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The Water Works.

ENGINEER'S OFFICE LOUISVILLE WATER COMPANY
LOUISVILLE, March 30, 1857.

To the Editors of the Louisville Courier:

I beg leave through the columns of your paper, over my own signature, to make a few explanations in regard to the Louisville water works. That done, my duty to the company and the public will have been discharged, and I will drop the subject in the public prints.

It can not be expected that the President, Directors, or Engineer of the Louisville water company, have either the time or inclination to enter into a fruitless newspaper controversy, with every anonymous writer, who misapprehends the motives which influence their conduct, and finds fault with what they have done. Still there are certain rumors in circulation, and insinuations thrown out by anonymous correspondents in some of the daily papers, which I feel it incumbent upon me in justification of the President, Board of Directors, and myself to set right before the public.

It has been stated on the streets, that I recommended certain sites for engine house and reservoir, and that the Board of Directors selected different ones. This is a mistake without the slightest foundation. The sites selected were, after the most careful surveys and thorough examinations, confidently recommended by me to be the best, and were unanimously adopted by the Board.

It has been frequently asked, why the land near the Blind Asylum was not selected as the site for the reservoir, it having been recommended by other Engineers as the most eligible point. If I have been correctly informed, no accurate instrumental measurement of distances, leveling of heights, and sounding of the river shore were ever made by any other Engineers. Yet there may have been; still I am not responsible for their acts or views, but only for my own. I was not employed by the Louisville water company to erect an engine house and reservoir, on certain designated localities. If I had been, my line of duty was a very plain one. But when I came to Louisville, Mr. Harris, the President of the company, informed me that the citizens of Louisville had determined to erect water works, and had voted a liberal subscription to build them; that for his part he had no preferences for persons or places, that there was the water power of the falls, and there were the surrounding heights, and sources of supply, and he wished me to make full and thorough examinations, careful surveys and estimates, and select the very best sites, and recommend the best plans calculated to insure the city of Louisville an ample, uninterrupted and reliable supply of pure water. These were all the instructions I ever received. Acting under them, and in a faithful discharge of my duty, I neither recommended the use of the water power of the falls, nor the selection of the land adjoining the Blind Asylum, as the site for the reservoir. The power to be used in elevating water, and the site selected for the reservoir, when their comparative advantages and disadvantages, as set forth in my report to the Board of Directors are fully understood, I am satisfied will meet the cordial approbation of the people of Louisville.

I am confident that the water power of the Falls cannot be relied upon as a certain and constant power to elevate an uninterrupted supply of water for the city of Louisville. To bring into requisition the aid of steam power, would involve in first outlay and keeping the machinery in proper repair to meet every contingency an expense far exceeding the cost of the works recommended by me.

The land adjoining the Blind Asylum is high enough for a reservoir, but is without a pure supply of water, within a reasonable and convenient distance. But inasmuch as efforts have been made through the press to fix the public mind upon that particular spot, it may be expected of me to give the reasons why I did not recommend it. Without going into minute details, I will mention only a few of the prominent facts which influenced me.

To place the Engine House below the mouth of Bear Grass Cut-off would require an inlet pipe to be laid under the stream between the main land and the Tow Head or Willow Bar. Through that Bar and beyond it some two hundred feet to reach deep and pure water, making an aggregate length of some eleven hundred feet of inlet pipe from the Engine House and pumps to the source of supply. I could not lose sight of the various casualties incidental to such a great length of inlet pipe, and the very many practical difficulties attending the cleaning it, from the fact of its being laid through a newly made and treacherous foundation, nor could I shut my eyes to the fact that Bear Grass creek discharges the accumulated filth of all the slaughter houses, butcher establishments, soap, glue and candle factories, situated upon it into the river above the mouth of the inlet pipe, making the most disgusting and poisonous compound and solution that the imagination could possibly conceive, contaminating and pointing with disease the whole source of supply. If I had disregarded these monitions, which were plain and palpable, and recommended this site for an Engine House, I should have exposed myself to the censure and just indignation of the whole community.

In casual conversation, I have said the lot adjoining the Blind Asylum, from its elevation and surface land, would be a most admirable place upon which to build a reservoir, but I never did say there was an eligible site for an Engine House and a supply of pure water within a convenient distance of it.

At the time I made the examinations and took soundings of the depth of water, the river was at its very lowest stage, and even then, the north side of Willow Bar was strewn with decaying hogs livers and other putrescent matter, and offal, from slaughter houses, the water was discolored with blood and slime for at least one hundred feet from the shore. When the creek is higher I am told the washings and impurities are carried out still farther into the channel of the river.

