

position as to the site of the pier, and placed transversely to the stream above the site of the bridge.

Thus we have the solution of the same problem of obtaining quiet water in a different way, and with it a *point d'appui* for the commencement of operations. Boats' crews could easily land here—and with them workmen—and this preliminary dam once in, it was easy to extend wings back over the area of the pier. But these dams were in themselves undertakings, for they consisted of two rows of cribbing fourteen feet wide each, with 7 to 8 feet of "puddle" (that is to say a thick clay rendered impenetrable to water by labor, by beating it well together,) between them and that part which was turned up stream was a regularly built up ice-breaker, to withstand the ice of the winter if necessary. The comparison between these two classes of dams may thus be made. The floating dam may be used several times; indeed one has been used four times, and it admits of the masonry being completed in one season, and what is more, early in the season, and it has been found to answer best in deep water. Its disadvantage is that it could not be made sufficiently strong to resist the shove of the ice in the winter; hence it had to be removed before the severe weather came. Consequently when the period arrived to construct the tube, the side of the pier was naked, and there was no point from whence the scaffolding to support the tube truss could start. With the Cofferdam this foundation existed, and hence it was necessary to frame one centre scaffolding only; whereas with the floating dams three such constructions were necessary, viz., the centre frame and the scaffold foundation, at the side of each pier. Nor was this consideration an unimportant one, for such foundation was obtained by sinking scows, and driving piles around them to keep them in position. Otherwise the operations were identical. From either dam framing was carried up, above the height of the pier, and on the capping pieces was run a Railway, to admit of the passage of a travelling machine which, mounted with a crab, admitted a contrary passage on itself. Hence stones of twenty tons were moved into position as easily as a lb. weight is thrown into a scale. On the platform of the dam were constructed sheds to cover the steam engine, the blacksmith's shop, the store room and carpenter's shop; and thus the scene was presented of these isolated areas of an acre and a quarter dotted along the river, busy with life and animation, and showing the work in its various stages. The dam perfected—the staging constructed, the travelling machine in position—stone delivered ready for the mason to lay—the anxious moment commenced; that of pumping out the water and getting in the foundation. Not that the labor was great in removing the water, but that the application of the test, to show the dams were water-tight and if the water would not force its way up from below, naturally created anxiety. Nothing could be better than the pumps used. They were worked centrifugally and threw 800 gallons a minute, passing up stones 6 inches square—the diameter of the pipe—and it was moreover one of those portable affairs that a man could take on his shoulder and move from one place to the other. It was calculated that these pumps lowered the area of the dam at the rate of 2 ft. an hour. Therefore in 8 or 10 hours the dam was empty. On the southern bank of the river where the work was under the direction of Mr. CHAFFEY, the scaffolding was not used, but a compound derrick, worked by a high pressure engine, supplied its place. Much ingenuity was shown in obtaining this motion, as the stone could be placed by it in any position, for the derrick had in itself a motion which admitted of precisely determining the stone's position. Its limit, however, did not extend to handling seven tons.

MASONRY.

Three millions of cubic feet of Masonry in the Victoria Bridge! That is to say if turned into lineal measure, it would reach 510 miles; or as a solid would form a pyramid 215 ft. high having a base of 215 ft. square. These figures will give some idea of the solidity of the structure, and the warrant that exists for its endurance for all time. The stone itself is mostly quarried from Pointe Claire, and forms the first in the series of the Lower Silurian, and is known by the geological term of Chazy, resting immediately on the calciferous sand-rock and the Potsdam sandstone. At Pointe Claire very extensive quarries have been in operation since 1853, and the Engineer student will be well repaid by visiting them, for stones are taken out in as large masses as in any quarry in the world. We see the proof of this fact in the dimensions of the piers. The courses being 3 ft. 10 in. and 3 feet 2 feet 6 inches to above water level, and thence verging into a course 18 in. under the plates, being in length from 7 ft. to 12 feet. One course of ashlar of 3 feet 10 in. was examined by the writer, the perimeter of the pier at this point measured 200 ft. It consists of 32 stones, the highest of these weighed 7 tons, the heaviest 17, the average weight of the whole was 10 1/2 tons. Such work, may indeed be termed Cyclopean. Each course, to the top of the cutwater is fastened by a dog-wedged bolt of 1 1/2 inch iron—that is to say a bolt with the base slit to receive a wedge into which an iron prism is inserted. Thus prepared, it is passed down until it reaches the bottom of the hole drilled to receive it, when the bolt itself is driven upon the wedge—thus widening out the end of the bolt, so that it never can be again drawn out, passing through two whole courses into the third below it. Thus every three courses are distinctly dowelled together, and the

