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1824, May 5
Report of John Busby on the pier and coal mines
at Newcastle and the iron in the district.
Estimate of expense of finishing the Pier at
Newcastle & of continuing it 75 yards

Sydney 5th May 1824

Sir

In compliance with the wishes of His Excellency the Governor, conveyed to me by the instructions I had the honour of receiving from you, I proceeded to Newcastle to examine the pier and the coal mines there; as also the appearances of Iron in its vicinity__

On account of the danger apprehended to the pier from the violence of the surf in South East Gales, any attention was first directed to it; and from the state in which I found it I cannot but agree in the recommendation of the Commandant Capt Gilman that "speedy means should be adopted to put it into a state of security," although it is not my opinion that the injuries it has hitherto sustained are chiefly attributable to the surf which endangers it at present.__ The original cause of these, is in my opinion to be looked for, rather in the original construction of the pier and particularly in the nature of its foundations__

Up to the level of low water mark, the stones were thrown without regard to position on a bottom, which though consisting of rock is in some places covered with sand, and in others subject to inequalities__ As might have been expected, and as has indeed usually occurred where it was necessary to resort to such a means of foundation, for piers and breakwaters__ The return of the water has removed the sand and Gravel on which many of the stones rested, and many stones which were originally in an angular or oblique position have in consequence of this and of the presence of the super incumbent weight found a more solid bed__ The consolidation of this mass of stones has been followed by the unequal shrinking of the regular superstructure founded upon it and by the sliding of many of the stones from their original positions.

The openings thus formed have allowed the water to act upon the backing of the building and the reflux of the waves having in the sum(?) of time swept away a part of the small stones and rubbish of which it consists, the building has still further shrunk in consequence__

Such appear to me to have been the causes, and of such a nature are the injuries the pier has sustained from the primary cause I think there is now nothing to fear, as the foundations have in all probability found their rest. But from the openings which have been made by their shrinking, and enlarged by the return of the water, the surf has now obtained a power which it never could have in a regular building and which by still further removing the interior supports of the facing stones, may still further alter their position__

To secure the pier from future damage all I conceive to be necessary is, first, that the openings should be built up with the largest stones they will admit, [and afterwards secured with large wooden wedges] and second, that a parapet wall should be built of

seven feet in height, with a breadth of four feet at the base, to be reduced eighteen inches from the inside at the height of five feet, and to have a curved batter of one foot outside reducing the breadth at top to eighteen inches__

To effect these operations I think not more than twenty four men will be required, nor will any expence(sic) of machinery excepting a few carts to bring stones for the wall be requisite__ The wind lasses attached to the cranes will be quite efficient for raising stones from those scattered on the outside of the pier, to build up the openings, of the twenty four men it will be necessary that six should be stone masons, and when the tide and state of the weather will permit, they should be employed in repairing the injuries of the pier, and when driven from that in building the parapet wall__

Such are the measures it appeared to me necessary to recommend for the safety of that part of the work already executed, and these are necessary for its preservation whatever may be the intentions of his majesty's Government respecting it__

At the same time that I examined the state of the unfinished work, I considered it my duty to obtain data from which I might estimate the quantity of labour and expence required to complete it__ On the expediency of doing so, it is not for me to give an opinion__ It will be for his majesties Government to weigh the advantages of its completion, with the expences shown by the accompanying estimate, and the comparative importance of other works on which the balance at the command of Government is employed.

The advantages purposed by the authors of the undertaking were, the deepening of the fair(?) way opposite the town of Newcastle, and, the sheltering of the shipping from the heavy swells which after South-Easterly Gales, act in between Nobby's Island and the Mainland__ These swells rendered the entrance dangerous especially to large vessels, which are partially becalmed within the island, and before their sails recover the wind are liable to be caught by the swell (in a situation where the narrowness of the channel makes it difficult to come to an anchor) and to be hurried by it to the opposite shore.__

The first object has been to a great degree obtained, the water being deepened from a few feet to admit vessels of 400 Tons burthen; nor has the pier been altogether ineffectual in obtaining the second, as its shelter is very beneficially felt in the harbour.

Having observed that a considerable portion of the water which during full tide is contained between the pier and the reef which stretches parallel to it at some distance in the water; empties itself at the ebb through the channel, it was for some time with me a question of doubt, whether the completion of the place would be really advisable__ the cutting off of such a flow of water might in many circumstances have the effect of causing the foundation of a [] at the conflux of the river and sea water, but when I considered the heavy floods which occasionally descend the river, and ascertained the depth of that part of the channel most liable to be affected by it, I was convinced that such apprehensions were groundless; and that the finishing of the work was in every respect desirable__ It occurred to me however that should the expence be considered greater than the advantages derivable from it would warrant, By extending the pier seventy or eighty yards further a much greater proportioned shelter would be obtained, as it would then be brought opposite the highest part of the reef – A finish would be thus given to the work at present, without interfering with the completion of the original

design whenever the importance of the place should make its expediency no longer questionable. I have accordingly but joined to the other, an estimate of the expence of extending the pier seventy five yards further.

