tubes, each a *prosodus* or *aditus* (fig. 8). This may be termed the *aphodal* or *racemose* type of Rhagon system, since the chambers at the ends of the aphodi radiating from the excurrent canal look like grapes on a bunch. As Haeckel, however, has used “racemose” in a different sense, we shall adopt here the alternative term. By the exten­sion of the prosodal or adital canals into long tubes a still higher differentiation is reached (fig. 9). This, which from the marked presence of both prosodal and aphodal canals may be termed the *diplodal* type of the Rhagon canal system, occurs but rarely. *Chondrosia* is an example.

The following scheme will render clear the foregoing distinctions :—

1. Ascon type : simple, ex. *Ascetta,* Hk. ; strobiloid, ex. *Homo­*

*derma,* Lfd.

2. Sycon type : simple radial tubes, ex. *Sycetta,* Hk. ; branched

radial tubes (cylindrical chambers), ex. *Heteropegma,* Fl. ; chamber-layer folded, ex. *Polejna,* Pol.

3. Rhagon type : eurypylous, with several prosopyles to each

chamber, ex. *Spοngelia ;* with a single prosopyle to each chamber, ex. *Oscarella, Thenea* ; aphodal, aphodal canals well developed, ex. *Geodia,* Lmk. ; diplodal, with both aphodal and prosodal canals well developed, ex. *Chondrosia,* O.S.

In the case of the calcareous sponges Polejaeff has argued forcibly that the eurypylous type arises directly from the Sycon and not from the Rhagon. It is therefore doubtful how far the Rhagon in other sponges is a primitive form derived directly from an *Olynthus,* or whether it may not be a secondary larval state resulting from the abbreviated development of a former Sycon predecessor. Whatever may have been its past history, the Rhagon serves now at all events as a starting-point for the development of the higher forms of canal system.

In the higher Rhagons, as in the Sycons, further com­plications ensue, owing to an independent growth of the external ectoderm and the adjacent mesoderm. While the endoderm, with its associated mesoderm, is growing out or folding to form the excurrent canal system, the super­ficial mesoderm increases in thickness, and the ectoderm, extending laterally from the sides of the incurrent sinuses, burrows into it, parallel to the surface of the sponge. Thus it forms beneath the skin (*i.e*., the layer of superficial mesoderm and investing ectoderm) cavities which may be either simple and spacious or be broken up into a number of labyrinthine passages by a network of mesoblastic strands (invested with ectoderm) which extend irregularly from roof to floor of the chamber. These cavities are known as *subdermal chambers.*

With the appearance of subdermal chambers the sponge becomes differentiated into two almost independent regions, an outer or *ectosome* and an inner or *choanosome,* which is characterized by the presence of flagellated chambers. The ectosome forms the roof and walls of the subdermal chambers, and is in its simplest form merely an investing skin ; but in a large number of sponges it acquires con­siderable thickness and a very complicated histological structure. It is then known as a *cortex.* The thickening which gives rise to a cortex takes place chiefly beneath those parts of the skin which are not furnished with pores. Beneath the pores—in this case collected into sieve-like areas—dome-like cavities are left in the cortex ; they open freely into the subdermal cavities below and their roof is formed by the cribriform pore membrane above. In many sponges *(Geodia, Stelletta)* the cortical domes are constricted near their communication with the subdermal cavity (sub­cortical crypt) by a transverse muscular sphincter, which defines an outer division or *ectochone* from an inner or *endochone* (fig. 10), the whole structure being a *chone.* The endochone is frequently absent (fig. 10). The early development of the cortex has scarcely yet been studied. In *Stelletta phrissens* (Soll.), one of the “ Challenger ” *Stel*­

*lettidæ,* an early form of the sponge (fig. ll), shows the choanosome already characteristically folded within the cortex, which forms a com­

plete not-folded envelope

around it. The roots of

the incurrent sinuses form

widely open spaces imme­

diately beneath the cortex

and are the rudiments of

subcortical crypts. Again,

in some sponges a part of

the endoderm and asso­

ciated mesoderm may like­

wise develop independ­

ently of the rest of the

sponge, as in the *Hexac*­

*tinellida,* where the choa­

nosome forms a middle

layer between a reticulation

of ectosome on the

one side and of endoderm

and mesoderm, *i.e*., *endo­*

*some,* on the other. Fin­

ally, the attached or lower

half of a Rhagon may de­

velop in an altogether dif­

ferent manner from the

other or upper half, the

endoderm not producing

any flagellated chambers. In this case the upper portion alone is characterized by the flagellated chambers, which are the distinctive mark of a sponge, and hence may be

called the *spongomere* ; the lower half, which consists of all three fundamental layers, may be called the *hypomere.*

The form and general composition of sponges are ex­ceedingly various and often difficult to analyse, presenting, along with some important differences, a remarkable general resemblance to the *Cœlentera* in these respects. Like them, some sponges are simple, and others, through asexual multiplication, compound. The only criterion by which the individual sponge can be recognized is the oscu­lum ; and, as it is frequently difficult, and in many cases impossible, to distinguish this from the gastric opening of a large excurrent canal, there are many cases in which the simple or compound nature of the sponge must remain open to doubt. The oscule may also fail *(lipostomosis),* and so may the paragastric cavity *(fipogastrosis) ;* the problem then becomes insoluble. The loss of the oscule