

compact limestone, very hard and tenacious, and distinctly stratified; over this is a cellular limestone; and above this, a blackish brown limestone, which yields a foetid smell when struck with a hammer, and is in some places more than one hundred feet in thickness. All these different beds Humboldt comprises under the name of zechstein, and agrees with other geologists in referring them to our magnesian limestone; the lowest bed rests on the red sandstone, and sometimes alternates with it: but according to some geologists, the connection between the two formations of red sandstone and zechstein is such, that the latter may be regarded as a subordinate formation to the former. The upper beds of what has been called zechstein alternate in Switzerland with beds of gypsum, which is intermixed with rock-salt: some of the beds are argillaceous limestone, containing ammonites and belemnites, and appeared to me to have a greater resemblance to lias, than to magnesian limestone.

In the lower part of the magnesian limestone in the West of England, there is a conglomerate limestone, which contains fragments of transition limestone, varying in size from several inches in diameter, to very minute grains.

The fossils in magnesian limestone are not numerous, at least in the upper beds. Fossil fish have been found in some of the lower beds in the county of Durham. One or two species of univalves, and about nine species of bivalves, occur in this limestone; but these shells are extremely rare, except in one or two situations. Some of the shells, the *productus* and *spirifer*, nearly resemble those in the mountain limestone, to which the magnesian limestone appears to bear a greater analogy, than to any of the secondary strata above it.

Magnesian limestone furnishes the most durable building stone that is any where found in the upper secondary strata.

I do not agree in opinion with those who regard the magnesian limestone districts as unfertile; and perhaps no parts of England are more salubrious, than those which have a subsoil of this limestone.

A few small strings of lead ore have been found in the magnesian limestone rocks near Sunderland. The limestone rocks on the coast of Durham are wearing away by the violence of the ocean: they have evidently extended much further to the east than at present.

It has already been stated, that beside magnesian limestone, gypsum and rock salt are associated with the new red marl and sandstone. Neither of these minerals is however confined to this formation. Salt springs rise in many of the coal strata, and gypsum and rock-salt are found both in the upper, secondary, and the tertiary beds; but the repositories of these minerals are more characteristic of the new red sandstone, and may therefore, with propriety, be described in the present chapter.

Gypsum, both fibrous and massive, occurs in the new red marl and sandstone: the fibrous gypsum forms numerous alternating seams in cliffs of red marl: the seams vary in thickness, from one to