The slime-moulds differ from typical fungi chiefly in the body not being formed of hyphæ, but, until spore-formation, of a mass of naked protoplasm or living matter, without any containing membrane. As disease-producers they are comparatively unimportant, powdery scab of potatoes and club-root or finger-and-toe of cruciferous plants being the chief diseases due to them.

Fungi reproduce by means of minute bodies termed *spores*, which are, in a sense, comparable to the seeds of higher plants. These spores vary greatly in shape, size, and the manner in which they are produced. They may be spherical, oblong, or thread-like; borne exposed at the tips of special hyphæ, or enclosed in sacs (*sporangia*). Often very special fungus-structures are produced solely with the object of forming and distributing these spores. What we commonly term a "mushroom," for instance, is nothing more than a fructification or reproductive structure, the mycelium or feeding portion of the plant being in the soil—the so-called "spawn." Although spores vary much in size, they are all very minute and easily carried by the wind, rain, insects, etc. Some of the smaller may be little more than 1/25,000 inch in diameter, whilst a very large one might be a hundred times as long by ten times as broad. Often a fungus produces two or more different kinds of spores. The fungus causing apple-scab produces one kind throughout the growing season on the living plant. On the dead leaves, during the winter, a totally different kind develops, to be scattered in the spring. Hence the necessity for knowing the full life-history of the fungus causing a disease, in order to be able to trace back the different infections to their source and take adequate measures against them. Spores which are designed to reproduce the fungus at once are generally enclosed by a very delicate membrane, and usually dry up and die after a short time unless the conditions are right for germination and infection. Resting spores—e.g., for carrying a fungus over winter—are generally thick-walled and resistant to adverse conditions. The method by which a spore germinates to produce a new fungus-plant varies, but generally a delicate hypha (germ-tube) is pushed out, which, if favourably placed with regard to a suitable host-plant, will penetrate into the tissues and develop into a mycelium. A suitable temperature is necessary for this, and, in most cases, a film of moisture such as results from rainfall or dew. This explains why wet weather and moist climates are conducive to epidemics of many fungus-diseases. The whole time between the germination of the spore and the production of new spores from the mycelium so formed may be less than a week, and since the spores are often produced in enormous numbers, it is not difficult to understand the rapidity with which a disease may spread if the conditions are favourable.

BACTERIA.

Bacteria are closely related to the fungi, of which, indeed, they are often considered a group. They differ chiefly in their exceedingly simple structure, each individual being a single minute cell. They multiply (in the case of those causing plant-diseases) by each individual dividing transversely into two, each of which goes on growing until it becomes full-sized, when the process is repeated. Many bacteria (but not those causing plant-diseases) also form spores, but these are of a different type from those of the fungi. The living matter (protoplasm) becomes aggregated together, surrounded by a resistant wall, and enters into a dormant condition. It is a device for resisting unfavourable conditions rather than a means of multiplication. The individuals which result from continued division of one or more original ones may remain together as slimy masses such as are often found on decomposing organic matter. In some cases the individuals remain end to end, forming threads much like fungus-hyphæ.

Bacteria are excessively minute. *Bacillus amylovorus*, which is the cause of fire-blight, has the form of a short rod about 1/10,000 inch long and 1/25,000 inch in diameter. Millions of individuals can, therefore, exist in a drop of liquid, and it is not difficult to understand how the disease may be spread from tree to tree by