It has been asked, why the Engine House could not be placed above the mouth of Bear Grass Cut-off, and the Blind Asylum lot be used for a reservoir. The answer is, that owing to very shoal water, mud and sand bottom, and the great length of inlet pipe, which would have to be as long as in the other instance, the expense of coffer damming to lay the pipe would be much heavier, there would be very great practical difficulties in scouring out and keeping the pipe free from deposit of sediment and rubbish, there would be no landing for coal boats. Besides, the bank is so low that it would require a fill of some twenty feet or more to place the pumping engines above the usual floods. An inlet pipe of such great length, from the changes of the current and channel, from navigation, floating timber, and other causes is more or less liable to accident, and if anything should happen it during a high stage of water or a freeze of the river, it would be impossible to repair it, and the supply of water would be cut off. After water has once been introduced into a city, and it has come into general use in private families, hotels, machine shops, and manufactories, there is no computing the loss and inconvenience it would impose upon a community to be deprived of it for a single day. How much greater then would be the loss and inconvenience to be deprived of it for several weeks and perhaps for months?

The true policy is, to build the waterworks upon a sure, simple, common sense and perfectly reliable plan, irrespective of local or individual interests or feeling, to insure, as far as the perfection of machinery, the Ohio river, and surrounding circumstances will permit, a certain and constant supply of pure and wholesome water to the city. The site selected by me for engine house has at the lowest stage of the river a depth of at least twelve feet water within sixty feet of the shore. At this point the river has a clean gravel bed, washed by the current. The source of supply is as entirely free from drainage and other impurities as it is possible to obtain from the Ohio river. This site also commands an excellent flatboat landing for delivering coal at all seasons of the year. The site selected for a reservoir is a third of a mile nearer the engine house than the Blind Asylum lot, which secures a very great and permanent economy of the pumping power and fuel. It has also the advantage of nearly thirteen feet greater head. There can be no doubt entertained that the very best and most reliable character of waterworks can be built upon the plan recommended by me and adopted by the Board of Directors.

An article which appeared in the Journal several days since, signed by quite a number of gentlemen, directs the attention of the public and the water company to the application of the water power of the falls to waterworks purposes. I have been told that the names signed to that article are those of very respectable gentlemen, and feeling disposed to treat all such, with due courtesy, and give to the opinion of every citizen a respectful and impartial consideration, I will say to those gentlemen that the power of the falls had not escaped my attention. I have given it, in all its phases, a careful examination, and am well satisfied that its application to the intended purpose, will be much more expensive and far less reliable than the plan of works submitted by me and adopted by the Board of Directors.

To speak of the application of the water power of the falls, in general terms, is far too indefinite to form the basis of an estimate. I have declined its use for the following reasons:

First. Because the source of supply will be rendered impure by the discharges from Beargrass and by the filthy offal and drainage of the city.

Second. Because, for a considerable period every year no power can be derived from the falls, from the fact that the greatest head is but 24 feet; and the rise below the falls exceeds that at the head, as 3 is to 1 or nearly so, at a very ordinary high rise of water, the river would back up and submerge the pump house and machinery. The eddy or dead water thus produced during a very high rise would effectually destroy the head and current, and of course the motive power and cut off the supply of water to the city.

Third. Because the water power required cannot be taken from the canal without interrupting navigation. The canal commissioners upon no consideration could, if they were so disposed, make any arrangement to furnish an unvarying water power from the canal. During the last summer there were three months suspension of navigation, when no water was passing through the canal. This often happens.

Fourth. Because the three items of constructing a new race or canal from the head to the foot of the falls, right of way, and laying a 30 inch pump main or pipe from the pump house to the nearest elevated ground above the city, a distance of over five miles, would be so enormously expensive as to far exceed the entire amount voted by the citizens to build the water works, and even then the water would be impure and the supply partial and interrupted.

Fifth. Because the deposit of mud and every kind of rubbish, to say nothing of the filth, is so great below the falls, in consequence of the eddy, as to seriously obstruct the passage of the water through the strainer and inlet pipe to the pumps, and when once it, would clog and cut the valves of the pumps and very soon render them inoperative and useless.

Sixth. Because such water works would be inefficient and unreliable, and could not be rendered

certain without the aid of steam power, which would add very considerably to the cost and complication of the works in their construction, as well as in running and keeping them in proper repair.

Seventh. Because assuming the head of the reservoir above the city to be 145 feet above low water mark, it would require an additional lift of 24 feet below the falls or 169 feet to attain the same altitude, which would demand an immense volume of water to perform this service, and involve a corresponding expense in the construction of the works and keeping them in proper action and repair.

Eighth. Because, in addition to the enormous outlay necessary to construct the whole works below the falls, in order to keep up a constant and reliable supply it would be necessary to add a steam engine to work the pumps, which would not only complicate the works very much, but would also devolve upon the company the expense of two sets of hands to meet the contingencies of high water and want of head. Steam engines will rust out from non-use faster than they will wear out when in active and continued service.

