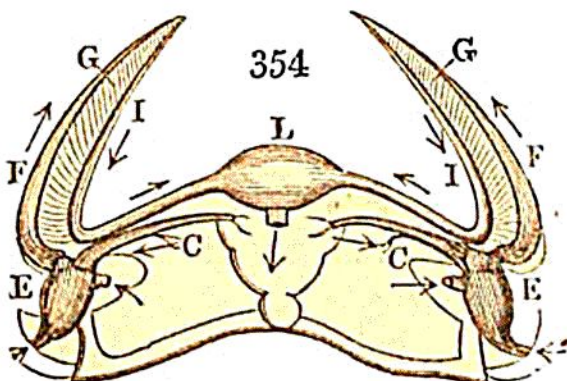


of blood vessels: so that in this case, which is represented in the preceding figure (353,) the lesser circulation is included as a part of the general circulation. But in all the higher classes the whole of the blood is, in some part of its circuit, subjected to the influence of the air; the pulmonary, being then distinct from the systemic circulation: In the Annelida, for instance, the *venæ cavæ*, which bring back the blood from the system, unite to form one or more vessels, which then assume the function of arteries, subdividing and ramifying upon the branchial organs; after this the blood is again collected by the branchial veins, which unite into one trunk to form the arteries of the systemic circulation.

Most insects, especially when arrived at the advanced stages of their development, have too imperfect a circulation to effect the thorough aeration of the blood: and indeed a greater part of that fluid is not contained within the vascular system, but permeates the cavities and cellular texture of the body. It will be seen, when I come to treat of respiration, that the same object is accomplished by means totally independent of the circulatory apparatus; namely, by a system of air-tubes, distributed over every part of the body. But an apparatus of this kind is not required in those Arachnida, where the circulation is vigorous, and continues during the whole of life: here, then, we again meet with a pulmonary as well as a systemic circulation, in conjunction with internal cavities for the reception of air.

In the Crustacea the circulation is conducted on the same general plan as in the Annelida; the blood from every part of the body being collected by the *Venæ Cavæ*, which are



exceedingly capacious, and extend, on each side, along the lower surface of the abdomen. They send out branches, which distribute the blood to the gills; but these branches, at their origin, suddenly dilate, so as to