THE SEARCH FOR ECONOMIC PLANTS*

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THE search for plants yielding spices and the history of their cultivation and use, as well as the story of the transport of the spices, is a romance which includes accounts of geographical discovery, monopolies, economic warfare, annexations of territories, and all the vices of theft, envy, hatred and malice, and all uncharitableness enumerated by the Apostle St. Paul.

Perhaps the spice which should be put in the forefront is pepper (*Piper nigrum*), native of Malabar and of the forests of Travancore, a spice now too seldom seen or appreciated in its natural condition as black pepper corns, which was the staple article of trade between Europe and India for many ages. Most people to-day use white pepper, which is the small berry-like fruit or peppercorn, ground after its pericarp has been removed, thus depriving it of some of its pungency and best seasoning qualities.

Pepper was well known to Theophrastus in the fourth century, B.C., and to Dioscorides and Pliny, the former stating it to be a product of India. Its export from Baraké on the Malabar coast, near Calicut, is recorded in A.D. 64, and black pepper is one of the spices on which the Romans levied duty at Alexandria about A.D. 176. The first particulars we have, that it was a climbing plant "sticking close to high trees like a vine", occur in the writings of Cosmas Indicopleustes, a merchant and later a monk, who wrote about A.D. 540.

The wealth of Venice and Genoa largely depended on this spice, for tribute was levied in pepper, when money was scarce; it was often enacted that rents should be paid partly in pepper, and the Easterlings, according to the Statutes of Ethelred (A.D. 978-1016), coming in their ships to Billingsgate, had to pay at Christmas and Easter for the privilege of trading with London, a small tribute of cloth, five pairs of gloves, ten pounds of pepper and two barrels of vinegar. Now the only survival of this practice is the 'peppercorn rent', which signifies a merely nominal payment. The merchants who trafficked in spices in England were known as pepperers, and existed as a guild in the reign of Henry II and later were incorporated in the Grocers' Company.

Pepper, gums, myrrh, frankincense and cardamoms reached Europe mainly either by the Persian Gulf through Mesopotamia and Syria to

the Levant or by the Red Sea and the Gulf of Suez and thence overland to Alexandria, while some consignments were conveyed by Arabian or Chinese traders to a port in southern Arabia and thence overland by the Frankincense route via Petra to Gaza and to Acre. From Alexandria or from the Levantine ports to which the spices had come overland they were shipped in the days of the Roman Empire to Rome, and later to Venice or Genoa, which cities for so many years held the monopoly of the traffic in spices.

During the Middle Ages the price of pepper was exorbitant. The high cost of pepper was one of the main inducements to the Portuguese to search for a sea passage to India, in order to break down the Venetian monopoly in this and other spices. Vasco da Gama anchored off Calicut in May 1498, and thus to pepper very largely, therefore, may be attributed the discovery of the Cape of Good Hope.

About the year 1500 the cultivation of pepper was taken up in the western islands of the Malayan Archipelago, especially in the islands of Rhio and Penang, and in Johore. The Dutch East Indies, Singapore, Penang, Ceylon, India and Indo-China are now the chief sources of supply.

The Venetians made every effort to retain the valuable traffic in their own hands, but in 1522, the first consignment of pepper reached Antwerp direct from India in a Portuguese ship, and the trade continued to be a monopoly of the Crown of Portugal until the eighteenth century. With the development of the all-sea route the overland traffic gradually came to an end. With regard to India, the century of Portuguese conquest of the west coast may be recalled, then their ousting by the Dutch, and finally, British dominion under the East India Company, and the efforts of the French and Danes to secure a share in the lucrative trade. Pepper thus was one of the principal economic products which has not only greatly enriched those who have held monopolies in its traffic, but has also incited geographical discovery, resulting in wars to secure possession of its native country.

Cloves, cinnamon, cassia, nutmegs and mace each have a history in which high enterprise, warfare, subterfuge and theft have all played their part.

Cloves are the dried flower buds of *Eugenia caryophyllata*, which is said to be native only in the five small islands of the Moluccas proper

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(Ternate, Tidore, Mutir, Machian and Bachina). The tree was introduced to Amboyna before the arrival of the Portuguese and is still cultivated there and in some of the neighbouring islands. Cloves are probably one of the oldest known of the spices, for it was customary for the Chinese Court officers, under the Han Dynasty, 266 B.C., to hold cloves in their mouth before addressing the Sovereign, to give their breath an agreeable odour. Nicolo Conti, a Venetian merchant, 1424-48, discovered the source of origin, previous writers having assumed that the places whence the spice was shipped, Ceylon, Java, or Malacca, were the homes of the plant. To the Portuguese however we owe our first accurate localization and description of the clove-tree, furnished by Pigafetta, the companion of Magellan, as he saw it in 1521.