whole mass of work being likewise laid in the best water-lime, and carefully grouted, is formed into one solid mass; for horizontally the joints are likewise kept cramped together by plates 12 in. x 5 in. of 1/2 inch iron.

TUBES.

Each tube covers two openings, that is to say, it is fixed in position in the centre, and is free to expand or contract on the adjoining two piers. They are 16 in. x 19 in. at the ends but they gradually increase to the centre, at which point they are 16 feet x 21 ft. 8 in. The length will accordingly be

On centre pier	16 feet
Two openings each of 242 min.	484
Resting on E pier	8
W pier	8
	516 feet.

The expansion rollers are seven in number, in each set of 6 in. diameter, in a cast iron frame rolling on planed bed plates the rollers themselves being turned and the beds planed they run as smoothly as on glass. The weight of each tube, with all its appurtenances of 516 feet, is about 644 tons, that is to say for each opening 322 tons. The construction of this character of work is now so well known that much allusion is not necessary. Moreover it is simple in the extreme, being formed of boiler plate rivetted together with angle irons and lateral and transverse braces. The skill lies in reducing this boiler iron to such dimensions that there is no unnecessary material, to add to the weight and to the expense, and yet obtaining a sufficiency of strength. We are not going into the theory of beams, but it is evident to any one breaking a stick that a strain on a beam proving too much for its strength, crushes the top—compresses it—and tears asunder the bottom; whereas the sides are merely rent away. Accordingly where the sides of the tube require strength, is at the abutment. Thus it will be seen that for the top and bottom of the tube the greater strength is at the centre, whereas the sides have most material where the span starts.

Thus, taking our data in all cases from the centre, the following shows the component parts of the tube:

TOP PLATES.			
SECTIONAL AREA.			
From Centre	Length of Division	Strips T irons and angle irons.	Thick-ness of plates.
1	11 ft.	125	217 1-16 5-8
2	"	125	211 7-16 5-8
3	"	114 3-8	200 13-16 5-8
4	"	107 1-16	191 1-34 9-16
5	"	87 1-2	172 3-15 1-2
6	"	75	159 5-16 7-16
7	"	58 1-16	134 3-8 3-8
8	"	58 1-4	108 1-2 6-16
9	"	50	105 1-4 1-4
10	"	50	98 1-4 "
11	"	50	"
Bearing	80	"	"

BOTTOM PLATES.			
From Centre.			
1	19 6	187.50	201.25 3-8 51-16
2	14	137.50	185.25 5-16
3	14	125	182.75 5-16
4	14	112.50	166.75 5-16 1-4
5	14	87.50	145 1-4 3-16
6	14	85.50	118 5-16
7	14	50	92 1-4
8	17 6	50	92 1-4
Bearing	98	50	92 1-4

