CHAPTER IV

MEDICAL BOTANY AND ROXBURGH

It was in Italy, where the first botanical garden emerged, from the merging of the traditions of the Prince and the apothecary. The Gardens of Padua and Pisa (1545) were the resemblance of patronage of politicians to pharmacopeia. The collections of theses gardens showed the hubristic ambition of their planters that they should contain the world in a garden. Botanic gardens experienced a change in usage during the seventeenth and eighteenth century. This was the age of exploration and the beginnings of the international trade. Different philosophies and ideology, such as, Cameralist and Physiocrates, brought natural Knowledge and agriculture to the central program of monarchical reform. The botanical knowledge was being used for the economic independency during the war by the European countries. Medical botany was the major part of the botany, since the evolution of botany. At the end of the eighteenth century, botanical knowledge was generally divided in economic, medicinal and poisonous properties. Surgeons, physicians and botanists were involved to procure some new form of knowledge from ‘new world’, for the benefit of medical science as well for the motherland.

The encounter with unknown tropical diseases forced Europeans to think about local remedies. During the late seventeenth and early eighteenth century the urgent need to understand unfamiliar floras, faunas and geologies was for commercial purpose and to counter environmental and health risks. These needs propelled trading companies to employ physicians and surgeons on a regular basis for full time. Europeans came from a different climate with low immunity towards tropical diseases. The European medicinal knowledge

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1 As Francis Bacon wrote in his New Organon, ‘Just let man recover the right over nature which belongs to him by God’s gift, and give it scope; right reason and sound religion will govern its use.’ Robert Boyle, John Locke and other founding members of the Royal Society of London aimed to use natural philosophy to restore man’s original dominion over nature.
was not able to deal with the tropical diseases. At the same time, Europeans were also struggling to get rid of epidemics in their own countries. So, the search for medicinal knowledge was for Asian and African as well as for sick Europe.

In the fifteenth and sixteenth century, Arab knowledge enriched Europe’s medicinal practice. And the seventeenth and eighteenth century was the time for exploration of new knowledge from so called ‘new world’. Most of the historians focused on the importance of emergence of medical institutions and hospitals from the late seventeenth century. They called the characterization of medical practice as “military medicine”. But, as Pratik Chakrabarti suggested in his paper that “military medicine in Madras was not only about survival in the battlefield: it was also shaped by the material culture of trade and the political appropriation subsequent to the military campaigns that unfolded in this region over the eighteenth century.” To fulfill the trade demand, different alternatives were opted with the knowledge given by local physicians and natives. Alternatives were also searched for the failed ‘discoveries’ or side effect prone discoveries like Peruvian bark or cinchona tree. These discoveries took place with the help of new contacted societies. The search of cost effective alternatives became the first motto for newly evolved trader countries like Dutch and Britain, to break the monopoly of established country like Spain and Portuguese.

Europeans wanted to empower their nation through trade and ‘green gold’ (spices, medicinal plants, tea, tobacco, opium etc.), but they had to fight with local agitation along with so many new and old diseases. Colonial settlements generally had very high mortality rates and for this reason Africa was later called ‘the white man’s grave’. By the early seventeenth century, Portuguese were facing high death threats in India through these

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unknown tropical diseases. As Timothy Walker writes, “in the three decades between 1604 and 1634, Portuguese military deaths exceeded 25,000 men in the Royal Military Hospital of Goa alone.”\(^4\) That is why Portuguese commanders were worried for the ineffectiveness of European remedies against the tropical diseases. So they turned to collect native remedies, and in this activity missionaries played a major role. They studied indigenous language and customs, which led them to gather detailed information about native healing arts, remedies and ingredients.\(^5\) They founded infirmaries and apothecaries, and developed the European body of expertise about indigenous medicine in the Portuguese colonies. In this way, Portuguese became the chief supplier of native drugs and they got the specialized knowledge of how to prepare and apply them. By supplying native drugs, missionaries received revenue or profit to support their evangelical operations in the Portuguese overseas territories.\(^6\) One of the important names who procured the information of indigenous medicine was Garcia de Orta (1563).\(^7\) His work *Coloquios dos simples e drogas e cousas medicinais da India* (Colloquies on the Simples and Drugs of India)\(^8\) published in Goa in 1563 and was widely accepted by the Europeans. This work remained the base for the later physician and naturalists until the nineteenth century.

