PERFUMES AND OTHER ODORS

By L. W. BOSART

WE are prone to look upon perfumes as a luxury to be enjoyed only by the frivolous or extravagant, indeed we may have—or affect—a dislike for them and are apt to frown upon their use by women as being in bad taste or by men as being effeminate. I am not prepared either to defend or condemn their use by either sex for personal adornment, but since few perfumes are universally liked, it would seem to be an impropriety to inflict them on others to whom they may possibly be distasteful. I am even prepared to retreat from this position if vigorously attacked.

It seems strange that we may witness scenes both beautiful and unsightly; we may listen to entrancing music, or harsh discordant sounds and have no fault to find with our senses, but the sense of smell is not as respectable as the other senses; it occupies a different social plane. I remember Elwood Hendrick telling a story which runs about as follows: You may be sitting in your room reading. Your intimate friend comes in and without looking up you say, "Hello, Dick!" He expresses surprise that you knew he was there. You say, "I saw you" or "I heard you" and he thinks nothing more about it, but if you were to say, "I smelled you" he would be offended—and yet a man wants his dog to know and recognize him by his odor.

The sense of smell of some animals is very keen. Especially is this true of the dog. But the dog appears to take no delight in pleasing odors other than those of the chase. The cat family, on the other hand, appear to make no use of the sense of smell in finding their prey, depending only on sight and hearing, and yet they are sensitive to the odor of the cat mint or catnip in which they seem to delight almost ecstatically. Animals that are preyed upon by men and other animals have a keen sense of smell, and when there is a wind blowing hunters frequently find it necessary to keep to the leeward of their game. Some horses are, or rather were, known to become very nervous when the circus with its menagerie comes to town, although the odor of the animals is not apparent to human nostrils except at very close range.

It is possible that man originally had a sense of smell rivalling that of other animals, but lost it, perhaps because of his erect posture which kept his nose farther from the ground or when his inventive genius developed the bow and arrow in which he placed greater reliance. And yet, some savage tribes, notably the Indians of Peru, are said to be able to follow a scent like a dog.

Some birds also are thought to have a keen sense of smell. It was believed that buzzards and vultures that subsist on carrion were guided to their food by the sense of smell while soaring high in the air. They were even credited with scenting approaching dissolution. It is now believed, however, that their sense of sight is the highly developed faculty.

It is very difficult to know just what may be the guiding instincts of dumb creatures, but insects are likewise believed to have a highly developed sense of smell. We know that the lowly mosquito is adept at locating his human victims and that certain perfumes which are rather pleasant to most of us appear to be extremely obnoxious to him, and he can be successfully warded off by their use. The odor of a chemical compound in the cotton plant is said to attract the boll weevil and it has been suggested that that fact might be made use of to lure this ruinous pest to its destruction. A certain plant known as Arum dracunculus has a flower which is said to smell so much like decaying flesh that blow-flies and other insects gather about it to deposit their eggs.

We scarcely realize how important to us is our sense of smell. True, we do not use it as does the dog to track down his quarry or as the hunted animal to sense the approach of danger that it may flee from it. But aside from the enjoyment we may get from pleasant odors, our nostrils are placed directly over our mouths to challenge any nourishment that seeks admittance and bid it enter if it gives the proper password or turn the stomach against it if the nose condemns it as unfit for food. Some of the things we accept as food, however, the nose would most certainly reject if the brain had not instructed it to let them pass, such as some of the more potent cheeses or meats that are "high" and are accordingly prized by some British epicures. Knowing them to be harmless and recognizing their value as food, we may even get to like their odors and find them appetizing. It is largely the aroma or perfume from our food which whets our appetite and causes us to enjoy our meals, doubtless also aiding digestion.

The functions of the sense of taste are extremely limited, as it recognizes only the sweet, the bitter, the salty, the acid, and perhaps the alkaline. I believe I am correct in saying that, aside from these, the savoriness of our foods is entirely due to our sense of smell and we enjoy them largely because of their perfumes. And true perfumes they are, even though they ordinarily lack this classification, for perfumes may be defined as odors that please.

