geologists, though data were still wanting for its proper application. Playfair, for instance, in speaking of the transference of material from the surface of the land to the bottom of the sea, remarks that "the time requisite for taking away by waste and erosion 2 feet from the surface of all our continents and depositing it at the bottom of the sea cannot be reckoned less than two hundred years."[313] This estimate does not appear to have been based on any actual measurements, and must greatly exceed the truth; but it serves to indicate how broad was the view that Playfair held of the theory which he undertook to illustrate. The first geologist who appears to have attempted to form any estimate on this subject, from actually ascertained data, was Mr. Alfred Tylor, who in the year 1850 published a paper in which he estimated the probable amount of solid matter annually brought into the ocean by rivers and other agents. He inferred that the quantity of detritus now distributed over the sea-bottom every year would, at the end of 10,000 years, cause an elevation of the ocean-level to the extent of at least 3 inches.[314] The subject was afterward taken up by Dr. Croll, who specially drew attention to the Mississippi as a measure of denudation and thereby of geological time.[315]

When the annual discharge of mineral matter carried seaward by a river, and the area of country drained by that river, are both known, the one sum divided by the other gives the amount by which the drainage-area has its mean

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[313] "Illustrations," p. 424. Manfredi had previously made a calculation of the amount of rain that falls over the globe, and of the quantity of earthy matter carried into the sea by rivers. He estimated that this earthy matter distributed over the sea-bed must raise the level of the latter five inches in 348 years. Von Hoff, "Veränderungen der Erdoberfläche," Band i. p. 232. See the other authorities there cited.

[314] Phil. Mag. loc. cit.

[315] Phil. Mag. for February, 1867 and May, 1868; and his "Climate and Time." See also Geol. Mag. June, 1868; Trans. Geol. Soc. Glasgow, iii. p. 153.