

## THE BAKER.

### INTRODUCTION.

BAKING, or the art of making bread, is amongst the earliest modes resorted to by the more advanced portions of mankind for the preparation of food. In the early ages, however, loaf or leavened bread was unknown, as it is amongst uncivilized nations to this day. The North American Indians contrive, by pounding their maize, or Indian corn, to make a sort of cake, which they bake by means of hot cinders. This serves them, and, indeed, occasionally the Anglo-Americans, as a substitute for loaf or leavened bread, and may be called unleavened bread. But in some parts of the world bread is not known; in others it may be known, but is not used—as amongst the people inhabiting the vast Pampas on the Rio de la Plata, where scarcely anything is eaten but beef.

Bread may be thus defined;—A nutritive substance made of corn, generally wheat, or other farinaceous or mealy vegetables, ground or reduced into flour or meal, that is, a powder more or less fine, and kneaded or mixed with water, and baked in an oven, upon hot ashes or other grise. This process makes unleavened bread, or, in other words, unfermented bread, or what is now called biscuits. To leavened or fermented bread, that is, the bread generally used in our houses, there must be an addition, yeast, or some other substance which has the property of promoting fermentation.

The origin or etymology of the word bread is not without interest. Horne Tooke says, bread is *brayed* grain, from the verb to bray or pound in a mortar, the ancient way in which flour was made. The meaning of bread, therefore, is something brayed—brayed wheat, or wheat bread—pease brayed, or bread—oats brayed, or bread, &c. The word bread was spelt differently in different ages; thus we have *brede*, *breed*, &c. Dough, Horne Tooke says, comes from the Anglo-Saxon word *deaw-ian*, to wet, to moisten. *Dough*, or *dow*, means wetted. The bread, that is, brayed corn or grain, by being wetted becomes *dough*.

Loaf comes from the Anglo-Saxon word *hlif-ian*, to raise, to lift up.

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Thus, after the bread or brayed corn has been wetted, by which it becomes dough, then follows the *leaven*, by which it becomes *loaf*, that is, *raised*. Leaven is derived from the French word *lever*, to raise.

Bread, in some countries, is not made entirely of meal, much less of wheaten flour. In many parts of Sweden, the bread is composed partly of the bark of trees, particularly during winter.

In Westphalia, a kind of very coarse black bread is made, of which the peasants bake one large loaf for the whole week. This is divided for use with a saw. It is called pumpernickel, and is sometimes exported. In many parts of Germany, bread is made of grain nearly entire, or but just bruised, which is very coarse, and frequently forms part of the food of horses.

The Romans, before they had acquired the art of baking, were called, either by way of distinction or reproach, the pulse-eating people. According to some authorities, indeed, the earlier nations knew no other use of their meal than to make of it a kind of porridge. Such was the food of the Roman soldiers for several centuries, or at most their skill extended no farther than to knead unleavened dough into cakes or biscuits. Even at present, as has been before intimated, there are many countries where the luxury of bread is unknown.

Loaf-bread is seldom used in the northern parts of Europe and Asia, except by the higher classes of inhabitants. You never see loaves in Sweden, though in the towns rolls are common enough. Gottenburg is a considerable town, containing between twenty and thirty thousand inhabitants. In the year 1812 it was crowded with merchants from all parts of Europe, being at that time the great connecting link between Great Britain and the Continent. Towards the end of that year only, the captain of an English packet ordered a Gottenburg baker to bake for him a quantity of bread, amounting altogether to the value of one pound sterling. The baker was astonished, and in fact confounded, at so great an order, and refused to comply till the captain gave him security that he would carry off and pay for the loaves, declaring that he could never dispose of so great a quantity of bread in Gottenburg, if it were left on his hands. In the country parts of Sweden, nothing in the character of bread is to be met with, excepting rye cakes, which are represented as nearly as hard as flint, and which are only baked twice a year.

### GENERAL REMARKS ON BAKING.

Baking, as a business or profession, was never confined to the baking of common bread alone, that is to say, bread in every-day use. A baker we take to mean a person who bakes and prepares any farinaceous substance intended for human food. If this definition be correct, then it will follow that not only loaf-bread baking, biscuit-baking, fancy-bread baking, belong to the business of the baker, but also pas-

try making and confectionery. We know, indeed, that all these branches are frequently to a certain extent practised by the same individual, and therefore, in a work of this kind, they ought all to be treated of, which we intend to do under separate heads.

