The amount of effective power for motive power, lighting, &c., available after transmission, may be put at 2,220,000 b.h.p. continuous working, or 4,440,000 b.h.p. for half-time full power. At the assumed rate of £12 for the horse-power-year, the gross revenue would be £26,640,000 a year in each case, if all the energy could be utilised.

To supply electric power to take the place of all steam, gas, and other plants, also locomotives now in use in the colony, would require an installation of, say, 420,000 b.h.p. to give 250,000 b.h.p. effective. The cost would be about £12,000,000 or perhaps less by selecting the easiest-developed schemes. In addition there would be the cost of conversion of railways and existing steam plants, the cost of which would be great, also for distributing networks in towns, &c.—together, perhaps, £5,000,000; but this is only tentative as the questions all require a very lengthy study. It is, however, impossible to displace all steam and other prime movers by electrically transmitted power. The percentage of inconvertible plant cannot now be estimated.

The cost of steam plant to give power equivalent to the 2,220,000 b.h.p. or 4,440,000, b.h.p. taken above, to be available from the hydraulic schemes after transmission, would be approximately about half, or rather more than the cost of the hydraulic and electric plant, but the cost of working per brake horse-power would be much greater; about double on the average, and much more for small plants.

The coal required to give power equivalent to the amount possible to deliver as given above, would be 17,500,000 tons of the best quality of coal, used in first-class large plants, and likely to be very much more if many small plants were employed, and still more if the inferior kinds of New Zealand coal were used. This amount of coal, in addition to what would be required for other purposes each year, would, in a comparatively short time, make an appreciable inroad on New Zealand's relatively slender stock of coal, a fixed quantity only which cannot be renewed. On the other hand the potentialities of water-power will remain as a national asset as long as the climatic conditions and the mountains endure.

Some information from the "Annales des Ponts et Chaussées," *re* the Chevres hydraulic-power installation at Geneva, is given below.

USINE DE CHEVRES.

This power-installation utilises the flow from Lake Leman, all the power being sold in the City of Geneva and its surrounding districts. A dam was built across the Rhone to give a fall in lowest state of river of only 14 ft. to 15 ft.; 12,000 to 15,000-horse power obtained; cost of scheme, 8,500,000 francs—say £340,000. 5,000-horse power sold for electro-chemical industries, 4,500-horse power sold for motive power and electric lighting, and 1,850-horse power for special purposes.

The works were begun in 1893 and the first year working appears to have been 1897. In 1900 the network of distributing-lines had a length of a hundred miles, some of these lines are underground somewhat less than half the length.

The dividends in 1900 amounted to 435,700 francs. The following table shows the progress made by the company in the first four years:—

Year.	Receipts, Gross.	Expenses.	Net Receipts.	Kilowatts Produced.
	Fr.	Fr.	Fr.	No.
1897	178,412 (£7,136)	110,113 (£4,404)	68,269 (£2,731)	3,669,876
1898	269,137 (£10,765)	129,390 (£5,176)	139,947 (£5,598)	9,517,262
1899	512,544 (£20,502)	223,167 (£8,927)	289,377 (£11,575)	28,066,480
1900	630,635 (£25,225)	295,000 (£11,800)	335,635 (£11,425)	31,111,454

The tariff varies from 8 to 23 centimes per kilowatt-hour, 0·57d. to 1·64d. per horse-power-hour, or from 150 francs to 750 francs per horse-power-year; or £6 to £30 per horse-power per year. (The figures given appear contradictory.) For electric lighting the charge is 8 centimes per hectowatt-hour, equal to 7·62d. per Board of Trade unit.

It is not necessary to assume that all the energy available from water-power should be converted into electrical energy, then reconverted into kinetic energy of motion with the resulting heavy losses involved in conversion, transmission, and reconversion. Industries, as in the French Alps, will in time move towards the sources of power, and use as far as possible the hydraulic power direct. When this comes to pass, the industrial value of the hydraulic power will be enhanced. No doubt for many purposes large amounts of power would continue to be transmitted long distances, but I think it is too much to assume that all will be so utilised.

Water-power is not to be obtained in New Zealand except at considerable cost. Apart from the lake schemes most of the possible schemes must of necessity be located in the central main range, or its offshoots, which runs from Otago to Marlborough, and thence through Wellington to Auckland Province. The best schemes appear, at present, to be obtainable by diversion of water from one lake to another or to the sea, or by diversion of water from one river-valley to another at a lower level. All other schemes must be got by dams, or by dams and conduits following the valley of the river utilised. Some of the methods adopted in the mountainous countries of Europe seem suitable as patterns for the development of some of the New Zealand water-power schemes, but many of these are at present unique in character and will demand special treatment, independent of precedent.