

*Ida Valley Scheme.*—Poolburn Drainage: The total length of main drain, improving, straightening, and deepening the Poolburn Stream, now completed, is 3 m. 72 ch., of which 3 m. 12 ch. was cut during the year. This drain is operating successfully, and has made a marked difference to the drainage of the land affected by irrigation water.

*Teviot Scheme.*—The driving of a tunnel to take the place of the 36 in. pipe-line has been carried on continuously during the year. The whole of the excavation is practically finished, and the concrete lining well on towards completion. The progress for the year was 3,420 ft. of excavation and 2,000 ft. of concrete lining. A concrete stream-diversion weir was constructed on the Teviot Stream, and the tunnel inlet built and control gates installed.

*Last Chance Scheme.*—Conroy's Creek Dam: As stated in my last report, a dam to improve the supply on this scheme was commenced on Conroy's Stream. This dam, which is an arch of 100 ft. radius and 80 ft. in height, was completed during the year, the total quantity of concrete placed being 1,547 cubic yards. A subsidiary earth dam with concrete-core wall was also completed, and the race-work in connection with this dam is now in hand.

*Butcher's Dam.*—To further increase water-supplies on this scheme, and to improve the race-system, it was decided to build a dam of almost similar type and size to that of the Conroy's Dam in Butcher's Gully. In connection with this proposal there is also a tunnel of 2,000 ft. length to be driven. At present the housing, plant, and access is installed, and the excavation for the dam well in hand in solid rock; 500 ft. of tunnel has been driven.

*Earnsclough Scheme.*—With a view to extending this scheme and improving the existing water-supplies it has been decided to build a concrete dam in the Fraser River for the storage of water. This work cannot be undertaken seriously until the worst of the winter is over, but a start is about to be made on the access road to the dam.

#### SURVEYS.

The field-work in connection with the Maniototo Scheme is almost completed. During the year 32 miles of main race on the west side of the Taieri River and 10½ miles on the east side were pegged, and 14 m. 60 ch. on the Gimmerburn section.

Working drawings for this scheme are now in hand.

An aerial survey for a race to supply Hawea Flat from Timaru Creek was made, and sites for diversion dams on Timaru Creek investigated.

A preliminary survey for a tunnel to divert water from the Nevis River into Long Gully near Bannockburn was made.

#### CANTERBURY.

##### SCHEMES UNDER CONSTRUCTION.

*Redcliff Irrigation Scheme.*—In my last report this scheme, which was then referred to as the Glenavy Scheme, was stated to contain 6,000 acres, but this proposal has been modified and only 4,600 acres will be commanded under the present proposal.

Work on construction was commenced in October last, and about a hundred men have been employed since then.

The cutting of the main race has been completed for 3 miles, and on one of the lateral races for a distance of 5 m. 10 ch. In these two races 41,500 cubic yards were excavated, which is about 63 per cent. of the total earthwork involved. A start has been made on the intake and other structures.

#### SURVEYS.

The comprehensive survey of the water resources of Canterbury commenced last year has been continued throughout the present year. A thorough topographic survey of the province has been in hand, the area completed during the year comprising 653,440 acres, made up as follows:—

	Acres.
Levels County .. .. .	24,960
Geraldine County .. .. .	144,640
Ashburton County .. .. .	464,000
Oxford County .. .. .	10,880
Malvern County .. .. .	8,960

The flow of twenty-four rivers and streams has been gauged to determine the minimum flow and to obtain rating curves of discharge. Seven gauging cableways were erected, and one automatic level-recorder installed on the Rakaia River.

Approximately 45,500 acres have been tested for depth of ground water by means of weekly readings from 155 stations. The information so obtained will also be of considerable assistance in the design of drainage schemes should these ever be contemplated.

The regular measurements of the amount of soil-moisture at successive depths down to shingle has been continued at fifteen stations in the Ashburton County and at six in the Waimate County. Daily rainfall records have also been kept. At all these stations mechanical soil-analysis was carried out by the International method, and the approximate wilting-points of selected soils were determined.

In order to obtain more accurate information regarding rainfall and run-off phenomena in the foothill streams of Canterbury, an intensive study of a representative catchment area—the North Ashburton River area—has been deemed advisable. The valley has been thoroughly reconnoitred and six specially designed automatic rainfall-recorders established at varying elevations.

During the year surveys of the proposed Mount Hutt stock water-race were carried out, and a report prepared for submission to the Ashburton County. The scheme comprises the augmenting of the stock water-supply to an area of approximately 50,000 acres of farm land in the north-west part of the county.