

crowded the ports of Quebec with numberless sailing vessels and built up the great fortunes of that city. The rafts of this trade passed Montreal by, but the grain trade for which our merchants and forwarders still struggle was greatly aided by the same liberal fiscal policy that extended to our grain exports that protection in the home markets that our producers now so earnestly covet.

While Lower Canada was building the Lachine canal, the Imperial Government was considering the safest means of securing water communication with Upper Canada. The works being built for purposes of defence the St. Lawrence route could not be utilized, and that by the Ottawa and Rideau rivers to Kingston was chosen. Upper Canada refused to contribute to this work on the ground that it would not furnish as suitable a commercial route as the St. Lawrence, and this refusal seems to have had the approval of the Royal Engineers, who for military reasons held that the War Department should have entire control of the canal. This view was long held and it was not until 1836 that the Home Government handed over the Rideau canal to Canada.

It was commenced by Col. By in 1826, and opened in 1832, the Carillon and Grenville canals on the Ottawa, which formed part of the route, being opened in 1834. The engineers of to-day sometimes make mistakes in their estimates, but it is questionable if their errors ever equal those made on the Rideau canal, which was commenced on an estimate of £160,000 and cost £800,000 to complete. It is but justice, however, to say that owing to the efforts of Col. By the magnitude of the work was greatly increased during construction, in order to make it suitable for steamboat traffic, which had been commenced upon the St. Lawrence by the Hon. John Molson in 1809. The Rideau route immediately became the route for heavy traffic to the west, and the attractions and the cuisine of its steamers were as energetically advertised as are those of the Empress steamers to-day. The locks were $134 \times 32 \times 5\frac{1}{2}$, but the through route was throttled by three locks of the Grenville canal, which were built before the adoption of Col. By's report, with dimensions of $107 \times 20 \times 5\frac{1}{2}$ and by a private lock at Vaudreuil. The Grenville locks were not rebuilt until after Confederation.

The Cascades and Cedar Rapids being within the limits of Lower Canada, the St. Lawrence route could not be opened except with the consent of that province, and it was openly charged in Upper Canada that the selfish interests of Montreal prevented this improvement. Angry at this indifference or opposition, out of sympathy with the military ends of Home Government, and urged on by that section of the province which lay below the mouth of the Rideau canal, Upper Canada was pushing on her own canal schemes. Chiefest of these was the Welland canal, built to connect Lake Erie with Lake Ontario, and to overcome Adam Lymburner's insuperable obstacle. Many claims have been made for the honor of the inception of this great enterprise, but that honor seems hardly worth striving for, for the historian Kingsford, himself an engineer, says of it, that "a wilder, more ill considered scheme than the one originally put forth, one showing more ignorance and recklessness on the part of the projectors, it is scarcely possible to conceive." Commenced in 1825 by a chartered company it was sufficiently completed by November, 1828, to let two vessels through its wooden locks of $100 \times 22 \times 7$. But misfortune came fast, and no other chartered company perhaps has ever left such a record of intrigue, mismanagement, and disaster. Subscriptions were solicited everywhere, in Lower Canada, in New Brunswick, in New York and in England; subsidies were given by Upper Canada, by Lower Canada, and by England, and the company struggled on until the story was ended by the purchase of its works by Upper Canada in 1839. Those were troublous days in that province, and the struggle against the Family Compact was being carried on in all its intemperance and virulence, but of all the Parliamentary reports of the period none is more extraordinary than that dealing with the Welland Canal Company. It characterizes many of the proceedings of the directorate as "inexplicable; no statement has been heard which supports the justice or even expediency of arrangements which, if applied to the ordinary transactions of life, would be deemed not only ruinous but the result of insanity." And it ends, even as a Parliamentary enquiry of to-day, by exonerating everybody concerned.

Upper Canada had commenced the Trent canal, and all but completed the Cornwall canal, when the great political struggle suddenly ended, and the adoption of Lord Durham's report brought about the union of the provinces in 1841. In 1840 Col. Philpotts, R.E., presented a report upon the canal navigation of the Canadas, which had been originally called for by Lord Durham. In it he recommends the St. Lawrence route as the only Canadian route that could be made to compete successfully with the Erie canal. Going into detail, he points out that the Welland canal with its badly built line and rotting locks must be reconstructed, that the Cornwall canal is unfinished and its structures rapidly deteriorating, that a new canal must be built past the Cascades and Cedars, and that the Lachine must be greatly enlarged.

Immediately after the union commenced an era of great activity in canal construction under the management of a Board of Works with H. H. Killaly as chairman, and S. Keefer as chief engineer. In these enterprises the Canadas were assured of the fullest support of the Imperial Government, both financial and military, if such were required. The recommendations of Col. Philpotts were closely followed, and by 1848, a nine foot route was open from Lake Erie to the sea. In the walls of its first completed work, the Cornwall canal remained for many years a record of changing conditions, for its locks alone of all the St. Lawrence canals were built 55 feet wide, the remainder being made 45 feet because the propeller screw had been invented and had proved more suitable for navigation than the paddle wheel. The locks of the St. Lawrence canals were built $200 \times 45 \times 9$, and they were rapidly opened, the Cornwall in 1843, the Beauharnois in 1845 and the Lachine in 1848, and with their completion the traffic left the Rideau route forever, and it remains to-day a work of local utility, and a monument to the efforts that Great Britain put forth for the defence of Canada. In these enlargements there are two points worthy of note. The locks of the new Welland were built only $180 \times 26\frac{1}{2}$ feet, because the Governor-General did not think the country could bear the greater cost of the full sized locks, and the location of the Beauharnois canals gave rise to one of the bitterest political controversies of the day. It was charged that the Governor-General influenced by the Seigneur of Beauharnois had caused the Board of Works to choose the present location, and that the canal ought to have been built upon the north shore of the river. The Board of Works seems, however, to have been supported by the best engineers of the day, and the controversy is only worthy of note now, because the last of the new 14 foot canals is being built upon the north shore location that was then so hotly advocated. While these works were progressing on the main route, the Chambly canal commenced by Lower Canada in the previous decade was completed, and the private lock at Vaudreuil rendered unnecessary by the opening of a Government lock at St. Annes.

The canal history of the next twenty years is one of minor developments and repairs, to accommodate a steadily increasing traffic; but with it grew a feeling that owing to the rapid increase in the size of the lake vessels, and the great activity displayed by the American railroads in concentrating the eastward traffic on the line from Buffalo to New York, that the canals must be greatly enlarged to enable our shippers to secure a share of that traffic. As more than once before, there was no practical outcome for this feeling until another great political change had come, and the Dominion was ushered in to carry on the policy instituted by Upper Canada and adopted by the United Canadas. In 1870 a commission with Hugh Allan as chairman, and S. Keefer as secretary, was appointed to consider canal enlargement. Their report of 1871 fully reviews the whole subject, and will be referred to later. They recommended enlarging the St. Lawrence canal to 12 feet draught, with locks of 270×45 , and this work was promptly undertaken by the Government, although the draught was subsequently increased to 14 feet. It is not yet completed, but we may hope to see vessels drawing 14 feet of water coming down to Montreal in the latter part of 1899 or the beginning of 1900. The commission also recommended some improvements on the Ottawa river canals, which have been completed.

Thus at the close of the century Canada finds herself possessed of a system of inland navigation, which for extent and capacity is unequalled anywhere in the world, and of whose