

for clothes. After all the milk is thus squeezed out, the butter should be lifted and worked over carefully, and afterwards receive one or two clean, cool waters, to wash away every trace of milk. It should then be salted with the best salt, containing a minute quantity of sugar mixed with it, and last of all it should again be submitted to severe pressure. The treat object in thus treating butter is to remove all the water and milk from it, because these induce incipient decomposition, and consequent rancidity. By churning the cream before it becomes too sour, and removing all the water and milk from the butter, and by careful and thorough salting and working, the best quality will always be obtained.

THE PHILOSOPHY OF BREAD MAKING.

The following remarks on the philosophy of bread making are from Johnston's "Chemistry of Common Life," a work which contains much useful and interesting information in regard to the food, beverages and narcotics in common use:—

When the grain of wheat is crushed between the stones of the mill, and is then sifted, it is separated into two parts—the bran and the flour. The bran is the outside, harder part of the grain, which does not crush so readily, and when it does crush, darkens the colour of the flour. It is therefore generally sifted out by the miller, and is used for feeding horses, pig, and other animals, or even for applying to the land as a manure.

If the flour be mixed with a quantity of water sufficient to moisten it thoroughly, the particles cohere and form a smooth, elastic and tenacious dough, which admits of being drawn out to some extent, and of being moulded into a variety of forms. If this dough be placed upon a sieve or on a piece of muslin, and worked with the hand under a stream of water as long as the water passes through milky, there will remain at last upon the sieve a white sticky substance, very much resembling birdlime. This is the substance which gives its tenacity to the dough. From its glutinous character it has obtained among chemists the name of gluten. When the milky water has become clear by standing, a white powder will be found at the bottom of the vessel, which is common wheaten starch. Thus the flour of wheat contains two principal substances, gluten and starch. Of the former, every 100 lb. of fine English flour contain about 10 lb., and of the latter about 70 lb."

When a little yeast is added to the flour before or while it is being mixed with water into a dough, and the dough is then placed for an hour or two in a warm atmosphere, it begins to rise—it ferments, that is, swells or increases in bulk. Bubbles of gas (carbonic acid gas) are disengaged in the interior of the dough, which is thereby rendered light and porous. If it be now put into a hot oven, the fermentation and swelling are at first increased by the higher temperature; but when the whole has been heated nearly to the temperature of boiling water, the fermentation is suddenly arrested, and the mass is fixed by the after baking in the form it has then attained. The formation of hard crusts on the loaf may be prevented by rubbing a little melted lard over it after it is shaped, and before it is set down to rise, or by baking it in a covered tin.

It is now newly-baked bread, and if it be cut across it will appear light and spongy, being regularly sprinkled over with little cavities, which were produced in the soft dough by the bubbles of gas given off during the fermentation. This fermentation is the consequence of a peculiar action, which yeast exercises upon moist flour. It first changes a part of the starch of the flour into sugar, and then converts this sugar into alcohol and carbonic acid, in the same way as it does when it is added to the worts of the brewer or the distiller. As the gas cannot escape from the glutinous dough, it collects within it in large bubbles, and makes it swell, till the heat of the oven kills the yeast plant, and causes the fermentation to cease. The alcohol escapes, for the most part, during the baking of the loaf, and is dissipated in the oven.

New-baked bread possesses a peculiar softness and tenacity which is familiar to most people, and though generally considered less digestible is a favourite with many. After two or three days it loses its softness, becomes free and crumbly, and apparently drier. In common language, the bread becomes stale, or it is stale bread. It is generally supposed that this change arises from the bread becoming actually drier by the gradual loss of water; but this is not the case. Stale bread contains almost exactly the same proportion of water as new bread after it has become completely cold. The change is merely in the internal arrangement of the molecules of the bread. A proof of this is, that if we put a stale loaf into a