

remain altogether undeveloped. The apical system consists of a dorsocentral plate, basals, and radials, with the frequent addition of under-basals and interradials. These plates form a cup, which either simply supports, or more or less completely encloses the visceral mass, and often bears jointed appendages, the arms and pinnules.

An oral system, consisting of a central plate (orocentral) and five orals is developed above the peristome of the larva to a very variable extent, and may be either altogether resorbed, or reach a high degree of importance by the appearance of additional plates so as to form a vault or "*tegmen calycis*." The anus is situated on the oral surface, which may be bare, or more or less covered by calcareous plates. The water-vascular ring does not communicate directly with the exterior, and the lateral branches of the radial vessels (when present) are respiratory, but not locomotor in function.

### Class 1. CRINOIDEA, Miller, 1821.

*Crinoidea*, Auctorum.

*Stilasteritæ*, Goldfuss, 1826-1835.

*Asterencrinidea*, de Blainville, 1834.

*Pinnigrada*, Forbes, 1841.

*Pinnastella*, Austin, 1842.

*Brachiata*, Burmeister, 1856.

*Actinoidea*, Roemer, 1856 (Date of Preface).

*Encrinida*, Quenstedt, 1876 (Date of Preface).

*Eucrinoidea*, Zittel, 1880 (Date of Preface).

*Definition*.—Pelmatozoa, in which the radial plates of the calyx bear more or less branching arms. These consist of segments which are articulated by means of muscles and ligaments, and in most cases bear similar jointed appendages, the pinnules. The nervous system consists (1) of a central organ situated in the calyx, and fibres extending from it through the skeleton of the stem, arms, and pinnules; (2) of a circum-oral ring and radial extensions which are in close relation with the ciliated epithelium of the ambulacral grooves. These are more or less extensively distributed on the ventral surface of the disk, arms, and pinnules; and are bordered by groups of tentacles which alternate on opposite sides. When they are absent, the radial water-vessels give off no tentacular branches. The water-vascular ring opens by five or more water-tubes into the body-cavity, which itself communicates with the exterior by a corresponding number of water-pores. The mouth is central, except in one genus, and the anus subcentral or excentric. The genital glands are lodged in the lower parts of the arms, but are usually fertile only in the pinnules.

*Remarks*.—Various writers have attempted at different times to separate the Crinoids and their allies from the remaining classes of the Echinoderms by somewhat more definite characters than those which distinguish these various classes *inter se*. Very little was