

of such, two schemes have been suggested, the idea being due in each case to Mr. E. Dobson, C.E. The first scheme (indicated on plan No. 5) is to construct a new relief-channel from a point on the new north branch about half a mile above Coutt's Bridge, and rejoining the main river above Stewart's Gully. The second scheme (also indicated on plan No. 5) is to construct, from a point just below the junction of the present north and south branches, a new river-channel across Irishman's Flat, right down to the estuary opposite the sea outlet. The objections which your Commissioners see to the adoption of the first scheme are, firstly, that it would tend to make the present north branch the permanent main river-channel; secondly, that, while certainly avoiding the constriction at Coutt's Bridge and the bad turn at the present junction with the south branch, it yet only reduces the total length of outlet to the sea by 10 per cent., and this in itself would not give increase in flood-slope sufficient to prevent ponding-up as at present. There also remains the difficulty in controlling the size and shape of channel, which in this case would pass through valuable land; and, finally, the scheme does not appear to offer any relief to Kaiapoi from flooding due to backwater from the existing channels. The second scheme, of cutting through Irishman's Flat, on the other hand, offers decided advantages. It shortens the present distance from Empire Bridge to the sea outlet by close on 50 per cent., thus increasing very materially the flood-slope and permitting of an augmented and quicker discharge of flood-waters. The land through which the suggested cut would be made is of very little value, and the ultimate size and shape of channel would be immaterial after it had crossed the railway-line. The danger of Kaiapoi Township being flooded by backwater from the Waimakariri would be practically avoided. By taking steps to induce scour of the existing channels between the north branch and the south branch, more especially those between McLean's and Templar's Islands and between Templar's and Coutt's Islands, the south branch might be made to again take its proper share of the river-discharge, thus greatly relieving the present scour of the north river-banks. Levels have been taken across Irishman's Flat, and from these a section has been plotted which shows that there are no great engineering difficulties to be overcome. This section, however, is not taken on the line of the suggested new channel, and before details of any scheme can be worked out it will be necessary to have a careful survey made in order to determine the best and cheapest route for such a channel. Alteration of the railway-line near Chaney's, with a new railway-bridge, also diversions of existing roads, and a road-bridge over the new channel would be rendered necessary under this scheme, but to what extent is contingent on the ultimate location of the new channel.

When the location of this proposed diversion has been finally fixed a strip of land between the river and the sea, not less than 20 chains in width, should be reserved and vested in the controlling authority. Both the new railway and road bridges should be of ample length, and have piers a sufficient depth to provide for subsequent scour of the new channel to what will probably be its ultimate depth and width. The length of bridging which may be ultimately necessary need not be erected at once, but the bridge may be extended from either end as required from time to time by the amount of scour taking place.

After careful consideration of all the points involved, your Commissioners consider that this scheme offers the only reasonable solution of the difficulty of flooding due to the ponding-up of the flood-waters in the vicinity of Coutt's Island.

With respect to (d), in order to relieve the lower end of the so-called old north branch in the vicinity of Kaiapoi Township from the flood-waters of the Eyre Main Drain, it has been suggested that the Eyre should be diverted at a point west of Harr's Road crossing, and, by a new main drain some two and a quarter miles in length, brought into the new north branch of the Waimakariri at a point west of the Education Reserve. While such a proposal, if given effect to, would no doubt relieve the portion of the old north channel referred to from excessive flooding, your Commissioners see many objections to such a diversion of the Eyre waters being made. The gradient of any diversion into the main river would be some 25 per cent. flatter than that of the existing channel, and might result in an accumulation of shingle near the point of diversion. The possible introduction into the main river of detritus from the Eyre drainage should be avoided, as the main river is already fully