

readily be accounted for, by assuming that there was a gradual subsidence of the ground for ages, which was as constantly raised by the accession of fluvial sediment, so as to prevent any incursion of the sea. Occasionally there were pauses in the downward movement, when trees grew on the soil, and vegetable matter of some thickness had time to accumulate.

Recent observations, by Morlat and others, have demonstrated that, since the time of the Romans, there has been a general subsidence of the coast at the head of the Adriatic, to the amount of five feet, which has not prevented the delta of the Po and other rivers from advancing on the sea, although it must have checked their progress. Of the much greater movements of elevation and depression which have taken place in the delta of the Indus, especially those wrought in the year 1819, I have elsewhere given an account.* It would, therefore, be perfectly consistent with analogy to find, in the neighborhood of New Orleans, ancient swamp formations, with the roots and stumps of erect trees, unmixed with marine remains, far below the level of the sea, as is the fact, if I can rely on the information given me in 1846.†

Finding it impossible to calculate the age of the delta, from the observed rate of the advance of the land on the Gulf in each century, I endeavored to approximate, by a different method, to a minimum of the time required for bringing down from the upper country that large quantity of earthy matter which is now deposited within the area of the delta. Dr. Riddell communicated to me, at New Orleans, the result of a series of experiments which he had made, to ascertain the proportion of sediment contained in the waters of the Mississippi. He concluded that the mean annual amount of solid matter was to the water as $\frac{1}{1245}$ in weight, or about $\frac{1}{5000}$ in volume.‡ Since that period, he has made another series of experiments, and his tables show that the quan-

* Principles, Seventh Edition, p. 437.

† See ante, p. 109.

‡ The calculations here given, were communicated to the British Association in a Lecture which I delivered at Southampton, in September, 1846. See "Athenæum Journal," Sept. 26, 1846, and "Report of British Association," 1846, p. 117.