The ancients had a great variety of spice bread and sweetmeats, and these, there is every reason to believe, were produced by the persons called bakers; pastry-cooks and confectioners being unknown as separate professions. The Asiatics were exceedingly fond of sweetmeats, and there can be little or no doubt that a similar taste was introduced by them among the Romans, when they were carried to Rome to practise their calling there. The Rhodians, we are told, had a particular kind of bread sweetened with honey, so exquisitely pleasant, that it was eaten with other delicacies after dinner by way of dessert.

The French, who are excellent bakers, have a great variety of breads, and these for the most part have been long introduced into Great Britain. The common bread of that country, or bread for general use, may be divided into three classes:—wheaten bread, made of the finest flour, sometimes called firsts; second, or household bread, made of flour somewhat coarser, called seconds; and brown bread, made of flour called thirds, and sometimes of flour of various degrees coarser than thirds. The coarseness or fineness of flour (supposing the wheat of the same quality) depends upon the dressing, or the separating of the flour from the husks of the wheat, after it has been reduced to a powder. The finest flour is entirely separated from the bran or husks—the other description not entirely so, but the broad bran is removed from the coarsest flour. The writers in many of our celebrated Encyclopædias say, that “our household bread is made of the whole substance of the grain, without the separation of either the finest flour or the coarsest bran.” This is a mistake altogether.

In making pure wheaten loaf bread, no other ingredients should be employed but flour, water, yeast, or some other innocent fermenting matter. Various other ingredients are used, principally by those engaged in making bread for sale. The London bakers employ alum, for the purpose of making the bread whiter, &c. Home-baked bread is never so white, even when made from the same flour, as that produced by the public baker; but of this we shall speak when we come to describe the methods of bread-making used by public bakers; at present we shall confine ourselves to bread as made in families for daily use.

The goodness of bread, whether baked at home or abroad, will depend, firstly, upon the quality of the flour employed; secondly, upon the quality of the yeast; and, thirdly, upon the skill and care of the baker. The process of baking, though simple enough, requires some experience on the part of him or her who may undertake to perform it. We need scarcely say, that experience is only to be acquired in one way, and that way is too obvious to need pointing out. To judge

of flour, experience is also necessary; but any one may form a pretty accurate idea whether it is good or bad, by attending to the following directions:—If flour is of a fine white colour, it may be pronounced good, so far as colour is concerned; but if it be brown, it shows that either it was made from bad wheat, or that it has been coarsely dressed—that is, particles of bran, more or less fine, have been left in it. Brown flour, however, may be of a good, sound quality, and fine white flour not so. To judge of flour, take a portion in your hand and press it firmly between your thumb and fore-finger, at the same time rubbing it gently, for the purpose of making a level surface upon the flour. By this means you will be able to ascertain the colour, by observing the pressed and smooth surface; and the act of pressing and smoothing it, will enable you to ascertain these facts. If it feel loose and lively in the hand, it is of good quality; if on the contrary it feels dead or damp, or in other words clammy, it is decidedly bad.

Flour ought to be a few weeks old before it is used; but it will keep good much longer, if kept in a dry place covered over. But it is, perhaps, better to trust to your miller or mealman, who, if you are a good and constant customer, will take care to serve you with good flour for his own sake; for if he employs any tricks, he is sure to be discovered when the bread comes out of the oven.

It has been found by analysis, that wheat flour consists of three principal substances, namely, starch, gluten, and sugar, and a very small portion of albumen; of these, the starch is the most nourishing as food. The gluten resembles animal glue in its tenacious qualities; and its smell, when subjected to a strong heat, is fetid, like burning horn or feathers. It will not ferment in warm water and yeast, but like a piece of flesh will become putrid. Mr. Edlin says, that “this substance is totally different from vegetable matter, but rather resembling animal.” The gluten in wheat-flour is the cause of its forming an adhesive paste with water, and of its rising in leaven.