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\(^5\) Though in other hand missionaries deliberately touted their knowledge of European medical practice to awe native peoples (typically among the poorest caste who had little access to prestigious professional healers of their own cultures) and attracted them to the Church.

\(^6\) “As an example Portuguese overseas council, the royal body responsible for colonial administration, in Lisbon requested to colonial medical authorities in Goa, the administrative capital of the Portuguese empire in Asia, to make reports about Indian medicines. Those reports became an important source of information to the crown officials in the metropolis and to medical practitioners in other parts of empire.” Timothy Walker, “Acquisition and Circulation of Medical Knowledge within the Early Modern Portuguese Colonial Empire”, in the book Daniela Bleichmar, Paula De Vos, ed. *Science in the Spanish and Portuguese Empires, 1500-1800* (Stanford: Stanford University Press, 2009), p. 250-53.

\(^7\) He was Spanish-born *converso* who moved to Portugal to escape the Inquisition after training in medicine at Salamanca. He practiced in Lisbon before entering Portuguese crown service and selling to Goa in 1534. He served as the personal physician to several viceroys and governors of Portuguese India, as well as to the Sultan of Ahmadnagar.

\(^8\) Here India consisted most of the part of Asia and fifty nine different dugs described by the Garcia da Orta were from all over the Asia but mostly from India.
Till the reception of germ theory in the 1870s-1880s, which led to the study on parasites, disease carriers, vectors and microbes, Europeans fear about the influence of the tropical climate was persistent. Laurence Monnais and Hans Pols divided the colonial medicinal search into two parts. Initially, Europeans focused on the challenges posed by the tropical climate and investigated ways in which Europeans could acclimatise to the tropics. In the second half of the nineteenth century, Europeans started to focus on identifying disease pathogens and disease vectors, which led to a number of breakthroughs in disease prevention, to the advent of ‘tropical medicine’ as a medical specialty and to the implementation of health policies in colonial settings. So, before 1850s Europeans were inclined to search local medicines of particular territories which enabled them to go interior.

Before 1800 health was viewed as a balance between an individual and his or her environment. This balance was influenced by an individual’s diet, habits and morality as well as environmental variables such as sudden change in temperature, chills and precipitation. In this context, Europeans had to explore native knowledge of medicine, food and precaution to survive. Europeans process to get native medicinal knowledge is discussed by Niklas Thode Jensen. Jensen discusses about two phase of this process of acquiring native knowledge. First phase was from 1498 to 1670; in this phase European doctors had a kind of kinship and equality with their Indian counterparts. Because, the both medical systems (European and Indian) were based on the philosophy, the health depends on the balance of a number of essential substances in the body. However, in the second phase, 1670-1770, the situation changed and European doctors started to consider Indian doctors as not scientific as the Europeans. Because Indian doctors did not know about blood circulation and had very less

knowledge in anatomy. Blood circulation and other knowledge were the latest developments in Europe. At the same time, the Orientalists and Company’s Doctors were very eager to find the precise textual sources for the native metallic drugs to find the better treatment for vulnerable diseases that haunted them in the new colonial region as well as in the Europe.

In the eighteenth century, Medical botany was an important branch of botany along with the economic botany, because each one of the European country was involved to claim the right and monopoly on the resources of America, Asia and Africa. From this prospects war had become inevitable. By the end of the eighteenth century, the East India Company possessed one of the largest armies in the world. As Mark Harrison describes, between 1789 and 1805, the number of men in the company’s armies rose from 115,000 to 155,000 in the Bengal Presidency. The Company’s transition from a commercial organization to a military-fiscal state had a considerable impact upon the development of British medicine. The formations of the medical departments for the three Presidencies of Bengal, Bombay and Madras in the 1760s setup the base for search of medicine. The setting up of the medical departments opened the sphere where European doctors could obtain the local knowledge from native physicians. The number of medicine practitioner arose, but situation did not improve to tackle vulnerable diseases. East India Company was very keen for the concern of health and discipline of its European soldiers and seamen at the foreign settlements. In 1664, William Gyford and Jeremy Sambrooke wrote to the governor of Madras, Sir Edward Winter, saying that a hospital and regimented health care were necessary to treat the English soldiers:

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11 However, the critical situation for Indian healers or Vaidya had been started from Portuguese time when in seventeenth century, they begun to regulate indigenous physicians, attempting to subordinate local methods to orthodox European practice. Vaidya were required to pass examinations administered by the Portuguese fisicomeror. A decree of 1618 limited the total number of indigenous healers permitted to practice in Goa to thirty. See Daniela Bleichmar, Paula De Vos, ed. Science in the Spanish and Portuguese Empires, 1500-1800 (Stanford: Stanford University Press, 2009), p. 256.

