

## CAMPHIRE AND CAMPHOR.

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IN the 14th verse of the 1st chapter of the Song of Solomon we find: "My beloved is unto me as a cluster of camphire in the vineyards of Engedi." At first sight the meaning of this verse is obscure. The word translated "camphire" is certainly not intended to convey to the mind any idea of the substance we now know as camphor. Solomon was very happy in his choice of similes, and such a comparison would have been absurd. In the original of this poem or love song, written about 1,000 years B. C., the word translated camphire is *copherim*, the Egyptian equivalent of which is *hennah*. In Egypt, on one of the nights before a wedding, "hennah" is applied with linen bandages to the hands and feet of the bride until the next morning, when they appear of that rosy red which Egyptians believe to be love's proper hue. This night, in the order of the marriage ceremonies, is called the night of the "hennah." The word "cluster," found in the text, no doubt refers to the flowers of this plant, which are of a golden yellow and are borne in clusters; they are remarkably fragrant whether fresh or dry, and were much esteemed by women in the East, especially the Jewish women, who carried bouquets of them in their bosoms and twined them into crowns for their heads.

This hennah is Pliny's "Cyprus of Egypt," and the women of Egypt and other Eastern countries stain not only the palms of their hands and the soles of their feet with a paste of hennah leaves, but also the tips of the fingers, the nails and the knuckles, from which custom probably arises the designation of Aurora as "rosy," or "rosy-fingered" (*ροδοδακτυλος ηως*).

A considerable business is done in the leaves of the hennah, which are collected in the green state and dried in the sun. The leaves are then coarsely powdered and beaten up with catechu, and the freshly made paste is laid on at bed time and renewed in the morning; it leaves a peculiar reddish-orange stain, ruddy, and somewhat similar to the color of red ochre, though hardly so deep, which lasts on the skin and nails for some three or four weeks, until removed by renewed growth. This coloration is much admired by Mussulmans in India and many Eastern countries.

On moistening the dried leaves a slight odor is perceptible; their taste is bitter and faintly aromatic, owing to an essential oil and tannin contained in them. A medicament prepared from them is employed by the Arabs in the treatment of wounds of all kinds, causing the skin to grow over and healing them very quickly; these effects are probably due to some exciting action of the essential oil and the astringent properties of the tannin. They use this remedy principally on horses, to heal wounds or sores caused by friction of the harness or otherwise on a journey. Having stopped for a rest and unsaddled, they will apply a plaster to it and continue their march without more thought of the wound, which, if it does not heal, at least does not extend by friction, and causes less suffering to the horse. They also employ it as a means of preventing the opening of old wounds where the hair has not grown over the scar. It closes and hardens the tissues—in fact, tans the skin. For similar reasons, the Arabs who can afford to indulge in the sport of gazelle hunting will give their horses a foot bath of hennah, especially if the animals are young, or have not taken exercise for some time. There may be some analogy to this in the custom prevailing among Arabian women of staining the palms of their hands and the soles of their feet—it may render the skin less tender.

This shrub, being known to the Arabs as "henne-al-hennah," appears to be a native of Arabia. It has been cultivated from earliest times, and is now very common throughout India, Cabul, and Persia, as well as along the coast of the Mediterranean. Botanically it is now known to us as the *Lawsonia inermis* of Linnaeus. It flowers and seeds most of the year, and is much used for hedges, growing readily from cuttings. It has been introduced into the West Indies, and is there known as Jamaica mignonette. The perfume of the flowers is rather a mixture of rose and mignonette. Acids destroy the dye yielded by the leaves, but alkalies and infusions of astringent plants deepen it; although this juice stains the epidermis, it does not communicate any color to cloth.

The name of the white crystalline substance commonly known as camphor is derived from the Arabic word "kafur," which in its turn was derived from the Sanskrit word "kapura," signifying *white* or a pure substance.

