of the *Ascetta,* as of all sponges, is most obviously mani­fested, as Grant (*5*) first observed, by a rapid outflow of water from the oscule and a gentle instreaming through the pores,—a movement brought about by the energetic action of the flagella of the

endodermic cells. The in­

streaming currents bear with

them into the cavity of the

sac (paragastric cavity) both

protoplasmic particles (such as

*Infusoria,* diatoms, and other

small organisms) and dissolved

oxygen, which are ingested by

the flagellated cells of the en­

doderm. The presence of one

or more contractile vacuoles in

these cells suggests that they

extricate water, urea, and car­

bonic acid. The insoluble re­

sidue of the introduced food,

together with the fluid excreta,

is carried out through the os­

cule by the excurrent water.

New individuals are produced

from the union of ova and

spermatozoa, which develop

from wandering amoeboid cells

in the mesoderm. The walls

of *Ascetta* are strengthened by

calcareous scleres, more especi­

ally designated as spicules,

which have the form of tri-

radiate needles. If we make

abstraction of these we obtain an ideal sponge, which Haeckel has called *Olynthus (6),* and which may be re­garded as the ancestral form from which all other sponges have been derived. To give greater exactness to our ab­straction we should perhaps stipulate for the *Olynthus* a somewhat thicker mesoderm and more spherical form than a decalcified Ascon presents.

*Canal System.—*We shall now trace the several modifi­cations which the *Olynthus* has undergone as expressed in the different types of canal system.

The simple paragaster of *Ascetta* may become compli­cated in a variety of ways, such as by the budding off from a parent form of stolon-like extensions, which then give rise to fresh individuals, or by the branching of the Ascon sac and the subsequent anastomosis of the branches ; but in no case, so long as the sponge remains within the Ascon type, does the endoderm become differentiated into different histological elements. The most interesting modification of the Ascon form occurs in *Homoderma sy­candra* (*12*), in which from the walls of a simple Ascon cæcal processes grow out radiately in close regular whorls, each process reproducing the structure of the parent sponge (figs. 2, 3). From this it is but a short step to the important departure which gives rise to the Sycons.

In the simplest examples of this type the characters of *Homoderma sycandra* are reproduced, with the important exception that the endoderm lining the paragastric cavity of the original Ascon form loses its primitive character,

and from a layer of flagellated cells becomes converted into a pavement epithelium, not in any distinguishable feature different from that of the ectoderm. The flagellated cells are thus restricted to the cæcal outgrowths or radial tubes. Concurrently with this differentiation of the endoderm a more abun­dant development of mesoderm occurs. In some Sycons *(Sycaltis,* Hk.) the radial tubes remain separate and free; in others they lie close together and are united by trabeculæ, or by a trabecular network, consisting of mesodermic strands sur­rounded by ectoderm (fig. 4). The spaces between the contiguous radial tubes thus become converted into narrow canals, through which water passes from the exterior to enter the pores in the walls of the radial tubes. These canals are the “ inter­canals ” of Haeckel, now generally known by their older name of *incurrent* canals. The openings of the incurrent canals to the exterior are called pores, a term which we have also applied to the openings which lead directly into the radial tubes or paragastric cavity ; to avoid ambiguity we shall for the future distinguish the latter kind of open­ing as a *prosopyle.* The term “pore” will then be restricted to the sense in which it was originally used by

Grant. The mouth by which a radial tube opens into the paragaster is known as a *gastric ostium.* In the higher forms of Sycons the radial tubes no longer arise as simple out­growths of the whole sponge-wall, but rather as outgrowths