viewer the third Arbitrator to whom together with ourselves the within matters in dispute between the Parties within named shall be referred according to the tenor and effect of the within agreement As Witness our hands this Twenty ninth day of August 1840.

Witnessing to the signing hereof by the said Nicholas Wood, W^{m}. Oliver – – – – – – – – – – } Nich^{s}. Wood

Witnessing to the signing hereof by the said John Buddle – W^{m}. Oliver – – – – – – – – – – – – } Jno. Buddle

[47]

Cramlington Colliery 4th. Septr. 1840

Met M^{r}. Wood this morning at M^{r}. Straker to commence the Valuation of the Colliery. (Present Messrs. Buddle, Wood Atkinson & Straker.)

Terms of Lease – M^{r}. Shum Storey Lessor
Term 21 Years from 12th. May 1837.
Certain Rent £1600 for 1600 Tens and 20/- for

[48]

Cramlington Oct. 6th. 1840
M^{r}. Wood & M^{r}. Atkinson.

Met at the Colliery this morning and Viewed the workings in the Low Main Seam in the Anne & Engine Pits.

M^{r}. A's Remarks

We first went into the Narrow West Boards going in the direction of West Cramlington Coll^{y}.

Overs for best Coals and 7/ 6 for Small. Ten 420 Boles
A Barrier of 30 Yards to be left against all other Collieries.
Extent of Royalty.
Eastern Division – – 976 Acres
Western Ditto – – 759 –
Total – – – 1735
The Winning is in the Eastern Division but will drain the Western Division also.
Depth of Engine Pit to Low Main Coal 90 Fa^{s}.
West Pit – – – – to – – – – – Ditto – – 84 –
There are only two Working Pits.

Total extent of Royalty – – – – – – 1735 Acres
Deduct for Coal left in Barriers
18260 Yards long X 30 – – – – 113
D^{o}. already worked in Low M^{n}.
in the whole – – – – – – – – – 344
D^{o}. Loss by Troubles – – – – – 20 477
Net Whole Coal remaining – – – 1258.

N.B. Here follow the Calculations of Coal in detail the result of which is as follows.
Quantity of Coal already wro^{t}. – – 358
Ded: whole Coal – – – – 14 Ac. – 344
Pillars Wro^{t}. – – – – – – – – – – – – – – 75
D^{o}. remaining to be wro^{t}. – – – Ac. 269

[Bud-33]

A succession of Troubles has been met with in this direction – commencing about 700 yards from then Anne Pit – their general line of direction being about S 60 E. A considerable quantity of Coal will be lost by those Troubles, as for more than 100 Yards where they have been set through the Seam is much deteriorated, and also much thinner. It seems from the information received from the Under Viewer (M^{r}. Laycourt) that on the rise side of the Troubles which have been met with in progress of proving the seam to the Westward, the Coal is invariably thinned out very considerably.
The following is a Section taken at the Face of the west Boards at about 920 yards from the Anne Pit.

	F In.
Candle Coal left Standing – – –	– .. 4
Good Coal – – – – – – – – – – – – – –	4 .. 7¼
Badger Kerved in & Cast Backs –	– .. 5½
	5 .. 4¾

The Roof is a Strong Metal with Post Girdles, and stands tolerably well, except amongst the Troubles, where it falls and makes the working very expensive. These West places have been rising very rapidly from the 17th. Holing from the Shaft – above the level of which the Face is 53 Feet – the total rise from the Pit to where the section was taken is 14 Fathoms.
The first Incline from near the Pit (of 400 Yards rises 1 in 34 – the Incline now being constructed

[49]

commencing at the 17th. Holing will be much Steeper (about 1 in 12).
Twenty 7 Cwt Corves are let down the Present Plane at one run.
Section N°. 2. Taken at 500 Yards (S 65 W) from the Shaft, and 310 Yards (N. 25 W.)

[50]

The Hewing Price is 1^{s}/ 0½^{d}. per Ton, with a Bouty of 1^{d}. per Ton extra to such Hewers as work more than 10 Corves per day, equal to about 3½ Ton – 3^{d} per Ton – 3^{d} per Ton on $^{1}/_{5}$th. of the Workings is also paid for Casting back Small.
Double Working – – 1^{s}/ 3^{d}
Holing Walls – – – – 1^{s}/ 10^{d}

20th. Board from the west Mothergait, or West narrow Boards.

	F	In.
Candle Coal – – –	– ..	4
Good Coal – – – –	4..	5½
Badger – – – – – – –	– ..	7½
Feet –	5 ..	5

Section No. 3. was taken at a point 1000 Yards (N. 25 W.) and 100 yards (N. 65 E.) from the north Rollyway (Engine Pit) and about 240 Yards from the East Boundary

	F	In.
Candle Coal – – –	– ..	4
Good Coal – – – –	5..	1
Badger – – – – – – –	– ..	7
Feet –	6 ..	0

The Seam in this immediate District, is better than in any other part of the Colliery yet explored – but at the northernmost extremity of the Workings and about 950 Yards further North than where the last Section was taken, the Coal is said to be much thinner and the Badger thicker – this is the case with all the Coal lying beyond the Upcast Trouble of 11 Fathoms which runs at about 700 yards to the north of the Anne Pit Boardways Course, and nearby in a line for the West Cramlington Pit – The Section on the rise side of this Dyke is said to be similar to that taken at the Face of the West Narrow Boards No. 1.

The Winnings are 15 yards – 10 Wall & 5 Board – but the Boards are turned only 4 yards wide & laid out at 2 yards – walls at 33 yds – 2 wide.

[Bud-33]

Narrow Boards – – – 1/ 3.

In working the whole Mine it is calculated that of 5 Corves Worked, I will be small & 4 Round.

In the Broken, out of 3 Corves, 2 would be Round & 1 Small.

Men: of Rents paid by the Cramlington Colly. Co.

Sir Francis Blake Certain Rent £200 per Annum – for 1333 1/3 Tens – and 3/- per Ten for Overs.

The Owners of Backworth Colliery £100 P. Ann:

The Duke of Northumberland. No Fixed Rent 10/ 6 per Ten of 420 Bolls.

Miss Liddle – Certn. Rent £100 per Annum.

Valuation continued.

Whole Coal remaining – – 1258 Acres

Pillars – – – – – – – – – – – – – 269 –

Total – – – 1527 –

Sections of Seam Ft.

No. 1. Good Coal – – 4 .. 7¼
2. – ditto – – – 4 .. 5½
3. – ditto – – – 5 .. 1
3) 14 .. 1¾

Average thickness of Good Coal – 4 .. 8½

Ft. In.

A Seam of Good Coal 4 .. 8½ Contains 2520 Chaldrons.

Winnings 15 Yards – viz 10 Wall and 5 Board. Walls holed at 33 Yards – 2 Yards wide, therefore

[51]

The proportion obtained by the first working is

$$\frac{33 \times 5 + 10 \times 2}{33 \times 15} = 0.3737 \text{ but say } 0.373.$$

Left for Second workg. 0.627 1.0

Ch.

[52]

this Quantity would give a duration of 37.8 Years.

Continuation of Cramlington Colliery Valuation

Decr. 11th. 1840.

Scores Drawn in 1837 xx. co.

Anne Pit – 11,303 .. 5 Cost – £10017..3..10

2520 Ch: P. Acre X 0.373 = 940 for 1st. Working
1580 left for 2d. Ditto
2520

Reduce

Quantity per Acre First Working – – – – – – 940 Ch
Ded: Small (exclusive of Badger) $^1/_6$th. – – 157
783
Ded: Skreened out at Bank $^1/_5$th. – – – – – 156
Net Merchantable Coal per Acre – – – – – – 627 Ch

Second Working

Chald: pr. Acre left in Pillars – – – – – – – 1580 Ch
Ded: lost Underground $^1/_{15}$th. – – – – – – – – 100 –
1480 –
Ded: Stowed Undergd. (Exc. of Badger) $^1/_5$th. 296 –
1184 –
Ded: $^1/_5$th. Skreened out at Bank – – – – – 236 –

Net Produce of Best Coals per Acre by second working – – – – – – – – – – – – – – 948 Ch
but say 950 Chalds.

[Bud-33]

	Engine Pit	11,077..11	Cost – –	9523..10.. 7
				10339.. 0.. 5
1838.	Eng: Pit –	14,399..12	Cost – –	~~19540..14.. 5~~
	Anne Pit –	16,388..14	– – –	13250..17.. 9
1839.	Eng: Pit –	13,857..14	Cost – –	10960..13.. 6
	Anne Pit –	15,918.. –	– – –	12934.. 0.. 7
		~~xx~~. co.		£67025.. 6.. 8

Overmens Bills on 2944..6 Cost

Vend		Ch:	
1837.	Best – –	54,293	
	Small –	12,015	66308
1838.	Best – –	59,679	
	Small –	14,291	73970
1839.	Best – –	59,545	
	Small –	12,539	72084
		Total Chas. – – –	212362

Produced of Best Coals

	Ch:	
Best Coals vended in 1837 –	54293	
– 8. –	59679	
– 9. –	59545	173517

Then 173517 Chald = 2.092 Chald: per Score produced of Best Coals
82944 Scores

[53]

Produce of Small Coals

Small vended in 1837 –	Ch:	12015
1838 –		14291
1839 –		12539
Total – – – –		38845.

Then 38845 Chald: = 0.468 Ch: per ~~xx~~.
82944 Scores

A Score of 7 Cwt Corves (20 to the Score) contains 2.641 Chaldrons of 53 Cwt. Ch:
Then – – – – – – – – – 2.641
Best Coal as above 2.092

[54]

	£ s d
Then 19..18..0 X 52 Weeks =	£1034..16..0
Average for last 3 years £2984..67 / 3 =	994..15..6
More than the Actual Average	£40.. 0..0

But Richd. Marshall the Engine Wright's Salary must be added which at 36/- P. Week X 52 = £93..12.. –

Add as above	1034..16.. –
Wrights & Joiners – – – – –	£1128.. 8.. –

Smiths Work for 3 Years £ 2851..16..9 = 953..12..3
may be assumed at £1042..11..3 as in 1839

Small – – – – – – – 0.468 2.560
Waste – – – – – – – 0.081
Or nearly One Twelth for Workmen's Fire Coal Engines, & Landsale . – – – – – – – – – –

Overmen's Bills.

During the Years 1837,1838,1839. The Overmen's Bills on the Best Coals Vended viz 173517 Ch: Amounted to £67015..6..8 equal to nearly 7s/ 9d per Chaldron.

Amount of Wright Work 3 Years £2984..6..7

This however includes a good deal of extra work in building new Houses, Waggons &c. – hence the necessity of Estimating what the regular Establishment of Wrights & Joiners should be.

2Y ? 2 Engine Wrights @ 21/- P week each £2.. 2.. –
5 Journeymen & Apprentices – – – – – 4.. 0.. –
6 Joiners at Trams, Sheaves, Brattice Water Tubs, Railways &c. 18/- – } 5.. 8.. –
Waggon Wrights – 4 @ 18/- P. week ea 3..12.. –
Sawyers – 4 @ 24/- – – – – – – – 4..16.. –
£19..18.. –

[Bud-33]

Masons Work for 3 Years £ 1548..10..0 Average £516.. 3..7 – There were 8 Houses Built in 1838, and 11 in 1839

Bill in 1838 – £441.. 0..7
8 Houses @ £10 – 80
Ded – – – – £361.. – ..7

1839. Bill – – £498..16..10
11 Houses & 10£ – 110.. – .. – 388..16..10
For two Years – – – – – – £749..17.. 6

Say £374..18..8 – But the Establishment of Mason which may be required Repairing Houses &c. say – – 6 Men at 21/- ea:: – – £6..6..0
4 Labourers @ 15/- – 6..0..0
weeks £9..6..0
£9..6..0 X 52 = £483..12.. –

Main Engine Cost working in 3 Years £593..3..4 Average £197..14..5

Labourage Cost £2274..4..4 for 3 Years – Average £758..1..5 – The Bills in 1839 Amounted to £621..10..7 – And 30 £ per would be equal to £780. The Average of 26 pays in 1840 is 26 £ = £676

[55]

Farm Labourage – (2 ½ Years) – – – – – – – £1216.. 8..11
Average £486..11..0

Filling Coals. In 3 years – £944.. 2..2 Average £314..14.. 1

Staith Expences. 3 years £992..16..5 Average £330..18..10

Store Keeper. Constant – – – – – – – – – – – – £ 20..16.. –

Sadler. In 3 Years £140..11.. 4 Average £46..17.. 1
A man at 21/- P. week sufficient = £54..12.. 0

Clerk & Under Viewer 3 years £462 = P.Ann = £156..

Rates, Cesses, Taxes In 3 yrs £696 = p.Ann = £232..

Dammaged Ground per Annum = £250..

Surgery – – – – – – per Annum – – – – – – – £75..

Law Expences For 2 years £25..9..6 Av: – – – £15..

Binding Expences – 3 years £131..11..2 Aver: £43..17.. 1

[56]

Colliery Rents. Ch 58000 @ 20/- P. Ten
12000 @ 7/ 6 – £3571.. 8..6½

Wayleave Rents – The Duke of Northumberland
Best 3314 Tens 120 Bolls
Small 685 – – – 300
4000.. – @10/ 6 £2100.. –
Tens Bolls

Sir F. Blake 70,000 Ch = 3818..80 @ 3/- – 572..14..6
Miss Liddell Certn. Rent – – – – – – – – – – – – – 100.. –
Owners of Backworth Colliery – – – – – – – – – – 100..
£2872..14..6

Purchase & Keep of Horses
Hay & Corn in 1839 – – – – – £2684..13..11

Brick Making – 2 years £341..5..6 Aver: – – – £170..12.. 9
Quarry Expences 2 years £57..12..2 Aver: – – £28..16.. 1
Dredging – in 1838 – £55..9..11 say – – – – – – £18.. ~~P. Ann:~~
Insurances – 3 years £59..11..-- Aver: – – – – – £19..17.. –
Fitting Office Ex: 3 years £1965..16..10 Av: – £655.. 5.. 7
Ded[t]. Interest – – £303..4..10
Incidentals – £90
Ditto 1837 £114..14..7 – 1838 £193..6..10 Av: say 154£
in all £244 P Ann.

[Bud-33]

Difference of Stock – – – – – – – 11..10.. –
8 Extra Horses @ £52..10 – – – – 420.. – .. –
Add keeping up Stock 7 @ £35 – – – 245.. – .. –
Annual Cost of Horses, Hay & Corn £3461.. 3..11
N.B. Establishment of Horses in 1839 –
Underground 42
Above Ground 24
66
Allowed for increase in Underg[d.]. Horses during
the Term 12 Making
Underground – 54
Bank say – – – 20
74
Damaged Ground. 3 years 861..5..0 Aver: say £250.. –
Leading Coals – – – – – £6974..19..3
Farm Rent – – – – – – – £ 340.. –
House Rent – – – – – – £ 233.. 5..6

[57] **Working Charges Collected.**

	£	s	d
Overmen's Bills 58000 Ch: @ 7/ 9 – – – – – – – – –	22475	10	–
Wrights and Joiners – – – – – – – – – – – – – – – – –	1128	8	–
Smiths –	1042	11	3
Masons –	483	12	–
Main Engine –	197	14	5
Labourage –	676	–	–
Farm ditto –	486	11	–
Filling Coals –	314	14	1
Staith Expences – – – – – – – – – – – – – – – – – – –	330	18	10
Storekeeper –	20	16	–
Sadler –	54	12	–
Incidental Charges – – – – – – – – – – – – – – – – – –	244	–	–
Leading Coals –	6974	19	3
Clerk & Under Viewer – – – – – – – – – – – – – – – –	156	–	–
Rates Cesses & Taxes – – – – – – – – – – – – – – – –	232	–	–
Colliery Rents – – – – – – – – – – – – – – – – – – –	3571	8	6½
Wayleave Rents – – – – – – – – – – – – – – – – – – –	2872	14	6½

[58]

M[r]. Forster fixed the Selling price of the Coals at 8/- Per Ton, or 21/ 2½ per Newcastle Chaldron.

Estimated Proceeds

58,000 Ch: or 153,700 Tons. Best @ 8/- £61480.. – .. –
12,000 Ch: of Small – – – – – – – @ 6/- 3600.. – .. –
Farm Produce – – – – – – – – – – – – – – – – 500.. – .. –
Landsale Coals – – say – – – – – – – – – – – – 30.. – .. –
Average Sales of Old Materials – – – – – – 795.. 5.. 3
Receipt Sales – – – – – – 66405.. – .. –
Working Charges – – – – 51,266.. 2..8
Apparent Profit – – – – £15,138..17..4

Deduct Expence of Working & Leading an extra quantity of Coals to Railway Engines for Leading the Seaton Delaval Coals 1750 Ch: @ 1/ 7 – – – – – – – – – – – – – 138..10..10
£15,000.. 6.. 6

This Considered as an Annuity for 18 Years at 14 per Cent, is worth in £ s d

Farm Rents –	340	–	–
House Rents –	223	5	6
Damaged Ground –	250	–	–
Surgery –	75	–	–
Law Expences –	15	–	–
Binding Expences –	43	17	1
Brick Making –	170	12	9
Agency at Colliery –	400	–	–
Quarry Expences –	28	16	1
Dredging –	18	–	–
Insurances –	19	17	–
Fitting Office Expences – – – – – – – – – – – – – – – –	655	5	7
Discounts –	303	4	
Tradesmen's Bills –	4000	–	–
Keep & Purchase of Horses – – – – – – – – – – – – – –	3461	3	11
£	51266	2	8

[Bud-33]

Present Money 6.4675 Years purchasor 97014..12.. –
Live Moveable Stock – – – – – – – – – 120584.. 5.. 7
Fixed D^{o}. Exclusive of Railway Stocks
£24796..3 from which deducting
35 per Cent for deterioration in Value
at the end of the Term leaves £16118
worth in present Money at 5 P. Cent,
0.4155 Years Purchase – – – or – – – – 6697.. – .. 5

Total Value of Colliery – – – – – – £115795..18.. –

[59]

Railway – Value thereof

For the 18 Years of the Term new remaining unexpired the receipts for Coal led from Seaton Delaval Colliery will be all profit but 1 Year has already elapsed – leaving 17 Years.

Suppose the Leading of the Seaton Delaval Coals to commence June 1841 and that the quantity led during the 1st. Year is 30,000 Ch: Then 30,000 @ 1/ 6 = £2250 which considered as an Annuity for One Year, commencing One Year hence, and allowing at the rate of 8 Pr C^{t}. is worth in present Money 0.8573 Years purchase – or – – – – – – – – – – – – – – – £1928..18.. 6

2 years 1.7833
1 – 9259
0.8574

For the 2^{d}. Year ending June 1843 (the Leadings being estimated at 60,000 Ch:) 60,000 @ 1/ 6 = £4500 which Sum considered as an Annuity for 1 Year, commencing 2 Years hence at 8 Pr Cent, is worth

3 years 2.5771
2 – 1.7533

[60]

Value of Railway after the expiration of the present Lease of Cramlington Colliery. (18 Years).

The Revisionary Value to the determination of the Seaton Delaval Colliery Lease – (31 – 18) – 13 Years' Annuity (of 110,000 Ch: @ 1/ 6) – – £8250
Cramlington for the same period 70,000 Ch @ 1/ 6 – – – – – 5250
£13500
Deduct the Expence of Leading – – – – – – – – – 6621
£6879

This Sum taken as an Annuity for 13 Years commencing 18 Years hence is worth 9.4790
8.2014 1.2776
Years Purchase or £8788..12.. 2
Bro^{t}. Forward – – – – – – 51,145.. 5.. 6
£59,933..17.. 8

Railway Stock – – – £20526..5.. –
Ded: 40 per Cent for Deterioration – – 8210..5

0.7938	0.7938 Years Purchase – – – – or – – – 3572.. 2.. –
	For the 3d. Year (the Leading being
	estimated at 75000 Ch:) –
	75000 @ 1/ 6 – – – £5625 –
	which as an Annuity for One
4 years 3.3121	Year, Commencing 3 Years hence
3 – 2.5771	is worth in present Money
0.7350	0.7350 Years Purchase or – – – – – – 4134.. 7.. 6
	For the Remainder of the Term
	the Vend is estimated at 110,000 Ch:
	which @ 1/ 6 Anm. To – £8250
18 years 8.2014	& which consd. as an Annuity for
2 – 3.1699	14 Years, commencing 4 Years hence
5.0315	is worth at 10 P Ct. 5.0315 y P. or – – 41509..17.. 6
	Value of Railway for 18 Years £51,145.. 5.. 6
	[Bud-33]

£12316.. –

Which to be recd. at the end of 31 Years
at 5 Per Cent is worth, in present Money
0.2204 Years Purchase – – or – – – – 2,714.. 8..11

Total Value of R. Way. £62,648.. 6.. 7

[61]

Value of the Colliery as per page – – – – – £115795..18.. –

Add for Overcharge for Leading viz
1st. Year 70,000 Ch: led & 200,000 Estimated.
200,000 : £3541 : : 70,000 Ch : £1239..7.. –
And 3541 – 1239..9 = £2302
Overcharge for Labour = 598
£2900
which at 14 Per Ct. & receiveable at
the end of 1 year id worth 0.87719
Years Purchase or – – – – – – – – – – £2543..17..0

2d. Year: 100,000 Ch:
200,000 : 3541 : : 100,000 : 1770.
Labour – – – – – – 598
£2368 @ 14 Ps.
Ct. Anuity for 1 Year, Commencing
1 Tear hence, is worth 0.76946 y P. or 1822.. 1..7

3d. Year: 130,000 Ch:
200,000 : 3541 : : 130000 : 1239 at

[62]

Colliery – – – £122,832..14..7
Railway – – – – 62,648.. 6..7
Grand Total £185,481.. 1..2

Additional Memorandua.

Quantity of Best Coals Shipped from Cramlington
Colliery in 1840 (as Pr. Mr. Straker 56,467 Chaldrons.
Mr. Hindhaugh's Letter to Mr. Buddle.

Round Coals – –	1839 – – –	1840 – –	decrease.
Coast – – – –	17073 – –	16050 – –	1023
Oversea – – –	24472 – –	40417 – –	2055
	59545 – –	56467 – –	3078.

"The Apparent descrepancy between the decrease in the
"Coast Vend and in the Trade Issues is owing to some
"overs having paid off in 1839 – Some Shorts ~~vended~~ in
"1839 Vended in 1840 and a few Tons over at the end of 1840"

Mr. Hindhaugh to Mr. Buddle. Dec: 28 : 1840.
"We are selling the Cramlington Best Coal, as under,
Oversea – Public Contracts 8/- per Ton on Board.
Merchants – – – 8/ 6 – – – .. – – – – –

14 P C^{t}. One Year Commencing 2
Years hence is worth 0.67498 Y P. or 836.. 6.. –

4th. Year: 145,000 Ch:
200,000 : 14500 : : 974 @ 14 : 1239 at
P. C^{t}. for 1 Year Commencing 3 hence
is worth 0.592 Years Purch: or – – – – 576..12.. –
Ch.
Remainder – 180,000 instead of
200,000 Ch: is $^{1}/_{10}$th. or £354 – which
at 14 P.Cent, considered as an
Annuity for 18 Years commencg:
4 Years hence is worth 3.55381
Years Purchase – or – – – – – – – – – – 1258.. – .. – 7036..16.. 7
Total value of the Colliery – – £122,832..14.. 7

[Bud-33]

Coastwise – – – 8/ 9 – – – .. – – – – –

[63]

"London – principally Freighted, a few Sales at 8/ 9 , 9/-
"and a Small quantity at 9/ 3. The Freighted to the end
"of October have produced 7^{s}/ 8½^{d}. " (Spoutage included).

"The Actual Produce of the Vend this Year (1840)
"to the end of October is:

83,491 Tons @ 8/ 6
9,116 – – – – 8/ 9
4,272 – – – – 9/-
964 – – – – 9/ 3
20,894 – – – – 8/-
7 – – – – 8/ 3
13,138 – – – – 7/ 8½ Freighted to London
131,882

"River Vend : Rough Small – 8/- per Ch:
Common ditto 6/-
"of the latter there is the largest proportion".

Minutes respecting the Colliery Stock
The Stock was Valued as being worth } £ s d

[64]

Bro^{t}. Forward – – – £5720..18.. – £67768..13..7
Furnace and Incl: Plane – – 90.. – .. –
Man Doors – – – – – – – – – – – 1.. 5.. –
Engines – – – – – – – – – – – 3696..13..5
R. Way Stock – – – – – – – 11251..13.. –
Ditto. – – – – – – – – – – – – 1586.. – .. –
Hauling Engine – – – – – – –7050.. – .. –
Materials at Staith – – – – – – 25.. – .. – 29422..13..5
Houses as P^{r}. Valuation. – £17,331.. – .. –
Ded: Wood Tunnels £16.. –
Old Staith – – – – 2050.. –
New ditto – – – – – 2228.. –
Wood Houses – – 1410.. –
Ditto – – – – – – 1485.. –
Brick Cabins at Staith } 20.. – 7,209.. – .. –

Which cannot be turned into Money – – – } 10,122..
Staiths &c. as above – – – – – – – – – – – – – – – – 7209.. – .. –

on the 31st. Dec: 1839. – – – 67,768..13..7

R.J.A's Minutes as to Fixed & Moveable – –

Fixed or Dead Stock } Settle Board plates, at Pit – – £75..18.. –
Branches £c. – – – – – – – – – 500.. – .. –
Anne Pit, Plates &c. – – – – – 71.. 6.. –
Skreens – – – – – – – – – – – 200.. – .. –
Saw Pits &c. – – – – – – – – – 24.. – .. –
Palings – – – – – – – – – – – – – 59.. – .. –
Engine Pit, – Plates &c. – – 1990..16.. –
Props – – – – – – – – – – – – – 165..15.. 6
Stables & Inclined Plane – – 57.. – .. –
Anne Pit, Plates &c. – – – – 2312.. 9.. 6
Props – – – – – – – – – – – – – 264..14.. –
Forwd. – – £

[Bud-33]

Value of Fixed Stock – – – – – 36,631..13..5
do. Moveable Ditto – – – 31,137.. 0..2
Total – – – £67,768..13..7

N.B. The Value of the Dead or Fixed Stock was afterwards Estimated at – £24796.. 3.. –
R. Way Ditto – – – – – – – – 20526.. 5.. –
Live or Moveable Stock – – 12084.. 5.. 7
Total – – – £57,406..13..7
(I have no Mem: of the details of the altered Account)
(R.J.A.)

[65]

An Acct. of Labourage on the Cramlington Railway for a Fortnight's Pay (Decr. 1st. to & with 15th. 1840).

No. 1. Colliery Engine – Plane 1 Mile Engine 25 HP.
1 Brakesman 12 days @ 3/ 2 Boilers 6/- – £2.. 4.. –
1 Fireman – 12 – 2/- – – – – – – – 1.. 4.. –
1 Attending Rollies 12 @ ½ – – – – – – – – ..14.. –
2 Waggon Riders ea 12 @ 2/ 6 – – – – – 3.. – .. – £7.. 2.. –

No. 2. Seghill Engine – 28 Horse Power = draws 1 Mile next the Colliery, and 1300 Fathoms to Backworth.
1 Brakesman (as above) – – – – – – – – – £2.. 4.. –
Waggon-riders, Fireman, and attending Rollers – – – – – – } – – 4.. 8.. – £6..12.. –

No. 3. Backworth Engine – 38 Horse Power = Planes 1300 Fas. S. & 1120 N. from Backws.
1 Brakesman (as above) – – – – – – – – – £2.. 4.. –

[66]

Brot. Forward – – – – – – – – – £33..15.. –

No. 5. Murton Row Engine – 34 Horse Power. Planes 925 Fa: N. & 1350 So. –
1 Brakesman & Boilers 24/- days – – – – – £2.. 8.. –
1 Fireman – 1 Rider – 24/- @ 2/ 6 – – – – – 3.. – .. –
1 Bank-head & 1 Rider 24/- @ 2/6 – – – – – – 3.. – .. –
2 Attending Rollies 24 @ 1/ 6 – – – – – – – 1 ..16.. – 10.. 4.. –

No. 6. Staith Inclines – 400 Yards
1 Brakesman 24 days @ 2/ 6 – – – – – – – £3.. 0.. –
2 Bankhead Men 24 – @ 2/- – – – – – – – – 2.. 8.. –
1 Assistant – – – 12 – – 1/ 4 – – – – – – – – ..16.. –
2 Greasing Waggons & Sheaves 24 @ 2/ 6 3.. – .. –
2 Ditto & Minding Switches 24 @ 2/ 4 – – – – 2..16.. –
Engine Wright – – – 6 days @ 6/- – – – – – 1..16.. –
1 Setting Sheaves – 12 – @ 3/- – – – – – 1..16.. –

Repairing & Laying R.Way Pr. Bargain – – – 22.. – .. –

1 Fireman. 1 Bankhead 24 @ 2/ 6 & clean & Boilers 3/- — 3.. 3.. –
1 Attending Rollies – & 1 Assit & Fireman 24/- – @ ¼ – – – – – – – 1..12.. –
1 Attending Rollies – 12 @ ½ – – – – – – – ..14.. –
1 Waggon Riders – 12 @ 2/ 6 – – – – – – – 1..10.. – — 9.. 3.. –

N°. 4. Prospect Engine – 54 Horse Power
Planes 1120 Fa: N. from Backworth & 1350 S. to Murton.
1 Brakesman & Cleaning Boilers – – – – £2.. 8.. –
1 Fireman – – – 12 & 1/ 8 – – – – – – – – 1..12.. –
Bank-head & Waggon Rider 24/- @ 2/6 3.. – .. –
Extra Waggon Rider – 12 – 2 / 6 – – – 1..10.. –
2 Attending Rollies – 1 Assisting Fire Man – – 36 – @ ¼ – – – – – – – 2.. 8.. – — 10..18.. –
Forw^d. – – – £33..15.. –

[Bud-33]

Police – – – – – – – 24 days @ 3/- – – – – – 3..12.. –
Spare Brakesmen 12 – @ 3/ 6 – – – – – – 2.. 2.. –
Labourage – – – – 60 days @ 2/ 4 – – – – – – 7.. – .. –
Drivers at Staith – – 36 – @ 2/ 6 – – – – – – 4..10.. –
Extra Labouage – – 12 – @ 2/- – – – – – – 1.. 8.. –
Watching Railway – 6 - @ 2/- – – – – – ..12.. –
Lodging Money – – – – – – – – – – – – – – – – – 1.. 4.. –
Masons & Labourers – – – – – – – – – – – – – – – – 9..18.. 8 — 78.. 2.. 8
111..17.. 8
2 Men & 3 Horses taking Ropes out every Monday Morning – – – – – – – – – – – – – – – – 1.. 8.. –
£113.. 5.. 8

The Whole length of the Way is 7¼ Miles. – –

[67]

Expence of Ropes for One Year (1840) ?

	Faths.				
Anne Pit Bank	1. 1200 –	60.. 3.. 4	@ 44/-	– –	£133..14.. 7
Seghill D°. –	2. 973 –	109.. 2..26	@ 44/-	– –	240..17.. 3
Backworth – –	1. 1346 –	80.. 2.. 7	@ 43/-	– –	173.. 4.. 2
Ditto – –	1. 1346 –	74.. 3..14	@ 44/-	– –	164..14.. 6
Prospect Hill –	1. 2050 –	133.. 1.. –	@ 57/-	– –	246..10.. 3
Ditto – –	2. 1135 –	158.. 1..12	@ 39/-	– –	308..15..11
Staith – – – –	4. 130 –	38.. – ..10	@ 50/-	– –	95.. 4.. 5
		655.. 2..17			
					£1362.. 1.. 1

Leading Expences in 1837.
Labour as per Railway Bills – – – – – – – – – – – – – £2956..12.. 1
Whale Oil – – – – 150 Galls @ 4/- £30.. – .. –
Sweet Oil – – – – 40 – @ 5/- 10.. – .. –
Grease – – – – – 110 Firk @ 31/- 170..10.. –
Tallow & Candles – – – – – – – – – – 72..16.. –
White Spun Yarn, Oakum &c. – – – 47.. – .. –

[68]

Average Expence per Fortnight, during the Years 1837-8-9. on the Cramlington Railway. – (Exclusive of Rails & Sleepers for Repairs).

Iron & Workmanship – – – – – – – £7.. 2.. 6
Joiners Work – – – – – – – – – – – – 5.. 1.. 6
6 Firkins of Grease @ £1..11.6 – – 9.. 9.. –
4 Gallons of Train Oil @ 4/- – – – ..16.. –
2 d°. Sweet d°. @ 6/- – – – ..12.. –
3 Quarters of Tallow @ 6 P. lb. – 2.. 2.. –
12 Sheaves & Stands @ 10/ 6 – – 6.. 6.. –
3 Rollers – – – – – – @ 22/ 6 – – – 3.. 7.. 6
2 lb. Candles – – – @ 6 ½^d. – – – .. 1.. 1
2 St. 6lb Spun Yarn @ 6 – – – – – ..17.. 0
£35..14.. 1

Marshall's Estimate of the Additional Cost of Leading the Seaton Delaval Coals, one Fortnight

White-Lead – – – 12 Cw^{t}. @ 40/- 24.. – .. –
Rails & Chains – Ton & £8/6 C[ ] – 85.. – .. –
Sleepers – – – – 350 – – @ 1/- – – 17..10.. –
630 Sheaves & Rollers @ 12/- – 216.. – .. –
Iron & Smith Work – – – – – – – – 156.. – .. –
Fire Bricks &c. – – – – – – – – – – – 50.. – .. –
2 Spur wheels for Engines @£12..10 25.. – .. –
New Ropes – – – – – – £1363
Ded: Old Rope sold – 210 1153.. – .. –
Boiler Pillars & Engine Bars – – – – 50.. – .. – 2106..16.. –
£5063.. 8.. 1

[Bud-33]

N°. 1. As per last Estimate – – – – – £7..2..0
N°. 2. 1 Man @ 15/- – £1..10.. 0
1 Boy – @ 8/- – – ..16.. –
Overtime 1 – 3/ 2
– 3 – 2/ 6
– 3 – 1/ 4 – ..17.. –
– 1 – 2/ 4
Cost as formerly Estm: – 6..12.. – 9..15.. –

N°. 3. Former Est: Cost – £9.. 3.. 0
1 Additional Brakes-
-man @ 15/- P. week 1..10.. 0
1 Boy – @ 9/- – – – – – ..18.. –
Brakesmans Overtime
2 days @ 3/ 2 – – – .. 6.. 4
4 Firemen ea: 2 @2/ 1 – .. 1.. –
4 D^{o}. ea: 2 @ 1/ 4 – ..10.. 8 13.. 8.. 0
Forward – – £30.. 5.. –

[69]

Bro^{t}. Forward – – – – – – – – – £30.. 5.. –
N°. 4. Former Estimate – – – £10..18.. 0
1 Add^{l}. Man @ 15 P. week – 1..10.. –
1 Bag – – @ 9/- – – – – ..18.. –
Overtime. 1 Brakesm^{n}.
2 weeks days @3/ 6 – .. 7.. –
Fireman – @ 2/ 8 – – – – .. 5.. 4
3 d^{o}. ea: 2 days @ 2/ 6 – ..15.. –
1 Boy – d^{o}. 1/ 6 – – – – .. 9.. –
other additional hands.
2 – @ 2/ 6 = 5/-
2 – @ 1/ 6 = 3/- – – – – .. 8.. –
Greaser – – – – – – – – – – – .. 5.. – 15..15.. 4

[Pages 70 to 75 are Blank]

[76]

Febr$^{y.}$ 1840.

Prudhoe and Wylam Collieries.

Those Collieries immediately adjoin each other and are both worked by Cha. Blackett Esqr. – Wylam being his own property and Prudhoe Main held by lease, under Lord Prudh[oe] & Robt. Capper Esqr.

Notwithstanding their contiguity. And manner in which they are connected in consequence of having been worked by the same Owner, those Collieries have hitherto been carried on as separate concerns and for reasons advanced in M^{r}. Buddle's Report of Decr. 1838. no underground communication has taken place, and further, for their more effectual separation, advantage has been taken of the Slip Dyke which runs between the two Collieries, and which as is observed in the Report above alluded to, forms a natural barrier between them.

[Bud-33]

Considering the way in which those Collieries are situated with respect to each other, it may readily be supposed that the accounts must have been in some degree mixed, but it seems highly desirable, for many reasons, that the Statements and Estimates for each should be kept entirely distinct.

M^r^. Blackett being Lessor in one case, and merely Lessee in the other the position of an entering partner would not be the same in both instances, and therefore the principles on which a person would proceed in making a valuation for a Purchaser, must of necessity be widely different.

The produce of each Colliery is shipped independently – that of Wylam on the North, and that of Prudhoe Main on the South side of the Tyne, with perfectly distinct Staith Establishments, Wayleave &c. &c.

Wylam Colliery has been long established – while Prudhoe Main has been recently won – and even now can scarcely be considered fairly under way – hence arises a difficulty in the consideration of this Colliery as regards the probable future working Cost – the Accounts for 1939 not presenting a proper basis on which to proceed in estimating for the Mason that

[77]

during that Year many of the Charges both for labour and materials have been extras, such as usually attend the opening out of a New Colliery rather than current Charges hereafter to be incurred in carrying it on.

It is for those reasons that the charges upon the two Collieries have been carefully dissected, and in the statements and Estimates which will follow, no item of expenditure or Receipt belonging to <u>one</u> (as far as could possibly be avoided) been placed to the account of the other.

Prudhoe Main Colliery is held by Lease under Lord Prudhoe and Robt. Capper Esq: at the following Rents –

<u>Lord Prudhoe.</u>

Certain Rent £400 per Annum

* Quay can be Outstroke Rent be avoided; While Water Courses between the

[78]

Mine having been the produce of a pair of South East exploring Headways, which are being driven for the purpose of proving the S.E. part of the Colliery.

The Tract of Coal to be gained by the present winning is of very limited extent being circumscribed by Dykes, both on the East and <at>
West sides of the Pit, and^no great distance from it. On this account another Pit will shortly have to be sunk.

It may not be considered exactly within the province of this paper to touch upon the site of such New Pit, but looking at the great difference of Rent between the two Royalties, and the saving to the Colliery which might be effected by working a larger proportion out of Capper's Mine, and drawing the Coals in his Ground,

Tentale on Best Coals – – – – 32/-
Ditto on Small – – – – – – – 15/-
Outstroke Rent – – – – – – – 1/ 6
Shaft Rent – – – – – – – – – – – 1/ 6
Wayleave Rent – – – – – – – 2/-

M^r^. Capper.

Certain Rent £200 per Annum
Tentale on Best Coals – – – – 18/-
Ditto on Small – – – – – – – 9/-
Iron Stone per – – – – – – – – 7^d^.
Wayleave Rent – – – – – – – –3/-

Lord Prudhoe's Ten consists of 420 Bolls, and the Rent is paid upon the Leadings.

M^r^. Capper's Ten consists of 480 Bolls, and he allows 50 Tens Rent free for home purposes.

In Capper's Lease all Coals are considered as best which are sold for 9/- per Chaldron.

The present winning is in Lord Prudhoe's Ground, and within a short distance of the Newcastle & Carlisle Railway along which the Coals are at present sent to Dunstan Staiths at a cost of 3/ 2 P. Chaldron, exclusive of Staith Rent and Wayleave Rents claimed by Lord Ravensworth.

Hitherto nearly the whole of the workings have been confined to Lord Rrudhoe's Royalty – the only Coal wro^t^. out of Capper's

[Bud-33]

two Properties are kept open?

(thereby saving Lord Prodhoe's Outstroke Rent* and a long underground lead) it is submitted that the most eligible place for a new Pit, would be to the South east of the present winning & in Capper's property the Coals to be brought to the John Pit Branches by a self acting Inclined Plane – in such case these would only be the 2/- per Ten wayleave Rent to pay Lord Prudhoe

" Hingeing on the above query

<Ten>
instead of 5/-" which he is entitled to upon each ^ of Capper's Coal drawn in the other Royalty – Further on is given an estimate of the Cost of working 9686 ~~xx~~. of Coals (the quantity drawn in 1839) in equal portions from Lord Prudhoe and Capper's property, for the purpose of shewing that by the above named arrangement, a considerable saving to the Colliery would take place.

Before giving the general Statement for 1839, it may be proper to observe that in addition to the extra outlay for labour and Materials mentioned at Pa. 2. there has been the almost unprecedented high rate of Freight during a great portion of the Year to contend against beside great drawbacks in the Shape of Fittage; while endeavouring to get the Coals established at mar[g

The cost of leading the Coals to Dunstan is high, but it is intended when the Railway Comp^y^. Arrangements for shipping at Shields are completed, to send them at once to Shields, which will necessarily be a great advantage to M^r^. Blackett, if the Charges are reasonable – as the Coals will be sent to market in a better state, than is the proposal by the present mode of Shipment.

Judging by the proposal made for leading the Stella Coals to Shields, along the Newcastle & Carlisle Railway and Brandling Junction Railway, it may be calculated that the cost to

[79]

M^r^. Blackett for the Prudhoe Main Coals would be about $^5/_8$ per Ch. or viz

	s	d
From Stella – – – – – – – – – – –	4..	6
4 Miles further to Prudhoe at 3^d^. P. Ch. P. mile	1..	0
$^5/_8$^d^. per mile for waggons. – –	0..	2½
	5..	8½

[80]

Prudhoe Main Colliery

1839. General Statement.

Overmans Bills on 9686 of 20 Peck Tubs, including all underground charges, Brakemen, Firemen Wailers Heap Keepers &c. but no materials – – – – – – – £	5310	4	6½
Smiths, Wrights, Masons Labourers, House Rents Wayleave & Damaged Ground, Rates, Cesses & Taxes			

But upon a large quantity, it may be supposed that the R. Way Co^{s}. May be induced to take say 5/ 6 P. Chald. making a difference of only 2/ 4 P. Chal. between the present cost of taking the Coals to Dunstan – and direct to Shields.

It may be some time before this change in the mode of Shipping the Coals can be carried into effect, on account of the necessary preparations at Shields not yet being complete, but there is no doubt that ultimately it will be found to be for the benefit of all the estimate a Page 11th. it is assumed that the Coals are sent direct to Shields at a cost as above of 5/ 6 P. Ch. – The Dunstan Staith being held for the vend of Small and Inferior Coals by River Sales.

It would however be a question, whether under these circumstances, it was necessary to have Staiths at Dunstan at all – the cost of leading the Small is now 3/ 2 – and for makings in Staith and Wayleave Rent, & Staith Charges, at best another shilling should be added – making 4/ 2 in all – and taking the selling Price of Small at 8/ 6 – this would only leave 4/ 4 P. Ch. to cover the Cost of producing this article. It seems therefore, very desirable, that as much Small Coal as Possible should be Coked, supplied to the iron Works or otherwise got rid of in the immediate vicinity of the Colliery; any accumulation to be sent to and Shipped at the Gateshead Drops.

[Bud-33]

Wherry hire, Colliery Rents, Hay & Corn, and sundry small Tradesmen's Bills. –				3233	12	5½
Tradesmen's Bills –				2250	6	8
Staith Charges – – – – – – – – – – – – – – £	391	4	9			
Fitting Office expences – – – – – – – – – –	127	10	–			
Fittage (Cash) – – – – – – – – – – – – – – –	457	9	5			
ditto (allowed) – – – – – – – – – – – – – – –	318	9	2			
Owners wages – – – – – – – – – – – – – – –	163	8	2			
Railway Charges – – – – – – – – – – – – – – –	2627	8	5	4085	19	11
Wayleave Rent claimed by Lord Ravensworth	75	–	–			
Staith Rent (say) – – – – – – – – – – – – – – –	50	–	–	125	–	–
Firecoal for 72 workmen supplied from Wylam Colliery at 18 Fothers of 8 Bolls 336 ch@ 8/ 6 –				142	16	–
				15688	13	1

Amount of Sales.

Ship Sales – – – – – – – – – – – – – – – – – –	12162	19	–
River ditto – – – – – – – – – – – – – – – – – – –	309	2	–
Carried Forward – – £	12472	1	–

[81]

General Statement Continued.

Bro^{t}. Forward – – – £	12472	1	–	15688	13	1
Landsales – – – – – – – – – – – – – – –	208	11	9			
Coke Ovens – – – – – – – – – – – – – – –	1130	12	–			
Thompson's Iron Works – – – – – } Value of resting Coals more than at Decr. 31st. 1838.	175	5	–			
	254	3	–	14240	12	9
Loss. £				1448	–	4

There is an overcharge of £129..2..0f or Workmen's Fire Coal (see the Abstract) leaving the net loss £131..18..4.

[82]

An Approximate Estimate on 9686 ~~xx~~. to be worked in equal Portions from Lord Prudhoe & M^{r}. Capper's Royalties.

