ditions, their collecting into regions acidulated by carbon dioxide excreted by themselves is particularly noticeable. It results in bringing the Paramecia together in dense swarms. To this is to be added, as a second factor in bringing the Paramecia together, the fact that contact with solids of a loose fibrous texture likewise tends to quiet the Paramecia, so that they collect about such solids. In the fluids in which the Paramecia live, such solids are present as masses of bacterial zoogloea, upon which the Paramecia will usually be seen to be collected in swarms.

The ordinary life of a Paramecium may then be summarized somewhat as follows: In the free water, as long as the animal is unstimulated, it swims forward in a spiral course, revolving on its long axis. But it comes in contact here and there with changes in the environment—regions of higher or lower temperature, or of greater or less amounts of certain chemicals in solution, or with mechanical obstructions. If these changes are of such a nature as to act as a stimulus, the Paramecium thereupon swims backward a short distance, turns toward one side (in a direction which is an entirely random one so far as outer objects are concerned) and continues forward. This reaction is repeated as often as the Paramecium comes in contact with any source of stimulus. Certain solutions or conditions cause no reaction. Thus the Paramecium may pass by chance into a group of other Paramecia, where the water is charged with carbon dioxide, which they have excreted. Now, the surrounding water containing *no* carbon dioxide causes the reaction, so the Paramecium remains with the others. Or, if it comes in contact with a loose, soft body it stops, only the oral cilia continuing to be active. These constantly carry a stream of water to the mouth, and if the solid is by chance a bit of bacterial zoogloea, this stream carries many bacteria into the mouth of the animal, so that they serve as food. But if no bacteria are present, the Paramecium nevertheless remains indefinitely against the bit of solid, especially if joined by other individuals, so that they are in a region containing carbon dioxide (excreted by themselves).

This resting condition may be brought to an end by too high or too low a temperature, by the diffusion of an alkali into the water, or by various other conditions that tend to produce a motor reaction. The Paramecium then continues on its way in some chance direction till it comes again into conditions which do not act as a stimulus.

Thus the life of the animals is extremely simple; they have but one mode of reaction to outer conditions—by swimming backward, turning, swimming forward—while under other conditions their activity largely ceases.

It is obvious that such simple activities, while they do result in keeping Paramecia out of certain conditions and bringing them into others, would not be adequate for preserving the animals under complicated and changing conditions. The Paramecia show no indication of intelligence or even of choice, reacting to everything in the same manner, if they react at all. They have no power of adapting their actions to their needs. Chance is the main factor in bringing the Paramecium into proper conditions and giving it food, and if the chances are not favorable the animals must soon die. This agrees perfectly with the facts observed in cultures of these and similar animals. So long as the conditions are exactly right—bacterial zoogloea covering everything, so that the Paramecia can not miss it, and the chemical condition of the water entirely favorable—the animals swarm and multiply by thousands. A slight change occurs in the conditions, and soon scarcely a Paramecium is to be found, though a few hours previously the water was milky with them. As in the case of plants, the proper conditions are the chief requisite for growth and multiplication;