actinal ends of the superficial vertical tubes, which I may call the ambulacral tubes, terminate as blind canals; at least, I have been unable to trace a direct communication between any of them and the vertical tubes which follow the sides of the digestive cavity, though such a communication is seen in the genus Bolina, as I shall mention hereafter. The fluid circulated upward through these tubes can be distinctly seen to retrace its way downward; so that, in the ascending branch of the ambulacral tubes, the fluid injected through its horizontal branch is moved up and down alternately. This is also the case with the lower branch of the same vertical tubes, and, though the abactinal end tapers more gradually, it terminates also in blind canals; and I was mistaken in formerly supposing them to open again into the main cavity. The movement in reality takes place in the following manner. Each of the eight horizontal tubes fills its vertical ambulacral branches, the fluid flowing, at the junction of the vertical tube with the horizontal stem, in opposite directions, upward and downward; then, flowing back through the same channels during the contraction of the mass of one side of the body, it is pressed into the horizontal tube, and returns to the centre of the movement to pass into the opposite side of the body. There can be no doubt, that the liquid moves decidedly to and fro in the ambulacral tubes and returns to the central cavity through the horizontal tubes, and that the dilatation of the four tubes of one side alternates with the dilatation of the four tubes of the opposite side; but in each vertical ambulacral tube the motion of the fluid is an undulatory one, owing to the alternate dilatation and contraction of the tube itself.

The movement of the fluid in these tubes can be traced very satisfactorily when following the course of the minute granules of colored matter suspended in the water after injection; but even in fresh uninjected specimens, the circulation can be tolerably well traced by watching the small particles of undigested food suspended in the mixture of water and chyme which is circulated throughout this system. As in Polypi, the whole mass of digested food, comminuted and reduced to a very uniform state, but in which the parts capable of being assimilated are still mixed with parts of the refuse matter, is emptied bodily into the chymiferous cavity, and, with a certain quantity of water introduced in the same way into this cavity through the mouth, kept in a constant, regular, undulatory circulation throughout life. But as there is a double outlet through which this system can discharge its contents on the side of the circumscribed area, the circulation is more or less active, all the tubes more or less turgescent, and the whole cavity more or less dilated, as the quantity of fluid in circulation is greater or less; which, to some degree, changes the relative position of the tubes and of the central cavity. When very full, the wider central space is considerably raised; while in a state of relaxation it sinks lower down, nearer the abactinal extremity of the body. As