Useful Information.

Impure Water.

The *Journal of Chemistry* says: Public attention cannot be too often called to the danger of using impure water in households. The origin of typhoid fever, which so frequently runs through families in city and country, is oftener in wells and springs than is supposed. In cities it is easy to understand, when aqueduct water is not supplied, how wells may become contaminated, but for many it is not so easy to see how wells in the country, among the hills, or in the green valleys, can become so impure as to be sources of disease.

Since the general introduction of aqueduct water into large cities, typhoid fever has become more common in the country than in the city, and this disease is certainly zymotic, or one which results from a poison introduced into the blood. Wells in the country are very liable to become contaminated with house sewage, as they are generally placed, for convenience, very near the dwelling, and the waste liquids thrown out upon the ground find easy access by percolation through the soil to the water. The instances of such contamination which have come to our notice, and which gave rise to fevers, are numerous. The gelatinous matter which is often found covering the stones in wells affected by sewage, is a true fungoid growth, and highly poisonous when introduced into the system. It is undoubtedly concerned in the production of typhoid fever. How it acts it is difficult to determine, but it is at least conceivable that the spores of the fungus may get into the blood and bring about changes after the manner of yeast in beer. These spores, as is well known, develop rapidly by a kind of budding process, and but a little time passes before the whole circulation becomes filled with them, giving rise to abnormal heat, and general derangement, called fever. These fungoid or confervoid growths are always present in waters rendered impure by house drainage, and great caution should be used in maintaining well waters free from all sources of pollution.

As a solution of the difficulty the *Artisan* says: The use of quicklime in the purification of water has long been practiced by dyers, the philosophy of its action being that, by neutralizing the carbonic acid dissolved in water, the carbonate of lime held in the solution is precipitated, the latter being insoluble in water which does not contain carbonic acid. It is customary to reduce the quicklime to a creamy consistence by the addition of water, and then to mix it with the water to be purified. After thorough incorporation, the water being left to settle for some time, not only the lime added but the carbonate of lime previously dissolved in water, would be found precipitated to the bottom. During the time the water is standing, it may, however, absorb more or less additional carbonic acid, and, therefore, be rendered capable of redissolving a portion of the lime. This defect in the process is much lessened, if not entirely remedied, while the purification of the water is entirely facilitated by immediate filtering after the addition of the quicklime. The carbonate of lime, being rendered solid by the addition of the quicklime, is distributed in very minute particles throughout the liquid. If the liquid be filtered immediately on the addition of the filtering agent, the separation may be effected much more rapidly than by allowing the water to stand and settle.

The patent upon a peculiar kind of filter for this purpose has been obtained by Mr. Gustave De Mailly, a civil engineer of Brussels. He used a filter consisting of a cylindrical vertical case of sheet or cast-iron, furnished with a lid, which case contains another cylinder, which is the filter proper. This last is also formed of sheets of cast or sheet-iron, one at the top and the other at the bottom, and united by three concentric cylinders of perforated sheet-iron. In the two annular spaces thus formed he places felt or wool, which is claimed to be rendered imputrescible by a peculiar process. It is claimed that when water passes through this material, which it does quite rapidly, all traces of suspended carbonate of lime are removed. The cleansing of the filter is accomplished by causing water to flow through it in an opposite direction from that it pursues during the process of filtering.

USES OF WASTE PAPER.—Few housekeepers are aware of the many uses to which waste paper may be put. After a stove has been blackened, it can be kept looking very well for a long time by rubbing it with paper every morning. Rubbing with paper is a much nicer way of keeping the outside of a teakettle, coffeepot or teapot bright and clean than the old way of washing it in suds. Rubbing them with paper is also the best way of polishing knives and tinware after scouring them. If a little soap be held on the paper in rubbing tinware and spoons, they shine like new silver. For polishing mirrors, windows, lamp chimneys, etc., paper is better than dry cloth. Preserves and pickles keep much better if brown paper instead of cloth is tied over the jar. Canned fruit is not apt to mould if a piece of writing paper, cut to fit each can, is laid directly on the fruit. Paper is much better to put under carpet than straw. It is thinner, warmer, and makes less noise when one walks over it. Two thicknesses of paper placed between the other coverings on a bed are as warm as a quilt. If it is necessary to step upon a chair, always lay a paper upon it, and thus save the paint and woodwork from damage.

TO BRONZE GAS FITTINGS.—Boil the work in strong ley and scour free from all grease or old lacquer, next pickle in dilute nitric acid till quite clean (not bright), dip in strong acid and rinse through four or five waters; repeat the dip if necessary till it is bright, next bind it very loose with thin iron wire, and lay it in the strongest of the water used for rinsing. This will deposit a coat of copper all over it, if the water or pickle be not too strong. When too strong the copper will only be deposited just around where the wire touches. When the copper is of sufficient thickness, wash it again through the waters, and dry with a brush in some hot sawdust (box dust is best), but oak, ash, or beech will do. It is now ready for bronzing. The bronze is a mixture of blacklead and red bronze, varied according to shade required, mixed with boiling water. Paint the work over with this and dry, and then brush till it polishes. If there are any black spots or rings on the work, another coat of the bronze will remove them. Lacquer the work with pale lacquer, or but very slightly colored, for if it is too deep it will soon chip off.

TOBACCO LEAVES.—The State Chemist of Connecticut, in his report, presents some interesting information in reference to the tobacco crop, with the results of tests upon the tobacco leaves. The general summary of the reports is as follows: The most highly valued tobacco in New England is the thin, tough, elastic leaf, which burns readily to ashes. Those leaves containing the most carbonate of potash in their ashes, burn the most freely and suitably. In some combinations potash does not favor the burning, and some tobacco manufacturers improve the flavor and burning quality by artificially impregnating the leaf with citrate, citrate, or tartrate of potash, applying the latter in solution and then drying. Chlorine injures the tobacco, as also does nitric acid. Sulphuric acid, united with potash, soda, or lime, favors the burning of tobacco. The best tobacco is produced on well-drained, warm, sandy lands. It is believed heavy manuring increases the quantity of the crop generally at the expense of quality as regards texture.