But if we consider perfume in the more restricted meaning of the word, it is something we cannot very well escape whether we want to or not. You arise in the morning and use soap, perfumed to at least some extent. Then you use a tooth-paste that is perfumed, or flavored, if you prefer, but the meaning is the same. You shave, and again you use a perfumed soap. You may then use a perfumed lotion or talcum powder. If you shine your shoes or have them shined, a perfumed shoe polish is used. If you use a hair tonic, it will probably be very highly perfumed, just why, I could never understand. Salves, toilet water, bath salts, cosmetics of all sorts are perfumed, so are furniture and metal polishes and all manner of cleaning preparations. A certain writer claims that he was accustomed to walking two blocks farther to have his shoes shined simply because the perfume of the polish used in the nearer establishment was not pleasant to him.

We use perfumes in our food, such as cloves, cinnamon, nutmeg, ginger, all spice, wintergreen, peppermint and vanilla. Perhaps we

would use rose, lavender, violet and other floral essences if they had been plentiful and easily obtained in the early history of the race. In fact, the Arabs are known to have used rose-water and musk in their cookery. The distinction between perfumes and flavors is not very marked.

Perfumes are used for their own proper enjoyment as in the case of handkerchief perfumes, which are made by diluting the various perfume mixtures with alcohol, or they may be added to other preparations for the purpose of covering an unpleasant odor in the preparation itself, or to give it antiseptic or germicidal properties, or to disguise ingredients that might be readily recognized by their odor, or for the sole purpose of giving it a pleasant odor.

The use of perfumes by man is coeval with the dawn of civilization and historic records of its use take us back to remote antiquity. The first accounts of it we have, seem to be connected with religious and sacrificial ceremonies and the derivation of the word "perfume" meaning "through smoke" seems to indicate such a use. Perhaps early man sent upward pleasing odors to gain the favor of his gods or to drive out evil spirits to whom they were thought to be obnoxious. The burning of incense may have come about in this way or it may have been used also to overcome unpleasant odors from sacrificial offerings. Later it was used as a means of purifying the temples and gradually became a part of religious ceremonies. Its use was common in all early civilizations including that of the Mexican Indians.

The earliest Biblical reference to perfume was, according to biblical chronology, about 1500 B.C. Moses was instructed to prepare a holy anointing oil of pure myrrh, sweet cinnamon, cassia and olive oil. He was also commanded to make a perfume as follows: "Take unto thee sweet spices, stacte and onycha, and galbanum; these sweet spices with pure frankincense: of each shall there be a like weight: and thou shalt make it a perfume, a confection after the art of the apothecary." This was probably intended for incense. Severe punishment was provided for anyone who should make it for his own use.

There are several other allusions to perfume in the Bible. Just one I will mention because there is an interesting story connected with it.

When a certain firm of soap makers began making white soap, they were anxious to find a suitable name for it and the partners of the firm held several meetings for that purpose without much success. One Sunday, when one of them was attending church services the 45th psalm was read, in which occur these words, "All thy garments smell of myrrh and aloes and cassia out of the ivory palaces." When he heard the word "Ivory," immediately the thought flashed through his mind, "There's the name"! He called a meeting of the partners and the name "Ivory" was approved and adopted. A better argument could hardly be offered for the value of church attendance in solving difficult business problems.

There are frequent allusions in the cuneiform writing of the Babylonians and Assyrians to the use of the censer for driving out evil spirits.

The Greeks and especially the Romans made much use of perfumes, as did also the Egyptians at least as far back as 2000 B.C., as a certain papyrus written about that time attests. Myrrh, cinnamon, and galbanum are mentioned among these. In Egypt besides their use by the living, they were used in embalming the dead and vases of unguents were sometimes buried with them supposedly for their use in the world beyond. There is evidence that the Egyptians even understood the process of distillation and were thus able to obtain the more delicate floral perfumes.

About 1375 B.C. Tutankamen, Pharaoh of Egypt, died and was sealed in his tomb. 3,300 years later there were found, among the many other interesting relics, some covered alabaster vases which had become sealed by natural agencies with the advance of time. One of these was opened and was found to contain a perfumed unguent, still somewhat fragrant, probably prepared for his anointment when he should arise from the dead. The odor was thought to be that of spikenard which is native to India and may have come from that source. The fatty material was evidently of animal origin and was not rancid, its preservation probably being due to an admixture of olibanum, which is the same as frankincense.

