Without a dam the stock-spur project would give about 22,000 b.h.p. on the Pelton-wheel shafts, and 31,000 b.h.p. with the dam. The length of conduit would be—intake, 1,050 ft.; tunnels, 12,700 ft.; pipes, 4,500 lin. ft. The cost for the 22,000 h.p. would be £440,000, including a transmission-line to Christchurch; and for the 31,000 b.h.p. £590,000. The cost per horse-power would be about £20 and £19 respectively. For the two schemes this is very low.

For the other conduit-route, giving 21,000 b.h.p. or 30,000 b.h.p., the cost would be £380,000 and £535,000. There is little to choose between the two alternatives when the extra power is allowed for.

The cost of power from this scheme, measured at the consumers' meters at Christchurch, for continuous service may be taken at £4 10s. per horse-power per year, and for about half-time service £7 per horse-power per year. For intermittent service in small amounts the cost would be somewhat greater.

This scheme could be further augmented by increasing the height of the dam at Lake Tennyson, and perhaps by building a dam at the most favourable point between the weir and Lake Tennyson. It might also be possible to divert water from the most northerly branch of the Waiau-ua if this stream is higher than the Clarence; this is a point worth getting information on.

This scheme would give very cheap power if uses were found at first hand at the power-site. In the production of nitrate-of-lime fertilisers about 15,000 tons annually could be made. The selling-value of this quantity would be about £150,000. I have no information about the cost of the electric and other plant and works required for the production of nitric acid. The electric energy could easily be supplied for this purpose at £1 10s. per horse-power per year.

Lake Coleridge.

The plans of further surveys and data for this scheme are not yet to hand, but on the fairly full information got at first, with subsequent information as to cost of electric plant, &c., the best alternative scheme at Coleridge for the generation of about 29,000 h.p. would cost £700,000, and the least cost in Christchurch of large supplies of power would be about £5 per horse-power per year.

Opihi.

The surveys finished at Opihi show that the best way to utilise the power available is to build a dam at the upper end of the Opihi Gorge (this structure would be about 130 ft. high and 370 ft. long on the crest), and to construct a conduit from the dam to a point about 4 miles 16 chains lower down the river. The conduit will consist of about 120 chains of tunnel, about 7 chains of flume, and 209 chains of open tunnel, cut in rock or earth. The length of steel pipes from the end of the conduit to the power-house would be short—about 450 ft. long.

The fall obtainable from the end of the conduit to the power-house would be 260 ft. The reservoir would store 4,600,000,000 cub. ft. of water, and would be located in the Opihi Valley. To supplement the flow in the Opihi water can be diverted from the north and south Opuhas and creeks between at no great cost; and at considerable cost water could be diverted from the Tengawai Stream into the reservoir, but this is not considered as a present part of the scheme.

The works required for diverting the water from the Opuhas would be a weir across each river, with short levees at the South Opuha; a large channel from the South Opuha to the head of St. Michael's Valley, about one mile long; and a channel between the two rivers about two miles and three-quarters, for the most part in earth. There would be 2,000 lin. ft. in flumes over two creeks. The diversion of the South Opuha would be done first; then, when circumstances warranted, further water could be taken from the North Opuha.

There are extensive flats along the river-bank below the power-station favourable for the establishment of factories to utilise the power direct. The distance from the power-house to Timaru is about twenty-two miles, to Oamaru seventy-five miles, and to Christchurch about ninety-six miles, if a direct line were taken.

The flow of water in the Opihi and the Opuhas should give water enough for about 16,000 b.h.p. continuously on the turbine shafts, or a proportionately greater power for shorter-time working. The reservoir would store about four months' supply supplementary to the low-water flow of the rivers. The snowfall on the higher portions of the basins of the Opuhas would also help materially, the flow-off from melting snow not being so rapid as in the case of flood rainstorms.

The cost of works to give 16,000 b.h.p. on turbine-shafts continuously would be £610,000, and the cost of work for 35,000 b.h.p. would be £860,000.

It is a question whether a central power scheme should be established at Coleridge for Canterbury, or two schemes—one at Clarence and another at Opihi.

The two schemes would, for full-time working, have a capacity of 46,000 h.p., capable of extension to 70,000 h.p. for part-time working, costing for the 46,000 h.p. about £1,045,000. The two schemes would command a much greater area, and over this area would supply power at a lower average rate than the Coleridge scheme.

The Coleridge scheme would give, at a cost of £700,000, 29,000 h.p., against 46,000 h.p., at a cost of £1,045,000, and it would be capable of extension to 58,000 h.p. for half-time working, against 70,000 h.p. for the combined schemes; but there are also other and larger but costly schemes possible at Coleridge. Coleridge is more favourably situated for partial development than the two combined schemes taken together, though not more so than the Clarence alone. The relative cost of energy at Christchurch from the three schemes is given below:—

	Horse-power.	£	s.	d.	
Clarence	30,000	4	7	6	per horse-power year.
	22,000	4	13	0	"
Coleridge	29,000	5	0	0	"
Opihi	16,000	5	10	0	