

[A series of printed Greenwich Hospital instructions and reports relating to their Northern estates, mines and related road plans in 1821-3, and associated newspaper reports, (probably taken from the *Newcastle Courant*), are to be found in the collection of John Thomas Bell's early 19th century papers now in Newcastle City Library. While the Bell papers have been used for these transcripts, they are catalogued here using the original National Archives piece reference, to place them in context and further reference.]

19 Jul 1823 Edward Locker to John McAdam

[Note: This sets out the terms of reference for the report requested of McAdam for the proposed turnpike road from Hexham to Penrith. Edward Hawke Locker resigned His situation in Greenwich Hospital In 1844 and Died at Iver in Buckinghamshire 16 October 1849 Aged 72 years.]

Haydon Bridge, 19th July, 1823

Sir,

Having now accompanied you in the inspection of the New Line of Road, proposed to be made under your direction through this part of the country, it is proper that I should more exactly define the objects which in consultation with the Receivers appear to require your immediate attention.

It is intended to reform the Turnpike Road from Highwood near Hexham to Aldstone, extending the line to Penrith, and uniting in the same trust the several branches hereafter mentioned. The above trust to be consolidated with that from Burtryford to Burnstones, but not interfering with the trust which extends from Greenhead by Hexham to Heddon on the Wall. The line to Penrith is to commence at the Highwood above-mentioned, passing through Bagraw and Elrington, re-entering the present Line by Langley Mills, and proceed over the Cupola Bank and Whitfield Fell by a New Level, and thence over Clargill by an improved Line from Lowbyer Inn to the Tyne Bridge at Aldstone, where crossing that River it will continue on the of Park Fell to Hartside Cross, and thence descend by an easier level to Melmerby, proceeding by the present road through Longwathby and Edenhall to Penrith. The following are the connecting branches which are intended to form part of the General Trust:-

1st. From the Highwood to the West Boat, where a Bridge, is to be erected, crossing the South Tyne by Four Stones to the Tower Tye, and thence by Simonburn to Bellingham, where a Bridge is to be erected across the North Tyne, reporting your opinion as to the best Line to be carried from thence to join the Road over Carter Fell.

2nd. From Clargill along the North Bank of the Nent, crossing that River at Nent Hall, and continuing the present Line from thence to Nenthead, and so to Burtryford.

3rd. From Aldstone in a New Line by Randleholme along the South Tyne to Burn Stones, stating your opinion as to the most expedient mode of connecting the Road from thence to Brampton to join the Turnpike Road to Carlisle.

4th. From Langley Mills to Haydon Bridge.

5th. From Melmerby along the present Line to Appleby, in order to connect itself to the Roads in Westmoreland and Lancashire.

6th. From Aldstone by a New Line along the Tyne to Garrigill, and thence by Yad Moss towards Middleton and Barnard Castle, reporting your opinion of the expediency of combining this object with the proposed trust.

I have to request you will furnish me with a preliminary report and estimate of the probable expense of these improvements, in order that the principal parties interested in the measure, may be consulted as to the best means of carrying it into execution. It is my intention to recommend to them, that the whole undertaking be entrusted to you, and that when completed, you may be authorized to provide a principle surveyor, with skilful assistants to be appointed to the permanent management and repair of the roads, throughout the whole district in which these improvements are to be made. I have the honour to be, Sir, your very obedient servant.

(signed)

E.H. LOCKER

To: J.L.McAdam, Esq.

29 Jul 1823 Edward Locker

[Note: An undated newspaper report paraphrasing what appears to be Locker's printed covering letter to the Hospital Commissioners to go alongside McAdam's report, which follows]

REPORT

On the State and Condition of the Roads on the Estates of Greenwich Hospital, in the Counties of Cumberland, Durham, and Northumberland: by Edward Hawke Locker, F.R.S. Secretary to the Institution.

This Report commences with a letter dated Haydon Bridge, 29th July, 1823, addressed to the Directors of the Hospital, by Mr Locker, stating, in general terms, the advantages that would be derived from improving the roads on the estate of the Hospital, and submitting an outline of the improvements necessary. This is followed by another letter from the same to the same, dated Hexham, August 27, 1823, expressing Mr Locker's satisfaction that the Directors had approved of his propositions, and stating that the subscription of 5000l, by the Hospital, towards the undertaking, had given great confidence to the parties interested in the undertaking. He goes on to state that Mr McAdam had completed his survey of the proposed roads, and found that the improvements would cover an extent of 120 miles, at an expense of about 26,000l.

'In order to give confidence to the subscribers,' he adds, 'I have suggested that transferable Turnpike Debentures should be issued for such sums as may be advanced, and that the first receipts from the tolls should be applied to pay the interest at four

and a half per cent., to re-pay the principal, leaving the residue of the income for the maintenance and improvement of the roads. In addition to the subscription of 5000l, which I took upon me to offer on behalf of the hospital, the Hudgill Burn company has already consented to advance 3000l., the Earl of Lonsdale 1000l., and Mr Ord, of Whitfield Hall, 1200l. I proposed to the agent of the London Lead Company, a contribution of 5000l. which he will recommend to his Committee, on their annual visitation a few weeks hence, and I have little doubt of their compliance, provided you consent to their application for a general lease of their mines, which I have already recommended to your favourable consideration.

'The inhabitants of Aldstone have requested me to obtain for them a piece of ground to be allotted as a market-place, of which they are in much need. On examination I found the Vicar's Croft, in the centre of town, the only eligible site for the purpose, and the Bishop of Durham, on my application, has already signified his consent that the Vicar should exchange it for another plot of equal value, belonging to the Hospital's estates adjoining the town. As the two roads to Garrigill and Penrith will intersect at this point, the trustees will have the means of effecting a very great improvement in Aldstone, by the removal of the dangerous pavement, buildings, and other encroachments, and thereby greatly promoting the public accommodation. I have to request that this exchange of land may be recommended to the next general court of Commissioners and Governors.

29 Jul 1823 John McAdam to Edward Locker

[Note: McAdam's report in response to Locker's directions of 19 July]

Aldstone Moor, 29th July, 1823

On inspection of the several roads to which my attention was directed by you, I find them in a most deplorable state, both as regards the lines and the surface.

The same may be observed of all the roads in this part of the country, the want of management being apparent throughout. The lines of road have been so improperly carried, that in many places the rise is one in seven, and in several parts one in five. With respect to the construction of the roads, they are altogether the worst that have yet come to my knowledge, - not only have the old defective methods been followed in the formation, stoning, and subsequent repair of the Roads, but the work has been executed in the most slovenly careless manner, without method, and regardless of expense. No pains have been taken to preserve the roads from winter floods, by keeping open the waterways, they are washed out so as to present the appearance of a bed of rocks, rather than an artificial road. Under such circumstances it must be obvious that the traffic required by the commerce and the agriculture of the district must be carried on with difficulty and a great expense. In the circle of which Aldstone is the centre, having a diameter of about thirty-six miles, all the articles produced in the

country, and requiring transport, are of a heavy description, viz. lead and lead ore, coal, lime, timber, and stone. And the distances to be travelled are considerable, the rate of carriage at present is high, yet the persons employed are very inadequately paid – such are the difficulties arising from the condition of the roads.