Pit Bills, as before – – – – – – – – – – – – – –	– –	–	£	5310	4	6
Smith Work – – – – – – – – – – – – – – – – –	96	12	6			
Wright Work – – – – – – – – – – – – – – – – –	94	11	9			
Mason Work (say) – – – – – – – – – – – – – –	90	–	–			
Labourage – – – – – – – – – – – – – – – – – –	173	11	3			
House Rents – – – – – – – – – – – – – – – – –	187	14	7			
Salaries – – – – – – – – – – – – – – – – – – –	195	–	–	837	10	1
Tradesmen's Bills 19286 Ch. @ 2/- P. Ch.				1928	12	–
Staith Rent, Wayleave & Damageed Ground				267	16	–

It will be seen in the Appendix Pa. That during the Year 4610 Chald. Of Prudhoe Main Coals have been shipped as "Wylam", Had they been sent as Prudhoe Main Coals the loss would have been greater than shewn in the last page

The Claim of £75 for Wayleave Rent by Lord Ravensworth has lately been made, and will without doubt have to be paid

The Staith Rent is not yet fixed, and in the foregoing Statements is assumed at £50.

As regards the Fire Coal charges it is evident that had the 72 Workmen been supplied from Prudhoe, the quantity of Small Coal sold, and placed to the credit of the Colliery, must have been less by 336 Chaldrons.

This change will not effect the Collieries considered jointly, as Wylam will be given credit for the same quantity.

The Coals supplied to the Cinder Ovens are also placed to the Credit of Prudhoe Main and charged against Wylam. The cost of leading those Coals from Hagg Bridge to Wylam Bridge End is included in the Public Railway Charge.

[Bud-33]

Leading 12514 Ch^{s}. Best Coals to Shields @ 5/ 6 P. Ch. – – – – – – – – – –	3441	7	–			
2350 Ch. of Small, unskreened Splint &c. to Dunstan Staith @ 3/ 2 – – – – – –	372	1	8			
3198 Ch. small to Coke Ovens, & Wylam Iron Works,from Hagg Bridge to Wylam Bridge Endby the Newcastle and Carlisle Railway @ 6^{d}. – – – – – – – – – – – – – – – –	79	19	–	3893	7	8
Colliery Rents.						
Lord Prudhoe.						
Ch. 6400 Best = Tens 365.300 @ 23/- – –	585	2	10			
3097 Small = – 186.408 @ 15/- – –	132	14	4½			
M^{r}. Capper.						
Ch. 6400 Best = Tens 320.000 @ 18/- – –	288	–	–			
3097 Small = – 154.408 @ 9/- – –	69	13	7½			
	1075	10	10			
Ded. 50 Tens allowed by M^{r}. Capper for home Consideration at 9/- P.Ten & say a like amount for Coal supplied to Workmen Rent free from Lord Prudhoe. – – – – – – – – – – – – – – – – –	45	–	–			
	1030	10	10	1030	10	10
Forward – – – – £				13268	1	1

[83]

Estimate on 9686 ~~xx~~. continued

Bro^{t}. Forward – – – £				13268	1	1
19286 Ch. @ for Wayleave & Outstroke Rents. The Ten taken at 450 Bolls, being the mean between Lord Prudhoe & Capper	155	14	6	155	14	6
				13,423	15	7
Amount of Sales as P. Pa. – – – – – – – – – – – – – –				13,986	6	9
Apparent Profit – – £				562	14	2

<be expended>

From this must be deducted the Interest on a Sum of Money to ^ in sinking a New Pit in M^{r}. Capper's Property (see Pa.) erecting of the requisite machinery Heapstead, Skreens, laying Branches &c. &c. also making a self acting Inclined Plane

[84]

This would leave only a very trifling Balance in favour of the Collierys even without considering the sunk Capital.

The Estimate however can only be considered as an approximation, and it must be borne in mind that it is made upon a small quantity, whereby the cost is materially increased.

A larger Scale of work will be mentioned afterwards.

It has already been stated that the Colliery has not yet been in a position to work to advantage (page) but to set against this it must be remembered that the Trade is in a very unsettled state; and its prospects very gloomy, and supposing a breaking up of the Regulation (an event by no means improbable,) and the consequent immediate fall in the Price of Coals of 3/- or 4/- P. Ch. Under such circumstances, and supposing the Prudhoe Main

from the New Pit to the John Pit Branch, with Plates, Ropes, Rollers.

In the foregoing Estimate it will be observed that the tradesmen's Bill have been charged at 2/- P. Ch. This Sum is fixed upon after a careful comparison between Prudhoe Mains and several other similarly situated Collieries and will not be far correct.

The Best Coals are supposed to be sent to Shields by the Public R. Ways at a cost of 5/ 6 P. Ch., and the unskreened, Small and Inferior Coals to Dunstan at the present Cost.

The Staith Charges, Fittages, or other Expences over and above laying the Coals on the Staith have been taken into the account.

Suppose those Charges to be as follows

Staith Charges one half of what they amount to in 1839

	£		
	195	12	0
Fitting Office expences.	127	10	–
Fittage (say)	50	–	–
Making in all	373	2	10

[Bud-33]

Coals all Freighted as hitherto, it would appear impossible that the Colliery could be worked to Profit.

Wylam Colliery is Mr. Blacketts's own Property, and consequently free from Royalty, Outstroke Shaft Rent – but like most old Collieries its Establishment is expensive, and it is moreover saddled with Wayleaves and other standing Charges to a larhe Amount.

In **1838** the estimated profit P. Ch. on the Gross produce at the Haugh Pit (the present working Pit) from the Horsely wood seam was 1s/ 8½d (Mr. Buddles Report Decr. 1838). at this time the Peggy Pit was also working in the Yard Seam – Since then the whole of the workings of the Colliery have been concentrated in one (the Haugh Pit) – and in consequence it is natural to suppose the expences must have been lessened, supposing the Colliery to be, in other respects, in the same situation. The general Statement Pa. will show how far this has been the case.

A very great Drawback on this Colliery, is the heavy expence of conveying the Coals to the Staith at Lemmington – the Wayleave Rents, Rates, Cesses & Taxes, upholding waggons & waggonways, Keel Rents, Locomotive charges &c. amounting to a large yearly Sum, and unfortunately Mr. Blackett has not the power of avoiding these charges, so long as the Lemmington Line of Way is used for the conveyance of any quantity of Coal or Coke, however small such

[85]

quantity may be as by an agreement with the Duke of Northumberland, Mr. Clayton, Mr. Bewicke, and others, he is prevented sending any of the Wylam Colliery produce by any of the Public Railways on the So. side of the River, without at the same time paying the Expences on the Lemmington Line while he shall continue to use in any way. Suposing that under such circumstances, the Colliery is not likely to yield Mr. Blackett a profit – there are two alternatives left – One to give up the North side, and send all the Coals produced from both Collieries by the Public Railways. The Others to endeavour to come ro an arrangement with the Wylam Iron Company

[86]

Account of Sales from Wylam Colliery in 1839.

1839.	Chas.	Amount			Owners Wages			Fittage Cash			Fittage Allowed			
January	61	54	18	–	4	19	4	110	12	7	–	–	–	
February	722	818	8	3	8	12	2	17	19	7	4	9	6	
March	1050	1032	13	8	26	11	3	18	18	9	13	15	6	
April	918	863	7	8	17	7	4	17	8	2	14	7	–	From the Gross
May	957	921	1	9	13	14	11	71	17	8	5	16	1	Proceeds £1167..2..7
June	1137	1067	6	9	22	16	–	139	19	–	12	7	8	Deduct
July	1119	1075	16	8	14	10	4	42	13	5	9	3	–	Prudhoe
August	1315	1257	19	1	19	10	8	16	7	11	3	17	3	Coals sent

for supplying their works with all the Coals worked at Wylam, and the London Coast and Oversea Vend from Prudhoe Main exclusively – in either case the necessity of Keeping up the two separate Staith Establishments, with their respective way-leave and other charges, would no longer exist. There would however in the latter case remain to be ascertained whether or not the Wylam Coals could be worked at a sufficiently low cost to enable the Iron C^{o}. to apply them to the purposes of their works, and at the same time have M^{r}. Blackett a fair profit on them.

Those considerations ought to be well weighed, before making any final arrangement with the Iron C^{o}., and should such arrangement be made, it ought to be defined and Binding, otherwise in going up the Lemmington Line, M^{r}. Blackett would in some measure be placing himself in that Company's power.

A larger quantity from Prudhoe Main would necessarily cause that Colliery to work at less expence. There were estimates made by M^{r}. Boyd in Octr. 1839 upon 20,600 & 30,600 Chas. (Gross Produce) by which it appeared that on the smaller quantity the loss would be £370..13..6. which on the larger the Profit would be £1984. No Fittage, Owners wages, or Wayleaves were taken into account in those Estimates, and supposing those items to amount to the same as last year the loss would be in one instance £1577..13..6; and the gain in the other £777. No interest for Capitol being charged.

[Bud-33]

September	1025	1059	7	11	12	9	4	21	14	7	2	9	6	as Wylam
October	1124	1005	4	2	12	18	–	15	10	3	2	12	–	4279-0-6
November	1737	1570	7	7	20	1	4	51	13	1	–	–	–	991-19-0
December	1293	940	11	1	15	12	8	181	11	1	27	12	1	5270..19..6
Cha$^{s.}$	12458	11667	2	7	198	3	4	715	16	1	96	19	7	Net proceeds
														£6396..3..1

Wylam Colliery, Landsale Account. 1839.

Best Coals							
Ch. 46.	48	6	–				
25.	22	10	–				
58.	15	9	4	86	5	4
Small							
Ch. 11.20	4	14	8				
106.18	47	17	–				
24	6	6	–	58	5	4
Splints.							
Ch. 26.20				20	2	6
Jett							
Ch. 26.12	117	15	–				
267 –	80	2	–	197	17	–
Carried Forward. £				363	2	6

[87]

Wylam Colliery Landsale Account cotinued

Brought forward £				363	2	6
Sundry Sales in the Village				18	18	9
Iron Works.						
Ch. 3000 Small	1200	–	–			
906 ditto	385	1	–			
1417 Splints	873	16	4			
16 Small	5	12	–			

[88]

Wylam Colliery Abstract, continued

Brought forward £				7724	19	10
Night Work on Waggons	15	3	9			
Smith D^{o}. on D^{o}.	22	19	9			
Waggon Drivers wages	34	5	8			
Locomotive Charges	70	11	3			
Repairing Waggonway	28	16	5½			
Wayleave Rents	628	12	10			
Staith Charges	307	18	7			
Rates, Cesses & Taxes	68	10	7	1176	8	10½

1 Jett	–	8	–			
1 Best	–	15	6			
Workmen	26	5	–	2491	17	10
Total Landsales. £				2873	19	1

Wylam Colliery. General Abstract 1839.

Overmans Bills on 10876 ~~xx~~. 16 peck Corves						
Horsely Wood S^{m}. 9874	5541	9	3½			
Yard Seam 1002	559	3	2			
10876	6110	12	5½			
Ded. Waggon Drivers Wages charged in the above	34	5	8	6075	6	9½
Smith work	223	8	9½			
Wright D^{o}.	171	5	8½			
Engine Charges.	219	8	11½			
Masons Work	121	2	4½			
Labourage	273	14	8			
Salaries	195	–	–			
Bill of sundries	24	11	9½			
Binding Money	15	19	8			
Rates, Cesses & Taxes	114	11	1			
House Rents	290	10	–	1649	13	½
Forward £				7724	19	10

[Bud-33]

Oats and Hay	766	10	6			
Cast Iron	114	11	5			
Malleable Iron	380	9	5			
Rope,Hemp &c.	91	14	8			
Brass Castings	5	–	3			
Nails, Shovels & Files	98	17	4			
Props, Timber & Deal	325	1	3			
Tallow, Oil & Grease	216	1	5			
Horse Drugs, Paint, Leather, Gunpowder and Stationary.	50	17	1			
Iron ware, Fire Bricks, Sacks, Saddlery & Hair	56	11	3½			
Lime.	18	1	3			
Fitting Office expences	127	10	–			
Cost of making Coke.	1724	19	8	3976	5	6½
				12877	14	3
Deduct Value of Materials supplied to Prudhoe Main Colliery				540	13	6
Amount of Abstract £				12337	–	9
Rent of Coke Ovens paid to M^{r}. Blackett				40	–	–
Net Amount £				12377	–	9

[89]

Wylam Colliery. General Statement 1839.

Gross Am^{t}. of Overmens Bills			£	6075	6	9½
Smiths, Wrights, Engine men, Labourers Salaries, Sundries, House Rents, Bond-Money, Rates Cesses & Taxes.	1649	13	2½			
Leading Charges consisting of Wright & Smith Work on Waggons, Drivers wages, Locomotive Charges, upholding Waggon-way, Wayleave Rents, Staith Charges, Rates Cesses & Taxes.	1176	8	10½			

[90]

The foregoing Statement shews loss of £764..9..4, but it is necessary to observe that a considerable sum of money has been expended during the year upon improvements on M^{r}. Blackett's Estate, and charged in the Colliery Accounts – with which, in propriety it ought not to have been in any way connected.

This Sum is stated at £1758..18..1. and if the Colliery is given Credit for this amount there would then appear an apparent profit of £993..18..9.

The Colliery is also debited with £290..0..0 for House Rents – those Houses are occupied by M^{r}. Blackett's workmen, and are his property – Had those Houses been rented by M^{r}. B. the Charge

Tradesmen's Bills.	2123	15	10½			
Cost of making Coke	1764	19	8	6714	17	5½
Fitting Office Expences	127	10	–			
Owners Wages	189	3	4			
Fittage Cash.	705	16	1			
Fittage allowed	96	19	7	1119	9	–
				13909	13	3
Amount of Shipping Sales	11667	2	7			
Ded. Prudhoe Main Coals shipped as Wylam	4279	–	6			
	7388	2	1			
Landsales	2873	19	1			
Coke Sales	2904	10	11			
	13166	10	11			
Deduct, Value of Resting Coals more than at Decr. 31st. 1838.	21	17	–	13144	13	11
		Loss	£	764	19	4
Resting Coals Decr. 31st. 1838.						
159 Ch. @ 19/-	151	1	–	151	1	0
D^{o}. 1839. #Best 80 Ch. @ 19/-	76	–	–			
Small 14 – @ 7/-	4	18	–			
Splint &c 69 @ 14/-	48	6	–	129	4	0
# Allowance is here made for Staith Charges &c on the resting Coals –				£ 21	17	0

[Bud-33]

might have been considered correct, but under the circumstances of the case, it appears rather an unusual charge – and the Colliery ought to be given credit for it, in which case the profit would be £1284..8..9.

Both those Charges are placed against the Colliery in the foregoing Statements.

In whatever ^<light> the present position and future prospects of these collieries viewed – it must be admitted that they are far from encouraging.

There is an absolute loss in 1839 – The probability of future profit commensurate with the invested Capital is small – There is a large outlay shortly to take place for a New Pit to be sunk at Prudhoe Colliery. The Demand for Prudhoe Main Coal is small and the price it will bring at market, comparatively low – The establishment at Wylam Colliery is very heavy – The question as to the propriety of abandoning the expensive Line of way to Lemmington involves many serious considerations – Coming to an arrangement with the Iron Company, on such terms as to ensure M^{r}. Blackett a reasonable profit on the Wylam produce is yet very uncertain – There is a likelyhood of an open trade and consequent immediate Fall in the price of Coals.

All these circumstances taken into consideration would make it appear that the prospect of an adequate return for Capital invested in those Collieries by an entering Partner would to say the very least of it be extremely doubtful.

(Copy.) R.T. Atkinson

Wallsend Feby. 17th. 1840.

[91]

Prudhoe Main Colliery Abstract for 1839.

Abstract of Overmans Bills			£	5310	4	6½
Smith Work	96	12	5½			
Staith Charge	391	4	9			
Wright Work	94	11	9½			
Labourage	173	11	3½			
Bill of Sundries	17	4	3			

[92]

Abstract of Tradesmen's Bills Prudhoe Main Colliery. continued

1839.	Brought forward		£	196	8	4
	R. Rayne & Co.	Sundries		74	16	9
	John Glynn & Co.	Castings		51	5	7
	D. Haggie & Son	Ropes		97	10	6
	Geo. Bourne & Co.	Nails & Chains		18	3	1
	S. & J. Hancock	Hardware		27	7	5

	House Rents	187	14	7			
	Mason Work	191	8	½			
	Workmen's Fire coal.	129	2	–			
	Corf rods, Lime, Slating	112	1	8½			
	Salaries	195	–	–			
	Joiner work	63	16	6			
	Building Expences	24	18	2			
	Poor& Highway Rate.	24	16	8			
	Ale and Wherryage	18	16	6			
	Boring	14	16	–			
	Railway dues	4	6	10			
	Files and Flagstones	8	2	6			
	Horses.	121	10	–			
	Wayleave	10	–	–			
	Hay	68	10	7			
	Leading Stones	52	15	6			
	Flannel &c.	5	10	10			
	Lord Prudhoe's Tentale Rent	1518	5	3			
	M^{r}. Cappers Certain Rent.	200	–	–	3624	17	2½
				£	8935	1	9

Abstract of Tradesmen's Bills Prudhoe Main Colliery.

1839.	Robt. Hall & Co.	Nails & Chains	£	4	18	9
	Riddle Robson & Co.	Castings		47	14	4
	J & t. Burrell & Co.	ditto		132	–	3
	Mich Benson	Stationary		8	–	6
	J & S. Cookson	Castings		2	13	6
	Mich & Jas. Hogg	Tin ware		1	1	–
		Carried Forward.	£	196	8	4

[Bud-33]

S & E. Richardson	Plasterer's Hair				2	19	4½
W^{m}.Hepple & Co.	Castings				155	19	–
Isa. Johnson	Timber 7 Props				55	3	3½
Geo Hancock	ditto ditto				176	2	1
E. Charnley	Stationary				10	4	–
N. Shields Foundary	Castings				55	12	5
Carr & Co.	Timber & Deals				141	8	6
North^{d}. Glass House	Glass				4	13	–
Pow & Fawcus	Timber				47	3	1
Laycock & Co.	Tubs &c.				165	15	–
Cargill & Johnson	Iron Rails &c.				386	7	–
John Henderson	Timber & Props				69	7	5
Nicholson & Black	Props				21	–	5
W^{m}. Walker	Fire Bricks				10	5	–
Birtley Iron C^{o}.	Castings				16	16	10
Tyne Iron C^{o}.	ditto				200	11	7
Benson & Ceslop	Lime				25	5	–
R. Todd & Co.	Timber & Deals				173	6	7
Spencers & Browm	Flannel				2	10	3
W^{m}. Futers	ditto				3	1	7
Heddon Stone C^{o}.	Ridge Stone				4	17	6
Robt. Watson	Lead				6	8	10
W^{m}. Hymes					49	17	3
				£	2260	6	8

[93]

Abstract of Tradesmen's Bills

Malleable Iron	£	660	7	2
Nails		15	11	4
Shovels		15	19	9
Castings		656	16	11

[94]

Account of Goods supplied to Prudhoe Main from Wylam Colliery. continued

Brought forward		59	14	8
1460 ft. Scotch Deals @ P. 100 ft.	12/ 6	9	2	6
84 $^{6}/_{4}$ Props	2^{d}. ½	–	17	6

Files and Stell	4	18	4
Chain	7	10	6
Brass Castings	1	7	4
Lead	6	8	10
Hardware	11	3	5
Horse Trappings	16	4	–
Timber & Deals	543	4	–
Props	140	7	4½
Rope	97	10	6
Stationary	18	4	6
Glass	14	13	–
Tin ware	1	1	–
Lime	25	5	–
Fire Bricks &c.	10	5	–
Ridge Stone	4	17	6
Hair	2	19	4½
Flannel	5	11	10
£	2250	6	8

Ann Account of Goods supplied to Prudhoe Main Colliery
<u>from Wylam Colliery.</u>

68½ lbs Candles. @	7d.	2	–	–
82 Gallons Oil	3/-	12	6	–
23 Firkins Grease	18/ 6	21	5	6
3..2..17 Tallow	58/ 6	10	13	7
119 lb Tram plate Nails	29/-	1	10	10
250 Spar Nails 6 P. lb = 42 lb	27/-	–	10	1
1300 Pit Double Tacks	9/ 9	6	6	9
1700 Pit Single do.	5/ 9	4	17	9
1000 8d. Nails	4/ 2	–	4	2
Carried Forward £		59	14	8

217 feet American Timber	1/ 8	18	1	8
704, 6feet slit Crown Trees.	5d.	14	13	4
1 Axle Shaft		–	–	6
65 feet Memel Timber	2/ 8	8	13	4
1 Picture 4½ by 3½ feet		–	3	–
2 Hoodtrees @ 2/ 6, 1 Bottom Sheth 6/ 6, 15 side do. @ 1/-, 2 ovens @ 3/ 6	– –	1	13	6
15 Pairs Trams at 1/ 8 per pair				
40. 21 feet Battens	12/ 3	24	10	–
2 Slit Deals 12 ft. X 9 In. & ½ Inch thick = 24 ft @	2d. ½	–	5	–
6. 10 ft. Am. do. 9 In X 3½ thick = 60 ft	3d.	–	15	–
3. 10 ft. do. do. 9 In X 1½ thick = 30	4d.	–	10	–
36. 10 ft. do. do. 9 In X $^{1}/_{8}$ thick = 360 @	3d.	4	10	–
16 ft. American Deal, 1 In thick @ per 100 feet	12/ 6	–	2	–
70 Sup. ft. of $^{7}/_{8}$ In American Deal		–	17	6
1 Fly Door 4/- 2 Oak Jams @ 2/- ea.		–	8	–
200 pieces Sleeper wood 16 ft long	2½ d.	2	1	8
9 feet Ash wood @ 2/ 6, 1 Hang lock 7d.		1	3	1
2 Oil Cans @ 1/ 6, 1 Oil lamp 8d, 1½ gal Oil @ 3/-		–	6	8
309 Bolls of Oats	7/ 2	110	14	–
1 Trap Door 4/-, 2 Oak Jambs 2/- ea.		–	8	–
10¼ Tons Tramway plates	7/ 9	79	8	9
25650 Common Bricks	20/-	25	13	–
Richd. Nixon leading Coals &c. 2 Horses @ 77 ¼Days = 154 ½ – – –	3/ 4	25	15	–
Barn. Kennedy – 2 do. 22 days = 44		7	6	8
Thos. Mingins 1 do. 12½		2	1	8
John Lawson 1 do. 62½		10	6	8
John Brown 1 do. 12.		2	–	–
Oil to Staith at Dunstan. 2 Gals @	3/-	–	6	–
Grease 1. Firkin @ 18/ 6. 4 lb white lead 4d.		–	19	10
		414	13	6
Fire Coal for 32 Men at 35/- P. An.		126	–	–
Total £		540	13	6

[Below Page, Text in transverse]

[95]

An account of Sales from Prudhoe Main Colliery in 1839.

	Chals –	Prudhoe Main Shipped as Prudhoe.			Chas.	Prudhoe Main Shipped as Wylam.			Total.			Fittage Cash. –			Fittage allowed –			Owners wages –		
January	897	761	7	2		300	–	–	761	7	2	34	11	9	86	14	8	13	9	10
February	455	351	9	6		300	8	–	651	9	6	15	–	8	28	5	3	11	2	–
March	909	749	7	1		118	–	–	867	15	1	29	13	10	39	16	5	17	–	6
April	1211	982	7	–		–	–	–	982	7	–	13	13	1	19	4	8	12	15	–
May	776	683	12	3		311	–	–	994	12	3	11	10	5	20	12	5	10	–	2
June	954	809	18	4		335	–	–	1144	18	4	8	19	5	24	1	1	15	9	4
July	797	685	7	11		295	–	–	980	7	11	153	9	4	27	14	3	11	3	–
August	487	408	19	–		560	17	6	969	16	6	11	9	10	9	14	5	16	10	–
September	1006	838	10	6		592	15	–	1431	5	6	7	10	1	21	1	–	13	7	–
October	396	323	18	5		546	–	–	869	18	5	9	9	–	8	15	–	14	17	–
November	1058	934	13	9		570	–	–	1504	13	9	41	17	9	22	7	1	15	14	
December	424	354	8	1		650	–	–	1004	8	1	120	4	3	10	12	11	12	–	2
	9370	7883	19	–		4279	–	6	12162	19	6	457	9	5	318	19	2	163	8	2

[Bud-33]

[96]

Total Ship Sales Bro^{t}. forw^{d}. .			£	12162	19	–
Deduct.						
Fittage Cash	£ 457	9	5			
Fittage allowed.	318	19	2			
Owners wages.	163	8	2	939	16	9
Railway Charges.						
Brandling Junction	32	15	11			
Newcastle & Carlisle	406	10	9			
Brandling Junction	78	1	5			
Newcastle & Carlisle	472	5	9			
Brandling Junction	74	13	6			
Newcastle & Carlisle	606	4	3			
D^{o}. D^{o}. due	577	13	8			
Br. Junction due	79	3	2			

Prudhoe Main Colliery Landsales Account, continued [97]

Bro^{t}. Forward			£	170	6	3
Small						
39 Chaldrons	10/ 8	20	16	–		
34 –	9/-	15	6			
3 –	9/-	1	7			
Ch. 1 (20 Bolls)	9/-	–	16	6	38	5	6
M^{r}. Thompsons						
Best 9 Chald.	15/ 6	6	19	6		
Unskr^{d}. 31 –	12/ 6	19	7	6		
Small 372¼ –	8/-	148	18	–	175	5	–
Coke Ovens. Chas.						
Small 2826½	8/-				1130	12	–
Total Home Sales				£	1514	8	9

	Waggon Rent	300	–	–	2627	8	5
	Staith Rent				3567	5	2
					12162	19	–
	Net proceeds on Ship Sales			£	8595	13	10
	The River sales are stated by M[r]. Burnett at	309	2	0			

Prudhoe Main Colliery Landsale Account

1839.	Best Coals	at						
	9 Chaldrons at	20/ 8	9	6	–			
	74 –	18/-	66	12	–			
	29 –	17/-	24	13	–			
	8¾ –	15/-	6	11	3	107	2	3
	Splints							
	1 Chaldrons.	16/-	–	–	–	–	16	–
	Unskreened							
	1 Chaldrons.	13/ 6	2	14	–			
	57½ –	14/-	40	5	–			
	29 –	13/-	18	17	–			
	1 –	12/-	–	12	–	62	8	–
	Carried forward –				£	170	6	3

	Prudhoe Main Colliery Sales collected	– 1839.					
	Ship Sales £	12162	19	–			
	River ditto	309	2	–			
	Landsales	208	11	9			
	Iron works	175	5	–			
	Coke Ovens	1130	12	–			
	Resting Coals	254	3	–	14240	12	9

N.B. The resting Coals at Dunstan on the 31st. Dec[r].
were – Best 240 Cha.
Small & inferior 166 –
406 Cha.
The value of the Best is found by the Sales during the year, as
Follows Cha. £ s. d.

As 13649 : 8595..13..10 : : 240 :	187	15	–
ch. 166 Small @ 8/-	66	18	–
£	254	13	–

[98]

Wylam Coke account 1839.

James Johnson & P[rs]. Burning Coke £	185	7	8			
Ditto Casting Coals	24	3	10			
John Bell &c. Leading Coals	23	14	6			
Jos Hunter 5 Barrow Corves	–	14	6			
James Johnson & P[rs]. Filling Coke from stack	1	12	–			
W[m]. Rutherford ditto ditto	–	8	6			
ditto Lighting Ovens	–	6	–			
ditto Filling Ashes	–	2	6	236	10	–
Smith work on Ovens	12	11	8			
Mason ditto	5	11	9			
Bricks & Lime	4	10	–			
Cast Iron Tops	4	13	–			

[99]

Brought Forward			£	2782	9	9
Resting at Staith	74	–	–			
do. at the Colliery	48	–	–	122	–	–
Total Sales				2904	9	9
Cost as per other side				1764	19	8
Profit			£	1139	10	1

Copy. Wallsend Colliery Ap[l]. 6th. 1840.

Dear Sir,
Herewith you will receive the Wylam and Prudhoe Main Statement, with a few observations bearing upon some points connected with them.

House Rents & Coals.	11	5	–			
Proport^{n}. Of Horses Keep.	32	–	–			
Bridge Tolls on Coke sold to the Railways 661 ch. @ 3^{d}. P.	7	10	3	78	1	8
2826½ Ch^{s}. Small Coals from Prudhoe Main	@8/-			1130	12	–
Makings in at the Staith 4227½ Ch. @ 3d.				52	17	–
Allowance to Merchants and waterage on 4227 ½ Ch. @ 1/ 0¾^{d}.	– –	–	–	226	19	–
Over Rent (M^{r}. Blackett) – – – – – – – – – –				40	–	–
			£	1764	19	8
Coke Sales 1839.						
Ship Vend						
1891 Cha.	1213	1	–			
River Vend						
2316½ –	1117	18	6			
20 –	8	–	–	2338	19	6
Landsale.						
5 Cha. @ 16/-	4	–	–			
576 – @ 14/-	403	4	–			
12 – @ 18/- – – – – – – –	10	16	–			
20 – @ 20/- – – – – – – –	20	–	–			
147 Bolls @ 9^{d}.	5	10	3	443	10	3
Carried forward –			£	2782	9	9

I have bestowed considerable care in dissecting and separating the Acc^{ts}. And I hope you will find the statements correct – The Documents furnished me while occupied in this investigation, are in my Uncle's possession and can, if necessary easily be referred to.

It plainly appears that to enable M^{r}. Blackett

to work the Collieries profitably in future, some change is necessary – and it rests with <u>him</u> to determine what manner, and to what extent, such change is to be made, but it might be well to direct his attention to the great expence entailed upon Wylam Colliery by using the Lemington Line of Waggon way – It appears that he has not the power of giving it up for many years to come if the Colliery is carried on as a Sea Sale Colliery without continuing to pay the Wayleave rents-

[100]

but could he not obtain a reduction of those Rents, on a fair representation of the situation of the Colliery to the Land Proprietors through whose lands these Line passes? – it is natural to suppose that they would rather forego part of their present Rents, than risk the losing of the whole – and from the extension of the Iron Company's Works shortly to take place, there is s much greater probability of M^{r}. Blackett being able to arrange with them for the whole produce of this Colliery.

Supposing the Proprietors reduce their rents, and leave M^{r}. B the option of using the way or not, as he might see proper –

[101]

Copy. Newcastle 23 April 1840.

My Dear Friend,

Prodhoe Main & Wylam.

M^{r}. Boyd and I have gone through very carefully the Report which M^{r}. Atkinson prepared in your absence, and which is very clearly and ably drawn up.

M^{r}. Boyd has prepared for your consideration some Estimates grounded upon M^{r}. Atkinson's Report, the object of which is, to save you some trouble in making your report upon the

or even suppose the way taken up, the materials converted into money, and the Coals sent by the Public Railways. It may be assumed that on a Sea Sale Vend of 20,000 Chaldrons, from the two Collieries, the cost of leading them to Shields might be about £5500 which is at the rate of $^5/_6$ P. Cha. and the charges upon last year's vend to Lemmington & Dunstan Staiths amounted to £4824 – making a difference of only £676, even without considering the large amount of Fittage upon the Prudhoe Main Coals, which might, to a certain extent be avoided in future of the Coals were sent to Shields, and Shipping there as "Wylam" – by this mode a better price at market for those Coals would also be secured.

It must be recollected that in case the Wylam Colliery produce is disposed of altogether to the Iron works, it is more ^<than> likely that the Basis allowed the Collieries by the Trade would undergo some alteration – and also, that in this case, all the Coal sent by Sea Sale would be saddled with Royalty Rent. There are several other considerations to be taken into account respecting the two Collieries, but I think the above, and those mentioned in the Paper which accompanies this, are the principal points.

If anything further occurs to you in which I can be of any service. I shall be very happy to render you all the assistance in my power.

And I am
Yours very truly
(Signed) R.T. Atkinson.
Ar. Donkin Esqr.

[Bud-33]

case, in all its bearings, and he has also prepared the heads of a new proposal to be made to M^r. Thompson in the event of your agreeing with him in opinion, as to the most profitable mode of working the two Collieries.

The papers which I send you herewith are as follows.

N°. 1. M^r. Atkinson's Report.
N.B. M^r. Atkinson wrote a letter explanatory of this report, which I cannot at this moment lay my hands upon, but of which, he can, of course, furnish you with a copy

N°. 2. Estimate of Expence of working Coals at Wylam Colliery from the Horseley wood and Yard Coal Seams taken on an Average of 6 Pays, with a Statement annexed. <u>Shewing the effect of disposing of all the produce of Wylam Colliery unscreened, to M^r. Thompson's Works, and leading the Small from Prudhoe Pit for Engine & Fire Coal.</u>

N°. 3. Estimate of Cost of producing Coals at Prudhoe Colliery, to supply the whole Sea Sale Vend therefrom.

N°. 4. proposed new offer to be made to M^r. Thompson.
M^r. Boyd will be happy to attend you at any time, and give you all the information in his power upon the subject.

I have been troubled with a Bowel-complaint since I saw you, but have got rid of it and will be at the Office to-morrow.

I am, my dear Buddle
Yours very sincerely
Signed Armour Donkin.
J. Buddle Esqr.

[102]

Meeting M^r. B. Thompson & M^r. Donkin – (Copy)
Arcade. 26. May 1840.

N°. 1. Read – M^r. Thompson's proposal of 31st. March 1840.
M^r. Boyd's proposed new Offer of 17th. April 1840.

1. M^r.Thompson sees no objection to M^r.Boyd's proposal N°.1 provided

[103]

the New Colliery.

<u>With regard to Additional Ground.</u>

The Company will require the two Fields containing 3..2..2 and 3..2..35, the 1st. named is already almost entirely occupied by them.

the proportion of Good Coal is not, at present, to be more than $^1/_3$rd. of the total quantity of Unscreened or 4323 Chas.

2. Mr. Thompson proposes that Mr. Blackett shall skreen the coals at the Pits, which will be no additional expence to him Mr. Thompson not having the mean of doing this at the works The Coals will be weighed as usual, so that, no overweight will be given – & being weighed the two Kinds, round and small will be taken an account of collectively, as unskreened, reckoning 53 Cwt. To the Chaldron.

3. Mr. Blacket shall find heap room for such quantities of Coals as the occasions of the Iron company may require to be so deposited, the Company paying the expence of refilling the waggons, when the Coals so deposited shall be required to the works.

4. In case the Iron Company should have occasion for more Splint Coals than the Old Colliery can supply, Mr. Blackett so let them have such proportion of the Splinty part of any of the Seams of the New Colliery, as they may require: at the same price as the Splints of the Old Colliery – delivering them at the south end of Wylam Bridge

5. The 5000 Chaldrons of Small & Splints from the New Colliery mentioned in Mr. Boyd's proposal, to be delivered, in Such proportions as the Iron Company shall require.

No. 2. As to Mr. Boyd's contingent proposal No. 2.

In the event of the Iron company finding it practicable to act upon their intended plan of operations as stated in Mr. Thompson's proposal of 31st. March, and which Mr. Boyd's proposal No. 2. is intended to meet Mr. Thompson sees no objection to that proposal, so far as it extends, provided no reservation be made by Mr. Blackett for Coke, still this would only bring the total quantity up to 23,700 Chaldrons would therefore require to have a stipulation for 6,300 Chas. in addition, which he would take unscreened from

[Bud-33]

31st. March 1840.

Mr. B. Thompson & Mr. Donkin.

Messrs. Thompson intend to double the works (which it will require a year to accomplish) by the erection of another Furnace this is the immediate object – This would consume 10,500 Chas. P. An. As much as possible of which is required to be small coals. Simultaneously with that operation, the further purpose is, to erect a Mill, to work up the whole of the produce after two Furnaces. That will require 7500 Chas. P. An. Principally, as worked, or as unscreened, but a portion of Small for the Engines would be desirable, but this depends upon the ability of the Colliery to furnish them. These two quantities will make 18000 Chas.: but Mr. Thompson thinks this will be within the mark, and that probably 20,000 will be required. The next step after that will be to build a 3rd. Furnace, and in that case, one half more Coals will be consumed at the Mill, as well as at the 3rd. Furnace This will consequently increase the total quantity one half, making it 27,000 Ch. or probably 30,000 in the same proportions as before – This last operation will be contingent, in some measure, upon the success of the 1st. operation. – If that be successful it would follow immediately.

Mr. Blackett ought to reserve no more small than necessary for his Colliery consumption (not for Cinders.)

13/- for unscreened & other prices the same as Per memorandum of 7th. Jany. 1840.

Messrs. Thompson can use the Yard Coal Unscreened for the Mill.

Mr. Thompson would not hesitate to say he would stipulate to take $^1/_3$ of that Lease (qr. Base) It is not improbable

[104]

he might go to a half.

Mr. Thompson is going to by the experiment this week of

Mr. Boyd's Estimate. [105]

April 16th. 1840.

Estimate of Cost of producing Coals at Prudhoe Main Colliery

using unscreened instead of Small for the Engines. If this shall answer he will take the Yard Coal Seam without hesitation.
Mr. Thompson repeats his proposition of 7th. Jany. 1840, as to renting as purchasing the Cinder Ovens – would prefer renting.
Mr. Thompson wishes to know whether Mr. Blackett will guarrantee to supply the quantities stated? If he be unwilling to do so, Mr. Thompson must be at liberty to supply himself elsewhere
Mr. Thompson will undertake to take the whole from Mr. Blackett. Mr. Blackett. Undertaking to supply him, in preference to all others, if the Collieries can supply the quantity – if no, Mr. Thompson may go elsewhere.
Mr. Thompson will bind himself to take the Coals so long as Mr. Blackett can supply them.
Mr. Blackett to have his opinion as to which[er] Colliery he will take the unscreened Coals from (one or both of them) except, that the Small will come from both.
The unscreened may be taken from both, or either of the Collieries. Mr. Donkin to send Mr. Thompson Mr. Graces plan of the Estate, and Mr. Thompson will then prepare, and have the option of taking, in addition to the present quantity –
The Rent will then be [l] negociated for:
Supply of Bricks,
Powers of passing the Bridge,
of making water,
of making Roads,
of using Waggonway,
and other privileges contained in the existing Lease to be included in the New Arrangement.

[Bud-33]

to supply the whole Sea Sale vend therefrom.

Suppose the Basis of this Colliery to be taken, after Wylam Colliery is reserved out of the vends altogether – at about 22,000.
Take the Issue at the same rate as last Year, viz: 639 per 1000, will require a vend of – 14000 Chas. Best Coals.
To produce which, 11666 Scores of 20 Peck Corves or Tubs will have
<2nd. Offer to>
to be produced. For the disposal of which dec^ Mr. Thompson's 2nd.
Suppose this quantity to be produced from the 5/4 & 6/4 Seam in equal proportions and from Lord Prudhoe and Mr. Capper's Royalties also in equal proportions – the following Estimates may be taken – being approximation only.

				~~xx~~.	
Pit Bills on 11666 including Hewing Putting Overmanship. Shift & Stone work, Narrow-Work, Brakemen, Firemen, and Labourers about the Pit.	6416	6	–	or 11.0 P. ~~xx~~	
Smith work	153	14	5	- 0.¾	0.65
Wright ditto	164	8	4	- 0.3¼	0.53
Mason ditto	97	4	4	- 0.2	
Labourage	97	4	4	- 0.2	
Salaries, on proportion between Wylam & Prudhoe	195	–	–	- 0.4¼	0.04
Sunday Bill	27	2	–	- 0- ½	0.23
Binding Expences	10	–	–	- 0- ¼	0.82
Rates, Cesses & Taxes (average of Year)	114	11	1	- 0- 2¼	0.42
House Rents taken on quantities of Houses rented, but exclusive of Mr.Blackett's own houses	60	–	–	- 0.1¼	0.93
£	7335	10	6	or 12.6¾	0.64

[106]

					or P. ~~xx~~.
Brought Forward £	7335	10	6		12.6¾ 0.64
Tradesmen's Bills on total chas. 24304 –1/10 = 21874 @ 2/- =	2187	8	0	or P. ~~xx~~. 3.9	

[107]

Brought Forward £	16740	–	–
In the case of the Coke Ovens being let to Mr. Thompson this Rent should appear here	50	–	–
Cost as above £15324..18..5			

Brick making, tavern expences, &c. wherryage Constables expences, Law	72	18	3	0.1 ½				
Surgery Horses and Farriercy	50	–	–	0 -1				
Damage Ground. Rent at the Pit	35	–	–	0-½ 0.88	2357	16	3	4.0½ 0.02
Leading by Carlisle Railway Best Coals to Shields. 1400 Ch@ 5/6	3850	–	–	6.7 ¼ 0.81				
Do. Small Coal to Old Wylam, for M^r^. Thompson's works 8700 per Fire Coal to workmen 700 9400 @ 9^d^.	352	10	–	0.7¼	4202	10	–	7.2¼ 0.82
				£	13895	16	9	23.9¾ 0.48

Amount of Sales from Prudhoe Main Colliery.

	ch.					
Best Coals – – – – – – – – – – –	14000	@ 18/-	12600	–	–
Fire Coal sent to Wylam Colliery –	900	@ 8/ 6	382	10	
Small Coal to Wylam-Iron works –	7000 cha^s^	@ 8/ 6	2975	–	–
	1000 –	@ 9/-	450	–	–
	700 –	@ 9/ 6	332	10	–
	8700 –	£	16740	–	–

[Bud-33]

1465.. 1..7 Profit (exclusive of £16790.. 0..0 Tillage expences) £	16790	0	0

£ s d

Fittage expences 9370 Chas. last year was 939..16..9

The manufacture and sale of Coke to the am^t^. of Chas.

From Prodhoe 2826½

22½ 2849 was 1139..10..1 Profit

There is no charge in this Estimate made for Rent of Cottages to M^r^. Blackett, which is paid at present.

M^r^. Boyd's proposed Offer.

April 17th. 1840.

Particulars of proposed renewed Offer to M^r^. Thompson

To take the entire produce of the Old Colliery as unsckreened exclusive of 1106 Chas. of Jett which could be used as Fire Coal at the Old Colliery: which at present rate of working will be about 12970 chas.of Best Unskreened and 2030 Splints

Total Chaldrons Old Colliery 15000

The remainder of the Demand to the Iron Works to be made up by Small and Splint, as produced from the New Colliery – to the Amount, mentioned in M^r^. Thompson's Renewed proposal of March 31st. to the amount of 5000

1st. Quantity named 20,000.

or by the Second Quantity named.

[108]

As above 15,000 Unskreened.

Total Small which will be produced at the New Colliery 10,300

Small wanted for Wylam Fire Coal 900

Ditto for Prudhoe – – – – 700

[109]

				or
Brot. Forward £	1408	11	0	12-1½ 0.048
Rates, Cesses & Taxes – average whole year –	1860	14	8	23-9¾ 0.48
House Rents, taken on quantities of Houses	26	6	–	or2.2½ 0.86
rented, but exclusive apell^n^. Blackett's own Houses	40	–	–	or0.4¼ 0.53
£	1474	17	–	o12.8¼ 0.50

	1600	1,600	8,700
Jett already – –	1106		23,700 Chas } total of 2nd.offer
	2706		

If 300 Chas. Small are reserved for Coke Ovens at Wylam
The Offer will be – – – – unskreened 15,000
Small from Prudhoe – 10300
4600 5,700
20,700

M^{r}. Boyd's Estimate N°. 2.

April 16th. 1840.

An Estimate of the Expence in working Coals at Wylam Colliery, from the Horseley wood and Yard Seams, taken on an Avarage of 6 Pays, from the 2nd. To the 7th. both inclusive, on 2323 ~~xx~~. of 16 peck Corves. –

				s d
Overmans Bills, on Horseley wood& yard Seams including all underground charges Brakesmen Firemen, Screenmen &c. about Pit	1153	10	4	or10– 0 P ~~xx~~
Smith work, inclusive of leading charges	40	12	–	or0– 4¼ 0.77
Engine charge including pumping Engine &c.	49	12	–	or0– 5¼ 0.33
Wrights work inclusive of waggons upholding	34	–	–	or0– 3½ 0.05
Mason work	25	6	–	or0– 2½ 0.45
Labourage	53	4	8	or0– 5½ –
Salaries, average on 26 Pays. –	45	–	–	or0– 4½ 0.6
Sundry Bills, in all &195, absolute payment	5	7	11	or0– 0½ 0.23
Binding Expences, (average on total Year)	2	6	2	or0– 0¼ –
Carried Forward £	1408	11	0	-12-2¼ 0.97

[Bud-33]

Leading Charges.							
Wrights' work on waggons £2..5..0							
Smiths' ditto 3..0..0							
Waggon Drivers' Wages 8..0..0							
Repairing Railway only to Iron Works 10.0	13	15	0				
Wayleave Rents, suppose a compensation were accepted.							
M$^{r.}$ Walker's – 40 – say £10.00							
M$^{rs.}$ Bewick – 40 – say 15. 140.00							
M$^{r.}$ Clayton's – 40 – say 15. P. Ann.	32	6	0				
M$^{r.}$ Bates' – – 200 – say 50. or 6Pays							
Duke of North^{d}. Say 50.							
Miss Simpson's Land attached let for as much as pays Rent, Rates, Cesses & Taxes on Railway	3	0	0	49	1	0	or0: 5¼ 0.27
Tradesmen's Bills including Oats and Hay Cast and Malleable Iron, Ropes, Hemp Spunyarn, Brass Castings, Nails, Shovels and Files, Props & Timber, Tallow, Oil and Grease, Fire Bricks, Hardware, Paints,Druds Leather, Gunpowder, Saddlery, Lime &c.				309	14	8	or 2.8 –
Brick making, Tavern expences, Wherryage &c Constable's Expences, Law &c.				18	9	4	or0.1¾ 0.63
Horses maintaining and Taniery				8	7	0	or0.0¾ 0.45
~~xx~~.				1860	9	–	or16.0 P.xx.

