

FAIRMOUNT DAM AND WATER WORKS,
PHILADELPHIA.

[The following statement prepared by the late Thomas Gilpin, in 1852, gives a detailed account as to who first proposed building a dam and erecting water works on the Schuylkill river at Fairmount, the main source of water supply for the city of Philadelphia for many years and an attractive resort of its citizens. The dam is still in use, but the old pumping houses have been dismantled and are now used for an aquarium; the reservoir is being reduced in height, on which is to be erected the Municipal Art Gallery.]

In the year 1817—I believe in the winter; Joseph S. Lewis called on me to consult me respecting an idea he had, for using a water power on the river Schuylkill, to be created by making a dam across it at Fairmount to raise up the stream there, so as to take in the water level above the Falls, which was used for works erected by Josiah White and Joseph Gillingham for their factory,—he told me, he could purchase their interest in the mill seat for that purpose.

This became afterwards the subject of several conferences between us, in which I gave encouragement to the project,—but it required deliberation owing to its novelty and magnitude.

Jos. S. Lewis stated to me, that he preferred the employment of water power to that of steam; that their steam power was not sufficient, and had become enormously expensive from the high price and scarcity of wood—I think he said that the cost of the steam fuel was then between thirty and thirty-five thousand dollars a year, with an increasing requisition upon it. The Coal Mines in Pennsylvania had not then been discovered or opened or the coal brought to Market under any expectation of its usefulness or of an adequate supply.

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Our conversations on the subject were continued from his idea that I was well acquainted with employment of water powers in consequence of being interested in them for a long time—and particularly at our Mills on Brandywine Creek near Wilmington Delaware—these had an extensive reputation, from the Water power being used there more economically and to more advantage than common thro' the country—and after the several representations which had been made to him respecting this, he considered the plan to be a suitable one to introduce at Fairmount.

These Mills had been in operation upon an improved construction and application of the water for more than ten years—they differed from those in common use by the water being let upon the wheels near to the level of its surface—and then the power obtained from its descending weight—it was not let into the wheels under the pressure of a head to cause an impulsive force—in this way, the water-wheels contained a greater body of water—moved much slower and were steadier—and were more effective. This plan had been originated after many experiments by John Smeaton, a very celebrated Millwright in England, who was employed largely in Government works—whose writings on his experiments had come to this country, and Joseph S. Lewis had obtained them from the Philadelphia Library. As the construction of a Mill and the best use of a water power was at all times a considerable operation both of skill and expense—science and experience were required to test the value of the operation, and it was some time before a new principle could be credited and adopted.

Owing to the Mills at Brandywine requiring heavy and permanent work, the movement of the machinery on the old plan with the use of the water on the wheels by impulse, had caused it to give way for want of steadiness and strength—in the meantime I had at-

tended to the English improvements—and after considerable enquiry I found that an English Millwright had come over and settled near Newark, New Jersey, previously to the year 1808, who was acquainted with this mode of applying water—I went on immediately to consult him about it, and found he fully understood it.

This person was Thomas Oakes, afterwards so well known by his works on the Schuylkill River, both at Fairmount and as Engineer to the Schuylkill Navigation Company. We with his partner Drury Broomley, had settled at Bloomfield, near Paterson, New Jersey, where they had met with some employment.

Both of them were well acquainted with their profession and the principles for the proper use of water power, particularly Thomas Oakes, who had studied, and practised under the experiments of John Smeaton with whom he had been acquainted in England, and he became the planner and engineer in their business here.

In consequence of this, my brother Joshua Gilpin and myself, owning the mills and water powers on an estate at Brandywine, had our mills and machinery rebuilt by Thomas Oakes. His first work there, was to put in the works of the original old mill, in 1808, and finding this to answer all our expectations we constructed there three other mills on the same principle in 1816; all of which answered well and required no repairs for many years. The first mill was in operation from 1808 to 1825—when it was destroyed by fire. The machinery had never required renewal, and the water-wheels and machinery in the new mills continued to go in the same substantial manner, tho' much injured two times by very severe river freshets, until the year 1837.

