

with the veins, forming also in their course several glandular masses, as seen in a portion of intestine connected with a vein in Fig. 54: and it is not until thus taken up and mingled with the circulating blood, that any of our food really becomes a part of the living body. Thus freed of the nutritive portion of the food, the residue of the product of digestion passes on to the large intestine, from whence it is expelled in the form of excrement.

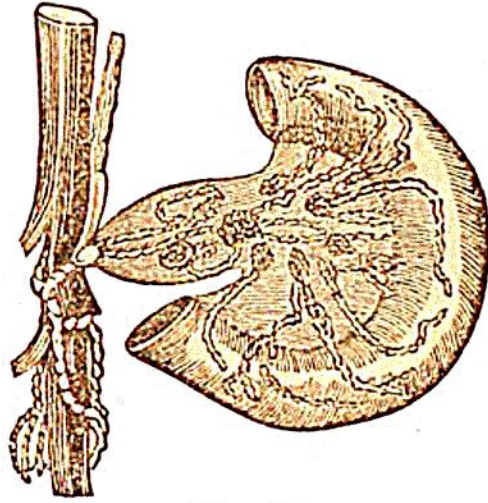


Fig. 54.

211. The organs above described constitute the most essential for the process of digestion, and are found more or less developed in all but some of the radiated animals; but there are, in the higher animals, several additional ones for aiding in the reduction of the food to chyme and chyle, which render their digestive apparatus quite complicated. In the first place, hard parts, of a horny or bony texture, are usually placed about the mouth of those animals that feed on solid substances, which serve for cutting or bruising the food into small fragments before it is swallowed; and, in many of the lower animals, these organs are the only hard portions of the body. This process of subdividing or chewing the food is termed *mastication*.

212. Beginning with the Radiata, we find the apparatus for mastication partaking of the star-like arrangement which characterizes those animals. Thus in *Scutella*, (Fig. 55,) we have a pentagon composed of five triangular jaws, converging at their summits towards a central aperture which corresponds to the mouth, each one bearing a cutting plate or tooth, like a knife-blade, fitted by one edge into a cleft. The five jaws move towards the centre, and pierce or cut the objects which come between them. In some of the sea-urchins