

by the sinking of wells—overlying irregular and undulating beds of clay. Any extensive gravitation system of general irrigation would be difficult and very costly, owing to the unsuitable surface of the ground and rapid percolation. The valley is of considerable extent (roughly about thirty miles by twenty), and the soil very fertile a few miles from the foot-hills, as evidenced in localities where water has been obtained for private irrigation on the alluvial silt from the hills, notably at Mr. Grier's farm, at Sowburn. In the centre of the plain, which is flat, the land is shallow and arid.

Sowburn I visited in company with Mr. Murray, the Government race manager, in quest of a site for a dam up the gorge seven miles from Patearoa Township. A small dam may be built here in the gorge for irrigation of the immediate neighbourhood, but at such a low elevation as to be of little use for mining purposes. There are three private races draining this creek with prior rights.

Pigburn.

It was my intention to examine this gorge to its source in the Rock and Pillar Range, but heavy snow and sleet set in. I ascertained, however, from reliable authority—old miners, resident shepherds, and others—that a fair site for a reservoir of from 25 to 30 acres existed, which would serve both the Hamilton and Sowburn miners, and could be supplemented by two or three smaller ones on the tributary creeks, especially one called Cave Creek. There would, in addition, be sufficient water from this source for irrigation of a large portion of the south end of the plain. The fall from Naseby to this locality is about 30 ft. to the mile.

By appointment, I met at Naseby Mr. Ryder, president of the Farmers' Club, and several other residents of the district, to obtain their views and requirements on the irrigation question. It is beyond doubt water is urgently required, not only to make the land productive, but for the bare existence of the stock at present being raised with difficulty in the valley. It therefore becomes necessary to save what water can be obtained, and which is at present going to waste, by tapping it at the gorges in wet weather for supply in times of drought. I pointed out that any scheme entered upon should be tentative, and be regarded as a nucleus for a larger scheme, which could be developed as necessity arose.

It would be advisable, if suitable sites could be obtained at sufficient elevations at the foot-hills, to erect storage-dams whence the water could be trained along the leading spurs in different directions to other and smaller receiving dams, such as Chain Gully, near the racecourse, and on the Little Eweburn, to serve, say, half a dozen farms in one locality. The cost of such small dams would not be great, and the farmers who would be benefited by such a dam could with advantage construct it with their own labour and teams. In such a work perhaps the Government may be asked to grant a subsidy of pound for pound, the farmers giving labour and plant as their share. Thus a series of small dams would be scattered over the plain in the localities at present urgently required. The large dam, hereafter described, at Wedderburn might be made to serve for this purpose by bringing in a head-race to command the subsidiary reservoirs. Every farmer could then cut his own small leading races, and pass the water on to his neighbours on the lower levels.

It will be seen that the primary object of this scheme is that the creek-waters will be caught before they percolate to the clay bottom, will be distributed over a large area, and be retained on the land for a lengthened period on their downward course to the Taieri River, which is the natural drainage of the plain. There is hardly a farm section on the Maniototo that could not be watered in this way by an equitable arrangement of sluices.

Windmills have been suggested for pumping water from the Taieri, but, as these are expensive, would have to be numerous, are costly to maintain, and would only serve the land running parallel to the river, I consider the system of supply by gravitation above described preferable.

Gimmerburn.

At Scott's farm, about 600 ft. below Naseby, there is an example of the depth of gravel and shingle 10 ft. below the surface. Here and at many similar localities any scheme of irrigation is almost impracticable unless water could be obtained in abundance, which I think is feasible for this and neighbouring country, from the Wedderburn.

Wedderburn Dam.

Up the Wedderburn about two miles and a half from the settlement, situate in a long, open, and nearly flat valley, with a good watershed, an earthen dam about 4 chains in length and 20 ft. in height (ruled by the confining terraces) would conserve about 90 to 100 acres of shallow water. A smaller site on a tributary, but not so good, would cover about from 30 to 40 acres. Both would command the Gimmerburn, Eweburn, and other districts.

From Wedderburn, being easy of access, I next visited the North Ida Valley with Mr. Browne, who pointed out an excellent site for a large and deep reservoir on the Idaburn, having the advantage of Hills Creek, with two smaller tributaries running into it. It is an extensive open flat, with a rock-bound gorge about 2 chains wide at the end of a spur, over which the main road runs. A rock-dam or weir, 50 ft. in height would throw the water back over an area half a mile by a quarter of a mile wide. It has two disadvantages, however: (1.) The main road would have to be shifted from the flat or bed of the proposed reservoir to a siding along the spur. (2.) The Otago Central Railway surveyed route runs alongside the road, and would also have to be shifted to the spur about 3 chains before cutting through the road saddle. The dam would command nearly the whole of the North Ida Valley. Mr. Browne's estimated cost is £5,000. There are prior rights in all the streams, and it is reported on the London market. There is a mill on the Idaburn in this valley near and above the dam site. The site is connected only with the Ida Valley irrigation, and cannot be used for any other purpose.

I next proceeded to St. Bathans, having failed to find any other suitable sites for conservation in connection with irrigating the Maniototo.