THE SODOM AND BOG BROOK RESERVOIRS IN THE CROTON BASIN, N. Y.

It is well known that for some time past New York City has been suffering from a scarcity of water. The new aqueduct, after a period of nearly six years, is now complete. Unforeseen delays increased the time occupied in its construction to more than double the anticipated period. The present watershed capacity in the Croton region, at least during the past two years, has been sufficient to insure a largely increased supply if the new conduit had been put in operation. The old aqueduct, with a maximum capacity per day of about 100 million gallons of water, has not been able to bring to the city more than one-third of the Croton supply. A long series of observations shows that over 276 millions of gallons go to waste on a daily average over the dam. This, of course, is not a constant flow; long periods will elapse when not a drop will escape, while a much larger amount than this will go to waste in a single day during the spring or fall after wet weather. It is, therefore, obvious that additional storage is needed. The water must be impounded during periods of freshet to be delivered during the dry period. If this is done, the capacity of the new aqueduct will be more available. It is placed at 318 million gallons per day to Jerome Park. Of this amount 68 millions are intended for the annexed district, the rest for Manhattan Island proper.

We illustrate in our present issue the work in progress in the Croton Basin upon what is known as Double Reservoir I. This includes the Sodom dam upon the east branch of the Croton River and adjoining it the Bog Brook reservoir upon the branch of the Croton River bearing that name. These two structures will form basins of a capacity of 9,000 millions of gallons. The capacity of the existing reservoirs is 8,700 millions of gallons. Thus, when the Sodom and Bog Brook reservoirs come into use, the reserve of water will be doubled.

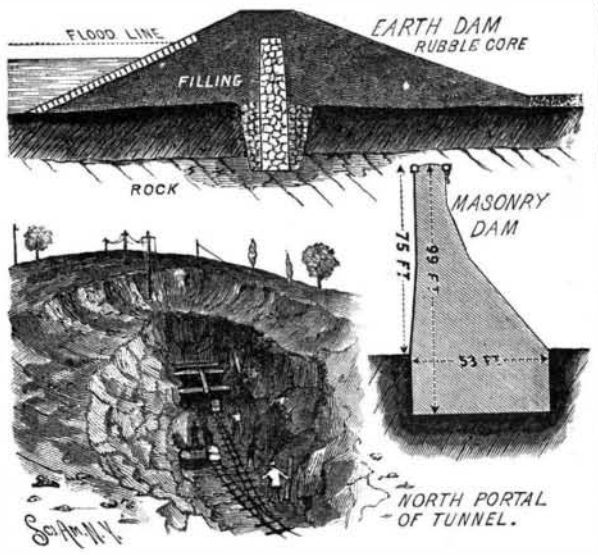
The Sodom dam is a masonry structure, as regards the dam proper, while to one side is the spillway, which is formed upon an earthwork dam. The general dimensions of the masonry dam are as follows: height, 88 ft.; length, 500 ft.; width on top, 12 ft.; width on the bottom, 47 ft. The spillway is 10 ft. below the crest level of the dam, and is 500 ft. wide.

Adjacent to the Sodom dams, which, it will be observed, inclose a single reservoir, are the two Bog Brook dams, also forming but a single reservoir. The general dimensions of the shortest one of these, which is sharply curved, and which may be termed the gate house dam, is as follows: Height, 65 ft.; length, 1,300 ft. It is for most of its length an earthwork dam with masonry core. The core of this dam is 4 ft. wide at the top and 10 ft. wide at the bottom, varying in height with the ground. On the reservoir side the slope of the dam is two to one; on the outside, two and one-half to one. It is 25 ft. wide at the top, and 308 ft. wide at maximum on bottom, with a maximum height as stated above. The other dam, which is only slightly curved, is 1,925 ft. long, is all earthwork with rubble core and is paved on the water side. On top it is 12 ft. wide, maximum at bottom 90 ft.; maximum height about 18 ft.; the core is 2 ft. 6 in. wide at the top and 4 ft. at the bottom. The dam slopes on both sides with a batter of two to one. Both are paved on the water side. In the construction of all the earthwork dams, each 6 in. layer of earth was watered and rolled in place, so as to secure the most compact kind of work.

