

**Observations on Mr Phillips's letter to the Court of the 21st of June, 1849,
as to a tunnel sewer : 29th June, 1849.**

Contributors

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Metropolitan Commission of Sewers.

OBSERVATIONS

ON

MR PHILLIPS'S LETTER TO THE COURT OF THE 21ST OF JUNE, 1849.

The remarks which Mr Phillips, in his letter of the 21st instant, which was read to the Court on that day, has voluntarily intruded with regard to the resolution of the Survey Committee of the 13th instant, and my Report of the drainage of Westminster of February, 1848, are accompanied with those grave misrepresentations on engineering points, that I conceive should not go forth without notice: and there are other facts in the case of that unusual kind, that in venturing to offer a few observations to the Committee on this part of the subject, I believe it will be of importance to the public service, that they should be made aware also of the whole course of Mr Phillips's proceedings in this matter, and of the nature of the plan which he has now propounded for the drainage of the metropolis.

Mr Phillips states that the principles upon which, in pursuance of the order of the Court of January, 1848, my plan for the drainage of Westminster was prepared, are wholly impracticable, and unworthy the objects which should be kept in view for the perfect drainage of this great metropolis; and in their stead he presents to the Court a plan, founded to some extent upon the same necessities, but totally misunderstood.

His plan is simply that of a tunnel, 20 miles in length, extending from Kingston to the Kent or Essex Marshes, in the general direction of the river, 100 feet

between its bed in the blue clay, to be confined, for the present, to 6 miles in length, from Pimlico to Greenwich, which is to convey the whole drainage of the metropolis in fine weather, and from which the sewerage is to be pumped up by "steam-power, and used either in a liquid or a solid state, or both."

"Views less comprehensive than this," Mr Phillips submits, "should not be entertained," and says, amidst other advantages, that "the plan is simple, economical, and efficient, and will be readily understood and appreciated by the public."

Unless, however, *more* comprehensive views are taken—views that will secure necessary works, instead of those which are perfectly unnecessary—simplicity, economy, and efficiency will very readily be sacrificed.

By the plan proposed the foul waters are brought from the uplands, in some cases a distance of several miles, and 100 feet and more *above* the river, and are carried down into a tunnel 100 feet *below* it, apparently for the mere purpose of being pumped up again, and sent back into the country through the very districts from which they have been derived.

Mr Phillips's estimate for this work is 200,000*l.*; but he omits to mention that the power and machinery necessary for raising the sewage again, *even to the level of the river*, for discharge, will cost about 150,000*l.*, and that a current expenditure of about 15,000*l.* per annum will be required for this object alone.

It must be borne in mind, that even after this enormous expenditure, the improvement of the drainage itself still remains untouched. Two objects only are attained—the avoidance of the pollution of the Thames, where it passes through the metropolis, and the provision of a deeper outfall for the drainage, *objects which may both be realized without any expenditure whatever, by a judicious arrangement of the outfalls, and of the power by which the liquid would be distributed*, while the amount of direct outlay by this plan, with the amount of capital represented by the annual expenditure, which would make a total of nearly three quarters of a million sterling dead loss to the community, would, I am confident, suffice for the laying down of a complete system of public tubular drainage over the whole of the densely populated portion of the metropolis, occupying an area of 24 square miles.

The estimated cost of the tunnel alone, however, through the particular portion of the Westminster district the consideration of the drainage of which by the Survey Committee appears to have provoked Mr Phillips's displeasure, would actually more than pay for the drainage of the whole area contemplated, engine-power included. Many questions will arise as to the possibility of accomplishing this tunnel, either in the time or for the estimate stated, being a work in which one man only could be employed at each fall at the same time; but it would be useless to enter upon the consideration of these points, for, granting them to be perfectly practicable, such a plan would serve only to retard rather than to advance the general improvement.

The inconvenience of conveying to one point the whole of the sewage of the metropolis, to be sent back again, was especially urged in the Sanitary Report of

1842, when one of the tunnel schemes was under consideration, and its fallacy pointed out; and I ventured myself to advert to the same point in my Report to the Court in March of last year, on the more practicable scheme of the Great London Drainage Company. Mr Phillips, however, says: "An important feature in this plan is, that the sewage may be raised and disposed of at any point or points of the tunnel, where it could be profitably applied for agricultural purposes at any season of the year," but in the very next paragraph asserts that "The annual expenditure of maintenance of machinery, with the staff of engineers at each of the numerous stations, required by that system"—the system which he opposes—"will, with the one exception of the engine at the outlet, be entirely saved."

What he himself proposes as an important feature of his own plan would appear, therefore, to be a serious defect in the other, and the annual expenditure for numerous stations in the latter case would be all saved in the former, although the liquid may be raised at any points of the tunnel from 100 feet greater depth.

