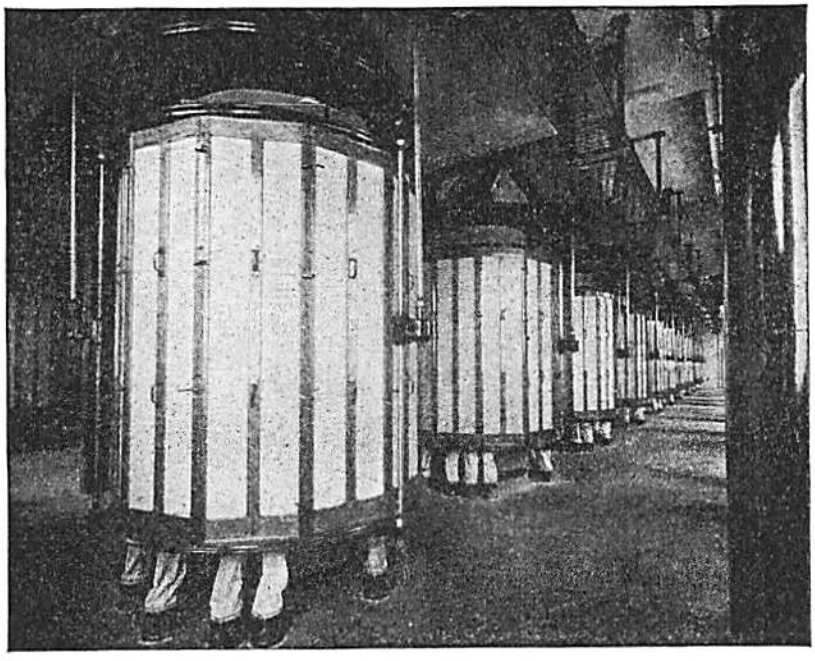


Gyrating sifter for separating the bran particles from the flour and semolina.

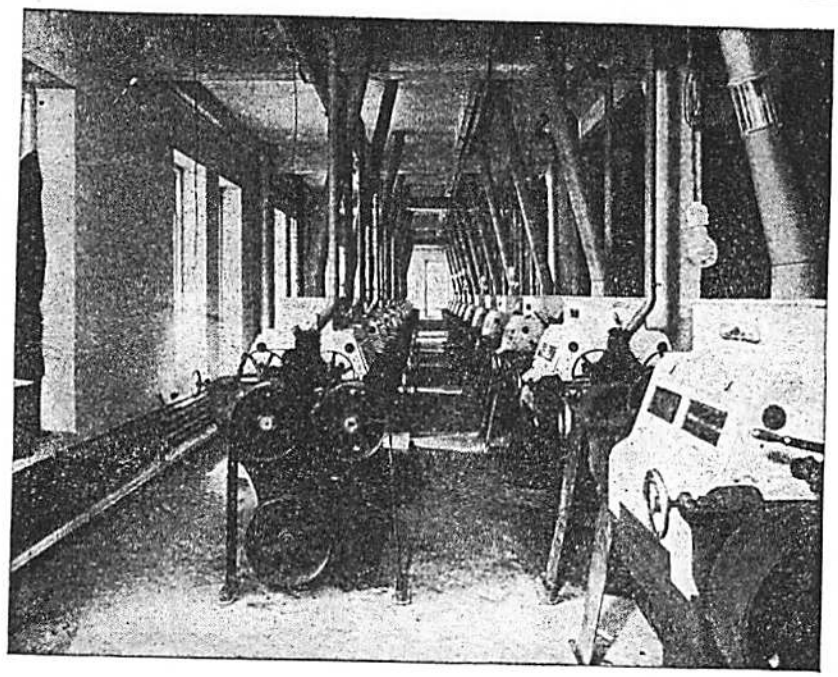
The Big Bolters with Silken Sieves.