Starch forms the most considerable part of wheat-flour, and there is reason to believe, from so many persons subsisting on potatoes, which contain much starch and no gluten, that it is the most nutritious; but starch cannot be made into bread, because it wants the mucilaginous gluten to give it tenacity, and the saccharine matter, or sugar, to induce fermentation.

From experiments made by Mr. Edlin, it appears that a pound of wheat contains three ounces of bran, ten ounces of starch, six drachms of gluten, and two drachms of sugar; which, with the loss of two ounces in grinding and reducing the flour to starch, make one pound, or sixteen ounces. From this it appears that he did not discover the albumen, which M. Seguin considers the fermenting principle.

Mr. Edlin also ascertained by experiment, that starch, isinglass, and sugar, mixed in proper quantities, and fermented with yeast, will make a light and porous bread.

Flour-paste may be considered as merely a viscid and elastic tissue, the interstices of which are filled with starch, albumen, and sugar. We know that it is from the gluten that the dough derives its property of rising on the admixture of leaven; the leaven acting on the sweet principle of the wheat, gives rise in succession to the vinous and acetous fermentation, and of consequence to alcohol, acetic, and carbonic acids. The latter gas tends to fly off, but the gluten resists its disengagement, expands like a membrane—forms a multitude of little cavities, which give lightness and sponginess to the bread.

To judge of good yeast, no positive directions can be given. Yeast should always be fresh, and if made from table ale it is better, because less bitter than that made from very strong ale. If the yeast is sour, the dough will not rise. Originally what is called leaven was uniformly employed, and it is now sometimes used as a substitute for yeast. Those who use it, keep a pound or more dough from baking to baking. It is kept in a wooden barrel, or bowl, covered with flour. Before it is fit to use, it must be both stale and sour. Bread made in this way is said to be more digestible, but it is not so pleasant to the taste. Leaven is now only used at sea.

A good oven is necessary for the production of good bread. If the oven be heated, as in country places, by dry wood, furze, or fern, burnt in the oven itself, it ought to be built round, not long, as there will be in the former case a greater equality of heat. The roof should be from twenty inches to two feet high in the centre; the mouth no larger than will be sufficient to admit the bread. But many people who make their own bread send it to be baked at the baker's. We have seen good ovens attached to a stove, and heated by the kitchen fire. These are not sufficiently capacious to contain loaves enough for the consumption of a large family, but they answer the purpose of a small family very well. To save room, it will be necessary, in stove ovens, to bake in tins. Bread thus baked is much more smooth and neat than when baked in the ordinary way; but the pleasant crispness of the crust is wanting.

The ovens used in London and some other large towns are, for the most part, heated by a furnace placed on one side. The heat in these ovens is very equable, and the baker is enabled to keep it up at all times with very little trouble, and with less expense than by the old method.

#### FAMILY LOAF-BREAD.

Under this head we shall give directions for making bread of wheat flour only. The manufacturing of barley flour, rye flour, and a mixture of different kinds of flours, with or without the addition of various other nutritive substances, &c., into bread, will be treated of hereafter.

*Family or Home-Baked Bread.*—An expeditious and simple method

of making bread for a small family is as follows:—Take half a bushel of flour; put all this flour excepting about four pounds into a tub or pan, and in winter place it before the fire to warm. Mix six ounces or half a pound of powdered salt with the flour—but it would be better to work the salt in with the dough. Then take a pint of good fresh yeast, and well mix it with a sufficient quantity of blood-warm water. Make a deep hole in the middle of the flour;—pour the water and yeast gradually into the hole of the flour, mixing the water and flour with your hands till both become well incorporated. Cover this mixture up, and place it near the fire till it has well risen, that is to say, fermented. Then work the other flour into it with your fists, till it becomes a nice, smooth, tough dough. Make this dough into loaves, and bake in an oven properly heated: if too hot, your bread will be burnt outside, and not done inside. It will take from an hour and a half to two hours in baking, but the bread should always remain in the oven half an hour after it has become brown; or, as it is technically called, it will not be soaked through. This is a method we have known to be used with success in many families, though not aware that it ever has been published before.