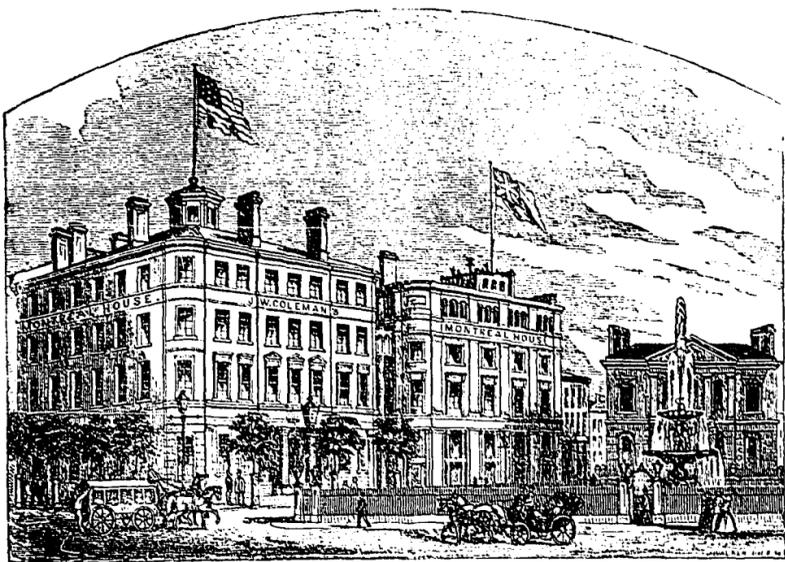
SIDE PLATES.			
Beginning at the centre, and strengthened by lateral irons inside and out, placed at distances of 3 6.			
The first space, 35 from centre is formed of 2-4 plates or 4.16.			
The second space of 45 5-16 plates or 5-16.			
The third " 45 3-8 " 6-16.			
The remaining space - - - " 8-16.			

The immediate part of the tube resting on the pier being likewise strengthened by increased lateral bracing. The tubes themselves are constructed in position, and the difficult and expensive process of floating them from the shore and lifting them by hydraulic pressure is thus dispensed with. Where the coffer dams are in use, the framing is carried up from them; and in the centre, a scow is anchored and piles driven in around it, on which the scaffolding rests. It is here that the difference between the two systems of dams is apparent. In the one three scows secured with piles is necessary; in the other but one. On these supports a truss is formed, which is in itself a bridge on which the tube is put together.

PRESENT CONDITION OF WORK.

The abutments and piers are all complete, with the exception of Nos. 14 and 15, which are built 6 ft. above water level, and No. 11 pier which was purposely left untouched in order to leave one channel open for rafts—the water-way being narrowed between the piers already constructed by the coffer dams. The two former will be finished in 20 days after the working season commences, the latter by beginning of September.

Of the tubes 16 of the 25 are fixed and finished in position. The centre span is completed. And on or about the 1st day of October in the year of our Lord 1859, this wondrous work will be in full play—bearing the tread of the mighty steam steed—conveying man, and all the materials of man's varied business on this great continent from the ocean's shore to the fresh-water seas of the remote west. It is expected that the LEVIATHAN steamer bearing thousands from the old world will have arrived at PORTLAND not long after this great celebration; and thus will AMERICANS be called upon at one and the same time to render hearty homage (as we are sure they will) to the mechanical genius of their brethren of the English dominions as shown so wondrously in these joint works. We are prevented by a proper feeling from speaking with confidence of another expected event,—one which greatly interests Canadians. We refer to the rumor that a PRINCE OF THE BLOOD will be present at the opening of the BRIDGE. Our advice upon this subject is derived from no private or official source, and is therefore not to be urged too boldly; but there is much reason to hope that the PRINCE OF WALES will be amongst us; and that our admiration of the power of science as exhibited in the VICTORIA BRIDGE will be invoked simultaneously with an outburst of loyal joy at the sight of VICTORIA'S SON.



COLEMAN'S MONTREAL HOUSE.

THE above cut represents the well known and highly popular MONTREAL HOUSE, than which there is not a more agreeably situated establishment in the city. It is unsurpassed as to scenic advantages, having in front a neat park with a *jet d'eau*, and commanding from at least fifty front rooms an extensive view of the river and opposite shore. The VICTORIA BRIDGE is also seen in *extenso* from nearly all the rooms of the house, and is within *five minutes' drive*. The grand FRENCH CATHEDRAL, in which not less than 12,000 people are seated during the celebration of High Mass on each Sunday, is within one block of the hotel. The Banks and other public institutions are also within easy distance—the farthest can be reached in less than five minutes. The furniture of this establishment is all new, and of the most modern style. Indeed the MONTREAL HOUSE embraces all the qualities desirable to the pleasure tourist; and the American traveller may possibly find it convenient to meet in the *lessee* and manager a countryman of somewhat extensive experience on both sides of the *line*.

