

it ceases to be independent. This feature of the life of the mesoblast, however, more properly belongs to another chapter, in which it will be shown, that the once free cell may finally be recognized as entering bodily, but not in its present entity, into the formation of the embryo.

We now proceed to consider the origin of the crystalloid entoblasts, of which we have already so often spoken in connection with the mesoblast.

*Formation of the Entoblast.*¹ In the same egg in which a mesoblast first appears, the entoblasts also begin to develop, but singly at first (Pl. 8, fig. 23b, *a, b, 25, d*). Their number very rarely amounts to more than two or three in each mesoblast, (Pl. 8, fig. 23d, *e, j, l*, fig. 25, *a*.) until the egg is from one eighth to one sixth of an inch in diameter. Casting the eye over the field of the microscope, there may be seen here and there a few of the minuter cells, containing mesoblasts, which are rendered more conspicuous by the presence of a dark dot in the centre of each (Pl. 8, fig. 23b, *a, b, 23d, d, f, g*; Pl. 9, fig. 3a, 6a, *n, o, p*): this dot is the nascent entoblast. Unlike the faint looming up of the mesoblast, the entoblast, minute as it may be in its incipient state, shows itself clearly and well defined, and usually with an irregular angular outline. The central orientation of this body, and its fac-simile repetition, in the same focus of centripetal influence, have been noticed before as a remarkable and unusual feature in concentric cell development; and now we would, in this its proper place, follow more in detail the elaboration of the design involved in its peculiar mode of growth.

Rarely is a single entoblast permitted to attain any 'considerable size alone; but, soon after the declaration of the first, two or three more appear in the field, (Pl. 8, fig. 23d, *e, j, k, l, 25, a*; Pl. 9, fig. 3a, *c*, fig. 8a, D, fig. 6a, *m*.) and thus, forming a cluster, proceed together in adding to their bulk. Soon, in a little older egg, more are added to the cluster, (Pl. 9, fig. 6a, *d, f, g, h, i, j*.) and again still others, (*a, e*.) until their number is beyond estimation, and the mesoblast is surcharged with them to its very wall (*b*). By this time the mesoblast has usually exceeded in diameter the radius of the ectoblast (*a, b, e*). In two mesoblasts of the same size, (*a* and *b*, also *c* and *e*, or *j* and *f*.) the entoblasts differ both in number and size; those in one being oftentimes equal in length to the diameter of their parent, (*a, j*.) whilst those in another are mere grains in comparison. The feature that particularly characterizes the entoblasts, and is prevalent from the beginning up to this period, is a sharp angularity, which at times gives a spiculate appearance to the clusters.

¹ The name *entoblast* may apply to that part of the cell which is commonly called nucleolus, whether it consists of a single dot, or is made up of a larger or smaller number of such bodies. However, while des-

cribing the formation of the individual dots, we shall use it in the plural. We shall also have occasion to use the name of mesoblast in the plural, to designate the parts into which it divides. See Ch. 2, Sect. 4.