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DEAR SIR:—

I have the honour to submit the following Report, bringing down to the present date the matters treated upon in my Report of 1860.

Great changes have taken place since that Report demonstrated the feasibility of improving the Ottawa and French Rivers into one of the greatest channels of commerce. What was then only a scientific discussion has now become a matter of great importance to two nations.

Including together the present exports from the basin of the Great Lakes, both in the United States and Canada, there is enough traffic in sight to warrant a large expenditure in opening a new route, if the conditions are such that the cost of transportation between the Lakes and the Ocean can be diminished. Canada alone does not at present furnish enough traffic. The Ottawa route must be treated as an international one.

Two remarkable changes have taken place during the last ten years, which have each resulted in greatly lessening the cost of water transportation; one, upon the Lakes, and the other between the North Atlantic ports of the United States.

The construction of the locks at the outlet of Lake Superior has developed a traffic vast in size, and differing from all others in the world, in that it enables vessels to get full cargoes in both directions during the whole season of open navigation.

The U. S. lake ports will all be deepened to 20 feet very soon. Steamers now carry cargoes of 6,000 tons of grain and iron ore eastward to South Chicago, Cleveland and Buffalo, and take back cargoes of coal to upper Lake ports. It is a well-known axiom that the larger the vessel the cheaper it can handle freight. These 6,000 ton steamers have carried grain from Chicago to Buffalo for $1\frac{3}{16}$ cts. per bushel, which is less than one half of one mill per ton-mile. Hence there has arisen a popular demand for ship canals of 20 or even 25 feet deep, from the Lakes to the Ocean. Even if such canals were built and could be used free of tolls, no such economy of transportation by large steamers could take place as in the open lakes.

The rate of speed of thirteen miles an hour would be reduced to five, as in the Suez Canal. Canal traffic would not give full cargoes in both directions, and more detention in port would be necessary than at Cleveland or Duluth where whole cargoes of 6,000 tons of coal or ore have been handled by machinery in less than one day. The large steamer is a very expensive machine, and if she were not able to make as many trips per season as she now does, much of her economy would be lost.

It does not now seem possible, except at a prohibitory cost, to deepen the Ottawa navigation to 20 feet, and fortunately it is not necessary.

The second change, which has resulted in lessening the cost of transportation between Atlantic ports, suggests the true method of improving the Ottawa.

Some ten years since all coal was carried between the shipping ports of Philadelphia and New York to other Atlantic ports, chiefly those of New England, in single collier steamers, at a cost of \$1.50 to \$1.75 per ton.

Now it is carried in tows of three or four large barges drawing from 16 to 18 feet of water, towed by a single powerful tug boat. This tug does not wait in port for coal to be loaded or unloaded, but each tug has many barges, and she picks up her tow of full or empty barges without detention, as a locomotive does cars. In this way many trips are made per season. The distance between Philadelphia and Boston and return is about 800 miles, and coal is now carried for an average of 75 cents per ton, which is nine-tenths of a mill per ton-mile.

This economy of transportation has increased the coal traffic to some twenty-five millions of tons annually, which is as great as the tonnage annually passing through the Detroit River. The use of these tows of barges is fast increasing upon the Upper Lakes.

All these facts have been clearly set forth by Maj. T. W. Symonds, U.S. Engineer Corps, in his admirable and exhaustive report to the U.S. Congress in 1897. He shows that if the Erie Canal were deepened to 11 feet and grain were carried in tows of barges of 1500 tons capacity, it could be carried from Chicago to New York, including reason