of Southern and Western railway lines centering in St. Louis and the Northern and Eastern lines centering in Chicago, and will do a very large proportion of the passenger, express and mail traffic of these systems between the two cities. The enterprise is backed by some of St. Louis' leading financiers."

Since the above was written there must have been important changes in the expectations and means of the company, for we cannot learn that any definite progress in the work has been realized.

MANUFACTURE OF MACARONI.

Our illustrations are taken from the plant of the Columbia Macaroni Manufacturing Company, New York City. Macaroni is a preparation of wheat originally peculiar to Italy, in which country it is an article of food of national importance. The same substance in different forms is known as vermicelli, spaghetti, Italian pastes, taglioni, etc. These substances are prepared from hard, semi-translucent varieties of wheat. Hard wheats are richer in gluten than the soft and tender wheats. These wheat preparations styled macaroni are met with in various forms, such as fine thin threads called vermicelli, from its thread-worm-like appearance, thin sticks and pipes, stars, disks, ribbons, tubes, etc. In the manufacture of macaroni about 100 pounds of semolina or granulated wheat is first put into a circular iron mixing machine 3 feet in depth and 2 feet in diameter. A quantity of boiling water is then added and the substance mixed up into a stiff dough by a revolving shaft armed with circular teeth which runs down through the center of the machine. The dough is then taken out and placed in a circular wooden rolling machine, 3 feet in height and 8 feet in diameter, over which for 40 minutes travels a revolving granite roller 5 feet in diameter, 18 inches in width, weighing 3 tons. After the dough has been thoroughly rolled and pressed, it is placed in a kneading machine. A layer of dough about 4 inches in thickness and about 8 inches in width is placed around the outer edge of a circular revolving pan 6 feet in diameter and 18 inches deep. Attached to the framework of the machine across the center of the pan are two loose cone-shaped gearing wheels. As the pan revolves around, the dough is passed under the cone-shaped wheels, which in turn revolve, burying their teeth into the dough. This operation continues about 20 minutes, thoroughly mixing and kneading the substance. It is then placed in the cylinders of the macaroni press. These cylinders are about 2½ feet in length and about 15 inches in diameter, on the inside of which, resting on a flange at the bottom, is a copper mould. These moulds are about 1 inch thick and perforated with holes through which the pipes of macaroni are pressed. The pipes are made hollow by means of a circular piece of copper held in place by a pin running across the center of the hole on the inner side of the mould. As the dough is pressed over the pins it divides in the center and unites itself again as it passes out of the mould. About 100 pounds of dough is placed in the cylinders at a time, which is pressed out through the moulds by means of an accurately fitting plunger or piston. One thousand pounds pressure is used, the cylinder emptying itself in about 45 minutes. As the pipes of macaroni pass out of the mould they are cut off into 10 foot lengths and taken to the cutting table, where they are recut into small lengths for drying. The macaroni is then placed on pasteboard and racked away for eight days to dry, in a temperature of 80 degrees, when it is placed in boxes and is ready for market. The company employs about 125 Italian hands and turns out about 3,500,000 pounds yearly.

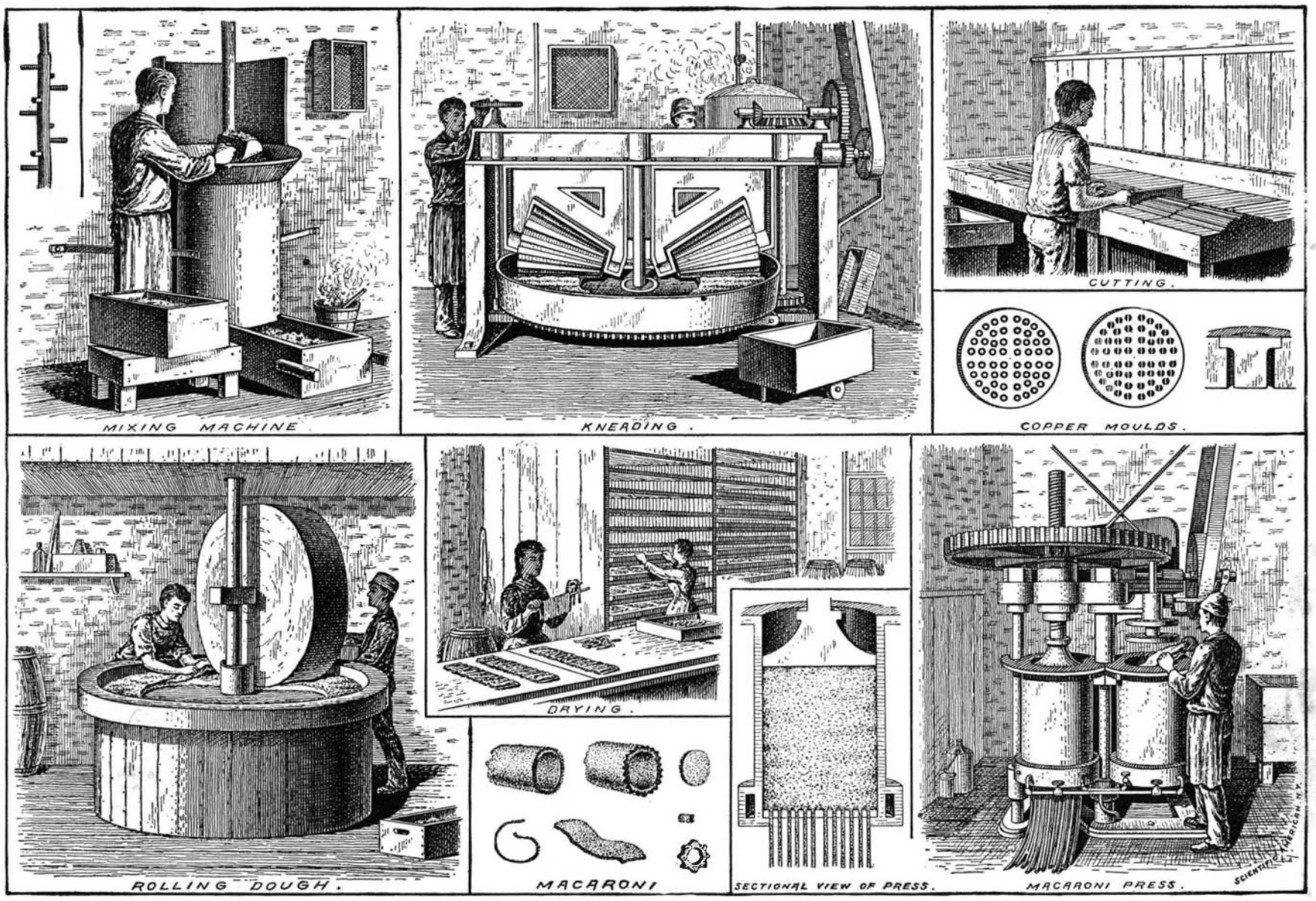
Having thus described the method of manufacturing macaroni in New York, we will now give an account of the way the article is made by hand in Italy.

