CAMPHOR
A VERY RARE PERFUME

Dr. E. Riva

It is common knowledge that camphor was known in China from remote times as it is quoted in the ancient *Pen-t'sao* under the name of *ciang*, a medicament that was used to calm the irritation of dermatosis. Although the drug had been widely used for thousands of years by the Chinese and Marco Polo also reported having seen the trees in the forests of Fokien, it is not known when unrefined camphor, the only real and effective medicine from this plant, was first extracted. It was apparently unknown in the West until at least the times of the medical school of Salerno. All authors agree in saying that the drug was not known to the Greeks or even to the Romans and that it was introduced for the first time into Western medicine in the Byzantine period, by the doctor *Aetius Amydenos*. In any case, it is certain that the Arabs made wide use of it as a medicine and as a "very rare perfume" to be kept together with the most precious drugs such as musk, amber and sandalwood. The monumental Canon of Medicine by Avicenna[1], contains all the information on these oriental drugs which were considered new or, at least were unknown to traditional medicine in Graeco-Roman times. They are the aromatic and so-called exotic drugs, which in time became commonly used and enriched books of medicinal prescriptions. The more than 700 medicinal drugs described by Avicenna in Book II[2] of his Canon are taken for a large part from *De Materia medica* by Dioscorides, which is well known to all scholars, whilst those considered new, typically Arabic and oriental, are certainly the result of the flourishing and profitable trade between spice merchants and the oriental world.

The so-called "nuts of the Arabs", for example, amply described in the Canon, introduced us to the *nux muschata, facile frangibilis, bonus habens odorem et acutum odorem oris bonum facit*, and which is none other than nutmeg, completely unknown to Theophrastus, Galen and Dioscorides, and which has always been commonly used. Similarly, we know how the by-products of what the Arabs called *nux indica, quae ex ea bona est acqua quae est in ipsa*, and which became very popular with all the apothecaries of Europe under the name of "coconut" (*Cocos nucifera* L.), have played a fundamental role in the preparation of cosmetics and detergents. Famous drugs such as camphor, for example, although already known by the ancients, are masterfully described in the Canons in every detail which helps identify them. Since they were drugs which reached the West after various commercial passages and were therefore liable to sophistication, it was important that their nature, the characteristics of how they were treated and collected were described by those who were able to analyse them in their place of origin. Avicenna notes the various different species according to the type of treatment they undergo, "it is that juice – he says – which is found in the cavity of the infrangible *lignum album* of a tall tree in the shadow of which leopards rest" (*Cinnamomum* sp.) and indicates the extraordinarily "cold" characteristic of this medicament due to the immediate effect of its volatile essential oils; it was a "very rare medicament" used widely by the Arabs who kept it with the most precious perfumes and spices. Other words in favour of the therapeutic virtues of this important medicament come from the doctor Rhazes (Al-Razi) who praised camphor as a drug with a "very cold" nature, to the extent of attributing it with – certainly induced by the immediate effect of its volatile essential oils – anaphrodisiac virtues.

A convincing line of the Salerno school then says that "*canphora per nares castrat odore mares*", whilst it was said that monks in the Middle Ages always used to carry a bag of camphor hanging near their loins to maintain their chastity. However, the chemist Ottone Tachenio[3] was not of the same opinion, claiming that the Venetian *resinatores camphorae*, who handled the drug, were very "audacious" and fathered many children. This - says Tachenio – by virtue of the extraordinary "very warm" nature of camphor due to the "bitterness" of its taste, its aromatic smell and its flammability.

These are all virtues which were considered miraculous to fight the epidemics of the plague, during which we know that doctors used to smell camphor to protect themselves from the illness. However, an air of mystery has always accompanied this extraordinary medicament due to the uncertain origins of this drug about which the most varied and singular fantastic stories were told. We have already said how Avicenna claimed that a watchful and threatening leopard always lay near the tree from which camphor was obtained and consequently it was very dangerous and almost impossible to approach the plant and take possession of the drug; the Arab Serapion wrote that camphor was collected in the Almazoid islands only in the years when there was a lot of thunder, lightning and many earthquakes; the Portuguese Garzia dall'Orto maintained on the other hand that the collectors of camphor were ready to do anything, even to kill each other to get the medicament; lastly, the doctor Girolamo Cardano discoursed on nothing less than the fossil origin of this drug. Fiction fuelled naturally by the greed of merchants who sold camphor at the price of gold. In fact, in Sumatra camphor was traded for its weight in gold, "*with great prowess by the Great Khan*" – stated Marco Polo – who also said that in those places there were "*mountains and valleys and plains, where there were many woods and many trees that produce camphor*" (CLVII, 153). It was also said that camphor was to be found in its solid state, hidden and kept in the "heart" of the trees and that to find it the natives would begin to "auscultate" the trunks first thing in the morning and, hearing a sort of "rattle" inside, proceeded to cut the tree to obtain the few granules of the drug that came out. Of course, to obtain a certain quantity, it was also necessary to cut down a large number of trees and, in fact, whole forests were cut down on Sumatra and Borneo for the sole reason of meeting the enormous demand for camphor by the Indians and the Chinese who used it to embalm their corpses and perfume the images of their divinities.