The quantity of lead and lead ore carried upon the roads within the circle under consideration, may be computed at 14,000 tons annually; of coal, perhaps 3,000 tons; timber and other heavy commodities, 3,000 tons, making an aggregate of 20,000 tons per annum. Supposing the average distance carried to be only ten miles, and that the improvement of the roads to lower the price of carriage at the very moderate rate of three-pence per to per mile, the direct saving would be 2,500l. per annum. The indirect saving of expense of carriage of provisions, and other light commodities, and the facilities to be given to the agricultural and other interests of the country are not so easily estimated, but may be supposed to be of much consequence, because the situation of the mines in a very high country has collected an extra population of 6,000 persons dependent for a supply of provisions on a lower country, distant from twenty to thirty miles, and because lime is much and very usefully employed in the agriculture of the country for the grass Lands required for the maintenance of a great number of horses employed in the transport. In addition to all the advantages belonging particularly to the domestic economy of the circle, good roads will open communications from South to North and from East to West, through a country in the centre of the kingdom, which in its present state forms a barrier to all improvement, by which the traffic will be much increased, and the toll revenues consequently improved.

On the road from Hexham to Penrith the greatest impediments are Cupola Bank, Whitfield Fell, and Hartside Fell. The road over Cupola Bank may be made at a rise of one foot in twenty-seven, without an increase of distance beyond half a mile, which will probably be regained soon after the ascent is attained. Whitfield Fell may be crossed at a rise of one foot in twenty-six on the eastern side, and on the western side about one foot in twenty-one to Clargill, and from thence to the summit one foot in twenty-eight. Hartside Fell may be crossed at a rise of one foot in thirty from Aldstone to the summit, and at one foot in twenty from Melmerby to the summit. All the other parts of this road may be so much improved, as to be considered nearly level. The road of communication to Nent Head, which branches from this road at or near Clargill, may be greatly improved, so as no part of it may rise more than one foot in twenty-three.

The tolls at present levied on these roads amount to about 1,500l. per annum, and the additional tolls that may be levied on the road, to be added, may be safely estimated at 1,700l. making an income of 3,200l. The future expenditure for repairs, allowing for statute labour to be performed, and including surveyor's salaries, will be about 1,775l.; interest of debt, 1000l.; income as above 3,200l.; surplus 425l.

I have the utmost confidence that there will be a material increase of the toll, as soon as the roads are put into a proper state of repair.

I have the honour to be, Sir, your most obedient servant,

(signed)

J. L. McAdam

[The newspaper report then adds 'Here follow resolutions of the Trustees of the Road, approving of Mr McAdam's suggestions', without giving the text]

16 Aug 1823 Edward Hawke Locker to John Taylor

[Note: John Taylor (1779 – 1863) was Britain's foremost mining engineer of his time, and founder of the company John Taylor and Sons, which had mining interests widely across Britain and Ireland and elsewhere in the world. The directors of the Greenwich Hospital commissioned him to report on their mines, associated works and mining leases on Alston Moor.]

Sir,

HAVING recommended to the Directors of Greenwich Hospital, that you should be employed to survey our Lead Mines in Aldstone Moor, and report your opinion of their present Condition, with such suggestions as may occur to you for their improvement; it is desirable that I should state the principal points which appear to me to require your more immediate attention.

My Report upon this part of the Hospital's property, which was printed last year, (and of which a Copy has already been delivered to you), will have acquainted you with the nature of this Property, and the practice which has been hitherto pursued. Your extensive knowledge of Mining Concerns in other Districts, will enable you to determine whether it may be expedient to make any important change in the Leasing and Management of our Property, and whether, under all circumstances, a greater permanent Revenue may be obtained, by the introduction of any other System.

Among many other points which will occur to you in the course of your enquiries, I have to request your consideration of those which follow:

1st. To compare the existing System of letting our Mines on Lease with that of other Properties who work their Mines on their own account.

2nd. As to the receipt of one general Rate of Duty from the Lessees, or varying the amount according to the relative value of each Mine.

3rd. As to the usual period of twenty-one years fixed under the present Leases, and the practice of uniformly renewing to the former Tenant on the same Terms, compared with the advantage of letting them on proposal at the expiration of the Term.

4th. As to the several stipulations for the security of the Proprietors, and the practicability of rendering the Leases more simple and convenient to the Tenant, and more advantageous to both Parties.

5th. As to the policy of requiring a systematic mode of working the Mines in general, in order to secure the complete exhaustion of each portion of Mineral Ground so leased, and thereby preventing the neglect of large quantities of Ore which may be left undiscovered, for want of more scientific research.

6th. As to the expediency of letting larger Tracts of Mineral Ground to Companies possessing considerable capital, and giving them a greater latitude in the mode of working the Mines so let.

7th. As to the policy of continuing the purchase of Lead Ore from the smaller Companies of Adventurers, as an encouragement to enterprize.

8th. As to the question how far it may be equitable to require an increased duty, or other mode of reimbursing the expence of carrying forward the Nent Force Level, upon the letting of Mineral Veins discovered by the intersection of that Line.

9th. As to the expediency of accelerating the progress of the Level into the Mineral Ground, by sinking another Shaft at or near Nenthead, and working back towards the higher Level, now driving from Nentsberry Hags.

10th. As to the policy of continuing the trial at Nunstones Copper Vein – and if so, whether it should be carried on at the expense of the Hospital, or let upon a fixed duty to such persons as may propose for it, or any other mode more advantageous; and as to the most eligible provision for smelting or disposing of Copper Ore so raised.

11th. As to the appointment of a better superintendence and control of the Mines in Aldstone Moor, the cheque of the accounts of produce, and the expediency of appointing an Assay Master to inspect the Ore previous to smelting, and of employing a Draftsman to complete a general survey of the Mines, and to continue the same in future, as a record of common reference.

12th. On inspecting the Smelting Mills, at Langley, to point out any improvement in the present establishment, the process of smelting and refining, and to give your opinion as to the preference of reverberatory furnaces over the blast hearths, now in use.

13th. As to the probable advantage of maintaining the Zinc Works, and the best mode of conducting that department, if continued.

In reporting your opinion on these, and other questions which will readily occur to you in the course of your inspection, you will receive every assistance and information from our Receivers, and from their subordinate officers in Aldstone Moor; and they will explain to you, the mode of keeping the Mining Accounts in their office at

Newcastle, so as to enable you to judge, whether any improvement in the system of accounts for the receipt and sales of Lead, can be introduced with advantage to the Hospital.

On the completion of this examination, I shall be glad to receive your Report, as early as may be convenient to you, in order that the Directors may have the opportunity of adopting your suggestions without delay.

I have the honor to be, Sir,
Your very obedient Servant,
E. H. LOCKER

To: John Taylor, Esq.

(Copy.)

21 Aug 1823 Edward Hawke Locker

TO THE RIGHT HONOURABLE AND HONOURABLE THE DIRECTORS OF THE
ROYAL HOSPITAL FOR SEAMEN AT GREENWICH

ALDSTONE MOOR, 21st August 1823

MY LORDS AND GENTLEMEN,

I HAVE now the honour to acquaint you with my proceedings relative to the Mines of Aldstone Moor, which you have directed to be inspected by Mr. Taylor, in compliance with the proposition which I took the liberty to make to you on the 5th November last, when I presented to you my Report on the state of this part of the Hospital's property. Having placed that paper in his hands, I also addressed to him a letter (of which a Copy is sent herewith), containing certain Queries, upon such points as appeared to me most important for his consideration; and, as some interval must elapse before he can be prepared with. A detailed statement in reply, I have judged it proper to submit to you a few observations on the subject for your more immediate information.

