

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

[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. The report was printed and the copy transcribed here is in the Thomas Bell papers in Newcastle City Library.]

(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.