Chemical Perfumes.

Almost all the natural perfumes are of vegetable origin, and are derived from the treatment of flowers and fruits. In this way are obtained the aromatic essential oils of rose, mint, anisi, santal, thyme, cloves, etc., and the perfumes of the violet, iris, and jasmin. Musk is the only important perfume that is of animal origin.

For a long time now, however, the odor of fruits has been imitated with the aldehydes and ethers of fatty acids, such as the acetates, valerianates, benzoates, salicylates and butyrates of metyyl, ethyl and amyl, which, mixed in definite proportions, recall the odor of strawberries, raspberries, apples, pears, etc. The following are two examples of such mixtures:—

PERFUME OF THE PINE APPLE.

Chloroform	10	grains.
Aldehyde	10	"
Butyrate of ethyl	50	"
Butyrate of amyl.....	100	"
Glycerine	30	"
Alcohol, 100%. .....(litre)	1	

PERFUME OF THE APPLE.

Chloroform	10	grains.
Nitric ether	10	"
Aldehyde	20	"
Acetate of ethyl.....	10	"
Valerianate of amyl	100	"
Glycerine	40	"
Alcohol,100% ..... (litre)	1	

The aroma of rum and cognac and the boquet of wines have also been reproduced artificially. We shall not dwell upon the danger that accompanies the use of these products in a large quantity when they are mixed with beverages and alimentary substances. We shall occupy ourselves here more particularly either with products like those which we find in nature, such as vanilline, or with perfumes such as musk and the odor of violet, which are designed not for alimentation, but for perfumery properly so called.

Among the aromatic products employed as perfumes we may first mention methylsalicylic ether, which reproduces the oil of wintergreen. The oil of bitter almonds, too, has been frequently replaced by nitrobenzine. Nitrobenzine, as regards composition, is absolutely different from the oil of bitter almonds, but it resembles it in odor. Benzaldehyde, likewise, has replaced the oil of bitter almonds in certain cases.

Such substances possess but a secondary importance; but vanilline, on the contrary, which reproduces the odoriferous principle of the vanilla bean, is an object of an extensive and very prosperous manufacture. The first process that gave rise to it was elaborated in 1874 by Messrs. Tiemann and Haarmann. In studying coniferine, these scientists found that it was formed of a glucoside which, under the influence of a special ferment (emulsine) split up into glucose and coniferic acid. This latter, through oxidation, gives vanilline. The coniferine itself, oxidised with a mixture of sulphuric acid and bichromate, furnishes vanilline. It was by this process that it was first manufactured. The method of purification was very simple. Like aldehyde vanilla possesses the property of forming an insoluble bisulphite combination, which was separated from the mass and afterward decomposed.

Chemically, vanilline methylprotocatechuic aldehyde.

The arrangement of the benzenic nucleus is of importance, since isovanilline, which is constituted by exactly the same groupings, but differently placed, has no odor. After the formula of vanilline became known, an endeavor was made to employ the neighboring bodies, to add the groupings that were wanting, and to properly place them with respect to each other. A host of methods was proposed to this effect, in making use of eugenol (De Laire and Tiemann), which was oxidised by permanganate; of eugenol and bromide of methylene (De Boissieu); and of guaiacol and pyrocatechine (Tiemann and Reimer). Vanilline is even found in certain natural products, such as the benzoin of Siam, crude beet sugar, assafœtida, and opium. A certain number of these processes is employed industrially.

Piperonal or heliotropine is closely connected with vanilline. It is, in fact, the methylenic ether of protocatechuic aldehyde. In order to prepare it, piperic acid is oxidised by permanganate, but it can also be obtained by means of safrol. It is found in the oils of sassafras and shikimal, and can also be obtained from the oil of camphor. Coumarine is the anhydride of ortho oxycinnamic acid. It has been obtained synthetically by Perkin by causing acetic anhydride to re-act upon the sodium salt of salicylic aldehyde. It is especially extracted from natural products, such as the tonka bean and the "vanilla plant" *(liatris odoratissima)* of the United States.

Spirit of turpentine has likewise yielded a perfume, the terpinol of De Laire. To this effect one can either dehydrate terpene or treat spirit of turpentine directly. This perfume is known under the name of lily of the valley or lilac.

We now come to the two most recent discoverers, viz., the perfume of musk and that of the violet. Natural musk is the product of a secretion of the musk deer, a ruminant mammal that inhabits certain regions of Asia. The perfume is found in a sack which usually contains from fourteen to twenty grammes of it. It is also found, but in much smaller or even minimum quantity, in other animals, such as the civet, the musk rat, the badger, and the martin. Certain plants, too, often possess the odor of musk. This product is of the highest importance, since it is the base of all artificial perfumes, which sometimes contain considerable quantities of it.

The first process of preparation of a product having the odor of musk was discovered by Messrs Shaafer and Haffeld, who heated a mixture of dimethyl benzine, insobutylic alcohol, and chloride of zinc, which they afterwards broke up and nitrated. The truly industrial discovery of an artificial musk dates back to 1889, and was made by Mr. Baur, on the occasion of some researches upon the oil of resin.

In order to prepare the Baur musk chloride of isobutyl is made to react upon toluene (methyl benzine) in the presence of chloride of aluminum. We thus obtain isobutyl toluene, which, under the influence of nitric acid, is converted into trinitroisobutol toluene, which is the somewhat cumbersome chemical name of commercial musk.

There exists, theoretically, a host of analogues and homologues of this musk. A certain number of them have been prepared from xylene, cymene, and the diphenyl and xylyl methanes. A large number of such products possess the characteristic odor of musk.

A no less important discovery is that made a year ago by Mr. Tiemann, who reproduced synthetically the perfume of the violet (called ionone) after a series of researches of the greatest interest, from a scientific standpoint.

In order to prepare this perfume we start from citral, which is itself derived from the oil of lemon, or from the oxidation of the alcohols of the formula $C_{10}H_{18}O$ that we find in certain essential oils: geraniol, linaleol, aurantiol, and lavendol. The citral is shaken with acetone and barytes, and pseudo ionone is thus formed. This body is odorless and in order to render it odorous it is necessary to convert it into ionone, a product which is very closely related, but which is cyclic while the psuedo-derivative is of the open-chain series. A long series of similar products can be made with other acetones, and these have been studied with the greatest care by Messrs. De Laire and Tiemann.

Messrs. Tiemann and Kruger, on treating orris root with appropriate solutions, have separated various products and, among others, irone, which is the odorous principle of this root, and it was in the wake of these experiments that the synthesis of ionone was made, these two bodies being, in fact, isomerous, and consequently very closely related.—*Le Genie Civil*; through *Chemical Trade Journal.*

THE INFLUENCE OF CO_2 ON FLAMES.—From experiments made with naked flames results have been obtained showing that the flames of liquid hydrocarbons burnt from wicks require a proportion of carbon dioxide to air, averaging about 15 per cent. of the mixture, for the extinction of ordinary flames. A coal-gas flame burnt from a jet requires as much as 33 per cent. of carbon dioxide in the air to extinguish it; while the hydrogen flame requires no less than 58 per cent. It is of interest to note that the flame of firedamp is easily extinguished, requiring the presence of only 10 per cent. of the extinctive gas.—*Chem. Trade Jour.*

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906 persons in 1,000,000 die of old age.