might have given a smaller low-water flow. The minimum flow measured is greater than would be expected from the August, 1899, rainfall at the Bealey, but the rainfall on the hills would be greater than in the Waimakariri Valley at the level of the Bealey. Only continuous records of river-flow can give any results of value, and these records would require to extend over many years to be reliable for rivers where no storage is possible.

It is popularly supposed that rivers such as the Waimakariri may be made to yield large amounts of power. While this is so, the cost will be relatively great, owing to the height of dam or length of conduit required to get the necessary fall.

The following schemes for the Waimakariri are possible, in addition to the partial one proposed by Mr. Dobson :—

1. Build a weir at the gorge bridge to enable all the water to be taken out of the river, and take all the low-water flow of the river to the point proposed by Mr. Dobson. This would give, say, 15,000 b.h.p.
2. Build a dam 80 ft. high at gorge, and use water near dam-site. This would give a little over 14,000 b.h.p.
3. Take water by weir from the river at about Patterson's Creek, and run tunnel and canal to take water to top of terrace, and then down to river-level by pipes ; or continue conduit down edge of terrace by armoured concrete pipes, followed by steel pipes to gain extra head, and then take water down to power-station at river.
4. Build a dam or weir at Broken River junction, and take water to point near Patterson's Creek by tunnel conduit. The fall in river is 100 ft., and with a dam, say, 100 ft. high, an effective head of 160 ft. to 170 ft. should be got. The cost of dam, tunnel, and other hydraulic works, but exclusive of the pipe-line from end of tunnel to power-station would not be less than £525,000. The power obtainable would not be likely to exceed 28,000 b.h.p. If about the same fall were to be got by building a dam at Broken River junction about 200 ft. high, the cost would be about £700,000—much more expensive than the low dam and tunnel.

From Broken River junction to the proposed crossing of the Midland Railway over the Waimakariri, the river rises about 620 ft. in a distance of about twenty-two miles by the river. If most of this fall could be used by, say, two or more power-stations, perhaps as much as 50,000 b.h.p. could be got. In all, about 115,000 b.h.p. should be got from the five schemes. The cost would probably be, say, £4,500,000. Smaller schemes would be possible on some of the tributary streams. A fairly good power scheme could be got by running the waters of the Bealey and the Mingha to a common point at their junction.

Lake Coleridge.

This lake has a drainage-area of eighty-six square miles, and the area of the lake is 13·8 square miles. Its altitude is 1,667 ft. above sea-level, yet it never freezes. The lake lies parallel to the Rakaia River valley, in a trough cut in the rock on the slopes of the valley. Its length is eleven miles. The lake enables the fall in the Rakaia River bed in this distance to be utilised for power purposes. The lake-basin is bounded on the north by some high mountains, the highest peak being 7,200 ft. ; nevertheless the flow from the lake was relatively very small when measured at the end of November last year. The Southern Alps probably screen the Coleridge basin from the westerly rains, and other mountains, Torlesse and Ben More, may do the same for the easterly rains. The flow is surprisingly small when compared with the results obtained from the other lakes whose discharges have been measured, and in view of the fact that the lake-basin comprises very high mountainous country.

It is possible by the construction of suitable works to divert the water from the Acheron, Harper, and Wilberforce Rivers into Lake Coleridge. The Acheron rises from Lake Lyndon, and has a drainage-area of twenty-one square miles above the race-intake. The Harper has a drainage-area of 124 square miles. It drains high country, and one of its branches is glacier-fed. The Wilberforce has a drainage-area of 202 square miles. It drains the eastern slopes of the Southern Alps for a length of fifteen miles, and its branches are fed by a number of glaciers.

Gaugings were made of these three streams, and also of the Coleridge overflow in November last year. The results are given in the table below, and Mr. Dobson's result for the Waimakariri is added for comparison :—

—	Flow in Cubic Feet per Second.	Drainage-area in Square Miles.	Flow in Cubic Feet per Square Mile.	Assumed Low-water Flow.
Wilberforce	1,144	202	5·72	600
Harper	419	124	3·38	200
Coleridge	82	86	0·95	50
Acheron	30	21	1·43	20
Waimakariri	1,955	927	2·12	...

Considering the physical conditions, the low-water flow of the Wilberforce in cubic feet per second per square mile may be higher or lower than that of the Waimakariri, but most likely higher. The Harper would, I think, certainly be lower, and the Acheron would be much lower. In view of the Waimakariri and other results, also of the season of the year in which the gaugings were taken, it is not safe to take the several results as the minimum flow for the streams in question. At present I would not be prepared to assume more than the figures in the last column. The Coleridge and Acheron