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THE KATHERINE GOLDEN BITTING
COLLECTION ON GASTRONOMY

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"Give us this day
our daily Bread"

To my dear Wife
10th July 1857
E.L.D.

THE

ENGLISH BREAD-BOOK.

"In no way, perhaps, is the progress of a nation in civilisation more unequivocally shown, than in the improvement which it realises in the food of the community."

THE

ENGLISH BREAD-BOOK

FOR DOMESTIC USE,

ADAPTED TO

FAMILIES OF EVERY GRADE:

CONTAINING THE

PLAINEST AND MOST MINUTE INSTRUCTIONS TO THE LEARNER;

PRACTICAL RECEIPTS

FOR MANY VARIETIES OF BREAD;

WITH

NOTICES OF THE PRESENT SYSTEM OF ADULTERATION,

AND ITS CONSEQUENCES;

AND OF THE

IMPROVED BAKING PROCESSES AND INSTITUTIONS

ESTABLISHED ABROAD.

BY

ELIZA ACTON,

AUTHOR OF "MODERN COOKERY."

LONDON:

LONGMAN, BROWN, GREEN, LONGMANS, & ROBERTS.

1857.

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PREFACE.

BREAD is a first necessity of life to the great mass of the English people; being in part the food of all—the chief food of many—and almost the sole food of many more. Everything, therefore, which relates to its consumption or economy is of real importance to us; and it might naturally be supposed that the art of preparing it *well, wholesomely,* and *without waste,* would be an object of peculiar household interest in families of every degree throughout the kingdom; and that a familiar and complete acquaintance with its details would be considered absolutely indispensable in the practical domestic education of all classes to whom it is likely ever to prove useful. Unfortunately, however, this is not the case; and the present volume has been written with a hope that it might attract some slight attention to

the subject, and assist in removing the host of obstacles which seem so unaccountably opposed to our having really good bread made in our own homes;—obstacles, for which there is, in general, no rational foundation nor excuse, and which a little well-directed effort and energy would easily overcome.

A very exaggerated idea of the difficulty and trouble of bread-making prevails amongst persons who are entirely ignorant of the process. The instructions for it contained in the following pages, will, at least, serve to show how simple and how facile the operation is; and if they should prove sufficient to aid the reader effectually in becoming independent of the industry and skill of others, for the preparation of the most valuable portion of our daily food, the great aim of the author will be attained.

May, 1857.

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THE

ENGLISH BREAD-BOOK.

PART I.

CHAPTER I.

Bread.—Its value.—Its wholesomeness.—Its faulty fabrication here.—The waste of it.—The necessity for a more general knowledge of the mode of preparing it.—The Bread-trade of France.

A COUNTRY which possesses the agricultural and commercial advantages that England does, ought to be celebrated at least for the purity and excellence of its bread, instead of being noted as it is, both at home and abroad, for its want of genuineness, and the faulty mode of its preparation. The production of the corn from which it is made is an object here of earnest and unceasing solicitude to cultivators of every class; and all that energy, intelligence, and lavish expenditure can do for its improvement, is freely done; but the fabrication

of the bread itself,—by which its value as human food is so materially affected,—is treated almost with neglect. It is not easy to account for this; for it is by far the most precious aliment that we possess, being indeed the very "staff" of man's strength and "life," and adapted equally to persons of all ranks and of all ages. It is in daily demand for millions of consumers, many of whom consider themselves fortunate if they can but procure a sufficiency of it to satisfy the cravings of their hunger, and who seek for little else. It may be further said, that, from its peculiarly pleasant flavour, it never palls on the palate as stronger and coarser diet often will, but becomes more and more a requirement of nature the longer it is subsisted on; and when in times of scarcity the people are compelled by its high price to have recourse to any substitutes for it of smaller cost which they can obtain, it will be seen that, as soon as the pressure is removed, they return always with renewed zest and thankfulness to *bread*. Their preference for it, when it does not exceed certain limits, and lead to a prejudiced and absolute rejection of the cheaper varieties of wholesome food which they might use in part, and in turn with it, is a proof of their just discernment of what is best suited to their need; but it happens unfortunately, from the ignorance which prevails amongst them of the art of preparing it well and frugally for

themselves, and from its passing, in some form or other, through many intermediate hands after it leaves the grower, before it reaches them, and being taxed, though perhaps not unfairly, for the profit of each separate agent, they obtain it often only at the dearest rate. It is no unusual circumstance for the entire earnings of a poor hard-working man to be expended upon *bread only*, for himself and family, without their being nourished as they really ought to be, even then. The usages and abuses of the bread-trade—of which I find myself compelled to speak, though I do it with the utmost unwillingness—tend in a measure to augment this misery, which it might sensibly relieve if its operations were conducted on the principles of sound reason and strict integrity, by saving the *time* of those whose lot it is to labour incessantly for the means of existence; for it is a precious commodity to them,—a fact which philanthropic theorists do not always keep sufficiently in view when they are suggesting economical plans for bettering their domestic condition. As it is now fabricated, however, the bread prepared for sale by the trade is, from the mode of fermentation adopted for it, so unsubstantial as not easily to satisfy the keen appetites of those who are engaged in daily active toil,—often in the open air; and it so quickly becomes dry and unpalatable that they are tempted, not unnaturally,

to the wastefulness of eating it always new. This is a great drawback on their insufficient means; but when, in addition to it, they have to contend against its adulteration and a deficiency of its weight also, their lot becomes one of severe hardship and struggle. What can be done for its improvement? is the question which naturally arises here. Much, by having the bread which they purchase of genuine and strength-sustaining quality; much more, by affording them the means of having it made as it ought to be in their own homes. For the first, there must be effectual changes or a thorough reform in the bread trade; and for the second alternative, such true practical education must be given to the female children, and *to the women* of the working orders, and such domestic appliances* furnished to their dwellings, as shall suffice for the purpose. Mr. Cobbett, in his "Cottage Economy," — a work possibly now out of print, but portions of which will always be valuable for their clearness and sound sense,— puts thus forcibly before the labourer the different facts connected with the present subject:—"As I have before stated, sixty pounds of wheat, that is to say, where the Winchester bushel weighs sixty pounds, will make sixty-five pounds of bread, be-

* As I have said in another part of this volume, not only are there no ovens in vast numbers of our cottages, but many a small village is entirely without one.

sides the leaving of ten pounds of bran. This is household bread, made of flour from which the bran only is taken. If you make fine flour you take out pollard, as they call it, as well as bran, and then you have a smaller quantity of bread; but even of this bread, equal in fineness to baker's bread, you get from *fifty-eight* to *fifty-nine* pounds out of the bushel of wheat, supposing it to be of fine flour in the first place. You get thirteen quartern loaves and a half. These cost you, at the present average price of wheat, seven and sixpence a bushel; then three-pence for yeast; then not more than three-pence for grinding, because you have about thirteen pounds of offal*, which is worth more than a halfpenny the pound, while the grinding is nine-pence the bushel. Thus, then, the bushel of bread of fifty-nine pounds costs you *eight shillings*, and it yields you the weight of thirteen and a half quartern loaves. These quartern loaves now (1821) sell at Kensington at the baker's shop, at one shilling and a penny; that is to say, the thirteen quartern loaves and a half cost fourteen shillings and seven-pence halfpenny. The baker's quartern loaf is indeed cheaper in the country than at Kensington, by probably a penny in the loaf, which would still, however, leave a saving of five shillings upon the bushel of bread.

* We should not in these days of advanced science, give this name to *bran* and *pollard*.

But, besides this, pray think a little of the ingredients of which the baker's loaf is composed,— the *alum*, the *ground potatoes*, and other materials. It is probable that out of a bushel of wheat they make between *sixty* and *seventy* pounds of bread, though they have no more flour, and, of course, no more nutritious matter, than you have in your fifty-nine pounds of bread. Even supposing their bread to be as good as yours in quality, you have, allowing four-pence for salt and a shilling for heating the oven [both these expences would not now (1856) amount, at the *utmost*, to more than eight or nine-pence, seldom to more than six-pence], a clear four shillings saved upon every bushel of bread. If you consume half a bushel a week, this is a saving of *five pounds four shillings* a year, full a sixth part, if not a fifth, of the earnings of a labourer in husbandry.

How wasteful then, and indeed how shameful, for a labourer's wife to go to the baker's shop; and how negligent, how criminally careless of the welfare of his family must the labourer be, who permits so *scandalous* * a use of the proceeds of

* Mr. Cobbett, in his wish to impress forcibly on the minds of his readers the facts he set forth, is sometimes rather more vehement in his expressions than the occasion seems altogether to demand. It is improvident and imprudent of the labourer to send to the bread-shop; but he has not always a free choice in the matter.

his labour." . . . . "As to the art of making bread, *it would be shocking indeed if that had to be taught by the means of books. Every woman, high or low, ought to know how to make bread;* if she do not she is a mere burthen upon the community. Yet it is but too true, that many women, even amongst those who get their living by their labour, know nothing of the making of bread; and seem to understand little more about it than the part which belongs to its consumption. Many women in England seem to know no more of the constituent parts of a loaf than they know of those of the moon. Servant women in abundance appear to think that loaves, made by the baker, are things of their pure creation—things, too, in which no one else can participate. Now, is not this an enormous evil? Servant women are the children of the labouring classes; and they would all know how to make bread, if they had been fed on bread of their own and their mother's making."

The ignorance of which Mr. Cobbett speaks as prevailing so generally in *his* time is, strangely enough, when our vaunted "progress" is considered, more than ever perceptible at the present day,—when a better state of things might naturally be expected from us; and it is often less easy to obtain, at any price, a loaf of really good home-made bread in an English household, than the rarest foreign dainty, the servants knowing nothing

of the process of preparing it*, and their mistresses being unable to direct them. The result is, frequently, an amount of inconvenience, discomfort, and (to persons not in health) of *suffering* also, which could scarcely be credited unless they were personally experienced.

It is sincerely to be hoped that more rational training and true enlightenment will soon remove this domestic grievance from us; and that we may altogether cease to deserve the reproach of being unable *to make bread for ourselves;* and that the IMMENSE loss which now arises from constant failure, where its preparation is attempted without due skill or experience, may be totally avoided for the future. *The portion of excellent corn wasted yearly in England from this cause only, would abundantly nourish some thousands of its half-starving inhabitants.*

Is it not then an imperative duty, for all who have power to assist in the work, to exert their

* If the first question to a cook, on her application for a place, or to a general servant professing to cook "in a plain way," were, "CAN YOU MAKE GOOD BREAD?" and her services were invariably rejected if she could not do so, there would soon be infinite improvement seen in this respect. Many modern cooks seem to think themselves absolutely *aggrieved* when they are required to perform this part of their duty, and assert, with an offended air, that they did not *engage to do it when they were hired!*"

best efforts for an entire suppression of this crying injustice towards those whom *it helps to deprive of necessary food?* Surely it will appear so to every really thoughtful and feeling mind! But it may be said in reply,—and it *will*, by many persons who do not penetrate beyond the surface of things, and are well content to take them quietly as they are, so long as their own tastes and convenience are entirely suited,—Why should this loss be risked, or any trouble incurred, when both may be avoided by procuring bread at once from the bakers, where it can always be had good?

The reasons why the bread of the shops, however excellent of its kind, is unadapted to the labouring classes and to the needy, have already been sufficiently explained. Others, equally potent, render it positively injurious often to invalids,—putting quite aside all question of its not being thoroughly genuine; while families who, through their whole lives, have been supplied with sweet, pure, well-baked, household bread, can seldom or ever reconcile themselves to any other; nor escape impaired health when deprived of it. It cannot be disputed that the bakers have all the advantage which the expertness derived from constant practice of the details of their business can give them; and that the form, colour, and lightness of their bread are well calculated to please the eye; indeed, from the delicate texture and attractive

appearance of the small fanciful loaves, habitually furnished by first-class bakers to aristocratic tables, and made in what is considered *perfection* by the eaters, it is sometimes difficult to convince persons of rank and influence that there is any foundation for the complaints which occasionally reach them of the mal-practices of the trade. And, after all, to them it is not a matter of vital importance whether the small portion of bread which they consume, amidst the abounding variety of their richer fare, be of indisputable genuineness or not. The grievous wrong of gross adulteration and of short weight falls the most oppressively on the very poor—often on those who are surrounded by half-famished children, for whom their utmost efforts can scarcely procure the means of life.*

To foreigners, it may be observed, the want of good bread in England is known to be a source of severe privation; the best which they can purchase here—from its totally different character to all they have been accustomed to—often disagreeing with them extremely, and failing, when it does not derange the digestive organs, to satisfy the appetite like that which is more wholesomely

* It unfortunately happens that the very poor are frequently compelled by circumstances to buy their bread of the lowest and most unscrupulous order of bakers, by some of whom, it is to be feared, they are cheated without mercy.

prepared. As a general rule, they prefer infinitely the brown bread of our shops to the white. Probably, as the same motives do not exist for mixing alum with it, they find it less prejudicial to them.

In France almost from time immemorial the operations of the bread-trade have been considered as far too important to be entrusted to the control of private companies, or to that of individuals, and they have been regulated by especial and stringent laws emanating from the government. Some curious and interesting particulars of these may be gathered from two able articles on the *Boulangerie de Paris,* which appeared in the *Journal des Débats* of January 6, and in that of January 27, 1855; in which it is shown that the first edict relating to the company of bakers is of the remote date of 630, and speaks of the proprietors of the mills on the banks of the river (the Seine, probably), who ground corn for their customers and even converted it into bread for such of them as did not like the trouble of having it made in their own homes. In the reign of the emperor Charlemagne, A. D. 800, another edict was issued, enjoining the provincial authorities to take heed that the appointed number of the *tameliers,* as these miller-bakers were called, was kept properly filled up "*by well conducted men,*" and that the places where they exercised their trade were maintained in good condition. From this time until the

reign of Philip-Augustus the Paris company of bakers enjoyed no very high degree of importance, the greater number of the inhabitants making their own bread, and having it baked in the public ovens* belonging to the great nobles; but the extension given to the capital in the thirteenth century by Philip the Fourth imparted a new impulse to the bread-trade, and caused the number of those who followed it to be augmented. A distinction was then established between the bakers of the city (or royal domain) and those of the suburbs; and the king bestowed many privileges on the former, to the entire exclusion of all others.

In these days of free trade and of independent action, we read almost with astonishment of the entire monopoly of any branch of commerce by a government; and of such regulations as the following being enforced in a country which has been one of the foremost in taking the lead in *what is called* civilisation:—"It was forbidden to the factors (or suburban bakers) to bring their bread into the city, except on the Saturday, which was the market day; but these factors could, in conjunction with the bakers of Paris, and to the entire exclusion of the country factors, sell on the Sunday, in the space between *Nôtre Dame*

* *Les fours banaux.*

and the church of St. Christopher, the bread which remained on their hands when the Saturday's market was over. This was permitted for the benefit of the poorer classes, who bought the stale bread at a low price, the sellers being obliged to leave after sunset *with empty hands*. The organisation of various trade-companies being completed under St. Louis, Etienne Boileau confirmed the regulations of the Parisian confraternity of bakers. The feudal ovens were gradually abolished; the bakers were exempted from military service; and the king's bread-purveyor (or bread-controller) was invested with complete jurisdiction over them. This office of bread-purveyor was created by Philip the Fourth; but under Philip-le-Long the title of grand bread-purveyor of France was assumed by the *Panetier du Roi**, and the function became subsequently one of the great offices of the crown, which was filled successively by members of the Montmorency, de Mailly, and Chabannes families. From the time of Henry the Second to that of Louis the Fourteenth it remained with the house of Cossé-Brissac.

To punish the bakers for their excesses in the

* *Panetier du Roi*, bread-steward, bread-purveyor, or bread-controller, whose office was to regulate the distribution of bread in the royal household, and who had supreme authority over all the bakers of the kingdom.

conflicts which arose from their resistance to the royal bread-controller and the provost of Paris, Philip-le-Bel annulled their privileges, and permitted all the inhabitants to make and to *sell* bread, and allowed the factors to bring it into the market on all the week-days, in addition to the Saturdays, to which they had been restricted under Philip-Augustus and St. Louis.

The lieutenant of the *Grand Panetier*, assisted by four jurymen, and a police-sergeant of *Châtelet*, visited from time to time the stalls of the bakers. If the bread were under weight, that is to say, if the larger proportion of loaves were so, the whole was confiscated for the benefit of the poor; a fine also was inflicted on the culprits, whose shops were closed until it was paid, and it was forbidden to give employment during the interim to their journeymen.

The charter of the company of bakers having been renewed, they were again guilty of such flagrant misdemeanors in their encounters with the bakers of the suburbs, that Charles V. issued letters patent addressed to the provost of Paris, 1366, to put an end to them. These letters decreed, that the factors (or suburban bakers) should be allowed to bring their bread into Paris for *sale only on the regular market days, and to sell it only in the market place;* moreover, *that all the loaves vended by them should be of the same weight, the*

same form, and made with flour of the same quality; and that their price should be three-pence or six-pence (2 et 4 deniers, or 30c. to 60c.*), *and never more.* In addition, the factors were obliged to sell them in person, or through the agency of their wives, children, or servants, and could not dispose of them wholesale to the retail dealers! *Once deposited in the market, too, they could not carry their bread out of it again; but* (as they were obliged to leave it early) *were necessitated to part with it at any price they could get.*

Still the factors did not give themselves up as vanquished; they made every endeavour to take their bread into Paris on the forbidden days; in consequence of which, a new act of Parliament again prohibited the sale of their bread on any other than the market days, but gave permission for them to deliver it *on those days* at the doors of such of their customers as had ordered it. This was a source of what were considered as fresh abuses, for the factors sold the bread from their carts as they went along, to any buyers who presented themselves; and it was impossible for the regular inspectors (*maîtres jurés*) to examine their loaves. "These disorders were therefore repressed by further edicts."

But if the bakers of the suburbs appear to us to

* Thirty to sixty centimes.

have been subjected to somewhat arbitrary laws, those of the city, with all their privileges, were not exempt from an equally rigid control.

They were restricted in the quantity of corn which they could purchase at each market, and incurred the penalty of its forfeiture, and that of a fine also, of eight hundred francs, if they exceeded it. They were constrained to have four different kinds of bread always on sale, and to have it all stamped with a mark by which the maker might be known; and likewise to have their carts, windows, and bake-offices, furnished with scales and legal weights. They were not allowed to wear arms, "neither swords, daggers, nor other offensive weapons;" nor to wear "hats, boots, or cloaks, except on Sundays and fête-days, and then *no other than grey or white cloaks, on pain of imprisonment, corporeal punishment, and confiscation of the said garments.*"

In 1757, some fresh enactments with regard to them were confirmed and registered in the Parliament. By these it was decided that it was necessary to be twenty-two years of age to become a master-baker; *to be a man of "good moral conduct, and free from all contagious disease* *; to be of the Roman Catholic religion; and to be able to fabricate, in perfection, different kinds of paste and

* These clauses are worthy of application in every country.

bread." *No baker could have a partner, nor more* than one shop; and no apprentice, when setting up in business for himself, could fix his residence within two streets of his master. In 1783, a slight change was made in the preceding regulations, which fixed the age at which the baker could exercise his trade on his own account at twenty-five years, instead of twenty-two; and secured to the Parisian bakers the exclusive privilege of making the finer kinds of white bread, leaving to those of the suburbs permission for a coarser sort only.

During the consulship of Napoleon, the organisation of the *Boulangerie Parisienne* underwent some changes and modifications. *One provision* of a new act which related to it was, that "*no person could exercise the trade of a baker without the permission of the Prefect of Police; and no baker could quit his business without having given six months previous notice to the proper authorities.**

In 1817, the price and the weight of bread were fixed by a new regulation emanating from the government of that epoch, which, at the same time, forbade the bakers *to sell flour;* and the police were ordered to maintain an active *surveillance* to

* "*Nul ne peut exercer la profession de boulanger sans permission du préfet du police; interdiction est faite aux boulangers de quitter leur profession avant d'avoir prévenu l'autorité six mois d'avance.*"

prevent their doing so, that the supplies of corn deposited for the fabrication of bread, might be strictly appropriated to that purpose only.

In 1828, some indulgences were granted to the trade: "the bakers, who were formerly obliged to sell their bread in person, were thenceforth permitted to do so through confidential agents; and (an innovation well worthy of remark)—after all the restrictions again and again confirmed, and which dated from the 13th century, the bread which remained on hand at the close of the markets, was allowed to be carried away by the factors, instead of being sold, as it had been until that period, for any price that could be obtained for it.

Under every succeeding government *some* alteration has been made in the baking and bread-laws of France; but many of these would possess but slight interest probably for the generality of English readers. The abstract given above will serve to show the high degree of importance attached in that country to everything appertaining to the baking-trade, and the sort of *dignity* even with which it has been invested. At the present day, great progress, as will be shown in another part of this volume, has recently been made there in the mode of fabricating bread, an example which, it is to be hoped, will speedily be followed in this country, where a better system is so much needed.

The number of bakers in Paris is now limited

to 601. "If we cross the Channel," says the article from which we quote, "and compare the organisation of the baking-business of Paris with that of London, we shall find that in the English metropolis, where trade is free, there were, in 1851, for a population of nearly 2,300,000 inhabitants, 2286 bakers, being 1 for every 1500 persons; and as in London the average consumption of bread is only 375 grammes* for each inhabitant, while in France it is 500 grammes, it may be concluded that the English baking-trade works under less advantageous auspices than those which have just been guaranteed to our own capital."

There are many other particulars given in these articles, both of the past and present laws, by which the bread-trade of Paris is regulated; of the amount of security which is required from the bakers; and that of the supply of flour which they are compelled to keep in store for provisioning the metropolis; but as these affect the interests of that one city only, they are omitted here, at least for the present.

* An ounce contains *thirty grammes.*

CHAPTER II.

ADULTERATION OF BREAD AND ITS CONSEQUENCES.

Government Investigation of Commercial Frauds.—Beautiful Adaptation of *pure* Bread to the Wants of Man.—Grievous social Wrong of Adulteration.—Power of the English People to redress it, in a calm and equitable Spirit.—Chemical and Medical Testimony to the injurious Effects of Alum.—Punishment in France for Bread-Frauds.

THE adulteration of bread with alum and other deleterious substances, has lately excited the serious attention of the public and of the government, and caused searching investigation to be made as to the extent of this fraudulent practice. The result has not been satisfactory, but has thrown great discredit, without doubt, on one or two branches of English trade, which, above all others, ought to be secure from such abuse. It is indeed a grave social offence to vitiate *any* part of the daily food of a nation, but especially that which, from its inestimable value to us, has been not inaptly named in a neighbouring country "*the blessing of Heaven;*"* and no plausibilities can ever justify or palliate it; nor will any right think-

* "*La bénédiction de Dieu.*"

ing man be induced by the love of gain, or deference to the conventionalities of his craft, to join in an offence so serious in its nature and in its results. All that has hitherto been pleaded in its defence, by those who are personally interested in the question, seems worse than trivial when urged in relation to such a subject. The facts of the case are plainly and simply these:—The earth yields us—thanks to a beneficent Providence!—abundant food of the purest character, exquisitely adapted, if we use it rightly, to the healthful maintenance of human life; and we are assured, on high scientific authority, that it is so tampered with in its preparation for sale, as to become a positive vehicle of diseases of a most painful nature. It appears indeed wonderful, that the habitual falsification of anything which is of such inestimable importance to us, should ever have been tolerated by the public; and, still more so, that it should have been continued to the present moment; but, like all else of fraud and of wrong, this evil will gradually give way, without doubt, to quiet but determined resistance. Let it be at once distinctly known and felt that the English people insist on being supplied with bread of genuine quality, and *they will have it*. They can effect—and with the utmost gentleness, if they will—any reform of the kind on which they are seriously resolved; and they cannot better exercise this power than in

putting an end to the gross injustice which compels them to pay a heavy price for food that, not only fails to afford them the nourishment they ought to derive from it, but inflicts on them formidable injuries as well; yet even to obtain a great good, a calm and equitable spirit should be exercised. To strive for the right, *from a love of the right*, is noble; but violent and indiscriminate attacks on a whole body of men, for real or supposed offences, are calculated rather to excite vehement reprisals, bitterness, and prolonged contention, than to obtain any benefit whatever; and certainly it would be unfair in the extreme to charge on the present generation of bakers all the faults of a system *which they did not originate*, but to the usages of which they served their apprenticeship, and which they continue to follow, in many instances, it is not to be doubted, without any really dishonest intentions towards their customers, or a thought of the mischief which they occasion. Amongst them, too, are men of unquestionable probity, who, taking no part in the frauds of their trade, may well feel themselves aggrieved at being included in the strictures directed against them. Still, when these exceptional cases have received all just consideration, there will remain a large amount of abuse to be remedied; but as it is always best to do freely and voluntarily what it has become evident *must* be done for the satisfac-

tion of nearly a whole people, the bakers will possibly perceive the desirableness of carrying into effect the reforms demanded of them by public opinion, without further agitation of the subject.