For large bakings, the following method is best:—

The common way is to put the flour into a trough, tub, or pan, sufficiently large to permit its swelling to three times the size it at present occupies. Make a deep hole in the middle of the flour. For half a bushel of flour take a pint of thick fresh yeast—that is, yeast not frothy—mix it with about a pint of soft water made blood-warm. The water must not be hot. Then gently mix with the yeast and water as much flour as will bring it to the consistence of a thick or stiff batter—pour this mixture into the hole in the flour, and cover it by sprinkling it over with flour—lay over it a flannel or sack, and in cold weather place it near, not too near, the fire. This is called laying the sponge. When the sponge—or this mixture of water, yeast, and flour—has risen enough to crack the dry flour by which it was covered, sprinkle over the top six ounces of salt—(more or less to suit the taste): mind, the time when the salt is applied is of great importance. We have seen directions in which we are told to mix the salt with the water and yeast. The effect of this would be to prevent fermentation, or, in other words, to prevent the sponge from rising. After the salt is sprinkled over the sponge, work it with the rest of the flour, and add from time to time warm water (not hot) till the whole is sufficiently moistened; that is, scarcely as moist as pie-crust. The degree of moistness, however, which the mixture ought to possess can only be taught by experience—when the water is mixed with the composition, then work it well by pushing your fists into it—then rolling it out with your hands—folding it up again—kneading it again with your fists, till it is completely mixed, and formed into a stiff, tough, smooth substance, which is called dough—great care must be taken, that your dough be not too moist on the one hand, and on the other that every particle of flour

be thoroughly incorporated. Form your dough into a lump like a large dumpling, again cover it up, and keep it warm to rise or ferment. After it has been rising about twenty minutes, or half an hour, make the dough into loaves, first having shaken a little flour over the board to prevent sticking. The loaves may be made up in tin moulds, or if it be desired to make it into loaves to be baked without the use of moulds, divide the dough into equal parts, according to the size you wish to have your loaves—make each part into the form of a dumpling, and lay one dumpling, if we may so speak, upon another—then, the oven being properly heated, by means of an instrument called a peel, a sort of wooden shovel, put in your loaves, and immediately shut the door as close as possible. A good deal of nicety is required in properly placing the loaves in the oven—they must be put pretty closely together. The bread will take from an hour and a-half to two hours to bake properly.

*Brown or Diet Bread* is made of flour from which the coarsest flake bran only is removed. This bread is made as in the preceding directions. By boiling a pound and a-quarter of bran in a gallon of the water in which the bread is made, and then straining it, there will be an increase of one-sixth more than if mixed with plain water.

*Bread not liable to become bitter.*—This process is an invention of a Mr. Stone. He took a tea-spoonful of yeast and mixed it with three quarters of a pint of warm water. He then took a bushel or fifty-six pounds of flour, and having put it into the kneading trough, and made a hole in the middle of it large enough to contain two gallons of water, he poured in his small quantity, and took a stick and stirred it until it was as thick as a batter pudding—having covered this sponge with a sprinkling of flour, it was left to ferment for an hour, at the end of which time he took a quart more of warm water and poured in, and repeated the operation of stirring it in with more flour, and again sprinkling it with flour, when it was again left for two hours, when it will be found to have risen and broken through the flour—then add three quarts or a gallon of water, and stir in flour to the consistence of butter, and again cover it with dry flour—and in about three or four more he mixed up his dough; which done, he covered it up warm and let it stand to prove four or five hours more, when he made up his loaves and baked them. The bread was as light and as porous as if one pint of yeast had been made.

Having, as we trust, explained the process of baking as it is practised by those who adhere to its simple principles, and who employ no other ingredients than those necessary to produce good bread, we shall now proceed to describe the methods pursued by the public baker; and, at the same time, give a description of a public bake-house, and the duties of the persons employed therein.

## ARTIFICIAL YEASTS.

Previous to entering upon the subject of public baking, by which so large a portion of the people are supplied with their daily bread, it will be necessary to lay before our readers some of the various methods by which yeast is compounded. Of brewers' yeast, or the yeast of ale and beer, we have already spoken, and therefore it will be necessary again to revert to it. Several of the following directions for the preparations of yeast have been long before the public, and some of them the writer has not had an opportunity of testing by experience, but there is no reason to doubt of their efficiency; of the patent yeast, however, now pretty generally used by the public bakers, he can speak with confidence, having witnessed the whole process of making it, and experienced its perfect applicability to the manufacturing of bread. We shall first, however, treat of the mode of preserving brewers' yeast.

