T. Mellard Reade estimates that the water (about 68,451,000,000 tons) which annually runs off from the area of England and Wales carries to the sea 8,370,630 tons of solids in solution, or 1223 parts in every 10,000 of water, consisting of about 0·95 of calcium and magnesium carbonates and sulphates, 0·166 of sodium chloride, and the rest nitrates, sodium carbonate, alkaline sulphates, silica, and iron sesquioxide; and at 15 cubic feet to the ton, the denudations thus occasioned would equal one foot in 12,978 years. Prestwich obtained (1872), in a similar calculation, one foot in 12,000 years for the calcium carbonate carried off by the Thames from the chalk, greensand, and oölitic formations. The total annual denudation for England, from this source alone, is made 143·5 tons per square mile. The Rhine, according to Reade's calculations, removes about 92·3 tons in solution per square mile; the Rhone, 232 tons; the Danube, 72·7 tons; the Garonne, 142 tons; the Seine, 97 tons. From these data the conclusion is reached that over the world the average annual amount of rock-material dissolved and carried off by rivers is about 100 tons per square mile, of which about $\frac{1}{2}$ is probably calcium carbonate, $\frac{1}{5}$ calcium sulphate, 7 tons silica, 4 tons each magnesium carbonate and sulphate and sodium chloride, and 6 of alkaline carbonates and sulphates. The annual amount of detritus brought down by the Danube is about $\frac{1}{3000}$ of the water, or three times the amount of solids in solution. Taking the amount of solids removed mechanically at six times that in solution, the total annual amount of denuded material for the globe would be 600 tons per square mile.

While the land loses through erosion, the gain of the oceanic depressions, or of its borders, is exceedingly small. C. G. Forshey, after stating that the Gulf of Mexico has an area of 600,000 square miles, an average depth of 4920 feet, and is about 85,000,000,000,000,000 (85 quadrillions) of cubic feet in contents; that its whole drainage area is 2,161,890 square miles, and the amount of fresh water it receives from this area is 37·78 trillions of cubic feet; adds that if empty, it would take its tributary rivers at this rate 2250 years to fill it with water, or the Mississippi alone, 4000 years. Consequently, if all the rivers contribute on an average $\frac{1}{2600}$ their bulk of detritus, it would take nearly 6,000,000 years to grade the depression up to the sea level, or for the Mississippi alone, about 11,000,000 years. This statement assumes that the bottom does not sink under the load.

The quantity of wood brought down by some American rivers is very great. The well-known natural "raft," obstructing Red River, had a length, in 1854, of 13 miles, and was increasing at the rate of one and a half to two miles a year, from the annual accessions. The lower end, which was then 53 miles above Shreveport, had been gradually moving up stream, from the decay of the logs, and formerly was at Natchitoches, if not still farther down the stream. Both this stream and others carry great numbers of logs to the delta.

DISTRIBUTION. — The transported material of rivers is distributed —

(1) Along the channel, forming sand-flats, and mud-flats, and deposits also in the lakes of the drainage area.

(2) Over the flood-grounds, supplying what these may annually lose during floods, and adding, in places, to their height, thus making *fluvial* or *alluvial formations*, and, about lakes, *lacustrine* formations.

(3) About the mouths of tideless rivers, making deltas on the sea border and on lakes.

(4) About the mouths of tidal rivers, making estuary, shore and off-shore deposits. This last subject is deferred to the chapter on the Work of the Ocean.