

CHAPTER VIII.—ANIMAL FUNCTIONS.

(§§ 218–225.)

218. *Motion*.—In addition to the internal movements which appear generally in the unicellular Radiolaria and have already been mentioned as plasmatic currents in treating of the circulation (§§ 207–209), two different groups of external motor phenomena are to be observed in this class: first, the *contraction* of individual parts, which brings about modifications of form (§ 220), and secondly, voluntary or reflex *locomotion* of the whole body (§ 220). These movements are partly due to changes in form of undifferentiated plasmatic threads or sarcode filaments, partly to the actual contraction of differentiated filaments which are comparable to muscle fibrillæ, and must therefore be distinguished as myophanes. In addition to this, endosmose and exosmose probably play an important part in some of the locomotive phenomena, but nothing is yet certainly known regarding these osmotic processes. We are at present equally ignorant whether all the movements of the Radiolaria are simply reflex (direct consequences of irritation) or whether they are in part truly spontaneous.

219. *Suspension*.—From direct observation of living Radiolaria, as well as from deductive reasoning, based upon their morphology (and especially their promorphology, §§ 17–50), the conclusion appears justified that all Protista of this class in their normal condition float suspended in the sea-water, either at the surface or at a definite depth. A necessary condition of this hydrostatic suspension is that the specific gravity of the Radiolarian organism must be equal to, or but slightly greater than that of sea-water. The increase in specific gravity brought about by the production of the siliceous skeleton, is compensated by the lighter fatty globules, and partly perhaps by the calymma, especially when the latter contains vacuoles or alveoles. The fluid or jelly contained in the latter appears to be for the most part lighter than sea-water (containing no salt, or only a very small quantity?). But if the specific gravity of the whole body should be generally (or perhaps always) slightly greater than that of sea-water, then the organism would be prevented from sinking, partly by the increased friction, due to the radiating pseudopodia and the radial spines usually present, and partly perhaps by active (if only feeble) movements of the pseudopodia.

220. *Locomotion*.—Active locomotion of the whole body, which is very probably to be regarded as voluntary, occurs in the Radiolaria in three different modes; (1) the vibratile movement of the flagellate swarm-spores; (2) the swimming of the floating organisms; (3) the slow creeping of those which rest accidentally upon the bottom.