*Yeast to Preserve.*—Take a quantity and work it well with a whisk, till it becomes thin; then procure a wooden dish or platter, clean and dry, and with a soft brush lay a thin layer of yeast on the dish, and turn the top downwards to keep out the dust, but not the air, which is to dry it. When the first coat is dry, lay on another, and let that dry, and so continue till the quantity is sufficient; by this means, it may soon be made two or three inches thick, when it may be preserved perfectly good, in dry tin canisters, for a long time. When you use it for baking, cut a piece and lay it in warm water till it is dissolved, when it is fit for use.

*Potatoe Yeast* is made of mealy potatoes boiled thoroughly soft—they are then skinned and mashed as smooth as possible, when as much hot water should be put on them as will make a mash of the consistency of good beer yeast. Add to every pound of potatoes two ounces of treacle, and when just warm stir in for every pound of potatoes two large spoonsful of yeast. Keep it warm till it has done fermenting, and in twenty-four hours it will be fit for use. A pound of potatoes will make nearly a quart of yeast, and it is said to be equally as good as brewers' yeast.

*The following are Dr. Lettson's directions for making another Prepared Yeast.*—Thicken two quarts of water with four ounces of flour, boil it for half an hour, then sweeten it with three of brown sugar; when almost cold, pour it along with four spoonfuls of bakers' yeast into an earthen jug, deep enough for the fermentation to go on without running over; place it a day near the fire; then pour off the thin liquor from the top, shake the remainder, and close it up for use, first straining it through a sieve. To preserve it sweet, set it in a cool cellar, or hang it some depth in a well. Always keep some of this yeast to make the next quantity that is wanted.

*Artificial Yeast.*—Take two ounces of flour, boil it in a quart of

water, till it comes to the consistence of a thin jelly, pour it into a machine for impregnating water with fixed air; then put into the lower vessel some coarse powdered marble, and pour on it some sulphuric acid diluted with water. The apparatus is now to be adjusted, and the upper vessel put in its place, and nearly stopped. The fixed air now passes through the valve, and ascends into the middle and upper part of the machine, where the gas is absorbed by the flour jelly in considerable quantity; and in the course of a few hours the matter will be found so strongly impregnated, as to be in a state of fermentation. This artificial yeast may now be put into a bottle for use. The great advantage of this yeast is, that it may be made in situations where it is impossible to procure brewers' yeast. The foregoing operation need not be performed but once by the same individual, as the process may be carried on by mixing this *artificial yeast*, which was invented by the late Mr. Henry, with the preceding preparation recommended by Dr. Lettsom, which it will cause to ferment the same as brewers' yeast.

Another artificial yeast is made as follows:—Take half a pound of fine flour, the same quantity of coarse brown sugar, and a quarter of a peck of bruised malt; boil these over the fire for a quarter of an hour, in half a gallon of water, then strain the liquor through a sieve into an upright jug, and when cooled to 80 degrees of heat, add one pint of the artificial Seltzer water, or, if procurable, Seltzer water itself, or water impregnated with fixed air—the mixture will soon begin to ferment: it should then be set before the fire, and when ebullition ceases, the yeast will sink to the bottom. Pour off the clear liquor, and the yeast will be fit for use.

*Patent Yeast*, which is extensively used by the London bakers, and which is, perhaps, preferable to all other yeasts, is made as follows:—Take half a pound of hops and two pailfuls of water, mix and boil in the oven till the liquid is reduced to one pailful; strain the decoction into the seasoning tub, and when it is sufficiently cool put in half a peck of malt. In the mean time, put the hops, strained off, again into two pailfuls of water, and boil as before till they are reduced to one; strain the liquid while hot into the seasoning tub. The heat will not injuriously affect malt, previously mixed with tepid water. Boil the hops again as before, and strain off as before into the seasoning tub. When the liquor has cooled down to about blood-heat, strain off the malt, and add to the liquor two quarts of patent yeast set apart from the previous making. It ought to be observed, that brewers' yeast will not answer the purpose.\* To the malt and hops some add a little flour, but the patent yeast is quite as good without the flour, which in summer is apt to make the yeast go sour. By the

