later date. It is most generally regarded as belonging to the Heteropoda, and allied to the Glass-Shell, Carinaria; but by some few it is thought to be a simple form of Cephalopod.

The carboniferous Cephalopoda do not depart so widely from the living type (the Nautilus), as do the more ancient Silurian representatives of the same order; yet they offer some remarkable forms scarcely known in strata newer than the coal. Among these is Orthoceras, a siphuncled and chambered shell, like a Nautilus uncoiled and straightened (fig. 529). Some species of this genus are several feet long. The Goniatite is another

Fig. 529.

Portion of Orthoceras laterale, Philips. Mountain Limestone.

genus, nearly allied to the Ammonite, from which it differs in having the lobes of the septa free from lateral denticulations, or crenatures; so that the outline of these is continuous and uninterrupted.

The species represented in fig. 530 is found in almost all localities, and presents the zigzag character of the septal lobes in perfection.

In another species (fig. 531), the septa are but slightly waved, and sc approach nearer to the form of those of the Nautilus. The dorsal position

Fig. 530.



Gonialites crenistria, Phill. Mountain Limestone. N. America; Britain; Germany, &c. a. Lateral view. b. Front view, showing the mouth. Fig. 531.

Goniatites evolutus, Phillips. Mountain Limestone. Yorkshire.

of the siphuncle, however, clearly distinguishes the Goniatite from the Nautilus, and proves it to have belonged to the family of the Ammonites, from which, indeed, some authors do not believe it to be generically distinct.

Fossil fish.—The distribution of these is singularly partial; so much so, that M. de Koninck of Liege, the eminent paleontologist, once stated to me that, in making his extensive collection of the fossils of the Mountain Limestone of Belgium, he had found no more than four or five examples of the bones or teeth of fishes. Judging from Belgian data, he might have concluded that this class of vertebrata was of extreme rarity in the carboniferous seas; whereas the investigation of other countries has led to quite a different result. Thus, near Clifton, on the Avon,

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