

willows in the river-bed. The flooding of the adjacent lands is caused by the fact that along some portions of the river the natural banks are lower than the grade of a high flood, and furthermore by the fact that the river, in common with most other Canterbury rivers, is running on a "fan," and once the flood-waters get over the immediate river-bank they tend to follow old channels which lead away from the main river and do not return lower down, as is the case with valley rivers.

REFERENCE No. 2.

To ascertain the nature and extent of the damage done to the lands adjacent to the said rivers, 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.

Very little information was obtained as to the extent of the damage done to the lands adjacent to the river, and owing to the water escaping practically out of the watershed of the river, as indicated under reference No. 1 above, it is impossible to say what area of land is affected by the floods.

Your Commissioners are of opinion that it is practicable at reasonable expense to prevent such flooding, and to gradually so train the river as to eliminate erosion to a very considerable extent in the future.

REFERENCE No. 3.

To ascertain the best method of providing for the control of the said river and its tributaries so as to safeguard the lands affected, and to provide for the effective control and improvement of the said river and its banks.

The only work which, in the opinion of your Commissioners, is necessary is the extension of the levees at present existing so that they will reach along the whole of the river-bank where the grade of the highest known flood rises above the natural banks. Wherever levees are thus necessary they should be not less than 2 ft. above the probable flood grade. The existing levees should also be raised to the same height, if on investigation any places are found to be below that grade. Levees should be not less than 4 ft., and preferably 6 ft., wide on top, with 2-to-1 slopes, on account of the permeable nature of the material from which they must be made. On the river side of the levees they should be protected with willow and wire-fence protection, practically on the lines which have been found so successful by the Sefton-Ashley Drainage Board. Should the river, owing to local changes in its course, make a violent onslaught on to any part of the works, special protection (into the details of which it is not necessary here to go) must be provided. The growth of scrub of all kinds within the river-bed proper should be prevented. The controlling authority, after careful investigation of the river-bed, should decide upon the width necessary to contain the flood-water without danger, and when the limits have been properly defined and recorded all the river-bed within the proposed permanent channel should be cleared and kept clear, and the reclamation of the balance of the river-bed should be encouraged by judicious planting and fencing. This latter will tend to raise the portions of the river-bed to be reclaimed, and will afford an added safeguard against local erosion, while at the same time the keeping-clear of the desired channel will tend to make the same scour and thereby reduce the tendency for the river-bed to rise.

The levees previously referred to must, of course, not encroach at any point on the width laid down as the permanent river-channel, but may in many places be very much farther from the centre of the river in order to take advantage of high ground. At the Lower Ashley Bridge it will undoubtedly be necessary to keep the levees farther apart than the length of the bridge. Whether the bridge should be lengthened to span the whole width between the levees, or whether its approaches should be kept low and traffic suspended for a few hours during the very infrequent large floods, would be a matter for consideration by the local authorities interested.

REFERENCE No. 4.

To ascertain the nature and extent of any drainage-works that may be required, and the best method of carrying out such works.

The works indicated above will not necessitate any drainage-work being carried