

CARBONIFEROUS OR MOUNTAIN LIMESTONE.

It has been already stated (p. 359), that this formation underlies the Coal-Measures in the South of England and Wales, whereas in the North and in Scotland marine limestones alternate with Coal-Measures, or with shales and sandstones, sometimes containing seams of Coal. In its most calcareous form the Mountain Limestone is destitute of land-plants, and is loaded with marine remains,—the greater part, indeed, of the rock being made up bodily of corals and crinoids.

The Corals deserve especial notice, as the cup-shaped kinds, which have the most massive and stony skeletons, display peculiarities of structure by which they may be distinguished, as MM. Milne Edwards and Haime first pointed out, from all species found in strata newer than the Permian. There is, in short, an ancient or *Paleozoic*, and a modern or *Neozoic* type, if, by the latter term, we designate (as proposed by Prof. E. Forbes) all strata from the triassic to the most modern, inclusive. The accompanying diagrams (figs. 514, 515) may illustrate these types; and, although it may not always be easy for any but a practised naturalist to

Fig. 514.

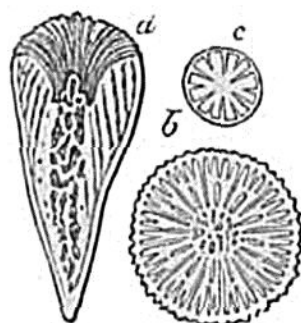
Paleozoic type of lamelliferous cup-shaped Coral. Order ZOANTHARIA RUGOSA, Milne Edwards and Jules Haime.



- a. Vertical section of *Campophyllum flexuosum* (*Cyathophyllum*, Goldfuss); $\frac{1}{2}$ nat. size: from the Devonian of the Eifel. The lamellae are seen around the inside of the cup; the walls consist of cellular tissue; and large transverse plates, called *tabulae*, divide the interior into chambers.
- b. Arrangement of the lamellae in *Polycalia profunda*, Gernar, sp.; nat. size: from the Magnesian Limestone, Durham. This diagram shows the quadripartite arrangement of the lamellae characteristic of paleozoic corals, there being four principal and eight intermediate lamellae, the whole number in this type being always a multiple of four.
- c. *Stauria astraeiformis*, Milne Edwards. Young group, nat. size. Upper Silurian, Gothland. The lamellae in each cup are divided by four prominent ridges into four groups.

Fig. 515.

Neozoic type of lamelliferous cup-shaped Coral. Order ZOANTHARIA APOROSA, M. Edwards and J. Haime.



- a. *Parasmilia centralis*, Mantell, sp. Vertical section, nat. size. Upper Chalk, Gravesend. In this type the lamellae are massive, and extend to the axis of loose cellular tissue, without any transverse plates like those in fig. 514 a.
- b. *Cyathina Bowerbankii*, Edwards and Haime. Transverse section, enlarged. Gault, Folkstone. In this coral the lamellae are a multiple of six. The twelve principal plates reach the central axis or columella, and between each pair there are three secondary plates, in all forty-eight. The short intermediate plates which proceed from the columella are not counted. They are called *pali*.
- c. *Fungia patellaria*, Lamk. Recent: very young state. Diagram of its six principal and six intermediate septa, magnified. The sextuple arrangement is always more manifest in the young than in the adult state.

recognize the points of structure here described, every geologist should understand them, as the reality of the distinction is of no small theoretical interest.