

have nearly equilateral shells. A depression or "sinus" frequently occurs down the centre of one valve, and a corresponding projection or "mesial fold" down the centre of the other. The sinus is almost invariably on the ventral, and the fold on the dorsal valve. The pointed upper extremity of the valve, is technically known as the "beak." In some forms the valves are close together; but in others, a closed space (often striated across) occurs between the two. This is called the "area." See Fig. 88 and accompanying explanation. In the centre of the area, or under the beak of the ventral valve, there is frequently (as in the *spirifers*, &c.,) a triangular or circular orifice, the "foramen." This opening, in the species which possessed it, served for the passage of the pedicel by which the animal was attached to the sea-bottom. The foramen is situated, at other times, upon, or near to, the ventral beak, as in *spirigera*, &c. In many species again, it appears to have become closed by age; and in others, it is altogether absent. The line of junction between the upper part of the valves is termed the hinge-line. It is straight in some genera, (*Orthis*, *Strophomena*, *Spirifer*, for example,) and arched or curved in others. (*Athyris*, *Rhynchonella*, *Pentamerus*, *Terebratula*, etc.) In many brachiopods, the shell is traversed by minute pores or tubular prolongations. When this is the case, the shell is said to be "punctate;" and when the pores are absent, it is termed "impunctate."

The brachiopods possess, as their chief characteristic, a pair of long fleshy "arms," covered with delicate cilia, and either entirely confined in a coil within the shell, or capable of protrusion to a certain extent. In some genera, the inside of the dorsal valve carries peculiar spiral processes, or a shelly loop or other calcareous framework, for the support of these arms. A support of this kind is however wanting in many genera, or is otherwise merely rudimentary. The brachiopods differ essentially from the lamellibranchiate bivalves in the non-possession of distinct branchiæ or breathing gills. In existing seas the brachiopods are comparatively rare, the number of known species



Fig. 88.*

* D=dorsal valve. V=ventral valve. a, area; b, beak of ventral valve; f, foramen; h-h, the hinge line; m, position of mesial fold; s, position of mesial sinus.