

claims at Back Creek, and in the sluicing-claims in the face of the terrace overlooking the Hokitika Valley, the presence of much olivine and some pieces of true serpentine was noted. And, in a claim in the terrace-face, one of the miners pointed out a boulder which had before attracted his notice as being composed of very peculiar materials, and of excessive hardness. I obtained two small specimens from the mass, which I brought to Wellington and submitted to Mr. Skey for determination. Mr. Skey pronounced the crystals included in the pale-green mass of the stone to be ruby, or corundum. This was during the last week of December, 1891.*

Subsequent to the dates mentioned, Mr. William Goodlet, whilst on a lecturing tour amongst the various Schools of Mines on the West Coast, visited Rimu, and obtained samples of the ruby-stone. These at the end of his trip he took with him to Dunedin. And sometime afterwards he submitted them to Professor Ulrich, of Otago University and School of Mines, Dunedin. Professor Ulrich pronounced the crystals to be true oriental ruby, of a fine colour, and pointed out the valuable nature of the discovery, provided crystals of larger sizes could be obtained, or, if of lesser size, abundant enough to collect as a superior quality of emery.

Where to look for the ruby rock *in situ* was the next matter to determine. One could but guess, since a stray boulder in the gold-drift at Rimu afforded little indication as to the whereabouts of the parent rock whence this had been derived. I somehow associated the ruby rock with the olivine and serpentine belt, much material from which had also become mixed up with the gold-drifts of Rimu and Back Creek. The evidence of the Arahura River-bed indicated a heavy band or belt of this rock somewhere along the upper part of the valley; but it was in vain I searched the river-bed for samples of the ruby rock. The gold-bearing sands of the more likely beaches were washed to see if minute or broken crystals of the ruby could be found in this way. Garnets in plenty could thus be collected, but no trace of ruby. Next, I examined the pannings-off of the Humphrey's Gully Tail-race, which, when washing-up, are usually thrown aside at a particular place; but these also yielded no result. The river was then followed to the Old Lake Basin above the first gorge, and the valley of the Arahura-Wainihinihini explored, and the left-hand branch of this, till the inaccessible mountain gorges of the Mica-schist Range barred further progress. Olivine and serpentine were comparatively rare in the valley of the Wainihinihini, and such boulders as were found seemed to have been brought thither by an off-set from the main body of the Arahura glacier which flowed up the valley, and escaped into the western low grounds through the saddle between Turiwhate and Island Hill.

A few blocks of white quartz were found at the foot of the gorge of the left branch of the Wainihinihini, but indications of metalliferous minerals were otherwise rare. The floor of the east side of the valley consists of gneissic schists, which also forms the eastern slopes of Turiwhate and Island Hill. The Mica-schist Range rises abruptly on the east side of the valley, and its slopes on this side expose only the lower series of the mica-schists, as a dark contorted mica-rock, abounding in garnets. A large mass of rhodonite (silicate of manganese) was the only mineral worthy of special notice collected from this tributary valley.

Mount Brown Creek joins the Arahura a mile and a half above the Wainihinihini Junction, and this also was explored, but without satisfactory results. Beyond the influence of the Arahura, when running at higher levels, or the lateral deposits of the main body of glacier-ice, great masses of sandstone were found in the bed of this creek, which seemed to indicate the existence of unaltered rock in the upper part of the creek, or on the higher part of the range. There were indications of a change in the nature of the rocks at the furthest point reached (1,000ft. above the sea), but there being an absence of quartz or other minerals of special interest, the further examination of the valley in its higher part was not proceeded with. Mount Brown Creek joins the Arahura at the entrance to the second gorge.

The second gorge of the Arahura, unlike the first or lower gorge, has been excavated across the rocks *in situ* of the Mica-schist Range. The banks and rapids of the river are studded with large boulders of olivine rock, and great masses of schist fallen from the adjoining height, or with the huge blocks of sandstone that have been brought from a distance up the valley by the action of the stream or glacier-ice.

To trace the power of the olivine blocks was now my principal object, as there were distinct evidences that this would prove the chief mineral belt of this part of the country. About two-thirds the distance through the gorge a large creek coming from Lone Peak, on the south side of the valley, brings into the river-bed great quantities of olivine rock, and above this junction the green boulders in the bed of the river are not nearly so numerous as below the junction. A mile higher up they are occasionally met with, while further on towards the upper end of the gorge they are rare. On the south side of the valley there was some difficulty in getting to these rocks *in situ* on account of the glacier-accumulations, which had filled the valley to a depth of nearly 1,000ft., and through which the rivers and creeks have cut their present channels. Beyond this, the mountains rise very abruptly, and it is not easy to get along the creek gorges, neither is progress less difficult by way of the cliffs and precipices of the range-slope. Finally, the mountain range had to be ascended, and the western ridge of Lone Peak followed to the point where it is crossed by the olivine and serpentine belt. This is from 300ft. to 500ft. in width, and divides the upper from the middle division of the schistose rocks. It does not, as has been supposed, lie along the junction of the schists with the unaltered Palæozoic rocks to the eastward. Copper is widely disseminated through the olivine rocks, and in the schists associated with or adjoining the mineral belt. Some of the schists are so rich in copper that it would be possible to work these did they occupy a more approachable position. Their inaccessibility debars the hope of this at the present time. The sample brought to Wellington contains from 8 to 10 per cent. of copper.

* Unfortunately no record of this determination appears on the books of the department, the test having been made merely for my satisfaction in the first place, and subsequently it was omitted to enter the result in the Laboratory records.