

trees and semi-aquatic plants. As a singular proof of this fact, I may mention that whenever any part of a swamp in Louisiana is dried up, during an unusually hot season, and the wood set on fire, pits are burnt into the ground many feet deep, or as far down as the fire can descend, without meeting with water, and it is then found that scarcely any residuum or earthy matter is left.\* At the bottom of all these "cypress swamps" a bed of clay is found, with roots of the tall cypress (*Taxodium distichum*), just as the underclays of the coal are filled with *Stigmaria*.

It has been already stated, that the carboniferous strata at the South Joggins, in Nova Scotia, are nearly three miles thick, and the coal-measures are ascertained to be of vast thickness near Pictou, more than 100 miles to the eastward. If, therefore, we speculate on the probable volume of solid matter, contained in the Nova Scotia coal-fields, there appears little danger of erring on the side of excess if we take the average thickness of the beds at 7500 feet, or about half that ascertained to exist in one carefully-measured section. As to the area of the coal-field, it includes a large part of New Brunswick to the west, and extends north to Prince Edward's Island, and probably to the Magdalen Isles. When we add the Cape Breton beds, and the connecting strata, which must have been denuded or are still concealed beneath the waters of the Gulf of St. Lawrence, we obtain an area comprising about 36,000 square miles. This, with the thickness of 7500 feet before assumed, will give 51,000 cubic miles of solid matter as the volume of the carboniferous rocks.

The Mississippi would take more than two million of years to convey to the Gulf of Mexico an equal quantity of solid matter in the shape of sediment, assuming the average discharge of water, in that great river to be as calculated by Mr. Forshey, 450,000 cubic feet per second; throughout the year, and the total quantity of mud to be, as estimated by Mr. Riddell, 3,702,758,400 cubic feet in the year.†

The Ganges, according to the data supplied to me by Mr. Everest and Captain Strachey, conveys so much larger a volume of solid matter annually to the Bay of Bengal, that it might accomplish a similar task in 375,000 years, or in less than a fifth of the time which the Mississippi would require.‡

As the lowest of the carboniferous strata of Nova Scotia, like the middle and uppermost, consist of shallow-water beds, the whole vertical subsidence of three miles, at the South Joggins, must have taken place gradually. If then this depression was brought about in the course of 375,000 years, it did not exceed the rate of four feet in a century, resembling that now experienced in certain countries, where, whether the

\* Lyell's Second Visit to the U. S., vol. ii. p. 245; and American Journ. of Science, 2d series, vol. v. p. 17.

† Principles of Geology, 9th ed. 1853, p. 273.

‡ Ibid. 1853, p. 283.