lakes, and those which empty themselves in the gulf of Mexico, are only separated at their sources, by elevations not exceeding a few feet, and when swelled by rain, the northern and southern rivers sometimes interlock. In this plain there are no mountains. These lakes were probably formed by partial subsidences, at the epoch when the whole country was upheaved from the ocean. The efforts of elevation and depression have been described in the preceding chapter.

Transversal vallies, or those which cut through mountain ranges, nearly at right angles to the direction of the ranges they intersect, may have been originally fissures or openings, made either at the period when the ranges were elevated, or subsequently, by the same causes that have rent and displaced the secondary strata. These fissures may have been afterwards widened by the erosion of water.

Geologists seem now generally agreed, that the action of rivers is not sufficient to explain all the phenomena of valleys, and still less to account for the fragments of rocks scattered over extensive plains, at an immense distance from Alpine districts, where rocks similar to these fragments occur. Another phenomenon, of more importance, is altogether inexplicable by the action of rivers. Immense tracts of the secondary strata, several hundred feet in depth, have in some districts been torn off, and the materials entirely removed, except detached patches, which here and there form isolated caps on distant hills; and incontestably prove, that they were once parts of one continuous stratum or formation. Numerous instances of this might be cited in our own island. It is probable that the beds of chalk that form the north and south downs of Sussex, once extended over the Wealden beds. See p. 192. This local disappearance of a stratum or formation, has properly been called *Denudation*. The theory advanced by Mr. Farey, to explain these denudations, was, that the surface had been broken and swept away, by the near approach of a comet. But the most rational explanation that can be offered, is that which ascribes the effect to a mighty deluge, sweeping over the surface of the globe, tearing off part of its crust, and transporting the fragments into distant regions, or into the ocean. The case is one which may be truly said to be *dignus vindice nodus*, and the geologist is compelled to call in the aid of Neptune; for none of the causes in present activity (however we may imagine them to be increased in power or magnitude,) will be found adequate to produce the denudation of an extensive district, and the disappearance of the stony materials, by which it was covered.

The fourth theory, which attributes the formation of valleys to the sudden retreat of the sea from our present continents, is founded on the admitted fact, that the sea has once covered them; and whether we suppose that the bed of the ocean was deepened in one part by a sudden subsidence, which drew off the water from another part;