The spores are very hardy; they can stand much rougher treatment than the plant itself.

The Thallophytes are subdivided into fission algæ and fission fungi. These last are the bacteria. They are, for the most part, unicellular organisms; some have a pair of legs or flagellæ, by means of which they swim; some are motile, some not so; they form colonies, some in chains, some in clusters; some are double, some grow only in one division of space, some in two, some in all three; and some prefer one medium for culture, some another. Thus we have a means of differentiating them. Moreover, they take different stains.

But do not imagine that all algæ multiply by fission. Many of them develop both male and female elements as well, only one ovum, however, forming in its respective cavity, and from four to eight sperm-cells in their place. The male elements are provided with a pair of cilia for purposes of movement; they swim towards the ova, penetrate them, and in due season the fertilised oosperm is expelled from the parent plant.

Thus we have shown the true relation of the bacteria to the vegetable world. They are unicellular organisms, and multiply either by fission or by spore formation.

That the bacteria cause disease is now but little questioned. Yet the most absolute ignorance of this fact prevails among the laity, and, I regret to say, among some of the profession. Just as for years after the death of Copernicus many astronomers refused to accept the doctrine that the earth revolved around the sun, so many of the older physicians refuse to believe that diseases are caused by bacteria. What is more, they have no idea of practical asepsis; and, I regret to add, they do not care.

Happily for us, Professor Koch has for all time settled the question. Had he done nothing more than to formulate his famous dicta his name would have been written high upon the pediment of the Temple of Fame. To be the cause of any disease the suspected bacterium must be found in the tissues of an animal sick or dead from that disease. Nay, more, it must be isolated and cultivated through many generations outside of the body. An animal must be inoculated with some of the new culture, the disease in question must appear, and the bacterium itself found in the tissues of that animal. When these conditions have been complied with (and only then), we say that the bacterium is the cause of the disease. Could any proof be more positive?

It is useless to trouble you with an elaborate classification of the bacteria, but you should understand the fundamental forms which the bacteria assume. A round or oval bacterium is called a coccus. If it exist in bunches, it becomes a staphylococcus; if in chains, a streptococcus; if in pairs, a diplococcus, and so on. A rod-shaped bacterium, on the other hand, is a bacillus. Thus we have the B. Diphtheriæ, Tubercle Bacillus, &c. Originally the short rods were known as bacteria, the longer as bacilli. But, fortunately, this differentiation is no longer recognised. The term bacterium has become generic. Again, if the bacterium assumes a spiral form, it is a spirillum; and if short, a comma, from its resemblance to that mark of punctuation. And of these perhaps the deadliest is the famous comma of Koch, the spirillum of Asiatic cholera.

The bacteria may also be classified according to whether they do or do not require oxygen for their existence. Those requiring oxygen are called aërobic, those to whom oxygen acts as a poison anaërobic, while those ordinarily living in the air, but capable of existing without oxygen, are known as facultative anaërobic. And right here let me call your attention to a very important fact. You have heard it said (and you thoroughly believe it) that no life can exist without oxygen. With one exception this is strictly true, and that exception is the anaërobic bacteria. The bacilli of tetanus and of malignant œdema, two of the deadliest of all the bacteria, are strictly anaërobic. Woe to the man so unfortunate as to become the prey of either!

A still broader classification of the bacteria would divide them into saprophytes and parasites—a saprophyte being one that lives upon decaying organic matter, a parasite on living material. Thus the bacteria of the soil, as well as that in the intestine, the B. coli communis, are strictly saprophytic. On the other hand, those bacteria causing pus and all manner of diseases are parasitic, though most of them can be grown upon nutrient media. Thus they are persuaded to renounce a state of parasitism for one of saprophytism. The odour of a culture upon any medium will convince you of this fact.

Bacteria prefer different media, though happily most of them can be cultivated upon the potato or upon bouillon, either in a fluid state or with gelatine or agar-agar (a gelatinous sea-weed from Japan) added. Yet this is not true at all. Glycerine must be added to obtain a culture of the tubercle bacillus; that of diphtheria grows best on a specialised blood serum devised by Löffler; while the typhoid bacilli, though growing readily upon ordinary media, can be cultivated, to the exclusion of certain others, by the addition to the gelatine or agar of a large quantity of grape-sugar. Thus you will see that the manner of growth upon the different media furnishes us with another means of identifying the bacteria. And it may also be added that the bacteria grow best at the temperature of the human body.

Of the way that the bacteria act many theories

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