Closely allied with the rolling process is the bolting process, which, working hand in hand with it has made modern flour making so perfect. The bolting process consists of a series of sieves —a sifting of the broken grain so that it is finally, after repeated breaking and sifting, a flour. The bolter machine contains a number of sieves covered with silk bolting cloth with varying mesh or number of threads to the square inch. This bolting machine, moving rapidly, makes from 8 to 10 different separations of the material. From rolls to bolters, from bolters to purifiers, from purifiers to rolls, over and over, the process continues, until five different grades of "middlings" have been selected by the mechanical hands of the millers. The purifier is still another step to the process. It is a machine having eight sieves of different mesh. The "middlings" flow down over the different sieves in a thin sheet, a current of air meantime drawing all impurities out. With this purifying process completed, the material is ready for the smooth rolls.

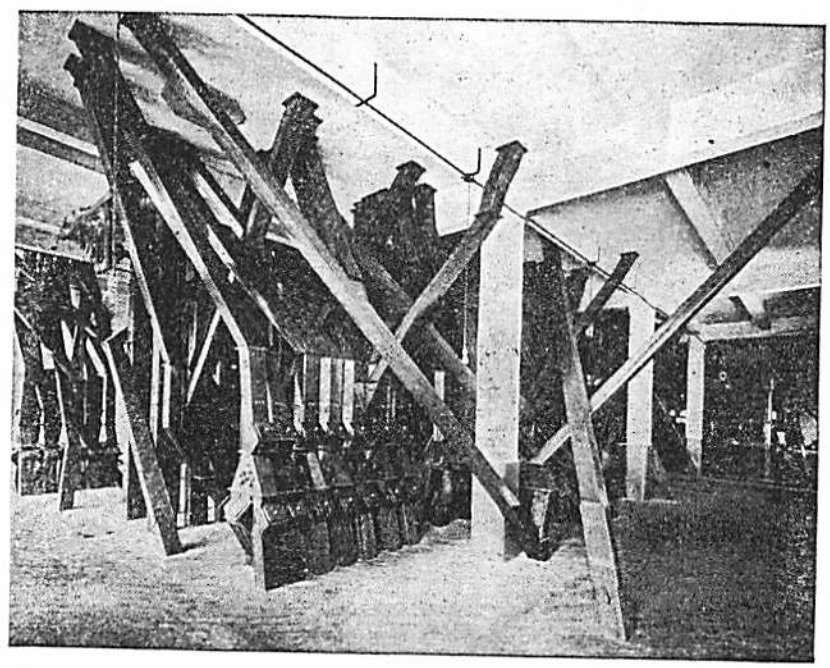
The Mill Tries to Catch Up with the Bins.

When the flour is made it is conveyed to large round bins—five sheets of hard wood pressed together. These bins are being filled all the time and being emptied all the time, the mill being about seven hours behind the capacity of the bins, so that from start to finish the modern flour mill is a tremendously busy place.

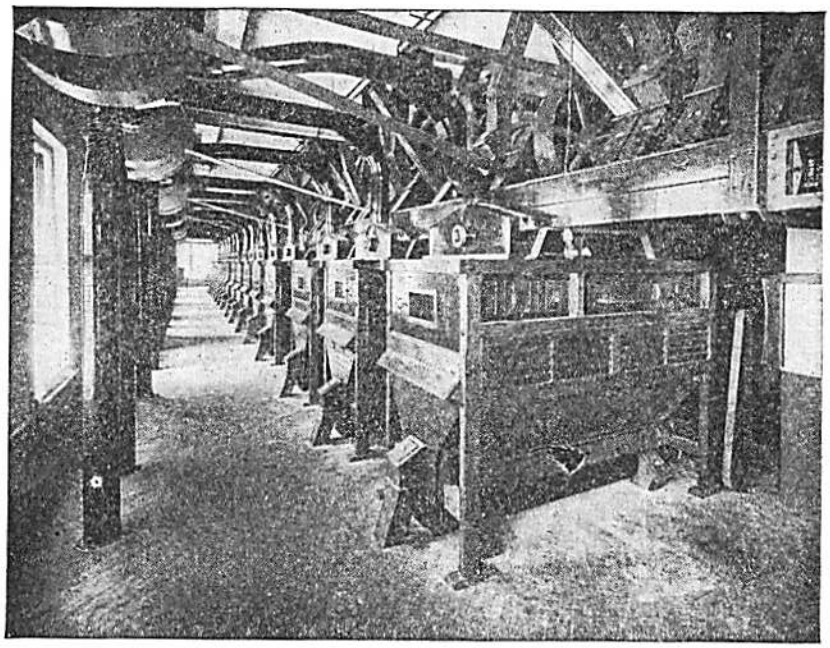
Underneath the bins and connecting with them are the flour packers—automatic devices which pack a 3½-pound paper sack as accurately as a 196-pound barrel. The filled packages are sent down "chutes" to the shipping floor. There they go to wagons or through other chutes to boats.