There is one point on which many of the bakers (and the millers also) decidedly err. They venture to deny that alum can affect the health in the way which medical men assert that it does. Now, as their education generally does not qualify them to form an opinion worthy of respect upon the subject*, it is unwise of them to make such an assertion. The *excessively astringent* nature of alum —which a particle laid on the tongue will, in a moment, render evident to the most incredulous person—must unavoidably have a very detrimental effect when it is taken, day by day, even in a minute proportion, on constitutions which are not unusually robust. And what are the objects for which it is intermingled with bread?—To give a deceptive appearance of superior quality, and so enable the vender to exact the highest price for that which is made with second or third-rate flour, and which ought to be sold much cheaper?

* From the laborious and exhausting nature of their occupation, which is carried on through the night as well as in the day, the bakers, as a class, have perhaps less opportunity for self-improvement than the members of other trades. They seek naturally too for some slight relaxation, when they have a little cessation of their toil.

Or, to cause it to imbibe such an extra quantity of water in its fabrication as shall add considerably to its weight, and so increase the profits of the maker? These are stated, on the best authority, to be the effects produced by it to the advantage of the trade. It will be seen that all the *disadvantages* fall to the lot of the consumers.

In his "*Dictionary of Chemistry*," published more than thirty years since, Dr. Ure says: "The habitual and daily introduction of a portion of alum, *however small*, into the stomach, must be prejudicial to the exercise of its functions, particularly to persons of a bilious or costive habit; and as the best sweet flour never stands in need of it, the presence of this salt indicates an inferior and highly ascescent food, which cannot fail to aggravate dyspepsia, and which may generate also *serious calculous disorders*. I have made many experiments on bread, and found the proportion of alum in it very variable. *Its quantity seems proportional to the badness of the flour.*" Amongst the disorders to which it gives rise, he mentions, "acidity of stomach, heartburn, headaches, and palpitations;" and he instances others of a more acutely painful and dangerous character.

All that Dr. Ure has stated here has recently received the fullest confirmation in the evidence given before the Committee of the House of Commons, appointed to examine into the general ques-

tion of the falsification of food and drugs*, now so common in this country. The combined testimony of medical men and of excellent practical chemists has proved beyond the possibility of dispute, the *fact* of the almost universal adulteration of many articles of our daily food, and of the medicines on which we depend for the restoration of health. It may well be called a *cruel* system, tending as it does to destroy the strength of the strong, and to shorten the lives of the weak and delicate, by converting what in its genuine state would be wholesome nutriment, into diet which is destructive to the unconscious eaters.

From the mass of evidence elicited by the Government Committee, a long array of facts might be selected in proof of the *reality* and magnitude of the evil which it was appointed to investigate, and of the necessity for some energetic measures for its suppression; but I confine myself to a short extract or two, bearing more immediately on the subject of bread and flour.

Dr. Challis, a physician, residing in Bermondsey, said that "he had had some experience

* The adulteration of drugs appears almost more unpardonable than any other, depriving, in many cases, the sick and dying of the relief which they might derive from them. When epidemics are prevalent, the most fatal consequences may ensue from the *deterioration* of what *ought* to be prompt remedies for them.

in that district on the subject of adulteration. In the first place, the adulteration of bread was most extensively practised, even by the best bakers, who had admitted to him that they used twelve ounces of alum to a hundred and forty loaves,—a quantity most injurious to the health of all classes, *more especially of the poor*, as, owing to many causes, their stomachs were unable to digest it as well as others. He totally disagreed with the statement which had been made, that the constitution of the alum was so changed during the process of baking, as to be rendered innoxious. The heat required to bake the bread would not be sufficient to cause the change; and he had himself found crystals of alum in bread. As a medical man he was of opinion, that alum would affect the teeth and gums, and more especially the mucous membrane of children, producing at one time constipation, and at another relaxation." But this is nothing compared with the substance of the following testimony of Mr. F. Crace Calvert, which appeared in the "Times," within two or three days of the preceding report. "Mr. Calvert, *professor of chemistry* at the Royal Institution, Manchester, stated,—that he had frequently been called upon to examine into cases of adulteration of food and drugs. With respect to flour, his experience was chiefly derived from articles supplied to several Unions in Lancashire. He had found the wheat-

flour to be adulterated with potato-starch, and flour of maize, to the amount sometimes of *seventy-four per cent.;* and not only was there this admixture, but frequently *the flour was unsound!* It was often the practice to buy wet or damaged flour at Liverpool, and, after it had been kiln-dried, to mix it with a portion of good flour, *and to sell it as such!*"

There is no need for comment upon facts like these! So almost incredible do they appear, that one is tempted to ask if indeed they can occur in a land so boastful of its pre-eminent civilisation as ours; and where the interests of the meanest subject are said to be *protected* as strictly as those of the highest class. Happily, such instances of flagrant injustice towards the poorest of the poor must be very limited, or exposure and redress could scarcely fail to follow them. It has been often said by the advocates of the bakers, that they are not the chief adulterators of the bread they sell, but that the *flour* they purchase is largely mingled with alum, and further falsified with *rice-flour* and other ingredients. If this be so, it reaches the public through a succession of inimical agencies.

Formerly in France, when the infliction of heavy fines proved insufficient to prevent dishonest practices on the part of the bakers, the following modes of punishment were resorted to. In one or

two instances, if not more, the offenders were condemned to be "whipped naked at the cross roads;" and in 1521, four of their number were sentenced to be taken by the police from the *châtelet* to the porch of *Nôtre Dame*, bare-headed, and each one carrying a taper two pounds' weight, "*there to beg pardon of God, of the King, and of Justice*, for the frauds which they had committed in the fabrication, and in the deficient weight of their bread." This done, they were to be conducted into the church, and to offer their tapers to be burned in it; they, in the meanwhile, exhorting all other bakers to make their bread of the weight and quality required by law, "on pain of being scourged." This sentence was strictly executed. At subsequent periods many other well-deserved punishments of various kinds were inflicted for similar offences. At the present day the penalties incurred by the defrauders are fines and *imprisonment*. In England the law deals even more leniently with such culprits, *pecuniary* loss being the only punishment allotted to them.

CHAPTER III.

LARGE INSTITUTIONS ESTABLISHED ABROAD FOR THE PERFECT AND ECONOMICAL FABRICATION OF BREAD BY MEANS OF MACHINERY AND STEAM POWER, WITH M. ROLLAND'S APPARATUS AND OVENS.

The Bread Question more seriously considered Abroad than in England.— The great interest manifested in it by intelligent men.—The Insalubrity, and other disadvantages of the old System of Panification exposed.—Difficulties of the Bakers.— Wilful blindness in England to existing evils.— The French Press on Bread-making, and on Monsieur Rolland's Apparatus and Ovens.— Magnificent Establishment at Lyons planned and reported by Monsieur Lesobre. — Particulars of the Rolland Invention.

THE bread question, in all its bearings, appears to have excited a far more earnest degree of interest in France, Belgium, and some parts of Germany, up to the present moment, than with us; and the practical results of it in those countries have been highly satisfactory and beneficial.

A general impression seems to exist there, amongst the intelligent orders of society, of the absolute necessity of a *thorough reform* in the old methods of "panification," or bread-making;

some not very attractive pictures of which are given in several of their recent publications on the subject, written by men of ability, who have entered with great zeal into the subject. They all concur in stating, that for centuries past there has been no real improvement in the operations of the baking-trade; and that while striking and rapid progress has been made in all other of the industrial arts, these—faulty as they are—have remained unaltered. The insalubrity, coarseness, and want of economy, which distinguish them are thus described, and commented on, in the archives of the French *Académie des Sciences*, and in various expositions which have been made through the press, or at the meetings of learned societies. I insert some of the details—unattractive as they are—without softening them for the fastidious reader, because any disgust which they may inspire, will be a natural and healthy consequence, and may awaken a desire to aid in their abolishment. It is not well to shut our eyes, and determine to ask and to see nothing of evils which more or less affect life itself; though thousands of irreflective persons prefer to do this, rather than to investigate and endeavour to remove them. Many do not even *choose to believe* that the water supplied to the inhabitants of London requires purifying before it can be drunk with safety; or that the imperfect sewerage of that

mighty city, so taints and loads the air with disease, as to render it often a deadly poison to those who inhale it. So it is with regard to the bread they eat. They do not wish to be disturbed in their belief that it is all that it ought to be; and treat as pure fancy, or prejudice, the idea that it *can* disagree with anybody, or be productive of serious and painful disorders. The common mode of making it is too well known to admit of contradiction. It is thus not very invitingly described by a foreign contemporary:—"It will be asked by our descendants, with astonishment, if indeed it could be true that, at this epoch of industrial progress, our principal aliment were prepared in the gross manner that it is, by plunging the arms into the dough, and raising and tossing it about with such force as to exhaust the strength of the half-naked journeymen, and cause streams of perspiration to flow and mingle with the alimentary substance?"

And again:—

"If instead of being satisfied with the aspect of the loaves exhibited in the windows of the bakers' shops, we were to descend into the offices where they are made, and witness the want of cleanliness and wholesomeness which attend their fabrication; could see *here* a reservoir of water *which is never changed; there* supplies of flour exposed to the influence of an impure atmosphere, either too damp or over-heated; and above all, sickly, per-

spiring men in contact with our food, we should turn away with a very legitimate feeling of disgust."

These are revolting pictures, but they are true; yet much which repels us in them is beyond the control of the bakers themselves, arising from the want of space, and fitting accommodation for the trade they follow. How can the air of the ill-ventilated underground premises in which their operations are carried on generally in populous and crowded cities, be otherwise than most unhealthily foul, destructive to the men employed in them, and having the worst effects on the food which they prepare? No article of our nourishment requires more scrupulous nicety in everything connected with its fabrication than bread. Its value—which cannot well be over-estimated—is *dependent on its purity;* and this can be preserved (even when it is composed of *genuine* ingredients) only by the utmost *cleanliness* in all the details of its preparation, and the absence of every unwholesome influence in the locality where it is effected.

The leading journals of France, in their notices of an invention which fairly promises to supersede, at last, the old objectionable routine of the baking trade, are unanimous in their severity of remark on its glaring defects. The *Courrier de Lyons*, 16th February, 1854, treats it rather humorously, thus:—"From the fine arts let us pass to the art of bread-making, which is not in itself a fine art,

but which has the merit of contributing to the existence of all others. If we call it an art at all, it is from pure politeness, and in conformity to common usage that we do so; for in fact it is nothing but a barbarous routine, unworthy of the civilisation which has created so many industrial miracles. There are truly singular anomalies in the march of material progress which nothing but custom prevents us from remarking. For example: we have decomposed all the original elements, water, fire, air, and earth; have conquered pain by means of chloroform; annulled distance and time by the electric telegraph; measured the mountains of the moon; brought to sight stars which were imperceptible; analysed light; and *made tables dance!* We have launched upon the ocean marvellous vessels which defy the tides and the winds; and created and subdued *horses of fire* which can drag a rolling village over precipices or through the bowels of a mountain with the speed of a hippogriff. In a word, we are become Titans through the medium of science, *which nevertheless has not given us bread worthy of man!* This fact is certain. In the midst of the general progress of civilisation, the important art of bread-making has remained very nearly as coarse and barbarous as it was in the times of the cabbages of Fabricius, or the plough of Cincinnatus;

and yet *nothing* can be easier than to carry it as nearly as may be to perfection."

The writer then proceeds to mention in the most favourable terms the "*Appareil-Rolland*," as it is called, which is, he says, so "superior in point of economy, uniformity of produce, and *cleanliness*," that it cannot fail to be generally adopted by the trade, except perhaps by those avaricious members of it, who prefer, before every other consideration, the few *centimes* which they gain by the weight of their *water-logged* loaves.

Extract, on the same subject, from "The *Cosmos*," a scientific review: —

"We might refuse to believe, if the fact were not forced on our conviction, that the most important and the most ancient of all the arts is the one which at the present day is the least advanced, and we might almost say, which is still in the rudest and most barbarous state; but enter into the first baking establishments of the capital, and follow in all its details the conversion of flour into bread! You will be grieved to see that, though incessantly repeated for thousands of years, the process has remained absolutely devoid of improvement; and you will turn away from the sight of it with a saddened spirit, even if it should not have inspired you with deep disgust.

"In the middle of the nineteenth century bread

making is still a cruel labour!* The closed knuckles must be violently thrust into a huge mass of tenacious dough, which must be raised by the muscular effort of the arms, and turned and tossed over repeatedly with the most violent exertion. The workman who performs this hard task has consequently received the too-expressive appellation of *moaner* (*Geindre*), because the exhausting nature of his toil is betrayed by the heavy stifled groans which it forces from his chest. Every part of his body is soon overflowing with perspiration, which falls in large drops, and is amalgamated with the dough he is kneading; and he is entirely overwhelmed with fatigue by the time he has reached the end of his killing labour."

The further sufferings of the unfortunate workman, from the fine dust which he constantly inhales, and which is said to cause various pulmonary affections, from the manner in which it clogs the lungs; and the destructive effect on the eye-sight of the burning atmosphere, which he encounters when placing his bread in the oven, are dwelt on by the journalist just quoted, as well as by other writers, in the most influential and popular of the French papers; and it is obvious

* This applies only to bread-making on an extensive scale. There is nothing very laborious in preparing it in small quantities for domestic consumption.

that some *great modification* at least is imperatively needed, of a system which combines so many serious evils as those which they describe; and which is not confined to their country, or to our own.

For some years past persevering efforts have been made in France to supersede manual labour, by the use of machinery in fabricating bread. None of these seem to have answered the purpose entirely, until *Monsieur Rolland* — himself an experienced baker — completed what other experimentalists had begun, and introduced, not only a complete machine by which the dough was perfectly mixed and kneaded, but an oven also of novel construction, in which it was baked in a superior manner. It will be seen that his inventions were met for awhile by the most vehement opposition on the part of the trade; but, to judge by a long list of places where they have been adopted, and of persons who have given the highest testimonials in their favour after having practically tested their efficiency, their real utility is now appreciated.

A Monsieur Lesobre, to whose intelligent agency and indefatigable exertions the *Appareil-Rolland* owes much of its success, addressed himself thus, upon the subject of it, to the *Scientific Congress of France*, at its meeting of March 1st, 1856:—

"Gentlemen,—In the list of questions which are to be discussed by the Congress in the present year, there is one which is especially opportune, and which deserves its most serious consideration. It is proposed in these terms: '*What measures ought to be taken for the introduction of mechanical power into the baking-trade, that its processes may be simplified, and bread obtained at a moderate price; and which is the best system of bread-making?*'

"It is because these questions have occupied my attention for many years past, that I beg to have the honour of addressing a few words to the meeting.

"You all know, gentlemen, what, even five years since, was the state of the bread-trade in France as elsewhere. The kneading of the dough was effected by the arms; and in countries where it was customary to make it very firm it was prepared by *stamping it with the feet!* This practice has been continued from the most remote and barbarous ages, up to our own times.

"Nevertheless, within the last century numberless attempts have been made to improve the fabrication of bread; and the annals of *The Conservatory of Arts and Trades** will show that more than a hundred inventions have been pro-

* *Le Conservatoire des Arts et Métiers.*

duced during that period for its mechanical preparation, and for a more economical and *cleaner* mode of baking it.

"Still the trade has remained obstinately unadvanced; rejecting with dogged and almost savage resolution every proposed improvement.

"Are we then to conclude that amongst so many new inventions there have been none which could have been generally adopted with advantage? Assuredly not! There have been several of which the general application would have been a great step gained; but which, having been tested only in individual cases, *were wrecked in the storm of opposition which they encountered.*

"The aid of machinery in bread-making is opposed equally by the journeyman-bakers and their masters; by the men, because they fear that it should throw them out of work; and by the masters, because they are not in general very enlightened, and for that reason adhere the more tenaciously to their old customs; and also because the purchase of the machinery would be expensive to them.

"This, gentlemen, explains the slight success which has attended the inventions designed for the improvement of the bread trade.

"But in 1851 a new state of things commenced. At that period the paste-kneader of a distinguished inventor, *M. Boland,* was in operation in several

establishments, and produced very good results; but it required a propelling power which precluded its adoption in small bakeries.

"Another invention, applicable alike to the preparation and to the *baking* of bread, appeared at this epoch. *M. Rolland*, the originator of it, thus presented to the world a new and complete system of panification. His kneading apparatus and oven, both of remarkably simple construction, have been described in two favourable reports; in one to the *Académie des Sciences*, by *M. Payen;* and in another to the *Société d'Encouragement*, by *M. Gaultier de Claubry*. These two reports mark the commencement of a real revolution in the baking trade.

"Certainly it would ill become me, of all people, to present myself here, after such distinguished and learned men, to pronounce an eulogium on this or that apparatus. I desire simply to state certain facts, and to leave them to the just discrimination of the Congress.

"I have earnestly examined and entered deeply into the subject, and it has assumed an aspect of far higher importance than it originally bore. It is no longer a mere question of converting the small bakeries, conducted on the old system, into mechanical bakeries; we seek to ascertain what results can be obtained by employing the

perfected apparatus in large public bread-making establishments.

* * * * *

"Convinced that the problem of obtaining bread, at the cheapest rate, was to be solved by the creation of large establishments, in which all the labour of converting wheat into bread would be concentrated, and entirely effected by mechanical means, I have endeavoured very energetically to disseminate this idea; and have aided in the organisation of two hundred establishments for mechanical bread-making. I myself founded one at Fontainebleau; and afterwards, in conjunction with a very active and intelligent man, Monsieur Delort, created a second at Lyons. I will not speak further of that at Fontainebleau, which still requires the addition of a mill to render it complete; but I could wish, gentlemen, particularly to draw your thoughts to the *Manutention Civile* of Lyons, which is really worthy to fix your attention, from its interesting economical results.

"There, on a wide space of ground which twelve months since was entirely waste, a magnificent building has been constructed. Two powerful steam-engines set in motion twelve pairs of millstones, and four kneading-machines, of sufficient size to prepare the dough for eight of M. Rolland's ovens, erected in a line in an immense bake-office.

"The work is continuous; there is no cessation in it by night or by day.

"The mills prepare 150 quintals of flour daily, which supplies in bread from 18,000 to 20,000 kilogrammes, enough for the consumption of 30,000 persons.

"Thus all intermediate agencies are suppressed, and the processes of grinding and bread-making are completely concentrated: *the wheat enters by one door of the establishment, and leaves it by another in the form of bread.*

"The results obtained by this organisation are as follows:—

"The finest quality of bread is sold at two centimes; the household bread at four centimes; and brown bread at six centimes the kilogramme under the current price; at a cost, in fact, scarcely exceeding that of good average harvest years; and this by means only of the concentration of labour; the employment of highly efficient machinery; and without any sacrifice from any body.

"These three kinds of bread are of a quality, cleanliness, and an appearance truly remarkable.

"The arrangements of the *Manutention Civile de Lyons* reflect the greatest credit on the director, M. Delort. It is the finest and most complete which exists in the world.

"Furthermore, if the bread be reduced in price

to the profit of the consumer, the capital engaged in the enterprise brings also large returns. Indeed, from the 1st December (1855), when the establishment was first in full operation, to the 31st of the same month, the clear profits after deducting all expenses, and even the interest of the capital itself, were *eleven thousand francs*, a sum which would appear altogether incredible, if the *immense* quantity of bread fabricated in it were not taken into consideration.

"It appears to me that these facts answer the double question proposed to the Congress, and solve it most completely; and, therefore, I have taken the respectful liberty of laying them before it.

"LESOBRE."

I have no further knowledge of the inventions and establishments spoken of by *Monsieur Lesobre*, than that which I owe to his having courteously supplied me, through a friend now residing in Paris, with the information of which I have made use here; and the favourable reply which I received in answer to my inquiry of the only English baker* who has given a trial to the Rolland

* *Mr. Deacon*, 10. *Chester Street, Kennington Lane.* Mr. Deacon informs me, in the note which he returned to mine,

kneader and oven, as to whether they really answered their purpose well or not; but should the reader desire such full and satisfactory evidence of their merits or demerits, as only a personal inspection of them can ensure, a direct application to *Monsieur Lesobre* himself (17, *Rue L'Estrapade, Paris*) would be met, I am persuaded, by the most urbane attention, and every facility afforded by him for seeing the effect of the machinery, as well as for ascertaining all particulars of the large *bread-factories,* in the organisation and direction of which he has taken so prominent a part. I am informed that he has entire confidence in the speedy adoption of the *Appareil-Rolland* in this country, if it could once be fairly known and tested. Many of the French bakers, both in Paris and in the provinces, have ceased to oppose its introduction amongst them, and appear to consider it a most advantageous innovation on their old system of labour. Some of them are quite enthusiastic in their expressions of approval, and give animated accounts of the striking success which has attended their experimental trials of it. Others have withheld their testimony until they had tested it thoroughly by months of uninterrupted

that he is quite satisfied with his kneader and oven, and finds them answer much better than the common English one.

operation, and then added their tribute in confirmation of its practical value. As their names and places of abode will be found in a work by Monsieur Lesobre, entitled, *"Notice sur les Appareils de Panification Rolland," Thilloy,* 17, *Rue de L'Estrapade, à Paris,* any of them can be referred to at pleasure. I insert a few of them here, taken at hazard, because, if it can be shown by a careful and unprejudiced examination of facts, that genuine, well fabricated bread can be secured to our population at a cost below that at which it has hitherto been procured of far inferior quality, leaving increased profit to the makers as well, a highly important object will be attained; and it appears desirable to open at once such channels of communication as may facilitate it. M. Rolland's inventions (or any others), which would effectually aid in its fulfilment, could scarcely fail to find immediate favour here, where the need of better and cheaper bread is beginning to be sensibly felt; though great innovations, however beneficial their tendency, are almost invariably met at first by a spirit of resistance, which defies all reasoning; for some individual interests generally suffer from their introduction; and there is often also, much misapprehension of their real nature and bearing, and an exaggerated idea of the injuries which will attend them. The English bakers may possibly

take alarm at the very mention of mechanical bread-making, and imagine that it will materially injure or destroy their trade; but it appears, on the contrary, to be attended with remarkable advantages to those who have adopted it in their bakeries.

The following document may serve to reassure persons who are apprehensive of any ill consequences from its introduction.

"Paris, 25th November, 1852.

"We, the undersigned bakers, having made use of Rolland's kneader, declare as follows:—

"The trade has hitherto stood opposed to mechanical bread kneading; but more, it must be owned, from the faultiness of the machinery employed, than from that of the system itself; for none of the machines invented hitherto have combined the qualities essential to successful kneading; moreover, these machines had, in a commercial point of view, drawbacks which prevented their general adoption. The mechanism was very complicated; difficult to clean and keep in order, and requiring a high propelling power; and the kneader was usually very expensive. For these reasons, but few of them have been brought into active operation; and in most cases they have been abandoned after unsuccessful attempts to employ them.

