REFERENCE No. 1.

To inquire into the cause or causes of the silting-up of the channel, the flooding of the adjacent lands by the said river, the erosion of its banks, and the damage to the surrounding country.

The silting-up of the channel is due in a great measure to the debris coming down from mining operations in the upper reaches, and, secondly, to uncontrolled growth of willows in the channel below Outram, which greatly encourages the deposit of the debris.

The flooding of the lands and consequent damage to the surrounding country are due partly to this silting-up, but primarily to the fact that the natural banks of the river are not sufficiently high; in other words, the cross-sectional area of the natural river-channel is not sufficiently large to carry the floods to which this river is subject.

Such erosion of the river-banks as has been experienced is small in extent and cannot be ascribed to any special cause; in fact, it may be neglected.

REFERENCE No. 2.

To ascertain the nature and extent of the damage done to the lands adjacent to the said river, and what area of land is affected by such floods or erosion, or both, and whether it is practicable at reasonable expense to prevent such flooding or erosion, or both, either wholly or partially.

The nature of the damage is as follows:—

(*a.*) Where the water issues in a large volume from the river, either by the bursting of levees or the overtopping of the banks, quantities of silt of an infertile nature are carried on to the land in the vicinity, and over a considerable distance back from the river. Great difficulty is experienced in regrassing the area so covered.

(*b.*) Where actual breaches occur areas of land are torn out by the rush of the waters, sometimes to a depth of 20 ft., and the land consequently ruined for farming purposes.

(*c.*) The flood-waters gravitate into the lower portions of the plain, submerging in the past areas sometimes as large as 18,000 acres, and even recently 15,000 acres, many thousands of acres remaining under water for long periods, extending up to six months. This long submergence kills the grass, necessitating reploughing and resowing, and only a short submergence or the mere rushing-over of the water is usually sufficient to destroy cereal crops and greatly damage root crops. The extent of the damage varies with the time of the year at which the floods occur. In February, 1919, a large flood occurred which almost breached the levees, and it was stated in evidence that had a breach then occurred the damage could not have been repaired for £200,000. The two floods which occurred in 1917 were stated to have resulted in a loss of £300,000, and the flood of August, 1919, caused damage estimated at somewhat less than half this amount. These figures given by the inhabitants of the plain may be somewhat overstated, but they afford an indication of the immense amount of damage that is done whenever a flood occurs.

(*d.*) Apart from the loss of crops and of the use of the land, very considerable expense is incurred by the Drainage Board in pumping out the flood-waters after they have subsided to as low a level as will not permit of their further being run out by gravitation.

(*e.*) In addition to damage to landowners, the railway-line between Dunedin and Invercargill, as well as the Outram Branch Railway, is submerged for considerable periods, all traffic being suspended.

(*f.*) Although not much physical damage is done to the railway property, very considerable damage is sometimes sustained by the roads and bridges controlled by the County Council. After the flood of 1908 it was estimated that the cost of repairing the damage would be £8,000, and it is probable that the actual cost considerably exceeded that sum. Road traffic through the district was also interrupted for varying periods, according to the locality.

(*g.*) Damage is also done to house property, and furniture is damaged in the low-lying houses.