“The fresh souldiers which came forth this year takeing up their habitation in the bleake winde in the hall, fell sick. Four of them are dead: about ten remaine at this time very sick and complaine (and it seems not without Reason) that the wages are not sufficient to supply them with the necessary now in this time of their sickness. Soe, Rather than see Englishmen dropp away like dogs in that Manner for want of Christian Charity towards them, we have thought it very Convenient that they might have an house on purpose for hem, and people appointed to look after them and to see that nothing comes in to them, neither of meate nor drinke, but what the Doctor alloweth.”13

After the severe demand, the earliest hospital in Fort St. George was established on 16 November 1664 with John Clarke as the first surgeon. But the establishment of hospital did not serve the full need of medical support till the late eighteenth century.14 The supply of medicine was major concern in the battle field and in the provincial hospitals. The main provision for the Madras hospital, usually, came in the form of medicine chests from Europe. These were often destroyed or lost on the long voyages from Europe. And whatever reached to the destination, most of them were in brittle condition due to poor packaging. The scarcity of medicines also enforced Europeans for the search of local alternatives.

### Table: 4.1 The number living above 60, for every 100 living between 30 and 60 years was, in 15

<table>
<thead>
<tr>
<th>Country</th>
<th>(Females)</th>
<th>(Males and Females)</th>
</tr>
</thead>
<tbody>
<tr>
<td>England and Wales</td>
<td>27.5</td>
<td></td>
</tr>
<tr>
<td>Scotland</td>
<td>28.0</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>30.3</td>
<td></td>
</tr>
</tbody>
</table>

### Medical Botany and Diseases

It was well known that the virtues and excellence of Medicinal Drugs depend much upon the soil where they grow.16 After vigourous exploration of plants from different region, so many

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14 East India Company was happy for his victory in this time (late 18th century) but Victory did not ensure well-being in a hostile land. After most decisive victory in Deccan, at Wandiwash against French, the victorious General Eyre Coote found the battle field scenes “dreadful” due to lack of medical support. *Ibid.*
new findings were obtained for the medicinal purpose. This was known to be the case with starch, which was produced from a great number of farinaceous seeds, and even from some roots. Arrow root was formerly supposed to be obtainable from no plant, but the West Indian *Maranta arundinacea*, can be produced in great abundance from the tubers of several species of Indian Curcuma. The same may be observed of Caoutchouc or Indian rubber, which was obtained from more East Indian plants and very abundantly from the *Ficus clastea*.

In Europe, the natural history cabinet was traditionally under the medical faculties in major universities since the sixteenth century. Beginning with the Italian universities, medical schools often included botanical gardens and, on occasion, substantial anatomical museums where fossils, comparative anatomical preparations, and specimens from wide ranges of animals and plants were displayed and studied by workers. The number of medicinal plants traditionally known to Europeans was relatively small, leading them to look for new remedies overseas. Before the eleventh century, Europe possessed only a rudimentary knowledge of the scientific ideas of the Greeks and Romans. Europe became strongly affected by the impact of the Arab translations which incorporated Aristotelian philosophical learning. The introduction of Arab medicine, and the subsequent re-acquaintance with Greek medicine affected European medicinal practice. By the end of the fourteenth century, medicine in Europe had become a blend of Greek, Roman and Arab knowledge.

The authors of the oldest herbals of the sixteenth century, Brunfels, Fuchs, Bock, Mattioli and others, regarded plants mainly as the vehicles of medicinal virtues; to them plants were the ingredients in compound medicines, and were termed as ‘simplicia,’ simple constituents of medicaments. Their chief object was to discover the plants employed by the

