material of which it is composed, and exhibiting its structure. It lies at about the same height above the sea as does the terminal moraine between the Kingston arm of Lake Wakatipu and the Matarua Valley. Speaking of Millar's Flat as a probable gold-bearing area, Professor Hutton says, "As some of the places which I consider very promising, and certainly deserving of the special attention of the drift miner, I may mention the part of the old Clutha lake-basin in the angle where the Bendigo Creek enters, and along the foot of the range on which the Bendigo reefs occur. Also the extensive so-called Millar's Flat, between Arrow and Queenstown, which, to all appearances, represents an old channel of the Shotover River, and should, as such, be very rich, judging from the splendid yields obtained from the river-workings higher up. Mr. Warden Beetham first drew my attention to this dormant field, the high prospective mining value of which is believed in by many miners in the district."* Most, if not the whole, of Millar's Flat is now freehold land in several holdings, and this might interfere with the ready prospecting and working of the gold-bearing drifts it may contain. It certainly appears to be as promising a field as the old bed of the Molyneux, at Island Block, and could as readily be worked either by dredger or by elevator.

Valley between Arthur's Point and Queenstown.—That the Shotover did at one time pass between the hill at the back of Queenstown and the range to the north is certain, river-gravels being traceable all the way till the lake-shingle of the old beach is encountered. The shallower ground lies towards the north-eastern end of this old channel of the Shotover, but in this no trace of former prospecting can now be discovered. In going from Arthur's Point to Queenstown, after passing the highest level at which lake-shingle is found, a hole has been sunk to a considerable depth in the narrowest part of the valley, but, from what could be learned, this, owing to the influx of water, could not be bottomed. I do not think in any case that river-gravels would have been met with; more probably glacier morainic matter would have been encountered. But certainly the saddle and fall to the Shotover should be further prospected.

Bob's Cove, or Twelve-mile, Lake Wakatipu.—Gold has been worked here since the early days of the rush to the Lake district. Shallow alluvial recent deposits along the bed of the creek have hitherto been worked, but as it is possible that other gold-bearing deposits of greater geological age are present it becomes necessary to deal with and describe these older beds that may chance to be gold-bearing. Professor Hutton describes the beds at this place as follows: "At Fews, or the Twelve-mile Creek, on the east side [north side of the cross reach] of Lake Wakatipu, there is a small patch of Tertiary rocks belonging to this [the Oamaru] formation. The lowest bed is blue shale, covered by green sandstone, which is again followed by calcareous sandstones with bands of conglomerate, the whole being capped by a hard grey limestone containing 90½ per cent. of carbonate of lime and about 3 per cent. of carbonate of magnesia. These beds are about 600ft. thick, and dip 15° S.E. towards the lake. They have, however, been a good deal undermined, and large masses of limestone have fallen into the lake, giving the western portions a very broken appearance. I have also been informed that other outliers of this formation exist on the north side of Aftonburn, on the west side of the lake, and up the Shotover, in Stony Creek."† From the locality last mentioned to the head of Skipper's Creek, immediately under the peak of Mount Arum, there is a line of fault, on the east side of which these deposits lie. There is involved along this line a variety of rocks, and frequently quartz grits, possibly auriferous.

During the early part of 1880 the writer made an examination of a large part of the Lake County, and in the report which followed dealing with the geology of that district the beds at Bob's Cove and their continuation to the north-east were described as follows: Both Tertiary and Cretaceo-tertiary rocks are developed on the north side of the middle part of Lake Wakatipu, and thence extend as a narrow strip, included as by a fault between the older rocks, along the eastern slopes of the Richardson Mountains to Stony Creek, north of Mount Gilbert. With these Cretaceo-tertiary rocks aphanite breccias belonging to the unaltered Palæzoic series are included along the same line, but have not been traced north of Butcher's Gully, on the south side of the Moonlight Gorge. These rocks embrace the coal sequence and overlying beds to the lower members of the Pareora series.

On the shores of Lake Wakatipu the beds dip to the west, and the sequence begins with a breccia conglomerate resting on the older rocks belonging to the Te Anau series. For a short distance the section of the immediately overlying beds is obscured, and the next rocks seen are mottled marly greensands, between which and the underlying breccia conglomerates coal-seams, if present, should occur. The prospects of finding coal-seams in these beds is, however, somewhat remote. The greensands are overlain by blue sandy marls with marine fossils. The fossils are very similar to those from other parts of Otago where marine formations immediately overlie the coal. Concretionary boulders occur in the sandy marls above the greensands, and some of these contain remains of vertebrate animals, cetacean or reptilian. The blue fossiliferous beds are overlain by a second band of green rock (green sandstone), and these are followed by a hard compact coralline limestone, alternating with marly strata, in which fossils are abundant, but very obscure. This limestone may be fully 150ft. thick, but its thickness cannot be exactly determined, as the whole is not clearly seen, and, on account of a change in the strike of the rock, looking from the shore, it appears to be much thicker than it really is. It is in many places so hard and compact as to show not the least trace of fossils, and these are only to be detected on fragments of the rock which have been weathered under the atmosphere or polished as beach-stones on the shore of the lake. Such specimens show that this limestone is composed almost wholly of minute branching corals very similar to those that form the limestone at Brighton, on the west coast of Nelson. The limestones are overlain by conglomerates and brown and green sandstones, the latter marly.

* "Geology of Otago": Dunedin, 1875, p. 181. † "Geology of Otago," p. 48.