There was therefore an enormously high cost to pay, right from the start, and which increased greatly due to the customs charges and the long and risky transport; therefore camphor was not only sold for its weight in gold but was also difficult to buy for Westerners. Nevertheless, even in the most modest apothecary's shop in medieval Italy this precious medicament was always to be found There were of course different qualities; solid, liquid or unrefined, from Sumatra, Borneo or China, naturally at different prices and with enormous risks of sophistication deriving from the uncertain and obscure origins of this drug. "*Good Camphor must be white, shiny, sharp and bad* – the first Ricettario Fiorentino[4] hastily says – *and is sophisticated with varnish…*", but the real and more common process of extraction of the drug practised by the Orientals was still unknown.

Perhaps the first to speak clearly was the Venetian spice merchant Giovanni Battista Capello[5]: "*The root with the trunk of the camphor-bearing tree cut into tiny pieces, and wetted with a little water, are put in large pans covered very well with thick wicker covers and applying a light flame, the camphor becomes white as we see it*".

Camphor is therefore obtained from the distillation of the wood of the *Cinnamomum camphora* Nees, a large tree that grows wild in the whole of Eastern Asia, especially on Formosa, and today is widely cultivated in the tropical regions; so-called unrefined camphor was obtained from the wood, divided into splinters and subjected to a current of steam and was then refined by subsequent sublimations (*Camphora* F.U.). Perfectly white crystals were formed, with the characteristic smell and burning taste. Very soon, the drug turned out to be of fundamental importance for therapy and in the last decades of the 19th century, it was the object of detailed pharmaceutical studies which showed that it acted with considerable benefit on the cardiovascular system. It was then widely used as a stimulant of the vasomotor and respiratory centres and in cardiovascular failures. From the chemical point of view, it is a *ketone of Borneol* and, until the advent of synthetic drugs, it was amongst the most important medicament with a cardiac and respiratory analeptic action recorded by history. It has a very powerful restorative action on tired, and intoxicated hearts and – in the appropriate dosages – procures an increase in the frequency of the heartbeats.

The sensitivity of the heart far from its optimum functionality appears with benefit on the contractility of the ventricular muscles with an increase in the breadth of the contraction and a greater systolic range. This action is explained by the fact that the camphor directly stimulates the specific muscular system of the heart and prevalently the sinoatrial node[6].

In addition, camphor also has a general vasodilator action which procures a considerable decrease in the viscosity of the blood, thus reducing specific resistance and facilitating the circulatory mechanism. It also powerfully stimulates breathing which becomes deeper and this action depends on the direct stimulation of the bulbar respiratory centre.

Thanks to these pharmacological characteristics, the drug was widely used in the treatment of heart disorders including those subsequent to acute infectious illnesses and poisoning; for doses higher than the therapeutic ones however, there is an inhibiting action both in the frequency and in the breadth of the contractions and the heart ends up by stopping in diastole. Perhaps for this reason, today its systemic use has been almost completely abandoned, giving way to the new synthetic molecules. The use of camphor is therefore "relegated" to topical application as a *rubefacient*, a cutaneous revulsive, *an antiseptic, an antineuralgic and parasiticide*; all properties which are common to many essential oils with a therapeutic nature.

[1] E. RIVA, *Le edizioni "critiche" dei Canoni di Avicenna curate dal medico arabista Andrea Alpago*, in Papers of the National A.I.S.F. Conf., Piacenza, 1988.
[2] The Latin translation by A. Alpago was used, published in Venice by Giunta in 1544.
[3] *Hippocrates Chimicus*...Venice 1678
[4] *Nuovo Receptario composto dal famosissimo Chollegio degli eximii Doctori della Arte et Medicina della inclita Cipta di Firenze*..., op. cit.
[5] G.B.CAPELLO, *Lessico Farmaceutico-Chimico*…, Venice, 1763.
[6] AIAZZI-MANCINI-DONATELLI, *Trattato di farmacologia*..., Vallardi, Milan, 1972, p. 2498.