

the rocks. Even the rootlets of grass and other vegetation bore their way through sub-soil, and thus prepare an easier path for the infiltration of surface water and its combination with the organic acids as it proceeds on its subterranean passage. While, therefore, a thick covering of vegetation helps to protect the ground from sudden landslips and rapid surface denudation, and has a beneficent influence upon climate, the decay of vegetation slowly and surely rots any mineral matter within reach of the powerful humus acids.

Peat-mosses occupy wide areas in the Temperate and Arctic zones, and have been frequently made the subject of scientific researches. In 1810, Rennie published his work, *Essays on Peat-Moss*, an able treatise on the Scottish peat-mosses; and the nature and origin of peat-deposits were afterwards elucidated in handbooks by Dau (1823) and Wiegmann (1837). What Rennie achieved for the Scottish peat-mosses, was done for the Danish and North German peat-deposits by Steenstrup (1841) and Griesebach (1845). These authors defined for the first time the differences between *Sphagnum* mosses characteristic of marshes on mountain-slopes and valleys; low-lying or lacustrine growths and deposits of peat rich in rushes and sedges; and forest-peat or swamps. A typical example of a forest moss is the "Dismal Swamp" in Virginia, which Lyell described in 1841, and Lesquereux afterwards examined in more detail.

Modern deep-sea researches have discovered a few instances of marine peat; and according to the new investigations of Eugène Bertrand, isolated coal-beds occur which have been mainly formed by sea-weeds, for example the "Boghead" coal, near Autun, and the "Kerosene" in Australia. The low coasts, estuaries, and river-mouths in tropical lands are frequently fringed by mangrove-trees whose withered roots and fallen radicles form coaly deposits on the sea-floor, mixed with a large proportion of the finer coastal detritus. In a similar way, drift-wood may accumulate in large rivers, and by the process of subaqueous decay may be converted into lignite, or a substance of the nature of brown-coal. Lyell's description of the "rafts" of the Mississippi will be familiar to most readers.

Fossil brown-coal may be compared with these recent formations. The origin of brown-coal from plant-decay has never been questioned. A valuable monograph on brown-coal, describ-