connect the lake with the Whangamarino Creek. On request by the parties interested, the Lands Department, through its Chief Drainage Engineer, had a survey made and levels taken with the object of demonstrating the practicability or otherwise of such a scheme. By the courtesy of Mr. J. B. Thompson we have been supplied with copies of the plans showing drainage-levels, areas, &c., which are forwarded herewith and recorded as M.D. 5354/H [not printed].

The objective aimed at is not only to shut out the flood-waters of the Waikato River and to reclaim the large area of swamp lands adjoining the lake and to unwater the greater portion of the lake-bed itself, but also to provide a main outlet-channel into which the settlers owning swamp land in the southern portion of the Whangamarino swamp district might drain their lands. Whilst realizing that such a scheme is feasible, and if given effect to would enable a large area of land to be reclaimed and brought into use, it appears to be clear that such benefit can only be obtained at a corresponding risk of loss, by increased flooding, to other settlers owning low lands abutting upon the Waikato River, and to those occupying the swamp lands in the northern end of the Whangamarino. Lake Waikare, with its low-lying adjacent lands, acts as a valuable relief reservoir when the river is in flood. Through the courtesy of Mr. W. H. Hamer we have been supplied with a diagram showing river-gaugings observed at Mercer over the four years 1915–18. From this diagram, which is recorded as M.D. 5354/F, it is shown that a rapid and uniform rise of the river to a height of 7 ft. or 8 ft. above the summer level is not infrequent, and may be looked for at least once a year. In 1915 the river rose twice to a height of 4 ft. in eight days. In 1916 rises took place of 4 ft. in four days and of 5 ft. in seven days. In 1917 a rise of 4 ft occurred in three days, and in 1918 rises of 4 ft. took place in eight and twelve days respectively, such rises being in all cases above the normal flow observed before and after the flood. It is therefore certain that with the river at its usual winter level a rise of 4 ft., with a uniform increase of 6 in. in height, in each twenty-four hours is an event that may frequently occur. Of the flood-rises above mentioned, six of them reached to within 1 ft. or less of the level of the railway-line at Mercer, whilst one just overtopped it. These floods must have been very much worse had it not been for the relief given by the flood-waters flowing into Waikare Lake, as each foot in depth of water introduced into that lake represents a storage capacity of from 375,000,000 to 400,000,000 cubic feet. The accompanying hydrograph [not printed] of the river at Mercer (M.D. 5354/E) shows the river-discharge at different heights between low summer level and a level 8 ft. above it, at which latter level the river overflows its banks in many places.

We are of opinion that were it not for the relief afforded by the flooding of Waikare Lake and district, and of the swamps adjacent to the Whangamarino and Maramarua Creeks, there would be a considerable rise in the flood-height at Mercer. It would appear from calculations that a 3 ft. rise of flood above ordinary winter river-level, taking a period of six days to reach the maximum height, would, if Waikare Lake were cut off from the river, result in the flood-level being raised at Mercer to 1 ft. higher. At the same time the flood-level on the Maramarua swamps would be similarly raised. With a 4 ft. flood the result would be proportionately greater.

It is very obvious that the closing and drainage of Lake Waikare, or the enclosure of any portion of the Maramarua and northern Whangamarino swamp lands from flooding from the Waikato, must inevitably augment the flood-discharge of the river past Mercer and result in an increased height in flood-times, not only at that point but also for a considerable distance down the river.

The advantages to be gained by the reduction of the water-level in the Waikare district, thus enabling large areas of land to be brought into cultivation, and the banking-out of floods from the Whangamarino swamp lands, must be set against the cost of stop-banking the main river in the neighbourhood of and below Mercer at those points liable to flood, and the provision of mechanical means of keeping such enclosed districts free from those land-waters which now find a natural outlet to the river.

We have not at our disposal the information that would enable us to determine whether such a course would be feasible or profitable, but we strongly urge that