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physicians of antiquity, the knowledge of which had been lost in later times. In later times the description, documentation, classification, depiction all emerged and formed the real characteristic of botany. There were also other reasons, which affected the development of medical botany. Syphilis and other diseases spread widely across Italy at the end of the fifteenth century after the French invasion. Bubonic Plague also flourished. In this context, Venice became a centre for the compound drugs for all of Europe. Its physician and apothecaries became systematic collectors of plants from the eastern Mediterranean region. When they got contact with other new world, like America, they were curious to know the local remedy of different unknown diseases. Hippocratic doctrine suggested that American diseases, which it was thought included syphilis, could only be cured by American remedies. Plants such as tobacco, was called a panacea, and guaiacum, a *Wunderbaum*, thus became prized specifics. Later, it began to be believed that all plants contained medicinal virtues. Thus an accumulation of the flora of all continents promised spectacular therapeutic resources.\(^\text{19}\)

During the sixteenth century, a number of Portuguese began to gather material on Asian natural history for similar reasons. Garcia da Orta and Cristovao da Costa both spent many years on the Malabar Coast to search Indian’s traditional drugs. It is significant that the first non-religious book to be published in the Portuguese colony of Goa was da Orta’s *Coloquios dos simple e drogas ... da India ...* in 1563. In this context, it was the proof of importance of the Asian botanical knowledge for Europeans. In his book various local recipes were used for different diseases. For example, sandalwood and China Root was used in an anti-veneral preparation by the Jesuit apothecary in Brazil. Indian cloves, nutmeg and cinnamon were used to address skin ailments composed in Lisbon. Garcia da Orta was almost immediately translated into Latin (1567) by Carolus Clusius, the founder of the Leiden.

botanical garden. At the same time, Dutch established their influence in the Indian Ocean. They had set up a surgeon’s shop in the 1610s in Batavia, followed by a proto-botanical garden to grow medicinal plants brought from various parts of South East Asia. In the 1670s the Dutch Commander of Malabar, Hendrik Adriaan Van Reede tot Dranestien (1636-91) did a gigantic work on the flora of this region – *Hortus Indicus Malabaricus*– in twelve folio volumes in Amsterdam, published between 1678 and 1693.\(^{20}\) Dutch were also obtaining knowledge of regional pharmacopoeias in order to commodify them. After Portuguese effort in Goa, Dutch attempted to systematise their knowledge of Indian *materia medica* from 1640s in Kerala.

The engagement in the spice trade and commerce generally enabled the Dutch naturalists and scientists to develop their tools of observation, objectivity, accumulation and description, which were the hallmarks of the late seventeenth century natural history. The commerce and natural history, spices and medicinal plants of Asia were highly coveted by Dutch physicians, naturalists and apothecaries. Thus, in the eighteenth century, spices and medicinal plants formed the foundation of the apothecary’s recipe book in the Dutch republic.\(^{21}\)

In the early seventeenth century, Dutch were trying hard to maintain their monopoly over spices with force and terror. They needed the medicinal help, when their army and settlers were dying of different tropical diseases. Dr. Jacob Bontius described six hundred peoples who suffered from saviour epidemic of dysentery. Jacob, himself, was one of the sufferers. He was seized first with an ardent fever, then dysentery, and finally beriberi.\(^{22}\) After this horrible experience he started gathering information on local medicine and natural

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history. At that time Garcia de Orta and his *Colóquios dos simples e drogas da India*, was only major source of Indian natural world for Europeans. The VOC’s governing bodies took new initiatives in the late 1660s that resulted in a wide range of new work on the natural history of the Indies.  

In the Cape of Good Hope, Dutch settled a station where ships could call to replenish their water and food halfway through their journey to or from Batavia. There Jan Anthonisz van Riebeeck and local people, Cape Khoikoi, laid out a large garden, orchards and woods, which were under the direction of Hendrik Hendricxsz boom and his family. About 1650s, the main interest of the garden was in growing vegetable foods for the settlers and the ships calling there. But, by the mid-1660s, it also started to grow local plants of botanical and medicinal interest and sent them to gardeners back in Netherlands. It eventually became the chief place for acclimatizing plants throughout the Dutch East Indies. The journal of one of the first Dutch voyages to the Spice Islands, that of Jacob van Neck, described- nutmeg’s use less discriminatingly as strengthening the nerves, sharpening the memory, warming the stomach, and stopping diarrhea and as an all-around remedy against illnesses having a cold origin. The order placed in 1617, by the Dutch, explains the amount of imports, which was used for medicinal purpose. See the table 4.2.

