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MAKING OUR WATER POWERS VALUABLE.

BY ARTHUR SURVEYER, M. CAN. SOC. C.E.

The utilization of the slope of rivers for power purposes is as old as history, but the harnessing of the larger and higher water falls has been a modern victory achieved in the last fifty years.

The chief factors in this conquest were the superseding of the old current wheel by the modern turbine developed by Fourneyron and Francis, and the discovery of the applications of electricity.

In this connection a few words of history may not be amiss. Between 1840 and 1850, the two French engineers Fourneyron and Girard both utilized water falls of over 325 feet in height to operate their turbines. These trials were not, however, entirely successful and it was only in 1860 that another French engineer, Aristide Berges, succeeded in operating steadily a turbine under a head of over 650 feet. This wheel was connected to the wood pulp grinders of a paper factory situated at Lancey. Because of the success of his first venture, Berges erected in 1873 another turbine, this time under a head of 1,640 feet.

Towards 1880 the Belgian electrician Gramme announced the development of his alternator, which was to be subsequently improved by Kapp and Westinghouse. Just at that time, or to be

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