Floral offerings to the dead which is a custom which prevails today, is of very ancient origin and was practiced by the Egyptians, as witness those found in the tomb of Tutankamen. It was also practiced by the Babylonians, the Assyrians, the Greeks, the Romans and in America by the Aztecs. Its origin is thought to be in the idea of offering pleasing fragrance to the gods.

Among the Egyptians, Cleopatra is known to have made lavish use of perfumes to increase her charms and Shakespeare writes of her:

"The barge she sat in, like a burnished throne
Burnt in the water, the poop was beaten gold;
Purple the sails and so perfumed that
The winds were love-sick."

The Romans with their wealth and splendor carried the use of perfumes to extremes. In their games, the air of the open amphitheater was filled with the odor from many censers. That most profligate of Roman rulers, Nero, at the funeral of his wife, Poppaea, is said to have used more perfume than Arabia could produce in a year. It even became necessary at one time, in Rome, to pass a law restricting the use of perfumes in order that there might be sufficient for public ceremonies. In the houses of the Roman upper classes, urns were kept constantly filled with dried flowers so that the air of their apartments might always be fragrant.

Caravan routes for transporting spices and perfumes were opened in very early time, somewhere between 1000 and 2000 B.C., leading south into Arabia and east to India and even into far distant China, many thousand miles from the center of Occidental civilization. Cassia, which was used by the Jews as early as 1500 B.C. and even earlier by the Egyptians, is native to Indo-China in the extreme southeast of Asia, and to Java. This product was either brought overland by caravan or else by ship. It is known that the Phoenicians were extensive mariners at this period and had sailed their ships into the Atlantic Ocean and even into the Baltic Sea and into the Red Sea and Persian Gulf, and they may have gone much farther east, touching at ports of India and the East Indies. In the fourteenth century B.C. one of the pharaohs opened a canal from the Red Sea to the Mediterranean just as has been done in our time, and marine traffic must have been quite heavy to justify it.

In ancient Rome a financial panic was once caused by the loss of three small shiploads of spices and perfumes coming from India. This will give some idea of the importance of this trade in early times.

There are two major classes of natural perfumes, those obtained from animals, which are quite limited in number, and those from plants. More recently, artificial perfumes, the so-called synthetics, have occupied a very prominent place.

The animal perfumes are ambergris from the sperm whale, castor from the beaver, musk from the musk deer, and civet from the civet cat. The secretion ejected by the skunk is not a perfume, but is purely a defensive weapon, perhaps I should more truly say an offensive weapon. The other animals do not voluntarily eject their perfumes.

Musk is obtained from a pod on the under side of the male musk deer. The deer is a small animal native to Asia. As the pod weighs only a few ounces, natural musk is very high in price, selling at about $25 an ounce for the better grades. We are all more or less familiar with the odor of musk, but it is the artificial or synthetic musk that we usually know, which is entirely different in odor.

Ambergris is a wax-like substance found in the alimentary canal of the sperm whale. It usually contains a considerable number of cuttle-fish beaks and it is believed to be a morbid secretion formed through the inability of the whale to digest these. Its purpose may be to counteract halitosis in the whale due to indigestion. It is frequently found floating in the water, supposedly having been ejected by the whale. Such a find means quite a fortune, as the best quality brings about $30 to $40 an ounce. The pieces found are of all sizes, from only a few grams up to several hundred pounds. What was probably the largest piece ever found weighed about 350 pounds. If of high quality such a piece would be worth about $100,000 to $150,000, more than a nugget of gold of the same weight. At least this was true before the devaluation of the dollar.

The civet on the market today comes chiefly from Abyssinia. It is about the consistency of lard. It is put up in ox horns which hold about three pounds, the large end of the horn being covered with leather and securely fastened with cord. Like ambergris and musk, its odor is very lasting and it has been much used in perfumery.

The civet cat has a small pouch from which the civet is removed by means of a small wooden spatula. I am informed that a single cat will ordinarily yield an eighth of an ounce of civet a week, but they are kept captive and teased by prodding them with needles and by this means the yield is raised to two ounces a week. Presumably the end justifies the means. Honey is sometimes used as an adulterant and the quickest way of detecting this is said to be by the taste. I have never tried it. Its odor is repulsive, but if diluted with alcohol it is sweet and pleasant. Its odor is said to be so alluring that dogs will forsake any other scent to follow a civet cat.

