PRODUCTION OF ODORIFEROUS OILS.

[For the Scientific American.]

The production of odoriferous or essential oils from plants has been accomplished in a great variety of ways, more or less adapted to the especial kinds of oils which were to be obtained. The oldest known method is that of "pressure," which is appropriate, when the odoriferous oils are very abundant, as, for instance, in the peels of oranges, lemons, etc., the materials are placed in strong cloth, usually linen, and subjected to powerful pressure. For small quantities a common tincture press, used by druggists, is sufficient, while a large screw press is used for greater quantities. The expressed juice is allowed to rest, and afterward filter in order to separate the aqueous and slimy particles from the oil.

Another mode frequently employed is that of distillation, the most appropriate for the greater part of essential oils, although some blossoms, containing the most subtile and precious odor, cannot be treated in this manner.

Formerly flowers were distilled with alcohol, but this having a low boiling point, extracted but little of the valuable principles and was therefore properly replaced by water, while the former method is still in use for the production of liquors.

The plants are placed into glass or copper stills, upon a false perforated bottom placed a few inches above the real bottom, exposed to the fire. The vapors pass through a condenser into a florentine flask where the oils separate from the water.

This water always contains a small quantity of the oil in solution, beside some organic acids, as cinnamic, propionic, angelicic, are sometimes used in perfumery, but most generally for medicinal purposes, as for instance, aqua foeniculi, aqua menthæ piperitæ, aqua sambuci, etc.

The great amount of water used in this method causes considerable loss of essential oil, which is dissolved, and it was found necessary to remedy this evil. Among the many attempts to that effect those of Drew, Heywood and Barron deserve credit, who procured Letters Patent for their methods in England. They surround the still with a steam jacket, which is the source of heat, while by means of a stirring apparatus, they keep the material to be extracted in constant motion. They then place a quantity of water into the still sufficient to cover the plant used and the distillate passes through a condensing worm and collects in a vessel, where the oil separates from the water.

The latter runs into the funnel of a siphon tube, which carries it back into the still. As a matter of course, in the distillation of oil heavier than water, like that of cloves, the water is discharged from the top of the vessel, while in the case of the lighter essential oils it collects in the florentine flask.

The same water is used in this manner until the completion of the process, and being then a saturated aqueous solution of the oil it is more useful than otherwise, its small bulk not rendering its waste necessary.

In consequence of weight of water in the fresh plants, drying the materials before distillation produces a better qualitative result. Aromatic seeds, such as annis, etc., are best when soaked in warm water for a few hours before they are exposed to distillation. But they should never be pounded or bruised, as by so doing the oil globules are surrounded by the albumen of the seed, which, on coagulating by heat, prevents the evaporation of the oil. The oil being mainly in the crown hull of the seed is not affected by the albumen in its interior, when the seed was left entire. The same may be said of spearmint, peppermint, etc. The distilled oils are purified by re-distillation and separated from adhering water by means of a glass funnel with stopcock.

A third method used for the production of odoriferous oils is that of maceration. For this process the so-called simple pomade is prepared by mixing purified tallow and lard. This pomade is melted in a metal or porcelain pot, heated by a water or steam bath, and kept in this liquid condition for a period of 12 to 48 hours, during which time the flowers to be extracted are immersed in the molten fat which deprives them entirely of their odor. As soon as this is accomplished, the pomade is strained off from the extracted flowers and a new portion is macerated in the same pomade. This operation is repeated ten to fifteen times, until the pomade is strong enough. The so-called "huiles antiques" or ancient oils, are prepared in the same manner, pure olive oil being substituted for the fat. This method is chiefly used for the blossoms of roses, of oranges, and of the acacia, and sometimes for violets and reseda, although the latter are more generally treated by absorption. This method is chiefly used in France, the perfumery of which country has a very superior reputation. It preserves the natural aroma of the flower unchanged and in full strength, which cannot be done by the methods already described, where heat is made use of. For the purpose of absorption glass plates, from two to three feet square, are laid into appropriate frames about three inches high. They are then covered with an even layer of purified pomade, a quarter of an inch thick, into which the blossoms are planted, open portion turned upward as if growing in the natural state. They then remain from one to three days, the frames being set one above the other, and the flowers are removed and replaced by a fresh one. This process is repeated for two or three months. When oil is to be saturated with the aroma instead of the pomade, the latter is replaced by a linen cloth saturated with olive oil. This is spread upon similar frames, having a wire gauze bottom in place of the glass, the rest of the process being the same as that used for the pomade. The linen cloths saturated with the perfumed oils are then subjected to a screw press, where they are freed from the oil. All the methods described are more or less effective, but slow and tedious, and the endeavors to supplant them by others conforming more with the present state of chemistry, were crowned with success. Dr. Millon was the first who produced oil from the cereals, having their specific odors by treatment with ether. He afterward experimented in Africa upon tropical flowers with sulphide of carbon, chloroform, ether and methylic spirit, all of which readily dissolved the perfume of flowers, the ether and sulphide of carbon working most satisfactorily. The flowers are placed in a percolator and exposed to the ethereal solvent for about fifteen minutes. The liquid is then withdrawn and displaced by a new quantity of the same used for washing. This is left no longer in contact with the flowers than the first portion. The ether, charged with the entire perfume of the flower, leaves it behind after evaporation, in the shape of a slightly colored residue, which is generally oily, but soon becomes hard and waxy. This residue, exposed to the sun for some time, and occasionally moved about, loses the flavor of the solvent entirely, preserving the pure perfume of the flower. The greater part of the ethereal liquid is regained by distillation, and serves an endless number of extractions, it being always advisable to use the solvent of any perfume after regeneration to obtain the same perfume again. The regeneration of the ethereal liquid is accomplished a great deal quicker than the distillation referred to in the older processes. This method even reproduces in the oil the slight differences caused by the timely or untimely harvest of the flowers, the time for which varies with different kinds of flowers, and is generally best learned by practice.

