

nites of the genera *Amaltheus*, *Schlonbachia*, *Haploceras*, also *Hamites*, *Ancyloceras*, *Crioceras*, and *Nautilus*; likewise fishes of the genera *Lamna*, *Aspidorhynchus*, *Belonostomus*, and various ichthyosaurs and plesiosaurs. The Upper Cretaceous formations are represented by the "Desert Sandstone," which must have covered at least three-quarters of the colony. It lies on an upturned and denuded surface of the Lower Cretaceous formations and contains land-plants and a marine fauna (*Micraster*, *Rhynchonella*, *Ostrea*, *Trigonia*, *Belemnites*).¹⁹¹

In New Zealand the "Waipara" formation of Canterbury is believed to represent Upper Cretaceous and possibly some of the older Tertiary horizons. It consists of massive conglomerates (sometimes 6000 to 8000 feet thick), sandstones, shales, brown-coal seams, and ironstones. The plants include dicotyledonous leaves, cones, and branches of araucarians and leaves and twigs of *Dammara*. Among the shells no cephalopods nor any of the widespread hippurites have yet been found. With the remains of fishes (*Odontaspis*, *Lamna*, *Hybodus*) occur numerous saurian bones, which have been referred to species of *Plesiosaurus*, *Mauisaurus*, *Polycotylus*, etc.¹⁹² According to the work of the Geological Survey Department of New Zealand, the Cretaceous system consists of a lower group (500 feet) of green and gray incoherent sandstones, in which beds of bituminous coal occur on the west coast (Lower Greensand), surmounted by a mass of strata (2000 to 5000 feet) which appears to connect the Cretaceous and Tertiary series. The upper part of the group (consisting of marls, greensand, limestone and chalk with flints) is thoroughly marine in origin, with *Ancyloceras*, *Belemnites*, *Rostellaria*, *Plesiosaurus*, *Leiodon*, etc. The lower portion, which is capped by a black grit with marine fossils, contains the most valuable coal-deposits of New Zealand. The plants include dicotyledonous and coniferous forms closely allied to those still living in the country.¹⁹³

¹⁹¹ R. I. Jack and E. Etheridge, "Geology of Queensland," chaps. xxxi.-xxxiv.

¹⁹² Etheridge, *Q. J. Geol. Soc.* xxviii. 183, 340; Owen, *Geol. Mag.* vii. 49; Hector, *Trans. New Zealand Inst.* vi. p. 333; Haast, "Geology of Canterbury and Westland," p. 291; Hutton and Ulrich, "Geology of Otago," p. 44.

¹⁹³ Hector, "Handbook of New Zealand," 1883, p. 29.