The French were also curious to participate in the transaction of local medicinal knowledge. In 1706 L’Empereur moved as senior surgeon to Chandernagore in Bengal, the

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23 In the early 1660s, the Heren XVII had begun to make the VOC settlements less dependent on supplies from The Netherlands. One of the consequences was the establishment of a “medical shop” in 1663 in the Castle of Batavia, which supplies all the medical chests to VOC factories and ships in the East or returning home. Now local medicinal plants could be supplied to the medical shop as a substitute for drugs sent out from Amsterdam, both cutting costs and furnishing good or even more effective remedies. The Heren XVII directed a letter of their own to the council of the Indies in Batavia asking for a full investigation into the natural resources of Ceylon. A few months after receiving these instructions from the Heren XVII, the council in Batavia in turn sent a letter to Colombo requiring Robert Padbrugge, the VOC surgeons and others to investigate these things and report to them. *Ibid.*, pp. 306-307.

most important French settlement in South Asia at the time. He reported that ‘The English send a large quantity of calumba wood\textsuperscript{25} to England each year’. Further he mentioned, ‘The

\begin{table}[h]
\centering
\begin{tabular}{|l|}
\hline
1) Pepper, 70,000 – 100,000 “bales” (used in medicine and cookery) \\
2) Cloves, “as much as possible” (used in medicine and cookery) \\
3) Nutmeg, 1000 “barrels” (used in medicine and cookery) \\
4) Mace, 300 barrels (used in medicine and cookery) \\
5) Galingale (galleguen, a rhizome with a hot, ginger-peppery flavour, 6,000 pounds (used in medicine and cookery) \\
6) Ginger and Cinnamon, “as much as there was space available” (used in medicine and cookery) \\
7) Lignum aloes (a scented resin), 6,000 pounds of the best kind (used in medicine and cookery) \\
8) India rubber (gommelack), 30,000 pounds \\
9) Camphor from Borneo, 6,000 pounds (used in medicine and cookery) \\
10) China root (a medicine), 30,000 pounds, but “fresh and scentless” \\
11) Wax, 200,000 pounds \\
12) Wood of Cassia fistula (a less valuable member of the cinnamon family), 3,000 pounds, (used in medicine and cookery) \\
13) Spikenard (a well-regarded oil from India), 5,000 ounces\textsuperscript{26} \\
\hline
\end{tabular}
\end{table}

Dutch buy 300 pounds of redovar (Telugu for spurge wort\textsuperscript{27}) each year, which they ship to Batavia for their own use, as well to Europe\textsuperscript{.28} In this way, French acquired different knowledge of natural history and uses of drugs in the land they visit. Consequently, French hoped to carve out a place on the drug market and encouraged the Compagnie’s servants overseas to collect useful plants, ‘send them for expertise to Paris and eventually ‘transplant the most useful of them in our newly founded colonies.’\textsuperscript{29} L’Emperur succeeded at the near end in South Asia in pulling together and maintaining a complex network of savants, merchants, missionaries and Craftsman\textsuperscript{30} (who were firstly indulged in the painting of plants

\textsuperscript{25} Mainly found in Ceylon and Malabar Coast.
\textsuperscript{27} Spurge wort is a species of Euphorbiaceae family of Euphorbia genus. It was first described by Carl Linnaeus in 1753 in Species Plantarum. For Euphorbia (Spurge Wort) William Roxburgh has given a large description in Flora Indica or Description of Indian plant, vol.II, (Serampore: 1832), pp.465-474.
\textsuperscript{29} Kapil Raj, Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650-1900 (New York: Palgrave MacMillan, 2007), p.54
\textsuperscript{30} Indigenous painters were to find natural history drawing and painting an increasingly lucrative business for the European market throughout the eighteenth century and were to start specializing in this art form.
and flower on cloths). Indeed, his experience, like that of other Europeans, had a long-term effect of the local communities. During the seventeenth century the import of drugs from the Orient and the New World increased twenty five fold.

