

# Chicago Drainage Canal.

## APPENDIX A—*Concluded.*

to enable the executive officers of the United States to act advisedly in the matter it is necessary, in the opinion of the board, not only that these measurements be taken, but that the money cost of restoring the navigable depths in channels and harbours be carefully estimated.

In this connection the board submits, without expression of opinion, an estimate prepared by Mr. Charles H. Keep, Secretary of the Lake Carriers' Association, of the commercial losses in carrying capacity of the lake fleet, should a reduction be made in lake levels of 1, 3 or 6 inches.

The board notices that the same peculiarity exhibited by the Niagara discharge curve is pointed out by Mr. Johnston as existing in the Morris, Ill., and South Branch Chicago River curves.

The board also notes Mr. Johnston's conclusions that :

Applying the reasoning to the St. Clair and Detroit Rivers, the value of the  $Q^1-Q$  may be taken from the diagrams illustrating the tables before described, the only uncertainty being as to the value of  $a$ . Suppose  $a$  to be a unity, and the mean depth 20 feet. Then  $Q^1-Q$  will equal something greater than 20,000 cubic feet per second.

This practically corresponds with the deductions made from the Niagara River observations.

So many uncertainties arise in the application of hydraulic formulas that the only way to ascertain the approximate discharge of these streams is to measure them for periods long enough to eliminate accidental fluctuations and to cover all stages.

While the navigable capacity of all harbours and channels on the Great Lakes below St. Mary's Falls will be injuriously affected by a diminution in depth, the navigability of the inner harbour of Chicago will be diminished also by the introduction of a current therein, which, in the present condition of the river, even with the minimum flow of 5,000 cubic feet per second, or 300,000 cubic feet per minute, is entirely inadmissible. The estimates of the effect of the drainage canal upon this harbour should also consider this element.

The Board of Trustees have not yet determined upon a plan of treatment of this navigable channel, and their plans may be such as may improve, impair or destroy its utility as a navigable river.

All of which is respectfully submitted.

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