The Receivers having joined us here from Newcastle, we accompanied Mr Taylor through several of the principal Mines, as well as in his examination of the Smelting Mills, and we have had frequent conferences with him and with the principal Lessees, as to the general Condition and Management of the Mines.---These Enquiries have led to the following result:

1st. That the Resources of the Mines belonging to Greenwich Hospital, are still very abundant and unfailing;

2nd. That the system hitherto pursued is in the main beneficial to the Hospital---but that;

3rd. Many improvements may be made therein, to the great advantage of the proprietors, as well as their Lessees

1st. The Mines possessed by the Hospital, yield nearly Six Thousand Tons of Lead per Annum, or above one-sixth of the whole quantity raised in Great Britain. When it is considered that the British Mines produce two-thirds of the whole consumption of Lead in Europe, or probably throughout the World, the importance to the Public (as well as to the Proprietors), that the Mines should be skilfully worked, is sufficiently apparent. In the last year 34,000 Tons of Lead were raised within the British Dominions; and it is computed by the most intelligent Merchants, that all the known Lead Mines do not produce more than 50,000 Tons. It may be observed in this place, that a very large proportion of the Lead produced in England is absolutely expended, i.e. never returns into use – not less than 5,000 Tons of Lead being manufactured into small shot, and double that amount converted into Pigments, or used in the making of Glass and Pottery. The prodigious quantity of Lead Ore which has been raised in Aldstone Moor, has led many to suppose, that this enormous supply cannot be continued much longer, yet this opinion, as I have shewn in my last Report, was entertained a Century ago, with no better foundation. The continued discovery of new Veins amidst the ancient Workings, and the large extent of Mineral Ground which has not been hitherto explored, afford the strongest presumption that immense resources are still remaining, and will long contribute to the prosperity of the Hospital's Revenues. The rich Vein of Hudgill Burn, is still yielding as large a quantity of Ore as in the last year, and Rampgill Mine, which is second only to that of Hudgill, has been worked for Centuries, and has produced more Lead than any other Mine within the Moor.

2nd. It has afforded me much pleasure to find, that Mr Taylor entirely approves of the principle of letting the Mines on Lease, instead of working them by your own Labourers; but he thinks some change in the Terms of the Leases may be made with advantage to both parties, which would go far to prevent the neglect of any Vein or Beds of Ore which may not be duly explored at present, though he has satisfied me that the quantity now neglected is far less than in former Years. The occupation of the Mines under Lease, by Persons who can command a considerable Capital, is highly important, and has derived from the London Lead Company, who have been its Lessees for seventy-eight years. During this period, that very respectable Body has enjoyed very large profits from the Concern; and in these the Hospital has liberally participated, without any risk whatever. Most of the important improvements in Mining have been introduced by them. Their Levels at Nenthead extend nearly twenty miles underground, and are still carrying on with great spirit, although for some years past they have been greatly surpassed in profit by others of your Lessees, who have not made equal exertions. I learn from good authority, that their Expenses last year, considerably exceeded their Receipts, and that on an average of the last twenty years,

their Profits from the whole of our Mines, have borne no proportion to the very large Capital they have expended; but their important gains upon Mines in other Districts, have enabled them to prosecute a speculation so little profitable to themselves, and so advantageous to the Hospital. To this Company, therefore, it is both just as well as politic to afford every encouragement, without which it cannot be expected they should continue these great exertions. Mining property is an adventure subject to very great fluctuations; and in times of difficulty, it is only by mean of Capital, that the Mines can be kept open, and the Income of the Hospital preserved. Not many years have elapsed, since this was strikingly exemplified in Aldstone Moor. The price of Lead, towards the close of the War, fell rapidly from £40 to £16 per Ton.

In consequence of this failure of the Market, the humbler adventurers here, threw up their Mines, and a great number of the workmen fell upon the Parish. Many emigrated, and those who remained were involved in the deepest distress. In this emergency the London Lead Company steadily continued the working of their Mines at a heavy loss ---and but for this, the Parish of Aldstone must have been involved in one common ruin, being utterly incapable of supporting any further burthen. The Company has pursued the same uniform course --- while they have very judiciously discouraged high wages in times of prosperity, they have proved the great support of the labouring people in the period of difficulty, not proportioning the rate of wages to their Miners, by the standard of the Lead Market, but by the price of provisions.

The Board had now under consideration an application from this Company for a General Grant of the Mines which they ay present hold under separate Leases from the Hospital. They desire to be freed from many of the present restrictions, as to the employment of their men, and the prosecution of improvements, and I strongly recommend that their request may be granted, because it is only by such means that Mines can be worked upon an extensive scale. There will still be a reserve of Mineral Ground for the humbler adventurers within the Moor, who though incapable of expending any considerable sums in their researches, have discovered several valuable Veins which have since yielded large profits to the Hospital.

The expediency of carrying on Nent Force Level has been much discussed since we have been at Aldstone. This great work (com-menced by Mr Smeaton under sanguine expectations of success) has certainly disappointed the anticipations of its distinguished projector, for it has led to no important discoveries, yet I am unwilling to believe that if prosecuted it may not still produce some return for the great Expenditure which has been incurred. The sinking of the Shaft at Nentsberry Hags in 1818, and the carrying forward the higher level from thence towards Nenthead, was undoubtedly a judicious measure, and the Board probably will consider it advisable to sink another Shaft nearer to Nenthead in order to accelerate the completion of the under-taking so soon as the two foreheads are brought into one, next spring. The Mineral Ground about Nenthead is known to be the most pro-ductive, for the great Lime-Stone in that District has produced four fifths of all the Lead Ore which has been raised within Aldstone Moor.

I was once of opinion that Veins intersected by this Level, might be let at an increased Duty, as they are discovered at the sole expense of the Hospital; but as the Ore produced from such Veins cannot be carried out by the Level, they must be worked by a shaft, at great expense, and as the existing duty is already very high in proportion to other Mining property, I am convinced by the better information I have now obtained, that it would be impolitic to make any increased demand for the Lease of such Veins. Mr Taylor expressed some surprise (until the circumstances were explained), that the Hospital should have maintained so high a duty as one-fifth, being more than is usually obtained by other Proprietors, and considers it advisable to afford the Lessees every facility and encouragement, in order to preserve this superior advantage. The London Company is now expending not less than six or seven thousand a year in making Trials, and therefore cannot be expected to bear any part of the expense of Nent Force Level, and I am inclined to think that all who propose to take Leases of Veins so intersected, should be allowed to work them at the usual rate of duty.

