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THE PROPOSED SHIP CANAL FROM THE LAKES TO THE SEA.

It will be remembered that, under the River and Harbor Act of 1896, provision was made for a survey and estimates for a ship canal from the Great Lakes to the Hudson River at the point where it becomes navigable. The work was intrusted to Major Thomas W. Symons, Corps of Engineers, U. S. A., and his very able and exhaustive report has recently been made public. The subject is handled in an impartial and scientific manner, and in this respect is in refreshing contrast to much of the extravagant and misleading literature that has appeared on this subject.

Major Symons is of the opinion that a canal capable of transferring full sized ocean ships from the sea to the lakes and vice versa is not called for either by commercial or military considerations. Its cost would be prohibitive; not even on the most sanguine estimate would the receipts cover the interest on the outlay and the maintenance expenses; the deep sea ships, even if the canal were built, would not make much use of it, and the freight would be carried in a special type of barge which could just as well be accommodated in an enlarged and improved Erie Canal.

The report states at the outset that, to justify construction, the benefits to be derived from such a canal should be clearly shown to be suitably commensurate with its cost and the cost of maintenance and necessary improvements. Present and prospective conditions limit the depth of a ship canal to 20 feet. The canal should be entirely within United States territory, should terminate at a first class seaport and commercial and industrial center, so that home as well as export trade may reap the benefit. A ship canal by the St. Lawrence route to Montreal, or by the St. Lawrence-Champlain route to New York, does not, in the opinion of Major Symons, fulfill these conditions, and should not be considered by the United States.

The best route for a ship canal is by the Niagara River, Lake Ontario, Oswego, Oneida Lake and the Mohawk and Hudson Rivers. As to the advisability of bringing the deep sea vessels through to the lakes, it is stated that for the best economical results a special type of vessel is needed for the lakes, the canal and the ocean, and neither can replace the other without loss of efficiency. For economical transportation through a canal from the Great Lakes to the sea, special vessels differing from both the ocean and lake vessels are required. Two serviceable canals already exist between the Great Lakes and the Hudson River: the Erie Canal from Lake Erie and the Oswego-Erie Canal from Lake Ontario. These canals are being improved by the State of New York to such an extent that the capacity of the boats will be increased 70 per cent, and it will be possible to carry freight for about 60 per cent of the present cost.

It is estimated that the possible tributary tonnage of a ship canal would be 24,000,000 a year, of which 18,000,000 tons would be carried eastward and 6,000,000 tons westward. A ship canal to accommodate the present largest vessels on the lakes would cost \$200,000,000, and the cost of operation and maintenance would be about \$2,000,000 per year. Now the Erie Canal, after the present improvements have been carried out, will provide commercial advantages which to all intents and purposes will be equal to those which would be conferred by a ship canal. Moreover, if the Erie Canal were further improved by enlarging it so that it could accommodate 1500 ton barges, and the Mohawk River were to be canalized, such an improved canal, navigated by barges, would enable freight to be transported between the East and the West at a lower rate than could a ship canal navigated by the large lake or ocean steamers. Such an enlargement of the existing canal would cost only about one-fourth as much as the construction of a ship canal; and indeed, even if the ship canal were built, the business, for economic reasons, would be done, not in ocean bottoms, but in barges and boats that could just as well be accommodated in an enlarged and improved Erie Canal.

The proposed ship canal would have no military value, and, in view of the foregoing facts, its construction, in the opinion of Major Symons, is not a project worthy of being undertaken by the general government, as the benefits therefrom would not be commensurate with the cost. On the other hand, the enlargement of the Erie Canal is recommended as being likely to bring returns of a commercial kind fully commensurate with the cost of the work.

THE ANNUAL WAR OFFICE REPORT.

To any one who is accustomed to read the annual reports of Cabinet officers, it will be apparent that Secretary Alger has made a new departure in the annual departmental report which he has just issued. Instead of including only an original review of the reports of commanding generals and the heads of bureaus, his report consists of letters from these parties giving a synopsis of their reports and recommendations, supplemented with comments of his own.