For nearly a century the Portuguese were in control of the Spice Islands and had the principal share in the clove trade, until 1605, when the Dutch took possession of the Moluccas, and attempted to control the trade. They tried to restrict the tree to the Amboyna Islands—as they did with the nutmeg—and destroyed trees that might be growing elsewhere. Supplies however managed to reach England independently, though the Dutch monopoly was nearly complete until the latter end of the eighteenth century. Intrigue and theft apparently have played a very important part in the history of the clove in more recent times, for in 1770, the Governor of Mauritius and Bourbon, M. Poivre, procured living plants, both of cloves and nutmegs, and established them in those islands. The clove industry of Zanzibar and Pemba is due to an Arab from Zanzibar, who managed to obtain plants in Mauritius and took them about the end of the eighteenth century to his own island. Great Britain also took her share in what were probably illicit introductions of the spice plants, for, after Penang was founded in 1786 by Captain Light, the East India Company deputed Christopher Smith—one of the Kew collectors sent out by Sir Joseph Banks and George III—to visit the Moluccas and bring back spice plants (cloves and nutmegs) for cultivation.

The cultivation of cloves is now being extensively developed in Madagascar, which may prove a menace to the industry of Zanzibar and Pemba.

One of the present-day problems of economic plants relates to cloves, since the trees in Zanzibar are affected by a die-back disease, which demands careful research into ways of combating the malady and possibly of finding forms or varieties that may be resistant.

Nutmegs, *Myristica moschata*, are natives of the eastern islands of the Moluccas (Ceram, Banda) and of New Guinea. Nutmegs and mace, the

crimson network arillus surrounding the nut, were imported into India at an early date by the Arabians and thus reached the West.

The home of the nutmeg was mentioned by Masudi about A.D. 918, and by the middle of the twelfth century nutmegs and mace were being imported to Aden, and duty on them was being levied at Acre about A.D. 1180. Ten years later they, with other aromatic products, were used in fumigating the streets of Rome at the coronation of the Emperor Henry VI. By the end of the twelfth century, nutmegs and mace were well known in Europe, but very costly, for about 1284, 1 lb. of mace cost 4s. 7d., the value then of three sheep or half as much as a cow. The Portuguese discovered the plant in Banda in 1572 and held the trade until they were driven out by the Dutch. The Dutch tried to restrict the trees to Banda and Amboyna by destroying the trees in all the other islands. In this however they appear to have been frustrated by pigeons, which swallowed the seeds and deposited them in neighbouring islands.

Great Britain occupied the Spice Islands during 1796-1802, and thanks to Christopher Smith's mission and the activities of Sir Stamford Raffles, nutmegs and cloves were introduced to Bencollen (Sumatra) and Penang. Plants were sent to Kew about that time and thence to St. Vincent and Grenada, where nutmegs now flourish.

Cinnamon (*Cinnamomum zeylanicum*), native of Ceylon, and cassia bark, the product of *Cinnamomum cassia* from southern China, are probably the earliest known of the spices. Frequent references occur to them in the Bible, and Theophrastus, Herodotus, Dioscorides, and other ancient writers refer to them as precious odoriferous substances. Cassia is mentioned in the earliest Chinese herbal, about the year 2700 B.C. To the Chinese may almost certainly be attributed the discovery of cinnamon in Ceylon, since they traded to Ceylon in very early times, and were no doubt familiar with the Chinese cassia-yielding species of *Cinnamomum*, which is very similar in appearance to the true cinnamon of Ceylon. An Arab writer, Kazwini, mentions cinnamon as a product of Ceylon in 1275, as do Ibn Batuta, the Muhammadan traveller, 1340, and Nicolo Conti, a hundred years later. The Portuguese discovered Ceylon after circumnavigating the Cape, and occupied the island on account of the cinnamon. Then the Dutch captured Ceylon, again because of cinnamon, about 1656, and established a monopoly in the spice, burning, as they did nutmegs, the stocks in Holland when the supply was greater than the demand. The English took Ceylon from the Dutch in 1796, and the East India Company held the monopoly in cinnamon until 1833.

(To be continued.)