Castor is not so fine as the other animal perfumes and not so widely used.

The animal perfumes are used in the form of tinctures (or alcoholic solutions) with other perfumes, to modify them and make the odors more lasting. They are seldom, if ever, used alone.

The vegetable kingdom offers a far greater variety of perfumes. These are derived not only from the flowers themselves, but also from the seeds as in the case of caraway and nutmeg; from the leaves, such as bay, myrtle, and patchouli; from the wood, as sandalwood, cedarwood, and amyris; from the fruit, as orange, lemon and bergamot; from the leaves and twigs, as petitgrain; from the bark, as cinnamon; from the root, as ginger and calamus, and from gums collected from the trees, as benzoin and olibanum.

The vegetable perfumes are got mostly by *distillation* of the plants or flower, or the wood cut into small pieces, usually with steam, which carries over the oil with it. I may state that the perfume of plants is always an oil except the gums and balsams. The general term for these oils is volatile oils or essential oils, denoting that it is an essence and not essential in the sense of necessary. This term is used in contradistinction to fatty or fixed oils, which, not being volatile, cannot be obtained by distillation. The plants or flowers are harvested and brought at once to the still. Steam is passed through the mass and the volatile oil goes over.

The perfume of some of the more delicate flowers suffers by this treatment and it is necessary to use some method of extraction.

One of the extractive methods is known as *enfleurage*. I use the French term because it has no English equivalent and the French word is always used in speaking of this process. This process is used in the case of certain delicate perfumes such as jasmin and tuberose, especially with flowers where the perfume keeps forming after the flower has been plucked. Sheets of glass, framed and known as "chassis" are covered with lard or soft tallow of the best quality and the flower petals are placed upon the fat where they are left for several days in order that the essential oil in the petals may be absorbed by the fat. The petals are then removed by hand, by brushing, or, as is done in the more modern plants, by means of vacuum, and new petals are placed upon the chassis and the operation is repeated until the fat becomes saturated with the essential oil, which requires several months. The pomade thus formed is then extracted with alcohol and the alcoholic solution used as a perfume, or the alcohol may be removed by distillation, leaving the pure essence.

Another method of extraction is known as *maceration*. In this the flowers are immersed in oil or melted fat heated to about 150° F. After standing a sufficient time to extract their perfume the oil is drained off and fresh flowers are immersed in it repeatedly. Finally the perfume is extracted with alcohol as in enfleurage.

Besides these two methods of extraction, *volatile solvents*, preferably petroleum ether, are used to extract the essential oils from the plants and flowers.

The oil from the peel of citrus fruits, such as orange, lemon, lime and bergamot, is obtained usually by *expression* in specially designed machines, or by hand pressing.

The essential oils owe their perfume to various compounds, such as terpenes, aldehydes, alcohols, esters and phenols. Bitter almond and cinnamon oil are evaluated according to the amount of aldehyde they contain. The value of citronella oil depends on its alcohol (geraniol) content; oil of thyme is valued according to the amount of phenols (thymol or carvacrol) it contains; French lavender oil is

usually valued according to its content of the ester linalyl acetate.

Lavender is one of the finest floral odors, but, being plentiful, it is comparatively cheap. Some of the essential oils, such as camphor oil, sell as low as 15 cents a pound, while some of the fine flower essences, such as hyacinth, jasmin, orange blossom and tuberose bring several hundred dollars a pound.

Patchouli, which is the most powerful vegetable perfume known, was introduced into Europe in the 19th century under rather peculiar circumstances. Indian shawls became very popular in Europe and were soon imitated by French manufacturers. But the genuine shawls always had a peculiar odor which the French were unable to imitate. Later the secret was discovered and then patchouli leaves were imported by the shawl makers. Patchouli, though very powerful, is not very pleasant in itself, but a very small amount of it will improve the quality of almost any perfume. It is especially valuable as an addition to lavender.

The third great group of perfumes is the synthetics.

