application of this two-leafed germinal form to all the Metazoa, and consequently of the "homology of the two primary germ-leaves," and did so in 1872 in my "Monograph of the Calcareous Sponges;" and detailed proofs of this were given in my "Studies on the Gastræa Theory." And as this very important germinal form, in its original pure shape (Plate V., Fig. 8, 18; Plate XII., Fig. *A* 4, *B* 4), resembles a double-walled goblet, I called it goblet-germ (*Gastrula*), and the process of its formation *gastrulation*. I shall discuss it more fully later on in my twentieth chapter. Even in 1872 I concluded, from the remarkable agreement of the Gastrula in all many-celled animals, that all of the metazoa (according to fundamental law of biogenesis) must have been originally derived from a single common primary form; and this hypothetical primary form is the *Gastræa*, in all essential points the same as the goblet-shaped Gastrula.

The gastrula of mammals, like that of many of the other higher animals—in consequence of the peculiar conditions under which it develops—has lost its original goblet-shape and has assumed the disc-shape already described. However, this disc-shape (Discogastrula) is only a secondary modification of the goblet-germ. As in the latter case, here also the two primary germ-layers divide subsequently into the *four secondary germ-layers*. And these consist of absolutely nothing but homogeneous cells; yet every single one has a different significance in the construction of the body of the vertebrate animal. Out of the upper or outer germ-layer arises only the outer skin (epidermis), together with the central parts of the nervous system (spinal marrow and brain); out of the lower or inner layer arises only