"It will not be the same, we have reason to believe, with the kneader invented by our *confrère* M. Rolland, who has perfectly solved the difficult question of effectual bread-kneading; consequently, his kneader (*petrin*), though invented scarcely a year ago, is now being used in a large number of establishments, both in France and in foreign countries.*

"The Rolland kneader (*petrin Rolland*), which is of remarkably simple construction, and of moderate price, requires scarcely the strength of a man to keep it in action; is of moderate dimensions, and easily cleaned; and the amalgamation of the flour and water is effected by it more perfectly and uniformly than by the human hand.

"In a word, the work of the Rolland kneader is clean, wholesome, and rapid; always regular and noiseless; and, moreover, it considerably alleviates the painful toil of the journeyman. Every day affords us confirmed proof of these advantages in our establishments; and we give

* "Il ne doit pas être ainsi, nous le croyons, avec le petrin de notre confrère M. Rolland, qui a donné, au difficile question d'un bon petrissage, la plus parfaite solution. Ainsi, son petrin inventé depuis une année à peine, fonctionne-t-il déjà dans un grand nombre, d'établissemens en France, et à l'Etranger."

here with pleasure the most favourable and complete testimony to them.

(Signed)

"M. M. KAUFFMAN, 77, Rue de Sèvres, Paris.
FONTAINE, 39, Rue Aumaire, Paris.
AUBOURG, 77, Rue St. Honoré, Paris.
JOUBERT, Rue Grenelle, St. Honoré, Paris.
PELLETIER, Rue du Petit Lion, Saint Sauveur, Paris.
MAINGUET, 96, Rue du Temple, Paris.
GONNET, 92, Rue Beaubourg, Paris.
LESUR, 319, Rue St. Martin, Paris.
THILLOY, 40, Rue Grenelle, St. Honoré.
J. LELIÈVRE, 94, Rue de l'Ecole de Médecine, Paris.
CERNAY, Barrière Fontainebleau (Seine).
BAUDON, Rue Picard, Gare d'Ivry (Seine).
RINGENBACH, à Bar le Duc (Meuse).
MATIFAS-DEBRAY, à Amiens (Somme).
FAUCONNIER, à Paris, Rue de Douai, 1.
HUMBERT, à Paris, Rue de Clichy, 67.
BAYLE, à Senlis (Oise)."

From the accounts given by the various writers who have inspected it, and which are cited by

Monsieur Lesobre in the work already mentioned, M. Rolland's oven appears to be of a truly novel and ingenious description. It is heated externally by means of hot air conveyed from a distant fire; the admission of smoke or other impurities into the interior being thus prevented. The floor is a moveable platform, which can be raised or lowered at pleasure, and which turns on a pivot, put in motion by a winch, so that every part of it can be brought round in succession to the opening, and filled with bread, without recourse being had to the awkward, long handled peel, which is of necessity used for ovens of common construction. The roof is not vaulted, therefore the loaves receive a more equal degree of baking than they do under the old system; and they can be watched through a pane of glass fixed in the door of the oven, the light from a strongly reflected flame of gas being thrown upon them.

There are many other particulars of interest connected with this invention, of which the *principle* appears admirable, so far as an idea of it can be formed from words, by persons not possessing sufficient scientific, mechanical, or practical knowledge of the subject to enable them to form any correct opinion on it; but able judges may perhaps be led eventually to bestow some attention on it, and to *perfect* it, should it be found to need improvement.

A French gentleman, of very superior powers of mind, accustomed to enter deeply into, and to examine in its most minute details, every question of importance presented to him, and who is a *real connoisseur* in bread, tells me, that for more than twelve months past he has been supplied exclusively with that fabricated by M. Rolland's *appareil*, and finds it so superior for its cleanliness, flavour, and general excellence, that he cannot reconcile himself to any other. As he has resided in England, and in various parts of the continent, he has had good opportunity of comparing that of different localities; and his testimony may be entirely relied on.*

In conclusion: M. Rolland has furnished all the bread supplied to the *Ecole Polytechnique* for more than a year, to the entire satisfaction of the establishment.

Amongst the bakers who have written to certify the success which has attended their trial of the Rolland oven and kneader, and to express their obligation to the originator, are a *Monsieur Con-*

* "*Que votre pain est mauvais!*" was his frequent exclamation when speaking *of the bread of our shops;* but when asked to taste and give his opinion of some good home-made bread, "Ah! that is excellent! *it is like cake!*" he said; yet it was merely what was always made in the most simple manner for common daily consumption, and not *enriched* in any way, nor prepared for the occasion.

stance (ainé), 4. *Rue de la Monnaie, Dijon*, who delayed his testimony for five months, wishing, he says, to make quite sure of the *durability*, as well as of the effective working of the machinery, and also to ascertain the real extent to which both labour and fuel were economised by the inventions.

From Besançon, Rue des Granges 37, on the 17th January, 1854, Monsieur Mosel, also a baker, writes thus:—"I have had a baking establishment on your system of panification open from the 11th of April, 1833. To tell you all the approbation and all the encouragement which it has met with, and all the satisfaction which I experience at having introduced your oven and kneader at Besançon, is beyond my power. The quality, cleanliness, and beauty of their products have brought me so many customers of all classes, that I cannot. Our work is continued by night and day. You will soon receive orders for more of your ovens and kneaders from Besançon; for the advantages of your system over the old one are so certain and so decided, that no hesitation can exist as to which should be preferred."

To close the list of the provincial bakers, whose names and addresses I have selected to afford the reader who may desire it every facility of reference to individuals whose own experience enables them to form an accurate opinion, and to impart precise

particulars of the result which these inventions give, I append the two which follow:—

"Your Rolland kneading machine has come to hand very seasonably; for there is much to do in these parts just now, and good workmen are scarce; but that does not put me out at present; for with my two boys—one fifteen, and the other sixteen years old—and the new kneader (*pétrin*), we get through our work better than with the best journeyman. I, who was for eighteen years a baker's journeyman, and passed ten of them in Paris—where I was foreman in various shops—have never seen our work so well done as I find it done now with Rolland's machine.

"BÉZAULT,
"Boulanger, à Drouet, Loir-et-Cher."

"I must assert it, because it is my conviction, founded on a thorough knowledge of the baking trade *(boulangerie)*, the Rolland apparatus will cause a complete revolution (in baking), and ought to bring to intelligent bakers a better class of customers, and a much increased amount of work.

(Signed) "DUZAN,
"Ancien President du Conseil Général des Syndics de la Boulangerie de France.

"Rue des Piliers du Tutelle à Bordeaux,
October 4th, 1853."

The baker of the *Hôpital Saint-Jean, à Turin,* named *Ruffinetti,* says, "The advantages of the new oven are very numerous and considerable," and that his workmen appreciate and wish to see it generally adopted in their country.

A *Monsieur Delmehae,* of *Rio Janeiro,* whose oven was constructed from plans, directions, and models, sent from France, speaks of its success in the highest terms.

In Venice, Vienna *(à la Manutention des Vivres de l'Armée),* and in a long array of other foreign cities, it is also at work: but I am unable to devote further space to it; nor is it necessary to do so for the simple purpose of directing attention to it in England.

Note.—In the slight description of M. Rolland's oven, which I have attempted to give at page 48, I find that I have made a mistake in saying that it was heated by means of hot air "conveyed from *a distant fire.*" The *door* of the furnace is placed quite away from that of the oven, but the fire is under it; and the hot air is made to circulate *over* and *round* it, by means of flues, which branch off from the main conductor in different directions.

CHAPTER IV.

GLUTEN.

The Super-excellence of Wheat as Bread-Corn, derived from the nature of the Gluten it contains—Curious Particulars of Algerian Wheat entirely devoid of this Principle—Superiority of the hard-grained Wheats to the soft—Agriculture in France and in England—Our more abundant Crops, from our higher Cultivation—Difficulties of French Agriculturists—Method of separating the Gluten from the Farina or Starch of Wheaten Flour, by Professor Johnson and Professor Donovan.

It is the substance called *gluten*, of which it is in part composed, that gives to wheat its superior value to every other kind of grain as bread-corn, and renders the flour derived from it easily convertible into light, elastic dough. It does not contain a large proportion of this element—not more, on an average, than ten parts in a hundred, but this is in the highest degree nutritious; and its nature is such, that bread cannot readily be made from corn in which it is wanting. A singular proof of this fact was shown in France some four or five years since, and reported to the *Académie des Sciences*.

A Monsieur Millon was deputed to examine some samples of wheat — specimens of the principal varieties cultivated in the environs of Algiers. Amongst them was one remarkable for the size of the grain. It was a soft, white wheat, of the most beautiful appearance, which was found, nevertheless, to be entirely devoid of gluten. Repeated experiments with it, conducted with the utmost care, led always to the same result. The paste made with it *broke* and *crumbled* (so that it could by no means be converted into bread); and when it was placed on a sieve, and subjected to the action of water poured on it in a small stream, instead of gluten, it left only a dry, brittle substance, in the proportion of two or three per cent.

Led by this circumstance to inspect the wheat with renewed and close attention, Monsieur Millon discovered that the sample consisted of two distinct forms of grain, a small number of which were transparent on the surface, and proved half hard when broken; from these gluten, to the amount of from ten to twelve per cent. was easily obtained; but, on the contrary, the whitest and most feculent of the grains, which constituted the main part of the sample, were proved to contain not the slightest trace of gluten.

During two years in succession, the wheat of Guyotville presented the same peculiarity, proving that flour of the best appearance, and free from

adulteration, may be deficient in the proportion of gluten which is generally supposed to exist in all wheaten flour in its natural state.

The above-mentioned particulars were communicated by Monsieur Millon to the public in 1852; and in the notice of a pamphlet published by him in 1856 (*Journal des Débats,* July 30th), he is cited as strongly recommending the more general consumption of hard wheat, which contains a far larger amount of gluten, and is therefore more nutritious than the white; though the bread made from it is somewhat inferior in *appearance.* At the present moment, when much anxiety on the subject of food naturally exists in France, all prejudices or abuses which tend to maintain its oppressive price deserve serious consideration; and as some of them are common with us, it may not be out of place to give them a few words of notice here. "If we overcome a senseless prejudice, and adopt for consumption the hard-grained wheats, let us go a step further, and renounce the deplorable and ruinous custom of having thirty-five per cent. deducted by bolting* from the flour destined to the population of Paris, instead of confining it to twenty-five per cent., which would

* "Je veux parler de l'usage en vertu duquel jusqu'ici on a *bluté* à 35 pour 100 la farine destinée à la population Parisienne au lieu d'arrêter le blutage à 25 pour 100."

render the bread made with it less white, but of better flavour, and more nourishing: we should thus preserve ten additional pounds of wholesome food in every hundred." The more general use of rice* and maize is also strongly recommended. The latter is both cultivated and much eaten in the South of France, but is almost unknown in the North. One other passage from the article already quoted deserves attention; for though not strictly appertaining to the subject of "*gluten*," it bears indirectly on that of bread. "Most important results may be anticipated from the improvement of our agriculture; for the soil of France is far from yielding all that it might be made to produce of the cereal grains; and without allotting to their cultivation a larger area than they have hitherto occupied, with the aid of time—which is indispensable to all progress in this world—we may obtain an increase of perhaps one-half more of corn of every kind, and especially of wheat. The average produce of a hundred acres of land is in England the double of what it is in France;

* "Pourquoi les populations Françaises mangent-elles en si faible quantité le riz? C'est pourtant un excellent aliment que le riche se plaît à avoir sur sa table. . . . . Il offre une ressource précieuse qu'on pourrait utiliser de bien des façons. *Il serait possible méme de la mélanger au pain;* avec la surveillance de l'autorité ce mélange n'offrerait aucun inconvénient."

yet, in natural fertility, the soil of the British Islands is not half equal to our own; and the climate of England is far less favourable than ours. The difference arises solely *from the English being better cultivators than we are.*

"Our agriculture, and consequently our cereal products, would derive infinite advantage from the free admission into the French territory of all the improved implements and machines with which foreigners could supply us. . . . Much has been gained, it is true, by a reduction of the duty upon them to fifteen per cent.; but even with this reduction, the forms which have still to be observed render the existing difficulties in the way of the cultivators so excessive, that they shrink from encountering them. What they require is, to have, in lieu of all the elaborate formalities, which now consume so much precious time as to drive them to despair, simply and purely *a fixed duty*, regulated by the weight of the object on which it is levied, and which could be settled in an instant, until the time shall arrive (which cannot come too quickly) when all agricultural implements, with other instruments of industry, shall be altogether exempt from duty." *

* I give rather the strict sense and spirit than a literal verbal translation of parts of this article, which is somewhat diffuse. In addition to all aids to agriculture, the free admission of fodder, or food for fattening stock *(les engrais)*, is recommended.

It is not *gluten* only which constitutes the nutritious properties of wheat, but the farina or starch also, which enters much more largely into its composition. A hundred pounds of the flour of good sound wheat contain from ten to twelve parts of gluten, and *seventy* of starch; and though the starch affords *less* nourishment than the gluten, it yields a very valuable amount of it.

By the following simple process, the two may be separated, and the precise nature of each may be ascertained, by persons who have no knowledge of chemistry:—"Let a little good wheat flour be made into a paste with a little water; let the paste be worked up in one's closed hand under water, and let the water be frequently changed so long as it continues to be whitened by the flour. The portion which remains in the hand will now be found very different from the original flour. It will be a tasteless, fibrous, tenacious, tough, elastic, gray mass, stretching, when drawn out, to a great extent, and collapsing again like India rubber. It dries into a brown, hard, semi-transparent mass, which is brittle, and breaks with a glassy fracture. This is the *gluten*, which derives its name from its glutinous quality; and this it possesses to such an extent, that it acts as a cement for broken glass and porcelain. It is scarcely, if at all, soluble in water; but it dissolves readily in acids. It is asserted by Taddei that gluten—and flour as containing it—possesses the important property of

acting as an antidote to corrosive sublimate."—*Professor Donovan's "Domestic Economy."*

The water which has been whitened in washing the flour, contains the starch or farina, which, if allowed to stand for some time, will subside, when the water may be poured from it, and the starch may be collected on a filter and dried.

Professor Johnson's more recent and highly interesting work, entitled, *"The Chemistry of Common Life,"* directs the gluten to be obtained in an almost similar manner. He says—"If flour be mixed with sufficient water 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 bird-lime. This is the substance which gives its tenacity to the dough. From its glutinous nature, it has obtained amongst chemists the name of *gluten*. When the milky water has become clear by standing, a white powder will be at the bottom of the vessel, which is common wheaten starch."

The proportion of gluten contained in wheat varies with the quality of the grain. As much as

twenty-five per cent. of it have been obtained from some varieties; and, from what has been stated, the reader will perceive that the richer the corn is in this substance, the greater must be its value. That grown in warm climates abounds in it more than any which is produced in England; and the *hard-grained*, as already shown, more than the soft-kernelled white wheat. It enters into the composition of rye and other of the cereal grains, but is not precisely of the same nature; therefore, none of them are so perfectly adapted for bread. The gluten of rye—which stands next to wheat as a bread-corn—is described as "*moist* gluten;" and it appears to be deficient in some quality inherent in that of the wheat, as the same process of fabrication does not answer equally for both species of grain.

CHAPTER V.

TO REMOVE THE TAINT OF MUST FROM WHEAT.

To remove the Taint of Must from Wheat — Best Method of treating Corn harvested in wet Weather, or damaged by it — Manner in which Bread made from Germinated Grain should be managed; extracted from Professor Donovan's "*Domestic Economy.*"

"THE wheat must be put into any convenient vessel capable of containing at least three times the quantity, and the vessel must subsequently be filled with boiling water. The grain must then be occasionally stirred, and the hollow or decayed grain, which will float, may be removed. When the water has become cold, or, in general, when about half an hour has elapsed, it is to be drawn off. It will be proper then to rinse the corn with cold water, in order to remove any portion of the water which may have taken up the must; after which the corn, being completely drained, is, without loss of time, to be thinly spread on the floor of a kiln, and thoroughly dried, care being taken to stir and turn it frequently during this part of the process.

"This is all that is required; and I have con-

stantly found that the most musty corn, on which ordinary kiln-drying had been tried without effect, thus became completely purified, while the diminution of weight caused by the solution of the tainted part was very inconsiderable."

THE BEST MANNER OF TREATING CORN HARVESTED IN WET WEATHER, OR WHICH HAS BEEN DAMAGED BY IT; AND THE MANNER OF MANAGING THE BREAD MADE FROM GERMINATED GRAIN.

"Crops which have been for a long time more or less exposed to an abundant humidity, experience different sorts and degrees of alteration. In each of these different states they present different results — to the cultivator in regard to his seed; to the miller in grinding; and to the baker in bread-making.

"*Wet grain, when heaped up in granaries or in stacks without currents of air being preserved through the interior, goes speedily to ruin.* The humidity does not ascend to the top, so as to evaporate; it concentrates in the interior, and hastens the germination which may have begun, or excites a fermentation, which heats and discolours the grain. At times the corn even becomes mouldy.

"When the grain of such corn is sent without preparation to the mill, it clogs the mill-stones, and is difficult to work. If the germination is

only just commenced, the process is soon completed in the sacks, and the flour begins in a few days to collect into pieces of such consistency, that it is necessary to pound it with mallets in order to render it workable. Flour of this description is difficult to work, even when very speedily used; and as it gets old, it is impossible to make bread of it without mixing it with some of a better sort.

"*The drying of wet grain is the only means of arresting the progress of its destruction.*—The most simple plan for this purpose, and the one which can generally be the most easily adopted, is to dry the grain in a baking-oven, which is to be met with in most places. It may be put into the oven immediately after the bread has been withdrawn: the temperature is then such that a person may introduce his naked arm without being much incommoded by the heat. After the grain has been thrown into the oven, it should be spread into a layer of from three to four inches in thickness, and turned frequently, in order to facilitate the disengagement of the vapour. At the end of ten or fifteen minutes, according to the state of humidity in which the grain is, it may be withdrawn from the oven, as it will then be sufficiently dried; and when exposed to the air until perfectly cooled, it will have acquired all the qualities necessary to render it fit for the miller and the baker.

* * * *

"The baking of flour which has been made from germinated grain ought to be proceeded in with much greater rapidity than that of flour from uninjured grain; because, the gluten of such flour having been more or less destroyed, the process of its fermentation goes on much more quickly. The water employed ought to be cooler; the paste should be kneaded more firmly (made stiffer, in fact), and divided into loaves of less thickness. The batch should be put into the oven a quarter of an hour sooner after it is completed. The oven should be hotter; the bread should be left in it forty-five minutes, instead of an hour, as in ordinary cases; and it ought not to be given out for consumption until two or three days after it is baked.

"By attending to these directions, bread will be obtained from germinated corn, which, without being as good as that made from the best flour, will yet be sufficiently salubrious, and of sufficiently good appearance. It is necessary to observe, however, that it is only from the flour of such corn as has been very slightly germinated, that bread of the above description can be obtained, *unless the corn has been dried before being ground.* But when corn, even greatly germinated, has undergone such previous desiccation, it will yield a flour capable of making much better bread than

flour from corn which, though less germinated, has not had the benefit of drying.

"It deserves to be noticed, that it is vain to employ a greater quantity of yeast, in the hope of improving the fabrication of the bread. The paste, *deprived of gluten*, is unable to retain the effects of the fermentation excited by the yeast. The bread has a good enough external appearance; but, in proportion as there has been an excess in the quantity of yeast, its consistency is so much the less, and all the bad qualities of the flour, in respect of flavour and taste, are more fully developed."

Professor Donovan further states, that it has been proved by a series of experiments that the addition of from twenty to forty grains of the *carbonate* of magnesia of the shops (*calcined* magnesia has a quite different effect) to a pound of the flour of germinated wheat, "materially improves it for the purpose of making bread." The dough, he says, "rises well in the oven; and after being baked, the bread is light and spongy, has a good taste, and keeps well." It is commonly believed that bakers mingle often magnesia with inferior flour, to improve its appearance; and it perhaps may be so; but—though equally a fraud—it is less objectionable than alum; and in seasons when the entire corn-crops of a country have been seriously injured by an excess of humidity, any

wholesome means of converting the flour of damaged grain into eatable bread becomes of infinite value. It must, however, always be remembered that it is only when the corn is dried *before it is "garnered,"* that any good result will be obtained. Nothing will effectually remove the taste of must or mould from *flour;* therefore every precaution should at once be taken to secure the grain itself from the destructive attack of either. A portion of sound flour, mixed with that of sprouted or malted wheat, will render it more easily convertible into bread of fair quality and nutritious character than magnesia or any thing else can do; for a certain amount of gluten will then be supplied to the dough, and will assist the fermentation, while it gives the bread increased value as food.

CHAPTER VI.

DIFFERENT VARIETIES OF BREAD-CORN (KNOWN AS THE CEREALIA, OR CEREAL GRAINS).

Wheat. — Rye. — Barley. — Oats. — Maize. — Rice. — Their relative Importance, and Adaptation to different Climates.

UNDER the article "*Gluten*" some explanation has already been given of the reasons which render wheat of so much higher value to us than any other variety of corn. It is so not only on account of the greater facility with which it may be made into bread, but because it supplies us likewise with excellent and wholesome food in a multitude of other forms. One of the most delicate and most nutritious of these is the macaroni which is now largely imported here from Italy, and which is manufactured from the choicest part of large *hard-grained* wheat, called there *grano duro*. This macaroni is in a great measure a substitute for bread to the people of Naples and other parts of the Italian States; and it is well suited to their climate, being extremely light and easy of digestion, yet containing so much nourishment of a very pure quality, as to constitute

most valuable diet. Invalids who cannot digest *bread*, can almost live on the macaroni, when *most thoroughly boiled*, and it is for that reason it is mentioned here.

Enough has been said already in the previous pages of the hard-grained wheats, to prove their *nutritious* value; and the comparative prices of those grown here, or imported from foreign countries, will show the estimation in which all varieties brought into our great corn-marts are held. Most of our leading public journals furnish regular lists of these, which will afford the reader all needful information on the subject, as thus:— It will be seen that the supplies from Kent and Essex are reported always as bearing a superior price to all other English wheat; and those from Dantzic stand much higher than *any* other: which may be received as proof that they are the best.

"If we except the Russian, which is inferior,* the wheat of the Continent is in general superior

* A new, and exceedingly fine variety of Russian wheat has recently been imported and sold in London at a *very high* price indeed; and I have been informed by the manufacturer, that the excellent preparation called *soujee* is made from a peculiarly hard wheat grown in Russia: it would, therefore, appear that the climate of some parts of that country is not unfavourable to the production of a superior quality of the grain.

to English wheat by five per cent.: hence it is said that the London flour is inferior to that of most large towns on the Continent.

"The best wheat is grown in Poland and Pomerania, and is conveyed down by the rivers on large barges or rafts from the interior of the country. The grain is beautifully white, hard, and thin-skinned; and in consequence of its small quantity of bran, it yields a large proportion of excellent flour. French wheat is in general superior to that of England. The Italians have the superiority over the French in their wheat crops; and perhaps the best wheat of all is raised in Barbary and Egypt. The Sicilian is the finest in Europe. It is of two kinds; one is a long grain, much larger than English, and is generally boiled whole as a substitute for barley or rice; the other is an oval soft wheat, yielding a flour that is remarkably white, and employed only in making the best sort of bread, biscuits, and pastry: but, from government restrictions, very little is imported."

* * * *

"In every climate where wheat can be cultivated it is raised in preference to all other kinds of corn. It contains the greatest quantity of starch, and likewise by far the most gluten; from which it derives the quality that fits it for bread above every other grain. The expense of its cultivation

is indeed somewhat greater; but from its superiority as a bread-corn it is always chosen where the climate permits, or the poverty of the country has not constrained the inhabitants to be content with cheaper food.

"*Wheaten bread is now almost universally used in England;* and in Scotland it is becoming much more general; but in the reign of Henry VIII. it was confined to the gentry, and the poorer classes ate only rye, barley, or oaten bread. About the middle of the last century very little wheat was cultivated in the northern parts of England, and the crust of the Christmas goose-pies of Cumberland was composed of barley-meal.