Test for Arsenical Colors on Wall-papers and in Paper generally.

Professor Hager recommends the following method for detecting this dangerous class of arsenical colors, which, we may remark, are not confined to green alone, for red sometimes contains arsenic: A piece of the paper is soaked in a concentrated solution of sodium nitrate (Chili saltpeter) in equal parts of alcohol and water, and allowed to dry. The dried paper is burned in a shallow porcelain dish. Usually in only a few moments, producing no flame. Water is poured over the ashes, and caustic potash added to a strongly alkaline reaction, then boiled and filtered. The filtrate is acidified with dilute sulphuric acid, and permanganate of potash is added slowly as long as the red color disappears or changes to a yellow brown upon warming, and finally a slight excess of chamelion solution is present. If the liquid becomes turbid, it is to be filtered. After cooling, more dilute sulphuric acid is added, and also a piece of pure clean zinc, and the flask closed with a cork split in two places. In one split of the cork a piece of paper moistened in silver nitrate is fastened, in the other a strip of parchment paper dipped in sugar of lead. If arsenic is present, the silver soon blackens. The lead paper is merely a check on the presence of sulphydric acid. According to Hager, the use of permanganate of potash is essential, otherwise the silver paper may be blackened when no arsenic is present.

DYEING VENEERS.—Veneers are readily dyed upon the surface, but in this condition are much more liable to disfigurement than when the color is made to permeate the mass. Those colored throughout are therefore the most sought after, and before the late war were chiefly furnished from Paris. During the war, the supply being cut off, some German cabinet makers took up the subject, and after numerous experiments perfected a process which secures the desired result. The veneers are first soaked for twenty-four hours in a solution of caustic soda, and then bolted therein for half an hour. They are then washed with water until all the alkali is removed when they are ready to receive the dye. This treatment with soda effects a general disintegration of the wood, whereby it becomes in the moist state elastic and leather-like and prepared to absorb the color. Veneers thus treated, if left for twenty-four hours in a hot decoction of logwood, and after superficial dyeing immersed for twenty four hours more in a hot solution of copperas, become of a beautiful and permanent black throughout. A solution of picric acid in water, with the addition of ammonia, gives a yellow color not in the least affected by subsequent varnishing. Coralline dissolved in hot water, to which a little caustic soda and one-fifth its volume of soluble glass have been added, produces rose color of different shades, dependent on the amount of coralline taken. After dyeing they are dried between sheets of paper, and subjected to pressure to retain their shape.—*Paint and Oil Trade.*

Progress in Glass-Making.

Siemen's regenerative process for melting of glass has proved very successful, and has been introduced in some of the most extensive manufactories in Europe. By means of its use the amount of smoke is greatly diminished, the color of the glass is improved, a greater control is obtained over the furnace, and a saving of fuel is effected wherever, by this process, slack can be substituted for large coal or lumps, such as is at present so largely in use. Should the expectations in regard to the use of this furnace for the melting of glass be fully realized, the gain in that manufacture will be very great, and the process will fully supplement those other improved methods which have brought glass-making to its present state of advancement. The substitution, some years ago, of carbonate of soda as the alkaline ingredient in glass, in place of kelp, and, subsequently, for crown and sheet-glass of sulphate of soda, in place of carbonate, was but the beginning, though a most important one, of improvement in this direction. This was followed by an increased size and better workmanship in the plates, sheets and tables, and by an improvement in the color of glass by use of purer materials and by modifications in the manner of melting. Numerous changes soon took place in the operation of flattening glass, resulting in the removal or diminution of many imperfections in glass; and to these succeeded the use of the diamond in the splitting of cylinders in the place of a red-hot iron, also an increase in the size of melting-pots and furnaces, with the view of economising coal and labor, and the adoption, in the casting of plate-glass, of various mechanical contrivances. Finally, the use of the same pots for the two processes of melting and casting plate-glass superseded the old method of transferring the contents of the melting-pot into the vessel used for casting, and then small coal or slack was substituted, in the melting process, for large coal or lumps. —*Paint and Oil Trade.*

Bridge Building.

Mr. J. M. Goodwin, of Cleveland, Ohio, has lately patented certain improvements in bridge construction, which are described as follows in the specifications: "The object of my said invention is to relieve the principal girders, chords, side or middle trusses or beams of bridges, and girders, beams of trusses used in structures other than bridges, of the action and effect of loads moving along or over them, technically known as 'rolling loads;' and to cause the stress of any load passing along or over, or distributed unequally upon, any bridge or structure in which said invention or device is used, to act always in a direction nearly absolutely vertical, and practically vertical, upon one certain surface, and at the same time to cause the stress of such rolling loads to be brought upon such surface or surfaces by a gradual accumulation, the stress upon such surface or surfaces of the principal girder or girders, acting at all times in a direction practically vertical, as aforesaid, and with a force always in proportion to the distance from the ends of the bridge at which any load upon the supplementary girders aforesaid may be (the said load being in this connection considered as passing from end toward center, the force only, and not the character, of such stress being changed by the changing of the position of the load), thereby removing from the principal girder or girders those undulatory and otherwise disintegrating disturbances of fiber which are produced by the direct action of rolling loads; and also to cause the stress of any unequally distributed load to be transmitted to the principal girder or girders aforesaid, through the surface or surfaces, and in the direction, nearly and practically vertical, hereinbefore specified."