The old English name for camphor was spelt *camphire*, and as the translators of the Bible may have been unacquainted with the botany and natural history of the plant hennah, they may have confounded the Hebrew word "copherim," or "kopher," with the Arabic word "kafur." This is pure surmise, but evidently the word "hennah" should be substituted for the word "camphire" in the Song of Solomon. Moreover, there is no record of the substance kafur, or kapura, being known in Solomon's day.

Camphor is first mentioned by Arabian writers in the sixth century. It is mentioned by Aetios, of Amida, in Mesopotamia, according to whom kaphura is a rare and wonderful medicine. It is again mentioned, together with musk, amber, and santal wood, among the treasures taken in the year 636, by the Kalif Omar, at the plundering of the Sassanides Palace, in Madain, on the Tigris, and is subsequently noticed as a costly gift, often presented by Indian princes to high Chinese officials. This camphor came from the land known as Kaisur, the present Sumatra.

Ishak Ibn Amran, an Arabian physician, who lived toward the close of the ninth century, states that the best camphor was produced in Fansur, a locality which was visited by Marco Polo in the thirteenth century, who mentions that the Kaisur camphor was then marketable at its weight in gold.

From various sources of information it may be concluded that camphor, as it was first known, was the variety which exists ready formed in the pith cavities of the trunk of the *Dryobalanops camphora*, a magnificent tree growing in Borneo, Sumatra, and Labua. In the forests of Sumatra these trees attain an immense size, often being found of six or seven feet in diameter. They do not all contain camphor, many of them containing an oil, which is supposed to be the first stage of the formation of the drug, and would develop into

camphor were the tree left unmolested. Both oil and camphor are found in the heart of the tree, not occupying the whole length of the pith cavity, but often in spaces of a foot or a foot and a half in length, at intervals. The method of extracting the oil is merely by making a deep incision with a Malay ax about 14 or 18 feet from the ground, till near the heart, when a narrower incision is made, and the oil, if any in the tree, gushes out, and is received in bamboos or other utensils. In this manner a party proceeds through the woods, wounding the camphor trees till they attain their object. From a tree containing both oil and camphor, two gallons of the former and three lb. of the latter may sometimes be obtained, but hundreds of trees may be mutilated before camphor is discovered, as the natives have no certain means of ascertaining if the tree produces either the one or the other. When camphor is found, the tree is felled and cut intounks of a few feet long; these are then split, and the camphor is found in the heart, occupying a space in circumference of the thickness of a man's arm. The quantity varies from three to fifteen lb., and rarely as much as twenty lb. are obtained. Some trees when felled are not found to contain any at all. The camphor thus found is called *tentary*, and by reason of the small quantity, it commands a high price—from 35 to 70 shillings a pound, according to quality. It does not find a market in Europe at all, but is used to some extent on the spot as incense, especially in the observation of funeral rites and embalming the bodies of the dead, and is exported to China, Japan, and other places in Eastern Asia, for similar purposes. It is heavier than laurel camphor, and sinks in water.

The date at which the Chinese discovered the production of camphor from the *Laurus camphora* is unknown. This is called laurel camphor, or "common" camphor. It was brought into Europe by the Arabians about the twelfth century, which is proved by the mention made of it by the Abbess Hildegard ("St. Hildegardis Opera Omnia," 1145, published in Paris 1855), who called it *ganphora*. Garcia de Orta, writing in 1563, states that the Chinese is the only camphor imported into Europe; that of Borneo and Sumatra, being a hundred times more valuable, is retained by the Orientals for their own use. Kampfer (strange coincidence of names), who visited Japan 1690-92 and made a drawing of the Japanese camphor tree under the name of *Laurus camphorifera*, expressly declares that the tree differs entirely from the camphor-yielding tree of the Malay Archipelago. He further states that the Borneo camphor is one of the most precious articles of merchandise imported into Holland from Japan. This camphor was refined in Japan by a process long kept secret.

The common camphor tree, *Laurus camphora*, is distributed throughout the eastern provinces of Central China, on the island of Hainan, and very extensively in Formosa. It also occurs as a forest tree on the islands Kiushiu and Shikoku of South Japan, its growth being much more vigorous there than in the more northern districts. The camphor of European commerce is produced almost exclusively from the camphor laurels of Formosa and Japan.

