

## BRITISH "CONDITIONING" METHODS.

BY G. M. FARRINGTON, BOSTON, ENG.

I WILL try to tell you how, at a small inland country mill, situated in a purely agricultural district, the wheats of Europe, Asia, Africa and America meet, and are cleaned, and blended, and conditioned and acclimatized till the golden grain of California need count it no dishonor to meet death side by side with the darkest-skinned, and once despised, product of our Indian empire; and the sweet, plump berry of old England need fear no contamination of its virtues from contact with the ill-reputed wheat from the land of the Pharaohs, as they lie side by side awaiting a common doom. It is scarcely necessary to refer to the fact that the first operation is performed on a warehouse separator, which removes the larger rubbish, such as stalks, straws, big clots, etc. And now man calls in water to his aid, and of all the means and processes employed to clean wheat there is not one so sensible, so natural, so effective and so cheap as that of washing. It is sensible and natural, because it is precisely the course that common-sense points out to any man as the proper way to clean almost anything and everything. We shall clean our hands before we dine to-day. Shall we get a dry brush and scrub them? If so, I am afraid dinner will spoil before we shall be presentable at the table. No, we shall immerse them in water, and with a little friction the thing is done. Just so with wheat, a plunge into pure cold water and the dirt begins to capitate at once, and when the wheat arrives in the sack there is as much improvement in its appearance as in that of a captured street Arab after a bath. And when I am told that there are mills using foreign wheats which to-day have no washers in them, I simply say, "I cannot believe it."

It is quite unnecessary to describe a washer; suffice it to say that there need not be the slightest difficulty in choosing a good one. I might almost say there would be more difficulty in finding a bad one. Mind, I say a washer; one that removes all the loose, and the comparatively loose, dirt, and of course the stones, not merely a damper for this, though doubtless at times a useful little machine, has no place in the system I am advocating to-day, but, whatever machine is adopted, remember this, that an abundant supply of pure fresh water is absolutely necessary for success. The process of washing is completed and discrimination and skill begin to play a foremost part. The softer and more delicate kinds of wheat, such as Californian, soft Chilean, American and Russian should at once proceed to the heater, but the coarser and flintier descriptions, such as Indians, Egyptians, Syrian and hard Chileans, are improved by a few hours interval to permit the water to penetrate into the interior, in the former kinds this is sufficiently well done in the continuous process. The object of the heater is not to dry the wheat, but to drive the moisture of the berry, whether it be natural to it as in the case of English, or artificially introduced as one of the results of the washing process, from the centre to the outside, thereby loosening not only any remaining dirt that the first washing may have failed to remove, but also the fine outer skin of the berry itself; in this condition hot, moist, in fact, perspiring profusely, it is introduced to the scourer, where anything from simply removing the dirt to almost skinning the wheat can be performed; it is then passed through a powerful exhaust, to clear it of the offal the scourer has detached, to the cooler, the real drier of the process, which is a most effective purifier, also where every trace of sweat or moisture is removed. All the loose particles of offal which may still be found adhering to the wheat berry are here effectually detached by the peculiar motion of the grain as it descends its zigzag course and effectually removed, and the wheat, as far as its condition is concerned, leaves this machine absolutely ready, for the first break-roll, it is also equally ready for storage in silos till wanted. For our own part we recommend, and, as far as possible, practice, the continuous process, that is, to mill the wheat as it leaves the cooler, with as little interval as possible, for it undoubtedly is a fact that the wheat is never again in such perfectly mild and kind temper and condition as it is at this stage, breaking freely, yielding clean, broad bran, and consequently allowing only a minimum quantity of offal to get through the rotary scalpels and into the general system

Having briefly described the process, let us have a look at the machines engaged in it. Now we will descend from the didactic to the descriptive, and begin with the heater, a machine which, though of very early origin in the wheat conditioning epoch, of entirely home design and home manufacture, is still doing work to-day which we in our own experience have never seen surpassed. What is our principle? Simply that of the Turkish bath. Our heater consists of a series of steam-jacketed inclined plates or trays, arranged over one another in zigzag form, and suspended between hollow columns which serve both as supports to the plates and conduits for the steam. Each plate is furnished on its upper side with adjustable striking bars or louvres for regulating the thickness of the stream of grain. A hopper is placed at the top of the machine, into which the grain, after being washed, is fed, and thence travels at a pace regulated to the greatest nicety by a valve at the outlet, and in a thin sheet of from three quarters of an inch to an inch-and-a-half in thickness, down the upper surface of the plates, and under the striking bars or louvres, being turned completely over in its passage from plate to plate, being precisely the action of the old-fashioned kiln, excepting that in this case the manual labor required to turn the grain over is supplanted by automatic means. Discharged from this machine, the wheat is then handed over to the care of the scourer, but before describing the operation and effect of this most useful and essential machine, which for our purpose requires to be in some respects of special design and construction, let us see what has happened to the wheat in the heater. We have likened our process to that of a Turkish bath. Are we adhering to the conditions of this humanly healthy and physically invigorating process? Let us see. The wheat has been well saturated in the washer, and the loose and extraneous dirt dispersed and dissipated, and what is supposed to be the comparatively clean berry introduced to the series of hot rooms represented by the zigzag heater. Each plate of this forms a hot room, and as the wheat is introduced to each room successively, it perspires more and more freely and when it reaches the outlet is not only hot and moist and clammy, but has an amount of dirt upon its skin, which, if not removed, would make a clear, bright flour from patent to low-grade absolutely impossible, and that this desideratum is attained we can prove to the stoutest skeptic that ever handled a spatula.

