Observations last summer showed that the calculations as to the raising of the surface of the river were correct. When the depth on the crest was 2·50 feet, the water at the foot of the Longue Sault was found to be 25 in. higher than if no dam existed. The intention was to raise it 24 in.

The timber slide was formed by binding parallel piers about 600 feet long up and down stream, as shown on the map, and 28 ft. apart, with a timber bottom, the top of which at upper end is 3 ft. below the crest of dam. It has the necessary stop logs, with machinery to move them to control the water. The approach is formed by detached piers, connected by guide booms, extending about half a mile up stream. See map.

Alongside of the south side of the slide a large bulkhead was built, 69 ft. wide, with a clear waterway of 60 ft. It was furnished with stop logs and machinery to handle them. When not further required, it was filled up by a crib as before mentioned.

The following table shows the materials used in the dam and slide, and the cost :

	Timber, cu. ft.	Iron, lb.	Stone filling, cu. yds.	Excavation, cu. yds.	Cost.
Temporary works	134,500	92,400	11,400	....	$ 79,000
Permanent dam..	265,000	439,600	24,000	6,500	151,000
Slide, including apparatus.....	296,500	156,400	32,800	....	102,000
Total......	696,000	687,000	68,200	6,500	$332,000

The above does not include cost of surveys, engineering, or superintendence, which amounted to about ten per cent. of the above sum.

The construction of the dam and slide was ably superintended by Horace Merrill, Esq., late superintendent of the "Ottawa River Improvements," who has built nearly all the slides and other works on the Ottawa to facilitate the passage of its immense timber productions.

The contractors were the well known firm of F. B. McNamee & Co., of Montreal, and the successful completion of the work was in a large degree due to the energy displayed by the working member of that firm—Mr. A. G. Nish, formerly engineer of the Montreal harbor.

THE CANAL.

The canal was formed by "fencing in" a portion of the river-bed by an embankment built about a hundred feet out from the north shore and deepening the intervening space where necessary. There are two locks—one placed a little above the foot of the rapid (see map), and the other at the end of the dam. Wooden piers are built at the upper and lower ends—the former being 800 ft long, and the latter 300 ft. ; both are about 29 ft. high and 35 ft. wide.

The embankment is built, as shown by the cross section, Fig. 6. On the canal side of it there is a wall of rubble masonry, F, laid in hydraulic cement, connecting the two locks, and backed by a puddle-wall, E, three feet thick ; next the river there is crib work, G, from ten to twenty feet wide and the space between brick-work and puddle filled with earth. The outer slope is protected with riprap, composed of large bowlders. This had to be made very strong to prevent the destruction of the bank by the immense masses of moving ice in spring.

The distance between the locks is 3,300 feet.

In building the embankment the crib-work was first put in and followed by a part (in width) of the earth-bank. From that to the shore temporary cross-dams were built at convenient distances apart and the space pumped out by sections, when the necessary excavation was done, and the walls and embankments completed. The earth was put down in layers of not more than a foot deep at a time, so that the bank, when completed, was solid. The water at site of it varied in depth from 15 feet at lower end to 2 feet at upper.

The locks are 200 ft. long in the clear between the gates, and 45 ft. wide in the chamber at the bottom. The walls of the lower one are 29 ft high, and of the upper one 31 ft. They are from 10 to 12 ft. thick at the bottom.

The locks are built similar to those on the new Lachine and Welland canals, of the very best cut stone masonry, laid in hydraulic cement. The gates are 24 in. thick, made of solid timber, somewhat similar to those in use on the St. Lawrence canals. They are suspended from anchors at the hollow quoins, and work very easily. The miter sills are made of 26 in. square oak. The bottom of the lower lock is timbered throughout, but the upper one only at the recesses, the rock there being good.

The rise to be overcome by the two locks is 16 ft., but except in medium water, is not equally distributed. In high water nearly the whole lift is on the upper lock, and in low water the lower one. In the very lowest known stage of the river there will never be less than 9 ft. on the miter sills.

As mentioned at the beginning of this article, four locks were required on the old military canal to accomplish what is now done by two.

The canal was opened in May, 1882, and has been a great success, the only drawback—although slight—being that in high water the current for about three-quarters of a mile above the upper pier, and at what was formerly the Chûte à Blondeau, is rather strong. These difficulties can be easily overcome—the former by building an embankment from the pier to Brophy's Island, the latter by removing some of the natural dam of rock which once formed the "Chûte."

The following are, in round numbers, the quantities of the principal materials used .

Earth and puddle in embankment..cub.	yds.	148,500
Rock excavation,	"	38,000
Riprap,	"	6,600
Lock masonry,	"	14,200
Rubble masonry,	"	16,600
Timber in cribs, lock-bottoms and gates	"	368,000
Wrought and cast iron, lb		173,000
Stone filling cu. yds.....................		45,300
Concrete "		830

The total cost to date has been about $570,000, not including surveys, engineering, etc.

The contractors for the canal, locks, etc., were Messrs. R. P. Cooke & Co , of Brockville, Ont., who have built some large works in the States, and who are now engaged building other extensive works for the Canadian Government. The work here reflects great credit on their skill.

On the enlarged Grenville Canal, now approaching completion, there are five locks, taking the place of the seven small ones built by the Imperial Government. It will be open for navigation all through in the spring of 1884, when steamers somewhat larger than the largest now navigating the St. Lawrence between Montreal and Hamilton can pass up to Ottawa City.—*Engineering News.*

PROPOSED NEW BRIDGE, LONDON.

(*See pages* 276-7.)

It is recorded that when James I. thretened to punish the citizens of London by the removal of himself and his court to some other city, the Lord Mayor calmly informed the King of the hope of the citizens that His Majesty would leave them the Thames. So long as the river remained, the people of London believed that they might endure the loss of even the Solomon of the West. Since that time much has been done by means of railways and improved roads to facilitate the intercourse of nations and to promote commerce ; but the Thames is still what it was in the days of King James, the link by which London is united with the rest of the world. If, as Sir John Herschel says, "London is the centre of the terrene globle," that position is due to the possession of a navigable channel. What other city can show such a proof of international trade as may be witnessed every day in the year between London Bridge and Blackwall ?

The supremacy of London in commerce is in a great measure attributed to the navigability of the river, and in dealing with the Thames this fact should never be overlooked While every one admits the advantage of unimpeded communication between the parts of the metropolis on both sides of the river, it should also be remembered that an advantage of the kind would be dearly purchased, if, to secure it, impediments were raised to interrupt the traffic on the water. The local requirements of Whitechapel and Bermondsey should never be allowed to override the general interest of the city (which is also the interest of England), and although it would be well for carts from Shoreditch to reach the Old Kent Road expeditiously, the