The London Company's Establishment shews a superiority in managing their Mines, above that of other Lessees; but still, many Improvements are wanting which have been made in other Districts, especially in the method of washing the Ore, which would greatly benefit the Lessees. It is extremely desirable that your Managers should possess the best intelligence. The present Moor Master, who has served the Hospital with great fidelity for Thirty-three Years, is too far advanced in years to acquire this knowledge; but as his Son has been recommended to succeed him, I propose that he should next Spring, be directed to visits those Mines of Cornwall and other parts of England, which are managed with the greatest skill, in order that the best modern practice, may be transferred to Aldstone Moor. Mr Taylor considers that in this respect, much improvement may be made in the present system. There is considerable deficiency in the underground management, and on enquiry I was particularly struck with the want of regular plans of the workings, in the Moor Master's Office. In this particular, the London Company's example may be followed with advantage, for in their office at Nenthead, they have complete plans and sections of all their Mines, and the progressive workings in each are added as they advance, so that at one view, the relative bearings may be seen, and all confusion prevented. I recommend that all the Lessees be required to keep accurate surveys of their Mines, and that these be copied and deposited in the Moor Master's Office, as a record for general information, and to prevent disputes.

Another important improvement in the system would be the appointment of an Assay Master, (who might unite other duties with that department), to ascertain the value of all the Ores delivered from the different Mines, and act as a checque upon the Smelting Mills: at present there is no such security, and though there is no reason to mistrust the care of our Agent at Langley, it is quite necessary that every precaution should be employed. It is stated, indeed, that he annually estimates, by actual experiment, the value of al the purchased Ores so received, for the purpose of guiding the Receivers in their prices; but the quantity of Lead and Silver to be produced from

all the Ore received at the Mills, is left entirely to him-self, and in the Silver, especially, there is danger of abuse on the part of the Workmen; the sole checque at present being the vigilance, discretion, and integrity of the Smelting Agent. Considerable doubt is entertained, whether the Ore in general is made to yield so large a proportion of Metal, as it is capable of producing in the furnace. It is believed that more is obtained in some other Smelting Establishments, and perhaps a more economical process may be introduced with better intelligence. The care and caution used in the Assay of Copper, in the Cornish Mines, may be applied to the analysis of Lead Ore, though I understand it is not so capable of an exact Assay.

I shall not further trespass on your attention at present, or anticipate the Report which I am to receive from Mr Taylor; but I cannot conclude without recommending to you the advantage of his making a periodical visitation to the Mines, as the best security for the improvement of the System, and to prevent them from falling into neglect. The Receivers who came to Aldstone, for the purpose of accompanying us through the Mines, and assisting us with their valuable advice and information, entirely concur in the suggestion which I have thus offered to your consideration. In discussing the variety of details which engaged our attention we were fully convinced of the soundness of Mr Taylor's opinions, as to the future management of this important part of your property. His extensive practical experience in Mining, added to his intimate knowledge of mineralogy as a Science, will prove of the greatest value to the Hospital's interests.

I have the honor to be, My Lords and Gentlemen
Your most obedient humble Servant,
EDWARD HAWKE LOCKER

22 Aug 1823 John Taylor to the Commissioners of the Greenwich Hospital

(Copy.)

ALDSTONE, 22d AUGUST, 1823.

SIR,

IN compliance with your directions, I have inspected several of the Mines on the property of Greenwich Hospital, and the works connected therewith, and I have received information respecting the whole so as to enable me to form an opinion upon them, and to give answers to the questions contained in your Letter of the 16th instant, and to suggest generally such observations as have occurred to me on an attentive perusal of your report to the Directors, dated in November last.

These answers and suggestions will I think most conveniently be classed under the following general heads:

1. The mode of Leasing or the arrangements with the Adventurers who work the mines
2. The mode in which Mining is conducted by the Lessees.

3. The disposal of the Ore and Lead accruing to the Hospital, with remarks on the smelting.
4. The great Nentforce Level.
5. The Trial of Copper Ore at Nunstones.
6. The general prospect of the Mines as regard their future produce, and the management of the property.

Under the first head, comes immediately the notice of your suggestion respecting a comparison of the existing system of letting the Mines on Lease, with that of other proprietors, who work their Mines on their own account.

On this, I feel no difficulty in giving a decided opinion, and to express that I perfectly approve the system that has been adopted of Leasing the Mines, instead of working them on account of the Hospital.

There may be, and there are cases, where a great Proprietor of Mineral Estates, is right in working Mines in his own lands, to a certain extent at least, he may by such a mode of proceeding, encourage a spirit of enterprize, or set an example of improved methods such as may be most beneficial to himself, or indeed thus convert a property from an unproductive to a profitable state. But as generally without some special inducement of this kind, it would be better for an individual proprietor to lease his Mines, so it must be peculiarly the case with a large body of persons, like the directors of a public Institution; and as I do not find in the circumstance of this Estate, any of those inducements to which I have alluded, to encourage a contrary practice, so I feel satisfied that the proper plan for you to pursue, is, that of leasing the Mines to persons who will work them, and pay a proportion of what is obtained.

The next consideration is as you have suggested it, as to the receipt of one general rate of duty from the Lessees, or varying the amount according to the relative value of each Mine. A uniform rate of duty where it can be obtained has certainly many advantages, and particularly for a public body, because it diminishes very much the chance of improper preference in the administration of their affairs; but at the same time unless it is a low rate, it limits the trials that will be made to such Mines as are expected to be rich, or to those which can be explored at moderate expense, and therefore where circumstances differ in these respects, a graduation of the duty becomes necessary, or a certain number of Mines must remain untried.

The adoption of a fixed rate on the Hospital Estates, has been I think completely successful hitherto, and though by offering to accept less in certain instances, probably more trials might be undertaken, yet I cannot think it proper to make any alteration at present; although I think a time may come when it may be even necessary, and when it must be done under such special arrangements as may make it as little liable to objection as possible. The reasons of the success of this mode on Aldstone Moor, are in my mind to be found principally in the following circumstances. The liberal view that the Commissioners of the Hospital have taken of the subject of grants, and the confidence that their practice has created in the minds of the Lessees. The great richness in some of the Veins, so that frequently at least some great instance of success

has encouraged the adventurers to further speculation, and lastly, the facility with which the Mines are worked, being accessible by levels which drain the water, and from roads for conveying out the produce.

It may further be observed, that improvements such as have been introduced in all Mines of late years, have the effect of increasing the profit of the Lessees, and consequently of enabling them to continue to pay a high duty; but should the Mines be hereafter worked deeper, or improvement cease, or a general diminution of produce take place, the duty must be varied. Any thing that will tend to reduce the expense of working the Mines, or disposing of the produce, will have the effect of keeping up the present rate, which is certainly higher than most Mines in England can afford to pay; in this point of view, the prosecution of the great Level at the expense of the Hospital, which will make the Veins accessible to greater depths, if they should prove productive there, and the formation of better Roads for the conveyance of Lead, Coals, &c. may be considered as most beneficial to the future interests of the property.

The plan which was some time since adopted of purchasing the Ore of the smaller companies of adventurers, although I should doubt whether an increased scale of smelting on the Hospital account might have been advisable, yet to balance this inconvenience, and to produce even an ample compensation, I believe has tended to maintain the rate of duty, and to encourage the exertions of the poorer Miners. I may allude again to this practice of purchasing Ores, when I come to consider the Smelting Establishment.

