

posed to view the succession of the different rocks and strata in many parts of our island, and has enabled us to obtain a correct knowledge of their thickness and direction, and of the organic remains peculiar to each series.

Before concluding the present chapter, let us take a view of some of the more striking appearances, which afford demonstrative evidence, that great changes have taken place in the relative level of the present continents, and that the ocean has, in former ages, rolled its waves over what are now the most elevated parts of the earth. Many proofs of this exist in our own island, and in various parts of the world.

The calcareous or limestone mountains in Derbyshire, and Craven in Yorkshire, rise to the height of about two thousand feet above the present level of the sea. They contain through their whole extent, fossil remains of zoophytes and marine animals, but more abundantly in some parts than in others. Particular species occupy almost exclusively distinct beds, and in some situations the whole mass appears a compact congeries of mineralised organic remains. Over these vast beds of ancient limestone occur a series of sandstone strata and shale, containing, almost exclusively, remains of terrestrial vegetables associated with beds of coal. Above this series we meet with other calcareous strata, containing remains of fish and enormous reptiles of the saurian or lizard tribe, intermixed with numerous species of bivalve and univalve shells, but of different genera or species from those living in the present seas. Again, in the uppermost or tertiary strata, we meet with bones and teeth of land quadrupeds of the class Mammalia, some of which belong to unknown genera, and nearly all to unknown species. Among these are the bones of large animals as the mastodon, the elephant, the rhinoceros, the hippopotamus, and the gigantic tapir. These large animal remains occur chiefly in beds of clay or gravel, or in caves. In the latter situation, they are abundantly mixed with bones of smaller quadrupeds, of which the species no longer exist in England.

The calcareous mountains of the Jura, and the outer range of the Alps, contain beds filled with the remains of marine animals, many of which I have examined, and found to be similar to those in the secondary strata in England. In the Alps they occur at the height of from six to eight thousand feet. Similar phenomena are observed in the calcareous mountains of the Pyrenees; and according to Humboldt, organic remains occur in the Andes, at the height of fourteen thousand feet. The distinct characters of the animals found in the upper and lower beds in these mountains, as well as in those of our own country, prove that they were not brought into their present situation by any sudden inundations, which would have mixed different orders of animals together. The beds which contain, exclusively, the remains of animals of the same species must have remained, for ages, under the ocean; for these animal remains often