The heart shows itself about the same time, under the form of a simple cavity, (Fig. 121, *h*,) in the midst of a mass of cells belonging to the middle or vascular layer. As soon as the cavity of the heart is closed in, regular motions of contraction and expansion are perceived, and the globules of blood are seen to rise and fall in conformity with these motions.

312. There is as yet, however, no circulation. It is not until the thirtieth day that its first traces are manifest in the existence of two currents, one running towards the head, the other towards the trunk, (Fig. 122,) with similar returning currents. At this time the liver begins to be formed. Meanwhile, the embryo gradually disengages itself, at both ends, from its adherence to the yolk; the tail becomes free, and the young animal moves it in violent jerks.

313. The embryo, although still enclosed in the egg, now unites all the essential conditions for the exercise of the functions of animal life. It has a brain, an intestine, a pulsating heart and circulating blood, and it moves its tail spontaneously. But the forms of the organs are not yet complete nor have they yet acquired the precise shape that characterizes the class, the family, the genus, and the species. The young White-fish is as yet only a vertebrate animal in general, and might as well be taken for the embryo of a frog.

314. Towards the close of the embryonic period, after the fortieth day, the embryo acquires a more definite shape. The head is more completely separated from the yolk, the jaws protrude, and the nostrils approach nearer and nearer to the end of the snout; divisions are formed in the fin which surrounds the body; the anterior limbs, which were indicated only by a small protuberance, assume the shape of fins; and finally, the openings of the gills appear, one after the other, so that we cannot now fail to recognize the type of fishes.

315. In this state, the young white-fish escapes from the