life in this way, but soon outgrows the housing capacity of its host, whose shell then serves merely as a base of attachment for the large independent sponge-colony.

One of the most striking features of living sponges is their colour, which is often very brilliant. Yellow, red, orange, purple, brown, black, green and blue are all met with, in varying degrees of purity and intensity, amongst the commoner Non-calcarea; whilst the calcareous sponges are usually white. It appears probable that the colour is more or less constant for each species, and may therefore afford a useful guide to specific identification. As a rule the colour is lost in spirit-preserved or dry specimens, but a noteworthy exception is found in the brilliant purple *Suberites wilsoni* of Port Phillip, in which the colour, though soluble in water, is permanent in dry specimens and in alcohol. The colouring matter is some­times lodged in special pigment cells belonging to the sponge itself, and sometimes in symbiotic algae, with which the mesogloea is frequently filled.

*Canal-system.—*Whether we start with the primitive Olynth us form of the Calcarea or with the more advanced Rhagon of many Non-calcarea, it is evident that further advance in the complication of the canal-system is arrived at either by budding or folding, or by a combination of these processes. As, however, the canal- systems of the calcareous and of the main types of non-calcareous sponges have been evolved along perfectly independent lines it will be well to consider them separately.

In the genus *Leucosolenia* (Calcarea Homocoela) the primitive Olynthus form may, as we have already seen, give rise, by branching and anastomosing, to complex reticulate colonies of the Clathrina type, in which a pseudoderm, pierced by inhalant pores, may cover over a system of inhalant canals which are simply the inter­spaces between the branching tubes of which the colony is made up, while at the same time a centrally placed pseudogaster, which is simply a space enclosed by upgrowth of the colony around it, may form the main exhalant canal and open to the exterior through a well-defined vent or pseudosculum. In this direction perhaps the most remarkable modification arrived at is that of *Leucosolenia cavata,*in which the Clathrína tubes, lined by collared cells, widen out into large irregular spaces, while the inhalant interspaces become con­stricted into narrow canals lined by collared cells on the *outside.* We have here a kind of inversion of the ordinary Clathrína canal- system, but a perfectly gradual transition from the ordinary to the inverted condition is seen as we pass from the older to the younger parts of the colony.

In *Leucosolenia (Dendya) tri- podifera* (fig. 13) we find a totally different type of colony formation, which is of great importance as indicating in its canal-system the possible starting-point of a line of evolution which culminates in the highest Calcarea. Here a large central individual, whose spacious gastral cavity is lined by collared cells, gives off radial buds from all sides, which branch slightly and terminate in blind ends in contact with one another, so that the entire colony has an approximately even surface. The inhalant canals are represented by the interspaces between the radial tubes, between the blind extremi­ties of which the water finds its way in from the outside. There is only a single vent, situate at the extremity of the central cavity. This cavity must be regarded as the original gastral cavity of a parent Olynthus, from which the radial tubes have been produced by budding.

’ We have next, amongst the Calcarea Heterocoela, the Sycon type of canal-system which differs from the foregoing in that the collared cells of the central gastral cavity are replaced by pavement-epithelium. The radial tubes now form definite flagellated chambers, pierced as before by numerous prosopyles through which the water enters from the spaces between the chambers, while the original gastral cavity forms a central exhalant canal terminating in the single vent, a true osculum, corresponding to the osculum of an Olynthus. In the simplest Syconoid forms *(Sycetta)* the radial chambers remain perfectly straight and unbranched. They do not touch one another at all and there is no trace of an ectosome or dermal cortex, and hence there are no true inhalant canals, and the water circulates without interruption between the chambers. In the genus *Sycon* (fig. 14) the walls of adjacent chambers come into contact with one another and fuse together and thus give rise to more or less well-defined inhalant “inter-canals.” The chambers themselves may branch, and in some species of *Sycon* a thin, pore-bearing dermal membrane connects to­gether their distal extremities and covers over the entrances to the inhalant canals. The canal-system now exhibits all the different parts found in the most highly-organized sponges: viz. dermal pores, inhalant canals, flagellated chambers, exhalant canal and osculum. In the genus *Grantia* and its allies *(e.g. Ute,* fig. 15) the thin dermal membrane of *Sycon* is converted into a well-developed cortex, cover­ing the extremities of both the. inhalant canals and the radial chambers, and some­times containing a system of special cortical inhalant canals. We may now dis­tinguish between an ectosome (the dermal cortex), which contains no flagellate cham­bers, and a choanosome in which chambers are present. The next stage has probably been arrived at by a kind of fold­ing of the choanosome, for we find the chambers arranged radially, not around the central gastral cavity but around diverticula of the latter which form special exhalant canals. This condition, sometimes called the “ sylleibid ” type, is not characteristic of any particular genus or family, but occurs in a few isolated species, such as *Leucilia connexiva* (fig. 16). A somewhat similar condition may be arrived at by branching of the radial flagellated chambers, as in *Heteropegma* (fig. 17). The next stage is marked by great reduction in the size of the chambers, which may become almost spherical, and by further folding of the choanosome, so that in a section of the sponge-wall we see the small chambers scattered irregularly in the mesogloea between the numer­ous branches of complicated inhalant and exhalant canals. Each