

the lake from 12 to upwards of 300 square miles. At the rapids along this route dams were to be built and locks placed to overcome the difference of level. The French River, and the tributaries of the Ottawa, and the Ottawa River, also, were to be made navigable by these dams and locks. The summit would require a canal 5 miles in length with a maximum cut of 30 feet through granite rock. The summit level was to be 83 feet above Lake Huron. The lockage from the summit level down to Montreal was 615 feet, a total of 698 feet. The total distance from Georgian Bay to Montreal is 430 miles.

An examination of the manuscript copy of this report, which was kindly furnished the author by the Minister of Public Works, shows that, while Mr. Shanley was not able to obtain all of the detailed physical data which he desired, yet his general conclusions can be relied upon as reasonable. The size of the locks of Mr. Shanley's project was as follows : length 250 feet, width 50 feet, and depth on miter sills 10 feet. His estimate for the entire work was \$24,000,000. While his plan contemplated throughout dams across the streams, wherever necessary to overcome rapids, his general principle was to build canals rather than to resort to high and expensive dams across the rivers.

In 1860 a second report on this project was made by Mr. T. C. Clarke to the Commissioner of Public Works. Mr. Clarke's estimate was about one-half that of Mr. Shanley, being \$12,057,680. His plan, however, was much different from Mr. Shanley's, resorting still more to making as long reaches of slack water navigation as was possible, thus avoiding to a great extent the excavation through very hard and refractory rock which would be required by Mr. Shanley's project. On the other hand, Mr. Shanley preferred to cut canals at the sides of rapids rather than to raise the levels of large rivers like the Ottawa by artificial structures. There was also a large difference in the price of rock excavation, Mr. Clarke estimating it generally at an average of about \$2.00 and Mr. Shanley at \$4.00 per cubic yard. Mr. Shanley also estimated the cost for enlarging the Lachine Canal, 8½ miles in length near Montreal, which Mr. Clarke did not ; but on the other hand Mr. Clarke estimated for a canal with 12 feet on the miter sills. Mr. Shanley estimated that the difference in cost between a 10 foot and a 12 foot canal must not be less than \$5,000,000, making his estimate for a 12 foot canal \$29,000,000. It is difficult to explain the difference in the estimates. It is unnecessary to go into the details of the plans and estimates of these two projects, except so far as it is necessary to use the very complete details given in Mr. Clarke's report for making an estimate for such an enlarged water-way as this paper contemplates.