

animals. Many of those forms that live in the soil thrive better at a lower temperature, ranging from 80 to 90 degrees F.

It is believed by many that the warmer it is the more rapidly do fermentative and putrefactive changes occur, but this is only true within certain limits. If we place a sample of milk at 110 degrees F., another at 95 degrees, and still another at the ordinary temperature of air, say 75 to 80 degrees F., the second sample will sour soonest. The sample kept at 100 degrees F., will not change as rapidly, because at this temperature the bacteria pass into a torpid condition, although they are not killed. To actually destroy them, even in a growing condition, requires a temperature of 130 to 160 degrees F., maintained for, at least, ten minutes. This is what is done when milk is pasteurized.

Where bacteria possess spores, they are much more resistant than this. An exposure to a boiling temperature for hours is frequently insufficient to entirely destroy all vestiges of germ life. Was it any wonder that the earlier scientists thought that life could spontaneously spring into existence from dead matter, when they found infusions of vegetables spoiling, after continued boiling for hours, even though they were fully protected from the influence of the air?

Influence of Air—All living things require oxygen in order to breathe. The bacteria are no exception to this universal rule, although they possess a peculiarity that distinguishes them from most other kinds of like. Most living things breathe by securing the necessary oxygen from the atmosphere but, at least, with certain bacteria, this element is taken from compounds containing it in combination, such as sugar, etc., and not from the air.

Such organisms are called *anaerobic* because they can live without air. The larger number of bacteria draw their oxygen supply from the ordinary source, and are therefore *aerobic*.

It not infrequently happens that canned fruits and vegetables spoil even though great care is taken in excluding the air. This is caused by the development of some of these anaerobic forms that find, under these conditions, favorable opportunities for growth. In many cases, bacteria possess the power of accommodating themselves to either condition. Thus, the bacteria that sour milk grow quite as well in absence of air, as they do in the air.

Moisture.—In a dried state, living things are

incapable of development, although many of the bacteria retain their vitality for a long time and are distributed in the dust. A certain degree of moisture is, however, necessary before growth can occur. In dried meats and fruits we have an illustration of where the water content is too low to permit growth to occur.

Effect of Light.—The Italians have a proverb that runs as follows: "Where the sun comes not, there the physician enters." The philosophy of this is that sunlight is a destroyer of germ life and, indeed, it is one of the most potent germ killing agents that are known. The good effect that is frequently supposed to follow a thorough airing, is in the main attributable to the disinfecting action of sunlight. The importance of this agent in controlling disease germs will be considered more fully under the head of various animal maladies.

Influence of Food. Everyone knows what substances are liable to ferment, to decompose, to decay. Such are evidently suitable for bacterial development, for the great majority of these changes are due to the activity of these germs. Those containing proteid substances are especially liable to putrefy; vegetables generally decay. Sugar containing fluids ferment, even in pure water. On the other hand, fluids may be so dense, i. e., the amount of solids dissolved in the same may be so large, that bacteria cannot thrive in them. When syrup "works" or condensed milk "spoil," it is because they are too "thin." Further addition of sugar will ultimately prevent all bacterial growth.—*Hoard*.

TUBERCULOSIS

The Veterinary Conference in connection with the Congress of the Institute of Public Health, which is being held in Dublin, on Friday discussed the question of tuberculosis, and, among other resolutions, passed the following:—"In the opinion of this Congress, tuberculosis should be scheduled under the Diseases of Animal Act, 1894, or, if that is not considered practical, it should be dealt with by a special Act." "In the opinion of the Conference, it is at once just, expedient, and, according to the invariable practice of the British Legislature, that when an animal which showed no outward sign of tuberculosis during life proves after slaughter to be affected, and the carcase, or any portion thereof, is accordingly confiscated in the public interest, the owner should received compensation for the meat so confiscated."—*Agricultural Gazette*.