I have perused the Conditions of the Leases, and have enquired into the manner in which they are acted upon, and I see nothing in them which it is essential to alter; but I think it might be more eligible, if the mode of assigning the boundaries to each grant, was by certain marks or lines on the surface, so as to enclose a given space of ground, rather than by limits which are governed by the vein itself. I am of opinion too, that a specific number of men being mentioned in the Lease, might enable a set of Lessees to hold a Mine, even without an effectual working, and that this proviso so far rather defeats the other covenants to this effect, which might be sufficient and better without it. The term of Twenty-one years is usual, and perhaps the best that could be adopted. The practice of renewing, which has always been acted upon by the Receivers, is highly praiseworthy, and has produced undoubtedly the best effect; it has inspired confidence in the adventurers, and encouraged their efforts when hope of success was distant or declining.

The whole business of Mining is experimental in its first stages, and the period of trial may last for a considerable part of the term of a Lease, and be attended with great expense and anxiety, and nothing in my mind would tend to deter proper persons from entering on such trials, more than to limit their prospect of reward, by offering the fruit of their labours to others. The disposal of grants by public competition in the way alluded to in your letter, would probably introduce a worse set of mineral Tenants, and drive away those upon whom the prosperity of the Mines must depend.

With regard to the stipulations of the Leases, one of the utmost importance, is, that by which the Mines may be secured from injury by the closing up of the Works, when

abandoned and left for a time unworked. The covenants in the deeds are sufficient and proper to reach this object, and no instance has come to my knowledge of these rules being neglected, but it is of so much consequence, that I mention it to suggest, that in the levels, walling and arching with stone, should be encouraged, or insisted upon as much as possible, instead of Timber, which is subject to rapid decay, and the Lessees should also be positively required not to obstruct or fill up the Mines by deads or waste. Where these two things are sufficiently attended to, I do not think that any benefit would arise from the attempt to force a more systematic mode of working the Mines, even in those where it may be deficient. A vexatious interference on the part of lords of Mines, is very likely to be resented by the Adventurers; and as the means by which a Mine is best to be explored, is often debateable ground, the persons employed on the one side and the other, would be led into disputes very prejudicial to the concern.

Again, as a matter often experimental, it is but fair that the person risking their money should have the controul as to how it is best to be applied. They may not always direct their efforts in the best manner, or they may sometimes (though now I believe but rarely), not exhaust the whole of the Ore they discover, for want of knowing the most economical way of working it; but if after this they should abandon the Mine, and it is left, as I require it should be, accessible to others, the Hospital will lose nothing in the end, as future adventurers may enter upon the works, taking advantage of what has been done to open the ground, and carry on the operations in a different way, and may meet with better success. I think that some improvements might however be introduced in the working of the Mines; but I would endeavour to lead the Lessees to it, rather than by heaping numerous covenants upon them, to embarrass and vex them.

One thing I think of great importance, which is, that perfect records of what has been done in the pursuit of every Vein on the Estate should be preserved, and I would recommend for this purpose, that in all future Leases, a clause should be introduced to require the Adventurers to keep sections and plans of all their workings, and that the Officers of the Hospital should have power to inspect and copy them at all times; and it would follow of course, that the Moor-master or some competent person, should delineate these on a general plan, and preserve a collection of the sections of each Mine.

You direct my attention to the expediency of letting large Tracts of Mineral Ground, to Companies possessing considerable Capital, and giving them greater latitude in the mode of working the Mines, so let. Generally speaking, I think it quite right to do this, where circumstances favour it, and particularly where Mines are getting into a state to require operations on a more extended and expensive scale, for their successful prosecution; but, as the particular condition of the Mines, and the character of the parties must be taken into the account, I shall venture to apply it (as I understand from the report and our conferences, you intend it,) to the London Lead Company's Mines at Nent-head.

In the first place, I must observe that this Company do not apply for more ground than they already occupy, nor do they wish to make any alteration to the covenants,

but such as may relate to the appropriation of the labour of the men, whom they are bound to employ. They hold their ground by a number of grants, separately limited in the usual manner, and with the stipulation that in each four men are to be constantly employed. The Company are thus compelled to divide their labour, and apply it in a different way from what they may often wish, and from what may as frequently be the best for the general interest of the property. I have particularly viewed and enquired into the trials that are making by this very respectable body of mining Adventurers, and I find them to be such as to merit every possible encouragement; and I am very strongly of opinion, that the revenue derived from this part of the property, has not only hitherto been much maintained and increased, by what this Company has done, but I think also, that its future amount will much be dependent on what they may hereafter do, I would therefore recommend, that a general grant be made to the Lead Company of such ground as they now apply for, which should of course contain stipulations for effectual working as usual; as also the covenant to keep and produce sections and plans; and further, I would beg leave to suggest, that in any such grant a clause should be introduced, by which it may be provided, that if any portion of the ground or any vein or veins contained therein should not be tried and explored by the Lessees, that it should be lawful for the Agents of the Hospital, after giving a certain notice, describing the part, and affording fair time to the Lessees to decide whether they would work there or not, to enter upon such part, upon the Lessees declining to work, and to grant it to others, or dispose of it as might be thought proper, without prejudice to the general grant, which should continue otherwise unimpeached. With suitable provisions and due regard to the circumstances of each case, I can see no objection to the making similar grants to other parties.

I now come to the second general head under which I have classed my remarks, which is the mode in which Mining is conducted by the Lessees. Viewing this part of the subject as a whole, which would include of course the operations of all, and of whom some carry on their works in a large way and others in a very limited manner, some are reaping considerable profits and others are working to a loss, I should say that there is room for improvement both in the underground departments and in the processes used for dressing the Ores on the surface, and more particularly in the latter. There must however always be great inequalities in this respect in all Mining districts, and it happens not unfrequently, that in making trials to discover Ore, success is attendant upon the most awkward attempts, while the most skilful miner is baffled and disappointed. This to superficial observers, serves to level the distinctions between well planned operations and imprudent schemes, and to give a triumph to the latter, which has the effect of making the progress of Mining improvement slow.

It is evident however that it has made great progress in the Aldstone Moor district, in latter years: I see abundant evidence of this, first, in the operations of the Lead Company, whose Mines are on the whole admirably conducted, particularly in the underground department; secondly, in the general substitution of Rail Road Levels, for the numerous shafts which preceded them, and in the improved mode in which

these Levels are now constructed and carried on; thirdly, in an increasing attention to a systematic pursuit of the different works; and lastly, in the adoption of machinery and other arrangements for dressing the Ores with more economy than heretofore.

As I have before observed, I am of opinion that more may be done with good effect, and particularly in some of the Mines, by a better system in laying out the portions of the vein, for working in a more regular way, by revising the modes of agreeing with the workmen, and applying constantly the principle of making their advantage to be concurrent with the discovery, and the most effectual exhaustion of the Ore, by arrangements conducive to the convenience and health of the persons employed. By more care and skill in the washing and preparation of the Ores for Smelting, and particularly in regard to such parts of the processes which incur waste, and which I think are too generally to be found. All these things are however more immediately the affair of the Mining Tenants, and though they are highly important to the interests of the Estate, yet I am well persuaded, that any attempt to enforce regulations would be injudicious, and would be attended with great chance of failure, and when abortive would do hurt instead of good.

