

fications of shale and sandstone with occasional beds of coal that lie between them, and which, excepting the beds of coal, were of ordinary aqueous sediments.

This naturally leads to the question under what circumstances were the purely mechanical sediments and the beds of coal formed? The answer is, that after the close of the Carboniferous Limestone epoch in the south, the area got filled up by the sands of the Millstone Grit and the more muddy strata (now shales and sandstones) that overlie them, and this shallowing of the seas may have been aided by partial upheaval of the area, till part of it was nearly at, and at length a little above, the level of the sea. Through this flat continental land, great rivers ran, bordered by wide marshy flats, on which the vegetation grew that by its decay and death became transformed into peat. Then by gradual depression these areas were again covered with water, in the first instance salt or fresh, as the case might be, but in all cases resulting in the deposition of layers of sediment. The area was thus converted by degrees into low land, covered by vegetation, a new growth and decay took place, and it was again depressed beneath the water to receive newer sediments, and so on through a vast period of time, till, for example, all the 10,000 feet of the South Wales coal-field were accumulated, interstratified with the hundred beds of coal, great and small, that lie among the shales and sandstones; and in equal or less degree the same was the case with all the other coal-fields of England and Wales, as far north as those of Lancashire and Yorkshire.

But when we come to other Carboniferous areas, further north, the case is somewhat different. There we find, in Durham, Northumberland, and Scotland, no