The first synthetic perfume, and I might add, the worst, was nitrobenzene, known also as oil of mirbane. It is made by nitrating the coal tar derivative, benzene. It is very cheap, costing about 10 cents a pound. It resembles somewhat bitter almond oil in odor, but is nothing like so pleasant, if bitter almond may be called pleasant. It was first made in 1834. Since then many of the natural perfumes have been made in the laboratory and have become regular articles of commerce.

Oil of bitter almond, whose odor is due chiefly to benzaldehyde, is now more correctly imitated by making that compound chemically.

Oil of wintergreen is chiefly methyl salicylate which can be made practically 100 per cent pure, and is probably not so fine in fragrance as the natural because of its high purity.

Phenyl ethyl alcohol is present in attar of roses. It is made commercially and is an ingredient of nearly all rose perfumes.

Amyl salicylate is much used and is said to give a clover note to perfumes. To me it seems very similar in odor to the flower of the Jimson weed.

These are all derived from benzene and are therefore coal-tar products just as are the synthetic dyes.

Oil of sassafras is well imitated by safrol which exists abundantly in Japanese camphor oil and is distilled from this and purified.

Coumarin is present in the tonka bean and other plants, vanillin principally in the vanilla pod. Both of these are now manufactured synthetically in great quantities, the former from salicylic aldehyde, the latter from eugenol, the active principle of both the oil of cloves and carnation.

There are a number of cases in which natural perfumes have been imitated by chemical compounds entirely different in composition. This is true of musk. Several artificial musks have been made with very powerful musk-like odors. We are all rather familiar with the odor of synthetic musk, much more so than with the natural.

Diphenyl oxide is a synthetic with a strong rose geranium odor, much stronger than that of the genuine oil. It was not until a number of years after its discovery that its resemblance was noticed and therefore its value as a perfume. It is now very cheap and rather in disrepute, I believe, perhaps due in part to that fact.

Terpineol, made from turpentine, is very cheap. It is the base of nearly all lilac perfumes.

The production of synthetics is a fast growing industry. These products are being used more and more by makers of perfumes and perfumed products. At the present time, most perfume mixtures contain both the natural and synthetic products. The natural perfumes, owing to weather conditions and other not easily controlled factors, fluctuate greatly in price. On the other hand, the prices of the synthetics are comparatively stable with a downward trend as the methods of manufacture improve, and this fact militates against the natural products.

Whether making perfumes for soap, cosmetics or for handkerchief perfumes, single perfumes are seldom used. If, for example, a lavender note is desired, lavender oil alone is seldom used, but more often this will be reinforced or modified by one or more other natural oils or synthetics, often as many as twenty or more different perfumes being used. More frequently bouquets are desired in which no particular floral note predominates.

In making handkerchief perfumes or what is commonly known as perfumery, the mixture of essences is dissolved in 5 to 20 times its volume of alcohol.

Eau-de-Cologne is one of the early bouquets, first made about the beginning of the eighteenth century. Napoleon is said to have had an extreme fondness for it and fairly doused himself with it. Coleridge, the English poet, visited the city of Cologne toward the end of the eighteenth century, but seems to have missed the perfume, for he claimed to have counted "two and seventy stenches, all well defined and several stinks," but he did not mention Eau-de-Cologne.

The performer's art lies in the proper blending of many ingredients to bring about a desirable finished product. Once he is on the right track, he may add a little of this and remove a little of that until he has a desirable bouquet. It is largely a matter of trial and experience. Science will not help much, not even chemistry. The finished perfume may be made up of fifteen or twenty individuals or even more. The bouquet must, of course, be pleasing and attractively priced, which means—frequently, at least—that its price must be sufficiently high, and the container should be artistic. The price and container are said to be the two most important factors in marketing a handkerchief perfume. The name is also important and should preferably be French. It would be almost as inexpedient to put out a perfume under the plain English name of "apple-blossom" as it would to call a virtuoso Harry Jones when a name like Ivan Bullonivitch offers so much less sales resistance.

There is no disputing matters of taste and this is nowhere more true than in perfumes. If I dislike something another finds agreeable, it is unbecoming of me to feel superior about it, for it may produce an entirely different impression on his olfactory nerve. He may also dislike something which is pleasant to me and have the same right to feel superior.

