

*Fraser's River, or Earnscliffe.*

This is a fine creek, on the right bank of the Clutha, with its source between the Carrick and Old Man Ranges and the Obelisk, and is fed also by the McLellan, Meredith, and Conroy Tributaries.

With Messrs. Ironsides and Laidlaw, of Earnscliffe Station, I inspected a good site, known as Shepherd's Flat, about seven miles up the gorge and 975 ft. above Clyde. A large open flat, about 40 chains long and 15 average width, confined by a range on one side and a firm 50 ft. terrace on the other, with a narrow perpendicular rock-bound gorge only a chain wide. A 25 ft. dam here would conserve an average depth of water 15 ft. over the whole flat, and there are no signs of broken rock or probable leakage. It is without doubt the best site I have seen for the purpose, and, looking to the future of the mining interests, in my opinion, should be secured for a large conservation, as the dam could be raised to 50 ft. if necessity required. The creek runs about twenty-two heads in the driest season, and is permanent, but, on account probably of its being the only available water (except by pumping from the Clutha), is entirely monopolized by prior rights to such an extent that the water in the creek in a normal state could not supply the demands. From the returns of the Registrar I find that there are no less than seventeen licenses renewed and issued since 1890 for fifty-two combined Government heads, and fifty-two conditional on the water being returned up the river above the races running from the catchment of the creek at the mouth of the gorge. Under the circumstances, the building of this dam is either entirely dependent on the extinguishment of most, if not all, of these existing rights, or some satisfactory arrangement.

There is no doubt, I think, if investigated, many of them would be found to be forfeited under the conditions not having been complied with, but, with the limited time at my disposal, and for the purposes of this report, they cannot from their nature be now dealt with in detail. I may state that in my opinion this question of private prior rights to nearly all the available streams in the Central Otago district will prove a difficulty which must be settled before any system, however small, of water-conservation can be attempted.

If it were not for the above monopoly a strong rock-dam or weir could be advantageously erected at a sufficient elevation at the mouth of the gorge to command the whole of the flat on both sides of the Clutha by taking the water in a siphon over the bridge, and, by means of irrigation, enhance the value of the land for fruit-growing and agricultural purposes.

*Conroy Gorge.*

At the request of Messrs. Iversen and Dawson, fruit-growers at the south-eastern end of the valley, I went over the hills into Conroy's Gully and Blackman's, or Omeo, but both places pointed out were unfavourable, mainly on account of probable leakage and expense, and the water in both the small streams I found monopolized by existing rights. In this neighbourhood, however, the climate is so suitable, the land so rich, and water in such demand for irrigation that the holders of these rights are anxious to forego them if they can be guaranteed sufficient for their use by a system of general conservation. But the only source, in my opinion, for this is from Fraser's River.

Stone fruit to the extent of between twenty and thirty tons annually have been sent from this neighbourhood to Dunedin until last season, which was an exceptionally dry one; still, with the limited quantity available, it is made evident by the luxuriant appearance of the orchards that only water is wanted to make the rich deep soil productive. I think hops would do well here. Grapes yield well, and ripen in the open at Clyde. Compared with Maniototo and Ida Valley, this little flat, provided a supply of water from Fraser's River could be obtained, would pay well for irrigating. The soil and magnificent climate is everything in its favour.

Having concluded my examination here I proceeded to Roxburgh, and there met Messrs. Burton and Peters, the manager of the Amalgamated Gold-mining Company, from whom I obtained plans and information of the Lake Onslow or Dismal Swamp Dam.

LAKE ONSLOW OR DISMAL SWAMP DAM.

So late in the season, and the weather very unsettled, it was considered by experienced residents a risk of being snowed up to attempt to visit this dam. My assistant, however, Mr. McKegg, volunteered to undertake it, and, a reliable guide being procured, I left him at Roxburgh to go up from there, take measurements, and obtain all information required in view of the dam being raised. I then went on to Miller's Flat and met by appointment a number of local members of the Miners' Association, and found the agitation for an increased supply of water by an addition to the dam very strong, the general opinion being a desire to raise the dam as much as 20 ft. or 30 ft. I cannot recommend this idea for reasons shown hereafter. The area of payable ground the lake is reported to command is of great extent, from Roxburgh to Beaumont. A large alluvial flat on the left bank of the Clutha at Miller's Flat and another containing 1,300 acres are much talked of as being rich if water can be obtained for sluicing and elevating.

It is claimed that if the dam is raised only 10 ft. it will impound three times the quantity of water the lake now holds. I am, however, unable to give the approximate contents of the conservation by the present dam, having only a plan and no cross-sections. The area is 1,500 acres, and the watershed supposed to cover eighty-four square miles, and, as the dam is 23 ft. in height and the lake-bed nearly flat, with the surplus water running over the top of the dam, there must be many millions of cubic feet in store.

The dam is in the Lammerlaw Range, about twenty-three miles from and 960 ft. above Roxburgh, and is of stone courses set in cement mortar quarried on the site. It is a solid well-built structure of its kind, nearly vertical at the back or water side, and stepped to a batter in front, with an unfinished course on the top of 6 ft. It has two iron outlet-pipes, with sluice-valves worked by screws, and a sludge-pipe. The dam appears to have been built in two parts, 18 ft. at first by Mr. Rawlins, with another 5 ft. added since by Mr. Davey, of Dunedin, who kindly lent me the plans. It was built for and is the property of the Roxburgh Amalgamated Gold-mining Company.