

## PSYCHIC GRADATIONS

the environment may, in certain circumstances, act as a stimulus on the psychoplasm, and elicit or "release" a movement. We shall see later on how this important physical concept of "releasing" directly connects the simplest organic reflex actions with similar mechanical phenomena of movement in the inorganic world (for instance, in the explosion of powder by a spark, or of dynamite by a blow). We may distinguish the following seven stages in the scale of reflex action:

I. At the lowest stage of organization, in the lowest protists, the stimuli of the outer world (heat, light, electricity, etc.) cause in the indifferent protoplasm only those indispensable movements of growth and nutrition which are common to all organisms, and are absolutely necessary for their preservation. That is also the case in most of the plants.

II. In the case of many freely moving protists (especially the amœba, the heliozoon, and the rhizopod) the stimuli from without produce on every spot of the unprotected surface of the unicellular organism external movements which take the form of changes of shape, and sometimes changes of place (amœboid movement, pseudopod formation, the extension and withdrawal of what look like feet); these indefinite, variable processes of the protoplasm are not yet permanent organs. In the same way, general organic irritability takes the form of indeterminate reflex action in the sensitive plants and the lowest metazoa; in many multicellular organisms the stimuli may be conducted from one cell to another, as all the cells are connected by fine fibres.

III. Many protists, especially the more highly developed protozoa, produce on their unicellular body two little organs of the simplest character—an organ of touch and an organ of movement. Both these in-