I have before suggested the necessity, that appears to me to exist of suffering Lessees of Mines to pursue their plans very much in their own way, on the ground of the risks they run, and the uncertainty of their gains, and I have never seen any good ensue from attempts on the part of the proprietors of Mineral ground to legislate too severely. Still this is no reason why improvements should not be encouraged in every practicable method, and it is generally found, that persons of this sort are ready enough to adopt them, as soon as their value is understood. Some proprietors have accomplished a good deal by example, but this requires, that they should work to a certain extent on their own account which I do not here recommend. Others have found great advantage by the encouragement of skilful and spirited Lessees, and nothing can conduce more to the benefit of a Mineral property, than the operations of such a body; and here again I beg leave to direct your attention to what the Lead Company has done and is doing on this Estate, for although some of their processes are not so perfect as I could wish them to be, yet I am assured by their very respectable manager, Mr. Stagg, that they have improvements such as I hinted, in a course of progress at other of their Mines, and that they will be transplanted shortly to Aldstone Moor.

What I should recommend to you, would be the appointment of an Inspector of Workings underground and on the surface, who might be a man taken from one of the most improved districts, who should spend his time in the Mines, and report to the Moor Master, or Receivers, the way in which each set of Lessees were carrying on their operations, the record of which alone would be of the greatest value. He should at the same time, with discretion, and without doing any thing to give offence, point out to the Lessees, as occasions offered, the modes by which improvements might be introduced, and endeavour to instruct them in their adoption: the same person would be very useful in the conduct of such works as are going on, at the expence of the Hospital, as I shall hereafter point out; and also, would probably make some saving in

the Smelting, and assist the Receiver's judgement in the purchase of Ores, by the washing being always under his eye.

The next point for consideration, is, the disposal of the Ore and Lead accruing to the Hospital, and which will include the answers to your questions respecting the Smelting, the Duty, and purchased Ores.

As I have expressed my opinion, that it would be unwise for the Hospital to engage in working their Mines, so I should doubt how far it is advisable that they should commit themselves to the detail of a manufactory like Smelting, which requires a peculiar kind of knowledge and the attention to many minute particulars, so that in general, individuals have better succeeded in it than large companies. The application of this principle, must however be considered with reference to the necessity of the case, and I shall therefore only premise, that if the Hospital could at once sell all their duty ore, and the smaller Companies of their Miners could get a fair value for what they produce, I should have no hesitation in saying that such sales would be better than the complicated Machinery of Smelting Houses, &c. At present, I see no way in which either of these could be done. In some other Lead districts, smelting the Ore is a distinct business from Mining, and is carried on by another set of people, and in accordance with the proper division of labour, I believe this is the best practice. In some of these places the Smelters are sufficiently numerous and respectable, to ensure both fair competition to regulate the prices of the Ore, and to guarantee payment to the sellers, and if this were the case in the North, there would be no difficulty in changing your system, if you thought it advisable. Such a body of purchasers of Lead Ore, are, however not to be found within reach of the Aldstone Moor Mines, the practise of the country has always been for great proprietors, or their principal Lessees, to smelt their own Ores, and no opening therefore existed for the establishment of Smelting Works to depend on purchased Ores.

The Officers of the Hospital therefore seem to be compelled to convert the Ore into Lead, as the only saleable form, and at a period of depression in the market, they probably preserved the poorer Miner from ruin, by undertaking to purchase his Ore also. In doing this, they may, and probably have, encreased the value of the duty received, as I have before observed, even though the smelting such Ore may have been unprofitable. Whether loss or gain may have attended this plan, in other respects I do not pretend even to insinuate, because I have no means of judging, and it would be almost impossible to investigate it, as so many circumstances must be taken into account. As the thing now stands I do not see how you can alter the present mode, as any difficulty thrown in the way of the poorer Miners in disposing of their Ore, would depress their exertions, and injure the Mines, and the duty Ore must evidently be made saleable in the best way it can.

The mode of fixing the prices for the Lessees' Ore in purchasing it for the Smelting-house, seems to me to be attended with some want of precision, but on the average it may be right, and as I have said before, even if this be not exactly proportioned to a profitable smelting of it, a liberal price would only operate like a

very moderate abatement of duty, which I am disposed to think would not be unreasonable in many of the cases to which it applies.

I viewed the Smelt Mills at Langley, which are conducted according to the process usually employed in all the Northern Lead Mines; the Lead being extracted from the Ore by Smelting in Blast Furnaces called Hearths, after having been calcined in separate Furnaces, constructed for that purpose. The construction of the apparatus, and the management as far as I could judge of both are very similar to others of the same kind with which I am acquainted.

There is another mode of Smelting Lead Ore, mostly in use in the Southern Mines, which is if more recent invention, by which the Ore is melted in Air or Reverberatory Furnaces, the metallic part is disengaged from its earthly mixture, and both being in fusion, the former sinks to the bottom and is protected by the latter from the direct action of the fire, which always occasions a certain waste of the Lead. It is a matter of controversy which may be the best process, and each is warmly defended by those who practise it. My own opinion is certainly in favour of the Reverberatory Furnaces, but there are many circumstances to be taken into account for any particular application of either, such as the state of the Ore, and the relative prices of fuel, as the Hearths are worked with a large proportion of Peat, while coal is required for the Reverberatory Furnaces. It would be a very expensive thing to alter any large establishment of this kind, and not only new apparatus, but persons having knowledge of the other mode must be supplied, and therefore a clear and decided advantage should be established before such an attempt could be recommended. I do not think that any very satisfactory comparative experiments have been made upon a large scale, those which I am acquainted with and which have occurred in my own practice, have been in favour of Reverberatory Smelting, but as Mr. Stagg informs me, that the London Lead Company are actually now making such experiments in their Works in Teesdale, I should at any rate advise the postponement of the consideration of this object of your enquiry until more is known of the results of the comparison.

It appears to me in calculating the proportion of Lead which is obtained from a given quantity of Ore in the works belonging to the Hospital, that it is rather inferior to what I should have supposed from the appearance of the Ores. But the mere inspection, even of the whole Ore if I could have seen it, would not have informed me, because it cannot be judged of by sight with any accuracy, and the deficiency may therefore be owing either to the quality of the Ore or to the mode of treatment.

Where smelting is conducted in the most accurate way, the exact proportion of Metal contained in any Ore is determined by assay, and upon this is founded an account which operates as a check upon the Master Smelter, and this applies to Lead and Silver as well as other Metals. Proper allowance must be made for inevitable waste in the former, while the greater value of the latter makes the precaution the more necessary. I do not think therefore that any establishment of this sort, can be said to be in a perfect state, where the operations in the large way are not compared with proper assays, and it is an important part of the scheme, that the smelter and assay-master

should be distinct persons, and even operating with as little connexion with each other as possible. In this way the assay-master would determine the quantity of Lead which ought to be produced from the duty Ore, and also from the Ores purchased, or in fact would determine their value from Samples properly taken even before they were removed for smelting or purchase, which would be most important in every point of view and more particularly if it be necessary to continue to buy the Lessees Ore.

The Zinc works adjoining the Smelting House at Langley, were not in use when I visited them, but are constructed in the usual manner. Of late, although the demand for this Metal has much increased for the East Indian Trade, yet it has been furnished from Germany at prices much lower than it can be made in England, so that it is probable they have a more economical mode of obtaining the Metal than we possess. The present value in the market is too low to admit of such works being carried on without loss, unless some considerable improvement is made in the process, and this is rather to be expected from some private concern than from one situated as this is, and therefore this part of the Establishment must I conceive remain unemployed until circumstances alter.