I venture to submit that, on full examination of this scheme, it would be difficult to believe that any one holding the appointment of Chief Surveyor to the Metropolitan Commission of Sewers had really been serious in laying it before the Court, had not the previous labours of that officer sufficiently exemplified the unsettled character of the principles upon which he acts, and of which this plan is but the crowning feature; and I believe that the time has now come when, for the security of the service, it becomes an absolute duty to lay the main facts of the case briefly before the Commissioners.

When, in January of last year, the Court ordered a Report from me on the drainage of Westminster, Mr Phillips having recently, under the old Commission, prepared a plan with the same object, it was considered only fair towards him that he should have an opportunity of bringing it forward, and he was subsequently directed, therefore, to report also on the same subject.

Mr Phillips's original plan was for a large outlet sewer, discharging into the Thames at Richmond terrace, and laid on a dead level, with a series of flushing gates at short intervals. A description of this plan was laid before the Sanitary Committee in the latter part of 1847. In February 1848 he, however, brings forward, instead of this, a totally different project, in which power is proposed to be employed, but by which no single advantage of the application of power is obtained, beyond that of a continuous discharge, which he had hitherto asserted to be unnecessary.

This plan was not only at variance with his former project, with his own expressed opinions, and with his evidence before the Sanitary Commission, but I submit that it was in most respects extremely faulty.

The cost was nearly double that for which it will be found that an efficient system can be carried out. The main gradients consisted of 1 in 1000 and 1 in 1250, when they might have had four or five times those inclinations, without going deeper into the soil than he himself proposed. An expensive system of

flushing was perpetuated for the removal of the deposits, which would thus intermittently accumulate, but for which, I submit, there was not the slightest necessity; and although the sewage was pumped up a certain height for discharge, a second pumping establishment was necessary to apply it to agriculture, and to avoid the pollution of the river. Upon this point, however, Mr Phillips says in his Report, among other remarks on the same subject, that "In order to prevent the common run of the sewage of the several districts under the control of the Court of Sewers for Westminster from discharging into and polluting the river, and that it may be conveyed away and used for agricultural purposes, I propose that a conduit should be built at the entire expense of the Metropolitan Sewage Manure Company;" yet in his recent letter he asserts, of the plan which was identical with his own in this respect, that it "cannot prevent the pollution of the river, which can only be completely protected from each day's accumulations by means of a tunnel sewer."

He asserts, moreover, "That the discharge of the sewage must, especially in rainy weather, be ultimately into the Thames." But this is a fact only to a very limited degree in the plan which he condemns, while in the tunnel scheme, which he now proposes, there would be no security whatever, in times even of the smallest rain, against the pollution of the river, with a vast amount of filth, for the tunnel would be adequate only to the sewage in fine weather, without even any calculation for the extension of the metropolis or for an increased supply of water.

Although Mr Phillips now lays much stress upon a tunnel sewer, it was only in March of last year that in a report with Mr Roe on the tunnel plan of the Great London Drainage Company he says, "A plan we have in contemplation to propose does not confine the distribution of the sewage to two lateral lines only, but divides it in such manner and in such portions as seem best, and we only wait the completion of the general survey and levels to lay the plan before you."

With regard to the survey, Mr Phillips had previously stated in evidence, among other strong expressions on the subject, that "Going on with works in towns without the plans is going on wasting money. I find it impossible to proceed a single step with safety and confidence without a complete survey and plan of the locality requiring to be improved." Yet for works which of all others would require the most accurate information as to the surface, he now says, "They stand independently, as regards their immediate execution, of the Ordnance Survey (which is merely a superficial work), or any other preliminaries, and require but a few weeks of levelling and boring preparatory to the actual commencement of the work."

With regard to the plan which Mr Phillips condemns as "wholly impracticable, and unworthy of the objects which should be kept in view for the perfect drainage of this great metropolis," I beg permission also to say a few words.

I believe it will be admitted by all parties who have considered this important question, that the three great evils of the old system are—1st. The want of depth of outfall, whence arise deficiency of inclination, intermittent drainage, and foul

deposits. 2nd. The unnecessarily large dimensions of the sewers. And, 3rd. The pollution of the Thames with the refuse, which, if properly applied, would become a source of great revenue.

A deeper outfall may, no doubt, be obtained to any extent, by a tunnel sewer; but in the adoption of artificial outfalls, from which the refuse has to be raised by power, the necessity no longer exists of fixing them along the valley line, and the tunnel, therefore, becomes, both as to extent of work and current outlay, an extravagant waste of money. The opportunity is afforded of placing them at such points as would be most convenient for conveying the liquid to the surrounding agricultural districts, and thus securing the utmost field for its application at the least cost. They may be fixed also at such points as would necessitate the least expenditure of power for the relief of the district, and the distribution of the liquid, and thus, on the table lands and elevated flat districts, where miles of sewer now exist with most inadequate inclinations, outfalls may be determined upon, and any desirable amount of fall procured, even a hundred feet and more above the valley.