2323 for 6 pays – cost £1860.9-0 @ 16/- Pr. ~~xx~~.
~~xx~~.
2323 for 6 pays = 9655 P. Ammum. Cost £7740. – @ 16/-

[100a] [Loose sheet of Paper, side 1]

Net Selling
Price of Coals.

A Landsale Book should be kept in which

[101b] [Loose sheet of Paper, side 2]

1833 16,238 Chaldrons of Best Coals to London netted, after deducting the loss by Freighting } 10974..

the quantities and prices of the different sorts of Coals Sold, and to whom sold should ~~be kept~~ entered. The Duke's Viewer charges tentale on a Certain quntity of Lanndsale Coals every Year but how this quantity is ascertained does not appear as nothing but the amo[unt] of Money rec^{d}. is entered in the Land Sale Accounts.

[Bud-33]

= 13/ 6½ Per Ch:

1834	17775 Chald: of Best = 18/ 6¼ per Ch:	£16463..6
1835	18529 Ch: Best – – – = 19/ 8.	£18265..7
1836	18726 Ch. – – – = 20/ 8¼	£19373..4
1837	20631 – – – – – = 23/ 3½	£24637..3.
1838	16160 – – – – – = 21/ 2	£17110..5
1839	15644 – – – – – = 21/ 0¾	£16481.17

[110]

2000 Chas. of Small Coal P. Annum. As consumption taking ½ of it from each of the two Seams Horseley wood and Yard Seams.

At a produce of 539 Chas. of Small for each score of Horseley Seam,

and 400 ditto of ditto ~~xx~~. ditto of Yard Seam ~~xx.~~

Will require to be screened off 87 P. day or 2175 P. Annum of Horseley Wood Seam – 97 ditto, or 2425 do of Yard Seam.

Total Scores to be screened if the small for Colliery consumption be taken from the Old Colliery } 4600 Scores.

Then 9675 – Total quantity
4600 – Deduct to be screened.
5075 ~~xx~~. = 8458 Chaldrons of Unccreened.

Again 4600 to be skreened will produce 3602Chaldrons of Best Coals

[111]

To dispose of all the produce of Wylam Colliery unskreened to. M^{r}. Thompson's Works, and lead the small Coal from the Prydhoe Pit, for Engine and Fire Coal would produce this effect.

Cost of working 9675 is £7740 or 16/- P. Score Forward.			£	7740	–	–
Producing in unskreened of the above exclusive of 1106 Chas. of Jett, which be used separately						
For Fire Coal is 15010 @ 13/- Chald^{n}. or in						
Unskreened Best 12970 @ 13/- ditto – – – – £	8430	10	–			
and Splints – – – 2040 @ 13/- ditto – – – –	1326	–	–			
15010	9756	10	–			

for sale, which must be charged Railway Dues to S^{o}. Shields @ 5/6 P. Chal^{n}. & 3^{d}. do. for Wylam Bridge and 554 Chas. of Splints to M^{r}. Thompson

Then 8458 of unskreened @ 13/-				5947	14	–
554 of Splints @ 13/-				360	–	–
3602 of Best at S^{o}. Shields @ 19/-				3421	18	–
			£	9279	12	–
Cost of producing and leading unskreened and Splints to Wylam Iron Works	7740	0	0			
Leading 3602 Chas. of Best Coals per. Newcastle & Carlisle Railway to S^{o}. Shields @ 5/ 6 P. Ch.	990	11	0			
Leading 6302 Chas. over Wylam Bridge @3^{d}.	45	0	6			
	8775	11	6			
Balance to Profit £	504	0	6	9279	18	0

[Bud-33]

To obtain Fire coal and Engine Coal wanted, besides the above Jett	cha^{s}. 1106								
Will require to be led from Prudhoe Main	894								
	2000								
894 @ 8/ 6 = £	377	19	0						
Leading ditto across Wylam Bridge N.Castle & Carlisle Railway 894 @1/- =	44	14	0	424	13	0			
				9331	17	0			
Balance to profit							1591	17	–
						£	9331	17	–
But as by this arrangement the Wayleaves already charged could be entirely quitted, – that Sum could be thus saved. viz.							152	19	0
Profit above							1591	17	0
						£	1744	16	0

N.B. There is no charge made in this Estimate for Rent of Cottages to M^{r}. Blackett, which is paid at present.
There is no charge made for Royalty Rent as M^{r}. Blackett is both Lessee and Lessor at present.

[112]

May 30th. 1840.

Wylam Colliery Considerations on M^{r}. Thompson's Offer.

At the present rate of working, the Old Colliery can only supply, of unskreened Coals, including Splints 92030 Cha.)
15,000

The estimated cost of working which, according to M^{r}. Boyd is 12/ 8 ¼ P. ~~xx~~. of 16 Peck Corves.

£	0	16	0
Deduct leading Charges			5½
	–	15	6½
Ditto Tradesmen Over Estimated for Leading	–	–	4½
	–	15	2

[113]

				£	s	d
Brought Forward £	–	9	5.28	–	13	–
But as the small Coal and Splints on Cappers Coal in this case will be chargeable with the full Tentale, and difference must be added – the quantity may be estimated at 4350 Chas. at 9/- per Ten, is per Chaldron, say.	–	5	4	–	9	10.6
Profit					3	1.4

5. The Coals to be delivered as the Seams will produce them – see last article.

40 : 15/ 2 : : 24 : 9/ 1.2 P. Ch. but say 9.2 P. Cha.

M^{r}. Thompson offers 13. –
3.10

1. Deduct for Jett consumed by workmen and cost of Small for Engines, reduces profit Per Chaldron to 2/ 4 nearly.

M^{r}. Thompson does not object to this, provided the proportion of Yard Coal does not exceed $^{1}/_{3}$ of the whole – but in Boyd's Estimate they are taken at nearly equal quantities, rather more of the Yard Seam.

N°. 2. This is included in Boyd's Estimate – not objectionable

3. Ditto.

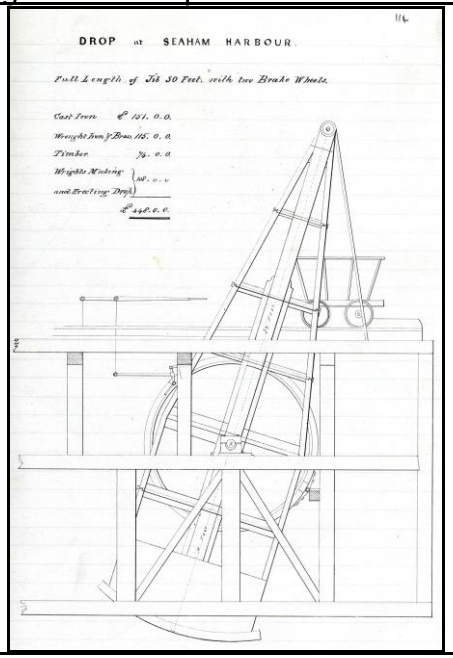
4. Not objectionable, if instead of the company having such proportion of the Splinty part of any of the seams as they require, the expression should be, such proportion of the Splinty part of any of the Seams, as they will produce in the due course of working.

	£		
The price of the Splint and unskreened Coals from Prodhoe at the C^{os}. Works per Chaldron.	0	13	0
The cost of working the Prudhoe Coals and delivering at Shields, as P. Boyds Estimate P. ~~xx~~. of 20 Peck corves			
s d			
26..3¼			
Deduct leading to Shields 6..7¼			
19..8			
= per Ch: to – – – – – – – – – – – – – 9..5.28	–	13	–

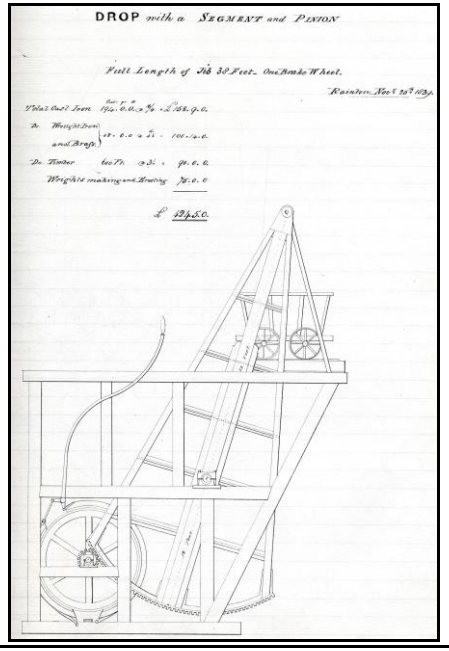
[Bud-33]

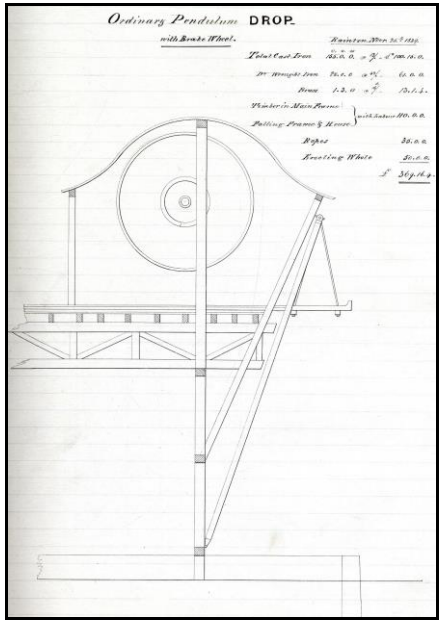
[Pages 115,117,119 and 121 are Blank, even numbers between have Diagrams on]

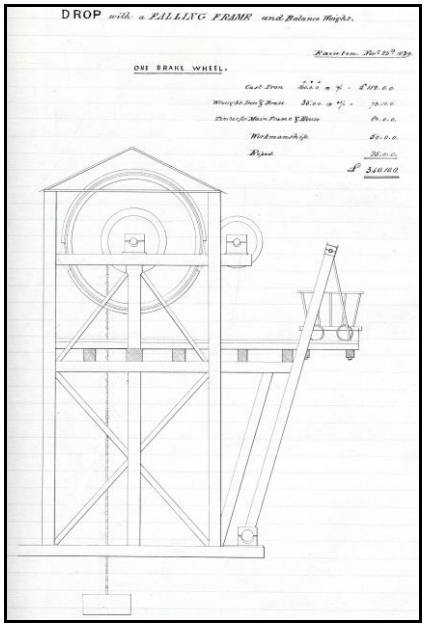
Page 114 – Drop at Seaham Harbour



Page 116 – Drop with a Segment & Pinion







[Bud-33] Page 118 – Ordinary Pendulum Drop

Page 120 – Drop with Falling Frame & Balance Weight

[Text on Diagrams]

Page 114 – DROP at Seaham Harbour.

Full Length of Jib 50 Feet, with two Brake Wheels.

Cast Iron	£151..0..0
Wrought Iron & Brass	115..0..0
Timber	74..0..0
Weights Making and Erecting Drop	448..0..0
	£448..0..0

Page 116 – DROP with a Segmment and Pinion

Full Length of Jib 38 Feet – One Brake Wheel.

Rainton Nov r. 25th. 1839.

	Cwt. Qr lb		
Total Cast Iron	194.. 0..0	@ 16/ 4 =	£158..9..0
Do. wrought Iron and Brass.	48..0..0	@ 4½ =	100..14..0
do. Timber	600 Ft.	@ 3/- =	90.. 0..0
Wrights making and Erecting			75.. 0..0
			£424.. 5..0

Page 118 – Ordinary Pendulam DROP-with Brake Wheel.

Rainton Nov r. 25th. 1839.

	Cwt. qr lb		
Total Cast Iron	155..0..0	@ 13/- =	£100..15..0
Do. Wrought Iron	28..0..0	@42/- =	61.. 0..0
Brass	1..3..0	@16/- =	13.. 1..4.
Timber in Main Frame Falling Frame & House with Labour			110.. 0..0
Ropes			35.. 0..0
Erecting Whole			50.. 0..0
			£369..16..4.

Page 120 – DROP with a FALLINF FRAME and Ballance Weight.

ONE BREAK WHEEL.

Rainton Nov r. 25th. 1839.

	Cwt. qr lb		
Cast Iron	160..0..0	@ 14/- +	£112.. 0..0
Wrought Iron & Brass	35..0..0	@ 42/- =	73..10..0
Timber Main Frame & House			80.. 0..0
Workmanship			50.. 0..0
Ropes.			25.. 0..0
			340..10..0

[Bud-33]

[122]

Darlington, Imo. (Jany. 18th. 1842.

To R.T. Atkinson
Civil Engineer.

I address thee for and on behalf of the Stockton and Darlington Railway Co. as a Gentleman than whom, I know of no one now conversant with the Coal Mining Districts of the North of England, to give thy opinion in the most impartial manner on the following points – and in order to such opinion not only being based upon thy long and intimate experience of the expences incurred, under the ever varying circumstances of the Coal Trade; – and the contingencies attendant upon the working, transporting and vending of Coals on the Tyne, Wear, Tees or Haltlepool and other parts of the nation; papers prepared by the adverse parties respectively, explanatory of their views will be laid before thee. I am aware that thou art already well acquainted with the Locality.

Thy opinion whether any change similar to that proposed by the Owners of Blackboy Collieries would, under the circumstances of the case, be likely to prove beneficial to the said Owners, having regard to present investment of Capital, future benefits, and reduced cost of Transport: greater facilities of conveyance or enhanced profits, on the working of the Mines belonging to the parties, and how far the aggregate charges now made by the Stockton & Darlington Railway Co. can considered fair and reasonable – for the work done and the Facilities given by the said Co.

I am
for the S. & D. Railway Co.
John Harris
Engineer.

[123]

Darlington Imo. 25th. 1842.

Dear Atkinson,

I have been requested to hand the following instructions, which Jos. Pease thinks would illustrate the Report if inserted at the commencement. – I also hand the enclosed propositions which have arisen on a consideration of the report – I think it takes a very comprehensive view of the whole case. – The Directors would be glad to have the report at their meeting of the 28th. Inst.

I am
very respectfully
Jno. Harris.

Southend
Darlington Imo.: 25.1842
Esteemed Friend
R.T. Atkinson.

I have had sufficient time to make my notes upon the Draft of Report; but purpose doing so this morning, and I write a few lines to say that the report I will be found, directed as below, tomorrow morning. This seems important because the re-copying will require some time, and the fair Copy ought to be at the Chevy Chase Office directed for Mr. Barnard. Railway Office on Thursday night.

Our Board meets at 10 O'clock on Friday.

I am sincerely
J. Pearse Jn.

To R.T. Atkinson Esqr.
paid Wallsend to be left at the Turf Hotel
Newcastle Coach Office, till called for,

[Bud-33]

Offer by the Stockton and Darlington R.W. Co. to reduce the Dues on Black Boy Coals £500 on the total quanty. on certain

[124]

Proposition arising out of consideration of Draft.
To address the Stockton & Darlington Railway Co.
To introduce instructions.
To touch upon the proportion – That Coals of any-kind cannot permanently maintain a high price in one Port than in another.

To give a sentiment on the agregate charges of the Stockton and Darlington Railway Co. which including Planea Tunnel Dues – haulage Tolls greasing-waggons weighing, and Shipment with return of waggon &. on average P. Ch. P. mile

Darlington 17th. Jan. 1842.

Meeting with Mr. Harris on business connected with the Stockton & Darlington Railway.

The object of this meeting was to take into consideration a project, at present entertained by the Owners of Black Boy Colliery, for laying a short line of private Railway, for the purpose of connecting the B.B. Pit with the Clarence for Shipment instead of to Middesbro' by the Stockton and Darlington way, as at present. This they propose to do unless the Stockton & Darlington Railway Compy. will make certain reductions the present dues, but to what extent this reduction is to take place is not mentioned.

The Stockton & Darlington Railway Co. offered at the end of 1842, to reduce the Black Boy Owners £500 on the Total Dues, provided they (the Black Boy Colliery Owners) would enter into the waggon arrangement is to be as follows.

The number of waggons on the Stockton & Darlington Railway belonging the Collieries is at present nearly 6000 – and owing to the very bad state of the waggon wheels, the Rails are much injured by the Traffic: the Railway Co. have therefore determined to offer to buy the whole of the waggons and find

sufficient accommodation in number for the Colliery for $^{3}/_{16}^{th}$. Per Mile per Ton.

Carlisle way $^{5}/_{6}^{ths}$.

Brandling Junction $^{5}/_{8}^{ths}$.

Stanhope Tyne ½ ?

Old Etherley Land, St. Helens Deanery and So. Durham have agreed to this arrangement, and Wilton Park ~~&c.~~ and wood are inclined to do so.

The Black Boy Company originally state that the annual Cost Pr. Waggon on the Stockton and Darlington Railway was £4.5; then £2..2 – & lastly 30^{s}/- – the payment for the waggons in 5 years by ½ yearly instalments, paying Interest at the rate of 5 Per Cent in the Mean time, the value to be made without reference to the present depressed state of the Iron &c. –

To enable the Black Boy Company to get their Coals conveyed to Port Clarence, it would be necessary for them in the first instance to lay an Incline Branch of ½ a mile with a Stationary Engine near Howlish Hall to draw the Coals up by 8 waggons at one time, making 5 pulls for a Set of 40 Waggons. The Gradient supposed about 1 in 36.

M^{r}. H. supposes on an Engine of 45 Horse power would be required for this purpose.

9" could Self Act Plane be accompl--shed or would the B.B C^{o}. require a Small Eng. to draw the waggons back?

From this fixed Engine a double way for horses of nearly one mile from thence as far as western and Chilton bank of way (about $^{1}/_{3}$ of a mile) – a self acting Plane. Along the western and Chilton Branch 3½ miles of Horse way, at present nearly all single, to top of self acting Plane on the Chiltern Branch (about ½ a mile long) – then ½ Mile self acting plane to the Clarence Locomotive Line – 15 miles from thence to port Clarence.

Supposing the Coals conveyed to Hartlepool instead of Port Clarence, they would diverge from the Clarence Railway at 3½ mile post (11 miles from the foot of the self acting plane) and go down the Stockton & Darlington Railway 8¼ miles to Hartlepool – At the Hartlepool

Descpt of

shipped in the Hartlepool Docks.

Description of the S & D^{r}. R.way

Present Stockton & Darlington Line.

From Black Boy New Pit ¾ mile self acting plane – ¼ permanent Engine Plane at the top – (50 horse power High Pressure), from thence 23½ miles Locomotive Line to Middlesbro' where the Coals are shipped. –

Tunnel 1207 yds uses S. 22/ 1 P. mile Semicircular arches from from the crown of wh: (inside)24ft to Rails.Breadth 23½

Future Line. When the Tunnel is finished – say 5 months the Line will then be as follows – From Black Boy, if the Coals are brought through the Tunnel, it will be necessary to form a communication of from ¼ to ½ mile between the Black Boy Pit and the Eldon waggon way as above. When this is accomplished there will be a Locomotive communication all the way to Middlesbro'. It must not be forgot that after the docks (at Middlesbro') which are nearly complete, are opened, very much increased facilities to the shipment of Coals will be given – Nothing will be charged for the use of the Docks, but 2^{d}. a Ton for Spoutage. At Samplire bats the charge is 1½^{d}.

Description of S & D Line When Tunnel completed

Private Branch from Black Boy to join the Clarence Line

Description of Private Bran^{h}. from B.B Colliery Wayleaves to be incured

This Branch passes through 3 districts properties for which wayleave will have to be negotiated. John Walker Esqr. Howlish, M^{r}. Wharton Esqr. Coundon, Dean and Chapter of Durham.

It is impossible to say what those proprietors may charge the Black Boy Co: for those privileges, but considering the circumstances that the distance thro' each are short and moreover that the line together with its fixed Engine will be very near Howlish Hall, it seems most probable that the wayleave charge will be heavy.

Extract from M^{r}. Fallows l letter re-comparative merit of Public Rail way Lines & Shipping Places

"Extract" – The Owner of Seymour's Wallsend having sent Coals to Hartlepool found by experience that it was contrary to their interests, and have ceased. "They sold their Coals at Port Clarence for 26/ 6, and at Hartlepool for 28/- after having had to pay 2/- P. Chaldron extra dues Haulage, Shipping, and other expences thereon – thus losing 6^{d}. P. Ch: addition to the inconvenience and delay both to Coal and Waggons."

Line. [Bud-33]	terminus it is necessary that the waggons should again be drawn up a short inclined plane, and		

Mr. Fallow's letter to Mr Pease	[127]	Fallow's Letter continued	[128]

Jan 13th. 1842.

Jos. Pease Esqr.

Sir,

On thinking over the events of the past year as regards the Interests of this place & also the Port, more especially with reference to the competition of the Hartlepool & out Trade, many questions arise thereon as to our gain or loss, to which I solicit your attention.

1st. It as the Port gained or lost by such competition? It has gained. – The experiment having been tried of sending Coals from the Auckland District and having failed, this place will obtain the advantage.

(Here follows extract I misplaced continuation from No. 1.)

Mr. Seymore has stated that it would be to their Interest to pay 9/ 6 P. Ton Freight at Middlesbro' rather than have to send their Coals to Hartlepool, & only have to pay 9/- P. Ton.

Out of the 9 Cargoes of their Coals sent to London during the year, I understand that 4 of them being sold, were on Ship's Account. The remainder being freighted on Account of the Colliery, by which they would lose 2/- P. Ch: expanded in sending them to Hartlepool, and not obtaining one penny per Ton more in London for them.

Mr. Seymore I understand, intends to send his Coals here, in preference to any other place, which I consider a sufficient answer as to the advantage of one place of Shipment over the other.

But it may be said this, not a Colliery on which the experement would be fairly tried, being but a second rate Coal. Let us then assume for arguing the case that the Owners of Black Boy Colliery were to send their Coals to Hartlepool – of what advantage would it be to them? None – but a certain loss, in as much as they now sell their Coals here at 11/- P. Ton. and a great many I believe they sell – if sent to Hartlepool they could not get more for them – to send them there would

[128]

advantage of a lower scale of Freights – in this they would be disappointed, finding that in January and February, the average rate of Freight from Hartlepool was ½ P. Ton lower here – in April 5d. P. Ton – in May 3rd. P. Ton in June, July and August, the Freights were the same at both places. September, 6d. P. Ton lower at Hartlepool – Oct. 6d. Do. Do. Nov. & Dec. the same rate at both places. Hence nothing can be saved in Freight to compensate for the extra Tonnage on the Coal being sent there (to Hartlepool.)

Again it may be said that the Black Boy Coal would then being the first rate price in London. That is, equal to Hartlepool Wallsend – in this the Owners would find themselves disappointed, – for on examining the prices obtained throughout the year for Hartlepool Wallsend, in the London Market, it is found to be 21/ 10 P. Ton, whereas the Tees Wallsend Coal, only averages 20/ 9 – shewing the difference of value to be 1/ 1 P. Ton These I consider the standard prices of these two kinds of Coal, fixed by the Trade, over which, neither the place of Shipment nor advance of Price on a certificate will operate.

I think I might safely conclude that the Owner of Black Boy Colliery would certainly lose 8d. P. Chaldron, on every Chaldron of Coals they might be induced to send to Hartlepool or <u>£1000 per Annum</u>, on what they might send to the London Market, taking the last year as the Basis. – 268 Cargoes, or say 80 Tons @ 3d. P. Ton.

In conclusion I think myself fully bourne out in stating that we have nothing to apprehend from the competition of Hartlepool however wayward the Coal Owners may be. &c. &c. –

Letter from Jno: Graham

Mr. Pease from John Graham. January 11th. 1842.

D. Sir,

I have seen Mr. Seymour's Agent this morning, and the cost of Coals Shipped at Hartlepool is 6/ 11 P. Chaldron, and at Sampher bats 5/ 2 – In general the Freights are 6d. Lower at the former than at the latter. – I asked if they could not better at

cost 9^{d}. P. Ton, and as they could not calculate on obtaining there a better price for their Coals than either Braddyl's or Hartlepool Wallsend viz 11/ 6 they must consequently lose 3^{d}. P. Ton on every Ton sent there, whether sold a shipped on Freight – It may be advanced, that they would have the

[Bud-33]

with some particular Coals at Hartlepool than Sampher bats – his answer was, No – we can do quite well in the Tees as at Hartlepool, and further said that they were put to great inconvenience by not getting their waggons back, on account of the bad arrangements

[129]

at Hartlepool, and that he was of opinion that we could do better for them than either of the others – (B. After some observations further, the letter proceeds.) They must be blind to their own interests if they do not comply according to our Scale of Prices the differences must be a sufficient inducement, which are as under.

Hartlepool 6/ 11 – less – 6^{d}. Freight 5^{s}/ 7 $^{1}/_{10}$ P. Ton
Sampher bats 5/ 2 –
Middlesbro' 3/10.425 –
Stockton 3/ 2 –

John Graham.

Clarence and Stockton & Hartlepool Railway Charges, also distance

Hartlepool Railways.	Port Clarence	Stockton Depots	Stockton Staiths	Hartlepool
West Branch				
Sim Pasture to	15½	12 ¼	12¾	20½
North Branch				
Coxhoe, W.Hetton, Crowtrees Barret's W.end (now Bentley's and Clarence Hetton Collieries	19½	16¼	16¾	24½
Carnforth Colliery	18	14¾	15¼	23
Thrislington	17½	14½	14¾	22½
Byer's Green Branch				
Whitworth Colliery Coals coming from the West Durham Branch on the Byers Green Branch Willington, or Seppings Henwick or Pontop Byers Green Colliery.	22½	19¼	19¾	27½

[130]

Clarence Railway

Clarence Rail Way.

Dues ½^{d}. Per Ton Per Mile – Export Coals.
1^{d}. – – Landsale. –
1^{d}. Wharfage on the Sidings to accommodate villagers.

Depots at Stockton £8 P. Annum.

Parties selling Coals out of Depots without renting them 2^{d}. P. Tonn 1½^{d}. Shipping Charge at Port Clarence and Pertrack Drop-except on small at the latter place, on which article there is no charge made.

Haulage $^{3}/_{8}$^{d}. per Ton per mile
¼^{d}. – for nuts, small, or for Export.
¼^{d}. – Small for Export.

Stockton &Hartlepool Railway.

Stockton and Hartlepool Railway.

8½ Miles from Junction at Billingham to Middleton, where it joins the Hartlepool Dock & Railway Coc. Line

Dues. ½ per Ton per Mile.
Haulage $^{3}/_{8}$^{d}. – –
Shipping 6$^{1}/_{3}$^{d}. Per Ton at Hartlepool i.e.
Railway from Middleton to Staiths & Incline dues 3^{d}. P. Ton
Drop dues 1½
Shipping Charge 2
6½

A Treaty is going on to get this charge lowered.

Rec^{d}. the above information from M^{r}. Harris Documents.

Sundry Tables as to the comparative Cost of leading Coals from BlackBoy Colliery by the Clarenceway &the Stockton & Darlingtonway.

Table N°.1. Shewing the cost of leading one Ton of Coals on the Stockton & Darlington Railway and shipping the same at Middlesbro' as per present charges.

These Collieries pay 1/ 4 P. Ton on all Coals coming off the West Durham Branch on to the Byer's Green D^o.^
The distance from the Pits to the point where they come upon the Byer's Green Branch, and the dues charged on the [6] Railway can be furnished by M^r^. Srenholm Darlington.

Chilton Branch.	Port Clarence	St. Dar.	S.S.	Hart.
Western Colliery – – – –	18¼ – – –	15 – – –	15½ – – –	13¼

N.B. No charge made for the self acting plane on the Chilton Branch. – – – – – –

[Bud-33]

Self acting Plane (Colliery)	1.50^d^. Per Ton.
Haulage 24¾ Miles at $^1/_8$ per Ton P. mile –	3.09 – –
Dues, 24¾ @ ½^d^.	1..0.37 – –
Incline Plane	9 – –
Bridge Toll	1 – –
Shipping	2 – –
Waggons	4.5 – –
Per Ton – –	2..9.47

[131]

N°.2. – Shewing the Cost of leading a Ton of Coals via the proposed wayleaves thro' the properties belonging to John Walker Esqr. L. Warton Esqr. And the Dean & Chapter of Durham – and Shipping the Coals at Port Clarence, by the Clarence Railway.

Haulage

Private Branch	½ Mile Engine Plane	1½^d^. P. Ton.	
	1 – Horse	½ –	
	¼ mile self acting	$^3/_8$ –	6¼ . $^7/_{20}$ P. Cha:
	3½ – Horses	2 –	
	½ – Incline	½ –	
15 Miles Clarence Railway @ $^3/_8$^d^.		5½ . ½ Per Ton.	
Shipping		1½ –	
Waggons.		6 –	
Dues 20¾ Miles @ ½^d^. P. Ton P. Mile		10$^3/_8$ –	
	Tons	2..3¾ . ½ –	
Wayleaves on 1¾mile £400 on 64000		1½ –	
or per Chaldron 6^s^..5½^d^ .$^1/_{20}$		2..5¼	

Cost of One Chaldron of Coals on the Stockton & Hartlepool Railway

8¼ Miles Haulage $^3/_8$^ths^.	3$^1/_8$^d.^ per Ton	
– dues ½	4$^1/_8$ –	
Shipping &c.	6½ –	
Per Ton 1..1¾ = 3/ 0¼ . ¾ Per Chald:		

Note by M^r^. P. – Junction to P. Clarence 3½ miles $^3/_8$

[132]

		Hours
	Brought forward	7½
Oiling (over rated R.T.A.)		½
	Hours	8.

N.B. The Oiling would be performed by the waggon Company, if the scheme mentioned at Page – is carried into effect.

Expence of forming a New Line from Black Boy Colliery to Leasing thome.

		£	
839 Roads of Fencing with quicks @ 6/ 6		£	273..13.. 6
839 Railway – – – – – – – – – – – – @ 5/-			209..15.. –
Bridge for carrying the railway over the High Road to Rushyford, with approaches, wing walls &c.			1000.. – .. –
Tons C. q. lb			
314..13..2..8 of Rails 60 lbs p. yd.	@ £8 P. Ton – –		2832.. 2.. –
131.. 2..1..8 Charis, averaging 25 lb	@ £6 – – – – – –		852.. 5.. –
11748 Stone Blocks – – – – – – – – –	@ 2^s^/ 4^d^. – – – –		1370..12.. –
28200 Wood pins – – – – – – – – – –	@ £1..15 [pevm]		49.. 7.. –
11748 Wood Keys – – – – – – – – – –	@ £15 – – – – –		176.. 5.. –
2692 Waggons of Ballast – – – – – –	@ 2^s^/- – – – – –		267.. 4.. –
Labour 2937 Yards – – – – – – – – –	@ 2^s^/ 6 – – – –		367.. 2.. 6
Engines &c. –			2000.. – .. –
Ropes –			400.. – .. –
Excavating, Embanking, Draining, Soiling, Slopes Culverts –			5400.. – .. –

Shipping 1½

1..0 $^{1}/_{12}$ P. Chaldron

(Including Waggons 3/ 3 Per Chaldron.)

N°.3. (Harris.)

Black Boy Colliery – Shewing the time that will be occupied in leading Coals from Black Boy Colliery. Via Tunnel & Stockton & Darlington Railway to Middlesbro' Dock, and returning with the empty waggons.

	Hours
From Black Boy Colliery over Eldon Branch. the Tunnel, and down to the Dock (at Middlesbro')	3½
Arranging Load.	½
Returning with Empty Waggons	3½
Carried Forw^{d}.	7½

[Bud-33]

[DP]	15199..6..0
Doubling the Chilton Line, or Parts thereof, being now formed single, and in some parts very high embankments, say 2½ miles, building walls, Culverts &c.	6000.. 0..0
£	21199.. 6..0

Table shewing the Time that will be occupied in leading Coals from Black Boy Colliery to Port Clarence, via way leaves thro' Walker, Wharton, & Dean and Chapter, and the Clarence Railway and returning with empty Waggons.

Engine Plane 1 Load	1 Hour
Horses and self acting Plane	2 –
Locomotive Line, inclined Plane & Oiling	2 –
Arranging Load	½ –
Returning with Empty waggons – – – – – – – – – –	5 –
Hours	10½

At present ascending Plane cost 3^{d}. this is Low. 3^{d}. per Ch = 1$^{1}/_{8}$^{d}.

[133]

Minutes by M^{r}. Pease.

½ Mile ascending Engine Plane – – – – 1½ P. Ton.

1 – haulage by horses – – – – – – – ½ –

¼ – Self acting Plane – – – – – – – – $^{3}/_{8}$ –

Wayleaves 1¾ Miles over 3 districts

Properties J. Walker Esq., W.L. Whalton Esqr. and Dean and Chapter.

(Query Westerton Colliery Railway)

say 200 P. Ann ea. £600.

£600 ÷ 71000 Tons – average yearly export = 2 –

Capital to be invested in forming the Branch, including deterioration (wear and tear independent of Repairs)

10 P. Cent, say £12000 = 1200 on 71000 Tons.

add also Landsale 23500

94500 1200 = $^{3}/_{7}$. $^{3}/_{8}$ –

Damages, repairs etc. in liew of Toll ½ . $^{3}/_{8}$ –

1/ 0 to ½ – – – – –

3½ Miles of Horses 2 –

[134]

Mr. Gurney's Letter

London Imo: 5 : 1842.

Dear Friend,

Under some hope, and a very strong desire to bring to a friendly settlement the differences that exist between my relative J^{no}. Backhouse, and the Stockton and Darlington Railroad. I have lately sent to his Agent some Queries, from the answers to which I wished to come to a clear view of the case, but before I make up my mind I should wish to have the answers checked by the adverse Interest – I therefore enclose them, and shall be obliged, if not intruding upon thee, by replies from thee to the same queries.

I shall be obliged by thy returning this document.

In addition to what appears, I have been informed that the Stockton & Darlington Railway Co. receive P. Annum for the conveyance of Coals about £88000

That the expence of this portion of their traffics 37000

leaving Profit of £51000

that the Black Boy has contributed about £11000, or about

½ Mile Incline (Chilton)		– ½
15 Miles haulage (clarence) @	$^3/_8$	5½ . ½
Shipping		1½
Dues 19 Miles	@ ½	9½
s d		2..3½ P. Ton.
2..3½ P. Ton. P. Chaldron		6..1 nearly
Port Clarence		$6^s..1^d$
Dues to Hartlepool		3..0¼ . ¾
miles		9..1¼ . ¾
Less from Incline 3½ ..	$^3/_8$	
3½	½	
Shipping	1½	
	$1..0^1/_{16}$	$1..0^1/_{16}$
		8..1 ¼.

[Bud-33]

$^1/8^{ths}$. Part of £51~~m~~, or upwards of £6000 to the Railway Profit. If the statements herewith should be correct J^{no}. Backhouse would have nearly £3000 P. Ann: by changing his line of traffic, but as I very far from wish to aggravate difficulties, I incline to place it at about £2000 per Annum.

Canst thou shake me from the point ? –

With respect to the capability of the Clarence Railway to perform the work to satisfaction. I take rather a favourable view – to whomsoever it may hereafter belong, it is, and will be so essential to secure and duly perform this business – indeed it is my opinion, having the business, would tend powerfully to resuscitate the Company.

Thy reply in due time will oblige &c. &c.

Saml. Gurney.

So far as I can judge the offer is a good one for making the needful additional Line to unite the Colliery with the Clarence Rail Road –

[135]

Replies to S. Gurney's Questions

1st. What sum per Ton, including the proposed new line, will that Company (the Clarence) charge, and are there any collateral charges by this Line?

The charge per Chaldron of 53 Cwt. Including the new line; for which 7^d. Per Chaldron is allowed is 4/ 4 to Port Clarence this includes every charge from the Pit to the vessel – An offer has been made to J^{no}. Backhouse to complete the Branch with Fixed Engine, Sheaves, and all complete, fit for the conveyance of the Coal for £8000.

2nd. What is the charge by the Stockton & Darlington Railway, including all incidental expences? –

The charge by the Stockton & Darlington Railway is 6^s/ 0¾ per Chaldron, to which add 3^d. per Chaldron for Jo^s. Backhouse's private incline Branch, making a total of 6^s/ 3¾ per Chaldron –

3rd. What advantage per Ton is there at Hartlepool (over Middlesbro') in the sale of the same description of Coal ?

[135 cont.]

4th. What is the comparative distance of the two Lines and of the time taken by both for the transit of Coals to the Sea ?

The comparative distance from the Black Boy Pit to the place of Shipment at Middlesbro' by the Stockton and Darlington Railway 25¾ Miles was charged by the S. & D. 24¾ Miles, to which add near 1 mile from the Pit. And the Distance upon the Clarence Railway is 17¼ Miles, to which add from Leasingthorne to the New Branch ¾ Miles, and 1¾ Mile the New Branch, making a total of 20¼ Miles, giving an advantage of 5½ Miles in favour of the Clarence Railway. We consider the time occupied on both Lines would be, nearly the same.

No Coal of the same description from Auckland valley has been shipped at Hartlepool – but Coals of an Inferior description, are realizing from 2/- to 3/- per Chaldron more than they did when shipped on the Tees (for instance Seymour's)
[Bud-33]

Tonnage Coals from Black Boy Colliery [136]

		Landsale.				Export.				Foreign.				Total.			
		Tons	Amount			Tons	Amount			Tons	Amount			Tons	Amount		
1839.			£	s	d		£	s	d		£	s	d		£	s	d
	November	2413	248	–	1	3378	394	–	2	158	9	12	11	5949	651	13	2
	December	2607	270	6	2	3977	467	17	10	185	12	13	10	6769	750	17	10
1840.																	
	January	1427	170	13	2	3320	382	3	8	42	2	10	9	4789	555	17	7
	February	1624	196	9	3	4144	481	17	8	–	–	–	–	5768	678	6	11
	March	1870	243	8	7	4173	494	10	1	135	9	–	–	6178	746	8	8
	April	1760	201	1	1	5411	633	14	8	855	58	2	7	8026	893	13	4
	May	2009	248	7	7	6259	735	6	3	1314	90	19	6	9580	1075	2	4
	June	1260	156	7	7	6447	759	15	4	1231	82	17	3	8938	999	12	2
	July	1441	191	6	6	6656	784	2	5	880	61	17	6	8977	1037	16	5
	August	980	118	5	5	6371	752	–	4	1574	104	18	8	8925	975	11	5
	September	1322	176	2	2	5893	688	7	8	1483	101	12	3	8698	966	19	1
	October	2134	256	11	11	6614	772	19	2	532	37	8	2	9280	1066	14	3
	November	2466	230	3	3	5856	679	7	9	495	33	14	9	8817	944	–	9
	December	2994	286	3	3	3781	449	7	1	85	25	2	9	6860	741	3	1
1841.																	
	January	2995	352	10	10	4082	457	16	2	–	–	–	–	7077	810	6	–
	February	2257	274	7	7	4901	551	9	11	–	–	–	–	7158	826	8	6
	March	1077	77	7	7	6087	689	8	2	479	39	3	4	7643	805	18	1
	April	1555	170	11	11	5886	657	16	–	–	–	–	–	7441	828	11	11
	May	3010	362	6	6	4639	519	1	7	1472	122	11	4	9121	1004	11	5
	June	2324	271	2	2	5745	646	13	9	1029	84	16	4	9098	1002	12	3
	July	3167	371	2	2	4957	558	–	2	617	50	18	2	8741	980	14	6
	August	1417	170	4	4	7430	834	10	7	379	30	19	10	9226	1036	1	9
	September	1031	115	9	9	6455	721	3	4	535	43	14	11	8021	880	10	–
	October	1908	195	8	8	6155	692	18	6	431	35	9	6	8494	921	17	8
		47048	5358	16	6	128617	14804	8	3	13911	1018	4	4	189576	21181	8	1

Black Boy Colliery and the Stockton & Darlington Railway.

Having been requested to turn my attention to certain points connected with a question at present in course of negotiation between the Stockton and Darlington Railway Company, and the Lessees of Black Boy Colliery, as to leading and Shipping the produce of that Colliery by the Clarence or Stockton and Darlington Line. I proceeded on Monday and Tuesday, the 17th. and 18th. Inst. to endeavour to possess myself of such information from the various sources which prevented them selves, as I conceive necessary to enable me to give my opinion on the matter in question – and having since carefully considered the principal points which seem to bear on the business. I beg to submit the following observations to the parties concerned, – Before entering on the subject however I must claim indulgence for any omission, or slight inaccuracy of detail, and I rely with greater confidence on such indulgence being afforded, because the time allowed has been too limited to give me the opportunity of instituting those^<minute> enquiries into the various details connected with the affair, which might otherwise have been desirable. The information I have received however, so far as it goes, I consider perfectly authentic, and have therefore, less hesitation in freely stating my opinion thereon.

Two modes of conveyance for the Coals produced at Black Boy Colliery offer themselves – One by Stockton and Darlington Railway, which is at the present moment available, and which constitutes the only present outlet from that Colliery – the other by the Clarence Railway, which it is proposed to gain access by the construction of a private Branch, and doubling the line of way on the Westerton and Chilton Branch to the self acting Plane which connects the latter with the Locomotive part of the Clarence Line. The point at issue seems to be this The Black Boy Company having applied to the Stockton & Darlington Railway Company for

construct the private Branch of way just mentioned, so as to gain access to the public Clarence Line, and send their Coals to Port Clarence or Hartlepool for Shipment, instead of to Middlesbro' by the Stockton and Darlington Railway – and the question for consideration is, whether such charge, in the present mode of leading and shipping the Coals, would have the effect of placing the Black Boy Colliery in any better, or even so good a situation, as to cost, celerity of Transit &c. as that in which they now stand, always bearing in mind the expensive nature of the Private Branch proposed to be constructed.

Commencing at the Black Boy Colliery new Pit, this Private line would consist of ½ a mile of Inclined Plane with a station and Engine near Houlish Hall – a double way for Horses of about a Mile – a self acting Plane of from ¼ to $^1/_3$ of a mile, to the Westerton and Chilton Branch the length of which is 3½ Miles, worked by Horses, and which being now nearly all single, would require to be doubled throughout to the Incline which forms the Junction with the Locomotive portion of the Clarence Railway, the length of which is 15 Miles to Port Clarence.

We have therefore.	Mile
Inclined Plane with Stationary Engine – –	½
Horse way	1 –
Self acting Plane	¼
Chilton and Westerton Branch – – – – –	3½
Locomotive Line	15
Miles to Port Clarence	20¼

Should the Coals be sent to Hartlepool they would diverge from the Clarence Line at the 3½ Mile Post or 11½ Miles from the foot of the self acting Plane between the Chilton and Westerton Branch and the Clarence way making a distance from the Pit of 16½ miles

and, add further to Hartlepool	8½	–
Total to Hartlepool	24 ¾	–

I am not in possession of surveys levellings, and other data, by

certain reductions, in their present charge for the conveyance of the Coals from that Colliery – they follow up their application by intimating that should the Railway Comp. decline to accede to their Terms, they will proceed to

[Bud-33]

which to estimate the cost of forming the proposed private line from the Black Boy Pit – to the Chilton and Westerton Branch and doubling the latter – (which, from the information I have

received will be an expensive business, on account of the height of a large portion of the embankments and cuttings) but I have no hesitation in saying that the sum (£8000) named as being that at which the work could be contracted for, is utterly inadequate to the purpose – if, as I understand, it is to include cutting, Embanking, Fencing, Masonery Culverts, Bridges, &c. also, Rails Chairs, Blocks, Sleepers &c. together with the Stationary Engine, Sheves, Ropes, and everything complete and fit for the leading of the Coals.

