

- “ (4.) To ascertain the nature and extent of any drainage-works that may be required, and the best method of carrying out such works ;
- “ (5.) (a.) To furnish estimates of the cost of such remedial measures as you may recommend should be taken for the effective control and improvement of the said river and its banks ;
- “ (b.) To report what area or areas of land should be constituted a district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of any loan that may be raised to carry out any river-improvement works which you may recommend should be undertaken ;
- “ (c.) To report your opinion as to what matters, if any, should be adjusted by legislation ; and
- “ (d.) Generally, to report your opinion on all matters arising out of or touching the premises, including the question as to whether or not one or more competent authorities shall be appointed to control the whole or any portion of the said river, and what statutory powers should be possessed by such authority.”

The Governor-General's Commission also required us to report separately in respect of each river.

INVESTIGATIONS MADE.

Sittings, Evidence, and Inspections.—Sittings of the Commission were held at the Courthouse, Rangiora, on the 22nd and 23rd July, 1919, when thirteen witnesses were examined. The Commissioners inspected the river throughout the whole length of its course where any damage is anticipated, and also perused all the plans in the possession of the Sefton-Ashley Drainage Board, as well as the plans prepared by the Railway Department to illustrate the cause and effect of the flooding of the Ashley River which has taken place in the past.

PHYSICAL FEATURES.

The Ashley River rises in the foothills of the Southern Alps. There are no large snowfields or glaciers within its watershed. When it issues from the hills and runs on to the Canterbury Plains it, in common with practically every other important river, traverses the higher part of a shingle-fan. In some places the fall away from the Ashley River and towards the low country between the Ashley and the Waimakariri is fairly decided. As it approaches the sea, however, the fall becomes very slight, and for the last mile or two the river runs through a tidal estuary, while passing through which it is joined by the Saltwater Creek. The latter, through practically the whole of its length, runs at a very much lower level than the Ashley, traversing what is really the northern side of the fan, and obtaining the greater part of its water from springs which no doubt percolate through the fan from the Ashley itself. The decided diminution in the size of the river-bed lower down, and the reduced volume of water running in the Ashley below Rangiora, accounts, no doubt, by percolation or seepage, for the water in the Saltwater Creek, and also for the water in the swamps on the southern side.

HISTORY AND CONDITION OF PRESENT WORKS.

A considerable amount of levee-building, protective planting, and groyne work has been done by the Sefton-Ashley Drainage Board, and to a lesser extent by other interested parties. After the flood of 1905 the Railway Department did a considerable amount of work to protect the approaches to the railway-bridge and to lead the flood-waters safely under the bridge. While the river in the past has overflowed its banks, it appears now to be fairly well controlled. A good deal of evidence was given by witnesses as to the rising of the river-bed. That some such rising has occurred appears to be confirmed by the fact that it was found necessary to raise the Lower Ashley Bridge 4 ft., and also by the fact that the piles cut off at the time of bridge-renewals are now completely covered with shingle. The absence, however, of definite levels, properly referenced and showing the river as it was in the past, makes it impossible to decide definitely the extent of this filling-up or the length of the river over which it extends,