"*Wheat grown in different countries varies considerably.* The climate of the northern parts of Europe is not favourable to its production. It has, however, been slowly making its way in this part of the world; but in Sweden* to this day nothing is met with usually, except rye-cakes almost as hard as flint, as they bake only twice a year. Wheaten rolls may be seen occasionally in some of the towns, but never loaves. In 1812 a baker at Gottenburgh received an order from the captain of a vessel to bake wheaten bread to the value of one pound sterling; but the baker, alarmed

* This probably does not apply to Stockholm and other large towns or cities.

at the risk, *required security for payment*, since, had the bread been left upon his hands, he could not have disposed of so large a quantity in that town, notwithstanding it had a population of *twenty-three thousand* inhabitants!"

Mr. Webster, from whom the preceding passages are quoted, informs us that "the soft wheats grow in the northern parts of Europe, as in Belgium, England, Denmark, and Sweden, and the hard in warmer climates. The grain of these last have," he says, "a compact seed, nearly transparent, which, when beaten through, breaks short, and shows a very white flour within. The soft wheats have an opaque coat or skin, which, when first reaped, gives way readily to the pressure of the finger and thumb; these require to be well dried and hardened before they can be ground into flour."

RYE.

Rye does not seem to be regarded with much favour in England, as little is grown here, and the imported supplies are very scanty, compared with those of all other grain; yet, from the positive amount of nutriment which it affords, it stands next in value to wheat, and makes excellent bread in combination with wheat-meal or flour. It fer-

ments easily; is considered by many persons as of peculiarly agreeable flavour; (to others its sweetness is sometimes an objection;) keeps well; is wholesome, and economical also. The *black bread* of Germany and other parts of Europe is composed of rye only, ground into coarse meal, and fermented often by means of *leaven* (or dough left from a previous baking, and become slightly sour), which is an unfavourable mode of fabricating it, because rye has a tendency to pass quickly into what is termed the acetous state of fermentation; and requires to be carefully watched and skilfully managed, to prevent the bread made of it from acquiring an acid taste. When the *flour* of rye is mixed with half or two-thirds as much of wheat flour, the dough may be prepared in the ordinary manner, rather less time in warm weather being allowed for its rising. One part in three of rye-flour may be used for paste also, which will answer excellently for plain puddings or common pies.

BARLEY.

Mr. Webster says of this grain, that "it is next in importance to wheat, and has one advantage over it; it can be propagated through a greater range of climate, bearing heat, cold, and drought better, growing upon lighter soil, and coming so quickly to maturity, that the short summers of

northern countries, which are not sufficient to ripen wheat, are yet long enough to bring barley to maturity. In Lapland it is sown and reaped within six weeks. In Spain they have two crops in one year. It was much in use amongst the Romans, and formerly, also, as a bread-corn in England, as it still is in Westmoreland, Cumberland, Wales, and Scotland; but in the south of Britain it is now chiefly raised for malt."

The bread made from barley-meal or flour is of a coarser quality than that of rye, though not of so dark a colour; and, from containing much less gluten, this grain is not so easily converted into a light dough. The most valuable form in which it is now used amongst us as food is that of *pearl barley,* which is very delicate and easy of digestion.

"*Pot barley* is barley of which the outer husk has been removed by mill-stones; it is used for making broth. *Pearl barley* is the small round kernel which remains after the skin and a considerable portion of the barley have been ground off. For this purpose spring-barley is chosen: it is steamed to soften the skin, dried, and passed between mill-stones of a peculiar kind to take off the husk, all except what lies in the deep furrow of the seed, and which is the cause of the short dark line to be seen on pearl-barley. The Scotch pearl-barley is quite round, and is made from the

sort called *bere*, or *bigg*. A decoction of pearl-barley was the 'ptisan' of ancient medicine, now better known by the name of barley-water. Besides its use in broth, it is sometimes boiled in water, and eaten as rice with milk.

"In Holland, pot-barley boiled in butter-milk, and sweetened with treacle, is a common mess for children and servants.

"As pot and pearl-barley are extremely wholesome and nutritious, it is to be regretted that they are not more used as food by the labouring classes in England, as they are in Scotland, Germany, and Holland."

One reason perhaps has not occurred to Mr. Webster of the comparatively small consumption of these excellent preparations of barley amongst our working people: they require *long cooking*, — two or three hours at least, — and fuel is often so expensive here that this is a serious objection with the poor to many articles of food to which they might otherwise have recourse with exceeding advantage. For these, as for much else, the public ovens, so strongly recommended in this volume, would be infinitely helpful to them.

OATS.

"This grain prefers a cold climate, and is one of the hardiest of the cereal plants. It cannot be

cultivated in the southern parts of Europe, and is scarcely seen south of Paris. Even in England its produce in the southern districts is inferior to that of the northern, and still more to that of Scotland. It has this advantage, that it will grow where neither wheat nor barley will flourish, and, indeed, on any land, from the stiffest clay to crude mossy soils, if sufficiently dry: it is also the most easily cultivated. Indeed, if it can be ripened before the frost sets in, the meal is superior when the climate is rather bleak and the soil not very rich.

"It contains more gluten than barley, though less than wheat; and experience shows that it is very nutritive, since the labouring classes in Scotland, Lancashire, Derbyshire, and some other parts of England and Wales, subsist and keep up their strength perfectly upon bread and other preparations of it. Many, indeed, who are used to oaten bread prefer it to every other kind. In the south of England oats are not employed for bread, but only for feeding horses, with whom they are supposed to agree better than any other species of grain.

"*Oatmeal is cooked for human food in several ways.* In Scotland it forms the dish called *pottage*, or *porridge*, the universal breakfast in many parts of labouring people and children. Deprived of the husk, it constitutes *grits*, or *groats*, much

used for making oatmeal-gruel, used both as food and medicinally. The advantage of grits over oatmeal is, that the fecula or starch, of which the meal or farina of the oats chiefly consists, is alone extracted by the boiling water, and that thus none of the cuticle which covers it is mixed with the gruel; but in the oatmeal this thin cuticle, which encloses it (not the *husk* of the oat), is ground up with the meal, and gives to it a rough and harsh taste; for, although the gruel made of oatmeal may be strained, still a quantity of the minute fragments of the cuticle escape through the strainer; whereas, in the case of grits, this cuticle is entirely kept back, which accounts for the smoothness of *grit-gruel*, as it is termed. Scotch oatmeal is superior to English, which is partly owing to the superiority of the grain, and partly to the climate; but is, in part, owing to the greater care employed in its cultivation. In Scotland, also, the oats are dried in a kiln previous to grinding, which gives it an agreeable flavour."

MAIZE, OR INDIAN CORN.

Maize, which until recently was little known in England, and which requires a much warmer climate to mature it, is not well adapted to *panification;* as, from its want of gluten, probably, the flour is not sufficiently adhesive to form a compact

paste; and it absorbs a large proportion of water, which creates a further difficulty in baking it, the surface becoming dry and hard before the heat has penetrated the entire mass, the interior of which will often remain quite moist, however long it may be left in the oven. Still, in America and other countries where it is largely cultivated and much eaten, bread is made, and well made too, it may be presumed, entirely of maize; but, though considered very nutritious, and supporting well, apparently, the strength of those who live on it, it can never be comparable to that which is made of wheat. Indian-corn seems altogether better adapted to such preparations as admit of its being combined with plenty of liquid, and rendered digestible by long boiling, as it is in Italy and in the south of France. Small proportions of it mixed with the flour of wheat, produce extremely good bread, biscuits, and paste. Cakes, excellent puddings, and savoury dishes are also made of it without the addition of flour.

Wholesome and profitable bread will be produced by blending one third of maize-flour with two of wheaten-flour or meal. These proportions are easily converted into a light, pliable dough, in which the peculiar flavour of the maize will prevail after it is baked, only so far as to be pleasant.

The ears of Indian-corn boiled whole, while the grain is still green and young, are exceedingly

good and delicate served as a vegetable. The corn is scraped from the stems with a knife after it is cooked, and in appearance and flavour somewhat resembles fresh peas.

Hominy is a preparation of the whole ripe grain, which, after being very long stewed or baked, and having absorbed a large quantity of liquid in the process, is considered very nutritious food, and it is also remarkably cheap; the hominy being sold at a low price, and one pound of it producing several when it is cooked.

Mush is a sort of porridge of maize-meal, made like the oatmeal-porridge of Scotland: it requires, however, to be much longer boiled.

RICE.

Rice, by itself, can scarcely be converted into bread; but it may be so when mixed with a tolerable proportion of wheat-flour or meal. It is the least nutritious of the cereal grains, containing little or no gluten; yet it constitutes almost the entire food of whole races of people in the East, where it is abundantly grown. Those, however, who live on it to the entire exclusion of animal food, — as the Hindoos for example, — take with it so much of the stimulating condiments in which their climate abounds, as well as of fresh green vegetables, and liquefied butter called *ghee*, that

the properties in which it is deficient, and the want of which would render it inadequate to the support of human life, are supplied to the eaters by their means. When its preparation is thoroughly understood, rice may be converted into a larger variety of excellent dishes than almost any other article of food that we possess; and it has also the advantage of being comparatively cheap. The highest in price, and the best for general purposes, is that which we derive from America, — the Carolina — which is large-grained and very white. The small-grained Indian variety, called Patna, is preferred to it for serving *dry* with curries, &c.

There are inferior kinds, as well as damaged and broken samples, which are sold at a low cost; but they are not really economical. That which is merely crushed, if separated from the powder with which it is generally mingled, might answer for bread perhaps as well or better than the entire grain, if first cleared by repeated and copious washings from the powder with which it is mingled. All rice before it is cooked should be washed until the water poured to it remains unclouded. To convert this grain into quite solid food, without any mixture of flour, it is merely necessary to mix it well with *three times its bulk of liquid* *, which it will entirely absorb; to prevent

* If this fact were generally known by cooks, the wholesome preparation of rice would be much facilitated. From a

the evaporation of any portion of this; to subject it to a gentle, but well sustained degree of heat, for between two and three hours; and to press it closely, while still warm, into any kind of mould. A well secured jar, placed in a slow oven, is best adapted to the success of this *rice-bread,* if it may be so called. In times of dearth it would be a valuable substitute for wheaten bread in part.

Another variety of the corn-plants is *millet,* "the smallest-seeded of them all;" which, however, is little known in England, though it is cultivated in the East, in parts of Africa, and in some parts of Europe.

Buckwheat also is used for bread on the Continent; but as it is not considered of value for that purpose here, and many other cheap ingredients which we can more readily command are better suited probably to the general taste, it does not appear needful to give an extended notice of it.

long series of experiments with different varieties of the grain, I have obtained always the same result.

PART II.

HOME-MADE BREAD.

The advantages to be derived from having bread for domestic consumption made in our own homes are great and manifold, provided it be *well* made, not else; and in every household, therefore, the true process of preparing it ought to be known, that it may be carried into practice when required.

In the first place, it is, in the best sense of the word, the most *profitable* mode of being supplied with this very precious portion of our daily food, though the saving in actual pence may not appear considerable. The real economy consists in having it secured from every species of adulteration and abuse, which would diminish its wholesomeness or value; and in the positive amount of nourishment which it affords, in consequence, to the consumers. It is also in other respects, by far the most *satisfactory;* as it affords also the best means of regulating its cost with strict frugality when circumstances demand it, by the substitution of such a portion of cheaper materials for wheat-

flour or meal, as will reduce its price without injury to its perfect wholesomeness. It must, however, always be remembered, that these benefits can be obtained only when the art of bread-making is *really* understood, and attentively followed out; for failure and loss will almost invariably result from carelessness or negligence in any of the details; and it is the want of success which so frequently attends the operation that deters many housekeepers from giving it a trial, and many more from persevering in it when they have once done so. As I have already stated in a previous work, "the heavy, or bitter, or ill-baked masses of dough, which appear at table under the name of *household* or *home-made* bread, are well calculated to create the distaste which they often excite for everything which bears its name*," and in-

* "It is surely a singular fact, that the one article of our food on which health depends more than on any other, should be precisely that which is obtained in England with the greatest difficulty,—*good*, *light*, and *pure bread*; yet nothing can be more simple and easy than the process of making it, either in large quantities or small. From constant failure it is nevertheless considered so difficult in many families, that recourse is had to the nearest baker in town or country, as a means of escape from the heavy, or bitter, or ill-baked masses of dough which appear at table under the name of *household* or *home-made bread*, and which are well calculated to create the distaste which they often excite for every thing which bears its name. . . . . When a miller

spire a prejudice against it which, in some instances, can never be surmounted. The bread of the better order of bakers has, at least, the recommendation of being always light, and of soft and agreeable texture, while it is quite fresh; though it speedily becomes dry and uninviting; and seldom or ever possesses the sweet, nutty flavour of *good* home-made bread; nor is it sufficiently substantial to satisfy easily the appetites of such of the labouring classes as, for the sake of convenience or from necessity, subsist principally upon it.* Men who follow any occupation, as a trade and source of livelihood, will naturally be more perfectly skilled in all that relates to it than private individuals can hope to be; and neither clever housewives nor domestic servants can fairly be expected to rival experienced bakers in the general aspect or in the endless and attractive *variety of forms* which their bread displays, though they

can be depended on to supply flour of good quality, and the other ingredients used in preparing it are also fresh and good, and mingled with it in due proportions, and the kneading, fermentation, and baking are conducted with care and intelligence, the result will uniformly be excellent bread."—*Acton's Modern Cookery.*

* The consumption of baker's bread in the families of many artisans, and other hard-working men is really enormous, and out of all proportion to what it need be, with better knowledge and more judicious management on the part of the women.

may effect what is infinitely more important, and satisfy at the same time all reasonable requirements as to the mere appearance of their preparations. A higher object than fashioning loaves into certain pleasing shapes may possibly be achieved by a little well-directed, sustained, and earnest effort. The common, but most precious food of the people may be rendered cheaper and more abundant, by being systematically guarded from waste* of every kind; and by replacing the ignorance from which much of it arises, and which is ever the worst enemy to the well-being of a population, with such plain practical knowledge as may enable those to help themselves who are now

* The waste of bread in England impresses thoughtful observers, and foreigners especially, with the most painful astonishment. It is not solely the fragments of it swept daily from the tables of the wealthy, and thrown away by pampered or careless servants; or those which ill-trained children are allowed to leave at all their meals; or the loss from want of skill in making it, which constitute this waste. It is said that in some of our large manufacturing towns, when work is plentiful and wages are high, some of the streets where the working men reside are literally strewed with its remains. I can but hope that this is an exaggerated statement, and that it will cease henceforth to be even partially true. If *all* classes of society would steadily and resolutely combine to suppress the waste of bread in *any* form, the number of "deaths" from absolute "*starvation*," or the more lingering ones caused by insufficient daily food in this country, would soon be sensibly diminished!

grievously helpless; and such of them to protect their own interests as are at present powerless to do so.

If the instructions which I have attempted to convey here should assist in promoting this desirable object, I shall rejoice sincerely; for it appears to me worthy of the deepest attention, and of the best exertions, which can be bestowed upon it.

At the commencement of this work both the extent and the effects of the "prevailing ignorance" of bread-making amongst us are dwelt upon at some length; and, to avoid the necessity of repeating here what has already been said about them, the reader is referred to the first ten or twelve pages of Part I. It must, however, be observed, that though far too general, particularly in our cities and large towns, this ignorance is not *universal* amongst us. Devonshire is celebrated for the excellence of its household bread (that of the bakers there also is said to be very good); in Suffolk almost every cottager's wife knows how to make it well. This is the case also in some of our northern counties, and in those where large dairy-farms are numerous; but in Kent, Sussex, Surrey, Middlesex, and many other parts of the kingdom, not one woman in twenty, on the average, is capable of making a loaf! When the educated mistresses of families shall be

better able to direct them, the women-servants at least will cease to be as inefficient in this matter as they now are.

THE COMPARATIVE WEIGHT OF FLOUR AND BREAD.

A *pint* of flour weighs fourteen ounces, or two ounces less than a pound.

A *quart* (or *half-quartern*) weighs one pound and three-quarters, and will make a loaf of two pounds and three ounces.

A *quartern* (or *half-gallon*) weighs three pounds and a half, and will make a loaf of four pounds and six ounces weight.

A *gallon* (or *half-stone*) of flour contains seven pounds. This will produce eight pounds and three-quarters of bread.

A *stone* (or *peck*) weighs fourteen pounds, and the product in bread will be seventeen pounds and a half.

Two pecks (or *half a bushel*) will weigh twenty-eight pounds, and make thirty-five pounds of bread.

A *bushel* (or *four pecks*) contains fifty-six pounds of flour, which ought to produce seventy pounds of bread.

A *sack* (or *five bushels*) should weigh two hundred and eighty pounds, and the product in bread should be three hundred and fifty pounds.

DIFFERENT INGREDIENTS OF WHICH BREAD MAY BE MADE, EITHER ENTIRELY OR IN PART.

Wheat.
Rye.
Barley.
Oats.
Maize.
Rice (boiled soft).
Potatoes (boiled).
Parsnips (boiled).
Beet-root (boiled soft).
Seed of French beans (boiled and skinned).
Buckwheat.
Millet.
Sago (boiled).

VARIOUS KINDS OF FLOUR, AND OTHER PREPARATIONS OF WHEAT.

Whites. — This is the name by which flour of the finest quality — made "from the very heart of the best wheat" — is known in the markets, and which is sold at the highest price.

Best Households. — Used generally for bread-making. This is, or ought to be, excellent flour, and stands next in price to the "whites," of which the use is confined principally to pastry, cakes, delicate home-made breakfast rolls, and similar preparations.

Seconds. — Perfectly good, but not very white bread is produced from this flour, which is that usually chosen by the economist.

Wheat-meal. — Commonly, this is the entire grain of the wheat, rather coarsely ground, and

freed from the bran. It is sold usually at the same price as the household flour, which appears altogether unreasonable, as it must cost the miller who prepares it much less. Yet even at this price it is economical to the consumer, as it contains, according to the statement of the best authorities, far more nourishment than wheat-flour only.

Whole-meal.—Whole-meal is the wheat ground into a proper state for bread-making without *any part* of it being taken away. Neither the bran nor any other portion of it is withdrawn; and this is stated by Baron Liebig, and other extremely clever men who thoroughly understand the subject, to make the most wholesome and strengthening bread that can be compounded.

Sharps, or *Best Grip.*—This comes next to that inner portion of the grain which contains the flour, and is good, *cheap,* nourishing, and excellently adapted to making bread, if mixed with flour for the purpose. It costs only from a shilling to eighteenpence the peck when flour is at its highest price.

Pollard and Bran.—Until lately both of these, which are now known to contain a considerable amount of nutriment, were rejected in making bread, and given as food to the inferior animals. At present, as will be seen by the preparation called *whole-meal,* they are ground up with the finer parts of the corn. When separated from

process can then render it fit for bread; for even a small portion of it, when so tainted, will always impart a most unpleasant flavour to everything with which it is mixed. To secure it from this injury, flour should be stored in a large chest or bin, as it is sometimes termed, and stand on a dry floor. Of late, flour-chests have been made lined throughout with tin, an admirable improvement, because they protect it well from the air, and can be kept perfectly clean without the application of water, which the wood could not. They require simply to be entirely emptied from time to time, and wiped out thoroughly with dry cloths. Few household stores can be preserved in good condition without care and nicety; and none are more easily injured by neglect than those which are used for bread. Small quantities of flour are sometimes merely put into stout linen bags tied at the neck, and set on a dry pantry or larder shelf or dresser. These should be often washed, well rinsed in plenty of fresh water, that they may retain no smell of soap or soda, and be dried quickly in the open air. When common wooden flour-chests of any size are used they should be occasionally emptied, scoured extremely clean with hot water, and be perfectly free from the slightest degree of moisture before they are again filled with flour. Meal requires the same precautions to preserve it sweet. If flour or bread

be left exposed, it will attract not only mice, but kitchen-beetles and other insects which abound in the underground floors of many houses: it should always therefore be well protected in some way from their attacks.

DIFFERENT KINDS OF YEAST, AND OTHER FERMENTS, AND THE MODES OF USING THEM.

YEAST is so important an auxiliary in making bread that its nature and quality demand especial attention; for unless it be *good of its kind,* and in a fitting state to produce ready and proper fermentation, the best flour of which dough can be fabricated will fail to produce wholesome or even eatable bread. A knowledge of the proportion of it required is also indispensable. *Too much* is commonly used by unskilful bread-makers, and this both impairs its flavour and diminishes its nutritious properties, while an insufficient quantity will fail to render it light. By attention to the receipts which follow, the learner will be enabled to avoid both these extremes. The yeast of strong beer or ale will produce much more effect than that of milder kinds; and the fresher yeast is, the smaller will be the quantity of it needed to raise the dough.

To purify yeast. — When yeast is either bitter

or dark-coloured, it can only be improved by copious and repeated washings. It should be well stirred into plenty of cold water and left for at least twelve hours undisturbed, when it will have subsided into a comparatively solid state, and the water may be gently poured away without disturbing it, and more be poured to it when time will permit, or when it is found to be necessary. Should any hops or impurities of any kind appear in it, it should be strained through a hair-sieve kept for the purpose after it is mixed with the water and before it is put aside to settle.

It may be preserved many days by changing the water every twenty-four hours, but must never be left for any length of time exposed to the air without it after it has once been mingled with it. The white of an egg beaten up with the first water poured on will assist to remove the bitter flavour of yeast.

To keep brewers' or home-made yeast. — If taken very new, and poured immediately into clean *dry* stone or glass bottles, and corked, but not very tightly, without delay, common yeast will remain perfectly good often for a fortnight at least. Should a little of the beer be mixed up with it, it will not matter: the bottles should be well shaken when the yeast is wanted for use, and it can still be watered for some hours to render it solid. With water only, if it be changed regu-

larly, it may be kept for many days, but it is always *best* in its effects when new.

To freshen or aid the fermentation of stale yeast. — Yeast may be made to ferment much more easily and quickly after it has become stale by mixing with it first a small quantity of sugar in powder, and then a few spoonfuls of warm water, and setting it in a warm place to rise. A teaspoonful of sugar will be sufficient for two tablespoonfuls of solid yeast: a little warm flour will further help the fermentation. The whole may be mixed into a thin batter.

German yeast.—This preparation, of which the true nature will presently be explained, has now very much superseded the use of brewers' yeast in such parts of this country as are conveniently situated for receiving quickly the supplies of it sent to us regularly from abroad; and it answers exceedingly well when it can be obtained fresh and is properly managed, as it is never bitter, and ferments very easily. Some prejudice — which appears to have been quite without any reasonable foundation — existed against it for a time; but it has given way in a great measure to the results of experience, and to the clear explanations which have lately been made to the public of its real character, which show that there can be nothing injurious in it. In *exceedingly* sultry weather it becomes putrid almost before it can be conveyed

from the places where it is manufactured here; and it is then better avoided; but in all other seasons it will be found well adapted for making very light bread and cakes. It has been sometimes objected to, from its rendering bread *too* spongy and unsubstantial; but this has arisen, I am inclined to believe, from double the quantity of it having been used which was really required. *One ounce* is quite sufficient to make a gallon of flour into bread. For many months this is the full proportion which I have habitually had employed, with entire success. In London, where I first had it tested, nearly twice as much produced no better effect; but the yeast, after having been kept a day or two in the heavy atmosphere of that city, may perhaps ferment less freely.* Great care should be taken to dilute it very gradually before it is mixed with the flour in making dough; for, unless this be done, the bread will be full of large hollow spaces after it is baked, which will never be seen in that which is properly made. When used in its dry state it should first be broken down in a large basin with the back of a strong spoon, and moistened with a few drops of liquid

* It is a rather curious question, whether the difference I have named may really have had its origin in any atmospheric influence which was unfavourable to the fermentation, or whether it may have arisen solely from the *freshness* of the yeast being impaired by the surcharged air of the great city.

at a time, until not a single lump is to be seen in it. When it has been dropped into water and stirred up with it, it will have become smooth at once. The usual price at which it is retailed is one penny the ounce. For the same cost sufficient brewer's yeast may be obtained to make a bushel of bread: the German yeast, therefore, is considerably the dearest, but it is more uniform and certain in its effects. It is sold at the bakers' and cornchandlers', and sometimes by the general shopkeepers.

