

clusively 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 Tasmu, 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 Kampher (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 enclosed in a second box; the vapors are conducted through all the compartments in succession by means of poles 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 into the camphor cake. The vessel used is a tinued 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 top forms 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 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 mixing 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 a 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 200 lbs., 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 over night, to become sufficiently cool. On removal of the sublimate, it is compressed into moulds by hydraulic pressure of 2,500 lbs. 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 temperatures 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.*

Flexible Glass.

Eckstein, an Austrian engineer, claims to have discovered a strong and flexible substance, as transparent as the ordinary brittle glass. His process is as follows: From four to eight parts collodion wool are dissolved in sufficient ether or alcohol; this solution is intimately mixed with from two per cent. to four per cent. of castor oil or other non-resinous oil, and from four per cent. to ten per cent. of resin or Canada balsam. This mixture is spread on a glass plate and dried under the influence of a current of hot air by which it is transformed in a comparatively short space of time into a transparent, hard, vitreous plate, the thickness of which can be regulated as desired. The material thus obtained, is said to resist the action of salts, alkalies and acids, and besides being transparent is odourless. It is flexible and almost unbreakable. Its inflammability is much inferior to that of other collodion combinations, and it can be further reduced by the addition of magnesium chloride, while an admixture of zinc white produces an ivory appearance. Any colour or shade may be imparted to the new glass. — *Storekeeper.*

PRODUCTION OF MERCURY IN 1891. — A circular of M. M. Sargent & Son gives the following information regarding the world's production of mercury in 1891; Austria produced nearly 150,000 flasks, against 14,090 in 1890. Italy, 10,440 flasks, against 12,470 in 1890, and 10,498 in 1889; Spain, 47,993 flasks, against 50,202 in 1890, and 49,778 in 1889. The figures given for the Austrian mines are from January 1st to December 31st, but those for Italy and Spain from November to November. Russia in 1889 produced 4,822 flasks, in 1890, 8,000 flasks. The figures for 1891 are not yet obtainable. Our Statistical Number gave the production of the United States as 21,022 flasks in 1891, against 22,926 flasks in 1890. Mexico, Borneo and Chili also produced a little mercury.