

ascertain the exact disposition of the mineral materials they afford ; but a circumstance cannot fail to have struck him during the course of his researches which opens to his view a far more extensive and interesting field of enquiry with regard to the relations of these rocks to the general revolutions of nature ; for he will have found in many of these beds spoils of the vegetable and animal kingdom imbedded, particularly the remains of marine zoophytes and shells, and often in such abundance as to constitute nearly the entire mass of particular strata. If he is led by the interest thus excited to examine more closely the phænomena attending the distribution of these remains, he will find them as remarkable in the detail as they are striking in a general point of view. In some countries he will perceive that none of these remains occur (for instance in Cornwall and the Scotch highlands), in others (as in the south-eastern counties of England) not a well can be sunk, or pit opened, without presenting them in abundance ; and pursuing the enquiry, he will arrive at the conclusion that the lowest series of rocks, which have therefore been considered as primitive, are *entirely destitute of those remains*.\* That the next contains them sparingly, while they abound in the three succeeding series, although not without the occasional interposition of beds in

tions, form what the Wernerians call formation suites. We may mention 1st, the limestone suite ; this exhibits, in the inferior or primitive order, crystalline marbles ; in the two next, or transition and carboniferous orders, compact and subcrystalline limestones (Derbyshire limestone) ; in the supermedial or flötz order, less compact limestone (lias), calcareous freestone (Portland and Bath stone), and chalk ; in the superior or newest flötz order, loose earthy limestones

2d. The argillaceous suite presents the following gradations ; clay-slate, shale of the coal-measures, shale of the lias, clays alternating in the oolite series, and that of the sand beneath the chalk ; and lastly, clays above the chalk.

3. The siliceous suite may (since many of the sandstones of which it consists present evident traces of felspar and abundance of mica, as well as grains of quartz, and since mica is more or less present in every bed of sand) perhaps deserve to have granite placed at its head, as its several members may possibly have been derived from the detritus of that rock ; it may be continued thus ; quartz rock and transition sandstone, old red sandstone, millstone-grit and coal-grits, new red sandstone, sand and sandstone beneath the chalk, sand above the chalk. In all these instances a regular diminution in the degree of consolidation may be perceived in ascending the series.

\* Some appearances of organic remains have indeed been said to have been observed among primitive rocks, but they may very possibly have been deceptive ; the only observation of this kind which requires notice is one of Dr. Mac Culloch's ; that most accurate geologist describes a bed of gryphite limestone as underlying gneiss in one of the Hebrides ; but when the extreme contortions of the strata of gneiss, as figured by himself, are