

secondary transmission circuits about 1,600 miles. Altogether some 143 municipalities are supplied. The supply reaches to a distance of 245 miles from the main source.

Another notable instance is to be found in Tasmania. Originally a concession was granted to a company authorizing them to undertake the generation and distribution of power in Tasmania; but the company failed, and after some negotiations the State took over the works and completed them. They started with 10,000 h.p. of plant, which was augmented by 8,000 h.p. soon after, and a further 16,000 h.p. of generating plant is on order. Arrangements are being made for developing other sources, as the present source is quite unequal to the demand. The magnitude of the contracts entered into is a feature of this undertaking. One contract alone amounts to 25,000 h.p. for electro-metallurgical purposes, and it is significant that when the State took over the plant from the company such big demands were not anticipated. Nor was there any indication that the business of electric smelting would attain such proportions. The total contracts already entered into amount to 42,000 h.p., and further contracts amounting to 50,000 h.p. are being negotiated.

New Zealand, now at the outset of its career as a nation, has a unique opportunity of securing the utmost possible efficiency for all time by developing its water-powers on such a scale and by providing for such a wide-reaching system of distribution that electric power shall become available to every householder throughout the Dominion, and available at any point where circumstances require the application of power.

The functions of that Department of State which deals with the generation and distribution of power is one involving great responsibility and wide range of knowledge, as it touches every phase of national life in its industrial aspect. It has to generate and transmit electric power; it has to make contracts with local authorities and other State Departments and individuals; it has to negotiate terms with industrial organizations outside New Zealand which may be desirous of taking advantage of the supply of hydro-electric power; it has to finance local authorities to enable them to reticulate their districts; it has to finance power-users to enable them to convert from steam or other power to electric power; it has to assist industry by carrying out experiments in industrial processes on a commercial scale, for the lack of which a great deal of talk concerning industry and science is lacking in cohesion. It may further be required to undertake the manufacture of a special class of product in the national interest.

ELECTRICITY IN AGRICULTURE.

The extension of the Lake Coleridge supply to the country districts in Waimairi, Eyre, Halswell, Papanui, and Springs has served to demonstrate its convenience, utility, and its effect in lessening the drudgery of farm life and in increasing production, especially so in dairying districts.

Electricity as a power agent is so flexible and adaptable, and its uses therefore so manifold, that there is scarcely an aspect of human activity to which it cannot be applied, the number of processes to which it is capable of being applied on farms being about 125.* The supply of electricity to farms and homesteads has already attained considerable dimensions in some parts of the United States of America, the extent of which is not generally known. A census made by the Western Power Association† of California in 1915 gives the total horse-power of electric motors on farms at 190,141, and the estimated figure for 1918 is 200,000.

Electric pumps are largely used in the districts mentioned for pumping water for irrigation purposes, which accounts for a large proportion of the power used, but after allowing for this there remains a substantial balance for other purposes.

One of the most remarkable and deplorable movements of the present day is the drift of the country population into the towns. Various reasons have been advanced to account for this tendency, but it will be admitted that the drudgery associated with farming is one of the main if not the primary cause. This drudgery will certainly be lessened when a general supply of electricity is available and the farming community has had time to become habituated to its various uses. In fact, the movement will then be in the opposite direction, as the stimulation given to production and the improvements made possible in the conditions of living will result in closer settlement of the country areas. At the same time these districts will be brought more closely into touch with the towns by the construction of light railways, made possible by a general supply of electric power.

ELECTRICITY AND INDUSTRY IN GENERAL.

Using the word "industry" in a more restricted sense of manufacture, the importance of a supply of cheap electricity for manufacturing purposes is one of paramount importance. It places at the disposal of the manufacturer a subtle and flexible form of energy which is adaptable to every kind of power, to heating, or to electro-chemical and electro-metallurgical uses. He is able to extend and adjust his business to the growth of demand without being hampered with the many considerations which a manufacturer has to face if he has to provide a generating plant or increase its capacity.

These advantages are of course well known and appreciated, but what is not appreciated enough is the importance of a general supply of electricity available for use anywhere in the Dominion. At present if a manufacturer wishes to avail himself of a supply of electric power he has to locate his works in the vicinity of a town where he can get a supply, or he has to consider the question of the coal-supply and the cost of coal, with the result that the factory is not always placed where it is best suited for the exigencies of the business. Moreover, it is quite certain that a number of industries which might be carried on are neglected altogether owing to the element of power being difficult to procure.

* C. I. Rohrer: G. E. Review, V, 16, p. 714.

† I. H. Davidson: G. E. Review, V, 21, No. 2, p. 130.