tombed in the strata, which enable us to determine their age and mode of origin, we regard them as part of the regular series of fossiliferous formations, whereas, if there are no fossils, we have frequently no power of separating them from the general mass of superficial alluvium.

The usual rarity of organic remains in beds of loose gravel is partly owing to the friction which originally ground down rocks into pebbles or sand, and organic bodies into small fragments, and it is partly owing to the porous nature of alluvium when it has emerged, which allows the free percolation through it of rain-water, and promotes the decomposition and solution of fossil remains.

It has long been a matter of common observation that most rivers are now cutting their channels through alluvial deposits of greater depth and extent than could ever have been formed by the present streams. From this fact a rash inference has sometimes been drawn, that rivers in general have grown smaller, or become less liable to be flooded than formerly. But such phenomena would be a natural result of considerable oscillations in the level of the land experienced since the existing valleys originated.

Suppose part of a continent, comprising within it a large hydrographical basin like that of the Mississippi, to subside several inches or feet in a century, as the west coast of Greenland, extending 600 miles north and south, has been sinking for three or four centuries, between the latitudes 60° and 69° N.* It will rarely happen that the rate of subsidence will be everywhere equal, and in many cases the amount of depression in the interior will regularly exceed that of the region nearer the sea. Whenever this happens, the fall of the waters flowing from the upland country will be diminished, and each tributary stream will have less power to carry its sand and sediment into the main river, and the main river less power to convey its annual burden of transported matter to the sea. All the rivers, therefore, will proceed to fill up partially their ancient channels, and, during frequent inundations, will raise their alluvial plains by new deposits. If then the same area of land be again upheaved to its former height, the fall, and consequently the velocity, of every river would begin to augment. Each of them would be less given to overflow its alluvial plain; and their power of carrying earthy matter seaward, and of scouring out and deepening their channels, will be sustained till, after a lapse of many thousand years, each of them has eroded a new channel or valley through a fluviatile formation of comparatively modern date. The surface of what was once the river-plain at the period of greatest depression, will then remain fringing the valley sides in the form of a terrace apparently flat, but in reality sloping down with the general inclination of the river. Everywhere this terrace will present cliffs of gravel and sand, facing the river. That such a series of movements has actually taken place in the main valley of the Mississippi and in its tributary valleys during

* Principles of Geology, 7th ed. p. 506, 8th ed. p. 509.