It shows that storage so far in sight, and for which controlling dams are either under construction or sites fully surveyed and contract plans under way are:—

Basin.	Area. sq. miles.	Maximum Possible Depth. feet.	Storage. sq. miles feet.
Lake Timiskaming	100	20	2,000
Lake Kipawa	100	20	2,000
Lake Quinze and Expanse.....	100	20	2,000
Total			6,000

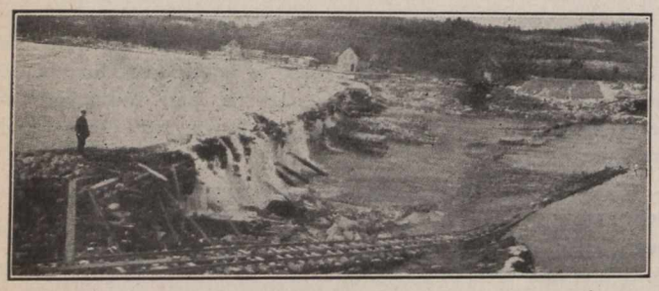

Fig. 2.—Timiskaming Cofferdam, Quebec Channel, 3rd May (Day Before Failure), Lake Surface Elevation 580.50. The Pit was Flooded from Below by Gordon Creek Water Several Days Before.

This represents a maximum possible reserve for each of these lakes of practically 56 billions cubic feet, or a total of 168 billions cubic feet of water, which instead of rushing to waste, would be pent up in these reservoirs and gradually let out during the low period.

Taking the low period at 150 days between October and March, it will then be possible to augment ultimately the low water flow at Ottawa for that period by 10,000 to 12,000 cubic feet per second. It can be seen, therefore, what immense benefits will be derived from these reservoirs. Their beneficial effect is admirably resumed in Mr. Coutlée's report, as follows:—

1st. They will improve the potability of the water.

2nd. They will increase the depth for navigation.

3rd. They will increase and steady the flow for power production.

These reservoirs, though large, would not, however, be sufficient to exert the full control that is required of the flood waters during the extreme years of flood flow, and further reserves may be had by other dams at the outlet of Lakes Turnback, Opasatika, Grand Lake Victoria, Birch, Barrière, Kakabonga and several other lakes on the main stream or on the tributaries, which are now under study, or will be investigated as soon as time and staff are available.

In relation to the reserve dams, the one at the foot of Lake Temiskaming and that on Kipawa River are under contract.

The progress of the work on the Timiskaming dam has not been as rapid as was desired and expected on account of heavy work in foundation. The Kipawa River dam is progressing satisfactorily. Both dams are of concrete with stop-log sluiceways, having an aggregate clear discharge sectional area at least as large as the original section of the river.

At the commencement of the fiscal year, $41,760 had been expended on the Timiskaming dam construction and a year's time. As stated in the last annual report, no adequate plant or force was employed on the contract at the commencement, so the summer of 1909 was lost. It was January, 1910, before a steam excavator began work, and February before concrete laying commenced.

The cold of this northern section created difficulties in excavating and concreting that had only been overcome when Timiskaming Lake, responding to a very early spring, flooded the foundations.

When driven from the base platform, however, the force was turned upon the island abutment, which was brought up to full height in May, 1910.

During June, new coffer dams were built across the Ontario channel and the section between pumped out by the 25th. This steam shovel resumed excavation and operated during July and August, but stopped for good during the first week of September with work still to finish. In May, two meetings with the contractors were held to discuss programs for hastening the work.

A couple more conferences were held in June, the hardness of the excavation and the unforseen difficulties of unwatering being discussed. With an active manager, a good scheme and better rate of progress were achieved during July and August, 1910; but this, the third, manager leaving at the end of July, the work became disorganized in a month. The time for completing the contract was extended from 22nd July to end of December, 1910.

Concrete.—When the foundation pit was pumped dry, 25th June, 1910, the concrete was found in good condition, although laid during the winter and flooded before the sun could hasten its set.

By the first week of July, forms were erected to half height for seven piers and concreting was resumed on the platform and aprons. A good speed was attained, and during August the most work was done, although the firm changed their manager on the first of the month.

In September, the concrete work on the Ontario sluiceways was finished and no more has since been done.

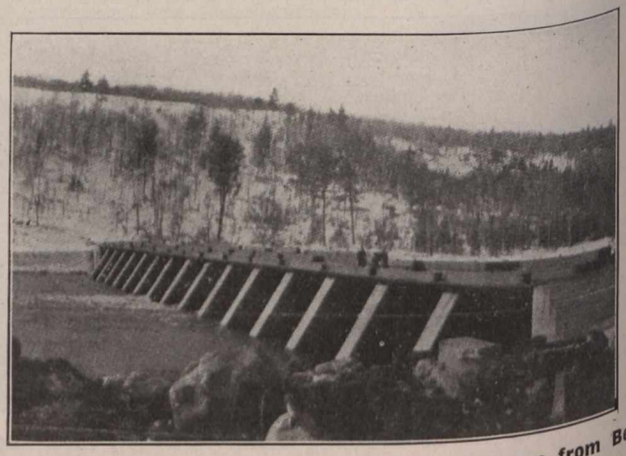

Fig. 3.—Timiskaming Dam. Ontario Sluiceways from Below, Showing Water on Lower Apron and Stop-Logs Piled on Roadway.

The piers and abutments are very fine samples of mass concrete work, the finish is good and the alignment particularly accurate.

The history of the concrete building in the Ontario sluiceways, during an unusually cold winter, is interesting.

Work began 12th February, 1910, and continued till April. Gravel of fair quality, but sandy, was the only available material and the mixing was done by machine. Large boulders were used as displacers in the concrete, each being thoroughly steamed to clean off ice before laying. The gravel and sand were stored in a bin that was heated by steam pipes and the water was also warmed. After laying, a movable steam radiator was set in place, and the mass covered with tarpaulins, so that all night the temperature was kept above freezing. The trench, into which the mixture, averaging 70° Fahrenheit, was placed, had, unfor-