The hardest and flintiest varieties of wheat are selected, first washed and then thoroughly dried in the sun. This wheat is then coarsely ground and run through a revolving sieve to separate the starch from the bran and flinty portions. It is then successively passed through a series of six hand sieves, each a little finer than the preceding, for the purpose of separating the flinty portions from the bran. This apparently simple process requires considerable skill, and a certain knack which it takes time to acquire. The motion which is given to the sieves by the sifters is half rotary and half up and down, with an indescribable side motion, which can only be characterized as a "boomerang," for it throws the mass which is being sifted in an opposite direction to that taken by the sieve. Every few minutes each sifter pauses and skims off the bran which has worked to the top and center of the sieve, and after these various manipulations there remains a clean, flinty farina, known as semolina. This is then mixed with warm water into a stiff dough, and this dough is thoroughly kneaded by means of a long prism-like, hardwood lever, so adjusted that the spring of the timber may be utilized in alternately raising and depressing it upon the mass of dough, which is then pressed and kneaded into the required consistency. It is rather amusing to see two or three men sitting on the end of this lever and bobbing up and down so as to throw their weight at one instant on the lever, bringing it down into the dough, and then allowing it to spring up again, in order that it may be brought down in a new place.

After it has been thus mixed and kneaded for about an hour, the dough is put into presses with perforated bottoms, and, pressure being applied, it comes out through these holes in the shape known to us as macaroni. At this stage of the process it is, of course, soft and flexible, and in order to keep the various little strings of dough from sticking together, it is constantly fanned by a boy, so that the current of air thus made may slightly dry the outside of the strings and prevent them from adhering. It is then cut off and hung on racks or frames made of bamboo to dry. As it hangs on the frames the different pieces are of unequal length, and a boy passes rapidly over them, wringing off the longer ends to make them uniform. The drying has to be done in the shade and in a place not exposed to the wind; for, if dried too quickly, or if the slender pieces were blown against one another, they would be apt to break. When sufficiently dry it is removed from the frames and packed in boxes such as are familiar to all grocers.

The different sizes are made by changing the movable bottoms of the press and employing different sized perforations. Each of these perforated holes has a core or center around which the dough has to pass, and this produces the hollow which is a characteristic of the macaroni. The reason of this arrangement is, if the macaroni is made solid, it would take very long to dry when hung upon racks, and also when dried it would be very difficult to cook it without a great deal of boiling, and impossible to do so uniformly. So important is this considered, and so defective do the Italians regard the product if not thus perforated, that a proverb has arisen in Italy to the effect that "A foolish person is like macaroni without any hole in it."

Vermicelli is made from the same material and in the same way as macaroni, except that it is not hollow, it being so small that it is neither practicable nor necessary to make it so.



THE MANUFACTURE OF MACARONI, NEW YORK.

Photographic Work in France and Belgium.

M. De Saint Florent has communicated to the French Photographic Society a method of printing with salts of iron, by which he says colors may be faintly reproduced—the red, yellow, and green being more distinct than the violet and blue. A gelatino-bromide plate is taken, and the silver is removed from the film by fixation in the hyposulphite bath, and, after washing, the plate is dried. The film is now sensitized in the following:

Water	100 parts.
Ferric chloride	10 "
Tartaric acid	5 "

After rinsing, the plate is dried and exposed for rather a long time under a colored original—as, for example, colored glasses or gelatines. It is next washed with warm water, by which some of the more soluble parts of the gelatine are removed, and it is finally dried.