the soil, therefore, whereon they grew, after remaining undisturbed for long periods, is ultimately torn up and swept away.

It is also found in excavating at New Orleans, even at the depth of several yards below the level of the sea, that the soil of the delta contains innumerable trunks of trees, layer above layer, some prostrate, as if drifted, others broken off near the bottom, but remaining still erect, and with their roots spreading on all sides, as if in their natural position. In such situations they appeared to me to indicate a sinking of the ground, as the trees must formerly have grown in marshes above the sea-level. In the higher parts of the alluvial plain, for many hundred miles above the head of the delta similar stools and roots of trees are also seen buried in stiff clay one, above the other, and exposed to view in the banks at low water. They point clearly to the successive growth of forests in the extensive swamps of the plain, where the ground was slowly but continually raised, year after year, by the mud thrown down during inundations. These roots and stools belong chiefly to the deciduous cypress and other species which inhabit morasses, and they bear testimony to the constant shifting of the course of the great river which is ever excavating, in many districts, the land that was originally formed at the distance of many miles from its immediate banks.

Formation of lakes in Louisiana. — Another striking feature in the basin of the Mississippi, illustrative of the changes now in progress, is the formation by natural causes of great lakes, and the drainage of others. These are especially frequent in the basin of the Red River in Louisiana, where the largest of them, called Bistineau, is more than *thirty miles* long, and has a medium depth of from *fifteen* to *twenty* feet. In the deepest parts are seen numerous cypress trees, of all sizes, now dead, and most of them with their tops broken by the wind, yet standing erect under water. This tree resists the action of air and water longer than any other, and, if not submerged throughout the whole year, will retain life for an extraordinary period. Lake Bistineau, as well as Black Lake, Cado Lake, Spanish Lake, Natchitoches Lake, and many other others, have been formed, according to Darby, by the gradual elevation of the bed of Red River, in which the alluvial accumulations have been so great as to raise its channel, and cause its waters, during the flood season, to flow up the mouths of many tributaries, and to convert parts of their courses into lakes. In the autumn, when the level of Red River is again depressed, the waters rush back, and some lakes become grassy meadows, with streams meandering through them.* Thus, there is a periodical flux and reflux between Red River and some of these basins, which are merely reservoirs, alternately emptied and filled, like our tide estuaries — with this difference, that in the one case the land is submerged for several months continuously, and in the other twice in every twenty-four hours. It has happened, in several cases, that a raft of timber or a bar has been thrown by Red River across some of the openings of these channels, and then the lakes become,

* Darby's Louisiana, p. 33.