It may be urged that the cost of this private Branch, is purely the affair of the Lessees of the Black Boy Colliery: – and to a certain extent, it is so, – but it forms at the same time, a prominent feature in the business, in question, in as-much as without giving it due consideration how are we to arrive at any comparison as to the respective merits of the two modes of conveyance, supposing the proposed alteration carried into effect ? A very important point here pre-sents itself, namely, the greatly increased length of time necessary for conveying the Coals to the shipping Place by the proposed change – First of all (commencing at the Pit) we have a locomotive load, (40 waggons) to be drawn up the Engine Plane by 4 or 5 successive hauls – the waggons have then to be put into setts suitable for conveyance by horses along 1 Mile of waggonway – they have then to be arranged as to suit the self acting Plane – again put into Sets to suit the conveyance by horses along 3½ Miles of way to the top of the short self acting Incline which connects the Chilton & Westerton Branch with the Clarence Line – where again, a new arrange-ment would be necessary. All this must inevitably, give rise to endless difficulty, expense and loss of Time – besides which, there is to be taken into consideration the Purchase,

Then again comes the question as to the Terms on which way leaves, can be secured, if they can be secured <u>at all</u>.

The Private line, would pass through 3 district properties, which. I am informed, it would very much disfigure . – One of those properties belongs to John Walker Esq. Another to W.L. Wharton Esq. and the third to the Dean and Chapter of Durham. And when it is considered that in addition to the disfigurement of the surface to be caused by the construction of the Line, the Stationary Engine is intended to be built close to Howlish Hall (M^{r}. Walker's Mansion) it cannot under such circumstances be expected that the privilege of wayleave could be obtained under an extra consideration, and it must be borne in mind that the power of the Owners of the soil is quite arbitrary in such cases.

For the sake of argument let us assume a rate of wayleave, say 2/ 6 P. P. Ten of 440 Bolls, to each of the above named Proprietors. By a return of leadings from Black Boys Colliery in my possession, I find for 2 Years up to October 1841, the total quantity of Black Boy Coals, on which the Railway Dues &c. were charged is 189576 Tons, or 71838 Chaldrons, equal to 35769 Chaldrons or 1928 Tens per annum – at the rate of 2/ 6 per Ten to each proprietor the annual sum, to the payment of which the Owners of the Colliery would become liable would be £723.. –

At 3/- per Ten X 3 – – – – – – – 867..12
At 3/ 6 – – – – – – – – – 1012..4. –
At 4/- – – – – – – – – – 1156..– . –

I have noticed the subject of wayleave Rents thus particularly, principally for the purpose of shewing that the Estimate of the leading cost on the private line of way, can only be an approxima-tion, and ought only to be considered as such in the compa-rative Table of charges presently to appear.

keep, and upholding such a stock of Horses, as would be necessary for the conveyance of the Black Boy Coals, over 4½ Miles of waggonway – also drivers' and other wages, which would form no inconsiderable item on so large a vend as that of Black Boy Colliery: – then comes the expense of working the Stationary engine on the First Plane, Brakesmen, Firemen, Waggon waymen, Riders, Guasers, and all other charges connected with the working & upholding this Engine

[Bud-33]

Middlesbro' Line. The line over which the Black Boy Coals are at present conveyed to Middlesbro' by the Stockton & Darlington Railway, may be described in a few words. – Commencing at the Pit. ¾ of a Mile of self-acting Inclined Plane connects it with the 1¼ of Permanent Engine Plane, which forms the Junction of ^<with> the 23½ Miles of Locomotive Line to Middlesbro', where the Coals are at present shipped.

Increased facilities in the conveyance and shipment of Coals

[141]

carried by the Stockton and Darlington Railway, are on the point of being afforded to all the collieries in the Auckland valley, by the opening for Traffic the great Tunnel near Black Boy Colliery, which is now on the eve of being completed, and which will afford to the neighbouring Collieries, a complete and uninterrupted conveyance Locomotive, from the west end of the Tunnel near Black Boy, and Adelaide, to the Shipping place at Middlesbro', at which place by the construction of the New Docks, and other great and important improvements in the Spouts, Drops &c. sufficient accommodation has been made for the ready shipment of an almost unlimited quantity.
of Coals

The great object with the Black Boy and other Collieries in the Auckland valley producing what may be called first rate Coal, must always be to ensure are expeditious conveyance for them, to the place of Shipment, and it is obvious that the mode of accomplishing this desirable object, is, by as far as possible substituting Locomotive Power for other less ready mode of transit.

The Great Tunnel once opened, will, as before observed, offer the advantage of a Locomotive Line of communicating from near the Black Boy Colliery to Middlesbro' – and , I calculate that between a load going to Middlesbro' by the Stockton and Darlington Railway and returning and a Load going to, and returning from Port Clarence by the proposed Junction to be effected with the Clarence line, by the private branch of way already described – the advan-

[142]

as per present charges, is as follows.

	d.
Self acting Plane (Colliery) – – – – – – – – – –	1.51
Haulage 24¾ Miles @ $^1/_8{}^d$. per on per Mile –	3.09
Dues 24 ¾ Miles @ ½ – – –	12.37
Inclined Plane	9.0
Bridge Toll	1.0
Shipping	2.0
Waggons	4.5
Per Ton	2/ 9.47

Approximate Estimate of the Cost of leading a Ton of Coals from Black Boy Colliery by the proposed New Branch and Clarence Railway, and shipping them at Port Clarence.

½ Mile		Engine Plane	1½^d.
1	–	Horse way	½
¼	–	Self-acting Plane	$^3/_8$
3½	–	Horse way on the Chilton and Westerton Branch	2
½	–	Self-acting Plane to the Clarence Railway	½
15	–	Haulage @ $5^3/_5$	5½
		Shipping	1½
		Waggons	6
		Dues 19 Miles @ ½	9½
		Per Ton	2/ $3^3/_8$

Comparing this with the foregoing charge on coals led to Middlesbro' by the Stockton and Darlington Railway, there appears a difference of very nearly 6^d. Per Ton, in favour of the Clarence line – keeping out of sight however the way leave rents,

tage, in point of time by the first mode of conveyance would be 2 to 2 ½ hours per trip: such a saving of time in the transit of the Black Boy Coals, I consider an object of paramount importance to the interest of the Colliery, and as far as my present information enables me to judge, I do not see how any possible advantage is to be derived by the adoption of this new line for the present mode of conveyance, taking into consideration the outlay of capital cramped powers of leading, and other contingencies as already stated.

The Cost of leading one Ton of Coals by the Stockton and Darlington Railway, and shipping them at Middlesbro'

[Bud-33]

and Interest on the Capital to be expended in constructing the proposed private Branch and doubling the Chilton & Westerton line. Would 6^{d}. per Ton cover those charges? Doubtful. (But admitting it to be sufficient for the purpose, where is the advantage to be gained by the change further than a saving of from 4 to 5 miles of land, by Locomotive power on the whole distance from the Pit to the place of Shipment against which must be set the disabilities with which a new line would be fettered as to its power etc. as formerly pointed out.

The extra cost of sending the Coals to Hartlepool, together with

[143]

the delay in getting the empty waggons back to the Colliery seem to afford sufficient grounds for assuming that there will not be any advantage to be gained by the shipment of the Coals at that Port.

The additional cost of taking the Black Boy Carlisle Hartlepool would be as follows;

		d.
8½ Miles Haulage	@ $^{3}/_{8}$^{d}.	$3^{1}/_{8}$
8½ – Dues	@ ½	$4^{1}/_{8}$
Shipping &c.		6 ¼
	Per Ton.	1..1¾

I am aware that it has been urged that the rate of Freight is generally lower at Hartlepool, than at either Port Clarence or Middlesbro' – it can however be shewn that, this is only the case during certain portions of the year, and there only to a trifling extent – and now that the Docks at Middlesbro' are finished, and the Port made complete in every respect, it is fair to presume that in future any disparity in the rate of Freight will be less than hitherto

In conclusion I beg to state that it is my fair conviction, from a due consideration of all the foregoing circumstances, that the Black Boy Lessees, would best consult their own Interests, by continuing to send their Coals by the Stockton & Darlington Railway, on which they can

[144]

December 31st. 1842.

Approximate Estimate of the Cost of working and Shipping a Chaldron of Hastings Hartley Coals, supposing the Colliery to command an annual vend of 60,000 Chaldrons of Best Coals.

The present Powers of the Colliery are equal to an average of 20 Keels, or 160 Chaldrons of Best Coals per day, at which scale of work, and allowing 300 working days a year, the annual quantity raised would be 18,000 Chaldrons. To produce 60,000 Chald. Would require a daily quantity of 25 Keels, being 5 Keels more than the present rate of working, and it may be assumed that the Colliery will presently be in a condition to work this extra quantity.

To estimate the cost is a matter of some difficulty the charges upon the Coals wrought up to the present time, not affording a fair criterion whereon to base calculations for the future. A tolerably accurate idea may however be formed of the probable cost of some of the principal items, and by carefully comparing the present charges on the remaining departments with what an increased vend would be likely to give, and also with the actual expenditure at Cramlington the adjoining Colliery as per documents collected during the late valuation of that Colliery, a conclusion pretty near the truth may possibly be arrived at. Still, however, the Estimate must only be considered as an approx-

have locomotive conveyance from the Shipping Place to within a very short distance from their Pit – and a communication between the Colliery and the west end of the Great Tunnel, may easily be effected by short connecting line of waggon way from the Pit to the Eldon Colliery Railway. This short connecting line may be formed at little cost, the surface being favourable – I am induced to recommend this continuation of the Stockton and Darlington line by the Black Boy Company more strongly from the vast importance which I conceive it to be of to them, to have secured to them a rapid and certain conveyance for their Coals.

Robt: Thos: Atkinson
(Copy) Wallsend Colliery
23rd. January 1842.

[Bud-33]

imation –

1. Driving, Hewing, Putting, Door Keeping; Overman and Deputyship, Horsekeeping, Furnace Keeping, Onsetting, Platelaying, and every other charge for underground labour, except waste and Shift work –

Cost of Pays 23,24 & 25.

	Round	Small	Cost
	~~xx~~.	~~xx~~. c.	
23.	651..6	60..1	£503..12.. –
24.	656..9	75..10	513..13.. 2
25.	684..6	66..19	526.. 5..10
	1992..1	202..10	£1543..11.. 1

Putting out of sight the small Coals drawn, and calculating merely upon the Round, the three above named Pays give an

[145]

average cost of 15/ 6 per Score.

The expence attending the large proportion of narrow work, extra score price for hewing in low places, making Tub height, and other contingences on the crippled condition of the Colliery have however added materially to what may be looked forward to, as the probable cost, when the Colliery shall have been placed in a fair working state, and the Coals can be had from working Places of tolerable weight. Due consideration of such an altered state of things, in all its bearings would appear to justify the assumption that 14/ 6 per score of 7 ½ Cwt. Tubs, will be ample to cover all underground charges, Waste and Shift ~~Bill~~^<work> included

In equating the Cost of the underground department per score, to the Chaldron, it must be observed that until very lately, over weight had been given to a large extent in addition to which, the underground separation had not been sufficiently looked to – the Out-making of the Coals was consequently very unsatisfactory. Experiment at the time proved that with the then measure, it required on the average 9½ Tubs to fill a waggon; it was however, subsequently ascertained that instead of the standard

[146]

to more than 5d. per Chaldron on 60,000 Chaldrons.

3. Wailing and Skreening The cost of this department maybe assumed to be the same as hitherto. The last 5 Pays give an average of 9.7d. per score as follows.

	~~xx~~.	£. s. d.
No. 21.	482.. 9	24..11.. 8
– 22.	651.. 2	27.. 4.. 8
– 23.	651.. 6	26.. 3..10
– 24.	651.. 2	24..11.. 4
– 25.	684.. 6	13..15..11
	3125..12	£126.. 7.. 5

$\frac{126..7..5}{3125..12}$ = 9.7d. per Score = 4.128d. Per Chaldron.

4. Filling & Leading.

	Ch.	
No. 21.	656.. –	10..16..10
– 22.	1046.. –	13..14.. 6
– 23.	1467.. –	15.. 3.. 9
– 24.	1072.. –	14.. 3..11
– 25.	1246.. –	13.. 4.. 4

weight of 53 Cwt. per Chaldron, more than 57 had been given, on the average of a considerable number of waggons accurately weighed both full and empty. This Over Weight has been gradually reduced to about 54 Cwt. which together with the better underground separation, and anticipated reduction in the produce better – 8½ Tubs should therefore be amply sufficient for a Chaldron of 53 Cwt.

The Tubs average 7½ Cwt. Each, and calculating 8½ Tubs, or 63¾ Cwt. per Chaldron, there would be left to be skreened out at Bank 10¾ Cwt. or, nearly $^1/_6{}^{th}$. A Score should therefore produce 2.35 Cha. which at 14/ 6 per Score is equivalent to 6/2 P.[C]

2. Corving. When the North Pits are sunk to the Low Main Seam, they must be fitted up with Slides and Cages for 25 Peck Tubs, the only expence on the Corving department will therefore be fore Leading Corves, and Corves used for tramming out the Coals on the heap, which at outside cannot amount

[Bud-33]

Nearly 3^d. per Chaldron $\frac{5487}{}$ £67.. 3.. 4

An extra quantity may probably render it occasionally necessary to lay down and refill more coals than at present, according to the demand for them, but to set against this the savings to be affected by substituting Steam for Horse Power, in leading the Coals from the Colliery to Seghill, thereby diminishing the number of waggon Horses, Waggon Men &c. Call this change therefore 3^d. per Chaldron as above.

5. Smith Work – The present establishment of Smiths is quite sufficient for a much larger scale of work than has been assumed, the average of the last 5 Pays may therefore safely be taken.

N°. 21.	£20..15.. –
– 22.	19.. 4.. –
– 23.	18.. 8.. 6
– 24.	17.. 1.. 4
– 25.	16..13..11
5)	92.. 2.. 9
	£18.. 8.. 6

[147]

$\frac{318..8..6}{60,000}$ X 26 = 1.9^d. but say 2^d. per Chaldron –

6. Wright & Joiner Work. There is still room for a further reduction in the Establishment of Wrights and Joiners, and the cost of this department during the last 5 Pays will give an average more than sufficient to meet a vend of 60,000 Chaldrons. Setting the extra work up to the present time however, against the additional wear and tear of Tubs and waggons to ensue from the increased quantity the charge may be allowed to stand as at present viz.

N°. 21.	£38.. 2..7½
– 22.	39..15..7½

[148]

	£.	s.	d.
5)	85..	16..	1½
	17..	3..	3

$\frac{£17..3..3 \text{ X } 26}{60,000}$ = 1.8^d. per Chaldron

9. Repairing Railways. Considerable expence has hitherto been incurred in this item, arising from the extra hands employed on the New Branch at the Staith, and also enlarging and altering the Branches at the Pits – 4 Men at an average wage of 2/ 6 per day will be sufficient in future.

$\frac{4 \text{ X } 2/\ 6 \text{ X } 11 \text{ X } 26}{60,000}$ = 5.7^d. per Chaldron

– 23. 37.. 6.. 6
– 24. 38.. 9..4½
– 25. 34.. 5..5½
5)188.. 2.. 9
£37..13.. 1

£37..13..1 X 26 = 3.9^{d}. but say 4^{d}. per Chaldron.
60,000

The charges in this department at Cramlington Colliery amounted on an average for 1837, 8 & 9 to 3.07^{d}. per Chaldron

7. Working Engines. The present cost of working the Main Engine and the Machines belonging the **C** & **D** Pits, the Saw Mill, Quarry & Thrashing Machines, is very nearly £20. a pay, but when the North Pits are sunk to the Low Main Seam, an additional sum will be required for Brakesmen and Firemen to the same amount as the present cost of the **C** & **D** Pits Machine, which averages £6..18..0 per Pay.

£26..18..0 X 26 = 2.8^{d}. per Chaldron nearly
60,000

8. Colliery Labourage. The charge for Colliery Labourage will not be increased by an increased quantity, a sufficient number of workmen in this department an already employed

Take therefore pay 21. £20.. 8.. 1
– 22. 19.. 7.. 7
– 23. 13..18.. 3
– 24. 14..19.. –
– 25. 17..53..2½
£85..16..1½

[Bud-33]

10. Mason Work. A saving of 3 Masons and 2 Labourers will shortly be effected, whose joint wages per day at 2/ 10 & 2/ 4 respectively would amount to £7..4..10.

N°. 21. pay £28.. 5.. 5
– 22. – 24.. 8.. 2
– 23. – 24.. 8.. 2
– 24. – 21.. 1.. 9
– 25. – 24..13.. 9
5) 122..18.. 3
Average £24..11.. 8

£(24..11..8 – £7..4..10) X 26 = 1.8^{d}. per Chaldron
60,000

The cost of the Mason work at Cramlington on an average of 3 Years was 1.7^{d}.

11. Clerk and Store Keeper 94^{s}/- X 26 = 0.49^{d}. say 0.5

12. Winning Stones. Principally for Draining and extra work, has averaged during 5 Pays 0.4^{d}. per Chaldron, say in future 0.25^{d}.

13. Farm Labourage. This is not, properly, a Colliery charge the Farm supplies the Colliery with part of his produce, but on the other hand the Colliery purchases horses seeds &c. for it; this item will therefore be better kept out of sight altogether; allowing that the Farm profits will meet the Rent &c.

14. Lord Hastings' Colliery Rent. on 60,000 Chas. = 3272 Tens 320 Bolls at 25/- or per Chaldron 1/ 4.36 (Ten 440 Bolls)

15. Duke of Northumberlands Way leave 10/ 6 for 420 Bolls

measure from New works going forward at that time. The Consumption of Pit wood in the Low Main Seam will be light, owing to the strong nature of the Roof, and comparative freedom from inflammable gas.

60,000 Chas. = 3428 Tens 240 Bolls = 7.2^{d}. per Chaldron
Tens Bolls.

16. Sir Francis Blake Way Leave on 3272..320 at 3^{s}/- = 1.17^{d}. per Chaldron.

17. Backworth Colliery Lessees & Miss Liddell.
£ 200 / 60,000 = 0.8 per Chaldron

18. Cramlington Owners 1/ 6 per Chaldron.

19. Salaries (Colliery and Fitting Office) say

M^{r}. Lamb	£400
Fitters & Clerks	350.
Colliery	650
	1400 / 60,000 = 5.6^{d}. per Caldron.

20. Staith Expences supposing them to be the same in proportion to the vend as at Cramlington 1.12^{d}. per Chaldron

21. Rates, Cesses and Taxes, say 1^{d}. per Chaldron
Cramlington averages 0.86^{d}.

22. Incidental Charges, including Binding money, Insurances, Damaged Ground, Ale and Allowances, and every other petty and irregular charge, say 2^{d}. per Chaldron.

23. Policemen, Saddler, Painter & Glagier &c., say
£ 130 / 60,000 = 0.5^{d}. per Chald.

24. Tradesmen's Accounts. This is the most difficult item to deal with. The amount of Tradesmen's Accounts in 1841 was £10511. which, on a vend of 60,000 Chaldrons would be at the rate of 3/ 5 per Chaldron, this however, appears to be far beyond the mark, and must have arisen in a great

During the valuation of Cramlington Colliery several long discussions took Place, as to the probable amount of Tradesmen's Accounts, and after a careful examination of the Bills for 3, Tears but excluding all materials for new work, such as altering the Railway for leading the Delaval Coals, additional Boilers to the Railway Engines, Pitmen's Cottages &c. &c. the sum was fixed at £4000 for 58,000 Chaldrons of Best Coals, or nearly 1/ 4½ per Chaldron.

There does not seem any reason, why the amount of Tradesmen's Bills at Seaton Delaval Colliery should exceed that of Cramlington, when the former gets fairly quit of the extra new work, especially as Cramlington has a long line of Railway, with 5 Stationary Engines to uphold with materials (the cost of the Seaton Delaval Leadings, except the short lines between the Colliery and Seghill and between Percy Main and the New Staith being merged in the 1/ 6 per Chaldron paid the Cramlington Owners, see No. 18.) to be on the safe side however, say that instead of 1^{s}/ 4½, each Chaldron costs 2/- for tradesmen's Materials.

25. Altho' scarcely necessary add for Law Charges, Staith repairs, Keel rents, Doctors Salary Gifts to workmen &c. 1^{d}. p. Chald.

Summary	s.	d.
1. Underground Charges – – – –	6..	2. –
2. Corving – – – – – – – – – – – –	– ..	0.5
3. Wailing and Skreening – – –	– ..	4.128
4. Fitting & Leading – – – – – –	– ..	3.0
5. Smith work – – – – – – – – – –	– ..	2.0
6. Wrights and Joiners – – – – –	– ..	4.0
7. Working Engines – – – – – –	– ..	2.8
8. Colliery Labourage – – – – –	– ..	1.8
9. Repairing Railways – – – – –	– ..	0.57
10. Masons work – – – – – – – –	– ..	1.8
Forward – –	7..	10.598

	s.	d.
Brought Forward – –	7..	10.598
11. Clerk and Storekeeper – – – – – – –	– ..	0.5
12. Winning Stones – – – – – – – – – –	– ..	0.25
13. Farm labourage –		
14. Colliery Rent – – – – – – – – – – –	1..	4.36
15. Duke of North^{d}. Wayleave – – – –	– ..	7.2
16. Sir F. Blake's do. – – – – – – –	– ..	1.17
17. Backworth & Miss Liddell do. – – –	– ..	0.8
18. Cramlinton Owners – – – – – – – – –	1..	6
19. Salaries – – – – – – – – – – – – – – – –	– ..	5.6
20. Rates Cesses and Taxes – – – – – –	– ..	1.0
21. Staith expences – – – – – – – – – –	– ..	1.12
22. Incidental charges – – – – – – – – –	– ..	2.0
23. Police &c. &c. – – – – – – – – – – –	– ..	0.5
24. Tradesmen's Accounts – – – – – –	2..	0
25. Law Charges &c. – – – – – – – – –	– ..	1
	14..	6.098

but say 14/ 6.

<considerably>

In this Estimate every charge has been made^ greater than the prospects of the Colliery seem to warrant the object being to shew the <u>outside Cost</u>

In the years 1837,1838, & 1839, the gross quantity vended from Cramlington Colliery averaged per year 70,789 Chald^{s}: the cost on which quantity was £51,266 making the average 14/ 5¾ per Chaldron – This however includes Railway Charges, Farm Rent, Fitting Office Expences, Discounts, Demurrage &c. &c., which items all, not taken into account in the estimate for Seaton Delaval except Salaries at the Filling Office, and cost of leading, which is provided for in item No. 18.

It is worthy of remark, in this place, that the cost per Chaldron on Cramlington vend, is upon both Round and Small, which the Estimate for Seaton Delaval is upon

The proportion of the Small Coals drawn at Seaton Delaval is less by 4 per Cent, than at Cramlington taking the average of the years 1838 & 1839, at the latter plan; where there was drawn in

	Round.	Small
1838.	~~xx~~. 30,786..16	– – 4884..15
	25,848.. 9	– – 3927.. 5
	56,636.. 5	– – 8812.. 0

or 15½ per Cent of Small

The vend also shews a large proportion of Small, viz

	Chs.	Chs.
1837.	Round 54,293	Small 12,015
1838.	59,679	14,291
1839.	59,545	12,549
	173,517	38,845

or 21.8 per Cent.

At Seaton Delaval during the last 6 Pays, the quantity of Small drawn amounted to nearly 11½ per Cent.

	~~xx~~.	c	~~xx~~.	c
N°. 21. Round	431..	1	Small 51..	8
22. –	562..	9	– 88..	13
23. –	651..	6	– 60..	1
24. –	656..	9	– 75..	10
25. –	684..	6	– 66..	19
26. –	342..	–	– 38..	7
	3227..	11	380..	18

or 11.45 per Cent, say 11½, to add to which is the small Skreened out at Bank calculated at $^{1}/_{6}^{th}$. or 16 per Cent making in all 28 per Cent.

The vend of Small from Seaton Delaval has been very limited, amounting to about $^{1}/_{28}^{th}$ only of the whole quantity.

To return to the cost of working the Colliery; assuming that the foregoing Estimate is correct, the charges on 60,000 Chaldrons at 14/ 6 would be £43,000. How would this bear upon the profits of the Colliery? Here another difficulty presents itself, viz the sum the Coals are likely

the Round only; any profit to arise therefore from the sale of the Small Coals produced in working the Colliery, must be considered as a direct reduction of the estimated cost of the Round.

[Bud-33]

to realize. –

The net price received for Cramlington Coals was in

	s.	d.	
1837.	22..	6	per Cha$^{n.}$
1838.	22..	3	–
1839.	22..	3¼	–
1840.	22..	2½	–
	4) 89..	2½ = 22..	3½ Average.

[153]

It is not probable however that this price has been, maintained during the years 1841 & 1842, or that the Cramlington Seaton Delaval will again command such a Price. In 1840 the net price per Ton, received for 131,882 Tons of West Hartley Coals was 8/ 4½. The Umpire in the Cramlington valuation assumed a selling price of 8/- per Ton to continue till the expiration of The Lease (18 Years).

Still those are higher prices than, with such a competition in Steam Coal, are likely to be realized, say the Coals realized 7/ 6 per Ton or 19/ 10½ per Chaldron.

Then 60,000 Chas. at 19/ 10½ – – £59,625
did. Cost of working – – – – – – – – 43,500
Apparent Profit £16125

On the supposition that the Coals netted 7/ 9 per Ton or 20/ 6½ per Chaldron

Then 60,000 at 20/ 6½ – – £61,625
did. Cost of working – – – 43,500
Apparent Profit £18125

The actual proceeds of sales up to the end of October 1842 were 17/ 3¼ per Chaldron.

Then 60,000 at 17/ 3¼ – – £51,812..10..0
did. Cost of working – – – 43,500.. – –
Apparent Profit £8312..10..0

This is without taking into account any Profit to be divided by the sale of the Small Coals produced in making the merchantable Round Coal. –

[154]

M^{r}. Buddle, whose clearness of judgement in matters of this kind is well known.

Altho' approving generally of the Estimate, M^{r}. B. is of opinion first, that the underground charges may have been underrated, in as much as he thinks it questionable whether the 14/ 6 per ~~xx~~. will be sufficient to cover all contingent charges of wastemen, Shifters &c. as the Colliery is likely to be 6<always> subject to Balks, Hitches and Troubles putting through; Secondly, that it is the large quantity on, which the Estimate is formed, which reduces the standing charges to so low a Figure, and that if instead of the vend of 60,000 Chaldrons, 40,000 or 50,000 had been taken as the Standard, the result would have been very different; and lastly, that the selling price of the Coals is taken high enough, as Cramlington and Seghill have already reduced their prices, and are likely still to reduce further.

In order to ascertain what difference in the Estimate would arise from a smaller vend, than has been assumed and allowing for an increase in the Cost of the underground department let the annual vend of Best Coals be stated at 50,000 instead of 60,000 Chaldrons.

1. Suppose that the underground Charge remains at the same rate as at present, but allowing it to be sufficient to cover all contingent charges for Waste and Shift work, and pulling over Dykes, Troubles &c. the cost per Chaldron would be s. d.

January 10th. 1843.

Addenda.

Although the foregoing Estimate has been drawn up with due and careful consideration of each item of Cost, it has been deemed prudent in order to provide against any misunderstanding likely to arise from the document coming before the Company officially to submit it to the inspection of

[Bud-33]

2.35 : 15/ 6 : : 1 : 6.7½ – – – – – – – – – – – – – 6..7.5

2. Corving should be less, but let the charge remain as before – 0.5d. per Cha.
3. Wailing & Skreening as before – – – – – – – – – – – 4.128 –
4. Fitting & Leading ditto – – – – – – – – – – – 3. –
5. Smith work £18.8.6 X 26 / 50,000 = – – – – – – – – – – – – – – 2.3
6. Wright & Joiner work £37..3..1 X 26 / 50,000 = – – – – – – – 4.7
7. Working Engines £26..18..0 X 26 / 50000 = – – – – – – – – 3.37

Forward – 8..1.498

[155]

Forward – 8..1.498

8. Colliery Labourage £17..3..3 X 26 / 50000 = – – – 0..2.1
9. Repairing Railways say – – – – – – – – – ..0.5
10. Mason Work £17..7..10 X 26 / 50,000 = – – – – – .. 2.16
11. Winning Stones – – – – – – – – – – – – – – – ..0.5
12. Colliery Rent as before – – – – – – – – – 1..4.36
13. Wayleaves do. – – – – – – – – – – – – – ..9.17
14. Staith Expences – – – – – – – – – – – – – – – ..1.12
15. Rates, Incidental Charges, Police, Staith repairs, Keel rents, Law charges &c. – ..4.5
16. Cramlington Owners – – – – – – – – – – – – – 1..6
17. Salaries – ..5.6
18. Tradesmens – – – – – – – – – – – – – – – – – 2..0

15/ 1½

Stating the net returns for the Coals as before, viz 20/ 6½, 19/ 10½ & 17/ 3¼, the profit on a vend of 50,000 Chald. Best Coals would be £13,541..13..4 – £11975 – and £5364..11..8 respectively

The latter sum is certainly a very inadequate return for the Amount of Capital expended on the undertaking but every addition to the annual quantity vended, will diminish the cost, and therefore enhance the profits, and

[156]

Observations on the Newcastle Coal Field.

Extent of the Coal Field

The Districts which may be considered as comprising the Newcastle Coal Field – in which all the Strata that occur in the series, may be to extend continuously by – embraces a Tract of the Counties of Northumberland and Durham of about square miles. Measuring by the out crop of the lowest Seam in the Series viz: the Brockwell, as far in the line of the dip as the seams have yet been traced on the axis of the greatest dip of the Strata under the Magnesian Limestone.

I have taken the Brockwell as the lowest – in the series, from its being the lowest workable Seam which lies above the Millstone Grit, and which I consider to form the depara-tion between the upper and lower Limbes of the Carboniferous Formation. That is to say, between that part of the series which is overlaid by the Magnesian Limestone, and under-laid bt the Mountain Limestone.

The Millstone Grit and associated Strata down to the Fell-Top Limestone forming the separation between the two great divisions of the Carboniferous Formation. The distance between the two divisions, that is to say, between the Brockwell Seam, and the 8 Inch Seam of Coal which lies below the first stratum of the Mountain Limestone – called the Fell-

Fa Ft In

it ^<must>indeed be an unfortunate result, if with the large extent of territory, surrounded as it is on all sides by prosperous Collieries, and with the Machinery and general Establishment on the concern, it cannot command a vend equal to Collieries of smaller caliber, and producing Coals of no better, if so good a quality as Hastings Hartley.

[Bud-33]

Description of the Face of the Country.

Top limestone, is, according to Forster's Sections 97..2..6 It is the upper region of this formation to which I intend to limit myself at present, reserving my observations on the Coal contained in the lower or Mountain Limestone Division – lying between in the Millstone Grit, and the Old Red Sandstone, for a future communication.

The face of the Country covering this extensive Coal Field, is finely diversified with Hill and Dale. None of the Hills reaching such an elevation as to give them a mountainous character, although they increase in altitude as they recede from the Sea. And none of the valleys, with the exception of the Hounds Gill perhaps, meriting the name of Ravine

[157]

or glen.

The Hills.

Generally speaking the hills all of a gentle declivity – sliding gradually into the valleys – the chief precipices or Escarpments which attract the notice of the Geoligist are on the western margin of the magnesian Limestone, at West Boldon Clax-heugh, Houghton-le-Spring, Pittington and Quarrington

Valleys

The principal escarpment beyond the region of the Magnesian Linestone is Sacristan Heugh, and it is worthy of remark that the escarpments of the Magnesian Limestone above referred to front the West & N.W. while that at Sacristan Heugh fronts the East immediately opposite the Limestone Rock at Houghton-le-Spring, at the distance of about 7 miles.

The Highest hills of the Northumberland division are of the Coal field are

Scaffold hill – 235 feet above the sea Spring Tide low water mark
Kenton – –
Throckley Fell – –
In the County of Durham
Gateshead Fell – –
Blackburn Fell – –
Pontop Pike – 1018 – –
Chopwell – –

[158]

formed by various tributary Streams which discharge their waters into the above mentioned principle Trunks.

The formation of those vallies which all of great width particularly the Tyne, the Wear, the Seam, the Derwent, and its tributary streams, the Pont, have denudated, and destroyed, an enormous extent of the most valuable Seams of Coal in the District.

The valley of the Tyne for example, in its course from Hexham to Tynemouth, makes a complete Section of the whole series of Seams lying above Millstone Grit, as it cuts through the several out-crops, in their relative order of superposition: thus it cuts through the lowest Seam, the Brockwell, near to Stocksfield, below Corbridge. And through the highest or Hebburn-Fell Seam, near Moody's quay, about halfway between Newcastle and Shields, where that seam may be seen, in the south bank of the River, and all the intermediate Beds may be traced in its Banks between those extreme points. The High main Seam is cut through by the bed of the River at Newcastle - the Metal Coal, Stone Coal, and Bensham between Newcastle and Benwell. And the Five Quarter, Low Main, and all the other Seams down to the Brockwell, are passed through between Benwell and Stocksfield. The slopes of the two sides of the River at Benwell from the Roman Station of Condereum on the N^{o}. Side, and from Wickham on the S^{o}. Side, form a

Warden Law	–	–
Charlaw	–	–
Brandon	–	–
Bishop Auckland	240 –	–
Hedley Hope	–	–
Howlish law	440 –	–
Kirk-murrington	–	–
Westerton	700 –	–
Brussleton	680 –	–
Cockfield	680 –	–
Etherly	700 –	–

The principal Valleys in the district all the Wansbeck the Coquet, the Blyth, the Tyne, the Wear the Seam, the Derwent, the Pont, Beamish and Chester Burn, with sundry smaller valleys

[Bud-33]

complete Section of Coal Strata from the High Main to the Low Main Seam, which latter is the bed of the River between Derwent Haugh and Delaval.

The vale of the Wear in its course from where it cuts the lowest Coal Seam in the series, to Sunderland, passes in like manner through the whole suite of Seams above the Millstone Grit – At Newton-Cap Bridge it traverses the Five quarter Seam. At Malagill near Finchale it passes through the Wear-water Five quarter, and Upper Main Coal, and through the three-quarter Coal near Low Lambton. At Claxheugh the S^{o}. Bank of the River presents a fine Section of the Magnesian Limestone, with its subordinate Beds of (Yellow Sand and the red Sandstone, the former of which is here of great thickness. Then again the vale of the Derwent makes a complete section of the whole series, with the exception of the highest or Hebbern Fell Seam, from the Tyne High Main

[159]

downwards as the Metal Coal crops out at Mountside on Tanfield Moor, and the Brockwell is exposed to view in the Bed of the River, at Derwent Bridge near Gibside.

Notwithstanding ^<therefore> the enormous destruction of Coal occasioned by the escarpments of those vallies they have afforded many compensating advantages, to the Miner. In the first place by exposing the seams of Coal to view they attracted notice at a very umate period, and enabled him to supply an abundance of fuel to contribute to the use and comforts of Men, probably ages before they otherwise would have been discovered, and rendered available to the purposes of society

In the infant state of mining too, those vallies rendered vast hacks of Coal, workable by means of adits, or free levels, driven under the adjoining Stable Lands, and even at the present time they afford the means of free drainage to many extensive Collieries. They also greatly facilitate the drainage of the deeper mines by Steam Power.

Besides the Hills already noticed, there is a subordinate range entirely of alluvial formation extending in a N. & S. di-

[160]

Line near Washington are some Gravel Beds, and one is also to be seen a little to the eastward of Warden-Law Hill, within the region of the Magnesian Limestone. And considerable masses of sand are preposited at Rye-Laws near Lanchester, and in sundry other places within the limits of the Coal Field.

This vast deposit of sand and Gravel shews clearly, that the last change of in the surface of this part of the District, has been effected by agency of water.

On referring to the line of Crop of the Coal, and to the line of the axis of the general dip of the strata on the Maps it would appear that this Field of Coal, so far as it has hitherto been explores, although traversed by various undulations and large Faults forms only a portion of an immense trough or Basin – the Southern, Western and Northern margin of which we have yet only been able to trace. But as the Strata so far as they have been yet explored in the line of the Dip under the Magnesian Limestone, are conformable, there is reason to conclude that the seams of Coal extend far under the German Ocean, before they

rection. This range of sand and Gravel Hills, commences at Newburn on the North side of the Tyne, and passes through the Country by Stella & Ryton, Beda-hills to the Derwent, between Lintz-ford and Gibside – then with some intervals by Pelton Fell, Broomy, Framwellgate-moor, and across the River Wear at Durham, where a ridge is cut through by the road leading from Durham to Shincliffe.

The most curious exibition of this range of Sand-hill is at Beda-hills, near Lintz-ford, on the Derwent the width of the mass of Sand, as well as its depth, is very irregular. At Pelton-Fell it extends over serpeth Colliery, ~~through~~ into the vale of the Seam, and it also extends to the Banks of the Wear at Picktree near to Chester-le-Street.

The sinking of shafts through this sand was a troublesome operation in several Collieries on its line of direction but it is superficial, and does not lie so deep as any of the Seams of Coal, which it overlies.

Besides this range of alluvial matter there are considerable deposits of sand and gravel to be met with in various parts of the District. On both sides of this

[Bud-33]

rise at the opposite margin of the Basin, if that should be their form, or cut off by the extension of the Magnesian Limestone Series.

A great many Seams of Coal are found in this extensive District, but they differ in number, character, quality and thickness, in its several portions, and it is seldom that more than five of workable thickness coexist, and frequently not more than one or two occur in the same locality.

In Monkwearmouth Colliery for example, we find on reference to the section of the Pit, that there are 31 Seams of

Fm ft In.

Coal sunk through in a depth of 26.4.. 4.. 9, containing an aggregate thickness of 47 Ft..2 In. of Coal, including the foreign substances with which the several Seams are interstratified; only one of which has yet been found of workable thickness from an inch and a half to 6 feet 2½ inches.

In Backworth Colliery 283 Beds of Strata have

Fm ft In.

been sunk and Bored through within a depth of 206.. 0..11 from the Surface, comprising 45 of Coal of the aggregate thickness of 60 Ft..1 In. including the foreign substances with

[161]

which, it is interstratified. Of these seams only two or three can be considered of workable thickness at present[Rea]

These numerous Beds or Layers of Coal, cannot however be considered as continuous, a district and separate seams throughout the whole district, as many of them are derived from the splitting a division of seams to which they can be distinctly traced. Thus the three of quarter Coal and on the River Wear, are clearly derived from the High Main on the Tyne. And the Metal Coal and Stone Coal Seams, to the East of Newcastle, unite and are derived from the Five quarter Seam of the Tanfield District. (See synopsis of the Seams of Coal in the Newcastle District Vol I. [hal.ttish] Seams.)

There are many instances of the division and joining

[162]

<u>Strata of the Newcastle Coal Field.</u> –

There is but little variety in the Stratification of this District, as it only consists of an alteration of Sand and Argillaceous Stones of various Texture and degree of induration.

The Argillaceous Strata are Known under the common denomination of metal, and Metal Stone, and are described according to their colour, as Blue Black and Grey Metal.

Metal is the name given to the substance when it is of a soft, friable texture, but when it is indurated, and particularly when aunaceous, it is called Metal Stone. Scarcely any of the Metal Stones however, are sufficiently strong and compact to resist exposure to the effects of atmosphere for any length of time.

Besides Sand and Metal Stone, numerous Strata of Argillaceous Iron Stone are met with. The Iron Stone is always

of Beds od Coal in the district, and of seams being nipped out a not deposited, in certain localities, which will be refereed to afterwards, I will merely notice in this place that the Five quarter and Low Main Seams, which are 6 ½ Fathoms asunder at Elswick Engine Pit near the Newcastle Infirmary, are worked together as one Seam, in the Mill Pit, near the W. Gate Mill at less than a mile distance where they are only divided by a thin layer of from 3 to 8 inches thick of Coarse Fire Clay.

In this same Pit the Bensham Seam is wanting although at the Billet Pit, by the river side, at a mile distance, it is 5 Ft..2 In. thick. This Seam lies 7 Fathoms below the Bed of the River here.

The prevailing Character of the Coal is Bituminous-Cannel and Splint Coal, only bearing a small proportion of the whole; But the several seams not only differ from each other in the quality of the coal they field, but it frequently happens that the same seam contains all the different varieties in alternate layers, and even changes its character and quality altogether within a very short distance, as will afterwards be shewn. I shall at present only allude to one example of this nature. On the South rise side of the 90 Fath: or Main Dyke, the Band and Coarse Coal lie at the bottom of the Beaumont Seam while on the North or dip side of the Dyke, the Band and Coarse Coal lie at the Top; as if the Dyke had the effect of turning the Seam up side down. –

[Bud-33]

found in the Metal Stone, and is interstratified with it. Detached nodules also frequently occur in the same stratum. The sand, as well as the Metal Stone Strata vary very much in thickness, as well as in colour, texture & hardness so that it is difficult to identify the different Beds in several parts of the district.

The last defined Strata of Sand Stone in the vicinity of Newcastle are, the Grinstone Post, the 70 Fathom Post and the Main Post: Post being the provincial name for Sand Stone. The Grinstone Post takes its name from being extensively quarried on Gateshead Fell, for Grindstones, from whence the Newcastle Grindstones, which are so celebrated all over the world have been supplied for centuries. This Stratum lies over an extensive tract of country, and is quarried for building Stone at Byker, Kenton (where it is brought in by the 70 Fathom Dyke) at Backworth and Pensher and Newbottle on the River Wear.

The 70 Fathom Post with its subordinate divisions which alternate, with Metal Stone Strata, occupies the space between the Grindstone and Main Post, and is separated from the latter by a Bed of Black Stone, which from its dark hue: is called the Black Stone. This stone is remarkable from containing an immence quantity of Fossil Shells of the genus renio. The 70 fath. Post is the most Quartzose and Coarse grained Sandstone in the District.

[163]

The Main Post is the most regular Stratum of Sandstone and is nearly coextensive with the High Main Coal Seam, as it is only wanting in a part of Burraton & Killingworth Collieries There are several Strata of Sandstone below the Main Coal Seam, but they do not preserve any decided character, nor extend to any great distance, but change their thickness and appearance and pass into, or have their places taken by other Strata.

The Metal Stone Strata are frequently interstratified

[164]

New Red Sandstone. A thin Seam of Coal occurs immediately below this red Sandstone. At the quarry this seam of Coal must be at least 190 Faths: above the High Main, and consequently 70 to 80 fathoms above the Hebburn Fell Seam.

This detached portion of the Red Sandstone lies immediately on the Dip side of the Main Dyke, which is estimated to be a down throw of about 200 fathoms at this point, its position here being sufficiently accounted for by the substance of the Strata on the North Side of the Nip.

with thin layers of sandstone; Iron Stone and arenacious metal Stone less or more indurated, in which case they are called Girdly Metal Stones – all thin layers bring technically called Girdles by the Miners.

The Magnesian Limestone with its subordinate Strata of Yellow Sand and New Red Sandstone, overlies a large extent of this Coal Field, in the County of Durham, as will be seen by referring to Maps, The nonconformity of the Magnesian Limestone to the Coal Strata, is confirmed by the various sinkings which have been made through it.

The Magnesian Limestone extends across the Tyne into the County of Northumberland: a small detached patch of it is seen on the top of the Rocks on the Sea shore at Tynemouth Castle, and another detached mass is found on the Sea Coast near Cullercoats, and at the village of Whitley when it has been brought down, by the subsidence of the Strata, at the time the great fault called the 90 Fath: Dyke was formed, as it lies on its dip side, and in juxtaposition with its southern cheek. A full account of this Deposit of Magnesian Limestone has been given by W. Hutton in the Transactions of the Natural History Transactions of Newcastle. Although the Magnesian Limestone is scarcely seen North of the Tyne it subordinate Strata of Yellow & Red Sandstone, are exposed to view in the Sea Banks at the mouth of the River, and under the Promontary of Tynemouth, where they form the foundation of the Monastery.

At Clowsdon-hill near the village of Killingworth, the red-sandstone which underlies the Magnesian Limestone, is quarried for Building Stone. Although no Limestone has been discovered here, there is no doubt of the identity of the

[Bud-33]

The Strata of the Coal Field are generally covered on the higher grounds by a strong Clayey soil; but in certain localities a thick Dilurrian prevails. This is more particularly the case, on the north side of the River Tyne, where a covering of detritus of considerable but of various thickness extends from Byker-hill to No. Shields, and occupying space of from 1 to 2 miles in width. It varies in thickness from a few feet, to 30 fath^{s}. or more. It is composed of an alternation of layers of Strong Blue Clay, Leavey Clay, Beds of Sand and generally a bed of Gravel lies immediately upon the stone-head, or Rock. The Section No. shews the nature of this Dilurrian as sunk through in the Percy Pit. Percy-Main Colliery.

The Beds of Blue Clay are invariably mixed with fragments of sandstone, Mountain Limestone, Iron Stone, and Basalt or Greenstone: all more or less rounded, and worn smooth by attrition, although not so much as to give them the character of Gravel. Those fragments are for the greater part ardently derived from the older rocks, lying beyond the west Crop of the Coal Seams.