The large and increasing quantities of this drug consumed in all civilized countries make the question of its continued production and regular supply a matter of considerable importance. It is a well known fact that the distillation of the crude camphor from the wood is conducted in a primitive, careless way, which causes great waste. The camphor laurels of Formosa are gradually being destroyed under the careless systems employed by the Chinese gatherers; in fact, they have been entirely exterminated along the seaboard, and the wood is now obtained in the forests along the frontier, between the settlements of the Chinese and the inland mountainous regions still occupied by the aboriginal population. The camphor gatherers are hence continually exposed to the assaults of the natives, which interrupt the profitable prosecution of this industry. No attempts are made to cultivate laurels to take the place of those destroyed, and a sufficient quantity of the drug is only obtained by constant encroachments upon the territory of the Formosans, destroying the trees still further into the interior at every new move.

The method of extracting the camphor is as follows: The trees are felled and the small branches chopped up. These, with the chips and twigs, are alone used, the heavy wood being abandoned. A long trough, made of a hollow tree, and coated with clay, is placed over eight or ten hearth fires, and is half filled with water. Boards, perforated with holes, are put across the trough, and above each hole is a jar filled with chips of the wood, with earthenware pots inverted above them, the joints being made tight by hemp and clay. The water in the trough is heated to boiling, and the steam passing through the holes saturates the chips, causing the camphor to sublime and condense in crystals in the inverted pots above. The camphor thus obtained is sent from the interior of the island to Tasmin, the principal port, packed in baskets covered with cloths and large leaves. On arrival it is repacked in tubs or lead-lined cases for export by Chinese vessels to Hong Kong, Shanghai or Canton, the loss by evaporation while in transit from the place of its production being very large. A yellow oil exudes from the packages of this crude camphor, locally known as "oil of camphor," and is used medicinally. The Formosa camphor, which sometimes goes by the name of "Chinese camphor," occasionally arrives in India in a semi-fluid state, owing to the addition of water before shipment.

The Japan camphor used to be extracted, according to Kampfer (the authority above referred to), by boiling the wood with water in an iron kettle, and condensing the vapor in an earthenware dome, closed at the top with rice-straw. The modern practice is to distill the wood with water in an iron retort fitted with a wooden dome, from which the vapors are led through a bamboo tube to the cooling apparatus. This consists of a wooden box, containing seven transverse compartments, and is inclosed in a second box, through which water is allowed to flow; the vapors are conducted through all the compartments in succession by means of holes placed alternately at either end of the dividing walls. The Japan camphor arrives dry; it is lighter in color, and somewhat pinkish. It arrives in double tubs (one within the other) without metal lining; hence it is sometimes called "tub camphor."

The European process of refining camphor was long kept a secret, and toward the end of the seventeenth century the entire camphor of Europe had to be sent to Holland to be sublimed. A monopoly was also held for some time in Venice, but at the present day camphor refining is largely accomplished in England, Holland, Hamburg, Paris, New York, and Philadelphia. Before describing the correct European method, it may be well to describe the fraudulent method adopted in India, the artful peculiarity of which is to get as much interstitial water as possible into the camphor cake. The vessel used is a tinned cylindrical copper drum, one end of which is removable; into this is put 14 parts of crude camphor and  $2\frac{1}{2}$  parts of water; the cover is then luted with clay, and the drum, being placed upon a small furnace made of clay, is also luted to the top of the furnace.

In Bombay, four of such furnaces are built together, so that the tops form a square platform. The sublimation is completed in about three hours; during the process, the drums are constantly irrigated with cold water. Camphor sublimed in this way is not stored, but distributed at once to the storekeepers before it has had time to lose weight by drying. It is sold at the same price as the crude article, the refiner's profit being derived from the introduction of water. The same practice seems to be followed at Delhi, and at a few other cities in India.

In Europe, it is usually refined by fixing it with lime, charcoal, or iron filings, and subliming the mixture in large glass vessels; cakes weighing eight to twelve pounds being thus obtained.

