The best scheme for utilising all the flow from Tekapo, if ever it is desired to do so, would be to drive one or more tunnels from the lake towards Silverstream, and from the end of the tunnel take the water in pipes to the level of the Opihi. About nine miles and a half of tunnel would be required. About two miles and a quarter of this length could be excavated from adits as well as from the end. The length of continuous tunnel would be seven miles and a quarter. The other two miles and a quarter should be all tunnel in preference to part open conduit.

The pipe-line would apparently be from a mile and three-quarters to two miles long. The tunnel might be straight or bent to get an adit, if possible, to shorten the length of lead. All leakage losses from conduit would be avoided by this scheme. The fall obtainable would be from 850 ft. to 900 ft., and the power would be 400,000 b.h.p. for continuous working, and, say, 800,000 for twelve hours per day.

The lake would be dammed to store water to the maximum possible height—perhaps 50 ft. The cost for dam, sluices, pipes, &c., all work up to the turbines, would be great, say, £6,000,000—a sum relatively small compared with the £880,000 for the "Jonage" canal, giving only about 4 per cent. of the power. In the wide valley of the Opihi, with the large extent of relatively flat land and easy transit facilities, many industries should be possible in which the power would be used direct, and all the conversion and transmission losses saved. The scheme should create industries enough to support a large city. In addition to the 400,000 b.h.p. available from the first scheme, another giving, say, 150,000 b.h.p. from using the water a second time in the Opihi gorge would be possible.

Utilised near the power-stations without conversion, the power in the two schemes is equal to that obtainable from the best steam plant using 4,300,000 tons of the best coal a year, and, if transmitted to various places, equal to power obtainable from 2,500,000 tons of coal per year.

The cost of the combined schemes would be, say, from £16,000,000 to over £31,000,000, according as twenty-four hours per day, or, say, twelve hours per day full power were worked. At the rates assumed above, the revenue would be at least £3,500,000 a year. The scheme is an immense once; so will the results be whenever New Zealand's industrial progress warrants the development. I think the scheme would be a financial success with lower tariffs than assumed in computing the above revenue. The difficulty will be in using the power.

Other schemes would probably be possible, starting from the Tekapo River and taking the water through Mackenzie's Pass, or in any other direction where a good fall is obtainable; as to Mary's Range below Simon's Pass, these would not offer the same advantages as the Silverstream scheme, and there would be loss of water from the canals.

There would be objections to the Silverstream scheme from the large increased volume of water in the Opihi. This would have its real force only at times of extremely high flood. In view of the advantages to be gained, the objection will not hold One difficulty may lie in the risk of the water cutting a deep channel in the present bed of the Opihi from Silverstream to the gorge. This depends much on the nature of the materials immediately underlying the bed of the stream. The fall per mile in the Opihi channel to the gorge is only a little greater than the fall per mile in the bed of the Tekapo River from the lake to its junction with the Waitaki. This point and many other questions would require to be carefully investigated.

Lake Pukaki could be made use of to develop power. The flow from the lake is very large. The water could be raised by a dam, and then carried down the terraces as far as possible. No surveys have been made to determine the fall likely to be available, but it would not be more than 120 ft., if so much. The greatest height of dam would be about 70 ft. The dam would be about 650 ft. long on top, and about 300 ft. at water-level, raising the lake-level by, say, 60 ft. If Pukaki were dammed to any height, a corresponding diminution of the height available for a power-station for Tekapo would result. About 70,000 b.h.p. would be available for a complete scheme for Pukaki. The works would be costly. Providing for the flood overflow over the dam would necessitate heavy works, as the dam would be in moraine. No information was got as to any partial scheme, as the conditions did not seem very favourable. The drainage-area of the lake is 523 square miles; the area of the lake is thirty-one square miles; and the length of the Southern Alps drained is thirty miles. The volume of flow measured in October last was 6,800 cubic feet per second, with a corresponding probable low-water flow of 5,000 cubic feet per second, as deduced from the levels given for low-water level of the river, but this appears low when compared with the similar results obtained for Ohau.

Ohau Lake.

A dam about 70 ft. high, or more, could be built at the outlet of the lake, and there would be a smaller dam likely to be required to the west of the outlet, to close an old channel. The height of this old channel above the lake was not determined. Perhaps it is too high to require any bank. A fall of about 225 ft. in the river is available at a point about four miles and three-quarters below the lake, measured in a straight line. The whole water or a part of it could be taken to this point in a suitable conduit in the form of a canal, flume, or in tunnels, as required by the configuration of the country, which consists of old river flats and terraces. Just beyond the point selected for the termination of the conduit, there is some slipping country, along which it would be injudicious to carry a conduit for water, while further down there is the sloping plain leading up to Benmore Station, which would be likely to cause a considerable *détour*. The Ohau Lake is 1,720 ft. above sea-level. The river falls about 300 ft. to the road-bridge, which is seven miles from the lake in a direct line, or about nine miles and a half by the river. There is, probably, a further fall of about 300 ft. at the junction of the Ohau with the Waitaki. The distance from the bridge to the junction is about seven miles.

The volume of flow in the Ohau River, when measured in October last, was 5,870 cubic feet per second. The flow at low-water level would be just under 5,000 cubic feet. The area draining into the lake is 420 square miles. The area of the lake is twenty-four square miles. The length of the Southern Alps drained is twenty-one miles.