It is really wonderful to what uses paper may be applied, and what a field there is still left for improvements in its manufacture. We may take some instructions from the Japanese in this department of the arts. A writer in *Blackwood's Magazine*, in describing the manners of the Japanese, says:—"It is wonderful to see the thousand useful as well as ornamental purposes for which paper is applied in the hands of these industrious and tasteful people. Our *papier mache* manufacturers should go to Yedo to learn what can be done with paper. We saw it made into material closely resembling Russian and Morocco leather; it was very difficult to detect the difference. With the aid of lacker, varnish and skilful painting, paper makes excellent trunks, saddles, telescope-cases, the frames of microscopes; and we even saw and used excellent water-proof coats made of paper, which did keep out the rain, and were as supple as the best macintosh (india rubber). The Japanese use neither silk nor cotton handkerchiefs, towels or dusters; paper in their hands serves as an excellent substitute. It is soft, thin, and of a pale yellow colour, plentiful and cheap. The inner walls of many a Japanese apartment are formed of paper, being nothing more than painted screens. Their windows are covered with a fine translucent description of the same material. We saw what seemed to be balls of twine which were nothing but long shreds of tough paper rolled up. If a shopkeeper had a parcel to tie up he would take a strip of paper, roll it up quickly between his hands, and use it for twine. In short without paper, all Japan would come to a dead lock." The writer says "Japanese mothers-in-law invariably stipulate in the marriage settlement, that the bride is to have a certain quantity of paper allowed her."

The Japanese do not use rags for making paper, but the inner bark of trees.—*Scientific American.*

Machine-made Unfermented Bread.

Raised bread, resembling common loaves made from fermented and baked flour, is manufactured at present upon a somewhat extensive scale, on the corner of Fourteenth-street and Third avenue, in this city. The flour and water for making a batch of bread, are run into a large globular cast-iron vessel, and thoroughly mixed by a stirrer revolving inside, and driven by a steam engine. The lid of the iron vessel is then rendered perfectly air tight, and all the air is extracted by an air pump when the flour is thoroughly wet.

The mixed flour is thus expanded and rendered porous. Carbonic acid gas, under a considerable pressure, is now admitted among the dough, which is still continually stirred, until the whole mixture is charged with the gas. When this is effected, the operator takes his seat at the table under the vessel, and piles of tin pans are laid at his side. A tube projects down at the bottom of the iron vessel containing the dough. The operator now shoves a pan under this tube, opens the cock, when the pressure of the gas inside forces out the mixed dough in a stream, and the pan is filled in half a second. The pans are handed to the baker, who instantly places them in the oven. From the time the flour is placed in the iron vessel to be mixed, until it comes from the oven in the form of bread, the time occupied is only one hour. This is a rapid method of making bread, and as the labour is mostly performed by machinery, the cost of its manufacture is less than for making fermented bread. We have seen raised bread made by charging the water with carbonic acid gas, instead of charging the dough, but the bread by the latter method was considered much the better. We understand that there is now a very large demand for this bread, and that the machinery is kept running day and night to supply it. The taste is slightly different from bread made by fermentation. There are no fears of the dough becoming sour during warm weather by the carbonic acid gas process.

The inventor (Mr. E. Fitzgerald) of this system of bread making, has also devised an apparatus which will soon be applied, by which the loaves will be weighed by self-acting mechanism, and the pans filled with the dough, at one continuous operation.—*Scientific American.*

Working in Aluminum.

The following valuable article is from the *Ironmonger* (English). The information was obtained from Messrs. Bell & Brothers, of Newcastle-on-Tyne, manufacturers of aluminum, by Professor Deville's process, and will be very useful to many of our readers:—

The peculiar properties of this substance having been so little understood, has hitherto hindered its general employment, but now that it is sold in a pure state at as low a rate as 50s. per pound avoirdupois, it is likely to be much more frequently used.

Aluminum is a metal of fine white colour, slightly inclining to blue, especially after being well hammered when cold.

Aluminum, like silver, is susceptible of a very fine "matting," which is not affected by exposure to the air, or by any of the impurities usually present in the atmosphere of towns. To obtain this matting, the aluminum objects (being previously washed in benzole or essence of turpentine) must be plunged into a weak solution of caustic soda, thoroughly well washed, and exposed to the action of strong nitric acid. When the desired matting has been obtained, it must be well washed again, and dried in sawdust.

Aluminum is easily polished or burnished. To do this, it is necssary to use a mixture of equal parts of rum and olive oil, as an intermediate substance between it and the polishing stone or powder used. The polishing stone is steeped in this mixture, and will then burnish aluminum in the same manner as gold and silver is burnished, care been taken not to press too heavily upon the burnishing instrument.

Aluminum can be beaten out, either hot or cold, to the same extent and as perfectly as gold or silver; and it is susceptible of being rolled in much the same way as either of the above metals. Leaves as thin as those used for gilding and silvering can be made of aluminum. Covered ingot moulds of iron answer best for receiving aluminum intended to be used in the rolling mill. Aluminum quickly loses its temper, and therefore requires frequent reheating. The temperature of this reheating is a dull red heat, and when the plates become very thin, this demands the greatest attention.

Aluminum is easily drawn into wire. For this, the ingots are run into an open mould, so as to form a kind of quadrangular shape of a little less than half-inch section, which is then beaten upon the edges by the hammer very regularly; the operation of drawing out is then commenced on a horizontal bench, by very gradually reducing the diameter of the metal intended to be drawn into wire, and by frequent reheating, and then the ordinary process of wire-drawing can be proceeded with. When the threads are required extremely fine—as, for example, for the manufacture of lace—the heating becomes a very delicate operation, on account of the fineness of the threads and the fusibility of the metal. The heat of the current of air issuing from the top of the glass chimney of an Argand lamp will suffice for the heating.

The elasticity of aluminum is very much the same as that of silver, and its tenacity also about the same. The moment after it has been melted, aluminum possesses about the hardness of pure silver; when it is hammered out, it almost resembles that of soft iron; it becomes