

Dunstan Mountains; and the mountain-wash at Bannockburn should also be referred to deposits of this class. Bald Hill, on Bald Hill Flat, may have been a deposit near the outlet of the Manuherikia Lake. Unless Frenchman's and Mid Run be considered as belonging to the same beds, these are not known to be auriferous in the Clutha Valley north of the Kawarau Junction; at Bannockburn and Bald Hill Flat they are. The Crown Terrace, at the old infall of the Arrow, at the eastern end of the pre-glacier extension of Lake Wakatipu, has also to be considered as coming under this head.

(g.) *Recent Alluviums*.—In the localities described, recent auriferous alluviums are present at Gabriel's Gully, Weatherstone's, Forsyth, Waitahuna Gully, Glenore, Tuapeka River, Waitahuna Flat, Upper Waitahuna River, Upper Waipori Valley; Island Block, Moa Flat, Bald Hill Flat, Butchers' Gully, Conroy's Gully, Bannockburn, Nevis Valley, and Miller's Flat; Arthur's Point to Queenstown, Bob's Cove (Lake Wakatipu); Clutha Valley along the base of Mount Pisa Range, Waikerikeri Creek, Devonshire Diggings, Tinker's, and Drybread, Hill's Creek, Hog Burn, Upper Kye Burn, Hyde, Horse Flat, Macrae's, Nenthorn; Macgregor's Creek (Lower Shag Valley), south-west slopes of the Horse Range, Trotter's Creek; Livingstone; North side of Maraewhenua River; Switzer's, Muddy Creek (Switzer's), Waikaka Diggings, and Knapdale.

With the exception of Island Block, and, perhaps, Bald Hill Flat, the recent auriferous drifts in all these localities may have derived their gold from contiguous quartz drifts or breccia conglomerates, and there can hardly be a doubt that they did so in the great majority of instances.

(h.) *Sea-beach Deposits*.—Gold is found near the mouth of the Mataura River, and thence along the coast-line to the eastward, on the beach of Molyneux Bay, and in small quantities at Coal Point, on Kartigi and Moeraki Beaches north of the mouth of Shag River, and at the mouth of the Kakanui River. North of the mouth of the Shag River the beach-gold has been derived from the breccia conglomerates and quartz drifts at the base of the coal-bearing series, the older rocks of the Horse Range, and eastern slopes of the Kakanui Mountains not being gold-bearing.

*The Quartz Drifts and Breccia Conglomerates a Source of Gold to more Modern and Recent Deposits.*

The amount of gold raised from the quartz-mines of Otago cannot be readily determined, but it is certainly short of one-seventy-fifth of the total gold raised in Otago since 1862. At the present time, with the exception of two small mines on the slopes of the Old Man Range above Bald Hill Flat, some fossicking at Nenthorn, and some prospecting at Waipori, the auriferous lodes being worked are confined to the Arrow and Shotover Valleys and the northern slope of the Dunstan Mountains. East of the Molyneux there is not at the present time a single quartz lode being worked on anything like a scale that would seem to give promise of a great future for this form of gold-mining in Otago. With the exception of the Cromwell Mine, at Bendigo Creek, on the north slopes of the Dunstan Mountains, and the mines now working in the Arrow and Shotover Valleys, perhaps also two small mines on the slopes of the Old Man's Range opposite Bald Hill Flat, all those that have been worked have proved too poor to pay at the prices then paid for labour, and with the machinery and appliances at the time in use.

That auriferous quartz-mining in Otago has been of very slow development is beyond dispute, and the reason appears to lie in the low-grade character of the stone and the comparative thinness of the quartz reefs. There can be no doubt that, when new and improved methods of extracting the gold have considerably cheapened the cost of treatment, reefs now abandoned, or in abeyance, will again be worked; but a poor reef, to pay, must show a large and constant body of auriferous quartz.

While thus, in the past, reef-mining has not flourished, the district east of the Remarkables and the Cardrona Valley has yielded an amount of alluvial gold such as might fairly lead to the inference that the auriferous quartz reefs within that area must be numerous, massive, and rich.

The reefs not bearing out this conclusion, we have to look to the older and newer breccia conglomerates and quartz drifts as being the immediate source of the greater part of the alluvial gold that has hitherto been raised in the Otago District.

These accumulations are so disposed that they are in a large measure, what remains of them, protected from being destroyed by ordinary denuding agents, being either overlain by younger deposits or involved between older or younger strata, so that the same result is effected. That their area in past times was much greater than at the present there is abundant evidence in the disjointed scattered patches that are preserved, and in the great abundance of cement stones over surfaces considerably distant from any deposit of loose quartz drift, and the quantities also of this particular kind of rock in the newer drifts and recent gravel-deposits of interior Otago.

As regards the time and mode of origin of these accumulations, there may in some cases be a difficulty in arriving at the truth. In the majority of instances the manner of deposition and the relative age of the beds can be fairly well determined.

During the latter part of the Permian period and older and middle Mesozoic times the New Zealand area was greatly depressed, and a succession of deposits were laid down amounting in the aggregate to fully 30,000ft. of strata. This is shown in the succession of Permian and Secondary deposits displayed in the Hokonui Hills, and in the district between the Mataura and Molyneux Rivers, south of the main road from Dunedin to Invercargill. In the middle and northern parts of the South Island, if the amount of deposit during the same period was somewhat less, it was still very great, and there is yet preserved in the Canterbury and Nelson Districts from 8,000ft. to 10,000ft. of Permian and older Secondary strata.

Widespread as these formations were over the South Island, it can hardly be supposed that they were absent from the central interior district or the goldfields of Otago, or that, at a later period, they had wholly to be removed in order to admit of the great denudation of the schistose