**OWL'S HEAD Mountain House,**  
 KEPT BY  
**A. C. JENNINGS,**  
 AT LAKE MEMPHREMAGOG,  
 CANADA EAST.

THE OWL'S HEAD MOUNTAIN HOUSE is now open for the reception of guests, and in future it will remain open the year round, thus affording the fashionable and pleasure traveller, and American and European Tourists an opportunity of visiting this delightful, wild and romantic region, (which is called the Switzerland of America) at all seasons of the year, on point of beauty and attraction. Lake Memphremagog has no superior on the American Continent. The lake is completely Mountain locked from the summit of the Owl's Head which is the highest Mountain, the view is most beautiful and extended, on a clear day with the aid of a glass you can distinctly see the entire ranges of the white and green Mountains, the city of Montreal, Lakes Willoughby, Champlain and Massawapsee, the rivers St. Lawrence and St. Francis, and other interesting localities, at a distance of from ninety to one hundred miles, thus presenting the most extended and beautiful Mountain view on this continent. The ascent and descent is accomplished with little or no fatigue, and the bridle path will be found in good condition. The Lake is about forty miles in length, and from six to eight miles in width, and is everywhere dotted with beautiful islands; the Lake abounds with fine fish of every variety, Salmon, Trout, silver Trout, brook or speckled Trout, Perch, Pike, Lung &c. &c., are taken in abundance; the lovers of fishing, hunting, sailing, bathing, &c. &c., will find themselves at home, and no pains shall be spared to render the pleasure traveller and American and European Tourists, who wish solid home comforts. The Lake is of very easy access, by rail from all points, from Montreal or Quebec, by the morning train of the Grand Trunk Railway to Sherbrook Station, thence by stage 14 miles to Magog, where they take the Steamer Mountain Maid, and arrive at the Mountain House in time to dine. From the White Mountains by taking the morning train on Connecticut and Passumpsic River Rail Road you can reach the Mountain House the same evening, passengers from New York, the South and West, take the 8 A. M. train of the New York and New Haven Rail Road and arrive at the Mountain House next morning.

OWL'S HEAD MOUNTAIN HOUSE,  
 Lake Memphremagog, May 1st, 1858.

**A. P. SAVAGE,**  
**METROPOLITAN SALOON,**  
 153  
 NOTRE DAME STREET,  
 MONTREAL.

**INTERNATIONAL HOTEL,**  
**R. B. COLEMAN**  
 PROPRIETOR,  
**NIAGARA FALLS.**

**RUSSELL'S HOTEL,**  
**QUEBEC.**

THE undersigned respectfully inform their Friends and the Public that their Hotel has been thoroughly renovated, repainted, and newly furnished throughout this Spring, and is now open for business.  
 W. RUSSELL & SON.

**LAKE GEORGE.**  
**FORT WM. HENRY HOTEL,**  
**DANIEL GALE,**  
 PROPRIETOR.

**CLARENDON HOUSE,**  
 ST. LEWIS STREET, UPPER-TOWN,  
**QUEBEC.**

THIS spacious HOTEL is prominently situated, commanding a beautiful and extensive view of the River St. Lawrence and the surrounding country, and is in the immediate vicinity of all the points of interest in and about the City; consisting in part of the Durham Terrace, Governor's Garden, Esplanade, &c.  
 H. O'NEILL, PROPRIETOR.  
 Quebec, June, 1859.

**UNION OFFICE!**  
 PASSENGERS FOR  
**NEW-YORK, BOSTON, WORCESTER,**  
**ALBANY, TROY.**  
 Saratoga Springs, Schenectady,  
 And all intermediate places.

On and after MONDAY JUNE 20th leave Montreal by Steamer IRON DUKE, connecting with Train at St. Lambert.

