A REPORT ON THE EXTENT AND CHARACTER OF THE DISTRICT SUPPLYING WATER TO THE CITY OF BROOKLYN

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A Report on the Extent and Character of the District Supplying Water to the City of Brooklyn by Theodore Weston

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THEODORE WESTON

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Trieste

Brooklyn Water Commissioners

A.

REPORT

ON THE

EXTENT AND CHARACTER OF THE DISTRICT SUPPLYING WATER

TO THE

CITY OF BROOKLYN.

BY

THEODORE WESTON, C. E.

WITH A

COMMUNICATION IN RELATION TO THE SAME,

FROM

JAMES P. KIRKWOOD, ESQ.

ENGINEER OF THE WORKS.

AND AN

ANALYSIS OF THE WATER OF THE JAMAICA RESERVOIR,

BY PROF. A. K. EATON, CHEMIST.

BROOKLYN, N. Y.
1861.

D. VAN NOSTRAND,
PUBLISHER.

REPORT.

Brooklyn Board of Water Commissioners,
May 10th, 1860.

A COMMUNICATION was received from the Chief Engineer, with a map of the drainage area of the streams from which the supply of the city is now arranged to be procured, together with two sheets of profiles, showing certain characteristics of the great water reservoir under the Hempstead Plains, and a report from Mr. T. Weston, explanatory of this drainage; also a report from Professor A. K. Eaton, showing a gradual improvement of the character of the water of Jamaica Pond during the first season, &c.

Referred to Messrs. Brevoort and Brush, with the power to print.

ENGINEER'S OFFICE, *May 9th*, 1860.

WILLIAM WALL, ESQ.,

Vice-President, &c.

SIR:—I submit herewith a map of the drainage area or water-shed of the streams from which the supply of the city of Brooklyn is now arranged to be procured, together with profiles, showing certain characteristics of the great water reservoir under the Hempstead Plains, and an interesting report from Mr. Weston, explanatory of this drainage.

In a note to my report on the gaugings of the different supplying streams (January, 1858), I estimated, from the map of Long Island, the drainage area referred to as comprising about thirty-four square miles.

The old map of Long Island, from which I made this measurement, was too general and indefinite in its character to furnish correct results of this kind; I therefore directed Mr. Weston, last Fall, to take advantage of the leisure which the stoppage of the mason-work on the conduit presented, to obtain a correct outline of the drainage-basin. To this he applied the conduit parties in December last, and the service has been performed by all concerned very satisfactorily.

Instead of 34 square miles of available watershed, as I had supposed from the old map, the correct survey shows an aggregate of 60¼ square miles connected with the streams which are now prepared for use, and 13 square miles of unapplied drainage area, belonging to Springfield Pond, and various small streams not available for pondage.

Of the average annual rain-fall falling upon any river-basin, a certain fraction finds its way into the channel of the stream, either directly upon the surface, or after percolation through the earth and strata underneath. Another fraction is consumed by evaporation and vegetation, and another fraction finds its way towards the sea by underground crevices and channels, and never escapes again to the surface.

This last fraction must be more than usually large on the Hempstead Plains basin, where the natural formation presents no rocks or clay to intercept the last-described portion of the rain-fall and force it to the surface, but, on the contrary, presents no obstacle to its descent seaward on the spaces of ground intervening between the various valleys, except the friction of the particles of sand, found in this case to be equal to a rate of descent of 12 feet to the mile.

It has long appeared to me that much of this

last portion of the reservoir water might be intercepted by underground drainage; but it might require these drains to be placed so low as to involve pumping to deliver the water into the conduit.

The water thus obtained is pure and limpid, and entirely free from the discoloration which attends, more or less, the water of the open streams. The subject, at some future time, will merit a closer study.

The water of some of the streams is sometimes found to be slightly brown in color. The Jamaica Pond water, when first used, was at times considerably tinted in this way; it is but little affected in this way now, though the evil can never, in my opinion, be entirely obviated until certain deposits of muck above the pond are either partially or wholly removed. The muck thrown out from Jamaica Pond was, during the first season, covered in spots with a white efflorescence of a bitter taste; and a similar salt was found deposited on the gravel at the water's edge of the upper end of the pond.

The pools of standing water outside of the pond, lying in contact with the muck spoil banks, had the same bitter taste.

I sent, at that time, specimens of the water of the pond, drawn from different points, and of these pools, to Prof. Eaton, chemist, for examination,

and submit herewith his report thereon. His report is very satisfactory, as showing a gradual improvement in the character of the water of Jamaica Pond during the first season, and a probability that the same depth of discoloration will not occur again.

To rid all the streams of the impurities referred to, and the tendency to discoloration growing out of the large deposit of muck in their channel-ways, will be a work of considerable time.

Within the limits of the different supply reservoirs, the muck has been entirely removed; but, above the reservoirs, nothing has been done as yet to separate the channels of the streams from the vegetable accumulation through which they flow.

At Jamaica Pond the discoloration can be readily traced to the cause suggested. When the pond is drawn down 12 or 18 inches, so that its surface water does not correspond with the surface of the bog or swamps above, the discoloration all but ceases; for the rapid flow of the water through a channel situated in the muck deposit seems to affect it but little, compared with its slow progress there when the surface of the water lies steeping over the surface of the bog.

At Jamaica Pond, the removal of the muck on Rider's Creek would tend much to the improvement of the water there; and the excavation of a wide