the foot of Maungatua and West Taieri Ranges. The scheme would be to throw all the waters of Taieri down the new channel by embanking across the present one below Outram; to cut the channel only two miles in length, which would take it below Grant's, and where it would spread itself over the great swamp and find its way by many channels to the lakes and sea outlet. The easy practicability of this will be seen by reference to the section, which shows that the surface at Station F, near Mr. Grant's, is below the low-water mark of the Taieri at Outram; and at half a mile below this the surface of the plain is three feet below that again. The cost of the work and extent of reclamation under this scheme would be as follows:—

New channel of two miles for all the flood-water of the Taieri, with embankment	£55,582
Twelve miles catch-water drains	4,056
Four miles of embankment	8,712
Four sluices	1,600
	£69,950

33. The extent reclaimed would be about 11,500 acres, instead of 14,656; but, as stated above, damage to vested interests would be greater.

34. Failing either of these schemes being carried out, or modifications of them, I may here state that 5,504 acres, situated on the Silver Stream, may be reclaimed without damaging other interests, provided the lagoon is allowed to remain as a regulator, as it has always been in high floods.

35. A new channel, with the necessary embankments, catch-water drains, and sluices, might be completed, so as to effectually serve the end in view, for about £10,000.

36. I think I have said sufficient on this branch of the subject to enable the Government to decide on their measures. In however small a way it may be thought necessary to proceed, it is evident that legislation will be necessary at the outset, as no part of the inundated plain can be touched without improving one part to the prejudice of the other. Without a systematic basis of operation, therefore, supported by law, it would be injudicious to move a step.

37. This report would be incomplete without allusion to another subject which will more or less affect the agriculture of the Taieri Plain—namely, the gold fields operations of the interior. Prior to their discovery the Taieri River was famed for its pellucidness; now its character is entirely altered, its waters being charged with sediment more or less thick according to the season of the year. In the spring and winter months, when the water for ground sluicing is abundant in the interior, the waters are more charged than in summer and autumn, as then the water supply of the mountains is deficient.

38. At the time I lately visited the river I found the water comparatively pure; notwithstanding this, I obtained specimens of the same, and forwarded them to Dr. Hulme, who has been so kind as to test them. The result of his analysis is, that the summer water of the Taieri contains one part of sediment or mud to 1,920 parts of water. But, as properly remarked by an old Taieri settler, Mr. Donald Borrie, the water when taken as a specimen by me being three times clearer than it usually is, we would be justified in assuming that this result by no means represents the full quantity of detritus brought down. It may be remarked in proof of this, that the Ganges, undisturbed by diggers' operations, but affected solely by nature, brings down one part of sediment to 900 of water; the Mississippi, however, contains only one of sediment to 3,400 of water, the various great rivers of the world varying much in this respect.

39. The basin of the Taieri River, above Outram Gorge being 1,730 square miles, and the rainfall being on an average of 34 inches per annum,* the fall will be 136,650,624,000 cubic feet of rain water per annum. Now, deducting one-fourth loss by absorption and evaporation, which is the European rate for such climates and districts, the annual delivery at the Taieri Plain will be 102,487,968,000 cubic feet; dividing this sum, therefore, by 1,920, the quantity of mud in cubic feet will be obtained, viz., 53,379,150. This is sufficient to cover 1,225 acres annually with one foot thickness of mud, or the whole of the Taieri Plain with about one-third of an inch.

40. As yet the effects of the diggings are not apparent on the surface, farther than where swampy the vegetation is generally covered with slime, the river banks are subject to miry quicksands, and the bed at the Outram bridge has been found to have risen one foot nine inches; but this latter may be due to the great flood of 1868, which washed away all jutting points of shingle into the bed for a long way up the valley.

41. In estimating the probable effects of the diggings, I have not for upwards of three years had an opportunity of examining the tailings of the principal seats of operations, viz., at Hyde, Hamilton, and Naseby, yet I then observed that in each case they were rapidly extending their length down to the Taieri River. At that time the light sediment alone was carried into it, but the time did not appear long distant when the heavier portions, such as sand, gravel, and shingle, would also be so borne on, more so especially during floods. This fact was pretty apparent even then, that with the extension and "prosperity" of the diggings, the Taieri River would have the greater burden to carry seawards; and when we examine the Gold Fields map of the province, compiled by Mr. Vincent Pyke, which shows gold-bearing valleys round all the Rock and Pillar Mountains, Lammerlaw Ranges, Mount Ida, and Highlay, we cannot avoid the conclusion that the Taieri River will in that future extension and prosperity become the great sludge channel of a very important mining district.

42. Now, when the sediment alone reaches the lower plains effects are little felt; but when gravel, sand, and shingle begin to roll down, then will the digger's gain be the farmer's loss, for the tailings will spread out even on the Taieri green fields as they may now be seen to do on the "interval" of Gabriel's Gully and Wetherston's Flat.

* NOTE.—To have made the calculations more complete, it would have been desirable that the fall in the interior were known by actual observation. This has never been observed. In the interior the plains are said to have a dry climate, yet the high fall on the mountains may compensate for this.