From the early eighteenth century, Europeans faced the extra need for medicinal knowledge because of exploration and voyages, long sea-trade, long running wars (like Seven Years War) and expansion of colonial territory. The trade of spices, sugar, tobacco, coffee, and slave were totally dependent on the sea voyages, so the study of diseases of mariners was important. Italian academic, Bernardino Ramazzini, produced the first occupation-specific study of the diseases of mariners in 1700. This was speedily translated and published in London in 1705 as *A treatise of the Diseases of Tradesmen*. Right from its inception, the Dutch East India Company, provided health-care service by employing ship’s surgeons on its vessels. Their task was a daunting one. The crowded vessels created ideal breeding grounds for epidemics; disorders resulting from malnutrition flared up as a result of the lack of vitamins in the diet on board; unhygienic conditions caused diseases such as dysentery to spread like wildfire. The various climate experienced by the seafarers gave rise to colds, pneumonia, and sunburn. Added to these natural hazards were the duties of sailors, which often caused contusions, ulcers, broken arms, and legs, and inflammations. Some of the hazardous diseases were dysentery, fever and typhus, scurvy, beriberi, malaria, etc. It seems that especially on English ships, for reasons that remain unclear; scurvy was one of the most malignant of all marine diseases in eighteenth century. As an example there was news from Calcutta about the Andamans, that how scurvy became devastation for crop also:

34 The cause of scurvy, a deficiency of vitamin C, was not discovered until the twentieth century. Iris Bruijn, *Ship’s Surgeons of the Dutch East India Company: Commerce and the progress of the Medicine in the*
Sufficient space has been cleared at New Harbour on the Andamans for a village or for planting. Scurvy has disabled many of our Bengal settlers but we expect to have vegetable crops harvested soon...We exist on animal and salted foods...Disease is common but as we clear away the fallen trees and vegetation and expose the area to the sea breezes, it should reduce...Lt Wales is proceeding in the Cornwallis to the Pedier coast to contact the Datoos and procure grain. We expect to be able to make reciprocal trade soon.\textsuperscript{35}

Whereas beriberi usually struck when (white) rice was introduced into the diet on board on the home-ward bound voyages. Fever and typhus were often mentioned as the causes for the high mortality rates on board.\textsuperscript{36} The table 4.2 is showing the total deaths of different Ranks which occurred in the Peninsular Army during 41 months, ending 25\textsuperscript{th} May, 1814; also, showing the average Number Living, and the proportional Mortality of each Rank during a year.\textsuperscript{37} The mortality rate compelled the Company to take some steps to first aid for the army. Company instructed to give certain medicine or medicinal plant to army that can cure them in the initial stage. As it was mentioned:

“Medicines may be dispensed to European soldiers to a value of 20 cash per man per day. This covers all indents for aloes, alum, asafetida, cardamoms, cinnamon, cloves, camphor, castor oil, gamboge,\textsuperscript{38} liquorice, musk, nutmegs, Patna opium, rhubarb, julep, pure nitre, senna, sulphur, Madeira, port, brandy and vinegar.”\textsuperscript{39}

So to enhance their knowledge about Indian medicinal plant and enrich their metria medica they focused on the documentation of various medicinal plants. Sir Whitelaw

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\textsuperscript{35} Saturday 8th June 1793
\textsuperscript{36} Typhus is caused by the Rickettsia micro-organism and is transmitted from person to person via body lice. The disease is often associates with people crowded together in filthy conditions and occurs during times of war and famine in prison camps and jails, on ships. Devastating epidemics of typhus occurred intermittently throughout Europe in the seventeenth, eighteenth and nineteenth centuries.
\textsuperscript{38} Gamboge, a powerful purgative, had been procured in the Wynad region by Arthus Wellesley’s guides during campaigns in 1801-02.
\textsuperscript{39} Saturday 3\textsuperscript{rd} October 1807, \url{http://www.houghton.idv.hk/?p=175}, Accessed on 27\textsuperscript{th} May, 2015.
Ainslie was a surgeon who wrote *matria medica of Hindoostan* at Madras in 1813. Ainslie worked on at two levels to accomplish his work. First, he collected information from his colleagues, the East India Company’s physicians and surgeons, and second from native ‘hakims and vaidyas’. His information ranged from Tellicherry on the Kerala coast to the far north as Chittor in Rajasthan. Even he took the help of Charles Wilkins for the translation of Sanskrit medical texts. He used an extensive range of Roxburgh discoveries.

**Diseases and Roxburgh**

Roxburgh in his first observation about India in the India Meteorological Diary mentioned about the weather, temperature, and about patients which were suffering from different diseases. With regard to the medicinal powers of plants much was written, but Petiver, Hoffman and Linnaeus were among them who tried to categories it. They thought that plants should not be assembled and arranged only in external forms, but also in internal qualities

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40 He became an assistant surgeon in the East India Company in 1788 and appointed garrison surgeon of Chingleput. In the later years he served in Ganjam district as a surgeon in 1794 and also became superintending surgeon of southern division of the army (Madras) in 1814.

