

and to date 11,847 cubic yards of concrete have been placed, all but 1,079 cubic yards of this being placed during the year.

The total quantity of excavation to date is 8,800 cubic yards.

Extensive deep drilling and grouting of foundations has been carried out.

This dam will augment supplies to the Earnsclough scheme.

*Manuherikia Scheme: Manuherikia Tunnel.*—This tunnel, which will eliminate a troublesome section of race in the Manuherikia Gorge, is 78 chains long. To date, the length driven is 3,714 ft., the balance to complete being 1,467 ft.

*Dunstan Creek Scheme.*—This scheme, which is an extension of the Omakau irrigation scheme, was commenced late in the year. To date, the length of main race excavated is 3 m., and work is proceeding on the intake in Dunstan Creek and other structures incidental to the scheme.

#### SURVEYS.

*Maniototo Scheme.*—The permanent pegging of the main race on the west side for an initial development of 30,000 acres was commenced, a length of 14 m. being completed and plans prepared. Other surveys and investigations were also carried out.

*Hope's Creek Dam.*—A survey of this dam-site and main race was completed during the year. This scheme would provide additional supplies for the Ida Valley area, and would permit of the irrigation of an additional 3,500 acres on the west side of the Valley.

#### GENERAL.

The usual work in connection with stream-gaugings, recordings of lake-levels, and meteorological records was carried out.

#### CANTERBURY.

##### SCHEMES UNDER CONSTRUCTION.

*Redcliff Irrigation Scheme.*—This scheme was completed in the winter of 1936.

The total length of main race, laterals, and distributaries is 17 m. 44 ch., involving 63,000 cubic yards of race excavation.

Twelve properties are served by the scheme, and forty concrete turnouts were provided. The total area that can be irrigated is 4,603 acres.

The first sale of water was made in October, 1936, and 24 in. of water was applied to an area approximately 400 acres, or 9 per cent., of the irrigable area during the first year of operation. This result compares more than favourably with figures available from similar schemes in United States of America.

From a farming viewpoint the results from the practice of irrigation greatly exceeded anticipations, and to those farmers not cognizant with the potentialities of irrigation in Canterbury the results were astounding.

Fifty per cent. of the farmers bought water during the first season, and are preparing land for watering larger areas next season. The results already obtained have demonstrated that the application of water can increase the productivity fivefold in some cases, and in all cases is sufficient to reward handsomely those farmers practising irrigation.

*Ashburton-Lyndhurst Irrigation Scheme.*—The net area of the scheme when completed will be 25,500 acres, comprising eight soil types ranging from stony silt loam to heavy clay loam.

The total length of completed race-formation is 25 m., comprising 104,000 cubic yards of earthwork.

The bulk of this excavation was done by contract labour, but machinery is now being introduced, and 5,000 cubic yards were moved by this means.

The following structures have been completed: Seven concrete syphons, sixty-three concrete drops, fifteen concrete bridges, seventeen concrete bridges and drops combined, and four special structures.

The following workmen's accommodation was erected during the year: Thirty-one married men's units, thirteen single men's units, and two recreation-halls. This accommodation is in two camps where filtered-water supplies and bathhouses were also provided.

The usual constructional buildings were also provided.

An area of 36 acres has been levelled, border-dyked, and sown in readiness to demonstrate the possibilities of irrigation; 14½ chains of fencing have also been erected.

The amount of work already completed represents approximately one-third of the total amount involved, and to expedite this the following plant items have been delivered: Six concrete-mixers, one Barber Green elevator, one gravel crushing and screening plant, one large tractor with associated scraper, roofer, road-builder, and tamper attachments, and one large power grader.

It is expected to have this scheme ready for operation by the spring of 1938, and to enable this to be done the Rangitata diversion race, which is designed to provide water for several schemes, is being actively carried out.

*Rangitata Diversion Race.*—Last December work was authorized for the construction of the Rangitata River diversion race with the object of providing a plentiful and reliable water-supply for irrigation and stock purposes over an area of 210,000 acres in the Ashburton County. This area comprises that of the Ashburton-Lyndhurst irrigation scheme, and four more large projected schemes which are expected to be undertaken at an early date.

The scheme calls for the construction of a large intake structure in the Rangitata River Gorge, and 35 m. of main race traversing approximately the 1,000 ft. contour between Montalto and Barrhill.