

of these have we ever seen making; but I think we have seen a process similar to rock-making in the beds of alluvial matter deposited by an overflowing stream. In traveling down the lower Mississippi, we can see from the deck of the steamer that the material of the alluvial banks is horizontally stratified. More strictly we should say that it is laminated; but the nature of the geological work is the same in either case. Now, if those alluvial banks should become firmly consolidated, they would present the appearance of some of the rocky cliffs—those in Watkins' Glen, for instance. You have also learned how large quantities of sediments borne down by rivers are carried out to sea many miles, and slowly deposited on the ocean's bottom. These deposits must necessarily be in layers, each of which is spread evenly over the bottom. You remember that the distance to which materials of a certain degree of coarseness may be carried before sinking to the bottom, depends on the velocity of the motion of the water. At a certain place in the sea the velocity is undoubtedly more rapid at one time than another. The motion is caused by winds, by tides, and by currents. Therefore, a coarser sheet of materials will be laid down at one time, and a finer sheet at another. The alternations of coarser and finer render the bedded arrangement conspicuous. Very likely the colors of the sediments will vary also; since, from one direction, they may be supplied by pulverized limestone, from another by pulverized sandstone, and from another by pulverized shale, which may be blue, red, or black. We noticed, too, in our walk under the sea, that sedimentary materials are spread over all the slope of the ocean's floor, within fifty or a hundred miles of the land—often much farther, if the shore is "shelving" or the currents are favorable.

These various indications compel us to adopt the conclusion that water has been the agent by which the materials of the stratified rocks have been spread out in broad beds or strata. But, though river overflows must leave the sediments in a bedded condition, these beds are not exactly like those seen in great formations of limestone and sandstone. River