Further than this, it will, I conceive, be admitted also that in draining to a given depth, the shortest lengths and greatest inclinations will be obtained by draining to a point *within* a district, rather than by draining to any point outside of it, and thus the smallest dimensions of the drains, and the greatest efficiency of action, will be secured at the least cost.

The Committee cannot fail to perceive that there is nothing new in all this, nor anything speculative or experimental in the application of such principles. They were laid down and fully discussed in the course of the original sanitary inquiry in 1842, and although plans for carrying them out were given in my evidence before the Metropolitan Sanitary Commission, and subsequently in the Report on the Drainage of Westminster which Mr Phillips condemns, they are of that obvious character, that I regret extremely that they should have assumed the appearance of a novel system, or that any impression should have gone forth that I either make any special claim of merit, or that any is due, for having methodised them, or aided in their development.

When the Survey Committee recently decided on considering the subject of the drainage of Westminster, which had awaited the preparation of the ordnance and subterranean surveys, thinking it desirable that the officers should be agreed on the plan to be recommended, in order that the service might not be impeded by the consideration of two plans so opposed to each other, I proposed to Mr Phillips that we should discuss the subject ourselves, with the view of determining the points which we should be mutually prepared to lay before the Committee for their consideration. He then professed himself willing to give up the plan which he had proposed in February of last year (his second plan, the first having already been given up), stating, that although he considered it the best adapted for the purpose at that time, subsequent experience had modified his views. On two or three occa-

sions, therefore, since, Mr Phillips has entered with me into the consideration of the plan which I had prepared, discussing, and at length fully agreeing upon that feature of it which would admit of most consideration, namely, the method of conveying the sewage from the centre outfall to the engine establishment. Those meetings have taken place in the present month, and, on the last occasion, among the heads of agreement between us, on general principles, the following were noted down at the time: "That the drainage should be arranged or intercepted at different altitudes, so as to prevent its discharge into the lower districts, and that it should be so laid out that it might flow from such districts to lower agricultural districts by gravitation, where practicable, whereby economy of works and proportionate saving of power would be secured."

Immediately on the request of the Survey Committee that I should prepare plans and estimates for their consideration, I had communicated the fact to Mr Phillips, and he had recommended to me a draughtsman for the preparation of the drawings; yet on the 21st inst., without the slightest intimation on the subject, he addresses a letter to the Commissioners entirely condemnatory of the plan which he had only a few days before approved, and proposes in its stead a scheme not only at variance with the principles which he had professed during the previous week, but embodying a flat contradiction to everything that he had done before, and being still further in error.

Whether these extravagant variations may be the result of impulse, rather than incompetency—whether these repeated breaches of faith with myself, for I can call them nothing else, may be the result of any personal feeling, matters but little; but I cannot conceal from the Committee that I have no longer any confidence that our continuing to work together can result in any benefit to the public service.

It is not for me to step forward in justification of the Court, but this uncalled-for proposition of Mr Phillips is brought forward amidst many unwarrantable expressions as to the course which has been pursued by them, and accompanied by an encouragement of public dissatisfaction and a direct perversion of a statement in Court, which he well knew was intended to bear a totally different meaning to that which he has chosen to put upon it.

He says that this statement as to the 3-feet pipe "is calculated to bring the Commission into ridicule, and to destroy public confidence both in the Court and its advisers;" but I would submit whether the whole course of conduct of their Chief Surveyor is not much more calculated to produce this result.

As an officer of the Court exerting his utmost energies to carry out their views, I dissent entirely from the statement that time has been wasted, or that labour has been misapplied.

The survey operations both of the surface and of the subterranean works will be a monument of usefulness, of themselves sufficient refutation of the charge; and the results already practically determined from the gaugings and expe-

riments in the reduction of the sizes of sewers, to the extent that three districts may now be efficiently drained at the cost at which one was improperly provided before, will form an epoch in the improvement of town drainage which no previous advance can equal. It was the truly great and economical course for the Commissioners, in the first instance, to arrive at a decision upon these points which would form the secure foundation for their future proceedings, and to consider well every step which they advanced, and it says but little in favour of an officer who can sneer at those labours as a limited attention to "minor matters," and who would desire in their stead that the Court should rush suddenly into ill-considered extravagancies such as this tunnel scheme.

It is folly to suppose that the mismanagement of ages can be rectified within a few months, precipitation would serve only to retard improvement; but the Commissioners have adopted that wiser course of laying a firm foundation for their labours, from which not only this metropolis but the country at large must reap the ultimate benefit; but for which, in the mean time, they are ridiculed by their Chief Surveyor, who sees no advantage in such a course.

HENRY AUSTIN,

Consulting Engineer.

28th June, 1849.

OBSERVATIONS

ON

MR PHILLIPS'S LETTER TO

THE COURT

OF THE 21st OF JUNE, 1849,

AS TO A

TUNNEL SEWER.

29TH JUNE, 1849.