The process adopted in Philadelphia is devised in such a way as to obtain the sublimate in the form of a finely powdered, snowy mass, to accomplish which about one-tenth per cent. of water is added to the crude material. The apparatus consists of a flat iron chamber, capable of holding about 200 lb., connected by means of an iron tube with a condensing chamber eight feet long, four feet wide, and four feet high. This chamber is constructed of enameled bricks set in Portland cement, forming an arched roof and floor of the same material. After an operation the apparatus is allowed to remain undisturbed overnight, to become sufficiently cool. On removal of the sublimate, it is compressed into moulds by hydraulic pressure of 2,500 lb. to the square inch, and the finished product obtained in small cakes, highly compressed, and weighing one ounce.

Camphor forms a tough, crystalline mass of characteristic taste and odor, and can only be powdered when it is moistened with alcohol or some other solvent. It dissolves in 1,300 parts of water at 20° C., and at 12° C. in 0.8 part of alcohol of sp. gr. 0.806. It is readily soluble in ether, acetone, chloroform, benzene, and other hydrocarbons; also in glacial acetic acid and in carbon disulphide. It melts at 175° C., and boils at 204° C., but volatilizes very rapidly at the ordinary temperature and sublimes, when kept in close vessels, in lustrous hexagonal crystals, which frequently form splendid stars.

Camphor oil is used for mixing with fine lac varnishes, rendering them less liable to crack. It is a powerful antiseptic and disinfectant, and covers the smell of mineral oils.—*Knowledge*.

## THE HONEY STRAWBERRY.

IN a letter to the *N. E. Farmer* Mr. S. L. Watkins says: Few persons are aware that in the Sierra Nevada mountains there is a variety of wild strawberries that stands unrivaled in the abundance and superiority of berries produced. It is a perfect flowering variety and is exceedingly valuable as a fertilizer among pestilential plants.

My attention was first directed to these berries by a Mr. Smith of this county, who states that several years ago he discovered near one of the springs on his place a wild strawberry plant of wonderful production, that bore medium sized berries of an exquisite flavor. They commenced to bear extra early, considering his location, which is 3,600 feet above the sea level, and continued fruiting and blossoming until the late frosts came. Mr. Smith dug up 25 of the plants and gave them a thorough trial and was so struck by their good qualities that he immediately started a patch of 300 or more and in time enlarged to a patch of 300 plants. Last season I found himself and family busily engaged in picking berries.

Viewed from a short distance there were enough ripe berries visible to give the entire patch a beautiful coloring; the atmosphere around was charged with a delightful, spicy, strawberry aroma; in fact, I know of no other variety of strawberry that will bear comparison with this California variety for fragrance. The berries are exceedingly sweet, juicy, aromatic and delicious, melting in the mouth without a particle of hard core. The fruit is oblong in shape and when fully ripe a beautiful crimson. The leaves are delicate and finely cut and in time form a rounding symmetrical plant. The berries hang very thick on the plants. I counted 65 ripe berries on a single plant, and found numerous young shoots loaded with blossoms and young berries of all sizes, and this plant was not an exception. The berries are not large, but by proper cultivation berries can be produced that are three-quarters of an inch in length. I know by experience that it does not take long to pick a box full. In addition to the above good qualities they are enormously prolific, and in favorable localities will blossom and produce fruit for ten months in the year.

In their native home, the upper Sierras, they bear fruit eight months in the year, and would bear longer but for frosty and snowy weather. They are wonderful propagators of their own kind and one plant will probably throw out 100 runners in a season. Young plants will bear a good crop the same season.

All growers know that occasionally there is met with in all varieties of strawberries a plant that is more thrifty than the rest, and which produces larger and finer fruit; it is one of these plants that originated the variety on Mr. Smith's place.

California wild strawberries in their native home grow in some of the most unpromising localities, and they would no doubt thrive well on poor soils.

On account of their delicious sweetness and delicate aroma, this new and improved variety will be known under the name of "honey strawberry."

As the honey strawberry is a perfect flowering vari-