

- “ (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.”

Your Commission also required us to report separately in respect of each river.

INVESTIGATIONS MADE.

Sittings, Evidence, and Inspections.—Your Commissioners proceeded to Otautau on the 15th March, 1920, and the same day inspected the right bank of the river for some miles above Otautau, and both banks of the river from Otautau to the sea. Measurements were made at all the bridges with a view to ascertaining whether there was any marked silting-up of the river-bed, and such plans as were in the hands of the County Council were examined. On these inspections your Commissioners were accompanied by representatives of the County Council and the River Board.

On the following day a duly advertised sitting of the Commission was held at the Courthouse, Otautau, when thirteen witnesses were examined, including representatives of the Wallace County Council, within whose district practically the whole of the river is situated, and the Otautau and Waimatuku River Boards, also representatives from Bayswater and the lower reaches of the river. The sitting occupied the whole day, and on the following day the river was examined on both banks and at all crossings for a distance of about forty miles above Otautau. The general character of the watershed was also inspected by your Commissioners.

Plans showing the river at the time of its first survey, and also at the time of the latest survey, were obtained from the Commissioner of Crown Lands, Invercargill, in order to ascertain whether any important changes had taken place in the course of the river.

After hearing the evidence and inspecting the river and its watershed, your Commissioners formed the impression that the problem was not such as would justify them in delaying their report in order to have special surveys made in connection with this river.

PHYSICAL FEATURES.

The Aparima or Jacob's River takes its rise partly in the northern extension of the Takitimo Range, but in the main the water comes from hills of low altitude. Except for the presence of isolated patches of bush in the gullies and on the hillsides, the whole of the drainage area of the river was open tussock country. Although a considerable portion of this country is cultivated, the cultivated area does not bear a very large ratio to the total, being mostly confined at the present time to the immediate river-flats.

The fall in the river is not excessive, particularly in the lower forty miles of its course, and in the last twenty miles might be considered as very moderate. As a result, under normal conditions it has not the great carrying and eroding capacity of many of the Canterbury rivers. At the same time, the material composing its banks is of such a very friable nature and so easily eroded that in flood-time acute bends tend to cut considerably. The removal of the protective covering of flax and other natural vegetation on the banks as the result of settlement has increased