1880.

NEW ZEALAND.

THE FLOODS IN THE TAIERI RIVER

(REPORT OF THE COMMISSION ON).

Presented to both Houses of the General Assembly by Command of His Excellency.

The COMMISSIONERS to the Hon. the MINISTER for PUBLIC WORKS.

SIR,— Dunedin, 7th June, 1880.

In accordance with your letter of instructions dated the 29th January, 1880, we have the honor to report as follows:—

The Taieri Plain is a large tract of alluvial land, surrounded by high ranges; the Taieri River winding through it from Outram, where it debouches from the mountains to the Lower Taieri Road Bridge, when it passes through a gorge in the coast range to its mouth. The lower end of the plain is very low, being about the level of high-water mark. The Taieri is bounded on the south-west by the Waihola and Waipori Lakes, into the latter of which the Waipori River empties itself. At its upper end the plain rises more rapidly, so that at Outram it is considerably higher, the Taieri River winding through it in a very tortuous channel. The banks at the margin of the river are several feet higher than the adjacent country, and there are several old watercourses and creeks intersecting the plain, which appear to be abandoned river channels. Above Greytown the plain extends for several miles in a north-easterly direction, with a gradually rising surface, through which the Silverstream flows into the Taieri, passing through a large lagoon and much swampy land near its point of junction.

This plain, together with the whole of the Taieri and Waipori River areas, as well as the country round Waihola, is drained by the Lower Taieri River, which passes through the coast range for a distance of six miles. This portion of the river varies from 6 to 10 chains in width, and from 16 feet to 30 feet in depth. The tide flows up this gorge with considerable velocity, raising the level of the Taieri in the plains, as well as the Waipori and Waihola Lakes. The rise of spring tides at the East Taieri Bridge, six miles from the sea, is about 4 feet 6 inches, or only three-quarters of the range upon the coast, their influence being felt as far as Greytown, seven miles above East Taieri Bridge and thirteen from the sea.

The total drainage area of the Taieri River is about 2,070 square miles. Of this, the Waipori River area, together with the country round Waihola, amounting to 290 square miles, drains directly into the Waipori and Waihola Lakes, the area of which is about six square miles. These lakes are sufficiently large to act as regulating reservoirs for the flood waters of the Waipori River, so that they are not liable to cause inundations on the plains.

The Taieri River, which is the immediate cause of these inundations, drains an area of 1,730 square miles, receiving also the melting snow from several lofty mountain ranges; consequently the floods which give rise to the damage on the plains accrue chiefly towards the end of spring and middle of summer.

There appears to be no record of the rainfall in the Upper Taieri basin. It is, however, most probably much less than on the coast. Mr. J. T. Thomson takes it to be 34 inches per annum, which is probably over-estimated. The floods seem to be produced by heavy storms of short duration, or by warm rains from the north-west melting the accumulated snow of the winter.

The floods of the Taieri have been reported upon by Mr. J. T. Thomson, late Surveyor-General, Mr. W. N. Blair, C.E., of the Public Works Department, and Mr. Barr, C.E.; various works having been suggested by these gentlemen to mitigate their disastrous effects.

Mr. J. T. Thomson in 1870 gave a very full and accurate description of their causes and effects, which are not annual in their periods of occurrence, but take place at intervals of from two to five or six years: the accidental accumulation of snow lying late in the spring, melted by a heavy north-west rain-storm, or a three days' south-west storm, occurring after a period of previous rain, being necessary for the production of an extraordinary flood capable of inundating the plains. When this occurs the flood water, bursting from the mountain gorge at Outram, breaks over the river banks, spreading over the western portion of the plain, whence it rapidly flows eastward, accumulating over an area of about thirty square miles, where it lies until drained off through the Lower Taieri Gorge. According to Mr. Thomson, this gorge is not capable of carrying off the flood water as rapidly as it is precipitated