### TABLE 4.4 A Table of Number of European Patients Admitted into Fort St. George (1776-1777)

<table>
<thead>
<tr>
<th>1777</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fevers</td>
<td>—</td>
<td>—</td>
<td>6</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Liver</td>
<td>—</td>
<td>—</td>
<td>7</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Liver Cough</td>
<td>—</td>
<td>—</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Liver Flux</td>
<td>—</td>
<td>—</td>
<td>9</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Fluxes, mostly of the belly</td>
<td>—</td>
<td>—</td>
<td>39</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>Fever and Flux</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Rheumatism</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Abdominal obstructions</td>
<td>—</td>
<td>—</td>
<td>39</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Dropy</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>—</td>
<td>—</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Peripneumonia vera</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
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<td>Gravel</td>
<td>—</td>
<td>—</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Cough, pectoral complaints</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Accidents</td>
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<td>—</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Disorders of the eyes</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Piles</td>
<td>—</td>
<td>—</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ruptures</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Nervous states</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Fistula</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rheumat. pains without sores</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Venereal</td>
<td>—</td>
<td>—</td>
<td>42</td>
<td>32</td>
<td>41</td>
</tr>
<tr>
<td>Intermittent fevers</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Icteric</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Surgical patients</td>
<td>—</td>
<td>—</td>
<td>11</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Anomalies</td>
<td>—</td>
<td>—</td>
<td>5</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>—</td>
<td>—</td>
<td>204</td>
<td>193</td>
<td>215</td>
</tr>
</tbody>
</table>


### TABLE 4.5 A Table of Number of European Patients Admitted into Fort St. George (1778)

Diseases admitted and discharged from Fort St. George Hospital, with an account of the different diseases, taken at the end of each month, during part of the year 1778.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Continued fevers,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>2. Intermittent fevers,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>3. Hepatitis; here it is commonly called the liver,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>4. Liver Cough,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>5. Liver flux,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>6. Bilious where there are no evident obstructions</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>7. Fever and flux,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>8. Diarrhoea and dysenteria,</td>
<td>24</td>
<td>25</td>
<td>24</td>
<td>27</td>
<td>42</td>
<td>70</td>
</tr>
<tr>
<td>9. Rheumatism, old venereal pains, &amp;c.</td>
<td>15</td>
<td>19</td>
<td>16</td>
<td>28</td>
<td>29</td>
<td>53</td>
</tr>
<tr>
<td>10. Abdominal obstructions, with little or no fever</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>11. Phthisis pulmonalis,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>12. Coughs and colds,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>13. Epilepsy,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>14. Nervous,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>15. Dropy,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>16. Jaundice,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>17. Icteric,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>18. Gravel,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>19. Diabetes,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>20. Strangury,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>21. Diseases of the eyes,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>22. Venereal,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>23. Piles,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>24. Fistula,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>25. Rupture,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>26. Surgical, mostly old ulcers,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>27. Anomalies,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>28. Accidents,</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td><strong>received into the Hospital</strong></td>
<td>125</td>
<td>113</td>
<td>67</td>
<td>79</td>
<td>78</td>
<td>107</td>
</tr>
<tr>
<td><strong>Discharged cured</strong></td>
<td>74</td>
<td>77</td>
<td>57</td>
<td>85</td>
<td>89</td>
<td>119</td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td><strong>1745</strong></td>
<td>125</td>
<td>113</td>
<td>67</td>
<td>79</td>
<td>78</td>
<td>107</td>
</tr>
</tbody>
</table>

and operative powers. Foremost priority of botanists was to examine the plants in certain categories that served medicinal need. In this regard, knowledge of the chemical composition was important eligibility for botanists to divide the plant into different categories. The categories were gum, starch, sugar, fixed oils, volatile oils, camphor, wax, resins, caoutchouc, various acids and alkalis, and tannin. All the collections of different botanists from various places were actually concentrated on this knowledge only. Only timber, dye and flower plants got high place in those collections due to high demand.

**Dysentery and Rheumatism**

Dysentery was an epidemic for Europeans in India, who had come from a different climate. Dr. Jacob Bontius described dysentery as a “horrible” and destructive disease, “killing more people” in the Indies “than any other affliction”. Jacob Bontius also described about the devastation from beriberi. Even, Dr. Koenig also died from dysentery.

