

the flour, yeast, or dough. It will be shown later on in this article, where bacteria are most likely to be found and how they may be killed or controlled.

BACTERIA. When any dead animal or vegetable substance is left exposed to the air, it immediately commences to decay, if it is at all moist. This change is caused by the growth in it of minute organisms called microbes, micro-organisms, or bacteria. These organisms are the most simple forms of life in the vegetable kingdom. They increase very rapidly by simply dividing into two; and each half then grows and again divides. In some cases, as in the ripening of cream and milk for butter and cheese-making, certain forms of bacteria are necessary in order to obtain good results; but in bread-making, yeast (not a bacterium) is used to ripen the dough, in a manner somewhat similar to that in which a "starter" (or sample of milk containing desirable bacteria) is used in the dairy business to ripen the cream. Other organisms, such as moulds and bacteria, are undesirable and often harmful in bread-making. While there is no way by which, in practice, the flour can be freed from bacteria, yet the yeasts and utensils may be kept comparatively free from them, if the conditions under which organisms grow and increase are understood. Few bacteria will be found where yeast tubs and all utensils are kept perfectly clean and are frequently scalded; but when the yeast is grown in an old tub or is stirred round with dirty hands (which is very frequently done by bakers who think they understand how to make bread, but are puzzled to know why their make is so often sour or dark in color) there is certain to be poor-flavored bread very often.

HISTORICAL. The earliest bread makers used nothing with their crushed grain to make it rise; hence their bread was hard and solid, and so had to be in thin cakes. Ching Nong, the successor of Fohi, is reputed to have been the first who taught men the art of husbandry and the method of making bread from wheat, and wine from rice. Fermentation was made use of at the time of Lot, for we read that "He did make them a feast and did bake unleavened bread." Baking reached a high state of perfection in Egypt. It became a profession at Rome, 170 B.C. After the conquest of Macedonia in 148 B.C., numbers of Greek bakers came to Rome, secured special privileges, and soon obtained a monopoly. Later, a special magistrate was appointed to superintend the public bakeries. Pliny states that the Romans used a leaven composed of grape juice and millet which kept for a year. This leaven doubtless contained a large quantity of yeast, as yeast is always found upon the surface of ripe grapes. From Rome the method of bread making spread gradually with civilization; and at present, fermented bread is in general use, except in a few of the northern countries of Europe, and in other places distant from civilization.

THE YEAST PLANT.

Yeast belongs to that division of the vegetable kingdom known as *Fungi*,—a class or group of plants which do not possess any chloro-