

rials heaped upon the embankment. In 1852 I saw a remarkable instance of such a downward and lateral pressure, in the suburbs of Boston (U. S.), near the South Cove. With a view of converting part of an estuary overflowed at high tide into dry land, they had thrown into it a vast load of stones and sand, upwards of 900,000 cubic yards in volume. Under this weight the mud had sunk down many yards vertically. Meanwhile the adjoining bottom of the estuary, supporting a dense growth of salt-water plants, only visible at low tide, had been pushed gradually upward, in the course of many months, so as to project five or six feet above high-water mark. The upraised mass was bent into five or six anticlinal folds, and below the upper layer of turf, consisting of salt-marsh plants, mud was seen above the level of high tide, full of sea shells, such as *Mya arenaria*, *Modiola plicatula*, *Sanguinolaria fusca*, *Nassa obsoleta*, *Natica triseriata*, and others. In some of these curved beds the layers of shells were quite vertical. The upraised area was 75 feet wide, and several hundred yards long. Were an equal load, melted out of icebergs or coast-ice thrown down on the floor of a sea, consisting of soft mud and sand, similar disturbances and contortions might result in some adjacent pliant strata, yet the underlying more solid rocks might remain undisturbed, and newer formations, perfectly horizontal, might be afterwards superimposed.

A buried forest has been adverted to as underlying the drift on the coast of Norfolk. At the time when the trees grew, there must have been dry land over a large area, which was afterwards submerged, so as to allow a mass of stratified and unstratified drift, 200 feet and more in thickness, to be superimposed. The undermining of the cliffs by the sea in modern times has enabled us to demonstrate, beyond all doubt, the fact of this superposition, and that the forest was not formed along the present coast-line. Its situation implies a subsidence of several hundred feet since the commencement of the drift period, after which there must have been an upheaval of the same ground; for the forest bed of Norfolk is now again so high as to be exposed to view at many points at low water; and this same upward movement may explain why the *till*, which is conceived to have been of submarine origin, is now met with far inland, and on the summit of hills.

The boulder formation of the west of England, observed in Lancashire, Cheshire, Shropshire, Staffordshire, and Worcestershire, contains in some places marine shells of recent species, rising to various heights, from 100 to 350 feet above the sea. The erratics have come partly from the mountains of Cumberland, and partly from those of Scotland.

But it is on the mountains of North Wales that the "Northern drift," with its characteristic marine fossils, reaches its greatest altitude. On Moel Tryfan, near the Menai Straits, Mr. Trimmer met with shells of the species commonly found in the drift at the height of 1392 feet above the level of the sea.

It is remarkable that in the same neighborhood where there is evidence of so great a submergence of the land during part of the glacial period, we have also the most decisive proofs yet discovered in the British