The general scheme provides for a navigable channel 60 ft. wide, with a minimum depth of 7 ft., between Fairy Lake and Port Sydney, with 8 ft. minimum on the guard sills of the lock, so that an 8-ft. channel could be provided in the future by dredging.

The adoption of the scheme would make 3 ft. of draft available in summer, and 2 ft. additional in winter, upon Vernon, Fairy and Peninsula lakes, making in all 5 ft. of draft available. Under similar conditions, 4 ft. of draft will be available on Mary Lake during the navigation season, and 2 ft. additional in the winter, making 6 ft. available in all. The combined area of Vernon, Fairy and Peninsula Lakes, is about 7,600 acres. The area of Mary Lake is about 2,600 acres. On the basis of the above figures for area and storage draft, the four lakes would provide 32,800 acre-feet of storage during the navigation season. The benefit to be derived from this volume of storage will be proportional to the length of the low water season, which will vary from year to year. The continuous supply from storage alone, for seasons of various lengths, would be as follows:—

107 days from	July 17 to Oct. 31.......	155 second-feet.
92 "	Aug. 1 to Oct. 31.......	179 "
76 "	Aug. 1 to Oct. 15.......	210 "
61 "	Aug. 1 to Oct. 1.......	271 "

Under the worst possible conditions that could be imagined the watershed of the Muskoka River above Port Sydney should produce a natural minimum run-off of one-tenth of a second-foot per square mile of watershed. This would mean a natural low-water discharge of 56 sec.-ft. at Port Sydney.

If the flow from storage under various conditions be superimposed upon this natural discharge, the figures given above will become 211, 235, 274 and 327 sec.-ft. respectively. These latter figures fairly cover the range of benefit to be derived from the utilization, during the navigation season, of 32,800 acre-feet of storage on Vernon, Fairy, Peninsula and Mary lakes.

As to winter storage, it has been assumed that 2 ft. additional could be drawn off the lakes after the close of navigation. Assuming no fall replenishment, there would be 20,200 acre-feet of storage available, to meet low-water conditions during the winter. Two months' use of winter storage would probably cover the worst condition; say, from January 15 to March 15. Over this period, the above specified volume of storage would provide a continuous flow of 169 sec.-ft., which, superimposed upon a natural minimum of 56 sec.-ft., would mean a continuous supply of 225 sec.-ft. under the worst winter conditions to be anticipated.

The outstanding points of advantage in the above scheme are the greater accessibility of the works, and the vastly greater degree of precision with which the flow can be regulated, if properly designed works are placed at the lock and at Port Sydney. The facilities thus afforded for efficient regulation would more than offset any advantage the upper lakes might have as regards aggregate storage capacity.

The complete development of the storage of the lower lakes will also allow the storage of the upper lakes to be properly utilized at very small cost, should the necessity arise. It would simply be necessary, in this case, to keep the wooden dams in a fair state of repair, and to flush out the various small lakes in rotation whenever the stage of the lower lakes was such as to permit the reception of the additional supply.

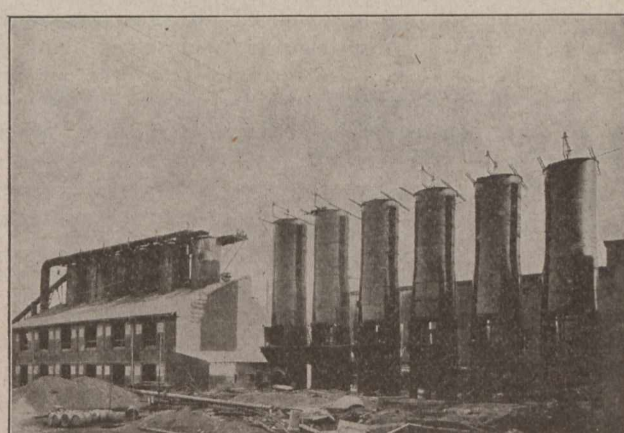
The cost of operating and maintaining the upper system under such circumstances would be comparatively insignificant.

In conclusion it may be noted that the development of artificial storage for power purposes on navigable lakes is not by any means a new idea. The navigable lakes on the Trent and Rideau systems have been used for storage purposes for years, and the range of level variation which obtains on the navigable lakes included in both of these systems is much greater than that contemplated in the case under discussion. Furthermore, in the case of the Trent Canal a through navigation route is involved, where the interests of shipping will be of vastly greater importance as compared to those of power than they can ever hope to be on the lakes above Port Sydney.

CYANAMID FACTORY AT NIAGARA FALLS.

THE problem of artificially fixing atmospheric nitrogen and combining it in suitable forms for plant food has been a difficult one for scientists and one which has had their serious thought and attention for many years. In 1895 two German scientists, Drs. Frank and Caro, found that when nitrogen gas is conducted through a hot mass of calcium carbide there is produced a compound known as Cyanamid, very rich in nitrogen.

This form of combined nitrogen was found to possess particular value as a fertilizer and its use for this purpose has developed an enormous industry. Cyanamid factories have been established all over the world. One of the largest of these is located at Niagara Falls, Ontario,



New Addition to the Plant, at Present in the Process of Construction.

where large quantities of electricity, required in this industry, can be obtained at low cost.

The American Cyanamid Company owns the sole right to manufacture and sell Cyanamid in America. Its factories at Niagara Falls began operations on January 1st, 1910. The original plant had an output of 12,000 tons a year, but this was increased during 1912 to approximately 32,000 tons a year and further extensions are under way to give an annual output of 64,000 tons.

From the very commencement of operations at Niagara Falls it was clear that a plant capable of producing 12,000 tons per annum was totally unable to meet the market requirements, but a policy was adopted to thoroughly prove the commercial practicability of, and demand for cyanamid before building a large plant.