

The following extensions of the Geological Survey have afforded important additions to the general mapping of the colony:—

1. *Auckland District*.—The country lying between Whangarei and Kaipara, about 1,500 square miles.
2. *Canterbury District*.—The country between Motanau and the Rakaia River, about 1,000 square miles.
3. *Otago District*.—Special examination of the Jurassic strata at the Mataura.
4. *Otago District*.—The Alpine district lying to the north-west of the Wakatipu Lake, about 1,400 square miles.

A *résumé* of the geology of the colony has been published in the Handbook of New Zealand, and the second edition of the same work is illustrated by a small-scale geological map, printed in colours.

The comparison of the geology of New Zealand with that of Australia formed the subject of a lecture delivered by myself in Sydney, which has been printed in the Transactions of the Royal Society of New South Wales.

#### MINERAL COLLECTIONS.

During the past year a large and interesting collection of minerals and rock-specimens has been made from the Wakatipu District by Mr. McKay, who was employed in running detailed sections through that part of the country west of the Wakatipu Lake, in continuance of what was done last year in that district by Mr. Cox and myself.

Amongst others may be mentioned specular iron ore, magnetite, pyrrhotine, rhodonite, copper-pyrites, chromite, a very rare chromium mineral (chrome mica), and scheelite; bearing out the statement which I made in 1864, that the country lying to the westward of the faulted area about Lake Wakatipu would, in all probability, prove to be highly mineralized.

Mr. Cox made a good collection of copper ores from the Nelson District, representing the different classes of ore which are found at the various mines. He also examined the so-called copper stratum in Aniseed Valley, the occurrence of which was mentioned last year, and states that no evidence has yet been found proving it to exist in more than irregular masses, but that its occurrence in isolated localities has been shown through a considerable stretch of country, and it appears to obey the laws which regulate the other copper deposits in the district. He also brought specimens of a highly-pyritous quartz from the Mount Arthur Reef, in Gridiron Creek, which yielded over 2 oz. of gold per ton, most of which was free, and, besides containing about fifty per cent. of pyrites, had also several other minerals, as galena, zinc-blende, and pyrrhotine, associated with it.

Some interesting specimens of coal have been forwarded from the Paringa River, Westland, from a seam stated by Mr. McFarlane, the sender, to be 12 feet in thickness; and the same contributor has also forwarded a sample of copper ore (chalcopyrite) containing 18.55 per cent. of copper, taken from a lode 3 feet wide, in the vicinity of Big Bay.

Good collections of rock-specimens, illustrating the geology of the district, have also been made in the Wakatipu District by Mr. McKay, while the volcanic rocks of the Auckland District were largely collected from by Mr. Cox.

At West Oxford the occurrence of a considerable and highly important deposit of chalk has been proved, which is not less than 100 feet in thickness, which will be of great value for the manufacture of "whiting" and "Portland cement."

#### PALEONTOLOGY.

The Geological Survey of the Auckland District from Whangarei south to Auckland has formed the most important part of Mr. Cox's work for the past year, this being undertaken in continuation of the previous work of the department in the northern part of the Auckland Provincial District.

I had previously pointed out that younger secondary rocks were represented in the Kaipara District, and Mr. Cox has now succeeded in proving the existence of still lower beds of the same formation in the Upper Wairoa River, which cuts through soft sandstones with *Inoceramus*, &c.

Besides these, beds of Cretaceous-tertiary age occur in the Kaipara Harbour, and at Komiti Point are overlaid unconformably by sandy marls and grits, over which are tufaceous sands and concretionary greensands. These beds, which are the same fossiliferous beds which I discovered in 1874 at Komiti Point, he classes together, and considers to be the same as the fossiliferous grits at Cape Rodney, and the equivalents of the Waitemata series; but, *Pecten pleuronectes* and many Orakei Bay fossils being found at Komiti Point only in the marls, whereas the tufaceous beds are associated with a great preponderance of lower miocene forms, this rather bears out the view that the Waitemata series must be divided at the horizon of the Parnell grits. It is only right to state, however, that it is not altogether on the occurrence of these fossils, but rather on stratigraphical grounds, that Mr. Cox has placed these two sets of beds in the same horizon; and if this view is borne out its bearing on questions concerning the distribution of coal in the North is most important.

The special examination of the beds at the Mataura Falls was made by Mr. McKay, with the view of placing beyond doubt the position at which *Macrotæniopteris* occurs. The result of this work is to prove that this fossil plant, which has special interest on account of it also being found in the Rajmahal beds in India, occurs in strata of Upper Oolite age. A fine series of fossils, numbering some one hundred specimens, were added to the collections by Mr. McKay during this survey.

A large collection of fossils was made at the Curiosity Shop, Canterbury, embracing 2,500 specimens, amongst which are a few bones of the extinct giant penguin, *Palæudyptes antarcticus*. The great feature of this collection is the Brachiopoda, one-half the total number belonging to this class. Most of the Gasteropoda and Lammellibranchiata are in the condition of casts, with the exceptions in the former class of the Turritellidæ, and in the latter of the genera *Ostrea*, *Pecten*, *Lima*, and *Pinna*, of which latter only fragments have been obtained. On the contrary, all the Brachiopoda retain their tests, as also, generally speaking, do the Echinodermata.