

## MANUFACTURE OF THE OTTO OF ROSES.

The following is an interesting article on the manufacture of this celebrated perfume, by Dr. J. Lawrence Smith, Professor of Chemistry in the University of Louisville, Ky., and written for the *American Journal of Pharmacy* :—

"Seeing an article in the May number of the *Journal*, on the otto of roses, it brought to my recollections some neglected notes made during my residence in Turkey, on the culture of the rose and the extraction of its oil, at Kisanlik, in the Balkan Mountains.

"The region where the rose is cultivated is a valley in the Balkan Mountains, in which is situated the city of Kisanlik, about 60 miles north-west of Adrianople, in lat. 42° 40'. It is only within 14 or 15 years that the cultivation of the rose has taken its present development in that region, although, for a number of years, the otto has been made there in limited quantity, especially for royal presents. The surface of the country is that of an extensive plain, shut in by elevated ridges, and here the rose is cultivated by the farmers, who sell the roses to the distillers residing in Kisanlik, seldom or never distilling them on their farms. The rose cultivated is of one kind (a full red rose), that was doubtless introduced into this region many years ago, and selected for its great fragrance and peculiar adaptation to the distillation of the oil. Its cultivation is attended with but little trouble. The bushes are allowed to grow from four to six feet high, although sometimes much higher.

"The roses are gathered during the months of May and June, six weeks being the term usually occupied in getting the crop; the yield is, on an average, about one and a half pounds of rose leaves to a bush, the roses being collected with the calyx. They are gathered half expanded, and at the dawn of day, and not unfrequently before daylight; they cannot be kept advantageously more than a day before being put into the still. If obliged to do so, they must be turned over frequently, as otherwise they will ferment, heat, and the otto will be lost.

"The roses are placed in copper stills of about 30 gallons capacity, in proportion of 60 pounds of rose leaves to 15 gallons of water, and the still immediately heated. The oil is in the first portion of the water which comes over, which is collected in several large bottles; this water is now placed in a second still, and about one-fifth of it distilled, on which all the oil will float. The oil is taken off the surface with a little spoon, and placed in an appropriate vessel. All the water distilled in both the first and second operation is sent into the market as rose-water; the water remaining in the still with the leaves is strained off, and added to a fresh portion of the leaves, in the proportion already mentioned.

"The quantity of rose leaves required to produce one metical (one and a half drachms) of the oil varies from 30 to 60 pounds, according to the nature of the weather. If the roses open during wet weather, and flower slowly, the yield is at its maximum; if, however, the weather is hot, and the bush flowers vigorously, the yield diminishes, the rose itself is paler, and, if not picked at an early stage, yields almost nothing. There is a green wax that comes off the calyx (attaching itself to the fingers of those collecting) that also yields an oil by distillation.

"The annual product of otto of roses in this region is from 28,000 to 30,000 ounces, although so largely is it adulterated, that the amount of oil exported is upwards of 70,000 ounces. The material employed for adulteration is the oil of a species of geranium (very probably the *Pelargonium roseum*), grown in Arabia, in the neighborhood of Mecca, and taken to Kisanlik for the purpose of adulterating the otto of roses; this geranium oil has the odor of the rose mixed with that of the lemon. In fact, it is a common thing, both in Europe and this country, to find this geranium oil in market, called otto of roses, sometimes mixed with a little spermaceti and benzoic acid. On one occasion, a merchant at Constantinople told me that he sent large quantities of oil of geranium to parties in New York, who informed him, through his agents in Smyrna, that it sold very readily in this country as otto of roses, and that the difference was not appreciated. It is almost impossible to obtain the oil of roses pure; the distiller hardly gets his oil together in the evening before he commences to elongate it by a little geranium oil; if it be only five per cent., he must put that in. Such small additions as that would be

made only by very conscientious traders; 50 to 200 per cent. are far more commonly added. And, should the otto happen to sojourn a little while at Constantinople, it would increase still farther in weight and bulk. In bazaars of that city, three or four grades of the otto can be bought. Of course, they are simply different degrees of adulteration.

"The exact cost of manufacturing the pure otto of roses at Kisanlik, may be estimated by referring to the following figures of an actual experiment made under my direction:—

10,000 lbs. fresh rose leaves.....	\$140.00
Paid for use of still.....	6.25
Paid for labor and fuel.....	16.50

Total.....\$162.75

"The yield was 36 ounces, thus costing \$4.52 per ounce to the producer.

"This fragrant oil is made in other parts of the world by processes differing, doubtlessly, from the one described; also, from a different rose. The one used in Tripoli is white, having but few petals; the rose grown in the southern portion of France, bordering on Italy, yields hardly a trace of oil by distillation, although only one-half a degree further north than Kisanlik; the rose leaves there being used directly to impart their odor to perfuming soaps or distilled water.

"As regards the manner of testing the purity of the oil, sulphuric acids and other tests are of no value. The odor is the best test, and that can only be applied by experts where the otto is made."

## SAFETY FOR STEAMBOATS.

Messrs. Editors.—I submit the following plan for securing steamboats against destruction by fire: let iron pipes be laid to connect with the engine and every part of the boat, say one or two main pipes with branches. To the end of each branch a short piece of hose and a nozzle should be attached, and a stop-cock to shut off and let out the water. In case of fire, a bell, communicating with the engine-room, should be struck; and by this signal the whole power of the engine applied to work one or more huge pumps to throw a vast body of water into the main pipes, thence to be ejected directly on the fire by one or more of the branches. No steamboat, with her engine in working order, should be permitted to burn up until the river, lake or ocean, as the case may be, is first pumped dry. Let this arrangement be universally applied to steamboats, for life and property are of paramount importance.

