

depths already indicate a serious deficiency in moisture-content in the dry months of the year, and these measurements, in conjunction with rainfall, wind-movement, and evaporation statistics, as well as soil-analysis, are being constantly recorded, and will be continued for at least some years.

I would like to place on record the help I have received towards this work from the Unemployment Board and from the Departments of Scientific and Industrial Research, Agriculture, and Lands and Survey. I welcome very much their co-operation in a work which I consider of such vital interest to the advancement of the country, and I feel encouraged to continue with the accumulation of such valuable information.

Comprehensive investigation is also being made into the amount of water available from the Canterbury Rivers. This information is valuable not only for land irrigation, but in connection with hydro-electric-power development, general water-supplies, and bridge-construction. A thorough topographic survey of the whole of Canterbury Province to determine the location of water-races and the cost of irrigation is well advanced, and to date 1,100,000 acres have been contour-surveyed.

Coming now to a brief description of the works in hand, that of greatest magnitude is the Omakau Irrigation Scheme, which provides for the irrigation of 14,000 acres in the Manuherikia Valley. During the year the rock-fill dam on the Manuherikia River was completed, with the exception of the completion of the concrete tunnel spillway and the outlet valves. About 35,000 cubic yards of rock-fill were deposited in the dam, and 4,200 cubic yards of reinforced concrete placed in the cut-off wall and impervious cover on the upstream face of the dam.

On the race-system at Omakau two miles and a half of main race and fifteen miles and a quarter of branch and distributory races were cut, making a total length of thirty-eight miles and a half of race. Some 9,000 ft. of concrete siphons, varying from 15 in. to 54 in. in diameter, were constructed, and about sixty road-crossings and bridges over the races. Work is now well in hand on the intake-gates and sluiceway. It is anticipated that water will be delivered during the coming season.

The tunnel that was needed to replace the 36 in. steel pipe on the Teviot Irrigation Scheme has progressed well, 3,420 ft. of excavation having been completed during the year and 2,000 ft. of concrete lining. A concrete diverting weir was also built.

The work on Conroy's Dam in the Last Chance Scheme has been completed, 1,550 cubic yards of concrete being placed during the year. To further increase the available water-supply in this scheme another dam at Butcher's Gully was put in hand, and the foundations are now being taken out. These are the two additional dams mentioned by me above which are now required to store water for the dry season.

Another dam is about to be built on the Fraser River to increase and improve the water-supply to the Earnscleugh Irrigation Scheme. This one will also prove financially sound with the help of unemployment-tax funds.

A tunnel in connection with the Butcher's Gully Dam is now being driven to improve the race-system.

The improvement to the drainage of the Ida Valley Scheme by the straightening and cleaning-out of the Poolburn Stream is well in hand, about four miles having now been completed.

Construction on the first irrigation scheme to be undertaken in Canterbury was commenced during the year—the Redcliff Irrigation Scheme. About eighty men are now employed on it, and to date three miles of main race and five miles of lateral race are completed. This scheme will supply water to an area of 4,600 acres, and it is expected that water will be available during the coming summer.

During last season 38,027 acres were irrigated in Central Otago by 402 irrigators. This is slightly more than last season, but is about 4,000 acres less than would have been irrigated had the irrigators who were in arrears with their rates not been compelled to pay for water in advance.

The schemes now operating on a trading basis are as follows: Ardgour, Arrow, Bengerburn, Earnscleugh, Galloway, Hawkdun, Idaburn, Ida Valley, Last Chance, Manuherikia, Tarras, and Teviot.