

*New Red Sandstone* is so called to distinguish it from a red sandstone found among transition rocks, (See Chap. VII.) The new red sandstone is a very extensive and complex formation: its prevailing mineral character is siliceous; but it sometimes comprises calcareous beds of considerable magnitude and extent. The new red sandstone may be conveniently divided into three series, or the upper, the middle, and the lower beds; where the beds of limestone occur, they serve to mark the divisions in the series with sufficient distinctness, but where they are wanting, these divisions cannot always be observed. A limestone containing magnesia, separates the lower from the middle series, in the northern counties of England, but is wanting in the midland and western counties.

In France, a calcareous bed, called *muschel-kalk*, separates the middle series from the upper; but this has not been discovered in England. The red sandstone in England covers the lower rocks unconformably, which proves that the lower rocks were tilted up, before the strata of red sandstone here were deposited: this upheaving of the lower beds must have been attended with great convulsions, which probably supplied the sand and fragments, of which many of the beds of red sandstone are composed. Indeed, it is highly probable, that this sandstone, and the conglomerate beds in different parts of it, were formed by the violent disintegration of the older rocks, and of trap rocks, that were protruded at the era of some great convulsion, which broke down a large portion of the ancient crust of the globe, and spread the debris, far and wide, over the bed of the existing ocean. Fragments of the older rocks occur in the different beds of this sandstone, and some of the beds are formed almost entirely of such fragments. This mode of formation, would sufficiently account for the great diversity, both in the nature and thickness of the beds, in different districts. I am inclined to believe, that the disintegrating causes which broke down part of the ancient rocks, and spread their ruins over a great extent of surface, acted at successive periods of comparatively short duration, succeeded by long intervals of repose, during which the calcareous strata were deposited.

The lower red sandstone was not known as a member of the red sandstone formation in England, before Professor Sedgwick ascertained, that it formed beds of considerable magnitude below the magnesian limestone in Durham and Yorkshire. It does not, however, extend, as he supposed, to the southern termination of the magnesian limestone in Nottinghamshire; for there I have found the lowest beds of magnesian limestone resting immediately on the coal measures, and a part of the upper red sandstone covering the limestone. The lowest beds of red sandstone are, in some situations, conglomerates; in others coarse, siliceous sandstone is often much intermixed with decomposing crystals of felspar. Sometimes, it is found finer grained, and mixed with micaceous shale and reddish marl. The beds are, generally, more or less impregnated with the oxyd of