

## CHAPTER XXIV.

## THE COAL, OR CARBONIFEROUS GROUP.

Carboniferous strata in the southwest of England—Superposition of Coal-measures to Mountain limestone—Departure from this type in North of England and Scotland—Carboniferous series in Ireland—Sections in South Wales—Underclays with *Stigmariæ*—Carboniferous Flora—Ferns, *Lepidodendron*, *Equisetaceæ*, *Calamites*, *Asterophyllites*, *Sigillariæ*, *Stigmariæ*—*Coniferæ*—*Sternbergia*—*Trigonocarpon*—Grade of *Coniferæ* in the Vegetable Kingdom—Absence of *Angiosperms*—Coal, how formed—Erect fossil trees—Parkfield Colliery—St. Etienne Coal-field—Oblique trees or snags—Fossil forests in Nova Scotia—Rain-prints—Purity of the Coal explained—Time required for the accumulation of the Coal-measures—Brackish-water and marine strata—Crustaceans of the Coal—Origin of Clay-iron-stone.

The next group which we meet with in the descending order is the Carboniferous, commonly called "The Coal;" because it contains many beds of that mineral, in a more or less pure state, interstratified with sandstones, shales, and limestones. The coal itself, even in Great Britain and Belgium, where it is most abundant, constitutes but an insignificant portion of the whole mass. In the north of England, for example, the thickness of the coal-bearing strata has been estimated by Professor Phillips at 3000 feet, while the various coal-seams, 20 or 30 in number, do not in the aggregate exceed 60 feet.

The carboniferous formation assumes various characters in different parts even of the British Islands. It usually comprises two very distinct members; 1st, that usually called the Coal-measures, of mixed freshwater, terrestrial, and marine origin, often including seams of coal; 2dly, that named in England the Mountain or Carboniferous Limestone, of purely marine origin, and containing corals, shells, and encrinites.

In the Southwestern part of our island, in Somersetshire and South Wales, the three divisions usually spoken of by English geologists are:

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| 1. Coal-measures                        | { | Strata of shale, sandstone, and grit, with occasional seams of coal, from 600 to 12,000 feet thick.   |
| 2. Millstone-grit                       | { | A coarse quartzose sandstone passing into a conglomerate, sometimes used for millstones, with beds of shale; usually devoid of coal; occasionally above 600 feet thick. |
| 3. Mountain or Carboniferous limestone. | { | A calcareous rock containing marine shells and corals; devoid of coal; thickness variable, sometimes 900 feet.  |

The millstone-grit may be considered as one of the coal-sandstones of coarser texture than usual, with some accompanying shales, in which coal-plants are occasionally found. In the north of England some bands