

*running water.*—If we suppose that the copious supply from the nether regions, by springs and volcanic vents, of carbonic acid and other gases, together with the decomposition of rocks, may be just sufficient to counterbalance that loss of matter which, having already served for the nourishment of animals and plants, is annually carried down in organized forms, and buried in subaqueous strata, we concede the utmost that is consistent with probability. An opinion, however, has been expressed, that the processes of vegetable life, by absorbing various gases from the atmosphere, cause so large a mass of solid matter to accumulate on the surface of the land, that this mass alone may constitute a great counterpoise to all the matter transported to lower levels by the aqueous agents of decay. “Torrents and rivers, it is said—the waves of the sea and marine currents—act upon lines only; but the power of vegetation to absorb the elastic and non-elastic fluids circulating round the earth, extends over the whole surface of the continents. By the silent but universal action of this great antagonist power, the spoliation and waste caused by running water on the land, and by the movements of the ocean, are neutralized, and even counterbalanced.”\*

In opposition to these views, I conceive that we shall form a juster estimate of the influence of vegetation, if we consider it as being in a slight degree conservative, and capable of retarding the waste of land, but not of acting as an antagonist power. The vegetable mould is seldom more than a few feet in thickness, and frequently does not exceed a few inches; and we by no means find that its volume is more considerable on those parts of our continents which we can prove, by geological data, to have been elevated at more ancient periods, and where, consequently, there has been the greatest time for the accumulation of vegetable matter, produced throughout successive zoological epochs. On the contrary, these higher and older regions are more frequently denuded, so as to expose the bare rock to the action of the sun and air.

We find in the torrid zone, where the growth of plants is most rank and luxurious, that accessions of matter due to their agency are by no means the most conspicuous. Indeed it is in these latitudes, where the vegetation is most active, that for reasons to be explained in the next chapter, even those superficial peat mosses are unknown which cover a large area in some parts of our temperate zone. If the operation of animal and vegetable life could restore to the general surface of the continents a portion of the elements of those disintegrated rocks, of which such enormous masses are swept down annually into the sea, the effects would long ere this have constituted one of the most striking features in the structure and composition of our continents. All the great steppes and table-lands of the world, where the action of running water is feeble, would have become the grand repositories of organic matter, accumulated without that in-

\* See Professor Sedgwick's Anniversary Address to the Geological Society, Feb. 1831, p. 24