**MORNING EXPRESS, 6.45 A. M.,**  
 Arrives at Rouses Point 8.30 a. m., Northfield 12.00 (dine) W. R. Junction 2.25 p. m., Boston 8.15 Littleton and White Mountains same evening. Also, at Burlington 11.00 a. m., Rutland, 2.15 p. m., (dine) Troy 7.15, Albany 7.20 connecting with H. R. Steamers arriving in New-York early next morning.

**EVENING EXPRESS, 3.15 P. M.,**  
 Arrives at Rouses Point 5.15 p. m., Burlington 8.15 Rutland 11.15 (Lodge) Boston 2.30 p. m., and Troy 8.28 a. m., Albany 9.00 New-York H. R. Railroad 1.30 p. m., next day. Also, at Northfield 9.47 (supper) W. R. Junction 12.32 (Lodge) Boston 1.00 p. m., New-York 4.33 next day.

**CONNELTIONS SURE!**  
 Leave White River Junction 2.40 p. m., for Littleton and White Mountains arriving early same evening.  
 Fares by this route as low as by any other from Montreal.

**DISTANCE**  
 From White River Junction to Wells River 40 miles; Littleton 60; White and Franconia Mountains 72.

Baggage checked through from Rouses Point. For Tickets and further information respecting the various Routes South and East apply at the Office of the Vermont Central and Rutland and Burlington Railroads, 65 and 67 Commissioners Street or to P. PICARD & JOSEPH GAUTHIER, agents at the principal Hotels and Offices.  
 J. B. FLETCHER, General Agent  
 Montreal, July, 1859.

**MONTREAL AND CHAMPLAIN RAILROAD.**

**THE ONLY DIRECT ROUTE FROM MONTREAL TO BOSTON, NEW-YORK,**

**Lake Champlain, Lake George, Saratoga, Troy, Albany,**  
 ALL PARTS OF THE NEW ENGLAND, STATES, WHITE MOUNTAINS, &c., &c.

The Ferry Steamer "IRON DUKE," leaves at 6.45 a. m., connecting at St. Lambert with Train for Rouses Point, there connecting with Lake Champlain Steamer and Vermont Central Railroad for Burlington, Ticonderoga, Lake George, Saratoga, Troy, Albany, White Mountains, Boston, &c., arriving the same day, and at New-York early next morning. Also, at 3.15 p. m., making same connections through to Boston and New-York, arriving soon after noon next day.

Full information given at the Office of the Company, No. 64 Commissioners Street, opposite the Quebec Steam-Boat Basin.  
 W. A. MERRY,  
 Secretary.  
 Montreal, July, 1859.

**LAKE GEORGE.**  
 SUMMER ARRANGEMENT FOR 1859.  
 FROM  
**MONTREAL,**  
 VIA  
**ROUSE'S POINT, BURLINGTON,**  
 AND  
**TICONDEROGA.**

THE splendid Low Pressure Steamboat MINNE- HA-HA, Capt. JAMES GALE, will commence her regular Trips on the 1st day of June.  
 GOING SOUTH—Passengers leaving MONTREAL in the Morning, via Rouse's Point, Burlington, and Ticonderoga, and arriving at Port Wm. Henry and Caldwell, at 6 P. M. Passengers by this route have a fine opportunity of viewing the unrivalled SCENERY OF LAKE GEORGE, and RUINS OF THE OLD FORTIFICATIONS.  
 Passengers can leave twice a day for SARATOGA, TROY, ALBANY, and NEW YORK.  
 Through Tickets can be had at the Office in Montreal.

**LAKE CHAMPLAIN ROUTE FOR SARATOGA, TROY, ALBANY AND NEW-YORK.**

**IMPORTANT CHANGE OF TIME.**  
**TWO BOATS A DAY.**  
 THE MAGNIFICENT UPPER CAIRN STEAMERS  
 United States, America and Canada.

On and after Monday, 20th June.  
 Passengers leaving Montreal.

