

If the filling in of the Lake is hurried on with as fast as possible, it can be completed before next winter, and then there will be no danger to be apprehended for a long time to come.

The manner in which the ice has affected the bridge is somewhat singular. As was predicted, there has been evidently a raising of the entire field of ice since its formation. The effect of this during the winter of 1853-4 was to draw out a few piles, near the Indian shore, which had been imperfectly driven, and to raise the whole, north of the truss bridge, some six or eight inches, except where it was held down by the cribs, sunk every five hundred feet. This gave it rather an undulating surface, and they were obliged to raise and block up the stringers at these low points. It is proposed to prevent this raising of the ice, by putting flash-boards on the dam at Crook's Rapids, at the lower end of Rice Lake, and raising it some two or three feet before the ice takes. As more water flows into the Lake it would be necessary to gradually take off the boards, and thus keep it at the same level.

When there is no snow on the ice, the heat of the sun in the middle of the day expands it, and it moves slowly, carrying the bridge with it. When night comes on and the temperature falls, it contracts again, and cracks and splits in a surprising manner.

One of these cracks took place at a very acute angle across the bridge, throwing one portion up stream about eighteen inches, and the other down as much.

The worst injury that the bridge has received was about the 1st of January of this year. The weather was particularly trying, the days being warm and the nights very frosty; and this, it must be observed, is the only kind of weather in which the bridge takes injury,—uniformly cold or warm weather not affecting it.

On this occasion there appeared to be an expansion of the ice from the channel towards each shore, and the effect was irresistible. The pile bridge north was thrown towards the Indian shore; but owing to the number of cribs in it, it moved but little. The truss-bridge was pushed towards Tie Island, so that the last span slid four feet upon the solid abutment. South of Tie Island, the pile bridge was crowded over toward the Cobourg shore,—so much, that at the place where it parted, near the island, the stringers were drawn apart nearly seven feet, so that they fell from the corbels. The piles were leaned over, and where the thrust met the resistance of the shore, it crushed up the solid 12" x 18" stringers, and turned them into splinters, and bent the iron rails double. This has all been since repaired, and the trains are now crossing regularly.

From inspection of the drawing, No. 6., accompanying, it will be seen that nearly three-fourths of the length of the piles are unsupported, and only one-fourth of them is in the solid ground. When the thrust of the ice comes at the water-line, it exerts a very powerful leverage, and it is not strange that the bridge should yield.

The dotted line in fig. 6 shows the outline of the embankment which it is proposed to make. This, it will be seen, will support the piles very much, and render it almost impossible that they should be moved. In course of time, as the piles decay, it will be found necessary to fill it up to the level of the track. The embankment must then be protected from washing away by a slope wall of loose stones and brush. Another very ingenious method of protecting it has been proposed, which would be less expensive than a slope wall. This is, to drive piles some twenty feet from the bridge in rows parallel to it on each side, cut them off below the depth to which the ice forms, and chain to them a succession of spars forming a boom

along the embankment on each side, and twenty feet from it. It is believed that this would render the water calm enough inside of it to prevent washing away the bank.

The material on the south side of the Lake is admirably adapted for filling, being a tough species of clay, or rather hard pan, which, when thrown into the water, consolidates, and packs around the piles, instead of wash ag away. A few hundred feet of embankment was made of this material in the summer of 1853, and has stood perfectly well ever since.

The Rice Lake Bridge was designed and built under the immediate superintendance of Ira Spalding, Esq., and reflects great credit on that gentleman's skill and judgment as an Engineer. The contractor was Mr. Zimmerman, whose well known energy was severely taxed to supply so large an amount of materials, and carry on the work to successful completion, in spite of sickness and scarcity of workmen, in the comparatively short space of eighteen months.

THOS. C. CLARKE.

Port Hope, April 2nd, 1855.

#### Report of the Select Committee on the Geological Survey of Canada.—Minutes of Evidence.

In continuation\* of the "Report of the Select Committee" appointed by Parliament to inquire into the condition of the Geological Survey of Canada, we proceed to furnish an abstract of the Minutes of Evidence which accompanied the Report. The importance which the Committee have very properly attached to this great undertaking is thrown into relief, not so much by the information elicited from witnesses respecting the actual results of the Survey, as by the proofs of a marked and highly complimentary attention, which the labors of Mr. Logan and his staff have met with among European and American Geologists and practical men.

The first witness examined was Professor Hall, of Albany. the author, among other valuable works, of the "Geology of the First District of the State of New York," and of those magnificent volumes devoted to the Paleontology of the entire State. Mr. Hall submitted in evidence that he had had an opportunity of knowing much of the progress of the Canada Geological Survey from its commencement, and entertained a very high opinion of the character and value of the work which has been accomplished, as well as of its importance to the Province, both in its Scientific and Economical relations.

In reply to the question, "What in your opinion would be the best manner of placing the information and materials that have been collected on the Canadian Survey before the public?" Mr. Hall considered it advisable to publish in one or more volumes an account of the Geology of the Province, which may be a revision and a condensation of the Reports of Progress, with such illustrations by Geological Sections, Maps, Fossils, &c., as may be required for the proper elucidation of the subject. Accompanying this volume should be a Geological Map of the Province on a scale sufficiently large to represent all the Geological formations in their entire extent, each formation being distinguished by a different color. This map might also be accompanied with a small Pamphlet, describing briefly the character and extent of the Formations as represented on the map by different colors. It would be very desirable to have copies of the complete work and the map so distributed that it would be accessible for reference to every

\* See "*Canadian Journal*," Vol. III., p. 234.