

of fermentation. The majority of these germs are innocuous, but some are pathogenic.

The second, *micro-bacteria*, *B. termo*, are slightly elongated, multiply by division, and often appear linked in chains. They are remarkably active, and while many of them are harmless, the bacterium septicæmiæ is rapidly fatal when introduced into the blood of a living animal. Others having a close resemblance to the pathogenic members of this class are found in the blood of persons in perfect health. The third, *Desmo-bacteria* (bacilli) are of various sizes, but all are more or less rod like. The long slender ones have been spoken of by authors as vibrones. They are sometimes provided with a flagellum or tail, which assists in movement. Their development is usually by spores, though fission has been observed. The *Spiro-bacteria* appear under various forms, but all have a characteristic twist or spiral. Some are provided with flagella, which assist in locomotion. They multiply by spores. While the principal forms have thus been spoken of, it is to be remembered that no hard and fast line can be drawn between them. They do not always retain their original forms; thus the micrococci often elongate so as to resemble the bacilli; and the bacilli sometimes break up into fragments so as to closely simulate the micrococci.

These little organisms are found in every portion of the universe where their existence can be maintained, and it is fortunate that only a few are pathogenic. "Their prodigious powers of reproduction, their astonishingly rapid alterations of the media in which they multiply, and the occult and subtle chemistry which they employ, these and other mysterious facts of their life history are subjects of profound concern." Many act as scavengers, hastening disintegration by oxidation, while others, if the theory be true, are the active agents in disease. All bacteria do not require oxygen for their existence, but all need water, without which they become inert.

Certain temperatures are necessary for the successful multiplication of these fungi, that of the body being most favorable for the pathogenic varieties, but while prolonged boiling is fatal to all known species except *B. subtilis*, their spores are less easily destroyed, though the question appears to be open, as to whether they will resist prolonged boiling, and in sterilizing for the purpose of pure

culture they are exposed to prolonged high temperature in an oven.

Some of the diseases in which specific bacilli have been isolated are as follows: tubercle, cholera, anthrax, septicæmia, typhoid fever, carbuncle, glanders, small-pox, syphilis, gonorrhœa, diphtheria, etc., etc. Recent observers have discovered minute organisms in the red blood corpuscles of persons suffering from malaria. They can be easily stained and indeed present all the chief characteristics of bacilli. They have been named plasmodes, and when injected into the blood of a healthy individual speedily produce febrile movement. The scientific world is now much interested in bacteriotherapy, and several experiments recently made seem to shadow forth the hope that much may yet be accomplished in the cure of specific disease by the destructive action of one species of bacillus upon another. Thus Cantani's phthisical patient who was subjected to inhalations of *B. termo* in meat broth, soon showed in his sputa total absence of *B. tuberculosis*, and had his condition "*wonderfully improved*." Salama of Pisa, found a similar disappearance of Koch's bacillus and improvement in a patient's condition, under the influence of the same *B. termo*.

Of course it is not certain that in either case the bacterium was the only means by which improvement was brought about; but it is sufficiently encouraging to permit us to hope that bacteriotherapy may yet be of service in the prevention and cure of disease. Let us however, be on our guard, and not allow this most inviting theory to carry us too far, for it must be remembered that we are by no means certain that we have discovered in these organisms the cause of certain obscure pathological states; that the bacteria may not be the cause, but the result of disease, whereby the soil becomes fit for their multiplication and growth; in fact *whether they are the cause, or the scavengers of disease*.

AMERICAN HEALTH ASSOCIATION.

We wish to inform our readers that it has been decided to hold the fourteenth annual meeting of the American Public Health Association in Toronto early in October, 1886. The Association dates from 1872, and from a very modest beginning has grown so rapidly in importance and numbers that