

From beds of the light-brown sandstone the building-stone so much prized, and used for various ornamental purposes in the district, is obtained. This is a highly indurated rock, traversed by a system of joints which cut the bedding-planes at an angle of nearly 45°. The stone is lifted along these joints, and blocks of almost any size can be obtained.

In Moke Creek and Poverty Gully, a branch of Moke Creek, the lower part of the sequence only is present. The rocks here consist of conglomerates and red or black shales, with sandstone. Occasionally thin streaks of coaly matter are present in these beds, and a badly-preserved dicotyledonous leaf may here and there be found; but otherwise than from the peculiarity of their position these rocks are of little interest or importance in an economic sense. They are deeply involved where continued across the eastern spurs of Benmore and where they cross Moonlight Creek, about the middle of the gorge. Further on they cross Jones's Creek, and thence extend into the watershed of Stony Creek; and more recently the same beds have been traced to the sources of Skipper's Creek, in the upper part of the Shotover Valley. There are associated with these beds bodies of quartzose cement, which, resulting from the destruction of the neighbouring schistose rocks, may in places prove to be auriferous, and as these are present in or across the valleys of such creeks as Few's Creek, Moke Creek, and Jones's Creek, all of which have proved richly auriferous, some part of the gold obtained from these may possibly be derived from this source. There is with the limestones at the head of Butcher's Gully, between Moke and Moonlight Creeks, a considerable development of these quartz grits, and, although these do not appear in the gorge of Moonlight Creek, they are again found in the upper part of Jones's Creek. More recently further exploration of this line has been made during a recent visit to the Shotover Valley, and the involved rocks have been traced into the upper part of Skipper's Creek. At Maori Point the valley of the Shotover widens somewhat, and heavy terraces of river-gravel lie upon the sides of the comparatively narrow valley. There are in these gravels numerous blocks and boulders of argillaceous limestone, fine-grained fossiliferous sandstone, and masses of quartz grit cemented into a hard rock.

*Stony Creek.*—The valley of Stony Creek is very gorgy and, to those not acquainted with it, difficult to explore. From information received it would appear that the fossiliferous rocks, cements, &c., cross the valley about three miles west of where the creek joins the Shotover. The beds were described as constituting a very large reef, by which is to be understood that, in their exposure as a narrow belt of country, these beds are included and deeply involved between schist rocks on each hand. In the large sluicing-claims at the mouth of Stony Creek there is a very considerable proportion of the wash derived from these younger rocks. In that part of Johnston's claim which has been worked one-sixth of the boulders left on the ground belong to these rocks, and a very considerable collection of fossils might be made from the gritty brown sandstones and fine-grained argillaceous sandstones. Considerable quantities of quartz grit are also present.

*Skipper's Creek.*—It is not easy to trace the line of these beds across the mountains between Stony Creek and Skipper's Creek, but that the beds are continuous there can be little doubt. Much material, and often blocks of large size, derived from these Cretaceous-tertiary rocks are to be found along the bed of the lower part of Skipper's Creek. In Butcher's Gully, a branch of Skipper's Creek, a great number of large blocks of white cement stone or quartz grit are seen near its junction; and in like manner the same rocks are to be met with in the west or right-hand branch of Skipper's. These rocks appear to be absent from the northern branches of Skipper's Creek, and it is just possible that they do not reach further to the north-east than the southern or left-hand branch of this creek. All the quartz grits and pebbly conglomerates met with in the Shotover Valley are so strongly cemented that they form a hard rock, and thus, though they might be comparatively rich in gold, they would not pay to work. Apart from their possible productiveness in gold, these rocks, and the line of fracture along which they lie, are highly interesting and otherwise of great importance, as leading to a solution of some of the more difficult problems in connection with the geology of the district.

*Coal-mine, Upper Cardrona.*—The strata in connection with this lie about a mile east of the bed of the Cardrona, at an elevation of somewhere about 2,500ft. above the sea, on its south-east slope and close under the higher part of the Crown Range, and about six miles up stream from the Cardrona Township. Speaking of these beds, Professor Hutton remarks, "In the Cardrona Valley the lignite beds, according to Mr. Wright, are perpendicular, and interstratified with yellow clay and green sandstone." I have not seen the beds at the coal-mine, but, as quartz grits and sands associated with lignite appear on both banks of the stream between the shepherd's hut and the township, these and the beds at the coal-mine must be regarded as belonging to the same series and formation; and, as on the Kawarau side of the Cardrona Saddle the same or similar sands appear in connection with a seam of lignite, these sands also should be represented at the coal-mine. To my mind there is little doubt that these beds are in direct continuation of the line worked at Gibbston, and thence traceable into the Nevis Valley, and, as just stated, the same in age as the beds found farther down the Cardrona Valley to within two miles of the township. The occurrence of green sandstone is perhaps the only puzzling feature in connection with these beds, and from this circumstance it might be inferred that they belong to the marine series, as developed at Bob's Cove, on the north shore of Lake Wakatipu. Probably the green colour of the so-called sandstone is due not to glauconite, but to a mere coloration of the beds by some other form of iron-silicate.

*The Cardrona Valley from the Junction of Coal Creek to the Township.*—The creek-bed has generally been worked for gold, but the gold-bearing wash is restricted to the bottom of the valley, which is narrow and confined by the descending spurs of mountains of considerable elevation. A mile below Coal Creek there are white sands on the left bank of the main creek, and again at the junction of a small stream coming from the east. At this latter place the sands and coarser grits form the point of the spur on the down side of the junction referred to. This bluff, undercut by the action of the stream, has in part slipped away and exposed the beds clearly to view, showing