\* If this be the case, it may be fairly asked, by what means the first patent yeast was generated? The answer is, by a chemical process similar to that invented by Mr. Henry, and which we have given under the head of ARTIFICIAL YEAST.

above process five gallons of very good yeast may be made, which will be ready for use the day after it is made. It occupies in manufacturing from about seven o'clock in the morning till two or three in the afternoon; but it gives very little trouble to the baker.

## ALUM, POTATOES, &amp;c.

These ingredients are now considered indispensable by the London bakers in the manufacturing of second or household bread, that is, the bread in daily use in the metropolis. The effects of alum upon bread are not well understood; but it is generally said to bleach and act as an astringent. Accum says, that "the theory of the bleaching property of alum, as manifested in the panification (making into bread) of an inferior kind of flour, is by no means well understood; and indeed it is really surprising, that the effect should be produced by so small a quantity of that substance, two or three ounces of alum being sufficient for a sack of flour. From experiments in which I have been employed, with the assistance of skilful bakers, I am authorized to state, that without the addition of alum, it does not appear possible to make white, light, and porous bread, such as is used in this metropolis, unless the flour be of the very best quality."

Mr. A. Booth, the lecturer on Chemistry, asserts, that "alum bleaches from the attraction of alumina, one of its constituent parts, to the colouring matter of the flour, and also acts as an astringent on the bread."

If these opinions are to be relied upon, of course the question is settled, as to the indispensability of alum in making London bread. Accum asserts, that he, in conjunction with skilful bakers, has tested the thing by experiments, which prove that alum cannot be dispensed with. For our part, we are inclined to think, that the whiteness of the London bread is owing, in some degree, to the process of baking, a process widely differing from that followed by women in making home-baked bread; which, as we have elsewhere asserted, is never so white or so porous, though made of the same flour, as bakers' bread. Accum, whatever talent he might possess as a chemist, was a fraudulent writer, and therefore his assertions are not to be relied on, as to the experiments which he alleges he had made. We agree with him, however, in his observation, that "the theory of the bleaching property of alum, &c., is by no means well understood."

The quantity of alum used in baking is much less than the public generally imagine, even by the most fraudulent of cheap-bread bakers, and indeed much smaller than many of the bakers themselves imagine. This may appear a strange assertion, and it is probably one never made before in print; but a little explanation will make the point quite clear. It is well known that the bakers are liable to a heavy fine if alum is found on their premises. To avoid this liability as much as possible, they have long been in the habit of buying the

alum ready powdered at the druggists, under the appellation of *stuff*. The druggists keep this *stuff*, which the bakers imagine is unadulterated ground or powdered alum, but which is, in fact, a compound, consisting of one part alum, and three parts of muriate of soda, that is, common table salt. This compound is made by pounding the salt with the alum in a mortar, and is kept by the druggists in pound packages, which they sell at twopence each. For this statement we have the authority of several druggists, and the evidence of our own eyes. It may appear extraordinary that the bakers should suffer themselves to be so *cheated*; but be this as it may, we believe it to be the fact. It should be recollected, that few bakers are readers, particularly of scientific or medical works. In the fourth edition of Gray's supplement to the Pharmacopœia and Treatise on Pharmacology, under the head of *stuff*, this term is thus defined:—"Alum, in small crystals, one pound, common salt three pounds, to mix with flour for baking." We have the evidence of our own senses for knowing, that the respectable bakers of home or household bread do not put more than half a pound or eight ounces of *stuff* to a sack of flour; and this *stuff*, as we have shown on the authority of Gray, only contains one-fourth part, or two ounces, of alum, the remainder being common salt. Some persons, however, will ask for powdered alum, but the druggist, knowing from the quantity required and the appearance of his customer that it is wanted for baking, uniformly serves him with the before-described mixture of salt and alum. This we have frequently seen done. The object of the druggist is profit. It would be scarcely worth his while to sell powdered alum for twopence a pound. Gray, in his book, puts it down at one shilling and sixpence a pound. This is ridiculously too high to sell by the pound, but it is generally charged a penny an ounce. The writer, giving this information to his baker, he exclaimed, "You don't say so!—the infamous rogues—why the rascally druggists cheat us before we can cheat our customers!"

