16. The Taieri River at the Outram Bridge has a breadth in high floods of about 9 chains, while 3 miles below this the breadth is only 3½ chains, the depths also having decreased 8 feet. It is therefore evident that a larger portion of the flood waters escape over the banks between these two points, and actual observation shows that most of the overflow is directed across the site of the township of Outram and the properties of Messrs. Borrie, Shand, and others, a small portion also finding its way to the north-east, over the property of Mr. Stevenson, against which an embankment has now been made by that gentleman.

17. From its point of inflow in the plain to its outflow at the lower bridge the Taieri River has a tortuous course of about fifteen miles, the fall between which two points at low water is 17·83 feet; but here the tidal influence is felt in a rise at high water spring-tides of 2·75 feet, and this influence extends in decreasing ratio up to the Silver Stream junction; it is also very visibly felt at the Waipori and Waihola Lakes. Again, the fall of the river below the above two points, at high flood, is found to be 29·02 feet. But the fall is very much greater near Outram, being equal to 9·75 feet at low water and 8·71 feet at high flood in three miles, *i.e.* 3 to 6 feet per mile.

18. Now it has been shown that the rate of inflow of the floods upon the plain greatly exceeds the rate of outflow below the lower bridge to the sea. The river when flooded, therefore, finding no sufficient exit, turns back by several wide channels, and flows over the Waihola and Waipori Lakes and adjacent swamps, distant from the Outram Bridge 17½ miles by this course. Here the flood waters remain one or two days, according to the height of the flood.

19. To improve the connection, therefore, between the flood waters at their debouchure on the plain and those lakes is the first consideration.

20. To this end, it is clear that to widen and embank so long and tortuous a course as that of the Taieri would be futile. An auxiliary direct channel must therefore be sought, and this I have denoted on the accompanying plan, taking its course along the west edge of the great swamp, measuring a distance of nine miles from Outram to the Waipori Lake, and whose fall in that distance is at flood 29·02 feet, and at low water 17·83 feet. It is calculated to carry all the overflow that cannot be taken by the present channel.

21. In connection with this subject, the control of the flood waters of the Silver Stream is also of vital importance, and I have indicated an improved course for it—but which subsequent detail surveys may modify—with embankments till it joins the Taieri River.

22. Catch-water drains will also require to be led along the bases of the hills, to prevent a flow on the level lands to be reclaimed.

23. The principle of construction that I would advocate in the main drains and channels is what I have seen applied in similar positions in Europe: to place the embankment 2 to 5 chains distant from the channels, so that the floods have room to spread, and which side spaces, being permanently laid down in grass, will serve to prevent a tendency to alteration of course. The space can be beneficially used as pasture by running wire fencing at divisions of properties, secured from loss by fastening to the embankment.

24. I say nothing of the Waipori River, being beyond the area on which I had to report.

25. I find that the capacity of the present Taieri River channel, between Rennie's and Greytown, is only 1,173.744 cubic feet per minute; the new channel will therefore require to have a capacity to carry off 3,479,324 cubic feet per minute. Now, as the fall will be in the first four miles 3·25 per mile and that of the other five miles 0·96 feet per mile, the section of the new channel is designed for that capacity.

26. The channel for the Silver Stream may be calculated in the same way, whose flood volume is estimated at 46,464 cubic feet per minute, and whose fall from the Big Bush to the Taieri—a distance of three miles—is 12·83 feet, or 4·27 feet per mile. In this case the section of the new channel to carry the flood water is designed for that capacity.

27. The capacity of catch-water drains will vary much, and are of minor importance, and are approximately designed and estimated; and I may remark here that, as the report only pretends to embrace generalities, careful actual surveys and levels would require to be made in detail before the works could be contracted for.

28. The following estimate will embrace a scheme to reclaim 14,656 acres, being all that portion of the plain subject to floods to the north-east of that road line which stretches across the plain, between Blocks III. and IV., Maungatua District, from Blackie's to McLaughlin's.

29. The scheme involves the cutting of a new channel 300 to 400 feet wide, and nine miles long, from Outram to Waipori Lake; the cutting of a new channel for Silver Stream, and an embankment across the plain.

New channel for the overflow waters of the Taieri	£128,936
New channel for the Silver Stream, as per plan attached	3,801
Twelve miles of catch-water drains	4,056
Three miles of embankment	6,534
Four sluices	1,600
Total	£144,927

30. Thus it will be seen that to stem the floods of the Taieri and Silver Streams from off the holdings in the settled part of the plain nearly £10 per acre will require to be expended. In the present state of the colony the scheme is, therefore, premature—a thing to be looked forward to.

31. My estimate will, no doubt, be disappointing to many; but, considering that the plain is a very limited area placed amidst a wide tract of surrounding mountains which pour their voluminous waters on it, the high cost of reclamation cannot be called surprising.

32. Subsidiary schemes to the one above stated may be suggested. The following may be executed with great benefit to the settlers on the east side of the proposed new channel, extending to the Silver Stream and beyond it; but it would involve the destruction of a good many holdings on the low flat at