After these changes in the prismatic cells a continuous membrane can be seen extending over the entire surface of the germ. By maceration it can be separated from the subjacent plasma, and by its resistance to the action of chemical reagents it appears to be of a chitinous nature. The first formed membrane increases in thickness by the formation below it of many successive layers, and the germ instead of being surrounded by a layer of naked prismatic cells has become enclosed in a thick chitinous shell.

After this outer shell has been completed there is formed between it and the germ a second envelope. This is a thin, structureless, transparent, and very elastic pellicle. It is probably formed by the hardening of an excreted liquid.

Kleinenberg regards the outer shell as formed by a total transformation of the entire outer cell stratum. The shell is accordingly an epidermal structure, and the first differentiation of the germ of *Hydra* thus consists in the formation of a peripheral one-layered cellular lamina, the component cells of which die, and have their plasma transformed into chitin so as to form a firm shell which protects the remaining part of the germ from destruction during the long period of its subsequent development. The first organ which proceeds from the *Hydra* germ is thus a transitory one which takes no direct part in the development, and which on the liberation of the definitive body is simply cast off.

As soon as the shell is completed the union of the germ with the maternal body is dissolved, and the germ falls off and sinks to the bottom. A remarkable change now takes place in the structure of the germ. This consists in the fusion of all its cells into an undifferentiated plasmodium. All trace of a cellular structure disappears, and the germ becomes again, like the unsegmented egg, a single large plasma mass, thickly filled with albumen granules, pseudo-cells, and chlorophyll grains.

In this uniform mass there is now formed a small cavity which lies excentrically near the surface. This is the foundation of the body cavity. It enlarges in all directions, and it is clear that it arises by a true liquefaction of a great part of the substance of the germ. The walls, however, of the hollow germ thus formed are as yet uniform and show no trace of differentiation.

In this state the germ remains for many weeks, during which the outer shell becomes softer, and is finally burst and cast off. The germ, however, which it had enclosed continues to be overlaid by the elastic transparent inner shell which lies close upon its surface.

In the hitherto uniform walls of the germ we may now distinguish two layers. This condition is caused by the retreat of the pseudo-cells from the more superficial parts of the wall into its deeper parts, resulting in the appearance of an external clear layer and an internal darker one. This is the first indication of the differentiation of the two germinal layers. Out of the clear layer the ectoderm is formed, out of the darker one the endoderm. By a further differentiation these layers become changed from a continuous plasma into cellular laminæ.