It is estimated that \$96,258,445 is necessary to carry out the recommendations of the War Department. Of this sum \$48,728,160 is asked for carrying out river and

harbor improvements, and this is the largest item contained in the estimates. The Secretary considers that, in view of the fact that the demands upon the Treasury just now are exceptionally large, the suggested appropriation for river and harbor improvement is excessive, and that the grant should be largely reduced below the estimates. In this connection special attention is invited to the fact that the continuous contracts for which the War Office is at present responsible will require an expenditure of over \$17,000,000 during the fiscal year ending June 30, 1899, and of amounts in the following four years decreasing to \$345,000 during the fiscal year ending June 30, 1903.

Regarding the sea coast defenses and the much needed increase in the army, the Secretary has little to say, and he relies upon the reports of the major-general of the army, the chief of ordnance, and the chief of engineers to make the necessary impression. According to the estimate of the latter official, the amount required for sea coast defenses is \$13,378,571—a larger sum than was ever before asked for since the present system of fortifications was begun, the appropriation for the current year being \$9,517,141, and for the last fiscal year, \$6,345,158.

Secretary Alger is of the opinion that it will be wise economy to push forward the work of sea coast fortifications to the fullest extent, for the reason that, though the work is expensive while it lasts, this item of expense will cease altogether as soon as the present scheme has been completed. "Sea coast defenses," the Secretary goes on to say, "are being rapidly constructed, and they should be completed at the earliest possible date. I cannot emphasize this too strongly, and therefore urge that the full amount of the estimate be appropriated."

The urgent plea of Gen. Miles for the formation of two additional regiments of artillery is strongly indorsed. The general states that we are erecting great sea coast batteries without providing the necessary skilled men to man them.

These costly works should, as soon as completed, be manned by a sufficient force to care for and preserve them, and to become familiar with the handling of the guns, the manipulation of which requires that experienced artillerymen should be on hand at all times to operate them. "A battery costing from \$100,000 to \$500,000 ought not to be manned by a corporal's guard." The increase called for by Gen. Miles would require a number of new barracks. The present appropriation for these is \$420,000 and the estimate submitted by the quartermaster-general is for \$2,000,000, an increase of \$1,580,000. The increase is a large one; but it is perhaps the most logical and absolutely necessary appropriation recommended by the Secretary; for to spend millions on fortifications and then refuse to provide the men to man them would be the very height of inconsistency and folly. Another item necessitated by our new venture in guns and forts is a needed appropriation of \$2,500,000 for army transportation necessary to move heavy ordnance, guns, gun carriages, etc.

Of special interest just now is the reference in the report to the creation of the military reservation of Fort St. Michael, at the mouth of the Yukon River. It is suggested that the creation of further military reservations would be the best means of preserving order in the Territory. It is requested that a boat be provided for transportation and patrol on the Yukon. The Secretary is of the opinion that 100,000 people may be gathered in the Yukon district during the coming year, and he urgently suggests that some adequate measures be adopted to send a military force to that Territory to guard persons and property.

Secretary Alger says of the proposed deepwater canal to the Great Lakes that "it marks the beginning of a new era." He quotes the statement of the chief of engineers that the commerce passing through the St. Mary's Falls Canal to and from Lake Superior alone, during the navigable season of 1896, included 16,239,061 tons of freight, valued at \$195,146,842, and through the Detroit River, coming from Lakes Superior, Michigan and Huron, about 27,900,000 tons, valued approximately at \$300,000,000.

NEW PATENT OFFICE RULES.

In order to harmonize the Patent Office practice with the new patent laws, which go into effect January 1, it has been necessary to make some substantial changes in certain of the rules. These new rules will also be enforced on January 1. They are too long to print in full, but a few of the following changes may be noted:

The new rules specify that no invention is patentable that has been described in any printed publication two or more years before the filing of the application. Heretofore, if a foreign patent has been taken out before an American patent, the term of the latter was limited to the expiration of the foreign patent, which often shortened greatly the term of the United States patent. Under the new rules, no such limitation will be brought about.

Rule 24 specifies that a patent may be obtained for any new invention or discovery which "has not been patented or described in any printed publication in