which give rise to the ova and spermatozoa, and also various other cells which are now generally believed to migrate into it from the primitive pavement epithelium (dermal epithelium) of the outer surface, such as scleroblasts, various connective tissue elements and contractile fibres.

*Pavement Epithelium* (fig. 34·1).—This always consists of a single layer of polygonal cells, which are usually flat and very rarely *(Oscarella)* provided with cilia or flagella. They may be glandular and may secrete a definite cuticle (as in many Euceratosa). They may also be highly contractile.

*Porocytes.—*In certain Calcareous sponges *(Leucosolenia)* it has been shown (by E. A. M inchin) that the primitive inhalant pores (prosopyles) arc formed as perforations in certain of the pavement epithelium cells, which acquire a tubular form and extend through the mesogloea from the dermal to the gastral surface. The outer portion of\*each porocyte forms a contractile diaphragm which doubtless regulates the admission of water to the gastral cavity. The porocytes are sometimes conspicuous on account of their highly granular character.

*Scleroblasts.—*We may distinguish three kinds of scleroblasts, according to the chemical character of the skeletal material which they secrete; these are *calcoblasts, silicoblasts* and *spongoblasts.* The calcoblasts and silicoblasts (fig. 35, *h—n).* form their respective spicules, at any rate in the first instance, as intra-cellular (perhaps sometimes intra-syncytial) secretions, though we must suppose

that in the case of large spicules the later stages in growth are accomplished by the activity of several or many scleroblasts in co-operation. The spongoblasts (fig. 7) appear to co-operate with one another in the formation of the spongin fibre from the beginning. They are found only around the young, growing fibres, where they occur in large numbers, forming a kind of sheath of somewhat flask-shaped cells, each placed at right angles to the surface of the fibre and with the nucleus in its broad distal end. The spongin is secreted in concentric lamellae and is obviously intercellular in origin, and probably of the same nature as the cuticle which often occurs on the surface of the sponge.

*Connective-tissue Elements.—*The following arc the chief forms assumed by the mesogloea according to the nature of its connective-tissue cells and intercellular substance, (*a*) *Collenchyme,* consisting of a clear gelatinous matrix with branching stellate *collencytes* (fig. 35, *a)* embedded in it; *(b) Sarcenchyme,* in which the quantity of intercellular matrix is greatly reduced and the connective-tissue cells are closely packed together; (*c*) *Cystenchyme* (fig. 7, *Coll*, fig. 35, *c*), consisting of close-packed, oval, vesicular cells with fluid contents and strands of protoplasm radiating from the nucleus to the periphery; (*d*) *Chondτenchyme* (fig. 35, *b),* somewhat resembling cartilage in texture and with a very large amount of intercellular matrix.

The name *desmacytes* has been given to certain slender connective-tissue fibres (fig. 35, *d)* often united in dense bundles or layers, which occur especially in the ectosome of many Tetraxonida, giving rise to a fibrous cortex of leathery consistence.

*Contractile Fibres.—*Muscular fibres or *myocytes.* (fig. 35, *e)* are of common occurrence, especially in relation to various parts of the canal-system, the diameter of which appears to be regulated by their agency. They may form definite sphincters around the vents or in other places (fig. 34, 2), or they may form transverse bands lying in the floor of pore-bearing grooves, by the contraction of which the lips of the groove are doubtless approximated and the in­current stream of water shut off *(Esperella murrayi, Xenospongia patelliformis).*

*Endothelial Cells.—*In many sponges the developing embryos are enclosed in definite capsules composed of flattened polygonal cells, the whole being embedded in the mesogloea. The origin of the endothelial cells forming the capsules is doubtful. They sometimes aid in the nutrition of the developing embryo (*e.g*. in *Stelospongus flabelliformis).*

No nervous elements, nor sensory cells of any kind, have as yet been recognized with any degree of certainty in sponges, in spite of various heroic attempts to demonstrate their existence.

*Collared Cells or Choanocytes* (fig. 35, *g)*.—These are quite the most characteristic histological elements met with in sponges.. Although exhibiting various minor differences in structure., and still more as regards size, they always show the same essential features. Each consists usually of an oval or rounded body (frequently appearing polygonal from the pressure of its fellows) surmounted by a more or less cylindrical or funnel-shaped collar, which surrounds a single long, whip-like flagellum projecting from the apex of the cell. The collar is a filmy, transparent ex­tension of the cytoplasm (cell - protoplasm), which can be completely with­drawn. The flagellum may also be withdrawn, and in preserved specimens nei­ther collar nor flagellum is usually visible. The cell is usually broadest at the base and narrowed to form a neck or “ collum," beneath h the collar. the nucleus may be situatcd either at the base or at the apex of the cell-body or between the two. the collar itself is often a more complicated structure than appears at first sight. It may be provided with one or two transverse hoops, presumably serving to stiffen it *(Ascandra falcata).* In many cases the collars of adjacent choanocytes have been observed to be connected by a definite membrane which stretches from one to the other at the level of their margins. This is known as *Sollas's membrane,* but it is apparently not a permanent structure, and the circumstances under which it appears require elucidation. In the Hexactinellida the form of the collared cells appears to be somewhat unusual (fig. 36).

*Archaeocytes*.—The term "archaeocytes ” has been applied to certain undifferentiated amoeboid cells which make their appearance at an extremely early stage in the ontogeny, and some of which persist throughout life, with little, if any, modification, as the *amoeoocytes* of the adult sponge, while others become germ-cells, differ­entiated into ova and spermatozoa.