Corrugated roller mills for grinding the wheat after it has been cleaned.



Wooden spouts for conveying the different products, bran and partly ground wheat, from one machine to another.



Purifier for separating the fiber, germ, and other impurities from the semolina (grits) before it is finally crushed or ground into flour by smooth roller mills.

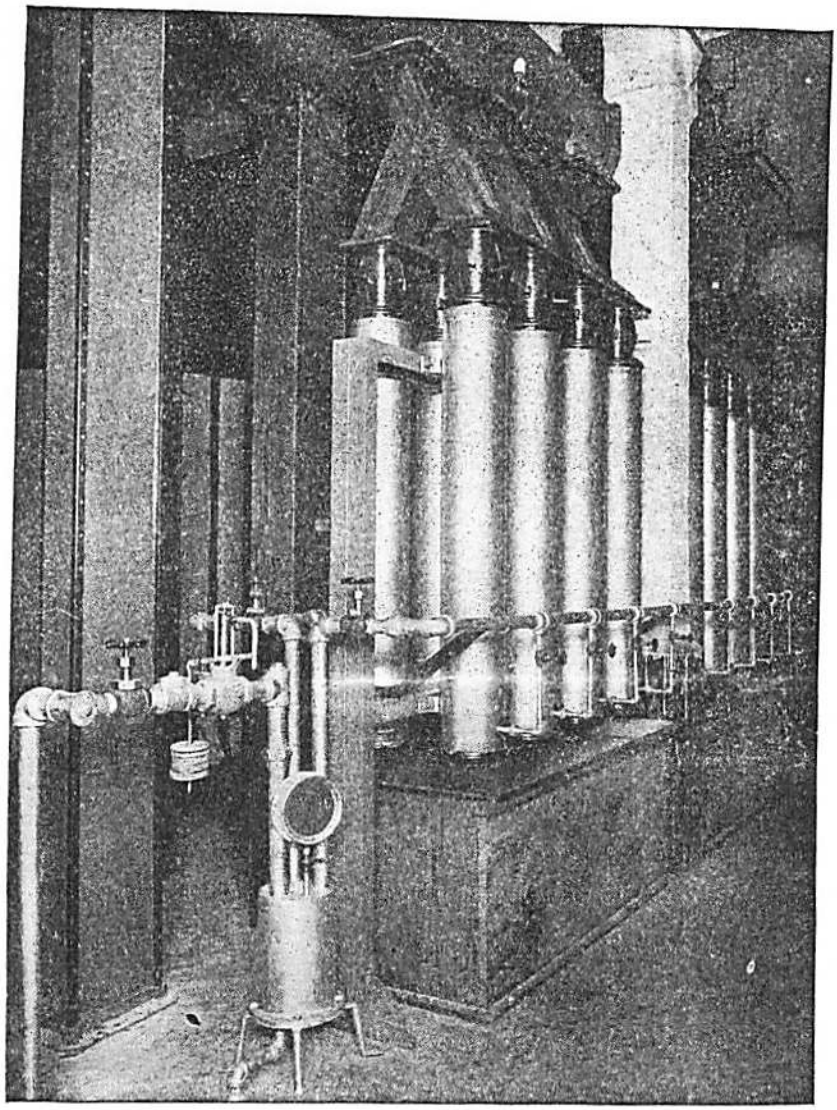
tors," "spouts" and "conveyors," like the veins and arteries of the blood-carrying system. Stop up a vein of wheat, the mill becomes clogged, and finally must shut down if it cannot be mechanically relieved. It is an intricate and intensely interesting process, the result of year-to-year experience.

