

fig. 2; w-c. 1, n<sup>o</sup>, p. 553) also arise from its posterior end. After a while its abdominal portion has less numerous outlets, (Pl. 13, fig. 3, *g*,) all of which finally merge into one, the omphalo-meseraic artery (Pl. 18a, fig. 14, *j*<sup>4</sup>, *j*<sup>5</sup>). This is very easily understood, if the very loose connection of the cells of the subsidiary layer is borne in mind; the channels for the blood, having no wall, readily change their course, and merge into each other, and finally form one large stream for the exit of the arterial blood. Around this single, large channel a distinct wall is eventually formed.

In the beginning, the omphalo-meseraic artery, or rather arteries, are mere lateral diverticula of the dorsal artery, (Pl. 18, fig. 7,) but do not originate from it as a starting point. It is rather singular, but nevertheless true, that the first indications of this system of vessels appear at the extreme edge of the subsidiary layer, in the form of a thickening (Pl. 9d, fig. 1, *i*<sup>1</sup>, *i*<sup>2</sup>; Pl. 9e, fig. 5, *i*<sup>1</sup>, *i*<sup>2</sup>) of the periphery of the latter. This thick border goes on broadening for a while, till it becomes quite conspicuous (Pl. 12, fig. 7, *i*<sup>1</sup>) as a well defined ring surrounding a broad space bordering on the abdominal region of the embryo. One portion of it, that nearest to the head, curves inward, and lies in close connection with the transverse vessel (*i*) which leads into the posterior end of the heart. For a short time, this ring gradually expands, and incloses a large area, (Pl. 14, fig. 12,) without exhibiting any other change; but finally little, dark, hollow spaces appear, (Pl. 14, fig. 11,) arranged in one, two, or three irregular rows or concentric circles. These are collectively called the vena terminalis; but it is impossible at this stage to separate them from the arterial vessels which commingle with them here, so that it is quite proper to say that the omphalo-meseraic arteries, and the veins also, originate first at the circumference of the vascular area.

Almost synchronically with these circular vessels the true omphalo-meseraic arteries appear as dark streaks, more or less continuous, converging from the vena terminalis toward the body. Presently both the interrupted channels of the vena terminalis and the external omphalo-meseraic system anastomose completely with each other, (Pl. 18, fig. 5, 7,) and form continuous channels for the circulation of the blood. The channels are very irregular at diverse points, (Pl. 18, fig. 6,) both as regards breadth and depth, some appearing very shallow, as if just forming. In the latter case, there is no mistaking that they are hollows in the upper surface of the subsidiary layer. It is difficult to say at what stage walls are formed around these channels; but certainly not till some time after they originate (Pl. 14, fig. 5; Pl. 17, fig. 5). Finally, however, they are endowed with a very thin wall (Pl. 18, fig. 2). At the first glance it would appear as if the walls of the vessels must be constantly resorbed, and new ones formed as