The Leavey Clay is deposited in thin layers with partings of sand between, which, when dry cause the layers to part in large flakes, like bind leather, in which state it possesses considerable elasticity. I have not observed the admixture of any foreign substances in the Leavey Clay, but have occasionally observed crystals of Selenite embedded in the sandy partings between the lamina. The specimen on the table is the largest I ever observed. On the Lanchester Common Peat Bogs prevail, they

[165]

are also found on Throckley Fell and some other localities.

In most of the valleys, alluvial deposits prevail and in some of the larger ones, as those of the Tyne and the Seam with their tribulary streams, lacustrine deposits of considerable extent and depth are found.

[166]

60 fathoms deep at that point

At the Low Fell a Derwent Crook Colliery it passes through the Low-Main Seam at the depth of about 29 Fathoms but it does not extend to the Beaumont Seam, which lies 29 fathoms lower. In Elswick Colliery where it terminates under the bed of the Tyne, it is found in

In ascending the Tyne one of those ~~one of~~ deposits which, provincially termed washes occurs in the little Dean, which
<in north Shields>
separates Dockwray square^ from Tynemouth Barracks, and extends from the Low Lights northwards, but its limit in that direction has not yet been ascertained. It has however, denudated & destroyed the Seams of Coal to an unknown depth, as so far as they have hitherto been explored, this wash is found to have formed a Gap in the Strata – the Seam of Coal terminating on its W. and appearing on its eastern side. It seems to terminate in the Bed of the River, as there is no appearance of it on the opposite side.

No other wash, materially affecting the Strata occurs till we arrive at the Ouse Burn, where in the workings of the Main Coal Seam in St. Laurence Colliery, an extensive accumulation of Gravel was met with, under the Bed of the Burn, and extending under the Tyne, as described by M^{r}. M. Dunn, in the 2nd. Vol, Part II. of the Newcastle Natural History Society's Transactions, The extent of this Deposit has not been ascertained, but I have observed a similar Bed in Jesmond Colliery, about a mile and half to the N.W. from that described by M^{r}. Dunn, and although no connexion has been traced between them, I am Inclined to think from their line of direction, and analogous appearance, that they are identical.

The next Wash, or^<probably> more properly speaking Lacustrine deposite, is in the vale of the Seam, where it has been traced to extend from near Chester-le-Street into the bed of the Tyne at Elswick Colliery. This wash is of various depths & widths. At Ouston Colliery under Peet's Houses it passes through all the upper Seams and the Yard Coal, but does not reach the Hutton or Low Main which has been worked underneath it. This proves that it extends to the depth of 30 fathoms, but that it is not

the Low Main Seam at the depth of 7 Fathoms below the bed of the river, but it has, not been met with in the Beaumont Seam 30 fathoms deeper. This wash has been traced by Barings on Dunstan Haugh to extend up the river to the Derwent Haugh, where it joins the wash under the Bed of the Derwent. This wash was proved by the works of the Shipdon or Blaydon Main Colliery, where it forms a Delta at the confluence of the Derwant with the Tyne. The Seam forms a similar Delta, so that the Dusnatan Haugh, and Derwent Haughs are formed by the junction of the two deltas

As far as I have observed, those washes are filled with detritus from neighbouring hills mixed with Clay, water side sand & Gravel.

About two months ago, a quantity of sand came down from a fissure in the roof in the Beaumont Seam workings in Benwell Colliery, which are carrying on under the wash, in the Dunstan-haugh, but no water was discharged, the sand was merely moist. I bored upwards from the workings, and found the beds of sand lying 14 feet above the Coal, at that point, but further borings proved it to rise gradually above the Coal as it recedes from the river to the southward. A specimen of the sand lies on the Table.

Borings from the surface have proved this wash, in the deltas of the Seam and Derwent to lie at the depth of from 6 or 7, to upwards of 20 Fathoms.

The next deposit of this kind in ascending the Tyne, occurs at Newburn, on the N^{o}. side of the River. It's precise depth and limits, all not Known, but it extends some distance up the N^{o}. side of the River and under Ryton Haugh on the opposite side.

No other similar deposit of considerable size occurs until we arrive at Prudhoe Heaugh. This haugh has evidently been the bed of a lake at some remote period since which the river has changed its course, by breaking through the neck of land or Dam at its N.E. Side, by which the

present Channel of the river has been formed. The ancient Channel has lain at a high level, on the S.E. side of the lake and had discharged its waters by the mouth of the Stanley Burn, valley into the river about a Furlong below the Gorge through which it flows at present. The River had flowed formerly under the high Banks on the S^{o}. Side of the haugh below Prudhoe Castle.

M^{r}. Blackett has lately sunk a pit in the haugh, by which we have Arrived at a knowledge of the depth and nature of this lacustrine deposit. It is upwards of 40 fathoms as shewn by the Section and the leavey Clay at the Bottom lies upon a rough sort of pavement formed of Blue Limestone Boulders – in all probability derived from the nearest out Crop of the Fell-top Limestone further up the river

I am not aware of any similar deposite of magnitude occurring further up the River, within the limits of the Coal Field although it is probable that may be one of considerable extent at the mouth of the Allen.

A very extensive wash or deposit of this description has been traced by borings from Framwellgate Moor to the Magnesian Limestone Ridge at Ferry-hill.

Its line of direction from Framwellgate Moor, is by Newton Hall, cross the wear, by Kee[pur] Colliery, and the Gilly-gate Church – through the wear again, and Durham Race-ground, then cross the wear again between Shincliffe and C[rex]dale, and thence by Thinford Mill and Hett to its termination at Ferry-hill.

The width of this Dil[uira]l deposit called the Cray Dyke is not accurately known it is probably from ¼ to ½ a mile wide at Framwellgate Moor and Newton hall. at Keeiper Colliery it is supposed to be between 200 and 300 yards, and between Shincliffe and Thinford-Mill if it is considered to be better than ½ a mile wide. It has been ascertained to be 38 Fathoms deep at Framwellgate Moor, and it was bored into 26 Fathoms between Shincliff and Thinford Mill without getting through it.

On considering the nature of the Country between Framwell-gate Moor and Chester-le-Street which terminates the Team

Foreign Substances in Coal.

Hardly any of our Seams are homogeneous through their whole thickness between the pavement and roof, as they are generally more or less interstratified with foreign substances, or have them ^<lying> scattered through their mass in detached fragments. Besides Whin and Slip Dykes, there are also many irregulari-ties, and dislocations of minor importance, met with in working Coal, which are described by the general Cognomen of Troubles by the Colliers.

These foreign substances are Bands of shale, Sandstone, Fire-Clay, Iron Pyrites Threads of Galena, Flakes of Calcauous spar in the Facings of the Coal, and sometimes, although rarely, rolled nodules of Quartz, and of Sand or Iron Stone. The dislocations, or Troubles in the language of the Miners consist of Balks, Nips, Hitches. Pappy Roof, Claggy Roof, Claggy-thill, or pavement, Danty, or disintegrated Coal and Scare Bands.

Heworth Band.

The usual interstratification of the Seams themselves, consists of Argillaceous Earth, sometimes of amorphous Strata, but more generally of a laminated slaty texture. Those Strata frequently vary in thickness, sometimes they disappear for considerable distances, and then occur again. Strata of this description, from their always lying conformable with the Seam differ from every other deposition, of Foreign matter met with in the Coal, and are therefore called “Bands”

The nature of those Bands is shewn by the various Sections which accompany this memoir, by a reference to which it will be seen how they vary in thickness and texture at short distances in the same seam. Some being laminated with Coal, and some with harder and softer layers of the same substance, while others are interlarded with lamina of Sandstone.

The most remarkable Band in the neighbourhood of Newcastle, is what is called the “Heworth Band”. This lies in the Tyne High-Main Coal, and received its name from having been first discovered in the Heworth Colliery, on the S^{o}. side of the River Tyne. Its general line of direction by its northern Margin, is about N. 80 E. by compass. From

valley to the South – there appears to be strong grounds for concluding that the "Clay Dyke" above described is a continuation of this Seam wash

[Bud-33]

Felling Colliery passing to the N.E. it crosses the Tyne, above Bill-point, runs through the S°. W. part of Walker Colliery,

Heworth Band

[169]

recrosses the Tyne at Hebburn Quay, runs through the N°. part of Hebburn Colliery, and then crosses the Tyne again into the Howdon Colliery, belonging to the Corporation of Newcastle, it then passes through Bewicke and Craster, Percy Main, and Collingwood Main Collieries, to where the Seam crops out into the Clay, or wash, at the Lowlights Dean North Shields.

Going S°. W. from Felling, it passes through Sheriff-hill, Seam, Urpeth, Stanley S°. Moor, and Lanchester Common Collieries, by Greencroft, and in all probability to the Crop of the Seam, although it has not been traced beyond Lanchester Common.

I have here described the general direction of the northern edge of this Band, but it is in reality a waving or serpentine line, with considerable indentations in various places. –

This band first shews itself as a mere parting in the Coal – generally at about 10 inches above the Black Band, which is incidental to the Seam. By almost imperceptible degrees it goes on increasing till it reaches the thickness of 3 inches and becomes a confirmed slaty band of a dark gray colour. A little before it attains this thickness, a 3 inch layer of coarse brassy Coal mixed with Crystals of Iron Pyrites appears at the bottom of the under division of the Seam – separating it from the bottom Coal – See the Section N°. – And it is worthy of remark, that this layer of Brassy Coal almost uniformly accompanies the Heworth Band. From 3 inches in thickness the band goes on thickening more rapidly to 12 inches, after which it goes on in a still more rapid ratio to 10 & 12 feet thick, and finally dividing and destroying the Seam as it goes southward. (see the section of the Seam at Team Colliery, and the Section of the Strata at Washington and other Wear Collieries, where the Lower part of the Seam only id known as the three Quarter Coal) When the Band approaches the thickness of 12 inches it chan-

[170]

its under side preserves its conformity and parallel is, with the seam below it, in which, with the exception of the Brassy Coal already mentioned, there is no alteration attributed to the influx of the Band. I do not recollect ever having noticed any vestiges of organic remains in this, or almost any other of the regular Bands.

Some of them afford a species of Inferior Fire Clay.

The line of thickening of the Heworth band runs about 50 or 55° to the west of what I consider to be the general line of the dip of the Strata.

Iron Pyrites.

This substance abounds in the many seams, and very few are quite free from it. It occurs in various forms, most commonly in what are called Melts, from the tongue like shape of the mass. Those melts are composed of small cubical Crystals, and are scattered irregularly through the Coal.

It is sometimes deposited in irregular layers in various parts of the seam, intermixed with scars of Coal, and occasionally occurs in detached Crystals.

In some instances it forms a regular layer intermixed with Coal, at the Top or Bottom of a seam, as is the case within the region of the Heworth Band as already noticed, where it forms a layer at the bottom of the workable part of the Seam. Pyrites seldom occur at the top of a seam, under a metal Stone Roof, but it is of frequent occurrence under a Sandstone Roof, when it usually deteriorates the quality of the Coal.

It sometimes happens that the Thill, or pavement of the Seam contains Pyrites, but this does not occur except when the pavement is acenaceous and much indurate.

Large quantities of Copperass, or Sulphate of Irons all made from this mineral, for which purpose several manufacteries are established in the neighbourhood of the Collieries.

ges to a much lighter hue, and increases in hardness. And as it goes on thickening it becomes acenaceous, and finally passes into a Stratum of Sandstone – 7 Fathoms thick in in the Washington G Pit and in the I Pit of the same Colliery it forms a variety of beds of Sandstone and Grey and Black Metal Stones. (See Section).

The thickness of the Band occurs on its upper side, as

[Bud-33]

Threads of Galina.

Threads of Galina sometimes occur in the fissures in the Sand Stone Strata which alternate with the Coal, and sometimes in the Seams of Coal themselves.

Those threads occur in the Coal at hitches in the Seams – they are very irregular in thickness seldom exceed 2 or 3 inches in any part, and do not extend to considerable distances.

[171]

They generally pass through the Coal in nearly a vertical direction The Ore from these threads is usually very rich. In Jarrow Colliery Sulphate of Lime occurred associated with Galina and Iron Pyrites – they were distinctly crystallized, and the latter in very peculiar forms. In Felling Colliery carbonate of Lime occurs in very distinct Crystals of a Dogtooth form, and Sulphate and Carbonate of Barytes both occur, in Belmont Colliery, and in other Collieries in the County of Durham.

Flakes of Calcareous Spar occur in the vertical facings of the Coal in particular localities, they are generally, not thicker than paper, but sometimes reach the thickness of half an inch. The occurrence of this substance is generally an indication of a deterioration in the quality of the Coal.

Nodules of Sand or Iron Stone

The large pebble from Backworth Colliery was a rolled mass of compact Guy Quartz – many have lately occurred in Team Colliery, and several in one of the Auckland Collieries.

These substances are of rare occurrence, but they are occasionally met with embedded in the Coal, without affording any clue by which to trace the locality from whence they may have derived. They are generally pebble shaped, from which it may be inferred that they are merely erratic masses.

Dislocations or Troubles.

Balks – Balks are depressions of the Roof, and occur almost invariably in the Sand Stone Roofs. The Diagram **A** is a Cross section shewing the manner in which Balks occur in a Seam of Coal.

This diagram exhibits what is technically called a

[172]

They are exceedingly irregular, and tortuous which renders it difficult on a partial view to ascertain their line of bearing, yet I am inclined to think, on taking a more extended view, this general line of direction will be found to coincide pretty nearly with the horizontal a water level line of the Strata.

Sometimes Balks consist of pure Sandstone, and sometimes they are intermixed with Layers, or masses of Metal Stone, but in all cases, the Coal, immediately under and adjoining them, is deteriorated by being mixed with earthy matter, and is rendered much harder than the adjoining Coal.

On looking at the structure of those Balks, it would appear as if they had been formed by rills, a streams of water running over the Coal deposit while in a plastic state, similar to the furrowing which we may observe, on the flat bed of a river after a flood. Those furrows or channels having been subsequently filled by the deposition of sand and silt.

Nips. See diagram **C**. Nips may be considered as the converse of Balks as they generally occur on the pavement. They are formed of Ridges, seldom of great width but of indefinite length, and never, as far as I have observed, pass quite through the seam of Coal. Most commonly there is a corresponding depression in the Roof, so that it frequently happens that the Coal, is nipped nearly out between the two protuberances, from which circumstances the name of Nip is derived.

Nips are more commonly met with under Metal than sand stone roofs. They are less irregular than Balks, in point of width and line, although their general direction is nearly

nest of Balks In certain localities, in almost every seam of Coal, Balks of this description occur – either singly, or in groups, as represented in the Diagram.

I have never been able to discover any indications in the Stratification by which to judge in what localities Balks are to be met with, further than that they rarely occur, except under a Sand Stone Roof. Diagram **B** represents the plan of a nest of Balks – the breadth of an individual Balk, or a group, seldom exceed a few yards but they are of indefinite length.

[Bud-33]

about the same. They occur much less frequently than Balks, and in groups seldom, so far as I have observed, neither do they deteriorate the adjoining Coal so much as Balks do.

The name of Nips is given to extensive tracts, where the Seams of Coal, are much thinned, or not deposited; as for instance, the Low Main Coal on the wear is not found of workable thickness between Washington Colliery and Houghton-le-Spring. And again, the Bensham Seam is entirely wanting in the North part of Elswick Colliery, but I don't consider any of those

[173]

barren Tracts as falling under the Miners definition of a Nip.

Hitches.

Hitches are small slip dykes, which do not exceed the height of the seam in which they occur; when they exceed that height they come under the denomination of a Dyke or Trouble.

Thus a slip Fault which would only be a hitch of say 4 ft. in a 6 ft. Seam, would in a 3 feet seam be considered a Dyke or Trouble.

Hitches vary in size from the least appreciable slip to the height of the thickest seam, but the smaller throws rarely keep their line of direction so long or so regular as the larger ones; and when they are tortuous or serpentine, they are called worm-hitches.

Hitches seem sometimes to be derived from neighbouring Slip Dykes, and in other cases, are not referable to them, but seem to have been formed by separate and minor convulsions of the Strata. Like larger slips they frequently terminate in a mere curvature of the Seam, without any fracture of the Strata.

Irregularities of Roofs and Pavements.

The roofs as well as the pavements of Coal Seams frequently vary in the nature of their connexion with the Coal – the most desirable is when there is little adhesion between them. As in this case the coal can be worked with little comparative waste, and with ease to the Collier. But there are a variety of Roofs as well as

[174]

irregular patches of smooth parts scattered over it. All those irregular and unfavourable covers as they are called, occur under sandstone metal stone roofs are generally free from such impediments

The Claggy and Scabby Pavement are just the counter parts of the roof bearing the same names. Those pavements have generally a great mixture, or are entirely composed of hard, and compact sand stone, and the Fiery pavement is composed of compact Sandstone, with minute grains of Quartz and nodules or irregular Crystals of Pyrites, which strike fire with the Pick, from hence the name of Fiery Thills is given to them by the Colliers. The name of Fiery is also given to Sandstone roofs of atralogous structure.

Metal Stone Roofs.

Metal Stone roofs occur as often as sandstone or Post Roofs – they vary in thickness from that of a wafer to several Feet or Fathoms. When the Metal Stone interposed between the Coal and the sandstone roof is thin not exceeding 1½ to 2 inches thick it generally breaks down as the Coal is worked from under it and is called Ramble, by the Colliers. See diagram **F**. When it exceeds 2 inches in thickness, and extends to 12 or so, and breaks down as the Coal is removed, it is called falling stone. In this state it is troublesome and even dangerous for the Colliers to work under and requests to be carefully propped up. This sort of roof is frequently interposed between the top of the Coal, and the irregular bottom of the Stratum of

of Pavements which are more or less [pryiedicial] to the working of the Coal, from its adhering to them.

The adhesive Roofs come under denomination of Pappy, Claggy, and Scabby roofs. And the pavements under the denomination of Claggy, Scabby, Brassy, & Fiery Thills.

The pappy roof occurs in the Sand Stone only, and is studded over with proturberances of various sizes projecting into the Coal, as shewn by the diagram **D**. The Claggy Roof also occurs in sandstone, and is serrated, as shewn in the Diagram **E**. and so firmly united with the Coal, that it can with difficulty be separated, without the use of Gunpowder.

The Scabby roof is a modification of the above, having

[Bud-33]

Sandstone, as represented by the diagram **G**. When the metal Stone exceeds 12 or 15 inches in thickness, it becomes a confirmed Metal Stone roof and frequently extends to several feet in thickness. When this takes place, the metal stone is generally disposed in thin beds, some harder and some softer, with thin Strata of sand stone occasionally intermixed. This sort of roof is called a Grindley roof, by the Colliers, any thin stratum whether of metal, or sand stone being called a Grindle. It is a roof of this description that the sigillaux occur in the greatest abundance. They are generally from 9 to 10 or 12 inches in diameter, but are sometimes met with of much larger size. I once observed one in Backworth Colliery which measured 9 Feet across between extremities of the roots.

[175]

The Colliers call the Sigillaux “Caldron Bottoms” – they are exceedingly dangerous, and occasion great loss of life and limb among the Miners. This arises from the difficulty of discovering them, as it is to be remarked that they never come in actual contact with the Coal; but are separated from it by a thin layer of metal stone of the same colour and texture as the roof. The circumference of the Sigillaux is polished in the socket, or recess which contains it, so that it has little adhesion to the roof, and as there is generally a cross fracture in the bole of the tree at 12 or 15 inches from its bottom, the weight of the Stump causes it to break through the thin cover which conceals it from the view of the Collier, as he works the Coal away from below, and but too often proves fatal to him.

These fossil trees are found in almost every seam of Coal, although rerely met with in some; but in certain localities they are very abundant. In some parts of the Main Coal at Backworth, in the Bensham Seam at Wallsend, and the Brass Thill at Tanfield-moor, they occur in great abundance.

It frequently happens as has already been observed that a covering of metal stone is, interposed between a seam of Coal^<and> an irregular ~~and~~ sandstone roof, as if it had been paved

[176]

any visible change in its level, or general character

Irregular masses also of this substance sometimes occur, without any alteration of the level of the roof or pavement, but the roof stone is generally more shattered and broke than it is above the sound parts of the seam.

That the Coal should be crushed to dust at the dislocations of the seam occasioned by slip dykes and hitches might be expected, But how those veins and masses of this sooty Coal have formed, where no dislocations in the roof or pavement are observable, baffles conjecture. This kind of sooty Coal also frequently appears in another, and a very troublesome shape, in what is called Scare band. See diagram **I**. These Scar Bands occur in some seams very abundantly, scattered through the Coal in irregular fragments, and injure its quality very much, as from their being, in the Coal like wedges, they cannot be extended without breaking the Coal into very small pieces. And when a large piece of Coal containing Scare Bands is burnt, the Bands swell and burst like quick lime, and give the Coal an appearance of being very foul and slaty as the Scare bands burn to a white slaty powder.

in to fill up all vacancies. The diagram **H**. represents a roof of this description, the metal stone which is interposed between the Sandstone, and the Coal being a Following Stone **a**. This Diagram represents a group of Sigillaux which I met with in Backworth Colliery, and from which this drawing was made.

Danty or disintegrated Coal.

This sort of Coal which is easily distinguished by its sooty appearance is found accompanying Hitches and slip-dykes, as a lining to them of various thickness. But if it is also frequently found to prevail to a considerable extent, where, no hitches or slips are present, from which it seems that does not owe its origin to the fractures made in the seam of Coal by these dislocations of the Strata. It usually runs in veins of limited width, but of considerable length. Sometimes several of those veins run parallel to each other at short distances, the intervals between them being occupied with good Coal, of the ordinary quality of the seam, and without

Seams of Coal are also subject to swellies, or Troughs, see diagram **K**. which are formed by undulations of the pavement. Between each swelly is a ridge or rising called a Crown. The Coal is generally of better quality and the Seam a little thicker in the Troughs than on the Crowns, although the seam is seldom under its mean thickness on the latter.

Scattered nodules of Iron stone frequently occur in the pavements of the seams of Coal, and are sometimes very abundant.

Besides the intermixture of bands of slate and other foreign substances, all seams of Coal have joints, and divisions in them, which are known by the technical names of Backs, rides, facings, and partings. Backs, Rides, and Facings, run nearly in a vertical direction, through the Coal, while partings lie conformably with the pavement

The direction of the Backs, determine what is called the Boardways course of the Coal, that is to say the direction-

tion in which it works best being at right angles to the line of the Backs.

The Backs are cracks in the Coal, which generally run completely through the seam at intervals of from one to 4 feet in a seam, which is said to back regularly. In some cases however they only occur occasionally and in certain seams they don't occur at all; but in this case the facings are much more abundant and the Coal is generally of a more tender and friable nature.

Backs are rarely passed through a seam of Coal, at right angles to the pavement – they generally incline at various angles from the vertical direction of the seam – sometimes on one side, and sometimes on the other, without observing any uniform Law. In crossing their line of direction, if they lie over towards you, at the top, they are called E. backs by the Colliers, if they slope in the opposite direction they are called west Backs – let their line of bearing be what it may. So that

seams in the same locality run nearly in the same direction, although there is no visible connexion through the intervening Strata of Stone.

The next singular anomaly which has fallen under my observation, with respect to the Backs in Coal, is at Percy-main Colliery, in the Main Coal seam. A series of slip-Dykes running in a N & S. direction separates the Colliery into two directions. The seam in both, is interstratified near its middle by the Heworth and Black Bands. In the western division the Backs run completely through the Seam from top to bottom in the direction of N. 86. W. while in the eastern side of the Faults the backs below the Bands only, run in this direction, while those above run at right angles to those below the Bands.

There are also Backs called headways Backs, which run at right angles to the Boardways backs, but they occur less frequently and seldom pass entirely through the Seam.

was is am E. back as you approach it in one direction, becomes a west back as you approach it in the opposite direction.

The Cracks which form the Backs, are generally filled with sooty Coal, and vary in thickness from half an inch to 3 or 4 inches in which case they called “Danty Backs”. It frequently happens in backs of this description that the sooty Coal is divided by a crack up its middle, with highly polished surfaces without the least adhesion, dividing it into two Strata or linings the after part of which adheres slightly to the Coal These sheets of sooty Coal are called the “peeling” of the Back.

There is generally a mark or line, in the Roof and pavement corresponding with the line of the Back, with a small slip or throw which seldom exceeds an inch or two – but is not, usually more than ¼ or ½ an inch. I have endeavoured to refer the formation of the Backs in the Coal to the effects of the dislocations of the Strata by the various faults which intersect it; but have not been able to discover any analogy or law by which to have their formation to this cause.

Generally speaking their line of direction is nearly at right angles to the principal Faults – this is more particularly the case with the seams of Coal immediately on the S^{o}. side of the Main or 90 Fathoms Dyke. The Back in all the

[Bud-33]

The riders or Leets, as they are called, run in a diagonal direction between the Boardways & headways Backs, in some localities they are so close, as scarcely to be visible, but in other localities, especially in the Main & Low Main Seams on the N. side of the Main Dyke those cracks become wider and all filled with white Calcauous spar, which is semi-transparent, generally in Flakes of the thickness of writing paper, but sometimes reaching the thickness of ½ or ¾ of an inch

The appearance of this calcauous spar is generally indicative of a detetioration in the quality of the Coal, from its becoming less bituminous. Those riders or Cracks never extend continuously through the whole thickness of the seam, but pass through it in facets of various sizes, overlapping each other.

The Facings run parallel to the Backs, in small vertical facets, and it seems to be a general law, that the more facings in a seam, the fewer Backs, and vica versa.

Beside the Backs, Riders & Facings, there are also horizontal partings, [sometim[g]s] running to a considerable extent and sometimes not exceeding a few inches in superficial area. A substance like Charcoal dust is generally found in these partings, which soils the fingers, and frequently exhibits ligneous impressions. And sometimes this substance reaches

[179]

the thickness of an inch, and thins out to the edges, in which case it becomes a scare band, as described in a former part of this Chapter.

Where seams of Coal are stratified with Clay or slate Clay Bands, the backs seldom pass through those Bands – but generally that part of the Back which is above the band, is shifted a few inches out of line of direction of that part which is below the band – according to its hard, that is to say, according to whether it may be what is called an east or west back thus

[Diagram of East & West Backs]

[180]

of the Natural history Society of Newcastle in 1830. Since then, it has been examined in Byker, S^{t}. Anthony’s, and Hebburn Collieries, and found to confirm the opinion I had then formed of its line of direction, and undulating character.

In Hebburn the Dyke id cleft into 7 veins, or vertical Strata, of various texture and Thickness, as shewn by the section **N^{o}.**

This dyke is remarkable for its serpent-like undulations, and its limited vertical depth, as is proved by the various Colliery workings, on its line of direction. From its out crop at Coaly-hill,it dips to the eastward, but it was not found on the Kenton Tyne-Level Drift which crosses its line of direction, at right angles from which it appears that it lies below this drift. Then at Fen-ham, the workings in the Beaumont Seam from Benwell Colliery,

As we cannot trace the formation of the Backs, Riders and Facings in Coal, to the Agency of Faults and Throws of the Strata, We, may probably refer them to the effects of Crystalization.

I have endeavoured to shew the nature of those divisions of the Coal by the Diagram **L**.

Dykes and Faults.

Considering the extent of this Coal Field, but few Whin Dykes occur, as only 3 or 4 of any considerable magnitude have yet them been discovered. These are Coaly-hill, the Hamsterley Common, or Hett Dyke, the Cockfield-fell Dyke, and the Acklington Dyke.

Coaly-hill Dyke.

The First of these was discovered at Coaly-hill, by its appearance on the surface, where it has been quarried for road materials, from time immemorial. The Cinder Coal, upon its line of direction, was from traditional Accounts Known to exist in Newcastle Town-moor, at a remote period of our local history. And about the year 1730, it was set through in the Jane Pit Byker Colliery. – See section – It was subsequently set through in S^{t}. Anthony's, Walker, Montague Main, and Benwell Collieries, it has recently been set through in Hebburn Colliery, and it emerges to the surface in Hedworth Burn near [Simonside] in the County of Durham, where it has been quarried.

It has also been found to pass from Coaly-hill, through Wallbottle into Throckley Fell Colliery at Duty-burn.

I wrote a notice of this Dyke in the 1st. Vol: of the Transactions

[Bud-33]

passes under it at about 40 fathoms below the level of the Kenton drift, which proved its^<greatest> depth at that point, to be only about 100 fathoms below the surface. But no traces of it are here discoverable on the surface. The only place where any indications of it appear on the surface between its crop at Coaly-hill and Simonside, is in the Bank on the east side of the Ouse-burn, near Heaton-hall. The sectional Diagram **N°. 1** Explains this.

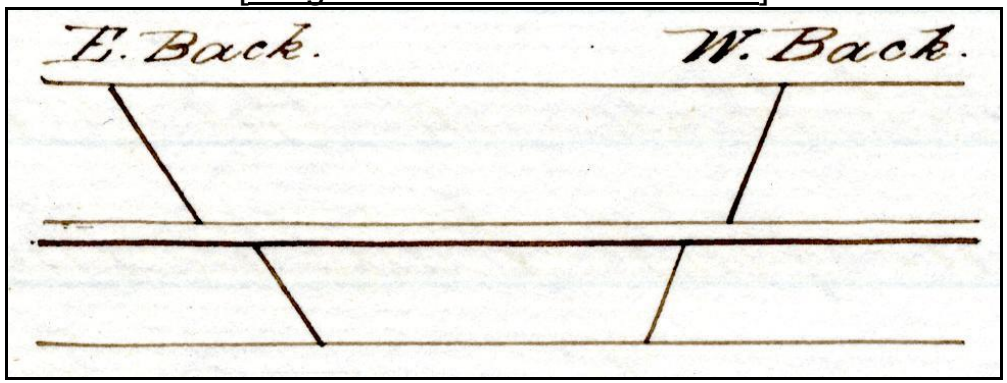
The Diagram **N°. 2** shews a cross section of the Dyke, where the Beaumont Seam passes under it at Fenham. **N°. 3**. is across section of the Dyke, in the Jane Pit, Byker, and **N°. 4**. is a section of it in the venture Pit S^{t}. Anthony's.

The diagram **N°. 2** shews that great mechanical force has been exerted in the Coal by the dyke, as it has depressed the seam several feet below its natural level, and thinned it to a mere thread or leader – but this thread of Coal is continu-ous and unbroken, which proves the connection of the seam on the two sides of the dyke.

It would appear from the peculiar formation of this dyke, that the matter has been injected in a state of fusion into the Strata, and has forces a passage through it, in its line of least resistance, and clearly at a period subsequently to the deposition of the Coal Strata.

In Walbottle Colliery this dyke is divided into two Cheeks of yards in thickness. This space between the two cheeks of the Dyke is filled with a sandy conglomerate (see Diagram **N^{o}.**)

[Diagram of East & West Backs]



At about 1400 Yards south from this dyke, is another Whin Dyke, which rims thro' the whole extrent of Walbottle Colliery, but which has not, so far as has yet been discovered any connexion what ever with it.

This dyke resembles the other in having two fragments of shale and there are two gaps through it fitted with sand. See diag. **N^{o}.** One of these gaps is 350, the other 280 Yards, with an interval of Whin 330 Yards between them. This dyke is visible in Walbottle-dean, at about yards below the Bridge on the S^{o}. side of the Carlisle Turnpike.

Hamsterly Common Dyke.

The Hamsterly Common, or Hett Dyke, extends from Hamsterly-common, by Helmington, and crosses the Wear between Willington and Byers-Green, and then goes by Whitworth and Sudhoe to Hett and thence to Th[ur]sdale, and has recently it is supposed been met with, in the Hutton Seam workings at Haswell Colliery, but has not been set through in consequence of its containing water. It is found here at the depth of 150 fathoms from the surface, and 100 below the Magnesian Limestone.

This dyke has been cut through in three different plans, in Crow Trees Colliery, at 14 Fath. Below the surface – its width <Bed of the> was found to be 4 yards and it altered the ^ Coal 4 feet between its two sides, but I have not been able to obtain any of the particulars respecting it in this situation.

At Quarrington it passes through under the Magnesian Limestone, from which we may conclude that the Dyke had been found anterior to the deposition of the Limestone.

It has not yet been traced further eastward towards the Sea coast on which in its line of direction the shore is covered with calcareous conglomerate. Where the dyke is quarried at Hett it is of irregular thickness, the Fissure in some places not exceeding 2 or 3 feet in width.

Cockfield-fell Dyke,

The Cockfield-fell Dyke.

This dyke seems to have been discovered at Cockfield-Fell, from which it takes its name, and has been traced from thence in

Cleveland to the Smeaton . It is to be seen at Cold Thorn Currach from whence it passes through Cockfield Fell and Butterknowe to a quarry, about a mile to the S.W. of Evenwood. It then disappears for about a mile, but is worked in a quarry on the east of the road, between West Auckland and Wickerfield from whence it continues in an easterly direction, and nearly in a straight line by Coatham & Preston through the Tees.

As far as it has yet been examined, this dyke is widest at Bolam where it is 40 yards thick, and it has been proved to extend below all the seams of Coal. This quarry at Bolam seems to be in an overflowing of the Fissure.

M^{r}. Mick Forster has given a very interesting account of the effects produced by this dyke on the seams of Coal, and adjoining Strata in Butterknowl Colliery in the first part of the Transactions of the Newcastle Nat: Hist: Society. M^{r}. Witham has also given an account of the effects produced on the seams of Coal, by this dyke, in the 2nd. Part of the second volume of the same society. Since these gentlemen wrote upon this subject, it has been discovered in the further prosecution of the Coal workings, that at 40 yards further west from the point described by M^{r}. Forster, in Butterknowl Colliery, it is crossed by a slip dyke, which throws the Strata up to the west 3 Fathoms. The effect produced upon the Whin dyke by this fault, is rather singular, as it seems to have separated, or broken it, and forced the part on its western side out of its line of direction, and shifted it 35 yards to the south, as represented by the diagram **N^{o}.** –

At 10 feet from the S^{o}. side of the dyke, and on the W. side of the 3½ fathom fault, an upcast fault of 8 fathoms to the S^{o}. runs parallel to the dyke, as represented by the dotted line. On the rise or S^{o}. side of this dyke the Coal is not coked, while on its opposite side the Coal is coked to some distance as usual.

It would appear from this, that the 8 fathom fault had been formed antecedently to the dyke, and had shielded the Coal on that side from its carbonizing effects. And that the 3½ Fath: Fault had been formed subsequently to the dyke, and by a sideways thrust at the time of the convulsion which formed it,

a S.E. direction across the River Tees, into the Lias hills in

[Bud-33]

had twisted the dyke, as well as the 8 fathom fault into the position represented by the diagram.

The dyke, where it is bent on the west side of the Fault, is

[183]

nipped to mere thread, being only 18 In. thick; but at 35 yards to the E: of the Fault – it is 3 yards, and at 170 yards further east, it is 22 yards wide. From this it may be inferred, that the dyke had sustained immense local pressure at this point when the fault was formed. It has not been ascertained whether the 8 fath. fault crosses the 3½ Fath. slip

At a place called Black-burn about 2 miles S^{o}. from this point, where the dyke is quarried to a considerable extent, another fault crosses it, at right angles, but whether it alters the level of the Strata, the quarrymen have not yet discovered. In its line of direction to the northward however, in Norwood Colliery, a down throw fault to the east has been met with, which, the Colliers are of opinion, is identical with that which crosses the dyke at the Blackburn Quarry.

In the quarry, this fault has the appearance of being [main]-ly a Fissure, or Gap in the dyke, which is filled with Blue and Yellow Clay, baked and disintegrated in the Centre with something of a rude vertical slaty appearance, mixed with rough projecting portions of whin at the sides. The dyke is 22 yards wide when this Fault crosses it, and the Fault is 7 yards wide. See the annexed diagram.

[Diagram of Plan & Section of Dyke]

The cheeks or sides of the Whin dyke are Freestone of a brownish

Acklington Dyke

[184]

colour, lying irregular beds, but the stone has not the appearance of having been exposed to great heat. This is by far the largest dyke in the district.

The Acklington Dyke is near the northern extremity of the Coal field – it is traceable from near the sea shore, at about a 1½ south from the mouth of the Coquet, and passing by the Radcliffe and Acklington Collieries in a zigzag direction, its general line of direction being N.W.. It crosses the Coquet near Brains-haugh, and goes on by [A]cton, to the North side of Nelson,s monument at Swarland, beyond which it has not been traced. The line of this dyke is well defined for, upwards of miles, but the quarries which have been worked in it, are so filled with rubbish and water that a correct drawing of it cannot at present be had.

Besides those Whin dykes there are others of less extent, in different parts of the Coal Field. In Hartley Colliery 4 Whin dykes have been discovered all running in a N.W. and S.E. direction. One of these dykes is in the S.W. angle of the Colliery, and has only been traced for a short distance but it cuts through the yard seam at the depth of 56 fath^{s}. and through the Low Main Seam at 82 fath^{s}. The Whin Fissure is 8 feet wide; and has a lining of Cinder Coal on each side, but it does not alter the level of the seams, nor is any trace of it to be seen on the surface. The other 3 dykes are in the N.E. part of the Colliery, they are visible on the Sea shore, and as they converge towards the S.E. it is probable that they emanate from the same parent root, or form a junction at no great distance from the shore, under the bed of the Ocean. The southernmost of those dykes is the most considerable – it passes in a line from the sea shore, between the Crag-house and Dove-coat, through Seaton Burn, near the mouth of the Swallow Burn, up which it runs for some distance and it has been traced by the underground workings of the Colliery, nearly as far as

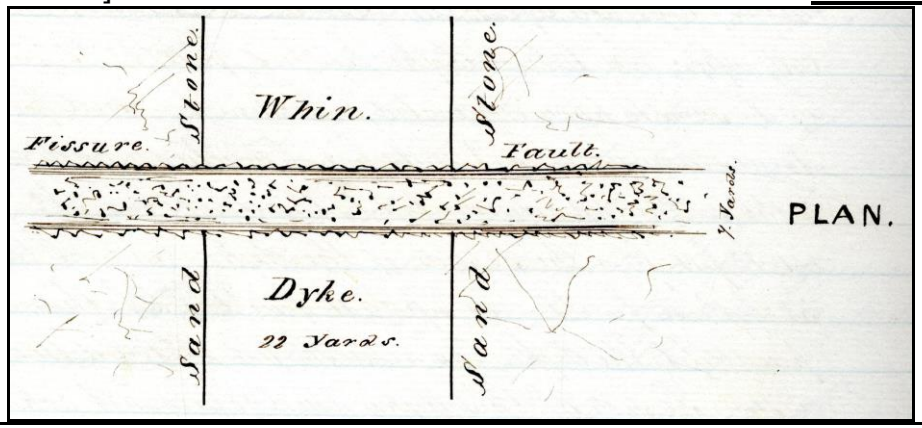
[Bud-33]

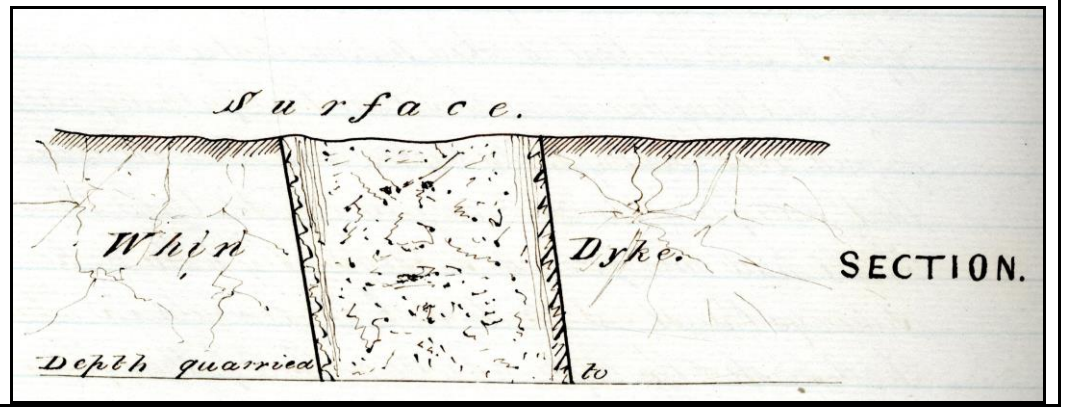
the pillar, on the North side of the Avenue from Seaton Delaval House. It has been traced by the Colliery workings, and by Borings, for about 2½ miles from the Sea shore, where it is supposed to run out.

This is called the Swallow Dyke, from its being quarried in

[Bud-33]

Plan & Section of Dyke





[185]

Maus-leum Dyke

the Swallow Burn. It throws down the Strata about 12 Fathoms to the north near the sea where it wears more the character of a slip, than a Whin dyke, but where it crosses Seaton Burn, about ½ a mile to the N.W., and in the bed of the Swallow Burn it becomes a regular Whin dyke of 8 or 10 feet in width. It produces no other change in the seams of Coal that merely charring them to a short distance on each side. In one part on the West side of the Seaton Burn, the whin is divided vertically by a core of Freestone, metal stone and Ironstone Conglomerate.

The next, or middle dyke of the three is called the Mauseleum dyke – it throws the Strata up 4½ Fath^{s}. to the N^{o}. where it crosses Seaton Burn, a little to the W. of Seaton Lodge. It is divided into two cheeks by a Core of sandstone Conglomerate in a similar manner to the other dyke at the Swallow burn. The seams of Coal are charred on each side of this dyke, in the usual manner. The third, or last of those dykes is exposed

[186]

Butterby Whin Dyke.

The Whin is 24 feet wide, and is full of joints and cracks – it is lined by a bed of blue plate or metal on its S side, which is baked very hard. The N. Cheek, is not visible being covered with debris and herbage.

The last Whin dyke which I have to notice is that at Butterby near Durham. This dyke crosses the Wear in a S.S.W. direction and is only visible for a short distance. It varies in width from about 5 to 20 feet like the Hett dyke, to which it runs, nearly parallel. It is chiefly remarkable for the salt spring which issues from its side in the bed of the river; a little further down the river, in its western bank is a sulphur spring, but it has no apparent connexion with the dyke.

Slip Dykes or Faults.

Those dislocations of the Strata called Slip dykes, or Faults are infinitely more numerous than when dykes in the Coalfield. They are of various sizes and run in various lines of direction, al-

	to view in the Cliff, and rocks, on the S^{o}. side of the debris of the Sea Bank, that its precise character cannot be defined.
Bedlington Whin Dyke	**N^{o}.** and are drawings of the Swallow and the Mausoleum dykes. A Whin dyke appears, in the bed of the river Blyth near Bedlington Bridge which is probably a continuation of the Mausoleum dyke from Hartley.
Tynemouth Whin Dyke	There is also a Whin dyke, at Tynemouth, which is to be seen very distinctly in the Rocks, immediately on the N. side of the Prior haven. The line of this dyke runs under the Monastry, but it has never been discovered further west, although the workings of several Collieries have crossed its line of direction. **N^{o}.** is a drawing of this Dyke, shewing also the small patch of magnesian limestone alluded to elsewhere.
Whin Dyke in the River Allen	A large Whin dyke crosses the River Allen, at about a mile above its confluence with the Tyne. It is not traceable beyond the western Bank of the river, and on the eastern side, it is only traceable as far as the escarpment of the Blue limestone near the limekiln on the east side of the Bogglebold Fields a distance of about 80 yards: but it is covered with debris, and herbage, at this season 31st. July, that I could not ascertain whether it passes through the Limestone a was overlain by it. [Bud-33]

	though the general line of bearing of the largest is southwest, and North west – take the Sea coast of the counties of Northumberland and Durham as the Base-line. I have traced the lines of all the principle Faults, as well as the Whin dykes upon the map of the Coal field which accompanies this paper. The Faults being represented by red – the Dykes by Blue lines. –
Great 90 Fath Dyke.	The largest fault which is known exists in our Coal field, is what is called the Great or 90 fathom dyke. This fault appears on the sea coast at Cullercoats, and runs westward by Whitley, towards Backworth, near which it changes its line of direction more towards the S.W. It passes by Long Benton Church, Gosforth Church, a little to the south of the village of Kenton on the edge of the Newcastle Town Moor, & thence by Denton Hall and across the Tyne near Stella-hall to Greenside and Coal Burns. At Coal Burns it makes rather a sudden turn, more to the westward, and goes on by Hedley-fell, crosses the Dillswater, below the Linnets, and so on to Stublick moor, and across the Allen at Staward Peel. It is crossed on the E. side of the Staward Peel, in Horsendale Burn by Burton Ford dyke. At Whitley, this fault has been ascertained to depress the Strata

	[187]
	to the depth of about 85 Fathoms on its N^{o}. side by the Coal workings on each side of it. It increases in size, as it proceeds westward to Killingworth, where its thrown to the North is estimated to be full 200 fathoms which seems to be the point of its greatest depression. As at Denton it is estimated to be only 90 fathoms and at Coal Burns it has been proved by the Coal workings on both sides to be only 75 Fath^{s}. See Section **N^{o}.** The Fissure of this fault hards or slopes at very different angles in the different parts but it is accompanied by such numerous dislocations of the Strata, and so many collateral Branch Faults on each side along its whole course, that it has seldom been reached by any underground workings, and when reached is difficult to identify the main fissure.