Ninth. Because I know that a simple, plain, common sense plan for water works is far cheaper than a complicated one, requiring two sets of motors, and far more reliable and durable.

Tenth. Because no city in the whole civilized world, up to this date, has ever shown herself so regardless of the cleanliness and health of her citizens as to foist upon them the concentrated filth from slaughter houses, pork establishments, candle and soap factories, together with the entire drainage and sewerage of the city. And I did not think that Louisville was emulous of setting such a precedent. It may be said that water purifies itself in a given distance, which as a general proposition is admitted; but not in the short distance of its passage from the city to the source of supply, for the water in the canal has been known to be discolored with blood from the pork houses.

These objections could be carried to an almost indefinite number, but it is not my purpose to enumerate any more. What I have urged I know will strike the common sense of every citizen, and each one is clearly demonstrated.

If there is in this whole city of Louisville a respectable gentleman who does not understand and fully comprehend the force of my objections, and wants information, if he will call at my office I will take great pleasure in going into detailed explanations and estimates, to convince him that my objections are well founded and unanswerable. I cannot go into the public prints again.

In several of the anonymous articles which have appeared in the public prints I am charged with utter ignorance of Hydraulics and Hydrostatics. This is a very grave charge against one professing to be a water works engineer, and coming from persons utterly unacquainted with my qualifications, to say the least is unkind. I did not seek my present position. It sought me. I have not pretended to any very great attainments, or attempted to herald my own praises. I am but too conscious of my own failings and shortcomings. For the last twelve years, the very flower of my youth and manhood, I have devoted to planning, remodeling, and constructing water works. I have devoted my attention and study to water as well as steam for the motive powers. My research has not been bounded by the limits of my own country, but I have visited all Europe, and there is not a water works of any importance in the world the dimensions and plan of which I have not accurately drawn to scale, which I now have in my office. Still, after all this, I am fully apprized of my very many deficiencies, and sincerely wish my qualifications were greater. What I have done as a water works engineer and builder is before the world. My works speak for themselves. I could not hide their faults if I would. It does not become me to speak of their merits.

This much, however, I will say to the citizens of Louisville, that my whole ambition, skill and energy are centered in their work, and if I am permitted to progress upon the plans I have recommended, and which have been adopted by the Board of Directors, I feel certain will produce a water works as reliable and cheap as any in this country, and when finished, that neither they nor I will have any just cause to be ashamed of them.

T. R. SCOWDEN,
Chief Engineer Louisville Water Company.

N. B. Not satisfied with my own surveys and estimates, and the inferences and conclusions deduced from them, I visited Mr. E. Lockhart, the very gentlemanly and intelligent Superintendent of the canal, and propounded certain questions to him, which, with the answers given, I publish below as fully confirmatory of the views I have expressed above.

Ques. How much head or perpendicular fall is there between the head and foot of the Ohio Falls?
Ans. About 24 feet.

Ques. How much does the river rise below the falls for every foot above the falls?
Ans. About 3 feet rise below the falls for every foot above the falls.

Ques. Could any water from the canal be spared as power to propel machinery of any kind? If any, how much could be spared 12 hours every day to drive water works machinery?
Ans. It would be utterly out of the question to spare any water from the canal for such purposes.

Ques. Does it ever happen that there is an insufficient head of water on the falls to create any considerable power?
Ans. Yes; it often happens that the head afforded by the falls or canal is entirely insufficient when there is not more than one or two feet head in the canal.

Ques. From your observation and experience, how many days in each year are there that the canal or falls does not, in your opinion, afford power to drive water works machinery?
Ans. About sixty days every year on an average.

Ans. About sixty days every year on an average.

Ques. Suppose the Canal Commissioners or General Government would rent water from the canal for power to drive machinery, let the quantity be ever so small, would it not sometimes happen from the contingency of extreme low water, repairs and cleaning out the canal or from sinking vessels in the same become necessary to draw off the water, and that power could not be furnished for any purpose whatever?
Ans. Yes, this often is the case; this last reason the water was shut off from the canal nearly three months.

Ques. Do you consider it possible, by any mechanical device or water motor, to maintain a constant power and supply of water for the city of Louisville from the Falls, without the aid of a steam engine as a substitute for water power during high stages of the river?
Ans. I do not. I know it cannot be done. I have no confidence in the resources of the Falls to obtain a constant and reliable power for any purpose.

Ques. Could you state any practical difficulties not mentioned likely to occur in taking a supply of water near the foot of the Falls for distribution through the city?
Ans. Yes. Speaking from my own experience with the canal, I apprehend there would be great difficulty encountered from the deposit of mud made by the eddy below the Falls, which is such, that the lower lock of the canal is filled with mud to the depth of ten and twelve feet after high water.

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