To keep German yeast. — In the state in which it arrives here, it is very difficult to preserve this yeast fit for use for more than a day or two, unless the weather should be very cold. It keeps best in an uncovered jar or cup; and should always be set into a cool and *dry* place. When procured quite fresh and sweet, if dropped into a jug of water* directly it is brought into the house, and well stirred up with it, it will remain good much longer and ferment very readily afterwards. The water may be changed once in twenty-four hours, and, if poured off carefully, will carry no portion of the yeast with it. A pint of water will be sufficient for an ounce of yeast.

Method of making German yeast.—"This yeast

* This, in London and its neighbourhood, ought to be filtered for the purpose, and so ought all which is used in making bread.

in many distilleries forms an important *by-product* of the manufactory, and is collected and sold under the name of dry yeast, for the use of the private brewer and baker. When this is done, the process adopted is nearly as follows:—Crushed rye is mashed with the proper quantity of barley-malt, and the wort, when made, cooled to the proper temperature. For every hundred pounds of the crushed grain there are now added half a pound of carbonate of soda, and six ounces of oil of vitriol (sulphuric acid) diluted with much water, and the wort is then brought into fermentation by the addition of yeast. From the strongly-fermenting liquid the yeast is skimmed off, and strained through a hair-sieve into cold water, through which it is allowed to settle. It is afterwards washed with one or two waters, and finally pressed in cloth bags till it has the consistence of dough. It has a pleasant fruity smell, and in a cool place may be kept for two or three weeks. It then passes into a putrefying decomposition, acquires the odour of decaying cheese, and, like decaying cheese, has now the property of changing sugar into *lactic acid*, instead of into alcohol, as before. A hundred pounds of crushed grain will yield six to eight pounds of the pressed yeast. It is made largely at Rotterdam, and is imported thence to this country through Hull."*

* Professor Johnson's "Chemistry of Common Life."

This is nearly the same process as the one pursued in Austria, and communicated recently by a correspondent of the *Times*. "Take brewery, or, by preference, distillery yeast, and filter it through muslin or a silk sieve into four or five times the quantity of water, which must be as cold as possible and in which, in summer, ice should be dissolved. Let the yeast and water be well stirred up together (in preference with a broom) until there is a good head of foam; then leave them until the yeast has settled and the water has become clear. Draw off the water gently without disturbing the yeast. (This is best effected by having a tub with taps in it placed at different heights, and by opening the highest first.) This done, again pump the tub full of fresh water, and stir the yeast up with it again. Repeat this until the water becomes tasteless and clear; then add to the settled substance, for every twelve gallons of yeast used at the commencement, half an ounce of carbonate of ammonia and one ounce of bi-carbonate of soda, previously dissolved in a pint of water. Mix this well with the purified yeast, and leave it for twelve or fourteen hours. Then again pump water to it, stir it up well, and, when once more settled, draw it off, which concludes the process. The yeast must next be turned into a linen bag, tied up, and placed between two boards large enough to cover

it well, and very gently pressed to free it gradually from moisture, and convert it into a substance similar to bread-paste or dough, which can be formed to size and weight as needed.

"In Austria the weight is something near one pound when dry, in square forms an inch thick.

"The whole process should be conducted in a very cool place, and the yeast should be kept in a cold place, when it will remain good from eight to ten days in summer, and from ten to fifteen in winter."

From this excellent receipt, which I have been obliged to curtail a little, it will be seen that German yeast is only common yeast *thoroughly purified* and rendered half-solid by pressure. It might easily be prepared in this country, either for sale or for domestic use, by the directions given above, which are very clear and ample.

Home-brewed yeast.—The yeast of mild* home-brewed ale is always much in request for bread-making, and is even bought up by some first-class London bakers from small farms and other places for the purpose. It does not require watering to *purify* it, but merely to render it solid, that a learner may know exactly the proportion to take;

* The yeast of strong beer, which is generally more highly hopped, and therefore more likely to be bitter, will produce an excellent effect in lightening dough, but will be less favourable to its sweetness.

which cannot so well be ascertained in its frothy and liquid state. Experienced bread-makers do not need such a precaution, as they are enabled, by long practice, to judge of the effect which it will produce in any form. A large tablespoonful of it when solid will be quite sufficient for a four-pound loaf.

Brewers' yeast. — Though often otherwise perfectly good, brewers' yeast is sometimes in these days so *extremely* bitter, that it can with difficulty be rendered fit for making bread, even by the *washing* and frequent change of water recommended at page 92. Neither passing it through bran, nor dropping kindled charcoal or live cinders into it, nor any of the expedients recommended commonly for the purpose, will produce the desired effect. The white of an egg mingled with the water which is first stirred to it may, in a measure, improve it; but as gentian and various other powerfully-flavoured ingredients are partly substituted for hops in brewing the bitter beer which at present finds so much favour with the English public, and which is so largely brewed for exportation as well, it is extremely difficult to make bread with it that is free from bitterness. The only plan to be pursued when no other can be procured, is to use it *very* sparingly, and to leave the dough much longer to rise. The yeast

of porter, from its dark colour, and its flavour also, is objectionable for bread.

INGREDIENTS FOR MAKING UNFERMENTED BREAD.

Good and wholesome bread can be made in several ways without yeast, or what is commonly called leaven or *"raising."* When a loaf is merely wanted quickly on occasion, soda and tartaric acid or sour butter-milk may be used for it; but for constant eating the tartaric acid would be objectionable, and *muriatic* acid should supply its place; but this must be kept and used with care and caution, as it burns severely before it is mixed with the soda, but is perfectly harmless afterwards, as it is then converted into common salt, and the hands may be used fearlessly to knead the bread which is made with it after the ingredients have been stirred together for an instant with a wooden spoon.

All unfermented bread must be despatched to the oven the instant it is made, or it will be heavy; it can therefore only be baked where there is an oven close at hand. If sent to a bake-office, it must be *made there,* and set into the oven immediately.

For the best kind of unfermented bread.—When this is required in large quantities, or is habitually eaten by a family, the ingredients should be kept

in readiness for immediate use when needed. Eight ounces of strong muriatic acid should be mixed with twenty-one ounces of cold water, and kept in a stopper-bottle. For each pound of flour half an ounce of this should be measured with a graduated glass kept for the purpose, and added to half a pint of cold water. One drachm (apothecaries' weight) of carbonate of soda must be rubbed through a fine sieve, and thoroughly mingled with the flour, before the acid is stirred to it.

Strong muriatic acid 8 ozs., cold water 21 ozs. Of this mixture, ½ an oz. in ½ pint cold water for each lb. of flour, and carbonate of soda (apothecaries' weight) 1 drachm.

For Dr. Pereira's unfermented bread.—For each pound of flour one drachm of carbonate of soda, and half a teaspoonful of pounded sugar rubbed through a sieve. Fifty drops of the muriatic acid of the shops and half a pint of water.

is to say, when so much liquid has been used in mixing the dough that it spreads about instead of remaining in shape when moulded into loaves, "it should be put into a rather slow oven; otherwise the outside will speedily harden and lock up the moisture," * and the inside, not being sufficiently baked, will be unwholesome eating; and in warm weather will soon become sour or mouldy.

Loaves which are baked in tins or pans should be loosened from them directly they are taken from the oven and, like all other bread, turned upside down, or the steam, not being able to escape, will cause the under-crusts to be wet and blistered. To render bread *soft* it is covered with a thick flannel while cooling, or wrapped in it.

A proper instrument for *rasping* French rolls or loaves is sold at the ironmongers'.

Observation. — To ascertain whether dough be light enough to bake, let the knuckles be pressed hard upon it, and leave it for a short time, when, if the impression of them has disappeared, it will be a proof that it is ready for the oven, to which it should be despatched *quickly* after it has been made up into loaves, unless it is required very spongy, when it may be kept, as directed in some of the following receipts, in a warm place to rise or *prove*, after it is moulded.

* Professor Donovan.

While bread is being baked the door of the oven should be opened as seldom as possible, particularly until the dough has *set*, or become firm, as cold draughts of air admitted to it will have an unfavourable effect upon it, and cool the oven quickly at the same time.

THE OVEN.

Management of a brick oven.—Much of the quality of bread depends on its being well baked, and therefore, the nature and construction of the oven used for it, when it is required in large quantities, are very important. Of all that are in common use amongst us at present, a brick oven, heated with wood, is generally considered as the best adapted to it; and, certainly, no bread seems so sweet and wholesome as that which is so baked in private families, when perfect cleanliness has been observed in all the operations connected with it, and they have been performed with care and skill. To ensure a sufficient degree of heat to bake bread properly, and a variety of other things in succession after it when they are required, the oven should be well heated, then cleared and cleansed ready for use, and *closely shut* from half an hour to an hour, according to its size. It will not then cool down as it would if the baking were commenced immediately after the fire was with-

drawn, but will serve for cakes, biscuits, sweet puddings, fruit, meat-jelly, jars of sago, tapioca, rice, and other preparations, for several hours after the bread is taken out.

I have known a very large brick oven, heated in the middle of the day with one full sized faggot or rather more, and a log or two of cord-wood*, which was added when the faggot was partly consumed, still warm enough at eight or nine o'clock in the evening to bake various delicate small cakes, such as macaroons and *mesingues*, and also custards, apples, &c.

It is both a great convenience and a considerable economy in many families to have such a means of preparing food for several days' consumption, and renders them entirely independent both of bakers and confectioners.

To restore the freshness of pastry, biscuits, or bread, when they begin to taste stale, it is only necessary to heat them through, without hardening them, in a gentle oven of any kind.

To heat a large brick oven.—Lay a quantity of shavings or other dry light fuel into the centre of the oven, and some small branches of faggot-wood upon them; over these place as many of the larger branches as will make a tolerably large fire, and set

* When there is no cord-wood at hand, the large faggot-stems can be used instead, but will not have so good an effect. Elm, or beech, or oak is the best of all fuel.

is too hot*, and should be closed, if the state of the dough will permit it to wait, until the temperature is moderated: this is better than cooling it down quickly by leaving the door open. It may also be tested by putting into it small bits of dough about the size of walnuts, which will soon show whether it be over heated or not sufficiently so.

When, from want of due calculation or any other point of good management, the dough is not ready when the oven is fit to receive it, and the heat has too much abated by the time it is so to permit it to be properly baked, the economist should bear in mind *that the cost of having it heated anew to the proper degree will be a very trifling consideration compared with the loss of the bread itself, if it should be spoiled by insufficient baking.* The price of half a bushel of flour would purchase a *large* number of faggots.

Cottage brick oven. — To bake half a bushel of bread in the oven of a working man's cottage, a *fourpenny faggot* — in those counties where wood is to be obtained at a reasonable price — is usually found sufficient. The bread in many cases is divided into eight or nine large loaves, which are baked for about two hours. The fire is kindled in the oven immediately after the dough is made; but it is not commonly left to rise so long as two

* This test is to be relied upon only when the flour is not very old and dry, as it will then take fire in an instant.

hours, much more yeast being used for it oftener than is really needed, and the fermentation being much quickened in consequence.

Iron ovens. — It is not easy to give very precise directions for heating these; they vary so exceedingly in size and in construction. Those which have a fire under them will sometimes bake extremely well if they are carefully attended to, and not *over-heated;* but in general they are a little difficult to manage, being apt to burn the surface of bread or pastry before they are half baked; and another disadvantage attached to them is that the iron-plate at the bottom, being so near the fire, becomes greatly over-heated, and quickly blackens what is placed upon it. A remedy for this is, to withdraw the sliding sheet of iron which usually separates these ovens into two compartments, and to set some clean bricks close together on the oven floor to receive the tins of bread or other preparations. A thick layer of sand placed between two sheets of iron will likewise prevent the excess of heat; but the bricks are somewhat preferable. In many of the cooking-stoves of the present day the ovens are so much improved that they bake admirably; and they can always be brought to the required temperature when it is higher than is needed, by leaving the door open for a time.

American ovens.—It is possible to bake bread

well in an American oven of moderate size; but the loaves must not be very large; and they must receive constant attention to prevent their being scorched in one part before they are sufficiently baked in another. They should not be placed too close to the fire at first, nor at any time quite near to it. They should be watched and turned round from time to time that the heat may reach them equally; and paper should be laid over the tops if they should accidentally take too much colour before they are done. They will answer best in this kind of oven if put into tins suited to its dimensions. Persons who use the American oven *habitually* will find it a great advantage to have a tin-mould nearly the size of the interior (or two smaller ones fitted easily to it), of about an inch and a half or two inches in depth, and the same size at the top and bottom. This shallow mould or tin permits bread, cakes, and many other preparations, to be baked in the best manner that an oven of the above construction will permit, and renders it altogether far more useful than those which are simply fitted with the common tin tray usually sold in them.

If dough be very evenly pressed into a slightly buttered mould of the height that has been named, to within a third or rather more of its depth, and slightly cut once or twice across the top, it will form an exceedingly nice loaf provided the baking

be well conducted. Light cakes, thick gingerbread, various kinds of puddings also, may be baked in it with equal facility.

Care must be taken to place the American ovens always in such a manner that the heat of the fire may reach the *lower* as well as the upper compartment of them, otherwise the baking will be very imperfect. They are extremely useful when their management is once thoroughly understood, and answer best with a *moderate* and not a very fierce fire.

Ball's revolving oven.* — This is a simple but very ingenious invention by which bread is baked in the same way that meat is roasted, by revolving in front of the fire; and it is so contrived that it may be suspended from the chimney-piece of any room at pleasure, which, in many cases, is a great convenience. It answers perfectly where the bars of the grate are straight and of the same width at the top and bottom, but not when the stove is of circular form, because it is essential that the heat should reach without impediment the lower part of the oven. Bread baked in it, if properly attended to, will be very light and good. Should the top not take colour sufficiently by the time the loaf ought to be done, the oven must be lowered, and left so until it is browned. It may

* Patentee, Mr. Ball, 3. Wells Street, Oxford Street.

be suspended from a bottle-jack, and will then require no attention beyond that of keeping up a proper fire while it is in operation; but when it is merely hooked to a woollen cord or a common string it must be closely watched, and kept turning, or the bread will burn. It is desirable to screen it from strong draughts of air during the process by placing something suited to the purpose before the fire. When there is no other oven of any sort in a house adapted to baking bread, this will be found very serviceable, particularly in remote country places, and in families who possess but scanty accommodation for domestic purposes. At a common kitchen-range, with a sound *roasting-fire,* a two-pound loaf will be done in an hour and ten minutes, and a four-pound loaf in nearly two hours. The price of these little ovens is very moderate, and they are light and portable. They do not require to be heated before the bread is put into them.

Observation.—There can scarcely be a stronger proof of the value of home-made bread in London than the avidity with which the specimen-loaves are sought which are made by Mrs. Ball, and baked in the one or two of her husband's ovens, which are always to be seen in operation in their own shop.

SECTION III.

WHOLESOME AND UNWHOLESOME BREAD.

WHETHER it be made with wheat-flour or meal only, or with a portion of sound floury potatoes, or of well cooked rice, bread will be perfectly wholesome, provided it be sweet, *light*, and *thoroughly baked*, though it will be more or less nutritious. This will be the case also if it be composed in part of rye*, or maize, or oat-flour, or even of barley-meal, unless it should be for very delicate eaters, to whom the maize and barley are not so entirely adapted as flour of wheat.

Hot, or *quite* new bread†, is exceedingly un-

* All kinds of grain are subject, while growing, to the attacks of diseases which render them unwholesome for food; but rye, more than any other, is *dangerous* to health and life when it is injured by what is called the "*ergot*." As it has then, however, a peculiarly acrid and repulsive flavour, its being diseased, or "*horned*," as it is termed, is easily perceptible.

† Very strong persons of active habits, can eat this and many other things, with impunity, which are extremely harmful to those who are less vigorous. *Heavy* bread produces often serious attacks of diarrhœa, particularly in aged people. The poor, who are the greatest sufferers, in many cases from

wholesome. Heavy bread is dangerously so. That which has become sour, either from having been over-fermented in the making, or from having been ill-managed afterwards, is very objectionable; and mouldy bread also is unfit for food.

For constant eating, bread made with tartaric acid is not to be recommended, though its occasional use will do no harm. Invalids whose digestion is much impaired, should avoid bread enriched with butter, eggs, or cream; and when they suffer acutely, a small portion only of milk should be mixed with that on which they habitually subsist.

It is scarcely needful to name the flour of highly damaged corn as furnishing unhealthy diet. Mention has recently been made in our leading journal of some which was absolutely putrid; and in its transit from the coast to London, was a cause of annoyance, from the dreadful smell which it emitted, to the passengers of the train by which it was conveyed. This was, perhaps, an extreme case, and it *might not* be destined to find its way to the bakers; but I cannot too often or too forcibly repeat, that to nourish the eaters as it ought, and to sustain "man's strength" as it was

their ignorance of bread-making (as they cannot afford to throw away the food they have spoiled), experience alarming effects from living on it. Some striking instances of this have become known to me.

country mill. One of the disadvantages attendant often on a city residence to families of limited income, is the being compelled, for want of due accommodation in their dwellings for keeping household stores of any kind, to buy them for daily consumption at full retail prices;—many bakers, too, refuse to bake bread for persons who do not purchase the flour of which it is made *of themselves*, which is another drawback, as they cannot of course afford to sell it without deriving some profit from the sale.

The *bread associations*, of which mention will be made hereafter, remove many difficulties in obtaining good bread at the least possible cost, and spare the housewife all the trouble and inconvenience which attend its preparation when insufficient means for it exist. In many localities these establishments would be of infinite benefit.

THE QUANTITY OF LIQUID REQUIRED TO MAKE A BUSHEL OF FLOUR INTO BREAD.

This will vary, according to the quality of the flour, as the *very best* will absorb considerably more moisture than inferior kinds. It is said that the finest flour will take up half its weight of water; consequently, sixteen quarts, or four gallons, would be required for it if this calculation were correct; but it is seldom that more than three gallons will be needed, with the addition of

half a pint of solid yeast. Rather less will usually be found sufficient when German yeast is used.

One bushel flour; twelve quarts (three gallons, *exact* measure) water; or, to each peck or stone of flour, three quarts of water, or other liquid.

Observation.—There is constant failure in culinary operations in many houses for want of such simple "means and appliances" as a few pence would supply. Amongst these, *exact liquid measures* are very noticeable; the *guessing* at quantities, from not having them at hand, producing the worst effects in many processes. In *every* kitchen there should be proper facilities for the work which has to be done there, and for weighing and measuring ingredients in particular. Much loss, vexation, and trouble might often be avoided by having these provided; and the jugs lettered "Imperial," which are proper legal measures, are so cheap that they come within reach of the narrowest incomes.

PROPER FERMENTATION OF BREAD-DOUGH.

The "raising," or lightening of dough to the proper degree, by means of yeast or any other ferment, is a most important part of bread making, and demands the greatest attention. The yeast smoothly mixed with a certain quantity of liquid at a given temperature, should be diffused equally by *thorough kneading* throughout the mass of flour; for if they be carelessly mingled, the bread, after

it is baked, will often display large cavities in parts, and be almost or quite heavy in others. This is frequently the case when the yeast has been left in lumps instead of having been gradually and well blended with the liquid used for moistening the paste; and when the kneading has been imperfect. Fermentation will be checked, and sometimes prevented entirely, by excessive cold; therefore, in seasons of severe frost, and in winter generally, dough should be guarded from exposure to it; though it must not be forgotten, that *over-heating* it, by placing it too near a large fire, or otherwise, will have an equally bad effect. It should be kept *warm* only, from the time of its being made until it is set into the oven. Very rapid fermentation, which is produced by using a large quantity of yeast, is by no means favourable either to the flavour, or to the general excellence of bread, which it causes to become speedily stale, and which it renders less agreeable and less nutritious than slower fermentation would do. If carried beyond a certain point, too, the dough will become sour from it. As home-made bread is usually prepared in sufficient quantities for some days' consumption, it is desirable to have it so managed that it shall remain fresh and eatable to the last; and this is best accomplished by fermenting it with so much yeast only as shall render it wholesomely light, and allowing such time for the process as will be

specified in the receipts which follow. The various causes which destroy or check the fermenting principle in yeast will be further explained amongst those which occasion "Failure in making bread," and in the general rules and observations addressed to the quite inexperienced learner. It will be seen that fermentation is so much affected by temperature, that it must be differently conducted at different seasons, and that the *judgment* must be exercised in carrying it to the proper point, and in preventing that degree from being exceeded.

It is very desirable that the *principles* of fermentation should be better understood in common domestic life than they now are. There would then — except from negligence — be no *over-working* of dough, of home-made wines, or of home-brewed beer, so often, from ignorance, permitted to reach the *acetous* state, which entirely destroys their value.

DIFFERENT METHODS OF MAKING BREAD-DOUGH.

There are several ways of preparing dough for bread, either of which, in experienced hands, will generally be attended with success. The most common mode of proceeding is, to mix the yeast carefully with part of the liquid required for the whole of the bread, and to stir it into the centre of the flour; then to add, by degrees, what more of

liquid may be necessary, and to convert the whole, with thorough steady kneading, into a firm but *flexible* paste, which, after standing in a suitable place until it has swollen to nearly double its original size, is again thoroughly kneaded, and once more left to *rise* or become porous, before it is moulded into loaves, and despatched to the oven. The required proportion of the different ingredients, and the time for the proper fermentation of the dough, will be found given with exactness in the various receipts for bread contained in this book.

To make dough by setting a sponge. — This method of making dough is usually followed when there is any doubt either of the goodness or of the sufficient quantity of the yeast which is used for it; because if it should not become light after standing a certain time, more yeast, mixed with a little warm liquid, can easily be added to it, and the chance of having heavy bread be thus avoided. After the salt has been well mixed with the flour, a hole is made in the centre, and the yeast, *very* smoothly diluted with a certain portion of warm water or milk-and-water, is gradually poured into it, the surrounding flour being stirred to it as this is done, so as to convert it into a rather thick batter, *quite free from lumps.* If the batter be thin, it will rise more quickly, but this is not desirable. Plenty of flour is then strewed on the surface, and it is left until the sponge has broken

through it, and appears full of small bubbles. Sufficient warm liquid is then added and stirred in with a strong wooden spoon, and the kneading is then accomplished with the hands. The precise manner of effecting this, is so minutely described in the "Directions to the Learner," page 129., that it does not appear needful to enter further upon it here.

Observation. — When *coarse* salt is used in making bread, it should be thoroughly dissolved and stirred to the liquid with which the dough is moistened. Fine salt may be well mingled in its dry state with the flour.

Dough slowly fermented with a very small quantity of yeast.—The method which is pursued in France and other countries in preparing a rich light cake or bun, called *brioche,* may be followed quite successfully for bread, as regards the proportion of yeast employed and the time allowed for the fermentation of the dough, which should be made *firm,* and be thoroughly kneaded, then tightly rolled in a thick cloth, and left for a night before it is baked. The *brioche,* which is but an unwholesome compound, though very light, if properly made, is managed thus :—A fourth part of the flour destined for the paste, is made into a *leaven,* with a small portion of good yeast, and sufficient warm water to bring it to the consistence of rather spongy dough. This is placed near the

worked with it into a stiff batter with a spoon, which should then be withdrawn, and the kneading with the hands commenced. Until a little experience has been gained, the mass of dough which will be formed with the pint of liquid may be lifted from the pan into a dish, while sufficient warm water is added to wet up the remainder of the flour. This should afterwards be perfectly mingled with that which contains the yeast. A better plan is to use at once from a pint and a quarter to a pint and a half of liquid; but learners are very apt to pour in heedlessly more than is required, or to be inexact in the measure*, and then more flour has to be used to make the bread of a proper consistence than is allowed for by the proportion of yeast named in the receipt. It is a great fault in bread making to have the dough so moist that it sticks to the fingers when touched, and cannot be formed into loaves which will retain their shape without much flour being kneaded into them when they are made up for the oven.