	[188]
	locality on the line of this Fault, and I ground the hypothesis of its arising from the effects of pressure from its occurring on the overlying side of the Fault only. From Gosforth to Stella Grand Lease Colliery, I have not had means of observing the concomitants of this fault – But the here the Fissure has fractured the Strata, into a sort of rude echellons, or ledges it is of various breadths and height but, occupying in the been aggregate a considerable horizontal width. At Stella estimated to be 90 Fathoms, but at Coal Burn, it has here, it proved by sinkings and borings to be only 75 Fathoms. See Section **N^{o}.** The Fissure of the Dyke is nearly vertical, is about 15 yards wide, and is filled with Sandstone, Metal

It destroys the ^,several> seams of Coal to a considerable extent in some parts by the space which the fissure occupies by its slope, and the distance between its two sides. This is the case from Whitley by Backworth and Killingworth to Long Benton, where, in addition to the width of its Fissure, it destroys a considerable extent of the Main Coal Seam, on its south side, by the singular effect which it seems to have produced on the "Main Post". As far as has been proved by the workings of the Main Coal seam on its S^{o}. or rise side – in Long Benton and Gosforth Collieries. It appears to have had the effect of throwing the Sand Stone Stratum, which reposes immediately upon the Coal into an undulating or wave-like shape, both vertically and horizontally, the undulations being largest near the Dyke and gradually diminishing as they recede from it, until the Roof resumes its usual regularity. In approaching the Fault in this direction, those undulations have the appearance of the ordinary Balks, which are incidental to Sand stone Roof: but I consider they originate in a different cause. The diagram **N^{o}.** shews the nature of these undulations. It would seem as if they had been formed by the downward pressure of the Strata, at the time when the dislocation which caused the slip took place, and which would appear to have happened where the Coal and sandstone were in a plastic state; as near the slip, the Coal seems to have been entirely squeezed out.

I am not aware of a similar phenomenon in any other

[Bud-33]

Stone and Clay much Indurated.

From Coal Burns until we reached Stublick Moor Colliery, little is known of this Fault, but in this intermediate space there is reason to believe that it is accompanied by many collateral branches, some being up, and some down-throws. At Stublick Moor the Main Branch is estimated to be down throw to the North of 90 fathoms, but in the workings of Stublicks Colliery numerous collateral Branches have been met with on its N^{o}. or dip side – one of which, at 50 yards to the N^{o}. is an, up-throw of 16 fathoms. This branch runs divergingly to the N.E. and between it and the Main dyke the Strata rise at the rate of 1 in 5. Either this branch crossing the Main dyke, or another Branch from its S^{o}. side running in a more S^{o}. westerly direction, becomes a down-cast of There are 8 Seams of Coal in Stublick Moor within 54½ Fathoms of the surface, containing an aggregate thickness of 15..11½ of Coal of various qualities.

Ft. In.

This Colliery lies about 1½ miles E. from the Burtree-ford dyke at Steward Peel.

The point where the Stublick Moor and Burtree-ford dykes cross each other in Horsendale Dean, forms an, interesting subject for Geological investigation.

The course of the Main dyke, so far as it has been explored in Stublick Colliery is exceedingly tortuous.

Heworth Dyke.

The Heworth dyke. The next fault of decided character, which we meet with in passing southward, is the Heworth or Shipdon Dyke.

This Fault received its name from being first met with in

Heworth Old Colliery, and subsequently in the Shipdon or Blaydon main Colliery

It is a downthrow to the North of 25 Fathoms, and its general line of direction is about N.60W. by compass. It passes through Gateshead Fell, by the S^{o}. side of the New water Pond. And thence by the north skirts of Whickham Banks, between that village and the Tyne, and thence by S^{o}. End of

down-throw, or rather depression, and bending of the Strata, as there is no visible Fissure or break in it. See Section **N^{o}.**

Nothing worthy of remark occurs on the line of this Fault eastward from Tantobie, till we reach the Birtley Salt works. At this point a copeous Brine Spring issues from its Fissure, on which the Birtley Salt works are erected. This Spring can supply about 180 Tons of Salt per Mo. I am informed – the Fault is an up

Swalwell Bridge, through Axwell Park, into Winlaton Lordship, where it divides into 3 Branches works. near Bett's Alkali The 3 branches are all down-throws to the North – the southernmost being 8 fathoms – the middle one 3 Fathoms and the north one 11 Fathoms, making 22 Fms. In all.

The North Branch crosses the Main dyke in Stella Grand Lease, near to Stephen's Hall, by which it is changed into an upthrow of 4 Fathoms to the north, at the point of crossing. From thence preserving its line of direction to the N. West it becomes an upcast of about 30 fathoms to the North at Craw-crook New Winning. At at Wylam where it crosses the Tyne, it increases to upwards of 40 Fathoms. I am not aware that this Fault has been traced further than Wylam Colliery, and nothing peculiar in its character has been discovered.

Taking a right line south from Axwell Park to Tantobie, a distance of 4½ Miles we meet with the Tantobie, or Portobello Dyke. The line of this fault runs nearly parallel with the Heworth dyke. It crosses the Derwent near the Derwent Coat Forge, which is as far as it has been traced in that direction. Proceeding S^{o}. Eastward it passes through Tanfield Moor Colliery by the village of Tantobie then through Beamish and the S^{o}. E. part of Blackburn Fell, Aupeth, Ouston, and the N^{o}. Side of the Boundary Pit in Fatfield Colliery, into Ox Close where it divides into 2 Branches, the N. Branch passes through Wash-ington Colliery 200 Yards S^{o}. of the B. Pit, and is upcast to the N. of 8 fathoms. The S^{o}. Branch passes through Wash-ington Glebe, at 300 Yards from the N. Branch, and is an upcast to the N. of 20 Fathoms.

Tantob-ie Dyke

At Tantobie the Fault consists of a great number of disloca-tions with patches of Coal between, but it finally resolves itself into an upcast to the N^{o}. of 40 Fathoms, occupying a space of 20 Yards in width between the two sides. Its N^{o}. side is a

[Bud-33]

cast to the north of 29 fathoms here, being Eleven fathoms less than at Tantobie. Although this fault has been crosses in various places both to the E. & W. of Birtley no other salt water spring has been met with in this fissure. As has already been stated, this Fault from is divided into two Branches, in one Branch in Ox Close at about a mile E the Birtley Salt works the one Branch being 8, the other 20 fathoms, making the whole up-throw to the North, nearly the same as at Birtley.

Marg-aret Pit Dyke

The next fault of magnitude, which we meet with in going southward, is the Margaret Pit Dyke, in Newbottle Colliery This fault is in 2 Branches – the one a down-throw of 10, the other of 25 fathoms to the south, but those branches converge to the west-ward, and unite in Morton Colliery as is more particularly stated in the description of the longitudinal Section **N°. 1A.**

Wood-stone House Dyke.

About 650 yards south from the Margaret Pit dyke, is the Woodstone Hous Dyke which is an up-throw to the South.

This Fault is divided into several Branches in Houghton Colliery, but unite in Murton, and become an up-throw of 26 to 28 Fathoms to the south.

Proceeding in the same line to the southward at the distance of $1^{1}/_{3}$ Miles is the Hazard Pit Dyke, a down throw to the south of 23½ Fathoms, the course by Compass about 76¼ W. At 50 yards to the S^{o}. of this Fault is an upcast of 5 fathoms, which seems to be a branch of the former, as they join at about 400 Yards to the west, and diverge at an angle of 6½^{o}. To the east. This Fault passes through the whole extent of Rainton Colliery, but it runs out to the west in a distance of 1 Miles. From this, as far south as the Coal Field has been explored to Thornley, no faults of more than 8 fathoms throw have been discovered. The whole of the slip dykes on this line are shown on the Longitudinal Section **N°. 1A. & 1.B.**

To the north of the Main dyke the following faults have

<Fault>

been observed. In Holywell Colliery a down cast ^to the North

[191]

commencing at nothing and gradually thickening in its course to the S^{o}. Eastward through Earsden Colliery, has been found to be

[192]

cover through the high Table lands of Plainmella, Kingswood and Craw-wood, west of the Allen, until they Crop out in the east

26 fathoms in the S^{o}. part of the Hartley Colliery, near Briar dean Burn, from which it has received the, name of the Briar dean Burn dyke.

The next Fault is an upcast of 8 fathoms in Cramlington Colliery, its line of direction being N.W. This is more like a bending upwards, than a slip or dislocation of the Strata.

From this point to Cowpen Colliery, a distance of about 4 miles, the seams of Coal have not yet been explored, so that it is not known what Faults may intersect it, and in Cowpen Colliery only one fault of any magnitude has been met with. It is a slip of 11 fathoms down to the north – its line of direction is north west.

From Cowpen Colliery northwards to the Coquet, the Coal-field has not been sufficiently opened to discover what Faults may intersect it.

The Faults which I have here noticed, may be considered as only the principle ones, and as has already been observed their general line of bearing is E. and W. varying a few de-grees on each side of those cardinal points. But there are numerous intermediate Faults of various sizes, running in all directions, which it would be almost impossible to describe in writing, and which can only be shewn on a map. It may however, be remarked that the tendency of the smaller Faults is to diminish to the westward.

There are also many faults of Considerable size running within a few degrees of a N^{o}. and S^{o}. line. The most decided of these is the Burtree ford dyke, which takes its name from Burtree Ford, where it crosses the river Wear, and running in a line almost due north, crossing the E. Allen, a little to the E. of Hindley & Cupola Bank, crosses the Stublick-moor Dyke in Horsendale dean, near Stewart Peel, – then runs down the vale of Allen, which it probably forms, crosses the Tyne at Crow-hall Bridge, and thence runs on to Boult, a little to the E. of the Roman Station of Bercovicus or House Strads.

This Fault is a down-throw of 80 fathoms to the West. This down-throw, combined with that of the Stublick Moor dyke, is the cause of depressing the seams of Coal, so as to keep them under

[Bud-33]

side of the S^{o}. Tyne.

The seams of Coal are here denudated and destroyed by the vale of the S^{o}. Tyne, but being again depressed by down-throw slip they reoccur in Hartley Burn and Midgeholm, and finally, terminate at the Mountain Limestone of Lindale Fell.

For a more detailed account of this locality, see M^{r}. Wood's on the Geology of Northumberland, 1st. vol. Nat. Hist. Sco. Transactions Newcastle.

A curious group of Faults originate in Percy Main Colliery, near the High Flatworth Pit, on the North side of the Shields road and passing through the Tyne between Howdon Pans, and the east end of Jarrow quay, proceed in a line pointing between Whitburn and Sunderland. One of the sections published in the 1st. Volume of the Nat. Hist. Transactions of Newcastle shows this group of Faults. It is highly probable that the same convulsion which formed this group of Faults contributed chiefly to the formation of Jarrow Slake – and as there is a con-siderable depression in the surface of the ground in a line from Jarrow Slake to that part of the Coast between Whitburn and Sunderland, where the submarine Forest was discovered a few years ago – it is probable that this convulsion may have sunk this Forset below the level of the sea also.

I may mention in this place that a Fault of 40 Fathoms upcast to the North, emerges from the Sea, in the rocks at the Low-lights or Black middens, at N^{o}. Shields, at the mouth of the Tyne. This Fault runs in a N^{o}. W. direction through Collingwood-main Percy Main, and Willington Collieries and splitting into sundry small Branches merges in the Main dyke at Long Benton it diminishes in size as it proceeds westward from the Mouth of the Tyne, and is only 7 Fathoms at Willington.

Pn the opposite side of the River, in the S^{t}. Hilda Colliery, a Fault of 58 fathoms up-cast to the North also, runs close past the S^{t}. Hilda Pit, in a western direction, but it dimin-ishes rapidly to the westward, and runs entirely out under Jarrow Slake, a little above the high end of S^{o}. Shields, in a distance of less than a mile. If therefore those faults continue to increase as they proceed to the Eastward, they must soon gain

immense size under the bed of the Ocean. The ancient Bed of the River, at its mouth, seems to have run just about mid-way between these two Faults.

The Group of Faults which Crosses the Tyne between Howdon Pans, and Jarrow Quay, as already described, does not cross the 40 Fath: Fault, which runs from the Black Middens, through Collingwood Main, Percy Main and Willington Collieries

These Faults diminish in size, as they approach the 40 Fath: Slip, and finally terminate at it.

In the Auckland district, a large Fault with several collateral branches, is traceable from woody Hills, by the N^{o}. side of the Cow-Close Engine, in the direction of about S^{o}. 80 E. through Butterknowl, Green-head, and West Auckland Colliery, into the Bishop's Park, at Bishop Auckland, and it is not improbable that this Fault with its several Branches continuing their line of direction from the slip dykes which have recently been met with in Thornley and Coxhoe Collieries.

At the Cow-Close Colliery, according to old M^{r}. Geo: Dixon of Cockfield's account, this fault seems to be divided into 3 Branches. The N^{o}. branch, which runs on the N^{o}. side of the Cow-Close Engine, is a down-throw to the South of 40 Fath^{s}. At 265 Yards to the south of this, is an up-throw of 20 Fath: and at 176 yards further S^{o}. is another down-throw of 40 Fath^{s}. to the S^{o}. Between the two latter Branches M^{r}. Dixon states that the Main Coal Seam is not found. The result of this Group of Faults is a down-throw of the Strata of 60 Fathoms in the distance of 448 Yards.

At Butterknowl Colliery 2 Miles E. from Cow-Close, this Fault is estimated to be a throw of 75 Fathoms down to the south in <u>one</u> Slip.

Passing still eastward to Hunter's House on Railey Fell, this Fault is reckoned to be a down-throw to the S^{o}. of 35 Fath^{s}. and it is estimated to be the same in Bishop's Park at at Auckland.

M^{r}. Dixon who wrought the west Auckland Colliery, gives

Colliery, the northernmost of which he considers to be the Railey-Fell or Greenfield Dyke. This Fault in the west Auckland Colliery is a down-throw of 35 Fathoms.

M^{r}. Wylam Walker's Account of the Stublick Moor, Burtree-ford and other dykes in its vicinity.

At Stublick the Dyke seems to divide into several Branches. The principal one at about a mile and a quarter W. from Stublick is crossed by an up-cast Fault, running in a N. & S. direction This Fault is said to be an upcast of 80 Fathoms to the West – it seems to shift the Stublick dyke out of its line of direction a mile to the south, where it is seen to cross the E. Allen to the Eels. M^{r}. Walker considers this to be the Burtree-Ford Dyke.

At Eels the Stublick dyke is again crossed by a large Clay dyke – a downcast to the west of unknown throw, which has moved it back to the North into its original line of direction at Tod Banks. From Tod banks the dyke runs west across the S^{o}. Tyne, near Lumbley, by Green-rig. Midgeholm and by the S^{o}. side of Hartley Burn where it runs into the Cross Faults in Tindale Fell.

This Clay dyke seems to cut off the Fallow Field Vein, at a-bout a quarter of a Mile west from Stawards Peel – about a mile and a quarter N. from the Eels.

This Clay dyke runs on the west side of the Allen, in a line which crosses the S^{o}. Tyne at Bettingham.

The Fallow Field Vein which is a down-throw of 40 Fathoms to the North, runs from Stawards Peel, north of Langley Castle, by Haydon Bridge – crosses the two Branches of the Tyne north of Warden Church to Fallow Field, and thence cross the Roman wall to Gratlinton, beyond which it has not been traced.

Description of Longitudinal Sections.

For the sake of convenience, the Longitudinal Sections are divided into lengths, and marked **N°. 1A. & 1.B.** &c.

N°. 1A. Commences at Sheriff Hill and extends to the Houghton Pit – from whence **N°. 2A.** Goes on in continuation

the section of a group of 5 Faults which occurred in a space of 650 Yards, and passed in an E. & W. direction through that

[Bud-33]

to Thornley Colliery.

The general line of direction of this Section, is about S$^{o.}$. 44 E. by compass, and its length in a right line is 14 Miles, but

[195]

by the line of Section it is rather more than 15 Miles I have not delineate the Strata on those Sections, except at the points where it has actually been sunk through, but the seams of Coal are drawn through the whole length, the latter to shew the several faults which intersect them, the Low water Mark at Spring Tides on Shields Bar, is taken as datum Line.

I have thought it better not to draw the Stratification between the points of the sinkings thro' it, as it varies so much, that attempting to draw the different Strata, where they have not been actually seen; would be mere guess work, and only tend to convey erroneous ideas of the thickness and position of the different beds of sandstone &c.

The scale of the Longitudinal Sections is too small to admit of the minute features of the Stratification being delineated, but this defect is supplied by the vertical sections, which are drawn on a larger scale of ½ In. to a Fath:

The Section **N°. 1A.** Commences at the Isabella Pit Dyke, in Sheriff Hill Colliery, which is an Upcast Fault to the North of 10 Fathoms. This Fault runs nearly in a South and west direction – It has been traced through Team Colliery past the N. side of the Aller-dean Engine Pit, into the wash in the Team valley, but its extent to the eastward has not been ascertained, although there is little doubt of its soon running into the Heworth dyke, See map

Passing along the line of Section from Sheriff Hill, by Springwell to Washington, a distance of nearly 3 miles, we don't meet with any Faults till we reach the [I] Pit dyke in Washington Colliery, a downcast of 8 Fathoms to the south, and at 300 Yards further South we meet with another downcast of 20 fathoms. The two faults are the Branches

[196]

called the Milburn Pit dyke, from its running through Fatfield Colliery in a western direction past the Milburn Pit. It is about ¾ of a mile from the S^{o}. Branch of the Tantobie dyke in Washington Colliery. At about the same distance further S^{o}. is the N. Biddick dyke, a downcast Fault of 14 Fathoms to the south.

This Fault runs a little to the N. of West through the N. Biddick Estate, and into Tanfield at Chater's-haugh Royalties. Between this Fault and the Milburn Pit dyke, the Seams of Coal are reported to be greatly deteriorated. The Wear High Main, the Maudlin, and Low Main Seams have been ascertained not to be workable, and the quality of the Hutton seam is doubtful.

From the Biddick dyke, passing through under the Bed of the Wear by Pensher D Pit to Herrington Burn, a distance of 1¾ miles, no Faults occur – and the seams only rise 14½ Fathoms in that place. At Herrington Burn is a dip Fault to the S. of 17 Feet. Between this Fault and the N^{o}. Biddick dyke, the Wear Five quarter – high main Maudlin and Hutton seams, are in their usual state of perfection, but the Low Main is not a workable Seam.

At ¾ of a mile further south, we meet with a succession, or Group of Faults in the Newbottle Colliery – called the Margaret Pit dykes. This group consists of three separate Faults – the 1st. or Northmost is a down throw of 10 Fathoms to the S^{o}. – the next which lies 185 yards further S^{o}. is also a downcast of 25 Fathoms. The 3rd. Which lies 410 yards further S^{o}. is an upcast of 15 Fathoms. This latter Fault is the Northernmost Branch of the Woodstone House dyke.

The general group line of direction of this group of faults is N.W. but they converge in this direction, and join in B[our]n-Moor Colliery, passing through Lumley Colliery by the Houghton Gate Pit, to the Wear – beyond which the Fault

of Tantobie's Potrabello dyke, as has been already stated in the description of that Fault. The only material alteration in the seams of Coal, in this part of the Section, is that the Tyne High Main becomes divided, loses its distinctive character, at becomes the Wear three quarter Coal at Washington.

Passing on southward from Washington into North Biddick, we meet with a 4 fathom down-throw Fault,

[Bud-33]

has not been traced. This Fault runs through Lumley Colliery in a direction very nearly parallel to the Woodstone House dyke. It is a down-throw of 10 Fathoms to the South, at the Houghton Gate Pit.

Innumerable Branches, or small faults are met with in the intervals between these Faults, on the meridian of the Margaret Pit.

[197]

It seems to be the Northmost or 10 fathom dyke of this group which brings the Magnesean Limestone into juxtaposition with the Grindstone Post, in the escarpment of the Hill at the west end of Newbottle village. Under the village this Fault resolves itself into a numerous group of dislocations, some up, and some down, till they ultimately result in a down-throw to the South of 48 Fathoms, as the Five quarter Seam on the dip side is found lying as the same level as the Hutton Seam on its N. or rise side. At 500 Yards further South, than this 15 Fathom Fault and within 100 Yards of the Houghton Pit is an upcast Fault to the S^{o}. of 8 feet. And at 45 Yards beyond the pit, is another up cast slip to the S$^{o.}$. of 19 Fm.. 4 ft. The Fissure of this slip is about 30 yards wide, and is filled with broken Metal Stone, but the leaders of all the Seams are traceable through it.

These Faults from the Southern Branch of the Woodstone House dyke. They form a junction with the northern 15 Fath: Branch near the William Henry Pit in Murton Colliery, where the Fault receives the name of the Woodstone House Dyke, and is an upcast to the S^{o}. of about 26 Fathoms, then passes thro' Lumley Colliery in a zig zag course, past the S^{o}. side of the Castle to the Wear, beyond which it has not been traced.

Between Pensher and Houghton Pit, the Low Main Seam regains its thickness but the Coal is an inferior quality.

N°. 1B. Proceeds along the Line of the Section Southward no dislocation with the exception of a 7 Fathom ~~Faul~~ upcast slip is met with, till we reach the Dunwell and Ha-

[198]

Continuing South along the line, [ox]yards, in the Hetton Colliery is a down cast Fault of 17 Feet – at 150 Yards is another down throw of 8 feet – and at 240 yards further is an upcast of thirty feet.

Continuing along the Line of Section 640 yards further at 125 yards S^{o}. of the Hetton Miner Pit is an upcast Fault of 7 Fathoms, and at 350 yards further S^{o}. is a downcast of 4½ Fath: At 375 Yards further S^{o}. is an upcast of 5 Fathoms, and at 110 yards further is a down cast of 4 Fathoms.

Another Fault has been discovered at 1¼ Miles further S^{o}. supposed to be a down throw, but it has not yet been proved.

Advancing along the Line of the Section to Haswell Colliery from the above unproved Fault, a distance of 1¾ miles, only 4 very small slips are met with, two being down, and two up-casts. The Haswell Engine Pit is sunk in the Fissure of the southernmost. The Five quarter and Hutton, are the only seams in this Line of Section which are at present deemed workable, and of merchantable quality.

From the Haswell Colliery to Thornley Engine Pit, the distance in the line of section is rather more than 1¾ miles, of which an interval of about 1¼ miles of Hutton Seam, has not yet been explored. At about 750 Yards S^{o}. from the Thornley Pit a downcast Fault of about 4½ Fathoms has been met with in the Five quarter Seam.

At 300 Yards N. from the Pit, a down Cast Fault of $8^{5}/_{6}$ Fathoms to the north. At 50 Yards further North is another downcast of 6 Feet. At 130 yards further N. is an upcast of 4 Fm..4 ft. and at 25 yards further N. is another

zard Pit dykes, at distance of about a mile and a third from the Houghton Pit.

Those Faults have not yet been actually proved, by the Colliery workings on the line of the section, but from analogy they are estimated to be as follows viz. the first or most northerly, a down cast of about 23 Fathoms. The next at 150 yards further S^{o}. is an upcast of 5 Fathoms – and the 3rd. 300 Yards further S^{o}. is a downcast of 5 Fathoms. They run out to the W. in Rainton Colliery.

Between Houghton, and those Faults, the Low Main becomes a workable seam, and a respectable Steam Boat Coal.

[Bud-33]

upcast of 2 Fm..2½ ft. – beyond which no other faults have been yet discovered in that direction.

The Five quarter is the only Seam which has yet been found in a workable state, on the S^{o}. side of this group of Faults on this Line of Section.

It is by no means improbable that this group of Faults may be a continuation of the Greenfield Group, which has been traced from Butterknowl in a N.E. direction through the Bishops Park at Auckland in the direction of Thornley.

Taking the depth of the Hutton Seam, below the surface,

and the Sea level line along the line of Section, we find it to be as follows, viz.

	Below Surface	below Sea.
At Sheriff-hill		
– Springwell		
– Washington [**I**] Pit		
– Pensher **D** Pit		
– Newbottle Margaret Pit		
– Houghton Pit		
– Hetton Miner Pit		
– Haswell Engine Pit		
– Thornley ditto		

From the small scale on which these Sections are projected, the principal Fractures only of the Strata can be delineated, but the detailed sections of Sheriff-hill, Springwell, Pensher, Houghton Hetton, Haswell and Thornley supply the deficiency.

The Sections shew that the stratification from the surface to the lowest seam which has been explored, consists merely of an alternation of sandstone, and metal or argillaceous beds, of various thickness, colours and degrees of hardness. Although these various strata preserve a general conformity, it will be seen that they alter their thicknesses, colour and texture so much in various parts, as to render it difficult, if not

Main Coal at Sheriff Hill, and at Springwell, but from the fall of the surface towards the Wear, it crops out at Washington, and does not appear again, till we arrive at Pensher, on the South side of the Wear, where it is extensively quarried. It continues to Houghton, but is absent at Hetton & Haswell, and reappears at Thornley.

The imtermediate group of Sandstone Strata forming what is called the 70 Fathom Post may be traced, with the exception of an interval of about 4 miles, between Washington and Pensher, all the way from Sheriff-hill to Thornley.

Between the Surface and the Low Main or Wear Hutton Seams there are at

Sheriff-hill	in a depth of	122	faths. – –	27	Beds of	Sandstone	
Springwell	–	126	– – –	27	–	–	
Pensher	–	123	– – –	18	–	–	
Houghton	–	130	– – –	18	–	–	
Hetton	–	148	– – –	14	–	–	
Haswell	–	155	– – –	19	–	–	
Thornley	–	144	– – –	9	–	–	

It thus appears that although the depth increases, the number of Sandstone Strata diminishes, towards the Southern extremity of the Coal Field.

Section **N°. 1B.** –

Commencing at Monkwearmouth, and extending

altogether impracticable, to identify them in different localities. In short, the various strata pass into each other and divide in a similar manner to the seams of Coal with which they alternate, so that, with few exceptions, it is very difficult to identify any particular Stratum, by Boring, or sinking, even at very short distances. The only decided exceptions, to the general rule, I would say, is in the grindstone Post, which is subordinate to the New Red Sandstone under the Magnesian Limestone; and the "Main Post," which lies immediately above the Tyne High Main Seam,

The main Post, is distinctly traceable, on the Line of section from Sheriff-hill to Thornley, for although it varies in thickness, it still preserves its order of superposition to the Seam even where the latter is divided.

The Grindstone Post lies about 50 Fathoms above the

[Bud-33]

by Pensher to Nova Scotia Pit.

N°. 2B. –

Extends from Nova Scotia Pit, to Tanfield-lea, and Wester-lea.

N°. 3B. –

Extends from Wester-lea to the Hounds Gill

These Sections stretch over 19 miles in a direct line, and 21 miles by the Sectional line.

N°. 1B. Shews the Stratification sunk through by the Monkwearmouth Pit to the depth of 264 fathoms where the first workable Seam was met with.

The Strata and the several thin Seams of Coal sunk

[201]

through by this Pit, differ so entirely from the Strata in the more thoroughly explored parts of the district, to the westward, that it is impossible to trace the analogy, or to identify any of them. But as far as I am able to form an opinion, I am inclined to think this workable seam is the Bensham.

The Pit it appears, is sunk between two Faults – the one a downcast of 7 Fathoms to the east, the other a down-cast of six feet to the West. This may probably account in some degree for the unusual discrepancy in the Strata, and the thinness of the Seams of Coal, as these faults are only about 90 Yards asunder.

From the Wearmouth to the D Pit at Pensher, a distance of 5¼ miles on the line of the Section, no borings or sinkings have been made, so that we are entirely ignorant of the nature of the Strata between those points except the outcrop of the Magnesian Limestone with its subordinate Strata at Claxheugh, Hylton, and Offerton, and at Pensher-hill. At Pensher, the dip of the Strata in the direction of Monkwearmouth is about 1½ in 24; which, supposing

[202]

what faults it may contain.

At 140 yards west from the Beamish 2nd. Pit is a down-cast of 10 fathoms.

Between this Fault and Tanfield-lea Pit in a distance of 2 miles, only 2 Faults, about mid-way, occur – they are both up-casts to the west the 1st. being 10 fathoms, and the 2nd. 10 feet.

From Urpeth to Tanfield-lea as distance of 4 miles, the line of Section runs nearly parallel, with the Tantobie dyke, on its South of dip side, at an average distance of ½ mile. And it is probable that the Faults are branches from it.

At 225 Yards west from Tanfield lea Pit is a down-cast Fault of 4½ Fathoms, and at 500 yards further W. is an upcast of 5 Fathoms. From this Point we don't meet with any more dislocations, till we come to a 10 Fathom up-cast, in Bushblades, at about 500 yards E: from the Hair-Law Pit in Lanchester Common.

At 1225 Yards west from the Hair-Law Pit is a group of 3 Faults, 1 down, and 2 upcasts, resulting in an upcast of 3 Fathoms. From this group to the Hound's Gill

no material Faults to intervene and allowing for the difference of Surface level, would make the Bensham Seam 271½ Fathoms deep at Monkwearmouth.

From Pensher to Nova Scotia Pit only 2 Faults occur, the first is an upcast of 14 Fathoms the other a downcast of 6 Feet to the West.

N°. 2B. Proceeding to the westward from the Nova Scotia Pit we fall in with a group of 5 faults, 3 of which are up, and 2 down-casts, by which the Seam is placed on precisely the same level on the two sides of the group – the united throws of the up, and down casts being precisely 8 fathoms each.

The westermost of these Faults, is under the Durham and Newcastle Turnpike, about a mile South from the Birtley Iron Works, and 350 Yards short of the Wash, in the Team valley.

We next proceed by Urpeth Colliery, to Beamish, the space between which is about 2 miles has not yet been sufficiently explored one the line of Section, to ascertain

[Bud-33]

where the Seams of Coal crop out, the distance being 4 miles, no more Faults have been discovered.

From Pensher to the last Group of Faults in Lanchester Common, beyond the Pontop Pike Bridge, in 11¾ miles, we only cross 16 Faults, the largest of which is 14 Fathoms. While on the Line of Section from Sheriff-hill to Thornley, in a distance of 15 miles, we cross 32 Faults, several of which are more than 10, and some upwards of 20 Fathoms throw. From which it would appear that the Faults which traverse our Coal Field in an East and West direction, are both more numerous, and larger than those which traverse it in a N. & S. direction.

The Monkwearmouith Pit, is the only Point on this line of Section, where the Magnesian Limestone has been sunk through – it is 45 Fathoms thick. Between the Limestone and the workable Seam, which as already observed. I take to be the Bensham, there are 23 beds of Sandstone.

Between Monkwearmouth & Pensher, as has

[203]

already been stated, we know nothing of the Strata, except the Out Crop of the Magnesian Limestone with some of its subordinate Strata at Clax-heugh, Hylton Ferry and Offerton, on the Banks of the Wear.

The Pensher W. Pit is sunk, beyond the N.W. Crop of the Limestone, and just upon the tail of the Grindstone Post. Nothing remarkable occurs here, except that the Low Main Coal of the Wear is much under its ordinary thickness, and is so coarse, and slaty, as not to afford a merchantable Coal. All the other Seams are good.

From the Pensher, by the Nova Scotia Pit, to Urpeth, notwithstanding the various Faults that intersect them, all the Seams of Coal are found in their ordinary perfection, the Low Main having regained its full thickness of 3 Feet at Nova Scotia.

[204]

Between the Surface, and the Wear Hutton or Tyne Low-Main Seam these are at,

Pensher	in a depth of	123	Fathoms	10	Beds of	Sandstone
Upeth	–	61	–	5	–	
Beamish	–	64	–	7	–	
Tanfield-lea	–		–		–	
Lanchester Common	–	97	–	4	–	

[All Pages Blank between 205 to 233]

In crossing the vale of the Seam, the 5 quarter and Yard Coal Seams, are intersected by the Wash, as shewn on the Section. These Seams are found again on the west side of the wash, in their regular orders, and the lower Seams, the Hutton at least passes undisturbed through under it.

Somewhere between Urpeth and Beamish, the six-quarter Coal disappears and is not again found any where on the line of Section to the westward.

From Beamish, by Tanfield-lea, Wester-lea, Bushblades and Lanchester Common, to their Crop, in the falling Ground between the Pontop Pike ridge, and the Hound's Gill, all the Seams preserve their relative positions, with conside-rable regularity. But, as has already been observed, the Five quarter and Bensham, become united, and form the Pontop Hutton Seam, somewhere between Beamish and Tanfield-lea;And the Low Main, or Hutton Seam of the Wear, approaches within 5 Fathoms of the Five quarter Seam at Beamish, and continues at that interval below, to its western Crop. The distance between these Seams at Urpeth is 12 Fathoms

The approximation of these Seams is to be accounted for by the six fathom Sandstone, which lies between them at Urpeth having disappeared before it reaches Beamish.

[Bud-33]

[233]

[234]

Durham 26th. August 1841.

To the Directors of the
Northern Coal Mining Co.

Gentlemen,

Having completed as far as circumstances will permit, my survey of your Collieries in the County of Durham. I have now to lay before you may report thereon.

I have gone into this survey with a degree of anxiety and care, equivalent, I trust, to the serious nature of the affair, and to the large amount of Capital involved and I regret to say that the results arrived at, are even more un-

[Bud-33]

favourable to your interests, than I had at first anticipated

It is abundantly clear that a portion of your directors in this District, who have sold to you the major part of the Collieries you possess, have violated in the grossest manner, the confidence you have evidently, and (permit me to add) 40 readily reposed in them. And that by representing the value of the Collieries of which you have become the purchasers, and the cost of winning them, as being far beyond their true value, and real cost, they have obtained from you (without even fulfilling in many instances the conditions they imposed upon themselves) more than double the value of such properties & winnings, and thus they as Individuals, are large gainers at the expence of the Company, for whom they acted as Trustees.

The low amount of profits capable of being realized from your Collieries arises principally from three causes – First, the Inferior quality of the Coal generally, none of which, so far as I have seen, and am able to judge, can even be ranked as a good second rate Coal.

Secondly. The great distance of your Collieries from the Ports of shipment, all of them, except Framwellgate Moor, and Andrews House, being situated near the western edge of the Coal field, and Thirdly – the disadvantages you labour under from possessing so many establishments, with all their Pumping Engines, Machines &c. from the

[235]

whole of which you will be able to vend a quantity of Coals greatly exceeding the vend of a First Class Colliery. The principle advantages possessed by your Collieries, speaking generally are the Cheap rate at which the Coals can be worked the freedom of the Mines from “Fire Damp”, or inflammable Air, from the liabilities and casualties to which many [diefur] and more extensive Collieries are subject and hence in estimating the value of your Profits, I have adopted 10 P. Cent as sufficient to cover the Risk of your Collieries, a risk, in fact more of a mercantile than a

[236]

The Cragwood and Storey Lodge, or more properly speaking, a part thereof, amounting to 200 Acres of whole Coal, and a Tract of Pillars in the Isabella Pit, now worked out, was purchased of the Durham County Coal Company, together with a portion of the Stock & Horses, Branch Railway, and 50 Coal Waggons for the sum of £14000.

It is not my intention to make any observations her on this purchase, much as it has been commented upon, in the public prints and elsewhere, beyond stating that whatever might be the disadvantages arising to the

Mining nature. I have also assumed the profits to be realized under a regulated vend, should the Trade be thrown open, I am bound to state it as my opinion, that several of your westerly Collieries would be incapable of yielding any profit whatever.

This report contains no estimate of the value of Framwellgate Moor Colliery, principally because I have been unable to see the Coal to the West of the Pit, to drain which, a Stone drift is now in progress, and which Coal, I am informed, very far exceeds in quality anything at present to be seen in the workings. – and my present opinion of this Colliery, differs so materially from that of your principal Agent M^{r}. Thomas Forster, that I must

This report contains no estimate of the value of

beg to decline making any Report thereon, until the Western Coal commences working, which will probably be in about a month from the present time, when I propose to report fully on this important Colliery, as well as on the cost of winning others similar purchased, and which I am not at present prepared to do with sufficient certainty.

Of the Mining Property called Old Park, and Byers Green, I have made no estimate, as nothing has yet been done, nor do I think it advisable at present that anything should be done, towards establishing a Colliery in this Property. –

I shall now proceed to lay before you an estimate of the value of each of your Collieries, commencing with that of Cragwood and Storey Lodge. -

[Bud-33]

Durham County Coal Company from the sale of this part of their Coal Field, the advantage to the Northern Coal Mining Company appears to have been greatly overrated.

The workings of the Isabella and other Pits having exhausted this northern portion of this Coalfield. The part remaining to be worked in the Cragwood and Storey Lodge Colliery consists of a Tract extending north and South of the River Gaunless, and intersected by the Stockton & Darlington Railway, being bounded in the south west by the Great Basaltic Dyke, well known as the Cockfield dyke.

There are two Seams of Coal in this tract sunk to by the Jane Pit, viz the Five quarter Seam at the depth of 14 fathoms, and the Main Coal Seam at the depth of 26 fathoms, the Five quarter over the whole Tract having been sold to the other parties, my observations will be confined to the Main Coal.

The thickness of this Seam in the Jane Pit workings is ft 6..2 inc. less 1½ Inches by a band occurring at two feet six inches from the bottom of the Coal, thus leaving six feet of clean Coal; the top part of this seam is vained by alternate thin layers of fine Coal, and a sort of grey Splinty Coal, which increases its hardness, without materially deteriorating the quality, the bottom part of the Seam is not so hard as the top, Altogether, the Coal may be considered as a good third rate Coal in the general market.

The whole Tract of Main Coal measures 200 Acres

200 Acres

But a part of the Southward is rendered, unavailable to the present winning, by a downcast dyke intersecting it from east to west – The Area of this part below the dyke is about 103

Leaving on the rise side 97 Acres

From which must be deducted as already

of 66 Acres already won, would supply the demand for 9½ Years nearly.

I estimate that the round Coals when delivered into vessels at Middlesbro' would average this period 22/ 6 per Newcastle Chaldron, or 12000 Chaldrons = £13500

And the Landsale Coals delivered at

worked in the Jane Pit, making allowance for Pillars 8 Acres

And a portion worked by M^{r}. Stobart on the North side of the Doghole dyke amounting to 8 – 16

81 Acres

Of this portion there lies to the dip of the present water-level, a tract which must be won by future sinking and drifting back, the extent of which is 15

Leaving available to the present winning only 66 Acres

And making the portion to be obtained by future winning 103 + 15 = 118 Acres.

To the former tract of 66 Acres, my observations shall at present be confined.

It appears from the agreement for sale, thereon to me by M^{r}. Thomas Forster, as well as the Lease to the Durham County Coal Company (which is for 21 years from the 1st July 1835) that the lease of this Colliery has only 15 Years to run.

The present Basis of the Cragwood Colliery being 55650 Ton or 21000 Chaldrons; the actual vend Calculated at the present average rate of Issue for sometime past will not exceed 12000 Chaldrons per Annum, and owing to the limited extent of the Coal won, although there is at present abundance of Pit room for three times the quantity, it is not probable that a larger basis will be obtained.

To this must be added for Coal sold to Landsale at the depots 1000 Chaldrons per Annum, so that the Tract

[Bud-33]

various depots @ 24/- per N.Castle Chaldrons or 1000 Chas. 1200

£14700

Owing to the distance from the place of Shipment and taking into consideration the wear and tear of Waggons, so serious an item on the Stockton & Darlington railway, the small coals from this Colliery would become so expensive, in the Transit, as to be scarcely saleable to profit as small, but the Nuts made in screening the small would amount to about 1400 Chaldrons per Annum, which if sold for Landsale at the depot of the Railway may be estimated as realizing on an average 13/ 6 per Chaldron a – – – – – – – £945..0..0

In addition to this, there are sold annually at Darlington & Stockton of Coke, made from the small Coals 500 Chaldrons at 19/- per Chaldrons an average -- – – – – – – – – – – – – – 475..0..0

Brot. forward – – – 14700..0..0

Total Annual receipt – – – – – £16120..0..0

The Cost of working Haulage, Raising and delivering into vessels at Middlesbro', as regards the Sea Sale Coals, and at the depots as regards the Landsale Coals, I estimate as follows.

Underground Department.

To produce 13000 Chaldrons of Best Coals, it will be necessary to raise annually 8228 Scores of 21 twenty Peck tens to the Score, or 320 Scores per Pay, reckoning 25 Pays per Annum, or very nearly 33 Scores per day, reckoning 10 days in each Pay

		Per Annum
Having 8228 Scores at 5/ 6 per Score		£2262..14.. 0
Yard price paid for Headways, Walls &c.		55.. 0.. 0
Puitting, on an average 1/ 6 per Score, on 8228 Sc.		617.. 2.. 0
Helping up out of dip places 250 days at 1/-		12..10.. 0
Cranman Keeping an account of the work 250 days at 1/ 6 – – – – – – – – – – – – –		18..15.. 0
Rolley drivers for 4 Horses at 1/ 2 per day each 250 days – – – – – – – – – – – – – –		58.. 6.. 8
Onsetting at the Shaft 8228 xx at 1¾^{d}. per day		59..19..11
Plate layer 52 weeks at 15/- per week		39.. 0.. 0
Trap door Keepers 500 days at 10^{d}. per day		20..16.. 8
Cleaning the Tram-way 250 days at 1/-		12..10.. 0
Keeping Horses, Furnace and Rolleyway Men 52 weeks at 15/- per week – – – – – – – – – – –		39.. 0.. 0
Overman, Deputy Handles for daywage men 8228 xx at 4^{d}. per Score – – – – – – – – – – –		137.. 2.. 8
Drifting thro' Troubles, Leading water, cutting up level &c. – – – – – – – – – –		80.. 0.. 0
Keeping Tubs in repair 8228 xx at 1½^{d}. xx		51.. 8.. 6
Keeping 4 Underground Horses, and upholding Stock. – – – – – – – – – – –		180.. 0.. 0
		£3644.. 5.. 5

Bank Establishment.

Bankman & Assistant 8228 at 2¼^{d}. per Score – – – – – – – – – – – – – –	£77.. 2..9	
1 Inspector at 15 per week	39.. 0..0	
3 Waiters @ 10^{d}. per day = 2/ 6 on 250 days – – – – – – – – – – – –	31.. 5..0	
1 Man & 2 Boys Screening & wheeling Nuts 250 day @ 5/-	62..10..0	
Trimming 13000 Ch. @ ½^{d}.	81.. 5..0	
1 Man & Horse putting Waggons onto Branches. – – – – – – – – – –	70.. 0..0	
2 Enginemen ea. 24/- per week	124..16..0	485..18.. 9
Carried forward – – –		£4130.. 4.. 2

Bro^{t}. forward – – –		£4150.. 4.. 2
Materials required for an Annual vend of 13000 Chaldrons of Best Coals Timber for purposes except Coal waggons and Tubs – – – – –	350..0..0	
Malleable Iron Nails &c.	125..0..0	
Ropes, Hemp & Cordage	50..0..0	
Leather, Flannel, Paint &c.	35..0..0	
Sundry & Hardware Goods	15..0..0	
Oil & Tallow	50..0..0	
Waggons, & Pit Shovels	10..0..0	
Bricks, lime & Stones	35..0..0	670.. 0.. 0
Keeping 4 Horses underground	180..0..0	
Agency, Office expences &c.	280..0..0	
Poor rates, Taxes & Cesses.	45..0..0	505.. 0.. 0
Assuming the Tentale Rent that after deducting $^{1}/_{5}$th. for Small, to amount on the Round Coal to 32/- per Ten there will be payable 869 Tens @ 32/- – – – – – – – –		1390.. 8.. 0
Haulage, Railway dues, Shipment &c Haulage, Railway dues and Shipment as charges by the Stockton & Darlington Railway C^{o}. from Crag-wood to Middlesbro' at 6/ 7½ per Cha. Maintenance of waggons at 1/ 2^{d}. per Chaldron per Mile 1^{s}/3 & 6/7½ = 7/ 10½ on 12000 Chas.	4725..0..0	
Fittage on 12000 Chas. at 9^{d}. including Risk	450..0..0	
1 Man between Staith & Colliery & ½ man's Wages to see waggons teamed at Staith	90..0..0	
		5265.. 0.. 0
Forward – –		£12291.. 6.. 2

		Bro^{t}. forward – –	£12291..16.. 2
Dues & Haulage on Landsale Coal viz. Best Coal & Nuts on 2400 Chaldrons taking Darlington as an average depot at	$7^{s}..7^{d}$		
Maintenance of wagg.	7	£. s. d.	
	8..2	980..0..0	
Expences of sale & Collecting per An.		60..0..0	1040.. 0.. 0
Coke expences upon 500 Chaldron annually 2 mens wages @ 18/- p. week		93..0..0	
Repairs of Ovens		30..0..0	
Haulage to Darlington as an average 500 Chaldrons @ 4/ 4		108..6..8	
Maintenance of wagg^{s}. 500 Chas.@7^{d}.		14..11..8	246..10.. 4
			13578.. 6.. 6
Contingencies – – –			250.. – .. –
			£13828.. 6.. 6
The Annual Receipt being estimated at – – –			£16120.. – .. –
And the Cost at			13828.. 6.. 6
The Annual Profit will be – – – – – – –			£2291..13.. 6

The present Value of Cragwood & Stoney Lodge Colliery will be as follows. –

The present value of £2291 annual Profit payable for 15 years allowing 10 p. Cent per Annum for Risk will be	17425.. 0.. 0
Present value of Stock on the Colliery sale able at end of 15 Years	1935.. – .. –
	19360.. 0.. 0
Deduct the present Value of Amount required for a New winning, payable at the end of 10 years at 5 p. Cent	1228.. – .. –
	£18132.. 0.. 0

The Willington Colliery, was purchased by Agreement dated Sep^{t}. 1st. 1837 from M^{r}. John Botcherby, who sold his Interest therein as Lesser of Certain Lands amounting altogether to about 500 Acres for the Sum of £48000, binding himself at the same time to make a good and effectual winning of the said Colliery with all necessary machines, Engines, Tenements, Buildings &c. necessary for winning and working the Colliery according to a specification attached to the said agreement.