Scouring that Suggests a Dutch Kitchen.

From the storage bins the wheat is drawn off through conveyors to the first of several cleaning processes, the "separators," where the coarse grain which naturally comes with the wheat, such as corn and oats, and imperfect kernels of wheat, is taken out. After this general cleaning the grain goes to the "scouring machine," which is an interesting device—a rapidly revolving cylinder with what are called "beaters" attached. The grain is thrown against perforated iron screens Any clinging dirt is loosened, and a strong current of air passing through the cylinder is constantly "calling for dust," as the miller aptly expresses it, and carries the impurities away as dust and dirt. Indeed, the cleaning process seems to be a constant one from the time the wheat enters the mill until the flour is made. Having been cleansed, the wheat is now ready for the rolls except for a "tempering" process, which is to prepare the grain, so that the outside of the wheat may be taken off without injury to the inside or kernel.

Then as the grain passes to the rolls there begins a gradual reduction of wheat to flour which is most intricate.

The first sets of rolls are corrugated and so adjusted as to "break" each grain of wheat into 12 to 15 parts. The "breaking" process goes on through five different sets of rolls.



Wheat conditioners for tempering the wheat before being ground by the corrugated roller mills.

How is Flour Made?

In great factories the raw material is frequently taken in at one end and comes out of the opposite end as a finished locomotive, a Pullman palace car, or a pair of shoes. There is no such progression in making flour. The wheat comes in at one place as a plain Spring or Winter wheat and at another goes out as flour, but in the process parts of it may go from top to bottom of the big mill 30 times. Instead of a factory where everything moves along from hand to hand or machine to machine, the flour mill is like a human body—a huge framework like the bones, with thousands of carrying devices, "eleva-

is sometimes made from roots, fruits and the bark of trees, but generally only from grains such as wheat, rye, corn, etc. The word bread comes from an old word *bray*, meaning to pound. This came from the method used in preparing the food. Food which was pounded was said to be brayed and later this spelling was changed to bread. Properly speaking, however, these brayed or ground materials are not really bread in our sense of using the term until they are moistened with water, when it becomes dough. The word *dough* is an old one meaning to "moisten." This dough was in olden times immediately baked in hot ashes and a hard indigestible lump of bread was the result. Accidentally it was discovered that if the dough was left for a time before baking, allowing it to ferment, it would when mixed with more dough, swell up and become porous. Thus we got our word loaf from an old word *lifian*, which meant to raise up or to lift up.

When Was Wheat First Used in Making Bread?

It is not clearly known when or by whom wheat was discovered, but it seems to have been known from the earliest times. It is mentioned in the Bible, can be traced to ancient Egypt and there are records showing that the Chinese cultivated wheat as early as 2700 B.C. To-day it supplies the principal article for making bread to all the civilized nations of the world.

The origin of the wheat plant is said to have been a kind of grass which is given a Latin name *Ægilops ovata* by the botanists.

Will Wheat Grow Wild?

This is a question that has puzzled the world's scientists for more than two thousand years. From time to time it has been reported by investigators in various parts of the world that here and there wheat has been found growing wild and doing well, but every time a further investigation is made, it develops that the wheat has been cultivated by some one. There is as yet no evidence for believing that wheat will grow in a wild state.

What is the Difference between Graham Flour and Whole Wheat?

Graham flour from which Graham bread is baked is made from unbolted flour. The process of bolting flour, which is described in one of the following pages, consists briefly in taking out of it all but the inside of the grain of wheat. When this has been done, we have pure white flour.

