

was installed on the Kaitaia River near the office, and readings taken throughout the year. The average reading of this gauge was 57 ft., whilst the range of readings was from 56 ft. to 67·5 ft. The last flood occurred on the 2nd February, after a fall of 2·08 in., the flood reaching its height in ten hours, but started to subside almost immediately afterwards, reaching its normal level four days later. Further gauges will be installed so as to obtain accurate information as to the height and period of the floods. Certain data as to the run-off from the area has been obtained, but further investigations in this direction require to be made.

Awanui River.—The main work carried out on this river has been the dredging of the channel, which is being widened, deepened, and straightened. The total distance dredged was 125 chains, entailing the removal of 58,809 cubic yards of spoil, at a cost of 10·16d. per cubic yard. Eight diversions of the river were completed whilst carrying out this work, and each diversion makes an appreciable difference in the lowering of the flood-level. This dredging has been especially difficult on account of the amount of timber in the channel of the river. Some of the clay country has also been exceptionally hard, but it is anticipated that this class will not be so pronounced as the work proceeds. Fortunately there has not been the same difficulty with the high banks as during the previous year, and consequently the work has been much easier. At the end of the year the dredge was about 30 chains below the Waihoe Junction.

The snagging of the Kaitaia River was continued above the Kaitaia Township. Some 229 chains of the river were cleared of willows, &c., and the logs removed from the bed, all this timber being topped and piled so as to be burnt as soon as it is dry. A small portion was burnt, but the greater part will now have to wait until next summer before a good job of the burning can be expected. This work has had a most beneficial effect on the land in the vicinity of Johnson's store. The flood-level in this vicinity has been lowered by at least 4 ft., taking similar rainfalls into consideration both before and after this last season's snagging was carried out. Until the Whangatane spillway is completed it will be unwise to continue this snagging farther up the river without very close investigation, for the removal of the obstruction in the river naturally increases the intensity of the floods lower down.

One diversion in the river near Awanui was deepened by hand so as to temporarily improve the drainage of adjacent lands. This measure will have to be resorted to in several other cases, as it will be two years before the dredging of the river in the vicinity is completed.

Whangatane Spillway.—This channel was opened up to an average depth of about 5 ft., and although not opened up into the Kaitaia River the effect of the work has been felt in some of the Awanui country. A Bay City dipper dredge was obtained for this work, and the construction of the necessary pontoon was commenced in November. The pontoon is 60 ft. long, 20 ft. wide, and 5 ft. deep, and some 22,000 superficial feet of timber were used in its construction. The dredge is oil-driven, the engine being a 45 horse-power two-cylinder opposed type, starting on benzine and, after warming, running on kerosene. The machinery has all been erected, and a trial run was given at the latter end of February. For a start the clay to be removed was very hard. During March some 2,500 cubic yards of spoil were shifted; but it is satisfactory to note that since then the rate of progress has improved, and it is anticipated that when this dredge turns round into the *maunga* the progress should be very marked. Scoops have been used to construct the channel through the clay country, and will be used again later in places where widening is required.

Dredges.—Three dredges will be at work on this area during the next season—two Priestman grab and one dipper—all of these being of the floating type. A pontoon for the new Priestman is well under way. This pontoon will be 62 ft. long, 24 ft. wide, and 5 ft. 6 in. deep, entailing the use of 27,000 superficial feet of timber. The erection of the machinery should be completed early in June, and then this dredge will commence to deepen and widen the present outlet from the Tangonge Lake.

The costs of the dredges for the year were—

	Yards shifted.	Cost per Yard.
Dredge No. 7 (Priestman)	58,809	10·16d.
Dredge No. 10 (Priestman) : Not erected.		
Dredge No. 22 (Bay City)	2,500	10·71d.

Drains and Roads.—The system of drains has been extended farther afield during the year, some 467 chains of new outlet drains having been constructed. Practically all main drains have been constructed or are in course of construction, although a large number will require deepening when the water-level in the Tangonge Lake and Kaitaia River permits. The maintenance of drains has been attended to, and this item alone entails quite a large expenditure. One matter that increases the maintenance charges is the neglect of settlers to fence off outlet drains; consequently cattle wander promiscuously in and out of the drains, and do damage that is very expensive to rectify.

The formation of roads from the spoil thrown out of the drains was continued, and to date some 680 chains of road formation has been spread. Most of the formation was in peat country, which later on will require to be ballasted with clay so as to make a satisfactory foundation, as peat itself would only make a temporary and unstable road. It will thus be seen that the formation of these roads, without even metalling, will be an expensive item, as the spoil in most cases will have to be carted or trucked for some miles. The first road connection on to the Crown land will be obtained by the road leading to the Waihoe channel from Kaitaia, and the next by the Wireless Road. In carrying out the ballasting of these peat roads it will be advisable to obtain a supply of rails and trucks, as any other means will be too expensive. Ballast-pits in the most convenient places have been laid off in the subdivision of the Crown land so as to facilitate the execution of this work.

Stop-banks.—To date six and a half miles of stop-banks have been constructed along the fore-shore and the banks of the Awanui River, Pairatahi and Waimanone Streams. Throughout this distance a drain has been constructed alongside the bank, so as to provide for internal drainage and the leading of the water to the flood-gates. In addition four and a half miles of bank have been constructed with the grader, but this will later be converted into the bank-and-ditch type as described above. The policy during the coming year will be to link up as far as possible the different sections