One of the greatest difficulties the perfumer finds in the practice of his art is the fatigue of the olfactories. Just what this is due to is not known, but it is a very interesting phenomenon, and it is probably fortunate and a wise pro-

vision of nature that it is so. Nearly all odors will quickly produce fatigue, some to a much greater extent than others. You will find in smelling any of the perfumes constantly for a few seconds that you are unable to detect any odor. After a brief rest you will again be able to smell it. Men working in places where there are revolting stenches soon become accustomed to them and fail to notice them at all, and are surprised to see strangers come in holding their noses.

Another handicap is a lack of descriptive adjectives. There are a few in common use and even these convey quite different meanings to different people. I may say that a perfume is floral, but there are so many flowers; that it is Oriental, but there are many perfumes derived from the Orient. One might think of cinnamon, cloves, patchouli, sandalwood, ylang-ylang, or many others according to those with which he is most familiar. It may be light, or strong, or mild, or sweet or acrid. There are not many more descriptive terms and none of them will convey to anyone more than an extremely vague idea of what is in the mind of the person giving the description. Of course, if one says an odor is like violet, or rose, or narcissus, a rather definite idea is conveyed, but occasions for making such comparisons are few and therefore such unrevealing terms as "delightful" and "exquisite" have to do more than their proper share of work.

In concluding, there are two facts that I want to particularly emphasize:

First, the commercial importance of perfumes. They do not occupy a position of first importance today, although it is a very large industry, but the commerce in perfume and spices between which formerly no very distinct line was drawn, marked the beginning of international trade and opened or helped to open up the great trade routes to the Orient.

The other consideration is the growing importance of the synthetics. Not so many years ago, when there were only a few synthetic perfumes it was not thought that there would be any very serious competition with the natural essences. Now every perfumer uses the synthetics as well as the natural products. There are numerous factories both in Europe and America devoted exclusively to the production of synthetic perfumes. Today natural dyes are a thing of the past and it is quite possible that we are facing a similar situation in the perfume industry.

Notes On The Characteristics Of English Cottonseed Oil

By W. G. McLeod

IN the development of the industrial era, England soon came to the front as a manufacturing nation, and because of its geographical situation it was necessary for the country to import vast quantities of raw materials from all over the world.

These raw materials are converted into finished goods which are consumed in the British Isles or are shipped to other countries through world trade.

One of the many industries which have grown up in England is the oil crushing industry. The oil mills are located in seaports and the industry thrives in Hull and Liverpool.

Oil seeds are brought to the mills by boats from various parts of the world where the seed crops are grown.

The cottonseed which are crushed in England come from Eastern and Northern Africa, mainly from British East Africa and Soudan, but seed are also brought from Syria and other near east countries and from South America, largely from Brazil.

I believe that the problems in connection with storing and transporting cottonseed under the climatic conditions which prevail and over such long distances are many, and the development of methods for overcoming the difficulties will not be easy.

The quality of the cottonseed varies from season to season, and the seed from one country will be good, while weather conditions in another country might cause poor quality. The English crusher must blend his seed in order to produce the best possible grade of oil.

It is my understanding that most of the cottonseed oil produced in England is made by pressing the seed or meats in hydraulic presses, but some oil is made by solvent extraction.

Due to the tariff situation and to conditions in world trade in recent years, Canadian edible oil refiners have switched from American crude cottonseed oil to English or European cottonseed, peanut, cocoanut, palm kernel or other oils, and to oils produced in other parts of the world.

During the last five years large quantities of English cottonseed oil have been brought into Canada.

Some of you have no doubt examined samples of English cottonseed oil, or have refined commercial lots, but for those present who are not familiar with the characteristics of this oil, I shall describe briefly some points relative to quality, and refining and bleaching methods, with special emphasis upon a comparison with American cottonseed oil.

English Crude Cottonseed Oil

Color—The crude oil is dark in color—red to reddish brown. It is darker than the better grades of American oil.

Odor and Flavor—English oil has a characteristic odor and flavor. The flavor could be classed as slightly musty or seedy. The seedy flavor suggests extractives from the hulls of the seed which are slightly bitter. The oil does not grade prime.