The drainage-area of the two lakes is 248 square miles: the area of Lake Rotorua is 31½ square miles, and of Rotoiti 13¾ square miles. The range of level in Rotorua Lake is given as 3.3 ft. That in Rotoiti Lake cannot be very great in view of the depth of the river at the outlet and the small range in Rotorua.

Rainfall-records have been kept at Rotorua for a period of eighteen years. The mean rainfall in that period has been 56·49 in., the lowest year 45·33 in., and the highest 93·72 in. in 1893; but this appears to have been quite an exceptional year and may be disregarded. The next highest year is 70·27 in.

The highest recorded level of Lake Rotorua is given as 0·87 ft. above the best level for the working of the baths, and the lowest recorded level of the lake is given as 2.43 ft. below the same level. This small natural range of level seriously curtails the capacity of Rotorua as a storage-reservoir for power purposes. The highest level at which the baths can be worked satisfactorily fixes the highest lake-level in Rotorua and also in Rotoiti, which must be at such a lower level as is required for the flow of water between the two lakes. The present difference of level is given as 2 ft.

It would appear at present that storage can only be got by putting a draw-off tunnel at a suitable level below the present low-water level of Rotoiti, and to utilise the volume between that level and what may be termed the bath-level for storage. This level also conserves the settlement interest on the lake-shores. Had there been no interests to be taken into account a dam could have been built at relatively small cost at the Kaituna outlet to conserve all the water from the drainage-area; but this would appear from present data to involve a fluctuation in lake-levels of from 15 ft. to 20 ft. above the present low-water level in order to conserve the water in an extreme year such as 1893, but only about 6 ft. to 8 ft. for the next-highest year.

To get full advantage of the possible storage it would be necessary to dredge a deep channel between the lakes to draw off the water from Rotorua to a depth of 10 ft. or 12 ft. or more, if it were found that no interference with the actions of the springs causing injury thereto were likely to result. Regulating-sluices might also be required on the canal between the lakes if it was ultimately found advisable at times to retain the water in Rotorua at a higher level than in Rotoiti.

The determination of the correct level at which a draw-off tunnel should be put below the present low-water level of Rotoiti will involve very careful investigation, and requires a continuous record of lake-levels with frequent measurements of flow in the Kaituna and Ohura for as long a period as possible before any works are undertaken. If the relation between one or more years' rainfall and flow-off were determined, the flow-off for past years might thence be inferred with some degree of probable accuracy, and also the amount of power likely to be available could be estimated.

A power-scheme on the Kaituna requires careful investigation, being more favourably situated than any of the upper Waikato schemes for the supply of power to the Auckland District where steam and other plants aggregating about 51,000 indicated horse-power are now in use. Also a scheme which contemplated the capture of a large part or the whole of this power-supply would have to be one of some magnitude at first, and be designed to be easily extended as required by the increasing demand for power that may reasonably be expected to arise with the continued increase of industries in the district. A power scheme can also be got in the Kaituna without destroying any scenic assets, as would be the case if Huka Falls or Aratiatia Rapids were utilised, perhaps a not unimportant consideration.

At present I will assume that by storage 600 cubic feet per second can be got, and that the highest point in the draw-off tunnel will be 15 ft. below the present low-water level of Lake Rotoiti.

Taking the three points in the Kaituna River where the fall from the lake has been determined as 101 ft., 177 ft., and 325 ft. at distances of 62 chains, two miles, and three miles respectively, from the lake; the power obtainable after deducting loss of height for storage, range of level, fall in conduit, &c., would be approximately 4,400 b.h.p., 8,100 b.h.p., and 15,800 b.h.p. continuously for twenty-four hours each day. If it be assumed that all the water is to be used in twelve instead of twenty-four hours, or at the rate of 1,200 cubic feet per second for twelve hours, then installations of 8,800 b.h.p., 16,200 b.h.p., or 31,600 b.h.p. could be adopted. As an approximate indication of the relative values of these schemes the following table is given:—

Power at station	8,800 b.h.p.	16,200 b.h.p.	31,600 b.h.p.
Cost	£340,000	£550,000	£880,000
Power delivered	5,280 b.h.p.	9,720 b.h.p.	18,960 b.h.p.
Probable revenue	£31,680	£58,320	£113,760

The Kaituna Valley has not yet been exhaustively examined. There is the ascertained fall of over 300 ft. in the first three miles, but in a further distance of about nine miles there is an additional fall of about 400 ft. The conduit should be taken as far as the ground will carry it, or, perhaps, some distance further by ferro-concrete pipes and then by steel pipes. I think an exhaustive investigation would be likely to show that this is the proper course. From the lake-outlet it is about nineteen miles to the sea in a direct line, while at the south end of the lake it is only sixteen miles. Search might show that it would be easier to get a high fall by diverting the water from Rotoiti into, say, the Waitahunui Stream, or into any of the streams between it and the Kaituna. The country is covered with scrub and it will take some time to examine it thoroughly.

Lake Rotoiti is 904 ft. above the sea-level, and it may be possible to get 40,000 to 45,000 b.h.p. for continuous working by developing it to the utmost, or 80,000 to 90,000 b.h.p. for a plant using all available water in twelve hours each day. A power-station on the Kaituna would be about thirty miles nearer Auckland than the Huka Falls or Aratiatia, and a good transmission-line should be obtainable by way of Katikati, Waihi, Paeroa, and Mercer, to Auckland, the distance being about a hundred and twenty miles. This line would in time deliver a considerable amount of power along its route