The two reservoirs communicate with each other by a connecting tunnel; it follows a straight line, and is circular in section, with a diameter of 10 ft. It is 1,800 ft. long. Where it connects with the reservoirs the circle is changed into an ellipse, a uniform area being preserved. It is lined with three to four courses of bricks, and is buttressed and supported by rubble masonry in accordance with the requirements of the ground. It is provided with a single gate, so that the reservoirs can be disconnected when necessary. The Bog Brook reservoir has no spillway, the one spillway being relied on for both reservoirs.

While thus connected with each other, independent gate houses and outlets are supplied for both reservoirs. The Sodom dam has three 48 inch outlets placed at surface, high and low level. The lowest outlet is at the bottom. The next is 30 ft. above it, and the surface, outlet is 59 ft. above the bottom. These pipes are embedded in the masonry, and are carried through the dam in this way. They are provided with permanent valves, and there are stop plank grooves in the masonry, forming the sides of the valve chambers or wells for the introduction of temporary wooden barricades in case of repairs or other necessity. Leaving the valve wells, two 48 in. pipes are carried out to a point beyond the base of the dam, and are for this portion of their course supplemented by five 12 in. pipes. Some distance below the dam these pipes terminate and deliver their water in a fountain or geyser. The object of this is to commence the work of aerating the water for the purpose of purification. It is well known that oxygen destroys much of the organic impurity of water, and the geyser delivery is designed to utilize this property of the oxygen of the air. The Bog Brook reservoir for outlet has two 36 in. pipes. These are carried through a tunnel of about 10 ft. general height, and passing out beyond the base of the dam form a geyser.

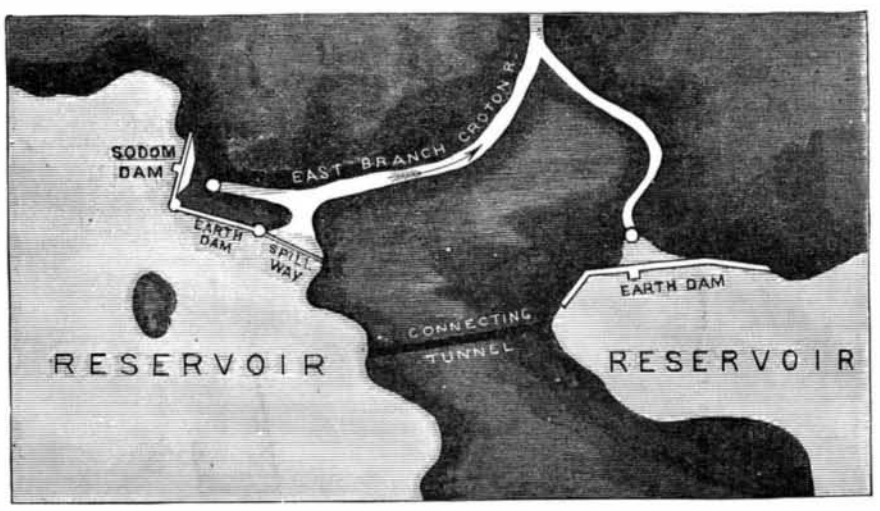
The functions of this double reservoir are clear. During periods of great precipitation of rain, the outlet valves will be closed and water will accumulate until it begins to pass over the spillway; from the spillway it will run by the natural water course down to the Croton Lake, so that the latter will receive its full and normal supply. In periods of dry weather, on the other hand, when the level of the Croton Lake tends to fall, and when no water passes over the spillway of the Croton Lake dam, the outlet valves of Sodom or of Bog Brook reservoirs can be opened. Water will pass out of the geysers, and by the same natural water courses will reach the Croton Lake and replenish it.



DETAILS OF SODOM DAM AND TUNNEL.

The new Central Park reservoir has a capacity of 1,000 millions of gallons. The double reservoir we are just describing has nine times this capacity, or will hold nearly three months' supply of water. It will be seen, therefore, that it will be a very important auxiliary to the water supply of this city, and that it will perform a specially important work in conjunction with the opening of the new aqueduct. It is definitely certain that the year 1891 will see us far removed from all danger of a water famine, not only on account of the new aqueduct, but also on account of the increased storage capacity made in the Croton basin by the double reservoir just described.

One of the illustrations on our first page shows how the reservoirs will appear when completed. The other one shows the present aspect of the work. One of the large pipes, it will be observed, is seen in use as a drainage conduit. Eventually it will be prolonged, and its end will be upturned in order to contribute to the geyser or aerating fountain. The small cut gives a good idea of how the two reservoirs are situated with respect to the line of the connecting tunnel.