Flour, a quartern, or half gallon (3½ lbs.); solid brewer's yeast, one tablespoonful; or German yeast, nearly one ounce; warm milk and water, or water only, one pint and a quarter to one pint and a half.† When made

* Servants and young people are too apt often to merely guess at the measure of liquid which they use.

† Flour, though it varies considerably as to the quantity

by setting a sponge, to be left to rise for an hour, or until light; made into dough, and left again to rise for three quarters of an hour, *or more if needed*, then made *lightly* into two loaves, sent to the oven from an hour to an hour and a quarter, or baked in one loaf from one hour and a half to two hours.

Observation.—A rather full proportion of yeast is allowed in the foregoing receipt, in order to avert any chance of failure on the learner's part; but a little practice and observation will soon show that it may be diminished to half an ounce, without the slightest disadvantage to the bread, which, if rightly managed, will be improved in flavour, and keep better than when more is used for it.

To make the dough without setting a sponge.—Merely mix the yeast with the greater part of the warm milk and water, and wet up the whole of the flour at once, after the salt has been stirred to it, proceeding exactly in every other respect as in the directions just given. As the dough will *soften* in the rising, it should be made *quite firm* at first, or it will be too lithe by the time it is ready for the oven.

When a little experience enables you to undertake a larger baking without danger of spoiling

of water which it will absorb, seldom requires so much as this; so it should be added cautiously and in small portions, when the dough is nearly mixed.

the bread, remember that it will probably require a longer time to become quite light than a very small quantity would; and that it will rise more quickly in warm weather than in cold.

When it is to be *home-baked* as well as home-made, you must endeavour to calculate correctly the time at which it will be ready, and have the oven in a fit state for it when it is so. Should it have to be carried to the baker's, let a thick cloth or two be thrown over it before it is sent.

GOOD FAMILY BREAD.

(Sufficient for a week's consumption for ten persons.)

With three pecks of the best flour, mix from half to a whole teacupful of salt, according to the taste of the eaters; some persons liking a full proportion of it, and others objecting to more than will very slightly flavour the bread. Next, dilute gradually and smoothly a short half pint of good brewer's yeast,—which has been mingled with plenty of water, and left for at least twenty-four hours—with two or three quarts of warm milk and water, taken from *nine* quarts, which will be required to make the three pecks of flour into dough. If the quality of the yeast should be doubtful, it will be better to set a sponge with it, by the directions at the beginning of this chapter, with about four quarts of the liquid; but other-

wise it may at once be kneaded up with the whole quantity, and left from an hour and a half to two hours to rise. Knead it thoroughly a second time, when it appears perfectly light; and let it remain for another hour, when it will probably be ready for the oven. Turn it then on to a paste-board or dresser, divide it into the number of loaves required, make them up quickly and *lightly*, dredging a little flour occasionally on the board to prevent their sticking to it, and despatch them quickly to the oven. It is always well to cut them slightly *across the tops*, as well as round the middle, to assist their rising. When it is necessary, the "Receipt for a quite inexperienced learner" should be attentively studied, and the minute instructions given in it be well understood before any baking on a large scale is undertaken.

Flour, three pecks; salt, four to six ounces, or half to a whole teacupful; solid yeast, short half pint; milk and water, nine quarts. Left to rise the first time from one hour and a half to two hours; the second time about one hour, or until perfectly light. Loaves baked in brick oven one hour and a half; longer if very large.

The bread made by the above receipt—for which genuine country flour of the best quality is always used—is as white, as well flavoured, and as light as can be desired. By substituting *seconds*, or

meal and flour mixed, for the more expensive kind, the same directions will serve for cottage, or for common household bread at any time. For a bushel of either, from a quarter to half a pound of salt, according to the taste, a *full* half pint of solid yeast, and three gallons of warm water, with about the same time allowed for the fermentation (or *rising*), is all that will be required, though a portion of milk, or *quite sweet* buttermilk, is always to be recommended when it can be had without much expense, as it renders the bread more nourishing, and improves it in every way. Rather more yeast and water should be allowed for brown or *meal* bread, than for white.

A SURREY RECEIPT FOR GOOD HOUSEHOLD OR COTTAGE BREAD.

(From the Wife of a Parish Clerk.)

The good woman whose receipt for bread is given here, is often called upon to supply it to persons who cannot otherwise procure it *home-made* without much difficulty; and as one feels assured in eating it that it is composed of honest country flour *, and as it is light and well-flavoured,

* Occasionally with that of the wheat grown in her own allotment ground, or with that which her family have gleaned, —*the leasing corn*,—supposed to make the best bread of any; and hers has been certainly most sweet and nice in flavour.

it is often peculiarly acceptable in London and elsewhere. She makes it even for the family of the clergyman of her parish, when their own servants cannot perform that duty; and the constancy with which it is required from her is sufficient evidence of their deficiency in that respect.

"Mix with about five gallons and a half of flour, a teacupful or about six ounces of salt, and three pennyworth, or rather more than a pint, of yeast. Make these up into a dough at once, with something more than a gallon of warm water; let it stand to rise until it is quite light, and in the meantime, kindle the fire in the oven, and heat it well. A fourpenny faggot is all the fuel that is used for it; but it is always heated once a week, and sometimes twice, so that it requires less than ovens which are not so regularly used. Divide the dough into four-pound loaves, and bake them well. They will be nicely done in about two hours."

This bread, when carefully stored, remains perfectly good in cool weather for ten days; and has occasionally been found quite eatable at the end of a fortnight, which it would not have been unless it had been wholesomely made and thoroughly baked. I think it might be slightly improved by diminishing a little the proportion of yeast used for lightening it, and allowing it to lie rather longer after it is kneaded down, before it is put

into the oven. A portion of milk, too, is always a desirable addition to bread when it can be had.

Flour (resembling what is called *households*, but excellent of its kind), four gallons and a half; salt, one small teacupful; fresh brewer's yeast, three pennyworth (or rather more than a pint); water, four to five quarts; made into a firm dough at once, and left to rise for an hour; kneaded down, and shortly afterwards divided into 4lb. loaves; baked in well-heated brick oven two hours.

Remark.—The proportion of fresh yeast for this bread being large, it becomes light in a shorter time than that specified for the *second* rising of the dough in the generality of the receipts contained here; but slower fermentation is to be recommended. In cottage life, many laborious avocations falling often on one individual, the same time and the same minute attention cannot well be bestowed on any of them as in families where the work is divided between several persons. The "clerk's wife," cited above, has to make bread for a large family of her own, as well as for her customers, yet the order and neatness of her house, even on the busy baking days, and the attractive appearance of her "batches" of wholesome-looking bread, have been remarked with pleasure by accidental visitors.

WHOLE MEAL BREAD, CALLED IN GERMANY PIMPERNICKEL.

(The most nutritious and economical of any.)

This bread is composed of wheat ground into meal, and used without any portion—even the bran—being taken from it; and it is highly recommended by some of the first scientific men of the present day as containing a larger amount of nourishment, and being more easy of digestion than that which is made with fine flour only, because it is now ascertained that the bran (which was formerly considered as altogether unfit for food), contains in reality more *gluten*, or nutriment of the best kind, than any other part of the corn; and it is stated by a very superior writer, that it possesses also a peculiar kind of ferment, which has the property of dissolving the bread or flour with which it is mixed, and rendering it more easily digestible in the stomach. He adds: "To this quality of bran, as well as to the nourishment it yields, are to be ascribed some of the wholesome qualities which many persons have recognised in whole-meal bread."

Now, it will be seen, that very great advantages would attend the *general* use of the wheat merely reduced by grinding to a proper state for being converted easily into bread, which is more strengthening in its nature than any other, and therefore of

more value to those whose toil is heavy and exhausting; and which, from its digestible character, is also well suited to persons of sedentary habits, and to invalids.* In the ordinary processess which the corn undergoes in separating its various parts, there is always considerable loss; and *the consumption of wheat in the country would be materially lessened* if this loss were in a great measure avoided by the adoption of the whole-meal bread. There would soon be a perceptible difference if a *portion* of it only were consumed in every family which is at present supplied entirely with that made with fine wheaten flour. After a time, it would be preferred by the eaters generally to white bread; and the poorer classes of the people, who now reject with absolute disdain every form of brown bread, from an idea that it is of inferior quality to the finer and more expensive kinds, would gradually lose their prejudice against it if they saw it commonly adopted for consumption by the wealthy.†

* I have received the warmest commendations of the whole-meal bread from persons who have eaten it exclusively for years, and who in point of health have derived the greatest benefit from its use. It may possibly not suit all eaters equally, but it seems at least worthy of a fair trial.

† In the family of a very intelligent London physician, all the members of which live entirely on brown bread prepared at home, *white bread* has always to be provided *for the servants*.

To derive from it all the advantages which it will undoubtedly yield, the following points should be observed:—*The corn should not be damped* before it is ground; and it should lie over for some weeks, and be kept very dry after the grinding, before it is converted into bread. Quite at first it will be well to mix a certain portion of flour with it for persons who are not in strong health, or who are unaccustomed to eat brown bread, as it will otherwise sometimes occasion a little irritation of the stomach for a few days; but this is easily avoided by using it only in part for a time, and by diminishing at each baking the proportion of flour added to it.

In making dough with the whole-meal, it will be seen that it absorbs more liquid than flour does, and requires rather more yeast to render it light, or a longer time to rise. It should not be made very stiff, or it will be too dry after it is baked, yet it should always be *workable*, and not stick to the hands. If well managed, its flavour will be peculiarly sweet and agreeable. It is prepared in precisely the same manner as white bread, and the directions already inserted will serve equally for either kind, with the slight variation in the quantity of yeast and liquid for the brown, which has already been mentioned.

Whole-meal, one gallon; good flour, one gallon; fresh German yeast, two ounces and a

half; or well washed beer yeast, two table-spoonfuls; salt, four to six teaspoonfuls, or one ounce to one and a half; warm water, or milk and water, *full* three quarts. To rise from one hour to one hour and a half, the first time, or until it is evidently quite light; the second time about an hour. To be *well* baked in moderately heated oven.

Or, whole-meal, seven pounds; flour, three pounds and a half; solid beer yeast, three large dessert spoonfuls, or fresh German yeast, nearly two ounces; liquid, rather more than four pints and a quarter; salt as above.

Or, whole-meal, one gallon; German yeast, one ounce and a quarter in summer, one ounce and a half in winter; or solid brewer's yeast, three dessert spoonfuls; all else as in foregoing receipt.

Remarks.—About an ounce, or a moderate-sized table spoonful of salt to the gallon of flour is sufficient to remove any insipidity of flavour from bread; but a larger proportion is liked by many persons. Not only will a smaller quantity of yeast be required in summer than in very cold weather for the fermentation of dough, but the liquid used in making it will require to be less warm than in winter. Experienced bread makers recommend that it should then be used at *blood heat* (98°.).

THE FRUGAL HOUSEKEEPER'S BROWN BREAD.

An economical, and at the same time a very agreeable and nutritious kind of bread may be made with wheaten flour, and what is commonly called *sharps*, or middlings. It would be preferred by many persons to that which is composed of the whole-meal, as it is less dark in appearance; and if carefully fabricated, may be rendered as light as the finest wheaten rolls. It is, in any case, infinitely superior to the common brown bread sold by the bakers in this country. One gallon of sharps, and two of flour, should be stirred together in the bread-trough or pan until the whole appears of one colour, and it may then be managed exactly like white bread, with the difference only of a little more yeast being allowed for it, as for other brown bread; or rather more time for the rising. The dough will absorb a somewhat larger proportion of liquid than flour does, and it should not be made very stiff, or it will not ferment freely.

EXCELLENT DAIRY-BREAD, MADE WITHOUT YEAST.

Some years since, when unfermented bread was first becoming known, I had it tried very successfully in the following manner; and I have since been told that an almost similar method of preparing it is common in many remote parts both of

England and Ireland, where it is almost impossible to procure a constant supply of yeast. Blend well together a teaspoonful of pounded sugar and fifty grains of the purest carbonate of soda; mix a salt spoonful of salt with a pound of flour, and rub the soda and sugar through a hair sieve into it. Stir and mingle them well, and make them quickly into a firm but not *hard* dough, with sour buttermilk. Bake the loaf well in a thoroughly heated but not fierce oven. In a brick, or in a good iron oven, a few minutes less than an hour would be sufficient to bake a loaf of similar weight. The buttermilk should be kept till it is quite acid; but it must never be in the slightest degree rancid, or otherwise bad. *All* unfermented bread, it must be repeated, should be placed in the oven directly it is made, or it will be heavy. For a larger baking, allow rather less than an ounce of soda to the gallon (7 lbs.) of flour.

Observation.—There are cases in which a knowledge of this, or of any other equally easy mode of bread-making, would be invaluable. The inhabitants of the Isle of Skye depend entirely for bread on supplies brought to them from Glasgow; and they are often entirely without when the steamer, which ought to arrive at intervals of eight days, is delayed by stress of weather. The residents are then compelled to have recourse to *scones*—as a mixture of flour and water and a little soda (cooked on a

flat iron plate) is called—or to ship's biscuit; and these are often found unsuitable for young children and invalids. There are no ovens in the houses, though there are grates for coal fires, in front of which small loaves of unfermented bread could be baked extremely well in good American ovens, or better still in the small revolving portable ones, invented by Mr. Balls, of which mention has already been made. Buttermilk can always be procured; and if not, a provision of carbonate of soda and muriatic acid might be kept at hand to ensure the means of making wholesome bread. In many other localities the same plan might prove of equal benefit.

RICE BREAD.

(The Rectory Receipt.)

I am indebted for the following receipt to an admirable housekeeper,—the wife of a country clergyman,—in whose own words I present it to the reader. It is given with so much exactness in all its details, that I have not considered it needful to have it tested before inserting it here, especially as it is the result of positive and long experience.

"We have been for some time in the habit of using a portion of rice for our bread. We commenced this plan when flour was very dear; and we think the bread so much improved by the

addition, that now we seldom omit it. We generally bake two stone (that is to say, four gallons, or twenty-eight pounds) of flour; and for this quantity we allow two pounds of rice. We first wash the rice, and then soak it for three or four hours in six pints of water. It is next turned, with the whole of the water, into a large tin dish with a cover (a Nottingham jar well tied down would be a good substitute for this), and put it into a tolerably hot oven for two hours, when it will be nicely swollen, and will have absorbed all the water. When it has cooled down sufficiently to be handled easily, we rub it into half the flour, in the same way that we should rub butter or lard into it for pastry, and proceed to make the bread. If we can procure good *home-brewed* yeast, we prefer it to any other, and find a quarter of a pint sufficient for our baking; but we very frequently use *baker's* yeast, which we find we can depend on better than on the brewer's. It is a thin liquid, somewhat resembling beer, of which we are obliged to mix three quarters of a pint with the dough. We add first to the flour and rice two small handfuls of salt, and then wet them up gradually with ten pints of warm water, reserving the yeast until they are tolerably well moistened, when we pour it equally over the mass, and beat it in well with the hand, and knead it about. This dough will be very lithe. We make it about four o'clock

in the afternoon, and place it by the fire, or on the top of the oven, where it remains until nine in the evening, when three quarters of a stone (a gallon and a half) more of flour is kneaded into it, and it is left to rise until the morning, when the remaining half gallon of flour will fit it for the oven. It should be put into large tins and allowed to rise to their tops before it is set into the oven. We divide it into ten loaves, which are baked for two hours. We consider that the rice renders the bread lighter, and prevents the crust of it from becoming hard, and it materially increases its weight. The four gallons of flour, two pounds of rice, and sixteen pints of water, produce *forty-two pounds* of excellent bread.

"To improve the yeast, and insure its being good, I would recommend that three or four well boiled potatoes should be smoothly mashed and mixed with as much hot water as will bring them to the consistence of batter, and that a small plateful of warm flour and the yeast should be gradually added and well beaten to them. This done, the mixture must be placed before the fire, and in two hours, or less, the whole bowl will be in a state of fermentation. Then is the time to lay the bread with it. It is a little additional trouble, but is a certain improvement also. Servants, however, will not often take all this trouble; and mistresses cannot always attend to such matters themselves."

Two pounds of rice soaked in three quarts of water, and afterwards swollen in it for two hours in a moderately hot oven; to be cooled down a little, then worked into a stone (two gallons) of flour; two small handfuls of salt; a quarter of a pint of yeast of home-brewed beer (or *three quarters* of a pint of baker's yeast), and five quarts of warm water to be added to them, and well mixed into a lithe dough. To stand near the fire, or on the top of the stove oven, from four o'clock in the afternoon until nine in the evening; a gallon and a half more of flour worked into it, left until the morning; the remaining half gallon of flour used in kneading and making it ready for the oven. This dough is divided into ten loaves, put into large square tins, left until it has risen to their tops, put immediately into a well heated oven, and baked for two hours. The product of this receipt,—forty-two pounds of bread.

Note.—"With the addition of about twelve pounds of brown bread, this," says our correspondent, "is our average weekly consumption for a family of ten or eleven persons."

SMALL BREAKFAST LOAVES OR ROLLS.

(Cold made.)

As bread made in the usual way, when prepared over-night for early baking on the morrow, is liable to ferment too much in very sultry weather, I recommend the following method, which I have many times had tried with entire success, as very convenient, and as producing at the same time bread of excellent quality. Mix with two pounds of fine wheaten flour a saltspoonful of salt, and put into a basin half as much finely powdered sugar, with a teaspoonful only of solid yeast, which has been procured at least one day before, and stirred up with plenty of spring water, as already directed in another part of this volume. Mix these well with nearly three quarters of a pint of new milk, and proceed to make the flour into a *firm* and smooth dough: add, in doing this, a little more milk if required. Flour a thick cloth lightly, roll the bread closely in it, turn the ends under, lay it into a pan, and throw another cloth, once or twice folded, on it. Place it on a table away from a thorough draught of air, and leave it until the morning. Before lighting the fire, knead it down, should it appear very light, as it ought to be, and either leave it until the oven is nearly hot enough to bake it, or make it up at once into small loaves

or rolls, and let them remain upon a tin until it is ready for them. Our bread made in this way has been excellent, both in colour and in flavour. Baked in a brick oven it would probably be better still. We had it made about ten o'clock in the evening, and baked between eight and nine the next morning in an *iron oven,* moderately heated. The rolls, which were not small, remained in it three quarters of an hour. They were perfectly light, and tasted almost like cake.

Fine wheaten flour, two pounds; one saltspoonful of salt, and half as much pounded sugar; solid brewer's yeast, one teaspoonful; new milk (or equal parts of milk and water) three quarters of a pint; a little in addition, if required, to make up the paste quite *firmly.* To remain all night; kneaded down in the morning, and moulded into rolls or small loaves: to prove about one hour. Baked from twenty to thirty minutes if small, longer if large, in iron stove-oven.

Observation.—By *solid* brewer's, or beer yeast, is meant at all times here, yeast which has been washed or purified by having been mixed with plenty of water and then allowed to subside until the water could be poured clear from it.

BREAD EXPERIENCES.

For works of a practical nature, our own every-day experience,—even though small,—is of more positive utility than a large amount of information derived merely from hearsay, or from books; because the successful working of any process is often more or less affected by many trifling circumstances which escape observation at first, and which are rendered apparent only by repeated trials. For this reason I give, familiarly and in detail, in what I shall call my *bread experiences,* the result of my own close observation of the effects produced by various influences on the receipts which I have myself had carried into practice for daily domestic use. In following these, or any others contained in the present volume, all due allowance must be made *for the difference of temperature* in various parts of England; for in the South,—where these have all been tested with full success,—the natural warmth of the atmosphere is sufficient in mid-summer to excite and to maintain the fermentation of bread dough to the proper degree; and the cold of winter seldom approaches in rigour that of our northerly, or wild moorland districts; but whenever and wherever it is *severe,* all precaution

must be taken to protect both the yeast and dough from its effects.*

The foregoing receipt for *Breakfast Bread* was the result of a first experiment, made some years since, with cold ingredients, and a very small proportion of yeast, and answered admirably; but more recent trials of the same process, with German yeast, have been attended with an equally good effect in many hours less of time.

Summer Bread. (No. 1.) June, 1856.

Flour four pounds, mixed in a very large bowl with a teaspoonful of salt. The middle made hollow, and a single tablespoonful of brewer's yeast (which has been well watered for two days, and kept in a cool larder) very smoothly mixed with a pint of *cold* milk and water,—of which one part of three was new milk, and two were filtered water,—poured in, and stirred and beaten well with as much of the surrounding flour as made it into a stiff batter. On this a thick layer of flour was strewed, the spoon removed, and a large cloth twice doubled was laid over the pan, which was

* It is well to warm the bread-pan or tub, and the flour also, before using them for dough in seasons of excessive cold: and *thick* coverings should be laid over, but not *upon*, the dough, after it is made.

placed on a table in a north room. It was left for two hours, when the sponge had quite burst through the flour, and risen much; and was immediately made into a firm dough, with the addition to the sponge of about a quarter of a pint of *warm* water. In from half to three-quarters of an hour it was divided, and very lightly kneaded up into two loaves; put into shallow, round baking dishes, previously rubbed with butter, placed on a tray, covered with a thick double cloth, and sent to a baker's oven, which was a quarter of a mile distant. This bread proved *excellent*.

Flour, four pounds; salt, one teaspoonful; brewer's yeast (two days watered), one tablespoonful; *cold* milk and water, one pint: two hours. Warm water, one quarter of a pint; kneaded into firm dough: rising nearly three-quarters of an hour.

SUMMER BREAD. (No. 2.) July 4th.

A gallon and a half of flour, and a dessertspoonful of salt, were made at once into a *firm*, well-kneaded dough with an ounce only (a pennyworth) of German yeast smoothly diluted with part of nearly five pints of weak milk and water, all of which was used *quite cold*. The pan, covered with a thick cloth, was then placed in a room without a fire, but with the door and win-

dows closed, and left for two hours and a half, or rather longer. The dough, which was then perfectly light, was well kneaded a second time, and in half an hour afterwards was made up lightly into five loaves of different sizes and sent, in shallow pans, to a baker's oven. This bread was exceedingly good, and *very* light, proving the small quantity of yeast really required for use in general, during the summer months.

Flour, one gallon and a half; salt, one dessert-spoonful; German yeast, one ounce; good new milk, full three-quarters of a pint; cold water, *exact* imperial measure, two quarts: rising two hours and a half to three hours. Kneaded down; rising again, half to three-quarters of an hour: five loaves. These, if of equal size, would not require, in a well-heated brick oven, more than an hour and a quarter's baking, perhaps rather less: in a common iron oven, more time might be needed for them.

SUMMER BREAD. (No. 3.) September 8th, 1856.

The ounce (or pennyworth) of German yeast with which this bread was made was brought in from a baker's late on the evening of Friday, Sept. 5th, and put immediately into an exact half-pint of cold filtered water, and remained undisturbed in a cool larder until about one o'clock on the fol-

lowing Monday. When the water was then gently poured from it, it was found to have settled at the bottom of the jug, and was perfectly sweet. It was mixed with three-quarters of a pint of water, *in addition* to that which was originally stirred to it, the whole being *fully milk warm*, and three pounds and a half (one quartern) of the best flour—purchased from a factor in Tottenham Court Road,—with a large teaspoonful of salt, were kneaded up with it into a very smooth dough, which at the end of an hour had become exceedingly light. It was then again kneaded into a smooth mass, and left for nearly three quarters of an hour, when it was sent to a baker's oven, after being divided into one small and one large loaf. It was well baked (in pans) and proved in every respect excellent bread, though rather less yeast would have been sufficient for it. I give these minute particulars to show that the German yeast may be preserved fit for use in the same manner as brewer's, when the weather is not excessively sultry. During part of the month of August last, when the heat was unusually intense, all kinds of yeast appeared to be more or less affected by it, and it was extremely difficult to obtain good bread in consequence. In such a case it is well to have recourse to unfermented bread.