Roses should be collected during the morning and while entirely opened, jessamine should be gathered before sunrise, while cassia flowers always give an agreeable perfume, although differing decidedly with the time of the day when harvested. This method, although first described by Millon, was practiced some twenty years ago by Robiquet and by Buchner in the extraction of a few especial perfumes. But what renders it most valuable for this country, is the fact that all the ethereal solutions mentioned can be effectively replaced by purified petroleum naphtha, or gasoline. Its volatility renders its regeneration by evaporation at a low heat practicable, which does not injure the perfume, and some experiments, made with reseda, May flowers, white lilies, cinnamon, vanilla and cloves, werevery satisfactory, as the extract produced in this manner is easily transferrable to alcohol, which leaves fat and coloring matter undissolved. The last traces of petroleum adhere rather tenaciously to the perfume, but are removed by a slight heat, a current of air playing at the same time over the extract. The perfume of the flowers is a fixed oil, seldom a volatile principle, and is therefore retained, when the naphtha is removed in the manner described. It remains unchanged in the atmosphere, unless its temperature is raised above its normal degree. It dissolves apparently without decomposition in alcohol, ether, fats, sulphide of carbon, chloroform, benzine, etc. It is capable of infinitessimal division, spreading rapidly in the air, where its pleasant odor betrays its agreeable presence. It is equally divisible in water to which a small quantity imparts a strong flavor, but it is so susceptible to chemical action, that an alcoholic extract of a perfume mixed with common water is rendered odorless, unless its quantity is exceedingly great, while pure distilled water preserves the full energy of the original aroma.

The extraction of the perfume of flowers is of immense value to commence, as a small bulk represents the aroma of an exceedingly large amount of flowers, and can be carried in this manner with great convenience to all parts of the world. It has been proved repeatedly, that the aroma of flowers is the same in intensity in all climates, and there is no reason why we should not produce as good extracts more abundantly, than is done now by France, where this branch of industry is one of the most important.

A NOVEL MODE OF TREATING COFFEE.

A somewhat novel case, involving a patent for treating coffee, was recently tried in the Superior Court of this city. One of the features of the process consisted in running it through black lead which gave the coffee a shiny metallic appearance. It appeared in the trial that William Newell sold to Ezra Wheeler & Co., in March, 1858, the exclusive right to use such patent in the State of New York and other territory for the sum of $5,000, and the further sum of six cents for every bag of skimmings, and ten cents for every bag of merchantable coffee passed by the defendants through the process of the plaintiff, and that the defendants should keep an accurate account of every bag of coffee that passed under said process, and to render monthly returns of the same verified under oath, and to pay over in cash on the first of each month the plaintiff's share of such earnings so stipulated for, the defendants having also the privilege of commuting the tolls aforesaid by the payment of the further sum of $15,000 within three years; and that the defendants took the interest aforesaid, paid to the plaintiff the $5,000, and used the patent; and the plaintiff alleges as breaches of the said contract:—First—That the defendants neglected to furnish the plaintiff with monthly returns of the number of bags of coffee they had passed through said process, and to pay the tolls due for the same. Second—And that the defendants have neglected to keep the plaintiff's interest in said agreement inviolate, by keeping in active operation the machinery in said agreement contemplated and used by the defendants, and have neglected to make the same available and productive, etc., and demands judgment for damages for such neglect. The defendants admit the contract, as set forth in the complaint, but allege that the plaintiff, to induce them to enter into the same, represented to them that by its use large sums of money could be made; that great improvement could be made in the appearance of coffee; that its value would be materially increased, and its merchantable quality improved, and its price enhanced; and that it would be made much more saleable; which representations the defendants allege are untrue, and that the process to them was valueless, and claim to recover the five thousand dollars paid, and to have the contract annulled; that running the coffee through black lead gave the coffee a metallic lustre, detrimental to its sale; that by reason of its effect upon the coffee—the loss in weight, the peculiar appearance it imparted to the coffee, the expense of operating and cost of renovation, and the depreciation in value arising therefrom—it became impossible to obtain any considerable employment for it, and none was obtained for which a true account has not been rendered.

The case was not disposed of, but the lovers of good coffee will be slow to believe that the beverage can be improved by the application of black lead.

As many as 26,000 vehicles often cross London Bridge in a day.