It was from the repute and good character of this machinery, that Joseph S. Lewis, who knew of it well, applied to me to give him information on the subject

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of water powers, and he was the more particularly interested about them after I told him we had connected with them a powerful iron forcing pump which had been in constant operation night and day thro' all the year, and raised more than 200,000 gallons of water per day, for the six Paper engines, and the Paper machine, and this was fully one-tenth part of the quantity then used at Philadelphia for all the city purposes.

As I thought it would be better that the Watering Committee should have every opportunity to be satisfied on the subject; I invited all the gentlemen composing the same to visit the mills in order to see their construction and availability, and I stated to the Committee, that as our waterfall in use there, was about seven feet in height, it would correspond so nearly to the proposed water fall at Fairmount that a similar calculation of machinery and wheels would answer.

In conformity to this, an appointment was made, and Joseph S. Lewis, Doctor Samuel Jackson, Benjamin Jones, and Frederick Graff came down to Wilmington, in their carriage, and I received them the next morning at the mills.

These Gentlemen remained with me during the day and examined all the works, particularly the water-wheels and their performance, as well as the application of the water power upon them; the water pumping; the quantity of water raised and delivered into a reservoir in the mill, but which was connected with a large Settling-pond which held near a million of gallons, the movement and substantiality of the work, and they were all satisfied of its efficiency.

In the course of the day Joseph S. Lewis told me, that the Committee had come to the conclusion to adopt the same plan for the Water-Works at Philadelphia, with the same improvements and workmanship; and I replied to them if they did so, and if Thomas Oakes could be obtained to construct them they would suc-

ceed; but if they employed anyone else in the country, I believed the work would prove a failure, because I did not think there was then any other person to whom such an operation ought to be entrusted.

In consequence of this, it was concluded by the Committee that I should write to Thomas Oakes to come on at once which I did; and he came to Philadelphia where I introduced him to Joseph S. Lewis at his house in Second Street, where our discussion took place the afternoon of the days after he arrived.

Joseph S. Lewis said that his engagements would prevent him from going out the next day to Fairmount as he had desired to do to go over the ground; but wanted no time to be lost because advantage ought to be taken of the season, and it was important to make a report to the Council without delay. At his request I concluded to go with Thomas Oakes the next day out to the position of the present Water Works where he sounded the river from the City side to the western side. He found the depth of the river to be very considerable on the City side, the current having set the channel of the river to the eastward; I think it was about 30 feet before a solid bottom could be found; but the water became quite shoal with a rock bottom on the western side.

Thomas Oakes concluded it would therefore not answer well to build a crib dam of logs and stones up to the City side because it would be too high, and in too deep water, he therefore should advise that an earthen mold bank or pier should be run out for about four hundred feet to go over the deep part of the river, and then to commence with a crib dam to go over to the other side grounding it upon the rock bottom, but as it would not be safe to contract the stream because the high water of the river freshets would have to be passed off, he would propose that the water fall part of the dam should be run diagonally across the

river to allow at least as much discharging surface as the average part of the stream. I think the cataract part of the dam he allowed to be about 1200 feet.

In addition to the plan or place for the dam, Thomas Oakes was required to give his opinion in general respecting the eligibility of the measure, and it was thought best to make a reply to the proposal under the following heads:—

1. Whether sufficient water power could be obtained from the flow of the Schuylkill River with a fall of 7. to 9. feet to raise the supply of water 100 feet high into the Reservoir on Fairmount for the city purposes, using the water fall height from the tail water of Peter Robeson's Mills, as the average level of the tides.

2. Whether if there had existed at Fairmount such a rock reef obstruction as existed at the Falls of Schuylkill it would not be eligible to use it for the purpose; and

3. That as there was not a reef of rocks at Fairmount, whether an artificial one, or an obstruction or dam could not be made there to answer the same purpose.