German yeast, one ounce, put into half a pint

of cold *filtered* water (which was not changed) on Friday evening, Sept. 5th, kept in cool larder until Monday, Sept. 8th; diluted altogether with one pint and a quarter of warm water, and mixed with one quartern (half a gallon) flour, and one large teaspoonful of salt; left to rise one hour. Kneaded down; left three-quarters of an hour; divided and sent to oven. Bread very good and light.

Observation :—Generally, it will be better to change the water gently into which the yeast is dropped.

The following memoranda of small bakings are inserted to show the average weight of the bread obtained from a gallon (seven pounds) of flour, much of which was purchased from the baker to whom the bread was sent to be baked, and not re-weighed before it was used. Occasionally the best quality of country flour supplied the place of this; which will probably account for some difference in the quantity of liquid used for the dough, and the amount of the product in bread.

No. 1.—Flour half a gallon (three pounds and a half); salt, one small teaspoonful; German yeast, half an ounce; warm milk and water one pint and a half; kneaded up at once. Rising altogether two hours and a quarter. When baked, weighed exactly four pounds and a half.

No. 2.—Flour seven pounds (one gallon); German yeast, one ounce; milk and water, moderately warm, two pints and three quarters. Made into dough at once; rising two hours and a half. Weighed, after baking, *nine pounds, minus one ounce.*

No. 3. (Feb.)—Flour, one gallon; salt, one teaspoonful; yeast, one ounce; milk and water, two pints and *full half*: rising two hours and a half. Weighed in bread *nine pounds and a half.*

No. 4.—Flour, three pounds; yeast, nearly half an ounce; salt, as usual; liquid, one pint and a quarter: rising two hours. Weighed *three pounds twelve ounces.*

These slight examples will serve as some guide to the practical housewife who may wish to know the most minute particulars connected with domestic bread-making. For the present, further space cannot well be dedicated to such details, lest it should compel the omission of other matter which is equally essential.

EXCELLENT SUFFOLK BREAD.

It is scarcely possible to have bread superior to that made by the receipt which I insert here, and which I give to show how perfectly the plan of slow fermentation answers when it is well conducted, as it was in the following instance. The

bread, I must observe, was sent to me from a distance, and was made by a servant who a few months before knew little or nothing of the art of preparing it, but who had the good sense to profit by the instructions which were offered to her, and who is now an excellent bread maker, much to her own advantage, as well as to that of her employers. "Cook mixed a tablespoonful and a half of good yeast, fresh from the brewery, with nearly three pints of warm milk and water, and made up a gallon of flour with it into a firm dough at once, after she had stirred in a dessertspoonful of salt. It was then left to rise from two to three hours, turned on to a pasteboard and *well* kneaded, and again left in the pan until it was ready to send to the oven. It was rising altogether between four and five hours, and was baked in two large tins at the baker's. The tops of the loaves were glazed with beaten egg."

Good and quite fresh brewer's yeast, one tablespoonful and a half; best Suffolk flour, one gallon; salt, one dessertspoonful; warm milk and water, nearly three pints: rising altogether between four and five hours. Baked in two loaves at baker's oven from one hour and a half to two hours.

Observations:—Very lately I have received another equally good specimen with the above, of bread made by the same servant. A larger

weight of flour was perfectly leavened with nearly the same quantity of yeast; and not the finest London bread, artificially whitened, could surpass it in appearance or in texture. The purity of all the ingredients used was doubtless one cause of its excellence. The *yeast*, as well as the flour, must have been extremely good.

A FRENCH RECEIPT FOR FRENCH BREAD.

Sift a gallon of the very best flour through a hair sieve, and mix with it two ounces of fine salt. Dissolve a quarter of a pound of butter in a pint of new milk, and when it is sufficiently cooled down, stir it to another pint or pint and a half, which has been very smoothly blended with two ounces of fresh German yeast, or with three table-spoonfuls of home-brewed or of brewer's yeast, which has stood for a night after being stirred up with plenty of water. Make the flour with these, and as much more warm new milk as may be needed, into a light dough, and leave it until it has risen to its fullest height, but do not let it begin to *sink*. Knead it up, and divide it into loaves of one or two pounds weight, and form them into *rouleaux*. Place them some inches apart upon flat baking-tins and set them in a warm place to *prove*, or rise again; and when they have swollen considerably despatch them to a quite quick oven.

From twenty to thirty minutes will bake them should they be small, and longer time must be allowed when they are large; but, from their form, they will not require such long baking as round high loaves do. They should be well browned, and be rasped as soon as they are perfectly cold. Sometimes as much as three quarters of a pound of butter is used for them, which is far more than is needed, or than is wholesome; sometimes they are made entirely without, and are still *very* good, if rich new milk be used for them. Nearly a quart of this will be required for the gallon of flour. As I have stated before, a little cream is an excellent substitute for butter in bread.

GINGER LOAF, OR ROLLS.

Mix intimately two ounces of *good* powdered ginger,—called in the shops prepared ginger,—and a little salt, with two pounds of flour, and make it into a firm but perfectly light dough with German or brewer's yeast, in the usual manner. Bake it either in one loaf, or divide it into six or eight small ones.

Flour, 2 lbs.; prepared ginger, 2 oz.; little salt; German yeast, ½ oz., or fresh brewer's yeast 1 large dessert-spoonful; milk, or milk and water, 1 pint: to rise one hour or until quite light: to be kneaded down and left again to rise until light.

Remark. — When diarrhœa or other complaints of a similar nature are prevalent, this bread will be found of excellent effect, especially in travelling; far better, indeed, than many of the compounds to which people have recourse to avert disturbance of the system. The proportion of ginger can be much increased if desired; but the bread should not then be habitually eaten for a long continuance, as the *excess* of any stimulating condiment is often in many ways injurious. Rather less than the pint of milk will often prove sufficient.

PLAIN ROLLS.

Any kind of light fermented bread may easily be converted into rolls by allowing the dough to rise much more than the usual time, after it has once been kneaded down: this is better than making them with a large proportion of yeast. When the dough has swollen to its full height turn it on to the paste-board, and divide it into parts of equal size; work them up very lightly into the form of rolls, and place them on tins, leaving spaces of two fingers width between them. Let them stand awhile to *prove*, or swell again; then bake them for about twenty minutes in a somewhat quick oven. To keep them hot until they are wanted for table, wrap them in a warm thick flannel, which should be kept for the purpose, and

lay them into a pan or basket placed near the fire. The dough used for them should be made entirely or *in part* with milk.

GOOD DINNER OR BREAKFAST ROLLS.

Crumble down, very small indeed, an ounce of butter into a couple of pounds of the best flour, and mix with them a large salt-spoonful of salt. Put into a basin a dessert-spoonful of solid, well-purified yeast, and half a tea-spoonful of pounded sugar; mix these with half a pint of warm new milk; hollow the centre of the flour, pour in the yeast gradually, stirring to it sufficient of the surrounding flour to make a thick batter; strew more flour on the top, cover a thick double cloth over the pan, and let it stand in a warm kitchen to rise. In winter it must be placed within a few feet of the fire. In about an hour, should the sponge have broken through the flour on the top, and have risen considerably in height, mix one lightly-whisked egg, or the yolks of two, with nearly half a pint more of quite warm new milk, and wet up the mass into a very smooth dough. Cover it as before, and in from half to three quarters of an hour turn it on to a paste-board, and divide it into twenty-four portions of equal size. Knead these up as lightly as possible into small round or oval-shaped rolls; make a slight incision round

them, and cut them once or twice across the top, placing them as they are done on slightly floured baking sheets, an inch or two apart. Let them remain for fifteen or twenty minutes to *prove;* then wash the tops with yolk of egg, mixed with a little milk, and bake them in a rather quick oven from ten to twelve minutes. Turn them upside down upon a dish to cool after they are taken from the tins. An additional ounce of butter and another egg can be used for these rolls when richer bread is liked; but it is so much less wholesome than a more simple kind, that it is not to be recommended. When it can easily be procured, a cup of good cream is an admirable substitute for butter altogether, rendering the rolls exceedingly delicate both in appearance and in flavour. The yeast used for them should be stirred up with plenty of cold water one day, at least, before it is wanted. Half an ounce of German yeast will have an equally good effect, and can often be procured more easily in these days than good brewer's yeast.

Flour, 2 lbs.; butter, 1 oz.; sugar, ½ tea-spoonful; salt, 1 salt-spoonful; new milk, ½ pint. To rise about one hour. Additional milk, nearly ½ pint; 1 whole egg or yolks of 2: three quarters of an hour. Baked in 24 small rolls, ten to twelve minutes, in rather quick oven.

POLENTA-BREAD OR ROLLS.

Polenta is the name under which Italian flour of maize is sold at the foreign warehouses in this country. It is much superior in quality to that which is imported from America, and is harvested with more care; but its consumption here is comparatively small, and it is sold at a price which must, while it is maintained, prevent its *general* use for bread, of which it makes a pleasant variety when mixed with twice the quantity of wheaten flour. Blend intimately in an earthen pan one pint of the polenta with a quart of the best flour, and rather less than the usual proportion of salt. Dilute gradually a dessert-spoonful of solid yeast, or half an ounce of German yeast, with a pint of warm new milk, (a few spoonfuls more than this quantity may be required, but it is better not to add it at first), and make the dough up at once. Let it be *firm* without being hard, as it will become lithe in rising. Leave it covered with a cloth until it appears quite light; then knead it down thoroughly, and let it again stand to rise. Divide it into large rolls or small oval loaves, place them, some distance apart, on a floured tin, and bake them in a moderate oven from three quarters of an hour to an hour. The polenta imparts a pleasant flavour to this bread, which eats almost

like rice-cake*, which it may be made to resemble still further by dissolving an ounce of butter in the milk with which it is made.

Polenta, 1 pint; wheat-flour, 1 quart; little salt; solid yeast, 1 dessert-spoonful (or ½ oz. German yeast); milk, 1 pint or rather more.

Obs.—American maize-flour can be substituted for the polenta in this receipt at any time.

COCOA-NUT BREAD OR ROLLS.

The oil contained in the cocoa-nut imparts a peculiar richness to bread biscuits and cakes, as well as to various other preparations of food; and to many persons its flavour is very agreeable. The rasped nut therefore, *when fresh*, may be used with advantage for them. If in the slightest degree rancid, it will produce a very unpleasant effect. Put four ounces† of the finely-grated nut

* I am informed that the polenta is carefully *granulated* between large stones set in a peculiar manner for the purpose; this probably renders it so dissimilar to the common maize-flour. The variety of Indian corn from which it is prepared is much smaller than that grown commonly in America.

† This proportion of a full-flavoured nut is sufficient; but it can always be increased at pleasure. It should be grated down on a delicately clean and bright grater; or, on occasion, it may be infused in the milk, after having been merely pared, sliced thin, and cut up small; but a much larger quantity of it must then be used to impart an equal degree of flavour.

into a quart of new milk, heat it slowly, and let it simmer very gently indeed, that there may be no great reduction of the quantity, for about three quarters of an hour; then withdraw it from the fire, and when it has cooled down a little, strain it through a fine sieve or cloth with so much pressure as shall leave the nut quite dry. Use the milk while it is still warm with yeast and flour as for common bread, and manage it in exactly the same manner. The grated nut in substance may be used instead of the flavoured milk; but the bread will then be less delicate and less wholesome. When this is done, it should be thoroughly blended with the flour before the dough is moistened.

Rasped *fresh* cocoa-nut, ¼ lb.; milk, 1 quart; simmered three quarters of an hour. The milk expressed from the nut to be used for dough in the usual manner. Or, with each pound of flour, 3 oz. of the grated nut to be well mixed, and the yeast and liquid to be added.

Obs.—The oil of the nut will render it necessary to reduce, for this last method, the ordinary proportion of liquid used for dough.

TURKISH ROLLS.

Blanch and pound to a perfectly smooth paste some fine Jordan almonds, moisten them gradually with boiling milk or thin cream, and then simmer

them for a few minutes together. Wring the milk from the almonds, with *strong pressure*, through a thick cloth or a tammy, and use it like other milk for making the required quantity of the *best* flour into dough. It may be slightly tinged with saffron when it is liked, and sweetened with a small quantity of pounded sugar.

Jordan almonds, 6 oz.; milk, 1½ pint; *best* flour, 2 to 3 lbs.; German yeast, ½ to ¾ oz.; rising as usual.

BROWN CARRAWAY, ON NEWCASTLE BREAD.

This may be made either with wheaten-meal, or with two parts of flour and one of sharps (or middlings). With the addition of a little sugar it will resemble a common cake, and will usually be very acceptable to children, to many of whom it will also be suitable and wholesome. Put rather less than the usual quantity of salt into a quartern of meal, or of meal and flour, or of flour and sharps mixed, and stir well into it three ounces of fresh whole carraway seeds, or two ounces which have been ground. When they are properly mingled, proceed to make the dough with full three-quarters of an ounce of German yeast, or a large tablespoonful of purified beer-yeast, and as much skimmed milk, or new milk and water, as will render it moderately firm. Less than a pint

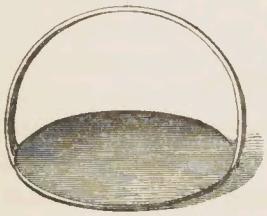
and a half of liquid will be needed for it when any portion of sugar is added, as this has always a softening effect in paste. It must be left to rise, and be kneaded down at the proper time like other bread. About two hours altogether will fit it for the oven, sometimes rather less. Precise directions for the general management of dough do not need repetition with each receipt here, as they are so fully given at the commencement of this part of the book, that they ought to be sufficient guide without.

Obs.—In Germany, aniseed is commonly mixed with bread. Indeed it is sometimes quite difficult to procure any that is free from it; and it is very distasteful to some eaters when flavoured with it.

OATEN CAKES, CALLED CLAPPED BREAD.

(A North Country Receipt.)

The large thin oaten-cakes, called *clapped bread* in the North of England, are made by mixing fine Scotch oatmeal with a little salt and cold water quickly into a moderately stiff paste, and patting it with the hands, with plenty of oatmeal strewed under and over it, until it



A Girdle-Iron.

is as thin as it can be made. The cakes, which should be about the size of a breakfast-plate, must be prepared *singly*, baked on a girdle-iron, turned while they are doing, and afterwards toasted a little before the fire to render them crisp. They must always be kept very dry. If mixed with warm water, the paste is more easily made into thin cakes, but is not so short and nice.

Oat-cakes may be baked in an iron-oven when but moderately heated. So much only of the meal should be moistened at once as will serve for a single cake, because the paste dries so rapidly, that it cannot be properly managed else. A Scotch cook, celebrated in the family in which she lived for the excellence of her oaten breakfast cakes, used to crumble a bit of butter about the size of a walnut into a quart of meal, wet it up with milk (or water, as the case might be) in suitable portions, roll it out as thin as it could be rendered, and bake her cakes in the oven of the kitchen stove.

OATMEAL BANNOCKS.

These are made simply of Scotch oatmeal mixed into a paste with water, and made into cakes about the size of a common saucer, and quite half an inch thick. They are then baked of a light brown in a moderate oven.

BROWN FADGE.

(An Irish Breakfast Cake.)

"Break up very small an ounce and a half of butter into a pound of meal just as it comes from the mill (*whole meal* is meant by this), and make it into a paste with about half a pint of milk. Roll it out to the size of a plate, and to the third of an inch thick, and bake it on a griddle or in an oven. If made with buttermilk and a pinch of soda, it will be improved." This is the exact receipt by which the brown fadge is made in Ireland, where it is served at the breakfast-table, even in wealthy households, and in those of some of the nobility. If rich slightly acid buttermilk were used to make it, and a small but due proportion of carbonate of soda were well mingled with the meal, the butter might be omitted.

Meal as it comes from the mill, 1 lb.; butter, 1½ oz.; little salt; nearly ½ pint of milk. Baked in oven *about* 20 minutes, or on a griddle.

A SALLY LUNN, AND OTHER VERY LIGHT PREPARATIONS.

To make a *batter-sponge*, which may easily be converted into many different kinds of "fancy bread," as it is called, or into buns or cakes, first

mix, very smoothly indeed, a pint of warm new milk with an ounce* of quite fresh German yeast, or with the same quantity which has been put into water for one night†, and make with them one pound of the best flour into a batter entirely free from lumps. A saltspoonful of fine salt should previously be well stirred to it. Throw a cloth over the pan, and place it where the air is warm. When it has risen extremely high, and the surface is covered with large bubbles, take another pound of flour, which in winter it is well to have slightly warmed before it is used; stir and beat smoothly part of it into the sponge, and when it is firm enough knead in the remainder until the whole is perfectly blended. The dough thus made will soon be ready for the oven, and may be moulded into small shapes, placed some inches apart on a flat tin (as they will spread and rise considerably), glazed with beaten egg, and rather quickly baked; or the dough, when first made, may at once be put into tins or pans, and left in them to rise to its full height before it is placed in the oven.

* For bread, half this quantity is really sufficient; but when butter is added in any quantity to the mixture, much more will be required.

† This yeast becomes perfectly smooth by being put into water; and sometimes the surface of it is hardened, so as to render this an advantage.

To make a Sally Lunn, dissolve three ounces of good butter, cut small, in less than half of the milk with which the sponge is to be set; cool it down with the remainder; and, if a sweetened preparation be liked, stir three ounces of pounded sugar to the flour before it is moistened; pour gradually the milk and butter to the yeast, of which there must be a full ounce, and proceed in all else as above. Three hours will sometimes be required to bring this sponge to its height. When it is ready add the second pound of flour to it, put it into a round buttered tin or tins, which it should not more than half fill, and when it has risen nearly to the edge let it be put without delay into the oven, and baked a nice brown. An egg or two, when they are considered requisite, can be mixed with the milk and butter either for the Sally Lunn, or to convert the dough into buns; but, to allow for the addition, a few spoonfuls of the milk should be omitted. Carraway-seeds, currants, or candied citron or orange-rind, can be kneaded in with the other ingredients when the second pound of flour is mixed with the sponge, or immediately after it is worked in. Two or three ounces more of sugar may, for many tastes, be thought needful for the buns.

Bread.—Best flour, 1 lb.; new milk, 1 pint; little salt; German yeast, ½ oz., to rise 2

hours or more; or yeast, 1 oz., 1 to 2 hours. Flour, 1 additional lb.; to rise ½ to ¾ hour.

Sally Lunn. — Flour, 1 lb.; butter, 3 oz.; pounded sugar, 3 oz.; German yeast, full ounce; 2 to 3 hours, or until *extremely* light. Flour, in addition, one pound; to stand in tins until risen to their edges.

Buns.—Butter, yeast, and milk, as above, with an addition of sugar and an egg or two at pleasure; carraway-seeds, 1 oz.; or currants, ½ lb.

CHEAP BREAD.

In point of fact, no bread is so *really* cheap as that composed entirely of good wheat-flour or meal, because there is none which affords the same amount of pure, wholesome, strength-sustaining nourishment; and a larger quantity will generally be required of any inferior kind to support, in an equal degree, the powers of life; but when the price of wheat is very high, it is sometimes impossible for poor families to obtain a sufficiency of it fully to satisfy the appetite; and in such cases any of the following receipts, which have all been well proved, may be had recourse to with advantage.

POTATO-BREAD.

This is one of the best varieties of mixed or cheap bread when it is made with care, as its flavour is excellent, and it remains moist longer than any other except rice-bread; but the potatoes used for it should be *good,* thoroughly boiled, well dried afterwards by having the water poured from them, and then standing by the side of the fire to steam; and be reduced to a perfect paste by mashing, or be rubbed quickly through a cullender or other coarse strainer. They should be perfectly mixed with the flour or meal while they are still warm; and after the addition of rather more salt than for common bread, the dough, which will require less liquid than wheaten-dough, should be made up smoothly and *firmly,* and be managed afterwards like other bread, but be baked in a more gentle oven. Seven pounds of potatoes, weighed after they are cooked and peeled, may be added to each gallon of meal or flour. Should it be necessary, from circumstances that cannot be controlled, to use such as are watery, the moisture may be partly wrung from them, in a warm thick cloth, before they are mixed with the other ingredients.

BREAD OF INDIAN CORN, RYE, AND WHEAT MEAL.

Dark-coloured, but very nutritious and by no means unpalatable bread, may be made with equal parts of wheat-meal, maize-flour, and rye-flour; and it will also be cheap as regards the price of the ingredients, and profitable from the weight of the bread produced by them. Persons accustomed, as the English people are, to live habitually on wheaten bread only, do not immediately become reconciled to any other; and the flavour of Indian corn, being dissimilar to that of any grain which is common amongst us, is often not relished by them at first; but a taste for it is very soon acquired. Three pounds each of the maize, the rye-flour, and the wheat-meal, with two not large teaspoonfuls of salt, a quarter of a pint of thick yeast, and *about*, or nearly, two quarts of warm liquid, thoroughly mixed and *well* kneaded into a smooth dough, which should stand to rise until it is unmistakeably light, both before it is kneaded down and again previously to being sent to the oven, will produce twelve pounds of substantial satisfying bread well suited to stay the demands of hunger, and perfectly wholesome in its nature. It may be divided into three loaves, and should be baked in a well-heated but not fierce oven.

Flour of maize, or Indian corn, 3 pounds; rye flour, 3 lbs.; wheat-meal, 3 lbs.; salt, 2 teaspoonfuls; thick yeast, ¼ pint; water, or milk and water, about 2 quarts. Product in bread, 12 lbs.

Obs.—Especial care should be taken to have all the materials for this bread in a perfectly sound condition; for if over-kept, or carelessly stored, either the maize or rye-flour may impart to it a very unpleasant taste, and so create a prejudice against the bread itself, which is unobjectionable when properly prepared, and in times of real scarcity would be a very valuable help to those who might find it difficult to obtain sufficient food without some such substitute for their accustomed diet. Potatoes might supply the place of the maize-flour on occasion; but they are by no means so nutritious. Barley-flour, too, might sometimes be used instead of rye. A skilful bread-maker would soon find it easy to combine various cheap ingredients, and prepare with them very good bread; but the nature of each, and the effect which it produces, should be attentively observed, that the yeast and liquid may be correctly apportioned to them, and the baking also be well regulated.

FRENCH-BEAN BREAD.

The seed of the *white* varieties of French-bean, boiled quite tender, and rubbed through a strainer to divest them of their skins, and mixed with two-thirds of their weight of flour or meal, will make bread which in flavour and appearance can scarcely be known from genuine wheaten bread; and as the bean is one of the most nutritious by far of all vegetables, it will replace very advantageously a portion of wheat-flour for persons whose digestion is not extremely delicate: by those who are out of health, this bread is perhaps better avoided.* After the beans have been prepared as above, the pulp from them should be intimately mixed with the flour or meal, and the bread finished in the usual way. It will be seen, as the dough is gradually moistened, that less liquid will be required for it than for common wheaten-bread; but the *exact* difference cannot easily be specified. The dough should be mixed entirely at once, and be made rather firm. The seed of the scarlet-runner, or any other coloured variety of the vegetable (if

* The French-bean seed, known as *haricots blancs*, served so abundantly at foreign tables, and very much now in England also, is not considered, even where it is so much eaten, as well adapted to invalids. When quite fresh, it is less objectionable than after it is harvested for winter consumption.

the flavour were not strong), would probably answer as well as the white, particularly for brown bread.

Pulp of white French beans (*haricots blancs*), 1 lb.; wheat-flour or meal, 2 lbs., made into dough with the common proportion of yeast, rather less liquid, and a little more salt. Fermented and baked like other bread.

PARSNEP AND OTHER VEGETABLE BREAD.

Many vegetables may be used in part for making bread; but it is only in cases of real need that such an expedient is recommended. When corn is unusually dear, the produce of a kitchen-garden or of an allotment ground will serve, in combination with it, to furnish *wholesome* bread; but, with the exception of potatoes and the seed of the French bean, all vegetables will impart their peculiar flavour to it, though their presence may not otherwise be perceptible. Parsneps, Swedish turnips, and beet-root will all answer for dough (parsneps the best of any) if boiled tender, mashed to a smooth pulp*, and stirred in a saucepan over a gentle fire until tolerably dry, and left to become cool before they are mixed with flour or meal for the purpose.