HENRY A. TRENCH.

Grand Ledge, Mich., Sept. 3, 1859.

[Except in the *minutes* of detail, this plan of our correspondent, for insuring the safety of steamboats, is already in use on several. It is not so generally applied, however, as it ought to be; the public attention, therefore, deserves to be more fully directed to its importance.—Eds.]

## TO CLEANSE WOOL FOR HOME USE.

A correspondent of the *Rural New Yorker* furnishes the following receipt for cleansing wool, which may benefit our readers:—

"Two pails of rain water; one of urine; one pint of salt, heat all to scalding heat. Put in the wool, stir with a stick, and let it remain for about thirty minutes. Take it out with a stick, and lay on a board to drain. Have the board so arranged on the side of the tub or kettle that the liquor will run back in the same. After the first kettle-full is taken out, add more water, urine and salt, to keep up the strength of the liquor, and proceed as before. The longer the liquor is used the better. Soft soap, or lye from ashes, will answer in the place of urine, or may be used with them. The liquor must be strong enough to dissolve the gum or oil on the wool, so as to rinse off clean. It is of no benefit to pick."

By leaving out the salt in the above liquor, it will be found very useful for the purpose. The addition of the salt is like mixing it with rain water for the purpose of improving its quality in the washing of clothes.

IRON CHURCH SPIRE.—An iron spire is about to be erected on a church in Pittsburgh. This will be the first construction of the kind in the United States, and it is fitting that it should be put up in the "Iron City." This church has now a brick tower 100 feet high, which is to be carried up almost as high again, by erecting upon it a beautiful cast-iron spire, 85 feet high, exclusive of the cross that will crown the apex. The style is to be the perforated Gothic of the Middle Ages.

## A COLUMN OF INTERESTING VARIETIES.

Philosophers regard it as demonstrated that, even in the most solid substances—gold, for instance—the particles do not touch each other. This inference is drawn from the fact that the metal shrinks in cooling. They say if the particles were already in contact, they could not come any closer together; and, consequently, the metal could not shrink.....Before the whites went to California, the principal articles of food among the Digger Indians was grasshoppers and acorns. They caught the grasshoppers in square holes, which they dug in the ground, and pounded them into a paste, which they dried into a hard cake; the acorns they pounded and mixed with water in a porridge, which they cooked in water-tight baskets, by putting in hot stones.....The reputation of American cutlery is now so fully established that some of the cutlery made in Sheffield, England, for this market, is stamped with the names of American manufacturers, in order to facilitate its sale.....The dress of the women among the Digger Indians of California, in their wild state, consists of a bunch of grass tied around their waists and falling down to their knees.....When Lieut. Berryman was sounding the ocean, preparatory to laying the Atlantic Telegraph, the quill at the end of the sounding-line brought up a mud which, on being dried, became a powder so fine that, on rubbing it between the thumb and finger, it disappeared in the crevices of the skin. On placing this dust under the microscope, it was discerned to consist of millions of perfect shells, each of which had been the abode of a living animal. These have been sinking down through the water to the bottom, and will no doubt form, in the course of ages, an extensive range of either silicious or limestone rock. The process is similar to the one by which stratified rocks were formed in ancient geologic periods.....It is reported that Stevenson, the celebrated English engineer, received \$225,000 for the plan of the Victoria Bridge, at Montreal.....A telegraphic message was recently sent from Albany to Kansas City, and an answer received, in the short space of six hours!.....The amount of money exchanged by the New York City banks, for the week ending the 5th instant, was \$120,568,395, an average each day of \$20,094,629.....The wine crop of Ohio, for the present year, is estimated at over \$1,000,000 in value. Within 20 miles around Cincinnati, the crop is estimated at 800,000 gallons. Our trans-atlantic friends will thus see that the production of wine in this country is becoming a vast interest. .... Among the papers published in costly style, by the Smithsonian Institute, at Washington, is one on microscopic plants and animals which live on and in the human body. It describes quite a number of insects. The animal which produces the disease called the "itch" is illustrated by an engraving about half an inch in diameter, which shows not only the ugly little fellow's body and legs, but his very toes, although the animal himself is entirely invisible to the naked eye.....Twenty-eight and a half lbs. of pure lime consist of 8 lbs. of oxygen, and 20½ lbs. of the metal calcium.....The battle of Flodden, on which Scott's poem, "Marmion," is founded, was fought on the 9th of September, 1513, in the reign of Henry VIII., of England, and James IV., of Scotland. The Scotch king was killed in the battle, with a multitude of the highest rank among the nobility and gentry of the kingdom.....In looking at the most distant stars, we see them, not in the places and condition in which they are at the present time, but as they were several years ago, when the light by which we see them started from them on its long journey to the earth. We are looking, in fact, upon their past history.....The engineer of the great tunnel (nearly nine miles in length) which is in process of being excavated through the Alps, has adopted a plan for working the drills by power, which is said to have succeeded admirably. By a water-power at the mouth of the tunnel, he forces air through a pipe into the tunnel where the operatives are at work; here it is used to drive small portable engines, which work the drills. By this plan, he avoids the smoke and steam which, of course, would be inadmissible in so confined a place; and the air, as it escapes from the engine, ventilates the tunnel, furnishing a fresh supply for the workmen to breathe.....The sun, with all the planets and satellites which revolve around him, the whole solar system, is sweeping along through space in a direction towards the constellation, Hercules.