I now come to the Nent-force Level, which I need not describe, as your Report gives all the detail with great accuracy; compared with the large Expenditure, it has certainly turned out an unfortunate speculation, and it agrees in this respect with similar undertakings with most of which I am acquainted, and with some in which I am directly concerned. In this too as in most others there were fair reasons to expect a different result, the intersection of so large a tract of Mineral Country, and the exploring deep beds of Lime Stone similar in many respects to that which has produced so large a proportion of the Lead raised at Aldstone Moor, appear to me to have warranted the undertaking, and to justify those who so long ago recommended it. I approve the departure lately made from the original line of Level, by taking one higher up from Nentsbury Shaft, for as the Scar Limestone and the deeper beds have hitherto proved so unproductive, it is better to try the ground near the bearing measures, and to establish a level more within reach of the Mines. A communication with the deeper part of the level, may probably be made in the course of next Spring, and after that, there would be a reduction in the number of hands employed, and a diminution of the expense, unless it should be thought proper to commence another Shaft, with a view of expediting the level and pushing it with vigor towards that part of the Estate which is or has been the most rich. If this should be agreed to, I should advise a Shaft to be sunk near Guddamgill vein, which is a strong one, and which would thus be proved into the deeper beds, and I should from the bottom of this Shaft, think it right to drive the level at least as far as Rampgill vein, which has been the most productive of any one on the property, and is perhaps likely to hold Lead to the greatest depth. For this purpose, the water wheel now working at Nentsbury Shaft may be removed to the place I have mentioned, where a fall of water may be applied to work it, without interfering with that use of the Stream which is essential to the Lessees of the adjoining Mines. I am of opinion that it would be proper to do as much as I

have pointed out in the further prosecution of this level, although the result of what has hitherto been done has been unfortunate. First, because the portion of ground which will thus be explored appears to me to be situated where discoveries are most to be expected; and secondly, because in the event either of a continuance of unfavourable appearances, or of an alteration for the better, time is very important, either by coming to a resolution to stop the expenditure, or arriving at a beneficial result quickly. And I may add, that the present period of large return from the Mines, is peculiarly one in which I should advise any large Proprietor of Mineral Ground to appropriate a part to such plans as may tend to future benefit.

With regard to the question how far it may be equitable to require an increased duty, or other mode of reimbursing the expense of carrying forward the Nentforce level upon the letting of Mineral Veins discovered by the intersection of that line, I think generally that the Hospital must expect remuneration from the duty on Ore, which this level may be the means of discovering, or laying open to a more effectual working, - rather than by any greater impost upon the miner, and I am led to this conclusion, by the consideration, that the present duty of one fifth is as high a one as can be expected or ought to be required under any circumstances, if applied as a general rule, which as I have before remarked is the present practice. The utmost that I should think it right to demand of the adventurers, would be, that as the level may now be considered as entering upon ground where the Veins are stronger, and may it is to be hoped produce some Ore in the deeper beds, that each company should contribute a proportion towards the prosecution of the work, and I think that if they would pay one half the expense where their grant extended some distance on each side the level, and a quarter of the expense, where the grants were bounded on the East or West by the level itself it would be as much as should be looked for. But I would not advise even this stipulation to be too strictly enforced, lest it should deter some from making trials of the adjoining ground.

It must be recollected, that though adventurers may have Ore laid dry for them by such a level, that yet it will be far below their present horse levels, and that it must be raised by Shafts at a greater expense, and therefore cannot bear too high a duty which might become a prohibition on the working. The advantages also to be expected from such an undertaking are very different in the case of a Lessee, or the proprietor of the land, the chances of discovery may be much against any particular spot of ground, but on the whole estate they may be worth the expense to be incurred.

COPPER MINE AT NUNSTONES.

The Vein on which this trial is making, is of unusual character and dimensions, and is rather a collection of branches irregularly distributed through a great mass of matter, than such a Vein as the Metals are commonly found in. Some of these branches have produced Ore of very rich quality, and the appearances at the surface were encouraging. A good level has been driven so as to intersect the vein at some depth, and Ore was found in it in some places, but the symptoms to be seen there are

not promising, and it was therefore proper to sink and try at a greater depth; the rock is exceedingly hard and a shaft has been put down seventeen fathoms under the level from which a cross cut drift is now making to open through the Vein. This will be expensive and take some time (probably three or four Months) in consequence of the great hardness of the rock, and the quantity of water which must be drawn out by hand. This must be completed, and then a better judgement may be formed as to the propriety of going further. A determination on this point may be most correctly made if this work was attended to by a person acquainted with Copper Mines, and such a one is not to be found in this neighbourhood; but if you should determine to employ an inspector of workings, as I have recommended, a man might probably be found who could take this as part of his duty.

I cannot dismiss this part of the subject without remarking, that I think more of the propriety of research for Copper in this district than I otherwise should, from what I saw at a small Mine on lands adjoining the Hospital Estate, where, in a vein, is a deposit of this metal far surpassing any thing I expected to see. I calculate that without further discovery, Copper to the value of £3000 may be produced, and that there is great probability of finding more. This vein will pass through the Hospital lands, and will at some point therein meet the Nunstones vein, at a future time, therefore I should expect a good deal of Copper will be found. I think for this reason, trials should be made, and for a time this may best be done, on account of the Hospital, provided they are guided by proper skill and experience.

I now propose to state, briefly, what occurs to me on a general review of the property, and its future prospects as regard the Minerals which it contains. Large estates of this kind, many of which I have had opportunities of seeing, and of being conversant in their affairs, have commonly their periods of comparative richness and poverty, and these alternate from a variety of circumstances. Old Mines seem to be exhausted and are abandoned, a desponding feeling is produced, and the spirit of enterprize is depressed, and a consequent reduction takes place in the value of the produce; this may go on and has done so in many instances for a considerable length of time, but it has generally happened that either an improved method of research, accidental discoveries, or the application of more effectual or more economical methods of working have renewed the spirits of Adventurers, and as it were given new life to the undertakings necessary for opening productive Mines, from these a restitution, or very often, (and I might say more generally) a great increase of former Revenue has arisen. Few mining districts in England, perhaps hardly any important ones, can be said to have been exhausted, even although the history of some and a continued series of working may be traced to remote ages. The Mines of Aldstone Moor, have fluctuated in the same manner and may be expected to do so again, but I have no doubt of their continuing a very long period to produce on an average of years a great Revenue. The older concerns are not rich at present, and their prospects in depth are limited by the peculiarity of the stratification, unless the great level should discover bearing veins in the deeper beds, but if they wear out and decline, other veins

still unknown will probably be found, and keep up or restore the productiveness of the Estate; such an instance is to be found in the case of Hudgill Burn, and indeed it is one of the common uncertainties of mining, that while disappointment often occurs in the pursuit of a favourite object, unexpected discoveries are made which compensate the losses.

These considerations have indeed introduced more system into the mode of exploring Mines, and the fluctuations of value, either in a particular concern of this kind or in an extensive Mineral Estate, may be modified by the skill and prudence with which its affairs are conducted. This therefore in all cases becomes an object of first rate importance, and I am directed to report my opinion upon what I saw of your establishment, by your question relative to this part of the subject. It becomes a pleasing part of my duty, because as far as I could possibly learn, it appears to me, that the conduct of your Officers is characterised by integrity, zeal, liberality, and a considerable knowledge of the best modes of promoting the interests of the property.