In making Graham flour every part of the grain of wheat is left in the flour, and ground up finely. Many people think that Graham flour is made from a special grain called Graham, but this is not true. It is said that Graham bread is not so good for you because it contains the outside covering of the wheat grain or bran which is composed of almost pure silica, the same substance of which glass is made, and cannot therefore be good for us.

Whole wheat flour is made from the whole grain of wheat from which the outside covering or bran has been separated. It contains everything but the bran and is therefore the most nutritious flour made.

The grain of wheat has several coverings of bran coats, the outer one of which is the one composed of silica, and which is not valuable as food. Underneath this husk are found the inner bran coats, which contain the gluten. Gluten is a dark substance containing the flesh-forming or nitrogenous elements, which are valuable in muscle building. The inside or heart of the grain of wheat consists of cells filled with starch, a fine white mealy powder which has little value as food, but is a great heat producer. Sometimes in making whole wheat flour, the heart of the grain is also removed, making a pure gluten flour. The name whole wheat for flour is not accurate, therefore, for Graham flour is made of the whole wheat grain, while "whole wheat" flour is made of only certain parts of the grain of wheat.

HARVESTING WHEAT.

The Story in a Loaf of Bread

Why is Bread so Important?

THE history of bread as a food reads like a romance. It has played an important part in the destinies of mankind and its struggles through the ages to perfection. The progress of nations through their different periods of development can be traced by the quality and quantity of bread they have used.

No other food has taken such an important part in the civilization of man.

To a large extent it has been the means of changing his habits from those of a savage to those of a civilized being. It has supplied the peaceful pursuits of agriculture and turned him from war and the chase.

It is an interesting fact that the civilized and the semi-civilized people of the earth can be divided into two classes, based upon their principal cereal foods: the rice eaters and the bread eaters.

Every one admits that rice eaters are less progressive, while bread eaters have always been the leaders of civilization.

It is an interesting fact that just as Japan is changing from a rice-eating nation to a bread-eating nation she is asserting her power.

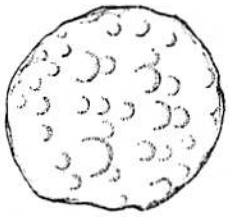
Any one who stops to consider the history of nations will see that this matter of what we eat is the one question of vital importance.

Bread is one of the earliest, the most generally used and one of the most important foods used by man. Without bread the world would not exist without great hardship. On bread alone a nation of people can exist, and to sit down to a meal without it causes us to feel at once that something is missing.

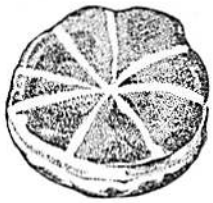
What Was the Origin and Meaning of Bread?

Bread is baked from many substances, although when we think of bread, we usually think of wheat bread. It

Egypt
2500 B.C.

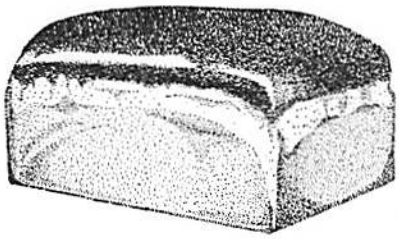


Unleavened Bread
2000 B.C.



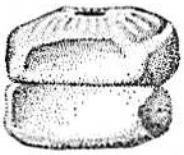
Pompeii
50 A.D.

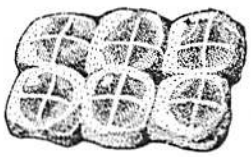
Palestine



Modern American Loaf

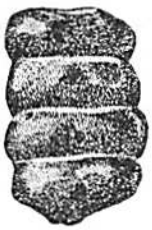
England





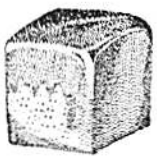
England

France



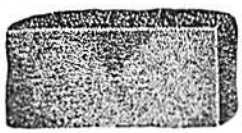
Hungary

Spain



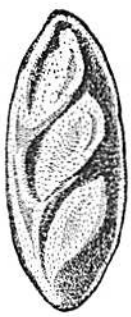
Switzerland

Bohemia



Holland

Italy



Austria

Germany

Balkan States