* The beet-root, which may also be baked, must be grated.

BREAD OF INDIAN-CORN FLOUR.

Half Indian flour and half wheaten flour, made and managed like common dough, and baked in a *moderate* oven, will produce good and economical bread. The meal is sometimes scalded* before it is mixed with the flour; but it is then rather less pleasant in flavour, and a little more difficult to preserve of a proper consistence, as it will absorb as much liquid as will be required for the bread altogether. The yeast must therefore be stirred to it when it is at the proper degree of warmth, and the flour worked in immediately after. No bread, of which Indian-corn forms a part, should be baked in a very hot oven. One third only of sound yellow maize-flour, with two thirds of wheat-flour, will form a mixture which will generally be liked, and with which it is perhaps better to *begin* the use of Indian-corn until the taste is a little accustomed to it.

UNFERMENTED BREAD.

The most perfectly wholesome kind of unfermented bread is that made with muriatic acid† and

* One peculiarity of the maize is, its becoming difficult to convert into various preparations, if quite *boiling* liquid be previously mixed with it. Half a pint of cold water to a quart taken in full ebullition, will cool it down sufficiently.

† I have in my possession a pamphlet written by a baker, who has received the marked public testimony of a scientific

carbonate of soda, of which the combination *forms common salt*, and cannot therefore be in any way unhealthful, though it is often denounced by ignorant people as such; but until some experience has been gained, there will be a chance of failure in this bread, in consequence of the variation in the strength and quality of the acid, which must have just sufficient power to neutralise the soda and evolve the necessary portion of carbonic acid gas for rendering it light, without either ingredient being in such excess as to impart its flavour, in the slightest degree, to the dough.

The soda, which should be of the best kind, and in fine powder, should be rubbed through a hair-sieve with a wooden spoon into the flour, and mixed intimately with it before the acid is poured in. The proper proportions of all the ingredients will be found, with directions for mixing them, at page 100. Both brown bread and white may be made in the same manner, and should be *well* but quickly kneaded as soon as they have been mingled so far as they can be with a large strong *wooden* spoon. No metal should be used in the process. The loaves should be expeditiously made, and set into a moderately heated oven without the least delay.

man of repute, as to the purity of his bread, in which he attacks his brethren of the trade rather vehemently as "*poisoners of the people*," &c. &c. In his list of wicked adulterations, *muriatic acid* is included.

Unfermented Bread made with Tartaric Acid.—Though perhaps not well adapted for long-continued consumption, this bread, which is more easily made with perfect success than the preceding, may be eaten occasionally without any disadvantage. For each pound of flour allow one drachm of bi-carbonate of soda, and rub it through a sieve over the pan which contains it, and stir them together until the soda is equally distributed amongst it. Dissolve fifty grains of tartaric acid in half a pint of water, knead it up well, but very quickly, and place it in the oven the instant it is ready. Salt must be added to *this* bread as for common dough; but none is required for that which is made with the muriatic acid. A very small portion of pounded sugar is an improvement to it; about half a teaspoonful to the pound of flour. For delicious bread, made with tartaric acid and butter-milk, see "Dairy-Bread," page 147.

CRUSTS TO SERVE WITH CHEESE.

Take a half-baked loaf from the oven, and tear it into small rough bits with a couple of forks; lay these on a tin, and put them back into the oven for ten minutes. If a light loaf be made for the purpose, with new milk and two ounces of butter, they will quite resemble rusks. A sweet

light cake pulled apart in the same manner is likewise very good.

LOAVES OF DIFFERENT FORMS.

The common shape of bakers' loaves is given by dividing the portion of dough intended for one loaf into two parts of unequal size, the smaller one being little more than a third of the whole. These are made into the form of very thick cakes, and then placed one on the other, care being taken that there shall be no flour between them, and then pressed together, and a deep indentation made in the centre of the upper one, sometimes *by the baker's elbow.*

The loaves technically called "bricks," which are baked in tins, are of convenient form for making toast or for slicing bread and butter.

Crusty, or College Loaves. — These are more frequently made in private families than for sale. The dough for them should be tolerably firm, and be first moulded and slightly cut round in the usual manner; and then, with a sharp knife, the tops should be divided into large dice of equal size, the paste being cut down nearly half through to form them. They will spread open in the baking, and furnish plenty of nice crisp square crusts for amateurs.

French Loaves. — In France the usual form given to common bread is that of a *rouleau* or

cylinder, which spreads and flattens a little in the baking. The loaves are sometimes two or three feet in length. One advantage of having them moulded thus is, that they are more perfectly and regularly baked than loaves of massive construction. Some few London bakers have adopted the French shape for their bread.

EXTRACTS FROM THE REPORT OF THE MEDICAL OFFICER OF HEALTH FOR THE DISTRICT OF HOLBORN, ON THE ADULTERATION OF BREAD. MARCH 16TH, 1857.

It is with no wish to exaggerate the importance of any fact connected with the subject of bread-adulterations, that I return to it here; but because the opinions expressed upon it in the following passages of Dr. Gibbon's report appear worthy of general respect and consideration; and, so far as the bakers are concerned, they are written in a most frank and liberal spirit.

"It is my deliberate opinion that, although alum is not a poison, yet that its use in the manufacture of bread is injurious to health, *and concurs indirectly with other things in increasing the mortality, especially of young children, the staple article of whose dietary is bread.*

"The more effectually to discountenance this practice, I will briefly detail some of the grounds whereon this opinion is founded.

"It is well known that small doses of alum repeated for a considerable time will produce at first costiveness, and afterwards great irregularity of the bowels. The quantity of alum which I have generally met with in bread has been in the proportion of from half a drachm to one drachm in the 4lb. loaf; so that the man who consumes half a loaf a day swallows every 24 hours from 15 to 30 grains of alum. Now, it is found that even 12 grains per diem, taken by a healthy adult, will produce constipation. Its effects on children would, of course, be greater than on adults; a smaller quantity would suffice to produce the diarrhœa and dysenteric symptoms, and they would appear sooner. Alum enters into chemical combination with the gluten of the flour, therefore I admit that its effects in bread are less active and injurious than when administered in its pure state. I have little hesitation, however, in assigning this impurity in the bread as the chief cause of the frequent constipation, headaches, liver derangements, &c., of those who are dependent on bakers for their bread. *The fatal diarrhœa of infants under three years of age may also have arisen from, or have been aggravated by, this cause.*

"As this adulteration has been practised for a very great length of time, I cannot recommend the adoption of any harsh measures for its sup-

pression; I would suggest that all bakers in the district should be cautioned against it. If any flagrant case occurs where the injury to health is clearly made out, I shall feel it to be my duty to advise your board to take the necessary proceedings to prevent its recurrence.

"When the bakers are duly informed of this opinion, I am in hopes that they will of their own accord cease to use alum in making bread. The bakers' plea at present is that it is harmless, that the public 'like it,' and 'will have it.' So that the more effectually to put down an adulteration which is injurious to health, the public on their part should cease to set so high a value on those qualities in a loaf which alum is used to produce.

"The following particulars will, I trust, enable the purchaser to distinguish a loaf that does not contain alum from one which does:—

"Alum increases the whiteness and firmness of the bread made from inferior flour, and thereby causes it to resemble bread made from the very best flour. The qualities which alum imparts to a loaf are very unimportant, having reference merely to the appearance, 'lightness,' neatness of shape, &c.

"*The chemical action of alum on moistened flour is analogous to tanning, and destroys in a considerable degree its nutritiveness. It converts the gluten (the most nutritious portion) of the flour*

into a kind of tough tenacious 'wash leather,' which is difficult of digestion. This gives the dough a tenacity and firmness, enabling it to retain the thousands of little air bubbles (given off by the yeast) which constitute the 'lightness' or spongy porous character of the bread. Hence, flour that will not 'rise' may be made to do so by means of alum. Another object in the use of alum is that it preserves the upright form of the loaves, and prevents them from adhering firmly together, thereby enabling the baker to separate them more readily on their removal from the oven — the 'batch parts clean,' as the expression is, without tearing. An unalumed loaf is, with a little practice, distinguishable from an alumed one by its appearance alone; it is wanting in all those peculiarities which I have mentioned as the effects of alum; it is not so bulky, nor so symmetrical in its shape; its sides are roughened and torn in being separated from the batch. Unalumed bread 'bites short,' alumed bread 'bites tough' and the rough, sour taste of alum is slightly perceptible in it. The most marked contrast, however, is apparent in 'crumbling' when a day or two old; unalumed bread crumbles with the greatest facility by rubbing it between the hands; whereas alumed bread, however old, 'crumbles' with difficulty. In the same way alum renders the new loaf less liable to crumble when cut.

"These, then, are the qualities and appearances in a loaf which I recommend the purchaser to disregard.

"SEPTIMUS GIBBON, M.D.,
"Medical Officer of Health."

BREAD ASSOCIATIONS.

There are now in various parts of the continent —in France and Belgium more particularly,— subscription-bakeries, or, as they call them, "*Friendly Bread Associations*,"* which are reported to answer remarkably well in every respect. Some of them are on a small scale, and conducted on a plan which enables persons of very limited means to profit by their advantages. The subscriptions, which can be constantly renewed, do not exceed eight or ten shillings; and bread, sufficient for the daily consumption of a family, is supplied to that amount, until it is exhausted, much better in quality and rather lower in price than that sold by the bakers. The wheat, as in the large factories already mentioned,

* An establishment of the same nature exists, I believe, at Manchester, or Birmingham. Some notice of it was given by one of the subscribers in *The Times* not very long since; but the particulars have escaped my recollection, and I cannot recall the date of the journal which contained them.

is purchased of the grower, by which a considerable saving is effected, and the genuineness of the bread is secured; and the profits which arise from the suppression of all unnecessary expenses, after a time are divided amongst the subscribers. When a building has to be purchased or erected in the first instance for the bakery, and all the accessories for the fabrication of the bread have also to be purchased, a certain period must elapse before any *clear* profits can be expected, beyond those which are in reality afforded by the purity and cost of the bread furnished to the members of the association.

A thorough knowledge of practical business details is, of course, necessary in organising these friendly companies; and an entire absence of what is familiarly called "jobbing," and which is said to prevent the satisfactory working of many enterprises in this country.

NEW FRENCH PROCESS FOR CONVERTING WHEAT INTO WHITE BREAD.

To supply the labouring part of the population of Paris with the *fine white bread* with which alone they will be satisfied, has become an object of natural anxiety in that capital, now that provisions of all kinds have risen to so very high a price there; and the first scientific men of the day are

seeking to discover processes, by means of which this false taste may be gratified at a less serious cost than it is at present. As *real* popular education advances, and people are brought to see the *truth* of things, as it becomes more and more developed by the aid of science, and by the efforts of enlarged and enlightened minds, it is probable that the deeply-rooted prejudices (which have their origin often in profound ignorance) that now stand opposed to much of what is *best* and *most profitable* as food, will give place—with many others—to a just appreciation of convincingly-exposed *facts*.

The man who understands the nature of the component parts of wheat, will not quarrel with the mere *colour* of the bread he eats, when he knows that it is not the result of any sophistication of the materials of which it is composed. He will not insist on the sacrifice of a large portion of the grain, the *whole of which* is so important to him as nutriment, merely to gratify an irrational prepossession in favour of *white bread*. In England —and in London more particularly, amongst the working classes—this prepossession exists quite as generally as in any part of the world; the consumption of brown bread being confined almost entirely to the families of the more affluent orders.

Only a cursory mention can now be made here of the recent discoveries reported at considerable

length, to the *Académie des Sciences* at its meeting of January 12th, 1857, and published in the *Moniteur Universel* of the 20th (and in other French journals most probably), and partly also in the form of a slight pamphlet, entitled "*Extraction and Conversion of the whole of the Flour of Wheat into White Bread of the first Quality, by M. Mège-Mouriès. To be had of MM. Firmin Didot Frères, Libraires, and of the Author, Rue Jacob* 19."

A short extract or two from the above-named report may give the reader some idea of its tendency, and of its claim to attention.

"CHEMISTRY APPLIED TO PANIFICATION.

"Report made to the Academy of Science, of a Memorial by M. Mège-Mouriès, entitled '*Chemical Researches on Wheat, Flour, and Bread-making.*'

"At its sitting of June 9th, 1856, M. Mège-Mouriès presented to the Academy the result of his researches on Panification, partly theoretical and partly practical;—partly theoretical, because the author explains the real cause of the dark hue of brown bread, and indicates the manner by which it may be avoided, even when the bran is left in the dough; partly practical, because he proposes a new system of panification which is something more than a mere project, since one of the colleges of Paris has for three months past

been supplied with the bread made by it; and the occupants of the orphan asylum of Saint Charles (of the 12th arrondissement) have lived on it since last June to the exclusion of all other.

It must be observed here that the *Académie des Sciences* has naturally much influence with the French government on questions of this nature, and that it considered the discoveries of M. Mège-Mouriés of sufficient importance to appoint a commission to ascertain their practical value; and this commission, after having seen his new processes in all their details, carried into operation at a small bakery, which he had himself established, applied to the prefect of the Seine for permission to have them tested by more extensive experiments, at the bakery of the hospitals of Paris, which was immediately accorded, and they were placed in communication with M. Salone, the director of the *Boulangerie de Scipion;* in conjunction with whom M. Mège-Mouriés pursued his labours until a definite result was obtained for the further investigation of the commissioners, who then proceeded with their examinations.

The positive advantages afforded by the new system appear to be, the deriving from seventeen to twenty per cent more of fine white bread from wheat than is commonly done, and reducing to comparative simplicity the present most elaborate

and tedious method of making it; of which the following account will give an idea.

In a modified degree the same plan is pursued by the baking trade of England. The intelligent reader will judge how far it is favourable to the production of sweet and nutritious bread.

Common mode of Panification practised in Paris. — The white bread of Paris is made with the best flour. If a hundred parts of wheat have yielded seventy of flour it is said to be "bolted to seventy," which is the quality used for the consumers of that capital. This is the process: —

"At eight o'clock in the evening a bit of paste * is taken, composed of eight kilogrammes of flour and four kilogrammes of water.† This is left until six o'clock in the morning, and constitutes the *main leaven (levain de chef)*.

* This is probably a portion of the paste called *leaven:* if it were merely flour and water, it would not become a ferment in so short a time: many days keeping in a certain temperature would be required to produce spontaneous fermentation in it. Formerly, this kind of leaven — which always imparts a certain degree of acidity to bread — was used commonly in England, and it is so still in various parts of the Continent. After the first preparation of the ferment, a bit of the dough made with it is kept from one baking to another (well covered with flour), and serves the purpose of yeast when well kneaded up with the other ingredients.

† Sixteen pounds of flour and four quarts of water. The *gramme* is the thirtieth part of an ounce.

Eight kilogrammes more of flour and four kilogrammes of water are then added: this forms *the leaven of the first degree.*

At two o'clock in the afternoon sixteen kilogrammes of flour and eight of water are added: this is *the second quality of leaven.*

At five o'clock *the complete leaven* is prepared by adding a hundred pounds of flour and fifty-two kilogrammes of water, mixed with from two hundred to three hundred grammes of yeast (*levure*).

At seven o'clock a hundred and thirty-two kilogrammes of flour and sixty-eight kilogrammes of water, holding in solution two kilogrammes of salt, and mixed with from three hundred to six hundred grammes of yeast, are added to the leaven, and made into well-kneaded dough.

With this quantity of paste five or six batches of bread are made in the following manner: —

1*st Batch.*—This is composed of half the dough prepared as above, which is moulded and left to rise, and then set into the oven.

The bread of this first baking is sour (*aigre*), rather brown, and not particularly light.

2*nd Batch.*—The dough remaining of the first batch is mixed with a hundred and thirty-two kilogrammes more of flour and sixty-eight kilogrammes of water, mixed with the same proportion of salt and yeast as the preceding

batch. Half of this dough forms the second baking, the bread of which is whiter and better than the first.

3rd Batch.—The same quantity of flour, water, and salt, with three hundred grammes of yeast, are again added to the dough, of which half is baked as usual.

4th Batch.—Same proceeding as for the third.

5th Batch.—This is prepared like the foregoing, and produces what is called fancy bread (*pains de luxe*), the finest quality of any.

I have used the word *yeast* as we understand it in English for the "*levûre*" mentioned in the process, though it may possibly differ from that which is commonly used amongst us.* The papers relative to M. Mège-Mouriés' discoveries, though published some months since, have reached me only just in time to permit of this very slight notice, leaving no means of ascertaining any particulars about them. The chief novelty which they disclose is the existence in wheat of a strongly fermenting principle which he calls "*céréaline*," of which the action gives, he asserts, its brown colour to bread. It is not possible to condense the substance of the report, from which I have taken the short extracts inserted here, in such a

* If beer yeast had been meant, it would probably have been called *levûre de bière*.

manner as to render its scientific and practical details intelligible; and to adapt it, at the same time, for admission into this small volume — brought at present so near its conclusion; but if real and great advantages are to be derived from the introduction of the new processes, by which M. Mège-Mouriés is endeavouring to replace the old ones, they will soon become extensively known, and will scarcely fail to attract the attention of the persons most interested in the important question of bread improvement, which is beginning, at least, to create the general and active interest which it deserves.

M. Mouriés has drawn his conclusions from the closest anatomical inspection of the grain of wheat, confirmed by microscopical examinations of it, made conjointly with him by a clever young botanist named *Trécul*, highly considered by the *Académie*. The position of the cells which contain the *céréaline* (which has been a principal object of experiment to the first of these gentlemen), is minutely described, together with its nature and the method of partly or entirely neutralising its activity in panification, in which it exercises a powerful decomposing influence in its natural state. It is asserted that the brown colour of bread is not attributable to the mixture of bran or pollard with the flour, but to the energetic fermentation produced by the *céréaline*.

PUBLIC OVENS.

(For Baking Bread, and for General Cookery.)

The establishment of large, well-regulated public ovens, to which the bread and other food of families could be taken to be baked, without danger of loss from dishonesty or mis-management, would be an inestimable boon to the labouring classes of the English people, and a valuable one to many others; and if the charge of such ovens were entrusted to persons who combined integrity and intelligence, with a due knowledge of the practical operations required from them, a new and profitable system of cookery might be generally adopted through their means, by the agency of a low, but equally sustained degree of temperature. When enclosed in earthen jars with covers, or other suitable vessels, pasted down, or secured in such a manner as to prevent the escape of the steam arising from them, and mingled with so much liquid only as is necessary for their preparation, meat, fish, fruit, rice *, and an infinite variety of other articles of food may be cooked in the very best manner, and without the loss of any portion of the nourishment

* The value and wholesomeness of rice as food, depend entirely on the mode of preparing it, which is ill understood in this country, and to which the above system is peculiarly adapted.

which they contain. A thick layer of pie-crust will often be a convenient substitute for the cover of a jar, in baking these, and will effectually confine the steam if carefully fastened to the edge.

The favourite but most unfrugal baked joints of meat of the people, on which often a large portion of a poor man's weekly wages is expended for one day's meal only, have been too often the subject of comment and remonstrance, for their wastefulness not to be generally recognised; and yet one would not willingly deprive those who have so few enjoyments, of the occasional savoury repasts which many of them earn with the heaviest labour, and for which they seem content frequently to pay the price of many days of comparative privation. Much greater economy, however, might be effected even in the "baked meats" for which the common national taste is so decided, and which dwindle in size so strikingly in the over-heated ovens of the bakers. They would be infinitely more succulent and nutritious, or more really resembling well-roasted meat, in fact, if long and gently cooked, and would lose far less in weight.

In very populous places it might answer to have several ovens in the same office, varying in their degrees of temperature, and so adapted to, and always ready at certain hours, for different preparations.

But it is most of all in many of our villages that better accommodation is required than now exists for baking generally, and for baking bread especially; for great discouragement to the makers often attends the sending it to a common baker's oven, should there chance to be one at hand, which in many instances there is not. It is a real grievance to the poor but industrious housewife to have the dough which she has prepared carefully and well, given back to her either underbaked or burned, or partially spoiled, by standing for hours in the heated air of the bake-office after it was ready for the oven. It is a disadvantage, under any circumstances, to be compelled to send bread from home to be baked; and in severely cold weather there is always a chance, unless great precautions be taken against it, of the dough being rendered heavy by exposure to the influence of the external air. The rich, who interest themselves in the well-being of the poor, would effect a good work in their favour by aiding in the erection of village-bakeries, which should remove the present difficulties of numbers of the rural population; but no beneficial results would ensue unless their management were entrusted to kind, conscientious, and efficient agents.

TO CLEANSE WHEAT FOR GRINDING.

I extract the following passage from a small pamphlet which has just fallen into my hands, entitled "OUR DAILY BREAD," (written and published by Mr. William Horsell, 492. New Oxford Street,) because it appears to me to contain a simple and sensible suggestion for the improvement of bread, and in consequence to deserve consideration:—

"Those who have given little attention to this subject, will probably think that the trouble of washing all their bread-stuff before it is ground, would be much greater than any benefit which would result from it. But a short experience in the matter would convince every one who has a proper regard for the character of his bread, that the trouble of washing his grain bears no comparison to the improvement effected by it. Indeed, those who have been accustomed to wash their grain, will soon cease to regard it as a trouble; and the improvement in the whiteness and sweetness of their bread will be so great, that they would be very unwilling to give up the practice.

"Having raised or purchased a quantity of the best new wheat, it should be put away in clean casks or bins where it will keep perfectly dry and sweet; and, according to the size of the family, take, as they need it, one or two bushels, and wash

it thoroughly but briskly in two or three waters, and then spread it out on the drying sheet or table, made for the purpose, and which is considerably inclined, so that the water remaining with the wheat will easily run off, Being thinly spread out upon the sheet or table in a good drying day, it will be sufficiently dry in a few hours for grinding. Let any one who loves good bread wash his grain a few times in this manner, and he will be very reluctant to return to the use of bread made of unwashed grain."

PURE BAKERS' BREAD.

It is with the greatest satisfaction that I find myself enabled to mention, before I close this work entirely, a movement which has commenced amongst the better order of bakers for supplying the public with really genuine bread. Some specimens have been sent to me which were truly excellent, and which remained good for so unusual a length of time, that I have no doubt they had been fabricated in a perfectly wholesome manner.

It would, perhaps, be only fair to give the names of those members of the trade who are foremost in the path of improvement; but believing that many oth rs will quickly unite with them in their good and conscientious work, I

prefer to wait a little before I add anything to this slight notice of a welcome fact.

DEFICIENT WEIGHT OF BREAD.

This is an evil which presses so heavily and painfully on the very poor, and which prevails, I regret to state, to so serious an extent, that I cannot withhold a few words of comment upon it, trusting sincerely that it will be one of the first abuses which the reforming spirit of the age will entirely abolish. It is not sufficient for genuine bread to be supplied to the public if the full value of the price exacted for it be not given in its weight as well; and the instances in which all that I have had tested (and which has been purchased of various bakers) has come up to the proper standard, have been very few. There may be some difficulty, perhaps, in having it always exact to an ounce; but *five* or *six ounces* of loss in every four-pound loaf, which is the average deficiency, is a serious consideration to the poor and scantily fed; and there is never any *overplus* of weight to make them compensation for it.

BREAD CHIPS.

(To serve instead of Biscuits for Dessert, or to Invalids.)

Cut thin shavings of bread from a stale loaf, spread them on a dish, or lay them singly on the

tin tray of an American oven, and dry them very gradually until they are perfectly crisp; then bring them to a pale straw colour; withdraw them from the fire, and, as soon as they are cold, pile them on a napkin, and serve them without delay. They require an extremely gentle oven to produce the proper effect on them; but, if well managed, will retain their crispness for several hours; and it may always be renewed by heating them through afresh. By many persons they are much preferred to biscuits, being considered far more delicate. A small American oven answers for them extremely well if placed at a distance from the fire: they require quite half an hour to dry them as they ought to be done.

THE END.

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