An allowance of one shilling per day as the value of a mans labour, is the basis on which both estimates are computed, and notwithstanding all the care I could exercise in forming a judgement, they may I fear be liable to some inaccuracy from the interruptions to which the work is subject from the weather, as well as to my want of experience in estimating the value of compulsory labour.

* After concluding the measurement and soundings necessary to enable me to form an opinion on the present state of the pier and an estimate of the expence of labour requisite for its completion, I proceeded to examine the coal mines.

The country around Newcastle presents an extensive coal field, and to the south of it four seams have been discovered though no more than two are met with where the shafts have been sunk, and of these the undermost only has hitherto been considered worth working – It has been worked by a shaft a little to the westward of the Commandants residence & at the period of my arrival all the coal which could be kept water free by a mine driven in from the shore was exhausted – The seam had even been followed eighty yards to the dip, which is there one in fifteen and it was then necessary to bale the water five yards in perpendicular height –

The quantity of coal free from water change(?) being thus exhausted a new shaft or pit had been sunk at a situation more to the South-East, and from a ravine to the South a mine was driven to join it where it passes(?) the higher of the two seams, which is there twenty yards from the surface; and the workings are thus relieved from all the water above its level – It was the intention of the overseer to keep the under seam free of water by pumps for which he had made a requisition to the chief engineer at Sydney and in the meantime he was endeavouring to keep the pit clean by drawing the water in buckets to the top –

As I found that the pillars of the old mine in which they had for sometime depended for a supply of coals, were nearly wrought out, and that the means employed to relieve the new mine from water were inadequate to that end, I caused a cistern to be constructed in the lumber yard and placed where the mine joins the shaft on the upper seam – The water being discharged into this, a saving of twenty yards was effected in drawing it, and the pit was soon cleared –

From the very defective system which I found to have been pursued, and which at the same time that it is attended with an unnecessary expence of labour, is the chief cause why the Coals are so small, & contain such a large mixture of clay. I conceived it my duty to embrace the opportunity offered by the opening of a new mine, to commence the workings on the plan which has been found the most advantageous with such seams in England. And should the alterations I have made and those which I am now to have the honour of proposing be approved and authorised by his majesties Government. I have no doubt the coals will in future be much superior to what they have been, while a considerable saving of expence will be effected.

The principal alterations I would suggest in the management of the mines; are the following.

1st That none but regularly bred(?) miners, if it is at all possible to procure such, should be sent to work coal. The business of a mine is as distinct as that of a carpenter or blacksmith and no man is capable of it who has not been accustomed to it from his boyhood__

2nd That the use of wheelbarrows in moving the coal from the face of the workings should be discontinued, bags with light trucks being more competent for that purpose. A boy will be able with ease to receive the coals worked by one miner; and those which are large should be kept separate, and brought out separately from the small – At the commencement of the days work the boy will be able to assist in the mining, and thus have an opportunity of becoming a good collier__

3rd The use of boys with trucks instead of men with wheelbarrows will make it unnecessary to bring down the thin stratum of indesicated(?) clay, which intertwines between the coal and the superincumbent & understone. One days labour of all the people employed will be thus [] saved, and the coals will be less liable to be spoiled by a mixture with foreign materials. It will be necessary to support the roof with posts, but this will not be too great a duty for the overseer to perform.

4th That screens should be placed at the mouth of the pit on which the small coal should be thrown – what passes the screen should be kept separate and employed for burning [] making coke []. An old man should also be stationed at the screen to pick out any foreign matter which may happen to have mixed with the coals.

5th That the road from the pit to the wharf which at present passes close to the corner of the enclosed ground, should be carried considerably higher up the hill, and planks for the wheels placed on that part of it where the sand is deep. The road will then be on a level or descending the whole way, and two oxen will clear the coals with greater ease than four do at present, and the labour of half the expence will be saved, while the expence of the alteration will be shifting(?), as from the nature of the ground only a few yards of made road will be required.