**FIRST EXPRESS MAIL TRAIN**  
 At 6 o'clock, A. M., by Steamer IRON DUKE will connect at ROUSES POINT, every Day with one of the above Steamers, at 8 o'clock, A. M., which leaves immediately for WHITEHALL, and arrives at 4 30 P. M. Take Cars and arrive at

SARATOGA	6 15 "
AL TROY	7 30 "
SCHENECTADY	7 50 "
AL ALBANY	7 40 "
And NEW-YORK	6 00 next morning.

**SECOND EXPRESS TRAIN.**  
 Leave MONTREAL at 3 o'clock, P. M., connect at ROUSES POINT, every Day (except Saturday) at 5 o'clock, P. M., with one of the above Steamers which leave on the arrival of the Train from Montreal and Passengers after enjoying a good night's rest on Steamers unsurpassed for Comfort and Speed,  
 Arrive at WHITEHALL, at 5 00 A. M.

SARATOGA	7 00 "
TROY	8 28 "
SCHENECTADY	10 00 "
ALBANY	9 00 "
And NEW-YORK by H. R. R. R.	1 30 P. M.
Or by TROY STEAMERS	6 00 A. M.

**TICKETS GOOD UNTIL USED.**  
**BERTHS FREE ON LAKE CHAMPLAIN.**  
 This Line connects at Troy with the Splendid Steamers

"Francis Skiddy and Commodore!"

WHICH LEAVE EVERY EVENING FOR NEW-YORK BY THE Steamers on Lake Champlain have been thoroughly overhauled and refitted, and are in tip top condition.

For TICKETS and information apply at the Company's Office, 68 Commissioners Street, or of E. WHEELER, at the principal Hotels and Office.  
 HIRAM TRACY, Agent.  
 North and South Through Line.  
 Montreal, July, 1859.

**LAKE ST. PETE NAVIGATION COMPANY'S Steamer CASTOR,**

CAPT. JOSEPH DUVAL.  
 LEAVES Montreal every TUESDAY and FRIDAY at 2 P. M., and arrives on MONDAY and WEDNESDAY NIGHTS, at 12 o'clock, calling at the HARBOUR COMMISSIONERS' STEAM DREDDERS, BORRIS, MARKINGOE, RIVER DE LOUP, YAMACHICHE, PORT St. FRANCIS, and THREE RIVERS.  
 Pleasure Seekers can leave Montreal every Saturday Evening, by Richelieu Company's Steamers, proceed as far as Three Rivers, and return early on Monday morning by the Steamer CASTOR.  
 The Steamer L'ASSOMPTION, Capt. MALHOT, leaves Montreal every TUESDAY, FRIDAY, and SATURDAY, at 3 o'clock, and arrives on MONDAYS, THURSDAYS, and SATURDAYS, calling at BOUL DE LAKE, LITTLE VILLAGE, and L'ASSOMPTION.  
 The Steamer TERREBONNE leaves Montreal every TUESDAY, FRIDAY and SATURDAY, at 3 o'clock, and arrives every MONDAY, THURSDAY, and SATURDAY, calling at BOUCHERVILLE, VALENCE, LACHENAIS and TERREBONNE.  
 The Steamer YAMASKA, Capt. SENECAL, leaves Montreal every TUESDAY and FRIDAY, at 4 P. M., and arrives every MONDAY and THURSDAY, calling at VERCHERES, SOREL, and YAMASKA.  
 The Steamer RICHELIEU, Capt. LAMOUREUX, leaves Montreal every TUESDAY and FRIDAY at 4 P. M., and arrives on THURSDAY and FRIDAY MORNING, calling at CONTEBECUR, SOREL, St. Ours, St. CHARLES, BRUEL, and CHAMBLEY.  
 The Steamer L'ALICE sails DAILY to LA PRATRIE, leaving Montreal at 4 P. M., and arriving every Morning at 8 A. M.

**THE SAGUENAY!**  
 THE Steamer "SAGUENAY" leaves Quebec for the RIVER SAGUENAY, every WEDNESDAY MORNING at EIGHT, and returns on Fridays in time for the Steamer leaving for Montreal,—connecting with the Steamers of the Richelieu Company, Royal Mail Line, "Quebec" and "Napoleon"; and on SATURDAY, to CACOUNA, and intermediate places.