Such being the case, it seems almost inconceivable, that so small a quantity as two ounces of alum in two hundred and eighty pounds of flour, the weight of a sack, should have any effect in bleaching it; especially when we consider that one hundred parts of alum contain but a fraction more than ten parts of alumina, the only constituent in alum, as we are informed, that possesses the property of bleaching. Nevertheless, there can be no doubt that alum, though perhaps not by itself, yet in conjunction with other ingredients, has the effect of whitening the bread. A circumstance occurred, which we have from indisputable authority, of a baker leaving out of his dough, by accident, his usual quantity of *stuff*, containing not more than two ounces of alum. The consequence was a batch of brown bread, which he was obliged to sell at half price.

Alum, it is true, is used in small quantities—for the most part in quantities too small to affect the health, perhaps, materially; but still, as it only whitens the bread, and makes it otherwise more pleasing

to the eye, while it deteriorates its wholesomeness, and injures its flavour, one would suppose that the great majority of people would prefer home-baked bread, as it is called, or bread without alum. This, however, they do not do; and there is little probability that they ever will. The Londoners in particular do not like home-baked bread. There have been many instances of persons being induced for the sake of their health to eat it for a time, but they always return to the *alumed* bread; and we question whether there is a single baker in the metropolis who sells sufficient home-baked bread to support himself and his family.

Formerly every baker was his own mealman or miller. This is the case now in Glasgow, and in other parts of Scotland. The bakers buy their own wheat, and manufacture it into flour at their own mills, which are held by them as joint-stock proprietors.

It seems to be generally agreed, that alum in bread is detrimental to the health of those who consume it. The fact, however, is, that the bakers eat the same bread as their customers; and it appears very improbable, that there should be a set of men who knowingly poison themselves. The following is Dr. Ure's opinion upon the effects of alum eaten in bread:—

"The habitual and daily introduction of a portion of alum into the human stomach," says Dr. Ure, in his Dictionary of Chemistry, "however small, must be prejudicial to the exercise of its functions, and particularly to persons of a bilious and costive habit. And, besides, as the best sweet flour never stands in need of alum, the presence of this salt indicates an inferior and highly acescent food, which cannot fail to aggravate dyspepsia, and which may generate a calculus diathesis in the urinary organs."

To ascertain whether alum is present in bread, crumble a portion when somewhat stale into cold distilled water; then squeeze the mass through a piece of cloth, and pass the liquid through a paper filter. A limpid infusion will thus be obtained. A dilute solution of muriate of baryta, dropped into the filtered infusion, will indicate by a white cloud, more or less heavy, the presence and quantity of alum.

It is said, that to counteract the costive quality of alum, when consumed in large quantities, the bakers frequently use jalap in the composition of their bread. This we do not believe. Dr. Darwin says, that when much alum is used, it may be distinguished by the eye in the place where two loaves have stuck together in the oven: they break from each other with a much smoother surface than those which do not contain alum. We believe this to be correct;—indeed the bakers say, that this is one of their reasons for using alum.

When the statute was enacted by king John for regulating the price of bread, and during many of the subsequent statutes of assize, the baker was his own manufacturer, purchasing his own corn, and having it ground and separated into flour, pollard, and bran. According to Pownall's work on the assize of bread, which we have no

doubt is correct, this flour, or the flour from which the bran and pollard only are separated, was found, from an unvaried series of experiments made from age to age, through the course of many hundred years, to be three-fourths in weight of the whole grain of wheat, taking all sorts of wheats together; and the bread made from this flour has always been decreed the standard of the food of bread corn. But, by insensible degrees, the manufacture of bread became separated into two distinct employments. To this cause Mr. Edlin attributes the custom—the pernicious custom, as he considers it—of making bread from other flour than that we have described, which many persons assert is more wholesome and more nutritious than that made of the finest flour. The miller not considering himself liable to the assize laws, made different kinds of flour, some of which was extremely fine and white. The bread made of this flour was so very white, and pleasing to the eye and palate, that in the course of a few years it got into general use, and the people, particularly the Londoners, refused to buy the bread made of the whole of the grain, except the husks, or coarse and fine bran.