6th That the wooden pier should be extended twenty yards further out, and secured in such a way that the carts may be safely wheeled back on rail roads, and discharged at once into the vessel which will then be enabled to lay close to the end of the pier and receive them. The intervention of wheelbarrows and lighters will thus be saved, and the labour of a number of men who at present are culled away from every kind of employment to load the lighters made unnecessary__

A still greater saving of labour might be effected, and a greater expedition in loading and unloading the vessels attained, were the old provisions casks which I presume are of little value, employed to contain the coals – Their being filled at the pit mouth would also be attended with this advantage, that the coals which lose much of their quality by exposure to the air, and by the various turnings they receive, would be kept fresh and large till they were used – The small coal could be filled in between the casks as dunnage, and the quantity which the vessels take would thus be inconsiderably if at all lessened.

Such are the principal changes I would recommend in the mining establishment; and while I hope they will go far to make the coals from their improved quality in greater demand as an article of exportation and domestic consumption, they will be accompanied with such a saving of expence, as ought to make the concern a profitable one to Government. It will be requisite that the men should be provided with a greater number, and more suitable tools than they have at present and should it be considered consistent

with their situation I would suggest, that some encouragement should be held out to them for working the coals large and clean – A small portion of tea or tobacco for every ton of large they obtained weekly, in addition to a fair proportion, would be a powerful stimulus for this end. I also think it my duty to mention that from the nature of his employment a miner is considered to require a larger quantity of food than other men, nor do I think an additional half ration a greater proportion than is required by the wants of nature.

Along with the cargo of the Mars which is the first from the new pit, I have sent six barrels of coal from the upper seam, and should its quality on trial prove good, its thickness which is from 28 to 30 inches makes it worth working: and it will be a valuable resource should the water increase so much in the under seam, as to clear(?) them from it – After the pumps are set at work and also two barrels which I caused to be constructed to be worked by the [] engine in progress of erection, I think they will be enabled from their command over the water, to work 100 yards to the dip in which case about 30,000 Tons of Coals may be wrought by the present pit, from the under seam – At the average rate of consumption for the past four years, it will therefore yield a supply for upwards of eight – When that supply is exhausted a quantity may still be obtained from the same seam to the Westward, as from a trouble or shift in the metals having there thrown it up, it may be drained and worked by an ingoing eye – What quantity may thus be obtained I cannot at present estimate. But before it is necessary to have recourse to it, I conceive that the increasing dearth of wood fuel in Sydney, and the prospective demand for exportation, will make the mines of such importance that the expence of a steam engine to relieve what is water charged will not be considered of moment.

* The appearances of Ironstone in the coalfield at Newcastle, are such as I consider to want no attention. What I have observed is very poor and from its situation (being chiefly imbedded between the strata of sandstone) it would not be worth working even though its quantity were more abundant and its quality better.

In conclusion I beg to observe that from the Commandant Capt Gilman I received the kindest attentions, and that the readiest disposition was shown by him to attend to the suggestions which in the course of my observations I thought it necessary to make

I have the Honour to be

Sir

Your Most obedt Serv

To

Frederick Goulburn Esq.
Colonial Secretary

&c &c &c

Sydney

John Busby

Estimate of Expence of Finishing
The Pier at Newcastle

10515 cubic yards under water	£	
building including cost of		
quarrying and carriage of stone at 14/-		7360-10
11892 cub yds Mason work above		
low water mark at	7/-	4162- 4
28790 Cubic yds Backing at	9/6	3598-15
753 Lin yds Parapet wall at	5/-	188- 5
Cost of Iron for and laying		
1800 yds Rail roads at	10/-	900
Cost of five lighters ---		500
Cost of 4 Trucks and 4 Waggon		100
Cost of 4 cranes with chains		160
Tear and wear of Tools		<u>500</u>
		£ 17.469-14
Deduct value of Iron of rail		
road and Machinery when		
the work is complete		880
		<hr style="width: 20%; margin-left: auto; margin-right: 0;"/> £ 16589-14

Estimate of
 Expenditure of construction [of extension(?) of]
 Pier at Newcastle [75 yds(?)]

2808 Cubic yds underwater building, including cost of quarrying and carriage of Stones at 14/- per cub yd 2419 cub yds Mason work above low water mark at 7/- 5123 Cubic yds backing at 2/6 315 Lin yds Parapet wall at 5/- Cost of Iron for, and laying 924 yds rail road at 10/- Cost of one lighter Cost of 2 Trucks and 2 Waggons Cost of 2 cranes with chains Tear and Wear of Tools	£	1965-12 846-13 640- 7- 6 78-15-,, 462- ,, -,, 250 50 80 200	£
Deduct value of Iron of rail Road, lighter and machinery When the work is finished	£	4573- 7- 6 438	£
			£ <u>4135 -7- 6</u>