

chalk-rocks, clays, and limestones; (b) Lower Murravian sandstones with *Zeuglodon*, *Lovenia*, *Magasella*, *Megalaster*; (c) Middle Murravian limestones and sandstones, with an abundant and varied marine fauna (*Carcharodon*, *Lamna*, *Odontaspis*, *Nassa*, *Ancillaria*, *Cassis*, *Voluta*, *Margarella*, *Mangelia*, *Cerithium*, *Conus*, *Cancellaria*, *Natica*, *Pecten*, *Lima*, *Spondylus*, *Nucula*, *Limopsis*, *Chama*, *Chione*, *Rhynchonella*, *Terebratulina*, *Waldheimia*, *Terebratula*, *Eupatagus*, *Deltocyathus*, etc.; (d) Upper Murravian oyster-beds and sandstones (*Trigonia*, *Pectunculus*, *Tellina*, *Mactra*, *Clypeaster*, etc.).

In Tasmania an important series of older Tertiary deposits has also been found. At the top, leaf-beds, lignites, and beds with marine fossils occur, associated with extensive sheets of felspar-basalts and tuffs. The tuffs have yielded *Hypsiprimum* and *Phascalomys*. Next comes a great series of sandstones, clays, and lignites, varying from 400 to 1000 feet in thickness, and sometimes, as in the Launceston basin, covering an area of at least 600 square miles. This series incloses a rich flora, including species of oak, elm, beech, laurel, cinnamon, and araucaria, with fruits of proteaceous, sapindaceous, and coniferous trees. The fresh-water and terrestrial character of the deposits is further confirmed by the occurrence in them of *Unio*, *Helix*, *Vitrina*, *Bulimus*, etc. The third group in descending order is of marine origin, and is well seen at Table Cape. It consists of shelly limestones, calcareous sandstones, coral-rag and pebbly bands, and is replete with fossils, only from 1 to 3 per cent of the shells belonging to existing species. Characteristic forms are *Voluta anticin-gulata*, *Cassis sufflatus*, *Cypræa Archeri*, *Ancillaria mucronata*, *Panopæa Agnewi*, *Waldheimia garibaldiana*, *Lovenia Forbesi*, *Cellepora gambierensis*.⁵⁴

In New Zealand rocks believed to be referable to the upper part of the Eocene series are mainly composed of a shelly calcareous sandstone with corals and polyzoa, which in its lower part passes occasionally into an imperfect nummulitic limestone (Nummulitic beds, Hutchison's Quarry beds, Mount Brown beds). Volcanic action was

⁵⁴ Mr. R. M. Johnston, Registrar-General at Hobart, Tasmania, has published a useful memoir entitled, "Observations with respect to the Nature and Classification of the Tertiary Rocks of Australasia," 1888, with references to the principal sources of information on the subject of Tasmanian Tertiary geology.