To this circumstance, perhaps, may be attributed the almost universal use of alum in bakers' bread not made of the finest flour; and very little of it is so made, for it is impossible from a second flour, which is the flour generally used, to make bread white without the employment of the bleaching properties of this ingredient.

The assize of bread has been for some time abolished, and the baker is entitled to sell his bread for as much as anybody is willing to give for it. There is very properly still a heavy penalty attached to selling bread short of weight.

Potatoes, called by the bakers *fruit*, are used by them for the purpose of aiding the fermentation, and, as they say, for the purpose of improving the appearance of the bread, and not for saving flour. Indeed, in the small quantities in which we have seen them used, not more than seven or eight pounds to two hundred and eighty pounds of flour, there can be little or nothing gained by them. Potatoes, however, as well as damaged rice, are no doubt used in large quantities by cheap, fraudulent bakers. We utterly disbelieve the stories about bakers using ground bones to adulterate bread, for this reason—namely, that the expense of making them fit for such a purpose would be much greater than the cost of flour itself.

There are instances on record of convictions having been obtained against bakers for using gypsum, chalk, and pipe-clay, in the manufacture of bread.

Carbonate of ammonia, which is sometimes used by bakers in producing light and porous bread from sour or damaged flour, does not appear to be liable to the same objections as those urged against alum; as the action of the former upon the bread is merely mechanical, no part of this salt remaining in bread after it is baked. During the operation of baking, it causes the dough to swell up into air bubbles, which carry before them stiff dough, and thus it renders the

dough porous; the salt itself is at the same time totally volatilized, and not a particle remains in the bread. Carbonate of ammonia, however, has not, like alum, the property of bleaching the bread.

It is said, that the carbonate of magnesia of the shops, when well mixed with flour in the proportion of twenty to forty grains to a pound of flour, materially improves it for the purpose of making bread. It is recommended to be employed when the flour is new, or of a bad quality. Mr. Davy, professor of Chemistry, says, that this substance must be most intimately mixed with the flour, previous to laying the sponge; and gives it as his decided opinion, that not the slightest danger can be apprehended from the use of so innocent a substance, in such small quantities as he recommends.

#### METHOD OF MAKING BAKERS' BREAD.

Having briefly described the utensils of a bakehouse, and having descanted at some length (but not longer, it is hoped, than the importance of the subject requires) upon the ingredients used by public bakers in the manufacture of bread, we shall proceed at once to show the methods they generally employ. We must observe, however, that the first method described was witnessed by Mr. Edlin nearly forty years ago; and the second, which is the mode now generally followed, has been witnessed by the writer himself in all its details.

*The Old Method.*—To make a sack of flour into bread, the baker bakes that quantity of flour, and empties it into the kneading trough—it is then carefully sifted through a wire sieve, which makes it lie lighter and reduces any lumps that may have been formed in it. The next process is to dissolve two ounces of alum, technically *stuff*, or some call it rocky, in a little water placed over the fire. This is then poured into the seasoning tub, and four or five pounds of salt are added to it, with a pailful of water pretty hot, but not too much so. When this mixture, technically *liquor*, has cooled to the temperature of about 84°, from three to four pints of yeast are mixed in it, and the whole having been strained through the seasoning sieve, is emptied into a hole made in the mass of the flour, and mixed up with a portion of it to the consistence of thick batter. Dry flour is then sprinkled over the top. This is called the *quarter sponge*, and the operation is denominated setting. The sponge must then be covered up with sacks or woollen cloths to keep it warm, if the weather be cold.

In this situation it is left three or four hours, when it gradually swells and breaks through the dry flour laid upon its surface. Another pailful of water, impregnated with alum and salt, is now added and well stirred in, and the mass sprinkled with flour and covered up as before. This is called setting *half sponge*.

The whole is then well kneaded, with about two pailful of more water, for about an hour, when the dough is cut into pieces with a knife; and to prevent it spreading, pinned or kept at one end of the