

The Development of Hydro-Electric Power in New Zealand

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While a good deal of public attention has been given to this subject during the last three years, and more particularly during the last few months, the general public have very little conception of the possibilities of hydro-electric development in the Dominion, or given those realized possibilities, of the infinite uses to which the power might be put, or the direct results on the cost of production.

Mr. Lloyd George in one of his historic speeches on munition manufacture said "The country that can produce an article of standard quality at less than the accepted standard cost, is well on the road to financial and commercial success."

Every manufacturer has at heart, a keen desire to cut cost of production, without sacrificing the quality of his goods, and to this end one sees constant factory improvements, in the way of better lighting, re-arrangement of machinery, classification of work, and standardization of parts. Each added improvement is of course a step in the right direction and probably tends to cheapen production, but the unfortunate part of the production problem is that the directors of the business concerns are mostly content to accept these small concessions to modern manufacturing methods, as the acme of effort in their own particular line, whereas, as a matter of fact they are merely scratching on the surface of things, where nothing but a thorough inspection of primary causes is likely to disclose a permanent remedy.

The most important and usually most expensive item of a process of manufacture is the prime mover, be it steam, gas, oil, or electricity. The cheapest reliable power available is of course water power applied direct through turbines or water wheels to the mill machinery.

Unfortunately it is often impossible, owing to want of shipping and railway facilities for the finished product, to establish factories within many miles of the source of water power, but the world-wide search for cheap power has resulted in the development of the hydro-electric schemes, a combination of the cheapest power on earth transformed into its most transmissible form. It is astonishing that manufacturers have remained so apathetic in the development of our natural hydraulic resources. Each will individually ascertain the merits of the various hydro-electric schemes discussed from time to time, and assure each other of the immediate advantage each would take of the power if it were available in his particular case, but concerted effort to attain the end desired by all has been lamentably wanting. The reason generally given for this inaction is that the available streams and rivers are controlled by the Government who are chary of granting rights to individuals or companies for

hydro-electric development purposes. Granted that this is so, has every effort been made to compel the Government to develop the latent power of our streams? It seems to us that it is only since the establishment of successful works by the Government at Lake Coleridge, that the average business man has given even a weighty thought to a scheme that in the ordinary course of events should have been his first consideration. Energy developed from oil, coal, and gas, is exhaustable, not in the immediate future perhaps, but certainly at some remote date, and as the deposits work out so will the cost of power proportionately increase, for even in our own generation we have experience of the finite character of some of the deposits.

Hydraulic power on the other hand is renewed perennially, the only contribution that mankind need make to the retention of nature's benefits, being the setting aside of the necessary water-shed area to ensure the renewal.

Hydro-electric development was commenced on a commercial scale only some 25 years ago and its rapid development has of course been due to the easy conversion from water power to electrical energy and the easy transmission in this latter form. In 1904 the highest power in use was 60,000 volts, and 100,000 volts was looked forward to at some remote future date as a possibility. As an indication of the rapidity of development, up to 1916 Canada and the United States alone harnessed millions of horse power as the following table will show:—

At 70,000 volts—100,000 volts .. 23 schemes
 „ 100,000 „ --125,000 „ .. 27 schemes
 „ 130,000 „ „ „ .. 1—135 mls
 „ 140,000 „ „ „ .. 1—230 mls
 „ 140,000 „ „ „ .. 1—245 mls
 „ 160,000 „ „ „ .. 1—241 mls

Water power development in other countries, as under:—

| | |
|---------------------|------------------------|
| Germany | 44% of available power |
| Switzerland | 25½% „ „ |
| United States | 25% „ „ |
| Canada | 21% „ „ |

As an indication of the rapidity of hydro-electric development Norway and Sweden are excellent examples. The configuration of the country of course has had much to do with this, and the enormous number of streams and waterfalls with which these countries abound, have perhaps served to make the advisability of development more obvious. During the last ten years as a period, millions of horse power have been developed, and as a direct consequence these two countries are becoming important manufacturing centres. In Sweden 800,000 h.p. is used in five industries alone, viz.:—The Iron, Timber, Pulp, Textile and Electro-chemical