

For hydraulic mining abundant water-supply is required, and could without much difficulty or expense be obtained from the Clutha River, which has a sufficiently rapid fall to afford power to raise part of its own water to an altitude that would command the terraces. Any expenditure for such a purpose would be of great ulterior advantage to the district, as there are very considerable tracts of land suitable for agricultural occupation if they were irrigated. The proof of this is to be seen in many parts of the district where water-races abandoned by the miners have been utilized for gardens and fields with the most gratifying results, even when the soil presents no marked superiority. The dry climate, and marked difference of the temperature of winter and summer, and day and night, which is so characteristic of this district, is all in favour of successful cultivation if irrigation were afforded; and the destructive effects of the high winds might easily be mitigated by the growth of plantations, as trees flourish vigorously wherever there is even a small trickle of moisture. The claim of the district for expenditure on water-supply therefore appears to me to be better founded than in many other districts, where it would have no ultimate advantage beyond the extraction of gold.

Other parts of the Otago District were visited during January and February with special objects, and the remainder of the season was spent in the Taupo and Rotorua Districts on business relating to the general examination of the district and particularly to the utilization of the thermal springs.

Mr. Cox was engaged during the months of October, November, and December on an examination of the district lying between Collingwood and Big River, along the coast-line, and bounded to the eastward by the Aorere River. He reports that the well-known black slates of the Perseverance Mine appear to be represented near the Golden Ridge Mine at Slaty River, Anatori, and at this latter locality he obtained specimens of *graptolites* which would place these beds as Silurian in age. The Golden Ridge Mine is worked in similar beds, and, notwithstanding the fact that very little systematic work has been carried on there, the reef has yielded much richly auriferous stone, and would, he thinks, prove of great value if worked on a wider basis. In the vicinity of Big River and the Turimawivi he mapped the boundary of the granite, which extends from Rocks Point northwards, and, occurring nearly at the mouth of Big River, forms a narrow strip inland, which is not seen on the surface further than the Turimawivi, where it ends, as a conical hill, at the head of Independent Creek. He further examined the coal measures, eliciting little further information than was previously known; but, from the limestones which overlie the calcareous sandstones of Kaipuhe cliffs, obtained bones of the giant fossil penguin, and he traced the boundaries of the different members of this Cretaceo-tertiary formation. The rocks in which the Golden Ridge Mine is worked appear to extend southwards through Friday and Independent Creeks, and form the greater part of the Wakamarama Mountains, being again met with on the Gouland Downs; it being from this district that Mr. Cox considers the auriferous cements were derived which have been worked on the quartz ranges near Collingwood, and which are probably contemporaneous in age with the Pliocene marls, which occupy a considerable area along the present course of the Aorere River and form the low hills along the coast-line between Takaka and Pakawau. During January, February, and March he was engaged on an examination of the Upper Buller District, between Rotoiti and the Maruia River, in order to determine the extent of the coal measures in this direction and the thickness and value of the coal. He reports that they occur flanking the crystalline rocks which occur in Mount Murchison, and extend from there along the western flanks of the Spencer Mountains as far as the Matakītaki River, from which point foliated and talcose schists are found, also flanked to the westward by coal-measures. The coal-measures occupy the greater part of the area between the line indicated and the mouth of the Matakītaki River, at Hampden, being thrown into several sharp anticlinal and synclinal folds, lapping, at places, round bosses of granite; the coal seams hitherto discovered vary from 2 feet 6 inches to 4 feet in thickness, and are of very superior quality. The upper beds of the coal-measures consist of heavy beds of conglomerate, on which rest marly beds, and it is probably from this conglomerate that a large proportion of the gold in the Mangles has been derived and not from reefs in the vicinity. At the base of the foliated and talcose schists in the Alfred River, Maruia, Mr. Cox found white and blue crystalline limestones interstratified with blue calcareous slates and carbon-schists, which resemble the Lower Devonian beds at Ræfton. During May Mr. Cox further examined the beds at the Whau, Auckland, in order to see if any prospects existed of coal being found there, but reported that nothing fresh had been discovered and there was no probability of coal being found.

Mr. McKay was engaged on Museum work until November, when he went to Oamaru, and was engaged until the latter end of December in making a collection of rocks and fossils, which were to form the nucleus of a museum at Oamaru, and examining the strata between there and the eastern slopes of the Kakanui Mountains. He endeavoured to prove the identity of the Shag Point and South Canterbury coal fields by means of their fossils, but failed to trace them farther south than the Kakanui River. He examined the chalk deposits at Cave Valley, and traced them south to Kakanui, opposite Mahemo, where they alternate with beds of Ototara stone and associated floes of basalt. Further south he examined the coal beds in the neighbourhood of Otepopo and the eastern slopes of the Kakanui Ranges to the Kurow River, and determined the rocks there as belonging to the Kakanui formation. Further west he examined the Otepopo slate quarries on the boundary of the Te Anau series, and thence proceeded to Moeraki and the district which has lately been bored, unsuccessfully, for coal, and on the western section where these beds crop out no trace of coal could be found. At Lyttelton he examined the deposits exposed in the cuttings for the new dock, and determined them as true loess, the proof being found in the occurrence of rootlets from the base of the beds upwards, while at Hillsborough the evidence was yet more conclusive. At Timaru and Oamaru he examined beds of similar origin, and found that in these localities the materials of which they are composed are not of local origin, as is evidenced by the presence of mica. At the mouth of the Kakanui River he traced the so-called gem-stones, which consist chiefly of pyrope, olivine, and augite, to their parent rock in the Waireka tufas, which it appears the Hon. Mr. Mantell had