

between the two sources of power, nature has done very well by mankind and we generally find either one or the other.

#### Commission to Develop Sites

Having come to a point where there could be no doubt as to the fact that this province has considerable hydro-electric resources, as well as large power resources from other sources, the provincial authorities have taken steps to put these natural resources at the disposal of the people. In the first place, everything possible is being done to supply to those interested adequate and reliable data, and at the same time to remove any restrictions of a legal or proprietary character, tending to retard development. In addition, the Nova Scotia Power Commission has been organized to carry out as a public measure such developments as may be in the interest of the public. There seems to be little doubt but that the province is now on a fair way to be adequately supplied with electrical energy for domestic and industrial purposes. Of course there will always be certain outlying districts which in the very nature of things cannot be supplied with such energy as a commercial undertaking.

As an earnest of what is proposed in this connection, the Nova Scotia Power Commission is already proceeding as rapidly as possible to develop a water-power site in the vicinity of Halifax. This will form one of the nuclei for a network of transmission lines, eventually serving all the more populous and industrial centres of the province and possibly with some of its ramifications extending into the province of New Brunswick, where similar projects are under way. This network of transmission lines may be likened to a large reservoir of electrical energy, with energy being pumped into it from various generating stations, both steam and hydro-electric, and which may be tapped at any point. It may be noted here that this arrangement is no dream of the future, but is an accomplished fact in many places even so near at hand as the upper part of New Brunswick, the State of Maine, the New England States and a large area of the other states.

#### Some Probable Plants

It is probable that the next undertaking of the Nova Scotia Power Commission, and that at an early date, will be a water-power development at Sheet Harbor to supply the industrial section of Pictou County, possibly interconnected with a steam plant in the vicinity of New Glasgow. A third development may well be one on the St. Croix river to supply Windsor, where there is already in existence a considerable industrial community which would be greatly stimulated by a supply of reasonably-priced electrical energy. A line could extend down the valley from this development to supply existing demands there and ultimately, as demands grow, link up some of the possible developments in that section. A fourth development might well be a steam plant located in the vicinity of Springhill, with a trunk transmission line following the railway and connecting at Truro with a line from the St. Margaret's Bay developments and the St. Croix development to New Glasgow via Truro.

#### May Electrify C. N. R.

With various plants thus interconnected there can be no question of dependability of supply, and advantage can be taken of the great diversity in the character of the power loads at various places to secure a maximum use of the generating equipment and consequent minimum costs for energy. It is quite probable that the availability of such a dependable source of supply would hasten the electrification of the C.N.R. from Moncton to Halifax, something which must be carried out sooner or later if the fullest possibilities of the port of Halifax in the interests of the country at large are to be realized. The existence of such a dependable source of power was a considerable factor in one of the largest railway electrifications now in existence, that of the Chicago, Milwaukee and St. Paul Railway, which is fed by a power system embracing some 13 hydro-electric power stations and three steam stations.

While the specific developments mentioned may be considered as commercially feasible now or in the immediate future, it is well to bear in mind that a proper balance must always be maintained between capital expenditure and market. There can be no question, however, but that a certain amount of electrical energy immediately available, with the certainty that more will be made available as demands arise, will prove a powerful stimulus to industrial and even agricultural development. Probably no person can better realize the benefits of electrical energy than the farmer, and all industrial and commercial development must rest on a substantial and satisfactory agricultural foundation.

#### MOVING PICTURES OF FRAZIL FORMATION

MOVING pictures showing the formation of frazil were shown to members of the Montreal branch of the Engineering Institute of Canada last Thursday evening, during the course of a lecture by John Murphy, electrical engineer of the Department of Railways and Canals, Ottawa.

The pictures showed practically the same experiments that were made in February, 1919, at the general professional meeting of the institute at Ottawa, and which were described in the February 20th, 1919 issue of *The Canadian Engineer* (pages 241-2). They showed bottles of water just at the freezing point or slightly below it, the water in the bottles being agitated by steel rods, the temperature of the rods in some cases being a fraction of a degree below the freezing point, and in other cases a fraction of a degree above.

The experiments showed that perhaps one-thousandth of a degree in temperature may determine the formation of frazil; that is, if the runner, casing, etc., of a hydraulic turbine be one-thousandth of a degree below the freezing point of water, frazil will be attracted, and, said Mr. Murphy, will often clog the machine in an incredibly short time. If the metal parts are one-thousandth part of a degree above the freezing point, frazil then will not cling to the metal.

To avert this danger from frazil, which, said Mr. Murphy, is the "bogey" of Canadian water powers, the easiest and cheapest method is to raise the temperature of the machinery or of the water to slightly above freezing point. He told of an instance where a small steam boiler kept a very large hydro-electric plant from freezing. "The simple fact is," he said, "that moving metal machinery below freezing point is an ice-making machine, and the only remedy is either to bring the machinery above freezing point by steam or electric energy, or to raise the temperature of the water."

The moving pictures were very clear. They were produced in Ottawa under the direction of B. E. Norrish and J. M. Alexander, of the Bureau of Publicity and Exhibits, Department of Trade and Commerce, with the co-operation of the Chateau Laurier, the bottles of water being brought to the desired temperature in the refrigerating plant of the hotel. The pictures were taken with the aid of powerful electric lights and microscopic lens.

Other branches of the Engineering Institute of Canada, or other technical societies, who might be interested in securing a showing of these pictures, should address Mr. Murphy, who is a government official and is interested in the matter merely from the standpoint of education and of increasing the value of Canadian water powers during severe winter weather.

Officers for the newly formed Vancouver branch of the British Columbia Technical Association were elected at a recent meeting. They are as follows: President, A. S. Wooton; secretary, R. Snodgrass. Executive: Naval architects, T. Halliday; mining engineers, Dr. E. T. Hodge, A. E. Hepburn; civil engineers, A. Lighthall, P. Philip, W. B. Young, F. O. Mills; mining engineers, W. Reith, A. D. Robertson; chemical engineers, Dr. J. G. Davidson, G. S. Eldridge; architects, S. M. Eveleigh, A. L. Mercer; electrical engineers, J. Muirhead, T. H. Crosby.