Thomas Oakes, after due consideration made up his mind affirmatively, and in favor of all these points; and at his request I drew up for him his report accordingly. This report, answering all these ideas, and covering the whole ground was handed by him to Joseph S. Lewis, and will be found to be the substance of the Report of the Watering Committee to the Council.

The importance of the subject engaged all his attention and Thomas Oakes wrote for his partner Drury Broomley, who came on and they were engaged soon after by the corporation to do the work, and to lay out the site for the dam and mills according to his plan. The position was for the location for eight mills to use all the water power, the guard docks, forebay, basin &c., but only one or two of the water powers

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were at first put into use by him; the remaining water powers were for use for the additional mills as they were required.

Thomas Oakes remained at these works till the principle and movement were fully tested by the wheels being put into operation but he had soon after to leave them to be executed more particularly by his partner Drury Broomley for he was chosen to be Engineer for the Schuylkill Navigation Company in the month of March 1819. First under the presidency of Cadwalader Evans, and afterwards under that of Joseph S. Lewis, when he had afterwards the erection and superintendency of all the works on the river, where his judgment and practical efficiency were always relied upon; and his salary was increased from time to time in consideration of his services, by the voluntary consideration of his employers. His death was occasioned by too great an exposure to the summer heat, in the faithful devotion to his business.

It was from very frequent intercourse and observation I had from time to time, as well as from the representation of everyone I conversed with; that I was satisfied the proposal to raise the water supply from the Schuylkill River by the present water works at Fairmount, originated with Joseph S. Lewis; that he was the first mover and projector of them, and as the conception and enterprise was bold and novel, he had great difficulty afterwards to convince others of their advantage, and get them carried into effect.

I was occasionally at the Fairmount water-works where conferences took place between the Watering Committee or the members composing it; and some of the persons under contract to do the material part of the work; and attended to their explanation, about it particularly with Ariel Cooley when building the dam across the river, as well as the progress of the mill works, and on all these occasions the opinion and de-

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cision which was required as a principal was very much controlled by Joseph S. Lewis, tho' for the practical planning of such work as the board could not be expected to be acquainted with, he depended chiefly upon Thomas Oakes. The work of the dam was from the nature difficult to be reduced to a descriptive contract, but the progress of the work was to be approved by him, both as it related to the Fairmount Water works and to the Schuylkill Navigation Company in its material workmanship and time.

In confirmation of this statement and of the ideas of the Corporation, and of his friends at the time of the decease of Joseph S. Lewis, I refer to the adjoining memorial respecting this enterprise. It is engraved on the panel on the north side of the marble monument placed over his tomb in the Laurel Hill Cemetery, which stands in a conspicuous situation on a hill, open to the view of the Schuylkill River—to the truth of which inscription, his cotemporaries can bear testimony.

On the panel on the south side of the monument, and fronting the river view, there is cut in relief the water front picture of the Fairmount Water Works, and, however, meritorious other persons were, in carrying out the further extension of the works and in the labor of laying out the beautiful grounds around the reservoirs; the bold conception of the enterprise in the origin of the Water Works at Fairmount is due to Joseph S. Lewis.

Thomas Gilpin.

Philadelphia 3 April, 1852.

A correspondent, in noticing the efforts of the various citizens who were instrumental in building up our Fairmount Water Works, notices, in warm terms, the conduct of the late Joseph S. Lewis, and begs us to transfer to our columns, the following inscription on the monument to his memory, as erected at Laurel Hill.

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“Erected, by Grateful Fellow-Citizens and Friends,
To the Memory of

JOSEPH S. LEWIS,

Who long and faithfully presided over
The Schuylkill Navigation Company,
And the Fairmount Water Works.

He originated the latter, and by his persevering and disinterested exertions, brought to a completion that great Public Work, which, for magnificence of conception, simplicity and solidity of execution, and unmixed character of beneficence, is worthy of being placed amongst the noblest achievements of enlightened Civic Enterprise. His remains fitly repose in this spot, on the River rendered by his labors a source of Prosperity, Health and Safety to his Native City.

Born, May 9th, 1778.

Died, March 13th, 1836.”