As regards the Amount of Royalty transferred, it would appear that it falls very materially short of the 500 Acres agreed upon.

On this subject I have received three distinct statements from different parties so that I am in no small degree at a loss to determine the actual amount of property in possession of the Company as Lessees.

Assuming however, that the last account I have received is correct, it would appear that the tract is made up of the following properties.

The Willington estate in which the winning is made, consists of 168 Acres – – – – – – – – – – – – – 168 Acres
Other lands belonging to Russell, Clutterbuck, and Johnson – – – – – – – – – – – – 201 –
And a Small Tract of 20 –
389 Acres.

The amount of fixed Rent for these Tracts, for the second and subsequent years of the Lease is stated at £800 per Ann:
The Tentale rents as agreed for the first tract of 168 Acres, (and I presume the others all at the same rate) on
Per Ten of Round Coals – – – – – 23^{s}/ 6^{d}.
– of Small thro' a $^{5}/_{8}$ Screen 11/ 9
2/ 6 per Ten of Coals Outstroke Rent
1/ 6 per Ten of Coals by Outstroke brought to Bank
1/ 6 per Ten of Coals by Outstroke brought to Bank and led away
Term of Lease 52 Years from 31st. May 1839 for the 168 Acres.
The Term of the other Tracts I have not been able to ascertains indeed there seems so much uncertainty concerning the

[Bud-33]

latter portions of the royalty that I should advise the Company to [lar] no time in obtaining the titles, and to

[243]

ascertain their precise position as regards the extent of the Collieries and their liabilities, in the shape of fixed and tentale rents.

The Company are also bound on receiving £50 per Annum to drain the Collieries of the parties granting the leases, by means of their Main Engine, this is a most objectionable agreement as regards the Interests of the Company and the same of £50 is so small as to be ridiculous, considering the indefinite nature of the agreement and the serious extent to which the Company, may thereby be rendered liable.

With regard to the fulfilment of the Contract for winning entered into by M^r^. Botcherby, it would appear that one pit only has been sunk to the Main Coal Seam, whereas it was agreed that a second pit should be sunk to the Five quarter seam. That instead of 50 Houses for the^<workmen> 21 single and 9 double Cottages have been erected and that there are at present on the Colliery 200 waggons, instead of 300 as stated in the agreement.

The engines &c. already erected, are however strong and substantial, and amply sufficient for all purposes required, so far as they go, in working the Colliery, and with respect to the omission of sinking the second pit to the Five quarter Seam, and erecting an engine thereon, it is of less consequence in as much as the Five quarter Seam does not appear to be workable to profit.

But the Company ought in fairness to be allowed the cost of such pit and engine as a deduction from the large amount they have paid

After deducting from the tract of 389 Acres about 9 Acres already worked, and to be left as shaft Pillars, there will remain, say 380 Acres, throughout the whole of which the Main Coal, and may be expected to extend, and a great

[244]

hence it will not take much Timber in working the Boards.

The roof however yields occasionally a large quantity of Inflammable Air, and hence a more ex[pensive system of ventilation will be required at this, than any of your other Collieries.

The yield, after making an allowance for Barriers, Coal left in pillars &c. I estimate at 1786 Ch. per Acre capable of yielding over 380 Acres 678680 N.C. Chaldrons. which after deducting 45 p. Cent for loss in Screening, will leave of Round Coals 373274 Chaldrons.

The present basis of the Willington Colliery is 20000, which of the present average Issues would amount to 11000 Chald^d^. only, but owing to the extent of the Royalty &c. I think this Colliery fairly entitled to a higher Basis, and I shall take the actual vend at 14,000 Chaldrons – I am not aware that Landsale Coals to any extent, can be sold from this Colliery, I shall therefore confine myself to the sale of Best Coals, and as sea sale, and to a proportion of Coke made from the Small Coals. The present Colliery therefore would supply 14000 Chaldrons per Annum for upwards of 26 years.

I estimate that the round Coals owing to the irfrangible nature, would not realize when delivered into Vessels at Port Clarence (the shipping port of this Colliery) more than 22/- per Chaldron.

I also think there ought to be disposed of annually 500 Chaldrons of Coke, which, owing to their superior quality, ought to sell for 20/- per Chaldron. – Therefore,

14000 Chaldrons of Round Coals	@ 22/-	=	£15400..0..0
500 – Coke	@ 20/-	=	500..0..0
will make the annual receipts of Willington Colliery			£15900..0..0

The Cost of Working, Raising, Hauling, & Delivery into Vessels at Middlesbro', I estimate as follows,

To produce 14000 Chaldrons of Round Coals,

portion of which is above the level of the present Engine Pit.

The Main Coal here will average 3 feet 9 Inches in thickness, it is a tender Coal but of very good quality, and capable of producing very excellent coke, it may be remarked as a good third rate Coal.

The Seam has an excellent roof of Sandstone, and

[Bud-33]

it will be necessary to raise annually 10769 Scores of large and Small together, or 430¾ Scores per pay, or upwards of 43 Scores per day.

[245]

Hewing 10769 Scores at 4s/ 9d.	£2557..12..9
Yard price paid for Headways, Walls & Narrow boards	155.. 0..0
Putting on an average 1s/ 8 per Score, on 10769 xx	897.. 8..4
2 Lads helping out of dip places, 250 days @2/- p.day	25.. 0..0
2 Cranemen Keeping an accot. of work ea. 250days@/6	37..10..0
Rolly drivers	102.. 1..8
Onsetting at the Shaft 10769 xx at 1/ ¾	78..10..6
2 Platelayers at 15/- p. week each	78.. 0..0
6 Trap door Keepers at 10d. p. day	62..10..0
Cleaning the Tramway 500 days at 1/-	25.. 0..0
Horse Keeper 52 weeks at 15/-	39.. 0..0
1 Rolleyway man and 1 Wasteman	78.. 0..0
Overman Deputy & Candles for daywage men 10769 xx at 5d.	224.. 7..1
Drifting thro' Troubles, Heading water per Ann:	100.. 0..0
Keeping Tubs in repair 10769 ~~xx~~ @ 1½d.	67.. 6..1½
Taking down Top for Rollyway	70.. 0..0
Keeping 6 Underground Horses and uphol-ding Stock	270.. 0..0
	£4867.. 6..6

Bank Establishment	£ s d.
Banksman Assistants 10769 xx at 2¼d.	100..19..2½
1 inspector at 15/- per week	39.. 0..0
3 Waiters 10d. ea. 250 days at 2/ 6	31.. 5..0
1 Man & 1 Boy screening 250days at 3/ 6	43..15..0
Trimming 14000 Chaldrons at 1½d.	78..10..0
1 Man & Horse shifting waggons	75.. 0..0
3 Enginemen at 24/- per week each	187.. 4..0
2 Firemen including Plugman 14/-	72..16..0

[246]

Brought forward – –			£6259..15..8
Ropes, Hemp & Cordage	210..0..0		
Leather, Flannel, Paint &c	95..0..0		
Saddlery & Hardware	25..0..0		
Oil, tallow & Grease	120..0..0		
Waggon & Pit Shovels	10..0..0		
Bricks, Lime & Stones	45..0..0		
Keep of 4 Horses aboveground	180..0..0		
Agency, Officer expences &c.	280..0..0		
Poor rates, Cesses & Taxes	45..0..0		1010.. 0..0
The Tentale rent on 14000 Chaldrons of Best Coals at 23/ 6 per ten, will amount to			897.. 4..7
			£8167.. 0..3
Haulage Railway dues & Shipment to Port Clarence per Chaldron 6s.. 1½d. Maintenance of waggons 10½			
On 14000 Chaldrons at 7 .. 0		4900.. 0..0	
Fittage on 14000 Chaldrons in-cluding risk at 8d.		466..13..4	
1 Man between Staith & Colliery		60.. 0..0	5426..13..4
Total Cost of Best Coals per Annum			£13593..13..7
Coke.			
Cost of Coking tentale rents, Haulage & delivery on 500 Chaldrons annually			334.. 7..0
Contingencies			350.. 0..0
Total Cost of Coke & Coal.			£14278.. 0..7

The total Annual receipts being estimated at £15900..0..0

1 Joiner at 18/- and at 12/-	78.. 0..0	
1 Man's wages	52.. 0..0	
Sundry wages	60.. 0..0	827.. 9..2

Materials required for an Annual vend
of 14000 Chaldrons of Best Coals.
Timber for all purposes except Coal

Waggons & Tubs	400..0..0	
Malleable Iron & Nails	165..0..0	565.. 0..0
	Forward – –	£6259..15..8

[Bud-33]

And the expenditure at 14278..0..0
The annual Profit will be £1633..0..0

The present value of which as an annuity payable for 49 Years allowing 10 p. Cent for risk will be £16067..0..0
Present value of Stock saleable at the expiration of 49 Years, allowing 6 p. Cent 579..0..0
Total – £16646..0..0

[247]

The Stanley and Wooley Colliery is situated to the North west of Willington Colliery about 2 miles, and upwards of 1 Mile distant from the west Durham railway.

The Colliery has not yet been transferred to the Northern Coal Mining Company, the winning not having been completed, and no part of the branch railway laid. A contract was entered into with M^{r}. Ord, who undertook to transfer this Colliery, together with 800 Acres of Royalty for the Sum of £48000.

The Pit it appears, is sunk in a small property of about 26 Acres, belonging to M^{r}. Allison, but no lease has yet been obtained by the Northern Coal Co. from any party whatever. The winning of the Colliery as before stated is far from completion, yet it appears M^{r}. Ord has received the whole of the large amount of £48000 for the Contract.

Assuming that a sufficient extent of Royalty can be transferred, and the winning of the Colliery were completed, I estimate that on a vend of 14000 Chaldrons, as at Whitelee, the annual receipts would be £15000.

And the Cost of working and Delivery as follows:

Underground department	£4283..13..4
Bank establishment (there being a Main eng.)	827.. 0..2
Materials do. do.	870.. 0..0
Keeping of Horses above ground	180.. 6..0
Agencies & Offices Expences	280.. 0..0

[248]

The Value of Stanley & Woodley Colliery, when won and delivered over, with the necessary quantity of Royalty &c. will be worth in present money £16315..0..0
To which add the present value of Saleable Stock at the Expiration of the lease including Materials in Branch railway 900..0..0
Total – – – £17215..0..0

The Whitlee and Old Roddy Moor Colliery is situated near the western extremity of the west Durham Railway.

The Colliery has not yet been transferred to the Northern Coal Mining Company, but an agreement was entered into with M^{r}. Thos. Brown, wherein he agreed for the sum of £45000 to transfer 600 Acres of Royalty connected with the Colliery, and to make an effectual winning by sinking 2 nine feet Pits to the main Coal Seam, with 2 engines and a Main pumping engine if required, with tenements, buildings &c. as enumerated in a specification attached to the agreement.

With respect to the Royalty, no lease has yet been excluded, and it would appear that M^{r}. Brown, is unable to transfer a considerable portion of the tract agreed upon, but it is presumed that the 600 Acres will be made out from the adjoining Royalties, in possession of M^{r}. Ord and

Poor rates, Cesses and Taxes	45.. 0..0
Tentale rent supposed same as Whitelee	
Clarence p^{r}. West Durham & Clarence Railway	
Per Chaldron 6^{s}..7½^{d}.	
Maintenance of Waggons 10½	
On 14000 Chaldrons at 7 .. 6	5250.. 0..0
Fittage including risk	466..13..4
1 Man between Staith & Colliery	60.. 0..0
Contingencies	550.. 0..0
Total Cost – –	£13,752..12..10

The ann: receipts being estimated at £15400.. 0.. 0
And the Cost at 13752..12..10
The Annual Profit will be £1647.. 7.. 2

[Bud-33]

others.

A plan indeed has been handed to me by M^{r}. J.A. Forster, which shews the following properties as being available to Whitelee Colliery. Viz.

1.	Tract belonging to M$^{r.}$. Ovington	110	Acres.
2.	do. M$^{r.}$. Spearman	187	–
3.	do. do.	105	–
4.	do. M$^{r.}$. Greenwell	12½	–
	Carried forward. –	414½	

[249]

Brought forward – – 414½ Acres.

5.	M$^{r.}$. Greenwell	10½	
6.	Miss Wilson		
7.	do. – – – – – – – – – – – – –	50	–
8.	Trustees of Cornsey Alms Houses –	149	–
		624	Acres.

M^{r}. Ovington's Tract is entirely separated from the remainder of the Royalty, and cannot be brought to the present Pits without an Outstroke Rent, being paid to a third party.

In the large tract belonging to M^{r}. Spearman, the Pits are sunk, and it may be connected with the other by a drift through one of M^{r}. Greenwell's Tracts, both of which are contiguous to the larger tract if M^{r}. Spearman –

Nine Acres of the tract belonging to Miss Wilson adjoin the smaller portion of M^{r}. Spearman's properties: the position of the remainder, I cannot precisely point out. The tract belonging to the trustees of Cornsey is the southernmost and may probably be reached through the larger portion of Miss Wilson's property.

As required the fulfilment of the Contract by M^{r}. Brown, the most important part, the transferring of the Royalty remains to be accomplished.

[250]

calculated upon; its average thickness from several measurements which I have made in the workings is 4 feet; namely,

Good Coal	3^{ft}..7^{in}
Splint a Coarse Coal	– .. 5
Feet –	4.. 0

The Coal is stronger than Willington, but not quite so fine in quality; it will however, in my opinion, bring the same price when put on board of Ship, owing to its superior size and hardness.

Assuming that the tracts above enumerated, there can be obtained 600 Acres, and that the vend will be the same as Willington, there is a supply of Coal for upwards of 45 Years.

I estimate that the Round Coal when delivered into vessels at Port Clarence, will bring 22/- per Chaldron.

The Small owing to the mixture of Splint or Coarse Coal, will not be available to other purposes than for the use of Engines, Workmen &c.

The annual receipts will therefore be on 14000 Chaldrons of Best Coals at 22/- £15400..0..0

The Cost of Working, Hauling & Delivery into vessels, at Port Clarence I estimate as follows.

Two Pits have been sunk, and two winding Engines erected, but the Contractor ought, in my opinion, to deduct from the amount agreed upon, which he has I believe already received, the Cost of a Pumping Engine, in as much as one of the winding Engines is employed a considerable part of the time in pumping water, and cannot therefore be wholly employed in the raising of Coal. I believe that 300 Waggons were stipulated as being necessary for the working of the Colliery, and that number ought to be attached thereto, when the Colliery is delivered over. The Engine Houses &c. are not so well built as the Contract entitled the Company to expect.

The Tract of Mining property under consideration will be found to contain the Main Coal throughout; its depth at the Pit is 33 fathoms; the Five quarter Seam was found at 12 fathoms. It is not workable, and crops out near the Pit. The Main Coal therefore, is the only Seam to be

[Bud-33]

To produce 14000 Chaldrons of Round Coals, it will be necessary to raise annually 10000 Scores of 20 twenty peck tubs to the Score, allowing 45 per Cent for small Coals.

On this basis the underground department at the Whitelee will cost per annum £4383..13..4

Bank establishment	683..17..0	
Materials	670.. 0..0	5737..10..4
Keep of Horses underground	180.. 0..0	
Agency & Office expences	45.. 0..0	505.. 0..0
Tentale rent at 22/- per ten on 14000 Chaldrons		839..17..0
	Forward – –	£7082.. 7..4

[251]

	Brought forward – –	£7082.. 7..4
Haulage Railway dues & Shipment per West Durham & Clarence Railway to Port Clarence	s. d. 7..6	
Maintenance of waggons	1..0	
on 14000 Chaldrons at	8..6	5950.. 0..0
Fittage including risk		466..13..4
1 Man between Staith & Colliery		60.. 0..0
Contingencies		350.. 0..0
		£13909.. 0..0

The Annual receipts being, estimated at	15400.. 0..0
And the Cost at	13909.. 0..0
The annual Profit will be	£ 1491.. 0..0

The present value of which, assuming that a lease can be transferred for 49 Years, allowing 10 per Cent for risk will be £14770..0..0

Stock saleable at the expiration

[252]

The Term of the lease has yet 29 years to run, as regards working the Coals. Certain rent £800

And a wayleave lease of 19 years unexpired with a certain rent for any quantity not exceeding 800 Tens 100

Together – – £900

Tentale rent per Ten of round Coals 25s/-

do.	do.	Small	10/-
do.	do.	Splint	12/ 6
Wayleave Rent per Ten			2/ 6

The Main Coal which is the only Seam that can be considered workable to profit in this Royalty, will average in thickness 3 feet 10 inches; it is a clean coal without band or parting, and has an excellent Roof. It is however so tender, that it is found necessary to send the Coals to Market unscreened.

The Yield per Acre for sale, after deducting for Coal lost by faults, left in barriers, and a portion of the small used

of 49 Years, present value 500..0..0
Total – £15270..0..0

The Greencroft Colliery is situated near the western boundary of Lanchester Common, and a winning has been made to the Main Coal Seam of that District, at a depth of 36 fathoms by the Company themselves, at a cost of about £13,500.

The extent of Royalty, viz of workable Coal in the Main Coal Seam is about 650 Acres
of which there lies above the level of the present pit available thereby 312
And below the said level, and which must be drained by a new winning 338
650 Acres.

[Bud-33]

by the workmen I estimate at 1600 Chaldrons.

The quantity of Coal therefore available to the present winning is – – – – – – – – – – – 499,000 Chaldrons

The quantity for which a New winning will be necessary – – – – – – – – – – – 540,800 –

Assuming that this Colliery is entitled to an actually end of 15000 Chaldrons, the tract already won will supply the demand for a period extending beyond the termination of the Lease.

The price of unsecured Coals from Greencroft Colliery delivered on board at Shields may be estimated at 17/ 6 per Chaldron.

The annual receipts on 15000 Chaldrons will, there be – – – – – – – £13,125.

The Cost of working, raising, Hauling and delivery into results at Shields, I estimate as follows.

To produce 15000 Chaldrons of unscreened Coals, and to supply workmen, Engines &c. it will be necessary to raise annually 7800 xx. of 20 peck Tubs, 20 to the Score, or 314 ~~xx~~.

[253]

per Pay, or upwards of 31 ~~xx~~. daily

Underground department.

Hewing 7800 xx at 2/ 9 – – – – – – – – – – – – – – –	£1072..10..0
Yard price	110.. 0..0
Putting on an average 1/ 6 xx on 7800 xx	585.. 0..0
Helping up per Annum	25.. 0..0
Keeping account of work	18.. 0..0
4 Rolley drivers at 1/ 2 per day ea. 250 days @ 4/ 8	58.. 6..0
Onsetting at the shaft on 7800 xx @ 1½^{d}.	48..15..0
1 Plate layer	39.. 0..0
2 Trap door Keepers at 9^{d}. p.day ea. 250 da at 1/ 6	18..15..0
Cleaning the Tram way 250 days at 1/-	12..10..0
Horses Keeping, and attending furnace & Rollyway 52 weeks at 20/-	52.. 0..0
Overman & Deputy, Candles &c. 7800 xx at 4^{d}.	130.. 0..0

[254]

Brought forward – – £4407..17..8

Wayleave rent and Waggons on 15000 Chaldrons at 1^{s}/ 6¼^{d}.	£1140..12..6	
Haulage, Railway dues, & Shipment at Shields, including use of waggons, 15000 Chaldrons at 6/ 10½	5156.. 5..0	6296..17..6
Fittage including risk 15000 Ch. at 8^{d}.	500.. 0..0	
1 Man between Staith & Colliery	60.. 0..0	
Contingencies	250.. 0..0	810.. 0..0
Total Cost of Coal		£11513..19..2

The annual receipts being estimated at £13125..0..0
And the expenditure at (say) 11514..0..0
£ 1611..0..0

The present value of which as an annuity for 29 years allowing 10 per Cent, will be £1509..0..0

Drifting thro' troubles & leading water p. Ann:		100.. 0..0
Taking down top for Rollyway		500.. 0..0
Keeping tubs in repair 7800 xx at 1½ d.		48..15..0
Keeping underground Horses & upholding Stock		180.. 0..0
		£2548..11..0

Bank Establishment.

Banksman 7800 xx at 1½	18..15..0	
1 Inspector 52 weeks at 15/-	39.. 0..0	
3 Wailers at 10d. ea.=250 days at 2/ 6	31.. 5..0	
Trimming 15000 Chaldrons at 1d.	62..10..0	
Haulage to Stanhope & Tyne railway, per Engine & attendants	131..10..0	
Man & Horse Shifting waggons	70.. 0..0	
Wages at winding & pumping Engines	112..10..0	
1 Joiner and Assistants	78.. 0..0	
Masons work	30.. 0..0	
Sundries	50.. 0..0	653..10..0
Materials for all purposes except waggons and tubs, excluding wear & tear of Incline Rope		790.. 0..0
Keep of Horses aboveground	90.. 0..0	
Agency, Office expences &c.	200.. 0..0	
Poor rates, Cesses & Taxes	45.. 0..0	415.. 0..0
	Forward – – –	£4407.. 1..8

[Bud-33]

The present value of the Stock upon the Colliery saleable at the expedition of 29y. Is 851..0..0

Total £15945..0..0

The Crook Hall and Hownes Collieries lie to the west of Greencroft.

A Pit has been sunk to the Busty Bank Seam at Crook Hall, but owing to the very inferior quality of the Coal, these Collieries have been abandoned for some time past

A number of Cottages were built, a Branch laid to join the Stanhope & Tyne Railway, and a winding engine erected at the Pit.

These collieries were sold to the Northern Coal Mining Company, by Mr. J. Botcherby, for the large Sum of £37,000, but the Coal which was sunk to, and opened out at this expence, being found, unsalable, he allowed the Company £4000 as a deduction, and transferred to them the Leases of Greencroft and Andrew's House Collieries by

[255]

way of compensation – These latter Collieries have been opened out at the Company's expence.

The value of the Stock for sale at Crook Hall Colliery. I estimated at £2050.

Andrew's House Colliery is situated within about 1000 yards of the Brandling Junction Railway, and about 14 miles from So. Shields, and a winning is now nearly completed to the Main Coal Seam, which has been proved in an old Pit, from which Coals are now raised to be at the depth of 43 fathoms. The total Cost of the winning will be

[256]

the Small Coals used by workmen & Engines I estimate at 17000 Chaldrons

The quantity of Main Coal in the Royalty will therefore be 544000 do.

Calculating on the same vend as Green Croft Colliery. (15000 Chaldrons per annum,) there is sufficient Main Coal to supply the demand for a period of 7 Years after the expiration of the lease.

The price per Chaldron, I consider to be the same as Greencroft 17/ 6. which on 15000 Chaldrons will make the annual receipts £13125.

about £16,000.

The extent of the Royalty is about 380 Acres, in which it is considered, there are yet unworked of Main Coal 320 Acres, as well as a considerable quantity of Hutton Seam (of the Tanfield district) independent of 338 Acres of Busty Bank Seam, which is about to be proved in the neighbouring Colliery of Marley Hill, and should the quantity prove good, the value of Andrew's House Colliery will be greatly enhanced; a portion of the remaining Hutton Seam also, in the Barcus close Estate, is known to be of very fine quality; I shall however confine my present estimate to the Main Coal Seam only, the thickness of good Coal in which may be averaged at 4 feet.

The lease has yet 29 years ti run, and the Certain Rent is £450 per Annum, after the 3rd. Year.

The tentale rents are for large Coals 21/ 6 per ten.

do.	Small	10/-	–
do.	Splint	10/-	–

with an Outstroke rent for other Coals amounting altogether to 4s..6 per Ten.

From the circumstance of the Main Coal being tender, it is considered best to send it to market unscreened.

The Yield per Acre for Sale, after deducting for Coal left on Pillars and barriers, and a proportion of

[Bud-33]

The cost of working raising, Hauling & Delivery into vessels at South Shields, I estimate as follows.

	£ s. d.	
Underground department, same as Greencroft		£2548..11..8
Bank establishment		653..10..0
Materials		863.. – .. –
Keeping 2 Horses above ground	90.. 0..0	
Agencies	280.. 0..0	
Poor Rates, Cesses & Taxes	40.. 0..0	415.. 0..0
Tentale rents, 15000 Chaldrons at 21/ 6p.ten	899..15..6	
Wayleave at 5d. per Chaldron	312..10..0	
Leading Coals along private railway per Chaldron 0s..3½d.		
From thence to Shields 3 ..4		
Hire of Waggons 0 ..9½		
Staith dues 0 ..6		
on 15000 Chaldrons at 4 ..11	– – – – – – – – – – – – – –	3687..10..0
Fittage, including risk on 15000 Chas at 8d.		500.. 0..0
1 Man between Staith and Colliery		60.. 0..0
Contingencies		500.. 0..0
Total Cost		£10,429..17..2

The annual receipts being estimated at	£13125..0..0
And the Cost at (say)	10430..0..0
The annual Profit will be	£2605..0..0

The present value of which as an annuity for 29y all g. 10 p.C. for risk will be 25251.. 0..0

To which add present value of Saleable Stock at the termination of the lease 950.. 0..0

Total £26201.. 0..0

[257]

Summary

Name of Colliery	Estimated annual profit	Estimated value in present money allowing 10p.Cent, including Saleable Stock at 5p. Cent.
Cragwood & Story Lodge	2291..13..6	18132..0..0
Willington	1622.. 0..0	16646..0..0
Stanley & Wolley (when transferred)	1647.. 7..2	17215..0..0
Whitelee &old Roddy Moor (when transferred)	1491.. 0..0	15270..0..0
Old Park * Byres Green (not commenced)		
Framwellgate Moor (not yet valued)		
Greencroft	1611..0..0	15945..0..0
Crook Hall & Hownes (abandoned)	Stock	2050..0..0
Andrwes House	2695.. 0..0	26201..0..0
Total of Collieries at present valued £	11358..0..8	£111,459..0..0

With regard to Framwellgate Moor Colliery, I shall, as before stated, proceed to examine it immediately after the completion of the drift, now in progress, and I beg to assure you that it will give me sincere pleasure to find that I have formed an erroneous opinion of its general merits, in judging from those portions of it which I have already seen; meantime

I remain
Gentlemen,
your's very respectfully
(signed) Fran. Forster.

[Bud-33]

[258]

Duffield near Derby Jany. 3rd. 1842.

To the Directors of the
Northern Coal Mining Co.

Gentlemen

Having surveyed and examined Framwell-gate Moor Colliery, I have now to report to you on its value and capabilities.

I shall however, in the first place, what your attention to a few remarks on your other Collieries comprised in my Report of the 26th. of August last.

I was very much concerned to find on my late visit to the County of Durham, that owing to the unexpected depression in the Coal trade, arising doubtless from the great number of Collieries lately opened, and the consequent over supply of second rate Coals in the Market that the price obtained for your Coals generally, are considerably below the respective amounts named in my former estimate. I have carefully gone over the working costs of these Collieries, and am firmly of opinion that with proper economy, the Coal can be delivered on Shipboard at the costs named in my former report, provided the quantities sold, equal the yearly vend, on which I have bases my calculations. – vends, to which I still think you are clearly entitled, from the extent of your collieries, and the amount of capital really invested – Unfortunately however, the Cost of working in no way affects the selling price, and there is no doubt that if the present prices continue, several of your Collieries cannot be worked to profit. It appears to me therefore, to be a matter for your present and serious consideration, whether it would not be expedient to close some of those Collieries, the produce of which obtain such low prices in the market, and dispose of the materials rather than continue working them at a loss.

As respects the valuation of the cost of winning each of the Collieries, I have considered the subject very closely in all it bearings, and have arrived at the conclusion that it would be imprudent for me to make such estimate unless assisted by some competent Colliery Viewer residing in the County – and provided you determine to have such valuation

made, I should beg to name M^{r}. George Hunter, Viewer at Pensher, &c. as a proper person to go through the Collieries with me; it is right to state however; that such a valuation as the case requires, would probably cost you £200, or there abouts, and you are the best judges, whether the position in which you now stand with the parties by whom the Mines were sold to you, renders it necessary that you should incur the expence I have named. I shall only add in this place that nothing which I have seen or heard in my last visit to Durham, has tended to alter in the slightest degree, my opinion, that you have been over charged to an enormous amount for those mines, and that the conduct of the parties by whom they were won and sold to you, is deserving of the strongest reprobation

With regard to Framwellgate Moor, it gives me great pleasure to be able to state that the quality and hardness of the Coal to the westward (a portion of which has been drained by the Stone drift), very far exceeds that, which I saw in my former survey. I have very carefully compared and examined its quality and hardness with the adjoining Collieries, and am clearly of opinion that, with sufficient skreening, it may be estimated for a term of years as being competent to bring 23/ 6 per Chaldrons, shipped at Shields.

I also believe the seam of Coal now worked to be the Hutton Seam and had it extended over the whole of Framwellgate Moor and Bear Park Royalties, it is very probable that you would have been able to raise Coal of equal quality to that now obtained for 30 or 40 years to come: unfortunately however the borings made on the estate by Coulson, one of the most skilful Borers in the Country, shewed that a portion only of Framwellgate Moor, and no part of Bear Park, can safely be estimated as containing that Seam in a workable state, in order to explain this more fully. I must call your attention to the accompanying Plan and Section, drawn from data given to me by M^{r}. John A. Forster.

The Section shews the thickness and depth of the Seams of Coal at three different points, the Pit **A**, the Borehole **B**, and the Borehole **C**, the line of which Section is shewn on the Plan.

Sand it is not workable – at about 35 Fathoms, the Hutton Seams was found, thickness 3^{ft}..2^{in}. From this Seam a Borehole was sent down to the depth (from the surface) of 80 Fathoms, and after passing through 4 thin Seams of Coal, reached the Beaumont Seam at 79 fathoms, which was there formed to be 4^{ft}..2^{in}. in thickness From its general character, as proved in the eastern part of the Durham Coalfield, this Seam is not considered of a merchantable quality at the present day, in the absence of other data therefore, I have not taken it into consideration in estimating the value of Framwellgate Moor

At the Borehole **B** about 1320 yards to the westward of the Pit (see plan and Section) the Borings shewed a Seam of 2^{ft}..2^{in}. at the depth of 29½ Fathoms from the surface, of 2^{ft}..4^{in}. at the depth of 40 Fathoms from the surface, and a Seam of 4^{ft}..2^{in}. considered the Hutton Seam, at the depth of 46 fathoms from the surface and 37½ fathoms below the level of the top of the Pit **A**,

That the 4.2 Seam, is actually the Hutton Seam, seems very probable from the dip of that Seam in the workings to the west of the Pit, which have been extended to about the point marked **x** in the Section, and the Borehole **B**, it will prove to be so.

But no analogy can be traced between the Main Coal, and the small seams met with above that which is considered the Hutton, and the discrepancy renders the existence of a large Fault not out of the Bounds of probability.

At the Borehole **C**, the depths of the then Seams passed through will be seen in reference to the Scale of fathoms on the Section – and it will be found that no workable Seam of Coal is met with, until the hole reaches 87 fathoms below the surface when a coal of 5^{ft}..2½^{in}. divided by a Band of 3 inches and considered to be the Beaumont Seam is passed through.

Whatever variety of opinions may arise, as to the identity of the Seams met with in these Borings & Sinkings, one point is clear that somewhere between the Boreholes **B** & **C**, the Hutton Seam ceases to be of workable thickness, and thus my estimate of the quantity has necessarily been circumscribed to some point between these Boreholes.

In the absence of any other ground on which to found

At the Pit **A**, the "Main Coal" was found at the about 23 Fms.
to be 5ft..7in. in thickness; owing however, to its proximity to the
[Bud-33]

[261]

an estimate as to quantity, I have assumed that the Hetton Seam will be workable up to a line half way between them, and on this Basis after making allowance for tender rusty Coal in the eastern part of the property. I do not feel justified in assuming that there are more than 496 Acres of workable Hutton Seam, in Framwellgate Moor and Bear Park Royalties taken together.

It is also to be observed that the Seam continues to dip to the westward, it will therefore be necessary to adopt measures to draw it, either by means of a Stone Drift, to be driven from a lower point than the present bottom of the Pits, or by means of lying pumps conveyed along the Rolleyway to the lowest part of the western workings. The latter plan will probably be the most expedient when the uncertainty of the Dip &c. is taken into consideration.

It may be remarked that the engine power is ample to meet any probable increase of water that may be met with in the workings, and that the whole of the machinery, Erections and Pit work, are of the strongest and most substantial description.

I shall noe proceed to lay before you my Estimate of the quantity of Coal contained in this Royalty – The Cost of working – The profits to be derived therefore, and the value of the property in present money

I consider that the average thickness of good Coal throughout the 496 Acres, will be 3ft..4in. which if all got, will yield per Acre. 1886 Chaldrons

Deduct for loss by Pillars, Barriers, Faults, and Small left underground.	687	
	1499	say 1500 Chs.
Deduct for Small skreened 45 p. Cent	675	
Round Coals for sale per Acre	825	Chas.

In 496 Acres, the quantity would be 409,200 Chals. and

[262]

would be as follows.

Underground department. –

Hewing 14733 xx of 20 peck tubs at 4/ 8 – – – – –	£3437..14..0
Hewing 2210 of Small to be left underground 4/ 8 –	515..13..4
Yard price paid for Headways, Narrow Boards &c.	310.. 0..0
Putting on an average 1/ 9 xx on 14733 xx	1289.. 2..9
Helping up out of dip places and leading water 4 Lads 250 days each at 1s/ 6	50.. 0..0
3 Cranemen 750 days at 1/ 6	56.. 5..0
10 Rolley drivers at 2500 days at 1/ 3	156.. 5..0
Onsetting 14733 xx at 1/3d. (including attending Furnace)	107.. 8..7
1 Plate layer and 1 Rolleywayman at 15s/ p. week ea.	117.. 0..0
3 Trappers	31.. 5..0
Cleaning Tramway 750 days at 1/ 6	37..10..0
Horses Keeper 52 weeks at 15/-	39.. 0..0
Overman, Deputy & Candles for day waggonmen	154.. 8..0
Drifting through Troubles	150.. 0..0
Keeping tubs in repair 1433 xx at 1/ ½ d.	92.. 1..7
Taking down top for Rollyway	120.. 0..0
Keeping 10 Underground Horses at £45 ea.	450.. 0..0
	£7113..13..3

Bank Establishment.

Banksman & Assistant 14733 xx at 2¼d.	138.. 0..0
1 Inspector 15/- per week	39.. 0..0
3 Wailers, Skreeners & attendants on apparatus	200.. 0..0
Trimming 23000 Chaldrons at 1½d.	143..15..0
2 Men and Horses taking waggons to Incline	150.. 0..0
Enginemen, Plugmen, Brakesmen, and Firemen 52 weeks at £6..9..0	335.. 8..0
Joiners wages exclusive of tubs	83.. 4..0
Smiths wages exclusive of tubs	143.. 0..0
Sundry wages	170.. 0..0
Rent of workmen's Houses	472..10..0

taking the actual vend at 23000 Chas. per Annum, this quantity would supply the demand for 18 years nearly.

To produce 23000 Chaldrons of Round Coals, it will be necessary to raise per ann: 14733 Scores, of 20 peck Tubs, 20 to the score or 590 xx per pay, or 59 xx per day, and the cost

[Bud-33]

5 Horses & 3 Men above ground	342.. 0..0	2216..19..5
Carried forward – –		9330..12..8

[263]

Brought forward – – £4407..17..8

Materials.

Timber for all purposes except Tubs & Waggons	£879..0..0	
Malleable Iron & Nails do. do.	300..0..0	
Ropes, Hemp & Cordage	350..0..0	
Leather, Flannel, Paint &c.	150..0..0	
Saddlery & Hardware	40..0..0	
Oil, Tallow & Grease	200..0..0	
Waggons & Pit Shovels	20..0..0	
Bricks, Lime & Stones	50..0..0	1989.. 0..0
Agencies & Office expences		300.. 0..0
Poor rates, Cesses & Taxes		70.. 0..0
Tentale rent 1254 Tens at 22/ 6 per Ten		1410..15..0
Wayleaves through Lord Durham's property 1254 Tens @ 3/ 6	£219..9..0	
On private railway	400..0..0	
Damaged Ground & part of private railway	50..0..0	669.. 9..0
Haulage to Lord Durham's Railway & private Branch		655.. 0..0
Haulage, Railway dues, wages & Shipment at Shields 23,000 Chaldrons at 7s/ 2½d.		8289..11..8
Fittage 23,000 – at 8d.		766..13..4
A man between Staith & Colliery		60.. 0..0
Contingencies		800.. 0..0
Total Ann: expenditure; or about 21s/ 2 per Chaldn.		£24341.. 1..8

Estimating the selling price of the Coal delivered on Shipboard at Shields at 23/ 6 per Chaldron, and making no allowance for small Coal sold, owing to the expence of transit the annual Receipts will be £27025..0..0

From which deduct the ann: expenditure as above 24341..0..0

[264]

at 14 per Cent will be £19,246..0..0

To which add the present value of the Stock on the Colliery, at the termination of say 19 years at 5 per Cent 2,851..0..0

Total present value – – £22,099..0..0

The answer to the question contained in your letter of the 29th. Instant, with regard to the additional value which the winning of Bear Park would give to Framwellgate Moor, has been in some measure anticipated in the foregoing report. It does not appear from the Borings that then is any workable Coal in Bear Park, except the Beaumont Seam. It might however at some future time be expedient to put down a trial shaft to that Seam, from the bottom of your present Pit, applying your spare winding engine for that purpose.

I remain, Gentlemen,

your's very respectfully

(signed) Frank Forster.

[Page 265 is Blank]

Leaving an Annual Profit of £ 2684..0..0

In estimating the present value of the Colliery I have adopted 14 per Cent per an: as an allowance for risk, owing to the uncertainty of the Stratification: the present value therefore of an amount of £2684 p. Annum for 18 years

[Bud-33]

Minutes on Mr. Frank Forster's Report and Investigation of the Northern Mining Co^{s}. Cragwood, Old Park, Byers Green, Willington, Stanley and Wooley, Whitelee & Old Roddy Moor, Framwellgate Moor, Greencroft, Crooks & Hounes, and Andrew's House Collieries.

Cragwood & Storey Lodge. Stated in M^{r}. Thos. Forster's Report of Augt. 27th. 1839 to contain "500 Acres belonging to Cragwood, "and 500 Acres more on the S^{o}. side of the Dyke, which may "in all probability be won from the New Pit at Storey lodge"
The Lease. has 20 years to run (not by F. Forster ? 15.)
Tentale said to be 27/- Tentale per Jno. Forster's Report, in Mining Journal 32/-
Cragwood Colliery – (remarks of Deputation) is the Norwood Isabella Pit, purchased of the Durham County Coal Mining Co. for £14000. the Contract including a portion of the Stock and Horses, the private railway and 50 waggons, & 200 Acres of Coal unworked. A seam of this was lately sold by the Northern Coal Mining Company to S.C. Gibson & others
Storey Lodge Colliery Is working, but to loss. The Sinking cost

the Company £17,708. It is now said, that it contains only 200 Acres of Coal.
Deed of Sale. Oct 1st. 1839. Price £5,000 for the $^{5}/_{4}$ seam under about 200 Acres. Contiguous to the Storey lodge Pit, which was purchased from the Durham County Coal Mining Company, being part and parcel of the Norwood & Evenwood Royalties – subject to the Rents payable to Lessors, – the venders undertaking to lay a line of way from the Stockton & Darlington

regulated vend. Northern Coal Co. guarentee the right and take of purchasers to work the Colliery to the extent of the Dog Hole Dyke, but purchaser guaranteeing the Northern Coal Comp^{y}. from any liability arising from their working beyond the Dyke.

Section of Main Seam – N.W. Side of the Pit		Ft. In.	
Top Coal	1. Top cleaty & not fine in quality	0 .. 6	
	2. Bright Coal	– .. 9	
	3. Splinty gray Coal	– .. –½	
	4. Bright Coal	– .. 6¼	
	5. Gray Splinty Coal mixed with Bright do.	– .. 3¼	
	6. Bright Coal	– .. 4¼	
	7. Gray Splinty Coal	– .. 2¼	Ft. In.
	8. Bright Coal	– ..11	3..6½
	9. Brass Band irregular	– .. 1½	
Bottom Coal	10. Coal	– ..10	
	11. Charcoal Band	– .. –¼	
	12. Coal	– .. 3	
	13. Charcoal Band	– .. –¼	
	14.		
Coal		1 ..4½	2..6

Depth 26 fath: to Main Coal. 14 fat. to $^{5}/_{4}$. Engine High pressure 30 HP. Works a 12 Inch Set 12 hours a day. Basis of the Colliery 55650 Tons. Coal burn to a whitish ash.

Frank Forster's Measurement of Royalty.

N. of a downcast Dyke, in which the present Pit is sunk		97 Acres.
Ded. part worked by Stobart	8	
Portion already worked	7½	

Railway to the Pit, Sinking to the $^5/_4$ Seam, the materials afterwards to belong to M^r. Gibson. To find 200 Coal waggons if required by Purchaser for his daily use, on condition of his paying 1/- per Ch. for Coal carried therein, purchaser not to send more than 2500 Chaldrons per annum, under forfeiture of 5/- per Chaldron on London & Coasting Coals.

Sale to Benjn. Bell of the $^5/_4$ Seam in the Cragwood Colliery May 10th. 1840. Price £6500. All the $^5/_4$ in Cragwood (probably 50 Acres) with Stock, Railways, Erections, valued by G. Dixon at £2212. (called the Old Norwood Colliery and Isabella Pit – No Coasting or London Coals to be sent under a

[Bud-33]

Dip Coal below level of present Pit 15 30½ –
At present available N. of the downcast dyke 66½ –
Tract to be won by Sinking the Engine Pit and drifting 400 to 500 yards 103 Acres.

[268]

Old Park Colliery. Extent per M^r. Thos. Forster's Report 1500 Acres
Lease 36 years from Jany. 1st. 1838
Certain Rents – 1st. year £200 for 4000 Chaldrons.
2nd, 3rd. 4Th, & 5th. Year £300 for 9000 –
After the 5th. Year £450 – 9000 –
Tentale Rents. 1^S/ 2^d. per Chaldron for round Coals.
7^d. – – Small $^3/_8$ In. Skreend.
4/- per Ten Outstroke on round.
2/- – – Small.
1/ 6 per ten of Round and 9^d. Of Small out of an adjoining Colliery, drained by engines of this Colliery.

The winning of this Colliery not commenced.

J.A. Forster's Report: Hutton Seam 4 ft. 1 In thick, lies at a depth of 65 fathoms, is of prime quality and very hard.

Willington Colliery. Contains per M^r. Th. Forster 650 Acres.
Tentale 23/ 6 for Best. 11/ 9 for Small. Outstroke &c. 5/ 6.
Certain rent £700. Pit 40 fms. To Hutton Seam.

		F.	In.	
Section	Coarse Coal	0 ..	1	
	Good Coal	3 ..	11	4 .. 0

Engine, High pressure, 60 HP. Machine 20 HP.
Pit 12 feet Bratticed.

[269]

Produce per Acre ($^5/_4$) 500 Ac. At 1927 Ch.	963,500
Bitchburn S^m. 500 Acres at 1972 Ch.	986,200
	1,949,700
Deductions	974,850
Merchantable Coal	974,850

Assuming annual vend 25000 Chaldrons.
Duration 39 years.