SODOM AND BOG BROOK DOUBLE RESERVOIRS AND DAMS.

The Hairs of Your Head Numbered.

Some writer has said that the average number of hairs on the human scalp vary from ninety to one hundred and twenty thousand.

There are a good many heads about the office of this paper which would hardly bear out either statement. But that a single hair can support a weight of two ounces and is so elastic that it may be stretched to one-third of its entire length, and then regain its former size and condition, can be done, according to an assertion in the *Southern Critic*, by C. C. Benson.

Among the 'Phones.

During the recent meeting of the Editorial Association, in Boston, some interesting experiences were had by the members. The delegates and their friends accepted an invitation of the Boston Press Club to visit its rooms on Bosworth Street and listen to an exhibition of the wonders of the long distance telephone. Communication was established by the American Telephone and Telegraph Company between the club parlor and the company's exchange at 18 Cortlandt Street, New York A long distance telephone and a large number of hand 'phones were placed in the clubroom, and four courteous young men were placed by the company in charge of the exhibition. When the entertainment was begun, the parlors were filled with ladies and gentlemen wearing the badges of the association. The first feature was the transmission of music on the piano and cornet from the New York Exchange, 234 miles distant, the music being made easily audible to every person in the rooms. "Little Annie Rooney" was liberally applauded. So were some less popular but equally familiar airs. Sounds from a phonograph were also heard by means of the hand 'phones. Later the operators made connections with the Broadway Theater and the Casino New York, and Keith's Gaiety and Bijou, Boston; and snatches of popular operas were heard as distinctly as the cornet and piano music had been. The strum-strum of a banjo was not forgotten in the display of melody. That came from the telephone office in Newport, R. I., where they had a very expert strum-strummer at work. The exhibition was a revelation to many of the visitors, but it did not surprise them. Nothing surprises newspaper men.—*Mod. Light and Heat.*

An Automatic Chair.

A company is in course of formation, says *Money*, an English newspaper devoted to financial matters, and will make its appearance shortly, to acquire the business, patents, concessions, and stock in trade of the Patent Chair Contract Company, limited. The specialty is an invention which may truly be said to meet a long felt want. The seat of the chair is hinged at the rear, and in its normal position is folded up against the back, and cannot be pulled down. Upon dropping a penny into a small box affixed to the side of the chair, the fastening is unloosed and the seat can be pulled down for use, and the chair sat upon. When the occupier rises to quit the chair, the seat is automatically folded up to the back again by a spring, and the chair cannot be further used until another penny has been dropped into the box Should the occupier only wish to leave the chair temporarily, an umbrella, a stick, or a newspaper placed on the seat prevents it closing fast. Thus in parks, public gardens, or places of public entertainments, where seats have to be paid for, which is the custom abroad, the public can always help themselves to a seat without the unpleasantness of being watched and followed up by collectors.

The Preservation of Rolled Iron Plates from Corrosion.

Mr. T. P. Bruce Warren has communicated to the *Chemical News* some observations on the corrosion of boiler plates, which also bear upon other similar structures of sheet or plate iron. It is well known, as Mr. Warren remarks, that a rolled iron plate has a skin or surface which resists oxidation. If this skin is removed by scratching or filing, the new surface rusts rapidly on exposure to damp air. If a freshly rolled plate is cut, the surface remains intact, while the edges rust in a very short time. If the iron is immersed in dilute acid, the skin-coated surface resists the action more or less, while the cut edges are rapidly attacked. This difference Mr. Warren ascribes to the altered electrical relations of the surface—one being much more electro-positive than the other. Pitting of plates can be explained in the same way. The only remedy is the entire removal of the surface of the plate after rolling, which would result in the presentation of a uniform surface less likely to promote local chemical action. The utility of a magnet for determining inequalities in a rolled iron plate seems to Mr. Warren problematical; but the difference of potential between two plates when immersed in the same liquid, which might be observed by means of an electrometer, would reveal the existence of chemical or physical differences of structure that might be favorable to corrosion. Care must be taken to keep a boiler in an electro-negative condition, which is done by suspending inside it, in a manner to preserve perfect metallic contact, a lump or plate of zinc. Whenever a boiler so fitted is cleaned, and the zinc put back, the perfection of the metallic contact must be carefully seen to If an impure zinc is used, the surface dissolves, leaving a preponderance of lead, which puts the iron of the boiler into an electro-positive condition, and corrosion ensues.