

CHAPTER L.

IMBEDDING OF AQUATIC SPECIES IN SUBAQUEOUS STRATA.

Inhumation of freshwater plants and animals—Shell marl—Fossilized seed-vessels and stems of chara—Recent deposits in American lakes—Freshwater species drifted into seas and estuaries—Lewes levels—Alternations of marine and freshwater strata, how caused—Imbedding of marine plants and animals—Cetacea stranded on our shores—Liability of littoral and estuary Testacea to be swept into the deep sea—Effects of a storm in the Frith of Forth—Burrowing shells secured from the ordinary action of waves and currents—Living Testacea found at considerable depths—Extent of some recent shelly deposits.

HAVING treated of the imbedding of terrestrial plants and animals, and of human remains, in deposits now forming beneath the waters, I come next to consider in what manner *aquatic* species may be entombed in strata formed in their own element.

Freshwater plants and animals.—The remains of species belonging to those genera of the animal and vegetable kingdoms which are more or less exclusively confined to fresh water are for the most part preserved in the beds of lakes or estuaries, but they are oftentimes swept down by rivers into the sea, and there intermingled with the exuviæ of marine races. The phenomena attending their inhumation in lacustrine deposits are sometimes revealed to our observation by the drainage of small lakes, such as are those in Scotland, which have been laid dry for the sake of obtaining shell marl for agricultural uses.

In these recent formations, as seen in Forfarshire, two or three beds of calcareous marl are sometimes observed separated from each other by layers of drift peat, sand, or fissile clay. The marl often consists almost entirely of an aggregate of shells of the genera *Limnea*, *Planorbis*, *Valvata*, and *Cyclas*, of species now existing in Scotland. A considerable proportion of the Testacea appear to have died very young, and few of the shells are of a size which indicates their having attained a state of maturity. The shells are sometimes entirely decomposed, forming a pulverulent marl; sometimes in a state of good preservation. They are frequently intermixed with stems of *Chara* and other aquatic vegetables, the whole being matted together and compressed, forming laminæ often as thin as paper.

Fossilized seed-vessels and stems of Chara.—As the *Chara* is an aquatic plant, which occurs frequently fossil in formations of different eras, and is often of much importance to the geologist in characterizing entire groups of strata, I shall describe the manner in which I have found the recent species in a petrified state. They occur in a marl-lake in Forfarshire, inclosed in nodules, and sometimes in a continuous stratum of a kind of travertin.

The seed-vessel of these plants is remarkably tough and hard, and consists of a membranous nut covered by an integument (*d*, fig. 79.) both of which are spirally striated or ribbed. The integument is composed of five spiral valves, of a quadrangular form (*g*). In