To the discretion and sound judgement of the Gentlemen who are your Receivers, may be attributed in a great degree, the present prosperity of the Mines, and the spirit with which the Adventurers carry them on; and the mode in which their accounts are kept, as far as I can judge, from what I could see at Aldstone and Langley, is such as is sufficient to establish the proper check upon the business transacted. The only thing I could wish to alter in this respect, is what I have already alluded to, that is to say, by adding an Assay-master, who with the Clerk of the Deliveries would determine, at Aldstone, the value of the Ore in Lead and Silver, as well as the weight only. Then the sales of each Metal at Newcastle, might be compared with the original assay produce, and the waste in Smelting appreciated and compared with other establishments, and the check would be complete. A great good to be expected from this arrangement, would of course be the stimulus to exertion on the part of the Master Smelter, at Langley.

The office of Moor-master is an important one, and is very well conducted by Mr. Dickinson, with the assistance of his son, Mr. Thomas Dickinson, as may be inferred from the general intelligence and knowledge of the Mines which I observed in the latter, and also from the harmony and avoiding of disputes, which in many mineral estates is prejudicial to the property. I consider him very well qualified to succeed to the Office, which must be the superior one on the spot; but to make the establishment more perfect, I would recommend the appointment of another Agent, who should constantly watch the operations of the Lessees, underground and on the surface, assist them with his advice, do what he could to improve their methods of working, and washing, and who should report to the Receivers, such facts or observations as might assist their judgement in the making grants or the execution of their duties. The choice of such a person should evidently be made from another Mining district, where other modes of working are known, and whereby a combination of skill may be obtained. As prejudices in favour of established systems often stand much in the way of improvements in Mining, it would be essential to select a man of temper and discretion, who would not exercise his influence in any vexatious or impertinent

manner. The district that I would recommend to look for such a person in, would be Cornwall, where the Mines are upon the largest scale, and worked with great spirit and intelligence. It is true, that a Miner from Cornwall would have more experience in Ores of another description, but this is no objection, as though one who was brought up in Lead Mines would be deficient in some respects for Copper, yet a good Copper Miner will at once know all that is necessary for a Lead country. Such a person would be very useful in the future conduct of the level and shafts upon it, which being now to be drained by pumps, will require more active superintendance and experience of a peculiar kind.

I must conclude this report by apologizing for its length, and for the defects you will probably find in it. I have been anxious however to inform you as fully as I could, and I shall most readily supply any omissions that may occur to you, upon being informed of them, and I beg leave to express my thankfulness for the information and assistance which was so cordially afforded to me by yourself and the other gentlemen connected with the Estate.

I have the honour to be, SIR, Your most obedient and humble Servant,
JOHN TAYLOR.

To Edward Hawke Locker, Esq.
Secretary to the Greenwich Hospital.

25 Oct 1823 John McAdam to Edward Locker

[Note: This appears to be a covering letter documenting costs of the project roads (see 19 and 29 July correspondence) accompanying the second letter given below, presumably of the same date, intended for transmission to the Hospital's commissioners]

To E. H. Locker, Esq. Secretary to Greenwich Hospital.

Office of Roads, Bristol, 25th October, 1823

Estimate of the expense of making and repairing the lines of road from Haydon Bridge to Penrith, from Haydon Bridge to Bellingham, from Aldstone Moor to Clargill, and from Burtryford to Brampton. – Sixty-six miles new road, at 203l., 13200l.; fifty-six miles old road, repaired at 80l., 4480l.; Bridges, 5,000l.; Surveys, 350l.; Fencing and indemnities for damage, 2,200l.; expenses of Act of Parliament, 1,000l. Total 26,230l.

This estimate is made upon the supposition that the several parishes will continue to assist in the repair of the roads on the same scale as they have formerly done, that the several parts of these roads which are now repaired by proprietors, by reason of their tenures, will either continue to be so repaired, or that a reasonable composition will be paid for their services, and that the whole produce of the tolls and pontages (after payment of the debt), will be applied for the next three years.

JOHN LOUDON McADAM

Sir,

I beg leave to report to you, for the information of the Directors of Greenwich Hospital, the conclusion of my labours in laying off and procuring plans of the various roads in the counties of Cumberland, Northumberland, Durham, and York, connected with the manors and estates of the Hospital. These roads are comprised in a circle, of which the diameter is fifty miles, extending from Bellingham in Northumberland, on the North, to Rokeby Abbey Bridge, in the county of York, on the South; and from Penrith to Cumberland, on the West, to West-boat in Northumberland, on the East; including several branches. – The estimate of expense has been formed upon the supposition of receiving a considerable addition from the Road Revenue, of tolls and statute labour. In making the estimates, I have also taken into account a reasonable time for accomplishing the whole plan, beginning with removing the most prominent evils which at present obstruct the communication, and proceeding with the other improvements in the order of their importance, at the same time getting the old roads put into good condition. I have likewise calculated entirely upon the Trustees committing the execution of the whole to the hands of skilful and economical officers, and placing the affairs of the roads under vigilant and respectable controul, by which in future the roads may be kept in good order, and their revenues protected from waste, fraud, and mismanagement.

The estates and manors of Greenwich Hospital in the counties of Northumberland and Cumberland, are placed in a mountainous part of the country, difficult of access, and having at present no other roads than those formed on the old pack-horse tracks, and carried upon lines so inconvenient and steep, as not only to be a great obstruction to the local carriage, but to present a barrier to all communication with commercial districts on every side. The heavy commodities produced within the circle described above, are transported at an expense, one third, and in many cases one half, beyond what they might be carried on good lines of well-constructed roads. This loss falls particularly heavy on the Hospital and its Tenants: and generally, the value of the whole property is depressed by this impediment to traffic of every kind.

The great impediments that surround, and, as it were, cut off the mining district from the rest of the world, are on the West, Hartside Fell; on the South, Kilhope Cross, and Yad Moss; on the North, Coal Fell; on the East, Whitfield Fell, and Cupola Bank. The late Survey has shewn that these impediments may be got over, without any increase of distance, by very easy ascents. The steepest rises will not exceed one foot in twenty, and these are not of any extent. A Branch Road has been laid off, into the most extensive mining district in Nent-Water, by which the distance is mutually lessened, and a new Road, nearly level, made to communicate with the present Turnpike Road. This, with the projected improvements of Cupola Bank and Whitfield Fell, will open a safe and easy Road to Langley Smelting Mills, from whence to Hexham the proposed

alterations will give easy access. Beyond this line it is hoped that the local Trustees will be induced to make the necessary and very evident improvements on the Road from Hexham to Newcastle, which is the port of shipping with which the Estates of the Hospital communicate.

The new method of constructing good and durable Roads, at comparatively small cost, cannot fail of producing extensive benefits in the Northern Counties, where the large sums expended in making, and the ignorance of those employed in repairing roads, have prevented the proprietors fully availing themselves of their natural advantages. This part of the kingdom abounds with the most excellent materials, procurable at moderate prices; the people are industrious, healthy, and ingenious, and the funds for maintenance of the roads are ample. Were these powerful means placed under the control of a respectable executive department, properly supported by the Commissioners, there can be no doubt of the favourable result. - I have the honor to be, Sir, your most obedient humble servant,

JOHN LOUDON McADAM