Let us return to the wheat, for to keep it waiting in its present prime condition would be to lose the golden opportunity of the whole process. We have got to the end of the hot-room stage, and the patient is waiting for the vigorous attentions of the attendant rubber, and in the meantime is jealously guarded from draughts or breath of air, which, whether hot or cold, would tend to dry the skin and close the pores, and make the value of the attendant's services comparatively nil. We do not mind the upper surfaces of the heater trays being open and exposed to the surrounding air, so that some of the vapor may of itself rise and disperse, and perhaps a slight suction here might simply carry this vapor away without militating against the good effects, but we strongly object to any means for drawing the heat through the grain; the heat must rise of itself and find its own way through, as in the old kilns, to produce the necessary sweat. Now for the rubber. Well, that is our scourer, and with a patient in such prime condition the work is easy, and the results to any but an actual eyewitness almost beyond belief. The wheat comes out of this machine still warm, but beautifully bright and clean and healthy, the separated dirt and fluff, the outer skin having gone directly from the scourer to a conveyor, which takes it into the mill to be automatically mixed with the bran or pollard most suitable for its company and complexion. The wheat must now be finally dried and purified, and the gentle action of the cooler effects this purpose and attains this end. The general construction of this machine is similar to that of the heater, but the plates or trays, instead of being hollow and filled with steam, are perforated, and a powerful fan draws a gentle but abundant current of air through these perforated plates, and through the thin stream of wheat which is gently travelling down them. The wheat here, as in the previous machine, is turned completely over as it passes from plate to plate, and its upper side is free

and unimpeded, and open to the fan, so that any of the particles of the dirt or skin, loosened by the preceding treatment, which may still be found adhering to the berry must inevitably now, by the regular and complete turn over of the stream of wheat, be brought into a position favorable for the fan to act upon them and carry them away. This machine, then, is not only a cooler and a drier, but, and mark this as one of its best qualifications, it is a purifier also.

Having now briefly described the principles of our system and the practical means by which we carry out those principles, let us consider some of the advantages to be gained by their adoption. First and foremost, a practically unlimited choice of the wheats of the world. Hard wheats can be made mellow, flints turned into flour, soft wheats can have their superabundant moisture eliminated and be brought to any degree of dryness, and all wheats, hard, medium or soft, can, so long as they are inherently sound, be rendered absolutely clean and fresh and pure. Further, by this preparatory process the work inside the mill can be simplified throughout by reason of the fact that the most baffling offal a miller has to deal with, the fluff and beeswing scraped off the brassy side of the wheat berry by the break-rolls, does not get into the system at all. The power required is reduced, the resulting products incalculably improved, the flour being stronger, brighter and purer, and the offals are offals indeed. Then again, this process enables the miller to attain to what, doubtless, as a miller, is the height of his ambition, the reputation for reliability and regularity in the quality of his flour. He needs no longer be the victim of such circumstances as the varying supplies of an erratic market or the constant changes of our uncertain climate. Does Russia prohibit, then America fills the gap. Does America fall short, then India comes to the front. Is India famestricken, then from some unexpected quarter of the globe supplies pour in. All the miller need want is wheat, sound wheat, and given conditions and means, such in principle, but not necessarily in detail, as we have described, and be the weather wet or dry, warm or cold, his wheat from eastern hemisphere or west, the resulting flour should be such as would produce a loaf as fine in flavor as the fastidious palate of the workman can demand, and there is not a more fastidious critic, or a finer judge of the quality of the staff of life than the toiling millions with whom bread is the staple food, and the flour should always yield as many of such sweet, nutritious loaves as the most anxious baker, whose laudable ambition is to pay his way, and make a provision for his old age besides, has any unquestionable right to expect. Further still, this system insures an enormous saving of power, and who does not desire this?

## HANDY TO HAVE AROUND.

DID it ever occur to our miller friends, says The Millstone, what a handy little tool a muffed mallet is? Every miller should be the owner of one, and it should be his constant companion when making the rounds of the mill, and with it give every chop or meal-sput a tap on the under side as he passes it. It will make no noise, nor will it in any way injure the spout, but what a lot of trouble and loss of time it may save! Spouts so frequently reminded of this duty in that gentle but somewhat forcible way, are not very apt to choke; in fact, never, unless suddenly overcrowded. If the millers will provide themselves with such mallets, and diligently use them a while, it will soon become a habit which will cling to them and make them feel lonesome without their companion, should they happen to forget it.

## A NEW FLOUR PROCESS.

A GERMAN scientist has patented a process whereby a flour containing 90 per cent. albumen is produced from wheat. It is claimed that it is easily digested, and can be kept any length of time without spoiling; that it is as nourishing as dried white of egg, and will take the place of the albumen now obtained from meat and eggs, and can be supplied at less cost. If the civilized people of the world will now depend upon ordinary bread for starch, whole-meal bread for phosphates, and the new patented process for their albumen, three constituents necessary as human food, can be supplied by millers, to which they will not object.