

shows the present power house, the main island and channel.

Cofferdamming in the west channel was completed in August, 1913, and was immediately followed by excavation work for the tailrace and power house in addition to the erection of more extensive construction camps.

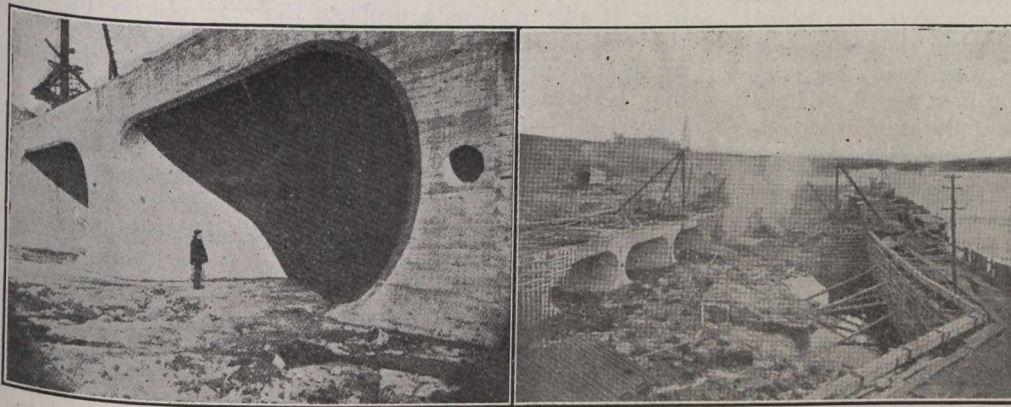


Fig. 4.—(Right) Power House Excavation With Draft Tubes, nearing Completion. (Left) Closer View of Completed Draft Tube.

These camps and their equipment have many distinctive features. They are located on the east side of the river, opposite the present mill site, as shown in Fig. 3, and are fully equipped with crushers, carpenter and blacksmith's shops, material bins, etc., in addition to the housing quarters for laborers. The need for a judicious arrangement of camp for the rapid and economical conveying and placing of material and supplies may be gained from the following: Over 2,000 carloads of lumber, cement, etc., are required for the work. The excavation will approximate 150,000 cu. yds. of rock and 250,000 cu. yds. of earth. About 175,000 cu. yds. of concrete will be required, with 1,000 tons of reinforcing steel and nearly 2,000 tons of structural steel.

The rock removed from Grand Mere Island is transported in large, flat buckets by Lidgerwood cableways 1,125 ft. in length, with a 2 $\frac{3}{4}$ -in. cable suspended from towers 150 ft. in height, across the river and island. Cars, running on transverse tracks over the cut, convey the rock to the cableway, where it is hoisted, carried to the eastern bank and dumped into serving bins for the crushers. It is to be noted that all the crushed stone used in the concreting work is provided in this way.

The rock is crushed in a large gyratory crusher, assisted by a small reciprocating crusher into which feeds the extra large pieces from the main crusher. The broken stone is conveyed by belt (as are likewise the bags of cement from the cement storehouse) to the mixer. Another crusher operates in the sand and gravel pit to crush the larger stones rejected by the screens through which the gravel is passed.

Another cableway of 7 tons capacity and 1,650 ft. span conveys the concrete from the main mixing plant across to the power house and over a portion of the dam, while another of 600 ft. span conveys concrete from an auxiliary mixing plant on the west side of the river close to the power house site. On the 1,650-ft. span cableway a bottom-dumping bucket is used for carrying the con-

crete. The dumping is effected by releasing the tension on the ropes by which the bucket is traversed on the cableway, this tension ordinarily holding together the two overlapping hinged leaves which form the bottom of the bucket. Slacking the ropes allows the leaves to swing apart, thereby dumping the material. The bucket holds 2.4 cu. yds. of concrete and empties itself clean when dumped. During operations last summer it gave very rapid service and conveyed 450 cu. yds. of concrete over a distance of 1,100 ft. in the usual 10-hour shift. Hoisting towers with gates and chutes are used extensively in a distribution of concrete in the construction of the power house. Electric hopper cars convey the concrete from the cableway to the hoisting towers. In places not readily accessible to the cableways portable mixers are used.

The completion of the spillway over the eastern channel will be attended to by a fourth cableway of construction similar to those mentioned above.

While work was in full swing during the earlier part of the present season about 400 cu. yds. of concrete were mixed and placed daily, the excavation and crushing capacities being sufficient to provide rock aggregate at this rate. A certain amount of concrete work was effected last fall but the greater majority of it has been put in this

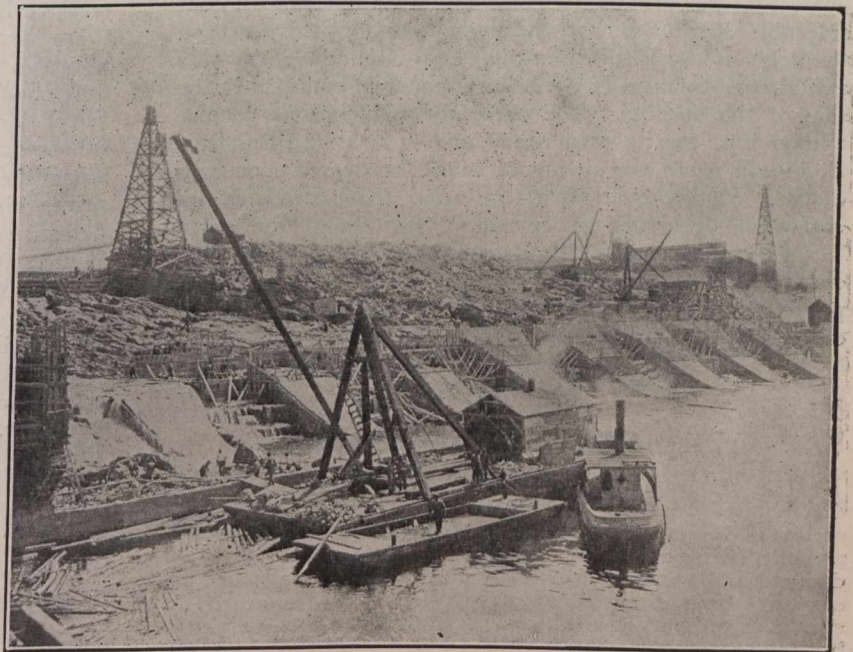


Fig. 5.—Recent View of Power House Construction.

season. It was delayed early in the summer owing to spring floods, which had not subsided from the power house site until early in June. Last Fall's operations on the power house structure consisted of the placing of the draft-tube forms and the pouring of concrete for the lower section. A portion of the adjoining dam was also constructed and the whole was brought above the normal