Anl. Sales	12,500 Ch. @ 25/-	£15625
	12,500 Ch @ 21/-	13125
		28750
Cost of producing (estimate)		22,500
Annual profit		£ 6,250

Worth at 12 per Cent 57,395..11..5
Live & discounted Fixes Stock 3,000.. – ..--
Value £54,395..11..3

Stanley and Wooley Colliery. Contains per M^r. Thos. Forster 800 Acres under Lease.

The deputation avers that no lease exists.

The Pit is sunk on M^r. Allison's property of 26 Acres. The Royalty was to have been had through M^r. Ord from M^r. Lyon – The matter is in Chancery. M^r. Ord, it is said, will provide a Royalty from adjoining lands of Lady Peat. M^r. Ord is the

Remarks of Deputation. M^{r}. Botcherby is Contractor, sells 500 Acres of Coal, and agrees to win it for £48,000.
No title yet given to anything more than 168 Acres, held by lease for 52 years from May 31st. 1839. And that the Title not satisfactory. Where the bulk of the 560 Acres is to come from does not yet satisfactorily appear, but the Shareholders are led to suppose they are to have part of an adjoining royalty of a M^{r}. Russell and a M^{r}. Spencer of Helmington. But no title as yet.
John A. Forster Estimate. Sept. 4th. 1837.
Extent 500 Acres. Coal in high perfection, Contains $^{5}/_{4}$ and Bitchburn Seams. $^{5}/_{4}$ at 30 fats. 3..11 thick, with a Band in the middle of 4 inches
Bitchburn Seam at 40 fathoms 3 ft. 8 in. thick.
[Bud-33]

Contractor, and received the whole of the purchase money, viz £48000.
J.A. Forster's Report. The Royalty (500 Acres) contains 1,075,555 Chaldrons of Merchantable Coals, and will supply a vend of 20000 Chaldrons 53½ Years.
The Hutton Seam, varying from 3..8 to 4 ft. lies at a depth of 56½ Fathoms.
Pumping Engine 80 HP. Double pow^{d}. Boulton & Watt. 12 feet Pit.

---

[270]

Whitelee and Old Roddy Moor Colliery Contains per M^{r}. Thos. Forster 800 Acres.
Deputation No lease executed – A Dft. shewn, leasing 600 Acres of which M^{r}. Ord is Lessor for 42 Years from June 1st. 1838, but 300 of the 600 is another part of Lyons, and in the same predicament as Stanley & Wooley, and it is said that the deficiency is to be made up from M^{r}. Russell's. M^{r}. Brown is Contractor for £45000. has received the whole amount, but the Colliery is not yet completely won.
J.A. Forster's Report Nov. 12th. 1836. States the aggregate thickness of the two workable seams to be 8 feet which will produce 1,505,000 Ch^{s}. of Merchantable Coals. And supply a vend of 21250 Chas. 70 years.

Sales	14000 Ch: @ 24/ 6.	£17,150
	6000 – @ 20/ 6	6,150
		£23,300
Cost of Working		15,750
		£ 7,550

Amount of Sales in an open trade

10,000 Chas. w.End Coals	@ 20/ 6	£10,250
10,000 Coast	@ 17/ 6	8,750

[271]

Railway dues as settled by the West Durham Railway Company

Whitelee Colliery.

Railway dues on 5½ miles at ¾^{d}. per Ton per mile		$4^{1}/_{8}$	
Haulage	5½ – @ ½^{d}.	$6^{6}/_{8}$	
2 Self Acting Inc: Planes	1^{d}. ea.	2	
Stationary Engine Plane		4	$12^{7}/_{8}$^{d}.
Small R.W. dues 5½ miles @ ½^{d}.		2¾	
Haulage	– @ ½^{d}.	2¾	
Self acting Planes	@ ½^{d}. ea.	1	
Stationary Engine Plane		2	8½^{d}.

Stanley & Wooley Colliery.
Export Round Coals.

R. Way dues on 3 miles @ ¾^{d}. per Ton per mile	$2^{1}/_{8}$
Haulage – @ ½^{d}. – –	1½
1 Self Acting Incline Planes	1
Stationary Engine	4
	8¾

Small.

Railway dues on 3 miles @ ½ per ton per mile	1½
Haulage – @ ½^{d}. – –	–½
Stationary Engine Plane	2

5,000 Gas Coals @ 16/ 6 4,125
23,125
Cost of Working 4,750
Profit – – – – £4,375

Assumes the amount of profit under all circumstances at £6756. Value with Stock £50,680..6..1

M^r^. Frank Forster's Notes "The $^5/_4$ Seam is found at 12 Fathoms, "but not workable, and crops out in going down the valley."

M^n^. Seam 4 feet including Splint of from 2 in. to 4 ½ Inches at the bottom.

Railway dues. By the Hartlepool Junction Railway 15 miles from the Byers Green Branch to Hartlepool. 15 miles @ ¾ per Ton p. Mile dues. – 2^d^. per Ton for one Stationary engine
1½ – Spoutage.

[Bud-33]

5½

Willington Colliery
Export Round Coals.
Railway dues on 2¼ miles @ ¾^d^. per ton per mile $1^{11}/_{16}$^d^.
Haulage 1¾ – @ ½^d^. – – $-^{14}/_{16}$
Stationary Engine Plane 4
$6^9/_{16}$

Small.
R. Way dues on 2¼ miles @ ½ per Ton per mile $1^1/_8$^d^.
Haulage 1¾ – @ ½ – – $-^7/_8$
Stationary Engine Plane 2
4

Framwellgate moor Colliery.
Extent Bear Park 704
Aycliffehead 106
Framwellgate 1000
1810 Acres

[272]

Lease of the 1000 Acres 20 Years from Nov. 13th. 1837.

Rents As regards the 1000 Acres.
£600 for 600 Tens.
22/ 6 per ten for Best Coals.
11/ 3 – – Small.

(Dep:) The lease is from J.C. Granger Esqr. Who grants for 20 years Certain, and covenants to grant for 11 years further at the expiration of the 20. It is held by lease by Granger from the Bishop of Durham.

Banes contracted to win the Colliery for £75,000, and £8,500 further by supplement at agreement for additional engine power to win Bear Park, another Royalty said to belong to the Company.

Main engine double powered Boulton & Watt.
66 Inch cylinder – working one lift with a 19¼ Inch working barrel – constant going 5 strokes per minute. A strong feeder of water flows into the sump from a Borehole bored 40 fathoms,

[273]

J.A. Forster Valuation. ac. ch. Ch.
produce of the Hutton Seam 100 X $233^1/_3$ = 2,330,333
Ded. For barriers, Dykes, Skreening &c. 932,134
1,398,199

Annual Vend 40,000 Chaldrons = 35 years duration.
Estimated annual profit Regulated trade.
Framwellgate moor Wallsend 25000 Ch: @ 30/ 6 £38,125
Coasting 15000 @ 26/ 6 19,875
£58,000

Deduct Working including Mine Rent.
Tradesmen's Bill's &c. £24,500
Fittage including Guarantees 2,000
Railway dues (supposed 5/ 2) 10,333 36,833
Annual profit £21,167

Estimated Annual profit Open Trade
Framwellgate Moor Wallsend 20000 Ch @ 25/ 6. £25,500
Coasting 20000 – @ 20/ 6 20,500

below the present working Seam.

2 winding engines – High pressure – 26 Inch Cyl. draw a 31 peck tub in $^{1}/_{3}$ of a minute.

The Seam is 3.2 In. thick, and is supposed to be the Hutton Seam (F.F)

J.A. Forster says "The seam of Coal explored to be the "Hutton Seam on Wear 4 ft. 4 in. thick large."

Coal thickness to the west (F.F.)

Cost of leading the Coals.	s. d.
Lord Durham's Railway including waggons – – – –	1 .. 6
Durham Junction, Stanhope & Tyne railways to Shields, including use of waggons.	5 .. 2½
	7 .. 2½

N.B. To this is to be added the Fitting, and the cost over the private Branch.

Sections by Frank Forster.

			Ft. In.
Good Coal	3f .. 5in.	Top Coal	3 .. 0
Swad	– .. –½	Soft Swad	– .. –½
Bottom Coal (coarse)	– .. 5	Coarse bottom Coal	– .. 6
	3 ..10½		3 .. 6½

Grey Metal roof.

[Bud-33]

	46,000
Deduct Working Charges as before	36,833
Annual Profit	£ 9,167

"As the trade owing to Conflicting Interests may be more or less "liable to interruption, the annual profit may be estimated "at £16387". This annuity for 31 Years, and allowing

12 per cent, is worth	£117,751.. 4..8
Live or moveable Stock	1,400.. 0..0
Fixed and discounted down	2,644..16..0
"Total value of projected Colliery and Stock "at Framwellgate Moor, after being effectually won"	£121,796.. 0..8

Greencroft Colliery. Lease 31 Years from Nov. 23rd. 1839.

Certain rents £500 for the first year

£800 – 2nd. and subsequent years

Rates which the number of Tens to be calculated

25/- per ten of Round & Coals

10/- – Small.

12/ 6 – Splint.

Further rents at the same rate for every ten above the stipu-

[274]

lated quantity.

Out stroke, Shaft, & Wayleave rents 4s/ 6

Way leave to Greencroft. Lease 21 Years from Nov: 23rd. 1839

£100 for 800 tens – 2/ 6 for Over leadings.

Depth of Pit 36 fathoms to Main Coal, or Hutton Seam.

At 12 fathoms a Seam 2..2 called the High Main?

At 26 – Pontop Hutton Seam – Section as follows:

	F. In.	
Top Coal	3 .. 3½	
Band	1 .. 6	
Bottom Coal	1 .. 8	6..5½

Thickness of Main Coal 3..10 to 3..11

Crook Hall & Hownes Colliery. Extent per Mr

Th. Forster 500 Acres per Mr. Steward 605a..3r..24p

[275]

Tentale Rents.	Round	21/ 6
	Small	10/-
	Splint	10/-
	Outstroke &c.	4/ 6

Royalty 358 Acres. Is contiguous to Marley Hill, and contains the same Seams viz.

Five quarter Seam

Main Coal do.

Busty Bank do.

The Low Main is the only working Seam – depth 28 fathoms.

A winning to the Low Main on progress.

? Busty Bank.

Framwellgate Moor August 30th. 1837.

Lease 42 Years from Nov. 1st. 21837
Certain rent £300 for an equivalent number of Tens at 16/-
Additional quantity.
16/- per ten for Round Coals
8/- – Small
13/- – Unskreened
4/ 6 – Outstroke &c.
(Deputation) Those Collieries sold to the Company by Mr. John Botcherby, who was to win the same for £37,000, but the Coal at Crook Hall, turning out very inferior, Hownes pit was not sunk and in consequence, Mr. Botcherby allowed the Company £4000 off the £37,000, and presented the Company with Andrew's House & Greencroft Royalties in compensation – the Company winning them at their own expence. These Collieries all held by lease from Sir [J] Clavering for 31 Years from Nov. 1839.

J.A. Forster's Report. – Royalty 800 Acres. Coal conveyed down Stanhope & Tyne Railway to Shields – contains two explored seams of Coal in considerable demand for particular purpose – Can be put on board Ships very cheaply – Now in working operation, and known at Market as "Baker's Main"

<u>Andrew's House Colliery.</u>

Lease 31 years from Nov. 23rd. 1839.
Certain rent for 1st. 2nd. & 3rd. Years £350.
4th. & subsequently £450.

[Bud-33]

By Articles of agreement between Chas. Barrett of Cockerton Hall in the County of Durham Esq. Of the one part, and Geo. Faith Esq. Mincing Lane London, & Hugh Panton of Sunderland, – two of the Provisional Committee of the Northern ^<Coal Mining Company of the other part.

1. Recites that Charles Barrett was possessed of the Framwellgate More Mines, containing about 1000 Acres for 31 Years from Nov. 13th. 1837.
2. That Chas. Barrett was making Borings &c. for opening out the said Mines.
3. That Barrett had agreed to sell his Estate &c. of, in, and to the said Colliery, to Faith and Panton, for £75,000 which they (the latter) had agreed to purchase on condition.
   1st. That Barrett transferred the Coal Seams, Pits Engines, Machines, Railway, Tenements, & other Appurtenances to the Colliery, made, or required to be made for the effectual winning of the Colliery, and agreed to grant a good and sufficient Lease or assignment.
   2. Barrett to erect 60 Tenements @£30[.. ..] value for Colliers Houses to be the property of the Owners of the Colliery.
   3. Barrett to make the winning according to specification

[276]

as set forth by J.A. Forster and Mr. Ed. Potter.
3. Faith and Panton agreed to Purchase the Colliery, and to pay for the same £75,000 to Barrett on the conditions following.
£5000 on signing the agreement
5000 Acceptances of the Company at 6 months date.
10000 9 –
10000 12 –
Payable at the Banker's of the Co. in London, making £3000 to be paid on signing the agreement – the remainder to be paid on completing the winning, and signing the transfer

[277]

1000 Acres or there abouts.
2. Liberty to work, dig, Sink Pits &c. with all requisite Powers for winning, carrying, vending &c.
3. To have and hold &c. from Nov. 13th.
4. Yielding & Paying £600 yearly Rent for 600 Tens of 432 Bolls.
   <u>N.B. Tentale Stated in a former page</u>
5. Proviso for distraining
6. Liberty to make up short yearly, but no surplus workings &c. &c.

of the colliery, Stock & materials as follows.
£10,000 in Cash
17,500 Acceptance at 3 months date
17,500 ditto at 8 – –
5. Barrett to furnish fortnightly, Reports of the progress of the winning &c. &c.
6. Until the payment of the Purchase Money in full, the sum remaining due to be a charge and lien on the Colliery, Machinery &c.for securing the payment to Barrett.
7. Usual reference Clause.

Executed by Barrett, Faith & Panton,
and duly attested.

Framwellgate Moor. October 1st. 1838.
Lease between Thomas Colpitts Granger of the one part, and
John Botcherby
Thos. Brown.
Geo. Faith.
Hunter Gordon.
Jno. Ch. Ord.
Hugh Panton
} Lessees.
1. Recites of Lease Mar. 1st. 1837. from the Bishop of Durham to Granger, of the Mines, quarries &c.
2. Granger agrees to demise the said mines &c. to the above parties,on the conditions to follow.
1. The demise to comprise all the Seam & Seams of Coal &c. &c. under Framwellgate Moor, in the parish of &c. &c. containing

[Bud-33]

7. Lessees to pay Taxes, Cesses &c. – give peaceable possession, Keep gates in repair – give Lessor the pre-emption of purchase &c. &c. &c.
8. Quiet enjoyment &c. to Lessees.
9. Lessees may determine at the end of any 3 years, on giving 12 months notice.
10. Arbitration Clause.

Executed by Grainger and attested by
Charles Joseph Ross, Temple, London.

By Deed Poll so dated, under the hands of Botcherby, Brown, Faith, Gordon, Ord, and Panton, Reciting "the said last hereinbefore abstracted Indenture. It is witnessed, and the said parties declared that the said indenture had been made and accepted by them. In trust for the Northern Coal Mining Co. as the Directors for the time being of the said Company. Executed by Botcherby
Attested by Geo. Allison.

Willington Colliery. Sept 1st. 1837.
Agreements between John Botcherby of the one part and Hunter Gordon, and Geo. Faith, two of the Provisional Committee of the Northern Coal Mining Co.
1. Recites that Botcherby is possessed &c. of 500 Acres for 42 Years and 21 Years respectively, subject to the rents expressed in the lease of the said Colliery, particularly described in certain Reports and valuations by J. A Forster – date 1836.

[278]

2. Botcherby was making Borings with a view to open out the Colliery.
3. Botcherby agrees to sell to the Comy. for £48,000 on conditions as follow. – Botcherby.
1. To convey the Mines, Machinery, Railways &c. made, or required to be made for the effectual winning of the Colliery
2. To erect 50 Pitmen's Houses of £30 value each.
3. Faith & Gordon to pay £48000 as follows.

[279]

11/ 9 for Small oasses through a 5/8 In. Skreen, For over workings Colliery Consumption free.
5. For the 2nd. & subsequent years Certn. Rent £ 300 for 300 Tens Overs at above rate.
6. Outstroke rent 2/ 6 wayleave &c. 3/-
7. Power to distrain in case of non Payment.
8. Covenants for payment.

Executed by Allison and attested by R. Collins.

£28000 on signing the agreement
4000 Acceptances of the Company at 12 months date.
8000 18 –
6000 24 –
Making £20000 to be paid at the Co. Bankers, in London, on signing the agreement.
The remainder to be paid on completing the winning as follows.
£3000 in Cash
10000 in Acceptance at 6 months
14200 12 –

4. Botcherby to furnish a fortnightly account of the progress of the winning.
5. Vender to have lien on the property till full payment is made.
6. Usual reference clause in case of dispute.

Executed by Botcherby, Gordon & Faith.
Attested by J.M. Wood 43 Lincoln's Inn Fields.

May 31st. 1839. Indenture of Lease between Geo. Allison on one part, & H. Panton, Geo. Faith, & Hunter Gordon & J.C. Ord of the other, as Lessees. Recites, A. p.

1. That the Lessees become possessed of 168..10.. of the Royalty, as delineated on a sheet of Parchment attached to the deed, with Liberty to sink, make waggon ways, build Engine & other Houses, " Break Barriers make drifts into any adjoining Collieries (except into "the said Geo. Allison his Execs. Admins. & assigns) power to "grant wayleave to any Person paying Rent therefore to said "Lessees, liberty to use waggons, ways &c. &c.
2. To have and to hold 52 years Tons Cwt. lb. Bolls.
3. Yielding & paying £200 Tens of 48..11.. ¼ each =440
4. During the first year you pay 23/ 6 per ten for Round, and

[Bud-33]

Nov. 16th. 1840. Diction by Panton, Faith, Gordon & Ord. they hold the Collieries demised by Lease. Intrust for the Northern Coal Mining Company.

Executed by all the said parties and attested.

Old Park Colliery. (Wharton's) Jan. 1st.

Lloyd Wharton as trustee for Robt. Wharton of Middleton, late of Gunkle Park in the County of York of one part (with others) Ana Thos Faith, Gordon Brown, Hugh Panton Wn. Kirk, and J.C. Ord of the other part Witnesseth.

1. That the Mines and 400 Acres of land in the acceptation of sundry Individuals as delineated on a plan attached to the document, was leased to Faith, Panton, Brown, Ord and Gordon for 36 Years, with certain reservations.
2. Certain Rent for the 1st. Year £200 for 4000 Newcastle Chaldrons.
3. For the 2nd. & 3rd. 4th. & 5th. Years £300. for 6000 Chaldrons
4. Over and above the said rent 1s/ 2d. p. N.Castle Cha. of Best Coals, and a moety for small passed through a 3/8 Inch Skreen.
5. Outsttroke for Best Coals 4/- per ten of 432 Bolls.
   Small 2/- – –
6. Shaft rent & wayleave 3/- (1/ 6 each)

May 1st. 1839.

Decton on by the said Faith, Gordon, Brown, Panton, Kirk & Ord that they hold the Collieries demised by the said lease inerest for the Northern Coal Mining Company.
Executed by all the Parties and attested.

[280]

Byers Green Colliery Oct 2nd. 1838 – Indenture between the Bishop of Durham of one part and Follcot Scott Stoke, Michael Middleton, Geo. Wm. Todd. Thos. Bulmer, Robt. Barker, John Botcherby, Thomas Brown, and Geo. Allison, of the other.

[281]

Signed by Botcheby, Faith & Gordon, and attested by J.M. Wood 43 Lincoln's Inn Fields.

Jany. 16th. 1841. The Revd. Thos. Shipperdson, Thos. Forster, and

Witnesseth,

1. That in consideration of certain Rents (specified) the Bishop demises the Byers Green Royalty, with the usual powers of sinking and surface easement to the abovenamed Stokes, Middleton &c.
2. To have and to hold 21 Years from Oct. 17th. 1831.
3. yielding and paying £2 for carrying away 800 Tens of Round, and 150Tens of Small Coal – the ten 18½ Newcastle Chaldrons, and 20/- additional for best, and 10/- for Small per ten for Over leadings.
4. Outstroke 2/- – Shaft rent 2/- Wayleave 2/-
5. The Indenture void by non payment in 20 days.
6. Lessees to pay Cesses & Taxes. – leave sufficient Pillars, Barriers Secure Outstroke drifts, and not make Pits or erect Engines within 2 miles of Auckland Castle.
7. Take an account of workings – Plans, and allow the Mine to be viewed.
8. Quiet Possession &c.
9. Liberty to make up Shorts during the Lease, but the over-workings of one year not no come to aid &c.
10. Usual reference Clause.

Executed & attested.

Crook Hall Hownes Colliery.

Agreement Sept. 1st. 1837. After reciting to the same effect as in the abstracted agreement for Willington Colliery, reports in which founded made by Edw. Potter.

For Hownes Colliery the Purchase Money as follows

£3500 on signing the agreement
£3500 Bills at 6 months
£3500 – 9 –
£7000 – 12 –
£2500 in Cash at transfer.
£8500 Bills at 6 months
£8500 – 12 –

[Bud-33]

John Douthwaite Nesham, trustees under the Will of Geo Baker of the one part, and John Botcherby, Thos. Brown, Geo. Faith, and J.C. Ord, of the other part. – Recites that the said Trustees under Mr. Baker's

A R p

Will, demise 605..3..24 of Royalty at Crook Carr House & Hownes as per plan on the deed, with like liberties as given in the before abstracted Deed. To have and hold for 42 years from Nov. 1st. 1837 subject to certain provisions as

1. Yielding and paying £300 half yearly.
   Agreement and Deeton. Lessees allowed an equivalent number of Tens of Round Coals @ 16/- paying also 8/- a ten for Small & 13/ 4 for unskreened – Outstroke & other Rents 4/ 6 Ten 432 Bolls or 18 Newcastle Chaldrons
2. Proviso for Re-entry and distraint.

Approved by the Master in Chancery, and executed by Shipperdson, Forster, & Nesham, & attested.

Jany. 21st. 1841. Decton by Botcherby, Brown, Faith, Ord &c. to hold the said Mines in trust for the Northern Coal Mining Co. and executed by all parties, and attested.

Greencroft Colliery. Novr. 23rd. 1839. Indenture.

Sir Thomas Clavering of one part, and Thos. Morse, Edwd. Blake, Wm. Martin Seppings (trustees of the Co.) of the other part

Witnesseth.

1. In consideration &c. Sir John Clavering demises Royalty of 1014 Acres to Lessees, as per plan attached to the lease, with liberty to sink &c. &c. &c. & surface easements. Yielding and paying Certain rent £ 500 for the first year, and for subsequent years £800 for an equivalent number of Tens at 25/- for Best 10/- for Small, and 12/ 6 for Splints. Overs at the same rate.
2. Outstroke & Rents 4/ 6
3. Power of Re-entry & distraining.
4. Lessees to pay Cesses and Taxes.

5. To Keep plans and accounts, to which, the Lessor's Viewer to have access.
6. "Not to allow any of the Buildings to be a tavern, without "consent – Not to Keep Hounds &c. or suffer the same to be kept "by the servants on the said lands"
   Proviso to enable Lessees to carry away resting Coals &c. within 6 months of the end or sooner determination of the Lease.
   Restore land, or pay compensation.
   Covenant for quiet enjoyment.
   Arbitration Clause.

Executed by Morse, Blake, & Seppings,
and duly attested.

January 14th. 1841. Indenture between the Bishop of one part, and Morrse Blake & Seppings of the other.

1. Witnesseth that in consideration &c. The Bishop demises right of wayleave from Greencroft Colliery to the Stanhope and Tyne Railway.
2. With liberty to make one main road, across and over all such Lands with Byeways.
   Breadth not to exceed 12 yards, except where Cuts, Batteries &c. are required to be made. Reservation of right of Lessor, to grant wayleave to other parties.
3. T have and to hold for 21 Years.
4. Yielding and paying £100 yearly for any quantity of Coal not exceeding 800 Tens of $18^1/_3$ Chaldrons – Also 2/ 6 per Ten of like measure for over leadings.
5. Power to distain.
6. Yielding quiet possession to Lessor at the end or sooner determination of the lease.
7. May remove Materials in 6 Months.
8. May surrender the lease at the end of any year, on giving 12 months notice.
9. Usual Reference Clause.

Duly executed by all parties
and attested.

Andrew's House Colliery. March 23rd. 1839.

Indenture between Thomas Clavering of one part, and Morse Blake, & Sepping (as trustees of the Company) of the other part. It is Witnessed.

1. That in consideration &c. Sir S.J.Clavering demises the Seam & Seams of Coal lying & being at Andrews House, Beckley & Barcus Close, Containing by Estimation 338 Acres.
2. With like liberties, and subject to like restrictions, as in the before recited indenture of lease of Greencroft Colliery.
3. Not to sink Pits, or erect Engines, in the woods or plantations.
4. Yielding and paying £350 Annually for an equivalent number of Tens at 21/ 6 for Round, & 10/- for Small, during the 1st., 2nd., & 3rd. Years, and subsequently £450 for an equivalent number of tens at the same rate. Overs at the same rate.
5. Outstroke, wayleave & Shaft Rents 1/ 6 each.
6. May make up shorts during the whole term, but no over workings in any preceding year to be brought in aid of deficiency in succeeding years.
7. Power to distance.
8. Lessees to pay Rates, Cesses & Taxes. – To work the Mines in a proper manner &c.
9. May carry away resting Coals or Materials, within 6 months after the determination of the lease.
10. To restore land.
11. Usual arbitration Clause.

Executed by Morse, Blake, & Seppings,
and duly attested.

Minutes. Frank Forster's Report. Durham 26th. Augt. 1841.

1. Has completed as far as circumstances permitted, his Survey of the Collieries, has gone into it with an anxiety equivalent to the Serious nature of the affair, and large amount of Capital invested, And regrets that the result is even more unfavourable than he at first anticipated.
2. States that it is abundantly clear that a portion of the Directors have grossly abused the confidence reposed in them,

[Bud-33]

by representing the value of the Collieries, and the Cost of

[284]

winning them, as far beyond their true value & real Cost, and thereby obtaining (without even in many instances fulfilling the conditions they imposed upon themselves.) more than double the value such properties & winnings, thus making themselves large gainers as individuals, at the expence of the Company for whom they acted as trustees.

3. The low amount of profit from the Collieries arises out of three causes,
   1. The Inferior quality of the Coal.
   2. Great distance from place of Shipment.
   3. Large establishment as compared with the powers of vending the Coals.
   4. The advantages possessed are, freedom from gas, and the cheap rate at which the Collieries can be worked.
   5. In consequence of those advantages, has adopted 10 per Cent, in valuing Collieries, as sufficient to cover the risk. Assumes the profits to be made under a regulated vend, but states, that, should the trade be thrown open, several of the western Collieries would be rendered incapable of yielding any profit whatever.
   6. Does not report on Framwellgate Moor Colliery, not having yet sufficiently examined it – but proposes to report fully on it when the western Coal commences working – Also on the cost of winning this, and other Collieries similarly purchased.
   7. Does not report upon Old Park & Byers Green, as nothing has been done there, and thinks it advisable that nothing should be done.
   8. Values Cragwood & Storey Lodge as follows (for particulars see detailed report, a copy of which is annexed to these memorands).

Gross annual receipt	£16,120.. 0..0
Cost	13,828.. 6..6
Annual Profit	£ 2,291..13..6
Which as an Annuity for 15 years allowing 10 per Cent for risk is worth	17,425.. 0..0
Present value of Stock saleable at end of 15 yrs.	1,935.. 0..0

[285]

M^{r}. Forster has assumed the selling prices of the Coals at

Best 22/ 6 p. Ch.
Landsale Best 24/- –
– Nuts 13/ 6 –

The sales he estimates at

Best by export	12000	Chald^{s}.
Depot sales, Best	1000	–
Do. Nuts.	1400	–
Coke @ 19/- per Cha.	500	–

9th. Willington Colliery purchased of M^{r}. John Botcherby 1 Sep: 1837. for £48000. – Botcherby to win the Colliery Royalty stated at 500 Acres, but contains only 389 Term of lease 52 years from May 1. 1839 for 168 Acres (being the Willington Estate) Term of remainder not ascertained.

The Company are bound to drain the Collieries of the parties granting the bases by means of their Main Engine, on receiving £50 per Annum. The contract required Botcherby to Build 50 Workmen's Houses – He has built 30. He was to find 300 Coal Waggons – there are only 200.

10. Estimated value of Willington Colliery.
Produce per Acre 1786 Chaldrons X 380^{Ac} = 678680 Ch: Deduct 45 per Cent loss, leaves of Round Merchantable Coals Ch. 373274, equal, on an assumed annual vend of 14000 Ch: to 26 years duration.

11. Estimates the Selling Price at Port Clarence at 22/- Per Chaldron. Coke 20/- per Chaldron.

14000 Ch. Best @ 22/-	£15,400..0..0
500 – Coke @ 20/-	500..0..0
Receipts.	£15900..0..0

12. Cost of working, leading, and delivery. £14278..0..7

13.

Receipts	£15900..0..0
Cost	14278..0..0
Annual profit	£ 1622..0..0

which as an annuity for 49 years at 10 p. Cent, is worth in present money

19,360.. 0..0

Deduct present value of amount required for a New winning at the end of 10 yrs at 5 p. Cent 1,228.. 0..0

Net value – £18,132.. 0..0

[Bud-33]

£16067..0..0

Present value of Stock saleable at the end of the term @ 5 per Cent 579..0..0

Net value £16,646..0..0

[286]

14. Stanley & Wooley Colliery. Situated to the N.W. of Willington Colliery, about 2 miles distant, and more than 1 mile from the West Durham Railway. Has not yet been transferred to the Company, and no part of the Branch railway is laid. A contract was entered into with M^{r}. Ord, who agreed to transfer the Colliery when won, with 800 Acres of Royalty for £48000.
15. The Pit is sunk on M^{r}. Allison's property (26 Acres) but no lease has been obtained from the Company from any party
16. The winning is far from complete, but M^{r}. Ord has received the £48000.
17. Assumes the receipts on a vend of 14000 Ch. annually at, £15000.. 0.. 0
    Cost of working 13752..12..10
    Annual profit £ 1647.. 7.. 2
18. Value when won and delivered over £16315..0..0
    Stock at expiration of lease 900..0..0
    Net Value £17215..0..0
19. Whitelee & Old Roddy Moor Colliery. Not transferred to the Company, but an agreement entered into with M^{r}. Thos. Brown for £45000 for 600 Acres.
20. Brown unable to transfer a large portion, but the royalty to be made up from adjoining properties, in the possession of Ord and others.
21. Selling price of the Coals estimated at 22/- per Chaldron
22. Receipts on 14000 Ch. Best Coals £15400.
23. Estimated cost of working 13909.
    Net Value £ 1491.
24. Worth as an Annuity for 49 yrs. at 10 p. Cent £14770.
    Present value of Stock 500.
    Net Value £15270.
25. Greencroft Colliery. Near western boundary of Lanchester

[287]

27. The Main Coal the only workable Seam.
28. The Colliery will supply an annual vend of 15000 Chas. for more than the term of the lease.
29. Coals to be sold as "unskreened" at 17/ 6 per Cha:
30. Receipts 15000 Cha: @17/ 6 £13,125.
31. Cost on board Ship 11,514
    Ann^{l}. Profit £ 1611 which as an Annuity for 29 Years is worth in present money, allowing 10 per Cent. £15094
    Present value of Stock 851
    Net value £15945.
32. Crook Hall & Collieries. West of Greencroft. Pit sunk to the Busty Bank Seam, but abandoned on account of the inferior quality of Coal.
33. Sold to the Company for £37000 by J. Botcher by, buton the Coal turning so badly out, he allowed £4000, and transferred to the Company the leases of Greencroft and Andrews House by way of compensation. The two latter Collieries have been opened out at the Company's Expence.
34. Value of the Stock for sale at Crook Hall Colliery, estimated by M^{r}. Forster at £2050.
35. Andrews House Colliery. 14 Miles from S^{o}. Shields, 1000 yds. from the Brandling Junction Railway.
36. The Cost of New winning to Main Coal about £16000.
37. Extent about 380 Acres of which 320 of Main Coal are supposed to be unworkable, as well as a considerable portion of Tanfield Hutton Seam – Also 338 Acres of Busty Bank Seam.
38. Lease has 29 Years to run.
39. The Main Coal will supply an annual vend of 15000 Ch: for 7 Years more than the term.
40. Price assumed at 17/ 6 per Chaldron.

Common – Extent 650 Acres, of which 312 are available to the present Pit.

26. Term has 29 Years to go

Certain Rent	£800.
Wayleave do.	100.
	£900.

[Bud-33]

41. Receipts on 15000 Ch: @ 17/ 6 £13125.
Cost of working & delivery 10430.
Annual Profit £ 2695.
Worth as an annuity for 29 Years at 10 p. Cent £25251.
Present value of Stock 950.
Net Value £26201.

[288]

Summary of Annuities and Estimateed Value.

1. Cragwood &c.	£ 2,291..13..6	£ 18,132.
2. Willington	1,622.. – .. –	16,646.
3. Stanley &c.	1,647.. 7..2	17,215.
4. Whitelee &c	1,491.. 0..0	15,270
5. Old Park &c.	– – – – – – –	– – – –
6. Framwellgate	– – – – – – –	– – – –
7. Greencroft.	1,611.. 0..0	15,945.
8. Crook Hall &c.	– – – – – – –	2,050
9. Andrew's House.	2,695.. 0..0	26,201.
	£11,358.. 0..0	£111,459.

Per M^r^. John A. Forster's valuations

Framwellgate Moor	£121,796.. 0..8
Whirelee and Old Roddy Moor	50,680.. 6..1
Willington	54,395..11..3

Distance & dues from the Collieries to the place of Shipment.

	miles	Round	Small
Cragwood	29¾ to Middlesbro'	6/ 7½	4 .. 9¾
Crookhall	– – – – – – – – – – – – –	– – –	– –
Framwellgate	16 ¼ to S^o^. Shields	6/ 3¼	6/ 3¼
Bear Park	17½ –	6/ 8¼	6/ 8¼
Old Park	22 Port Clarence	5/-	5/-
Willington	24½ –	5/ 8	5/ 4½
Stanley	25 –	6/ 0¼	5/ 7¾
Whitelee	27¼ –	6/ 7¼	6/ 10¼
Greencroft	19½ So. Shields.	6/ 10 ½	6/ 10 ½
Andrew's House	14 –	4/ 11.	4/ 11

Distances on the Tanfield Lea & Bran. Junc. Rways from Bowess

[289]

Contract for Sinking two Pits at Harton and Whitburn Collieries. January 21st. 1842.

1st. The Pits to be 14 Feet diameter when finished. To find Sinkers, Banksmen, Gin drivers, Powder & Candles, Tin Cartridges, Paper & Oakham, Hacks, Drills, Mauls Wedges, Shovels & Spades. To put in all Air Boxes, Temporary Brattice a Main Brattice. To gather all water, and take the same down in Boxes. To put in all temporary Cribs to secure the pit in any soft Stone a Metal which may be met with in the sinking. To sharp and repair all sinking Gear, and to do all the labour of sinking the said pits complete to the satisfaction of the viewer of all the Colliery, except what is hereinafter specified for all the following prices which shall include all payment whatever.

For sinking the Engine Pit from where at present standing viz. 23 Fathoms from the surface, to the Bensham Seam and such a depth below as may be required as a sump for Engine Standage £13 per Fathom.

For Sinking the drawing Shaft from the surface to the depth of 23 Fathoms £10 per Fathom, and from thence to the Bensham Seam £13 per Fathom.

2nd. Ring Cribs. To put in all Ring Cribs, if of wood to make them all ready including sawing the Timber, making its Bed Wedging, and if of Cast Iron, to include all cost of making its Bed wedging &c. and doing, in both cases everything necessary to complete the same without any extra charge on any pretence whatever, at the following prices, for an entire Crib round the Pit, and so in proportion to an entire Crib.

Wood £3..10 each
Cast Iron £2..0 each

3rd. Water Boxes. To make ready and put in, all water Boxes,

Bridge.

To Seam Staith	3½ miles
– Redheugh	4 –
– Gateshead depot	4¾ –
– Gateshead drop	5 –
So. Shields	13¼
Monkwearmouth Docks	15¾
Andrew's House Pit	1065 yards

Stanhope & Tyne Railway Co. in a bill up to May 15th. charged for leading & Shipping

	s.	d.
From Greencroft to S°.Shields per Ch:	6 ..	10½
Framwellgate Moor	5 ..	8¼

[Bud-33]

finding Nails, Spikes, Crampets etc. and every article and thing connected therewith. Taking out all Temporary water Boxes, and doing everything necessary to complete the same, and likewise ~~making~~ making any temporary Boxes at 3/ 6 per Fathom for the permanent Boxes, the payment for the Labour of Temporary Boxes being included in the price for sinking.

[290]

4th. Wedging Cribs. To put in all wedging Cribs, making the bed, shearing back making wedges, Sawing and making ready the sheeting etc. wedging the Cribs etc. whether of wood or Metal, and doing everything requisite to complete the same at £6 for each Crib.

5th. Metal Tubbing. To put in all metal Tubbing, making wedges, sawing and, making ready the sheeting, Spaces etc. To find all labour in getting the Tubbing from some convenient place, where it will be laid down near the Pit, to the Shaft, and send it down. To Back up the Tub with proper material, and to complete the wedging the same, and to make it to the entire satisfaction of the viewer of the Colliery, and to take out and replace and wedge any defective, or Cribs improperly or imperfectly put in The sheeting to be sawn upon the Colliery, at £4..12..6 per Fath:

6th. Main Brattice. To be of 3 Inch Plank. To be cleaned, jointed and Groved to receive the wood or Iron Slivers. The side planks to be groved and crampeted to the side of the walls, so as to receive the Main Cross Brattice properly. To find all Nails, Spikes, Crampets &c. and to do everything necessary to complete the same, except finding Timber at 7/- per Fath:

7th. Cribs and Cleading. To make all permanent Cribs ready, putting them in, and cleading the same, finding all nails and everything complete[2] necessary[1] to the

[291]

9th. Spears, Pumps &c. To put in all pumps, Sinking and Standing Setts. Standing Sett Buntons, Block Buntons, and Buntons for Sinking Setts. To put in all Spears, Dry, Wet and Ground Spears. To put all wedges, Flange Bolts, Spear Bolts, Flange Bolts to the ¾ inch square; and the Spear Bolts to be from $1^1/_8$ to 1¾ inch square, as may be fixed upon by the Engineer of the Colliery. The screws being made to his satisfaction, he having power to reject any Bolts not sufficient. To find all Spear plates, The dry Spear plates to be 17 feet long, and 7 inches broad, $1^1/_8$ inch thick in the middle, and $^5/_8$ inch thick at the ends. The Spear plates to be 17 Feet long, 6 inches broad, $1^1/_8$ inch thick in the middle, and $^5/_8$ inch thick at the ends. The size of the Bolts to be determined by the Colliery Engineers, say from 13 inches to 8 inches, and from $1^3/_8$ to $1^1/_8$ inch in thickness. The number of Holes in each plate to be 14, viz 7 at each end. The Spears to be from 36 to 40 feet long. Cross Bars / Bolts for Buckets and Clack doors, to be made of the size and number the Colliery Engineer, may direct and found by Contractor.

To make ready all Spears, dressing, squaring fitting on all Spear plates, and to put them in, replacing all Broken Spears.

The Company to find all Yokes, Ys, Us, Bottom Rods, Offtake

same, taking out all temporary Cribs, and Cleading, including all labour of cutting out Crib Holes, at £3..10..0 per Fath.
8th. Walling. To put all walling, comprising, finding & dressing walling Stones, putting the same in, with all labour in sending them down the pit. The Stones not to be less than 9 inches in the bed, and the Courses not less than 8 inches high. The Stone to be obtained from the Felling Quarries subject to the approval of the viewer of the Colliery who shall have power to reject such as all not of proper quality. To do everything necessary to complete the same at £12..5..0. per Fathom.

[Bud-33]

Joints, Stoops, Crossbraces, Falls, Clack Graithing, Fishhead, and Buckets & Clacks. The Company finding a full set satisfactory to the Contractor of the last named materials, and after they are complete, they are afterwards to be Kept in repair and any broken ones replaced by the Contractor.

The whole of the above materials, and the work necessary to furnish them in a complete state, and to put them all into the pit Keeping everything in good working replace, and to replace at the expence of the Contractor all broken materials, to be done at the following price viz. £8..10..0 per Fathom, reckoning 540 Fathoms of Spears and payable on the Engine Pit from the Delivery Drift down to the Bensham Seam, or 3 Fathoms of Spears for every Fathom of sinking – any excess or diminution of this proportion to be allowed for either way.
10th. Keeping the Engine & Machines &c. The Contractors

[292]

to keep the Pumping Engine and winding Engines with all materials and workmen. To Graith all Buckets and Clacks, and to change the same, finding all Leather Muds &c. To find Flannels for sinkers Buckskins. To find all Brakemen, Firemen, Enginemen, a Plugman, Oil, Tallow, Hemp, Spunyarn, for the use of the Engines. To find all nails, Spikes and wea[ges] for Pumps for the use of sinking. To find all Corves and Trams, and to find every article not above enumerated, and all labour what ever, requisite to sink the Pits to the Bensham Seam. The Owners finding only all timber, Metal Tubbing and Horses, and all Pumps, Ropes Coals and 20 Houses for Sinkers.

The above articles and work to be done on the payment of £10..10. 0 per Fathom, on the Engine Pit from where standing, down to the Bensham Seam, should the Pumps be required that depth: any less depth required, a proportionate reductions to be made, and it is undertood that the above payment is made on the supposition that not more than 3 Engines are going at the rate of 8 Strokes per minute, and ~~with one sinking sett of Pumps~~ the winding Engines at the rate of (when pumping) 14 Strokes per minute, with one

[293]

Split Pump,
Broken Spear,
Broken Bucket Joint,
Drop Bucket.

And that in those cases no further payment beyond the Contractor prices shall be paid until after the Sinkers shall have been driven out of the bottom for more than 8 hours. And it is further agreed that if any of the above accidents cause a longer stop than 8 hours, the Contractor shall be paid in full discharge of all remuneration to Sinkers, and workmen of all descriptions, and for Keeping the Engines &c. at the rate of £2..15..0 for each 12 hours, or 4/ 7 per Hour, provided that the Engineer of the Company is satisfied that every exertion has been used by the Contractor in repairing the damage.

All Screw Keys, Mauls, Threading Bolts, Drift Bolts Pinches, Spear Keys, and all working Gear, and Materials of any description, to be found by, and at the expence of the Contractor, except those previously enumerated, to be found, by the Company, and all labour of every Kind, without exception, to be found by the Contractor.

Sinking Sett of Pumps in the bottom. Any excess or diminution of these to be reckoned for accordingly.

The Company to find Bellows, Anvils, and Vices, and to fix them. The Contractor to find all tools &c. and when the Colliery is won, the Company to take such of the materials as may be required, or may then be considered useful for carrying on the Colliery, at a valuation in the usual way.

All the Materials found by the Contractor, and which have to become the property of the Company, to be of approved quality. The Company's Engineer, to have power to reject all that he does not consider of proper quality and to order materials from other manufacturers to replace them at the Cost and Expence of the Contractor.

It is understood that the above payment for Keeping the Engines &c. and the price paid for sinking comprises all payment for stops, or loss of time, except in case of accident, and it is hereby declared and agreed that the following Casualties only shall be considered as accidents, viz.

[Bud-33]

Payment to be made Fortnightly for all labour within 10 per Cent of the value of the work, which 10 per Cent, shall be Kept in the hands of the Company a\s a security for the completion of the Contract, and all materials to be paid for within 10 per Cent of their value, at the end of every 12 months by approved Bills at 6 months date. The latter 10 per Cent to be also retained as a security for the due and complete fulfilment of the Contract. And it is hereby agreed that if the Contractor shall not to the satisfaction of Viewer of the Company complete the said Contract, the aforesaid 10 per Cent of Labour and Materials, are to become forfeited to the Company.

Memorandum. That M^{r}. W^{m}. Coulson agrees to perform the several works set out in this Contract, in a due, proper, and workmanlike manner, & the Owners of Harton and Whitburn Collieries agree to pay him for the same after the rate mentioned in this Contract. It being also agreed that the Owners of the Collieries shall be at liberty, at any time to terminate and

[294]

put an end to the Contract, on payment of whatever may be then due, in respect of the same, should the said William Coulson not precede with the said sinking, and other works with all practicable expedition, and to the satisfaction of William Anderson, the Colliery Viewer of the said Owners

Dean House
nr. S^{o}. Shields
March 1842.

[Bud-33]