The cost for any of these schemes for an average of twelve hours per day would be nearly double the cost given for twenty-four hours working.

The choice lies between a station at the 480 ft. drop—Hururu, with conduit starting from Okere; or Te Akau, with conduit starting from Pokopoko; and final decision awaits further information as to length of pipe-lines, it being necessary to have these as short as possible on account of the cost, and especially so in this case, as the lake-waters are said to induce corrosion on metals. Long lengths of pipes are required in all the Kaituna schemes—an unfavourable feature.

The Kaituna could best be utilised by two power-stations; the second conduit starting from the first power-station; the combined power obtainable would likely amount to 50,000 b.h.p. on turbine-shafts.

Any of the larger Kaituna schemes would deliver power in the Auckland, Thames, and Waihi districts at lower rates than the Huka schemes by 15 per cent. at Auckland, and by quite 20 per cent. at Waihi. For large and continuous supplies of power in Auckland a charge of £5 10s. per horse-power per year would give good returns, and about £4 10s. at Waihi. These are the extreme minimum rates. For small quantities of continuous supply somewhat higher rates would obtain, and for short-time supply proportionately higher rates would be charged.

Huka.

At Huka there are two plans for dealing with the development of the available power.

First, a short channel may be cut on either side of the river to take the whole river low-water flow to a series of turbines located as near the edge of the pool below the falls as may be deemed safe. The present channel would be blocked sufficiently to send the necessary amount of water at all times to the turbines, and provision would be made for the escape of the surplus water at periods of high flow, or of the whole of the water when the turbines were not at work. No storage of the lake-water would be attempted. Turbines with vertical shafts would be necessary unless excessive excavations were made. The area is too limited to admit of the ready use of turbines with horizontal axis. In addition to the channels, the works required would be a concrete wall to protect the power-station from inundations, sluice-valves and gear, concrete and steel pipes, and chambers and tail-races cut below the level of the surface of water in the pool of sufficient sectional area to take the water freely from the draught-tubes. The power obtainable would be about 22,000 h.p.

This scheme completed with transmission-lines to serve the Auckland district only would cost about £615,000; but the whole need not be carried out at once—about half, costing about £325,000, could be done first, and additions made as required.

This scheme would not attempt to control the flow of water in the Waikato River, and perhaps less than the average minimum flow would have to be accepted at times owing to winds affecting the outflow of Lake Taupo.

Secondly, it is possible to build a dam across the river-valley just above the falls, and thereby control the waters of the lake. This scheme need not be taken as independent of the first one, but as a final development thereof if the power-station in the first place is put on the left bank of the river. If only the first development were to be final the best position for the power-station would be on the right bank of the river, but there is too little room here for the larger power-station required if the water is all conserved. The power-station being put on the left bank of the river at first and all works being suitably designed the dam could be completed at any time, and power developed up to 70,000 to 80,000 b.h.p. as may be deemed necessary. For continuous working 38,000 b.h.p. would be the probable limit of power from the Waikato flow at Huka. The cost for 76,000 h.p., all power delivered at Auckland, would be about £1,600,000.

The cost of the dam would not likely exceed £25,000. The Huka scheme is one for which the development may be continuous from 10,000 or 12,000 h.p. to, say, 80,000 h.p. without waste in any way or sacrifice of previous work. Part only of the canal-excavation might be saved by complete development at once, but this is so small a part of the total necessary expenditure that it need not be considered.

The fall available without a dam would be about 50 ft., and with the dam about 64 ft. The turbines and generators would all be designed to work at maximum efficiency for the 64 ft. head, so that if the additional development were made before the first units wore out they could be advantageously used.

The low fall available at Huka will entail much more expensive turbines and generators per horse-power than in the case of higher falls. This with the long-distance transmission will increase the cost of power obtained from there.

For the completed scheme, 38,000 h.p. at Huka, the cost for any large continuous supply of power (8,760 hours per year) may be taken as £6 10s. per horse-power year measured at the consumer's meter at Auckland, and for part-time supplies in smaller quantities higher rates, and for a partial scheme the rate would have to be 15 per cent. higher at least.

Tauherenikau.

This is a rival scheme to the Hutt. The power-station would be in the Township of Featherston, on a flat between the main road and Abbott's Creek.

The works required would be a dam, five miles of conduit (three miles of which would be in tunnel—the longest tunnel being 135 chains, and four tunnels in all). The pipe-line would be 33 chains long; the fall available from the end of the conduit to the flat would be about 430 ft.

There is a very large volume of flow in this river, in view of the fact that the drainage-area is only some twenty-seven square miles. The only possible site for a dam is not a very favourable one, the gorge being rather wide. A dam costing about £120,000 would probably store about 500,000,000 cubic feet of water, giving about one month or more reserve supply to supplement the lowest flow.