

- (h.) The river-channel below Coutt's Island is inadequate for a flood-discharge of 80,000 cubic feet per second, estimated as a big flood.
- (j.) The erosion of the river-banks is excessive, and mainly responsible for the silting-up of the channels lower down.
- (k.) The margin of safety is insufficient for the protection of Christchurch from big floods.

EXISTING FLOOD-PROTECTION WORKS.

So far the greater part of the protective work has been carried out on the south or right bank of the river, and the object in view has been the prevention of flood overflow down the beds of the old channels leading to Christchurch City—the Avon and the Styx. These works consist in the main of groynes, stop-banks, and willow-planting. The groynes, as a rule, are of a substantial character and well carried out, either in massive concrete blocks or in netted stone (gabion work). The stop-banks cutting off the old overflow-channels to the south-east are, however, in many places too low, and do not offer a sufficient margin of safety against the risk of big floods finding their way down to Christchurch. All this work on the south side has been carried out by the South Waimakariri River Board. This Board has, since 1869, taken steps which on the whole have been adequate for the protection of the south side of the river, and to assist them they have had the revenue derived from large endowments. Your Commissioners understand that it is claimed by the South Waimakariri River Board that these endowments were given for the protection of Christchurch, and that the revenue derived from them could only be expended on the south bank of the Waimakariri. A careful search of old records convinces us that the endowments were intended for the protection of the banks of the Waimakariri, no stipulation being laid down that either bank was to have preference. Although the South Waimakariri River Board was asked to produce evidence in rebuttal of this conclusion it was unable to do so. As at a later stage in this report—under reference No. 5—your Commissioners will recommend that both banks of the river should be placed under the control of one body, and this body will be either the South Waimakariri River Board or its successor, it will be a perfectly simple matter to have the revenue from the endowments made available for expenditure on either bank in the future, as necessity may require. These works were started in 1859, but the main work was not carried out until twelve or fifteen years later.

On the north side of the river much work has been done, chiefly in the direction of stop-banking along the low-lying river-banks opposite Templar's Island. Some of this work has been done by the Eyreton Road Board and the Eyreton County Council, but the most of it has been carried out by private enterprise. The Government has subsidized the work to some extent. No information is available as to the total amount of expenditure incurred in the past on protective works.

In connection with the responsibilities of the South Waimakariri River Board there is one aspect of the Board's action—or, rather, inaction—which requires comment, and that is their failure to keep the south branch clear of gorse and other vegetation, and thus—either wilfully or negligently—allowing the south branch to get into such a condition as to have now made the north branch practically the only branch of the river. This may have resulted in great benefit to the settlers on the south side of the river, but has been, and will be, very harmful to those on the north side. This is one more instance of the folly of placing the two sides of a river under separate control. Your Commissioners are of opinion that every endeavour should be made to reopen the south branch so that it may carry its fair proportion of the normal and flood flow. This is impossible until the existing mass of vegetation is cleared off the river-bed.

DAMAGE BY FLOODS.

Erosion of Land.—This, by recent survey, is estimated to be about 3,740 acres, of which about 2,740 acres has been eroded on the north side of the river and 1,000 acres on the south side. The capital value of this land may be put down as