of the Minister of Lands, Forests and Mines, as well as investigations in connection with these, is in the hands of the Hydro-Electric Power Commission of Ontario, created in 1906, and the regulations for granting waterpower privileges embody strict conditions, limiting licenses to 20 years, and provide for approval of plans, also government supervision of development, which must be completed within a limited time and, if necessary, later, extended to satisfy public demand. This Commission is very active in its investigations regarding undeveloped power, and, according to its last report, has 69 regular stream measurement stations and many other temporary ones. Besides this work, the Hydro-Electric Power Commission has followed its primary object with excellent results, namely, to serve as a medium, both physically and otherwise, between interests generating hydro-electric energy and the users or municipalities. Upward of 200 of the latter are now supplied with electric energy through the Commission, for which purpose, extensive electric transmission lines have been constructed.

In the Prairie Provinces, water-powers are under Federal control, and the Department of the Interior both administers and conducts investigations in connection with these. All water-powers are licensed for a term of 21 years, which is renewable for three further similar periods with certain readjustments, while development within specified time is provided for and further assured by having an agreement for the period of construction and granting the license proper only after completion of work to the satisfaction of the Minister. Investigation work, surveys and explorations are being pursued in connection with the northern water-powers, while detailed surveys of some of the large rivers in the south have permitted elaborate plans and estimates to be prepared in connection with possible water-power development. Numerous stream measurement stations have been established, and surveys and other investigations in connection with irrigation are also included.

The water-powers of British Columbia are under the control of the Provincial Department of Lands, through its Water Rights branch, and are administered under the Water Act of 1914. The latter provides for the disposal of water-powers by license, with fair annual rental, the latter being readjusted every five years, also, for the approval of plans and the completion of works within limited time. The Water Rights branch also pursues systematic investigations and reconnaissance surveys. The more accessible portions of the province are being thoroughly covered, while upward of 200 regular stream measurement stations have been established in connection with the work.

This work should be further encouraged and extended, as the proper and intelligent disposal, administration, utilization and conservation of our water-powers can only be expected after thorough investigations and surveys, which should be undertaken by the various government organizations interested, and not left to private parties, as has often been the case in the past.

## Stream Flow and Level Variation

A commencement has been made at collecting stream flow and level variation. These data, which are otherwise not available, are mostly being obtained by correspondence with operating hydraulic plants, or with private parties. The province of Quebec has practically all been covered, and the results are very encouraging. The correspondents appreciate the value of the work, and companies and individuals keeping records have. willingly gone to considerable trouble to supply the desired information, while others have expressed a wish to co-operate in keeping future records. In this connection, studies of the flow of the St. Lawrence River were also undertaken and have progressed satisfactorily.

As an outcome of the power survey recently undertaken by the Commission, it has been found advisable to obtain additional and more detailed descriptive information, respecting the electric power plants throughout the Dominion. The importance which electric energy has at present, and, in the near future, will have in the industrial development of Canada is appreciated. While this is particularly true of hydro-electric energy, steam, gas and oil operated electric plants also offer special interest with regard to power conditions. These latter plants are usually of large size, and, as the question of economical production of power is the principal item, they can usually be taken as a criterion, so far as power conditions are concerned. The additional data are being obtained by correspondence, and, when complete, will prove of much value.

Many articles and short reports have been supplied during the year, either on our own initiative, or in answer to special requests. The various subjects include summary reports on the water-powers of the province of Quebec and of the Prairie Provinces, developed and undeveloped water-powers in Canada, water-power regulations, water-power conditions at Sault Ste. Marie, water supply and sewerage situation in Canada, floods, electric heating and the industrial importance of our water-powers.

## Shortage of Power

One of the most important considerations in many portions of the Dominion during the past year has been that of need of additional power. This has been particularly emphasized in the Niagara district, where the principal cause may be attributed to the enormous quantity exported. Other indications are the permission for the full diversion of the St. Mary River (Sault Ste. Marie) at its minimum flow and the recent statement of one of the officials of the Shawinigan Company which supplies power to Montreal from its plant on the St. Maurice, that they were taxed to their full extent, with heavier demands still being made. In the above, as well as in other cases which could be cited, it is noteworthy that, where the supply is not equal to the demand, this condition has usually been brought about, not through "actual lack of water-power, but more frequently through the improper timing of improvements, extensions and new developments; instead of keeping ahead of the demand, the hydro-electric companies have allowed themselves to be overtaken by it. The large amount of power required by munition factories is an important factor in the increased requirements, but other industries are also large buyers of energy.

## Water Diversion

Closely allied with the power shortage at Niagara, as well as at all water-powers of the St. Lawrence, is the question of water diversion through the Chicago Sanitary Canal. One feature, which has perhaps not been sufficiently emphasized in connection with this scheme, has been forcibly brought out in recently published figures respecting the power plant, which evidently is a very important factor of the project. The figures show that the disposal of sewage is only a secondary consideration, when compared with the financial aspect of the hydroelectric power development. This is further accentuated