The Chara also plays the same part in the subaqueous vegetation of North America as in Europe. I observed along the borders of several freshwater lakes in the state of New York a luxuriant crop of this plant in clear water of moderate depth, rendering the bottom as verdant as a grassy meadow. Here, therefore, we may expect some of the tough seed-vessels to be preserved in mud, just as we detect them fossil in the Eocene strata of Hampshire, or in the neighbourhood of Paris, and many other countries.

### *Imbedding of freshwater Species in Estuary and Marine Deposits.*

*In Lewes levels.* — We have sometimes an opportunity of examining the deposits which within the historical period have silted up some of our estuaries; and excavations made for wells and other purposes, where the sea has been finally excluded, enable us to observe the state of the organic remains in these tracts. The valley of the Ouze between Newhaven and Lewes is one of several estuaries from which the sea has retired within the last seven or eight centuries; and here, as appears from the researches of Mr. Mantell, strata thirty feet and upwards in thickness have accumulated. At the top, beneath the vegetable soil, is a bed of peat about five feet thick, inclosing many trunks of trees. Next below is a stratum of blue clay containing freshwater shells of about nine species, such as now inhabit the district. Intermixed with these was observed the skeleton of a deer. Lower down, the layers of blue clay contain, with the above-mentioned freshwater shells, several marine species well known on our coast. In the lowest beds, often at the depth of thirty-six feet, these marine Testacea occur without the slightest intermixture of fluviatile species, and amongst them the skull of the narwal, or sea unicorn (*Monodon monoceros*), has been detected. Underneath all these deposits is a bed of pipe-clay, derived from the subjacent chalk.*

If we had no historical information respecting the former existence of an inlet of the sea in this valley and of its gradual obliteration, the inspection of the section above described would show, as clearly as a written chronicle, the following sequence of events. First, there was a salt-water estuary peopled for many years by species of marine Testacea identical with those now living, and into which some of the larger Cetacea occasionally entered. Secondly, the inlet grew shallower, and the water became brackish, or alternately salt and fresh, so that the remains of freshwater and marine shells were mingled in the blue argillaceous sediment of its bottom. Thirdly, the shoaling continued until the river-water prevailed, so that it was no longer habitable by marine Testacea, but fitted only for the abode of fluviatile species and aquatic insects. Fourthly, a peaty swamp or morass was formed, where some trees grew, or perhaps were drifted during floods, and where terrestrial quadrupeds were mired. Finally, the soil being flooded by the river only at distant intervals, became a verdant meadow.

*In delta of Ganges and Indus.* — It was before stated, that on

* Mantell, Geol. of Sussex, p. 285.; also Catalogue of Org. Rem., Geol. Trans., vol. iii. part i. p. 201., second series.