Rheumatism is still used in colloquial speech and historical context, but now is no longer utilized in medical literature. When Europe was stick to the notion that the bleeding was the only an auxiliary remedy for rheumatism, then also local remedies were being examined by the European

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44 However this substance does not exist quite free in the vegetable, but as it can be easily separated from the principles with which it is associated. Sago was a kind of starch procured from the pith of palm trees.

45 Sugar is nutritious and demulcent. A demulcent is an agent that supposedly forms a soothing film over a mucous membrane, relieving minor pain and inflammation of the membrane.

46 Like mustard, castor, hemp tobacco, palm all produce fixed oil that means seeds contains oil. Fixed oils are emollient, laxative and nutritious.

47 This oil can be found from the root, the stem, the leaves, the flowers, or kind of fruits. Like from cinnamon, anise, cloves.

48 Resins are bitter and acrid, are commonly cathartic.

49 It was commonly known by the name of Indian Rubber.

50 Tannin and Gallic acid are uniformly antiseptic and powerfully astringent.


53 It is a non-specific term for medical problems affecting the joints or connective tissue or both.

54 Arthritis is the modern medical name.

physicians and botanists in India. A list of medicinal plants was sent by Sheerman Bird (Collector of Chittagong) to Robert Kyd for botanical garden, which contained different local plant’s name for the remedy of Rhumatism (Rheumatism), Cough and Consumption of the lungs, sore throat and Dysentery. Lady William Jones suffered from acute Rheumatism. Remedies of these two diseases were examined by Roxburgh and his contemporaries: *Artemisia Vulgaris* was well recognised plants with great success in the dysentery. Firstly Dr. Koenig discovered this plant, as John Fleming wrote in his book that he got all the description of this plant through Roxburgh. Even Patric Russell was informed by the Physician-General at Madras, that he had used the root of the *Asclepias vomitoria* with great success in the dysentery. James Anderson accepted that “it was certainly an article of the *materia medica* highly deserving attention”.

*Cassia senna* was highly laxative and was widely used in the problem in bowels movement. The purgative qualities of Senna were known to the Arabian physicians, Serapion and Mesue, who flourished about the beginning of the ninth century, and was used it as a medicine. In England, *Cassia senna* was difficult to be cultivated perfectly. England imported this medicinal plant from Alexandrian, Tripolian, and East Indian. The Senna in common use amongst the Indian practitioners was the blunt-leaved (Senna Italica). It was a common plant on the Coromandel Coast. But John Stephenson wrote in his book *Medical Botany* that the use of this plant as a medicine was too limited in the Coromandel Coast. Roxburgh’s study on this plant was in his *Hortus Bengalensis* and as Nathaniel Wallich wrote

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58 He was the Surgeon in the Bengal settlement.  
in his ‘Notes on Cassia Lanceolata’,\textsuperscript{61} that this plant was first introduced into the Botanic Garden of Calcutta in the year 1800, by the Rev. Dr. Carey. \textit{Flora Indica} of Roxburgh described twenty two species of Senna. They species of Senna not only served the medicinal purpose, but was used some for the need of wood and cattle also, including S. exigua, S. absus, S. Tora, S. toroides\textsuperscript{62}, S. aurata, S. bicapsularis, S. purpurea, S. occidental, S. obtuse, S. arborescens, S. officinalis, S. esculenta, S. sophora, S. speciosa, S. Sumatran\textsuperscript{63}, S. auriculata\textsuperscript{64}, S. alata\textsuperscript{65}, S. glauca\textsuperscript{66} (this was particularly conspicuous in the germ), S. prostrate, S. dimidiata\textsuperscript{67}, S. sensitive, S. tenella\textsuperscript{68}. See the table: 4.4. The greater part of \textit{Senna}, consumed in the United States was imported from the East Indies, because of its cheapness. The common India \textit{Senna} had a narrow lanceolate leaf. The Egyptian had frequently a slight admixture of foreign leaves which were nauseous and bitter. Medicinally considered, \textit{Senna} was one of the most valuable sorts, operating with mildness and certainty.

\begin{table}[h]
\centering
\caption{An account of the \textit{Senna} quantities sold at the East India sales in the years 1804 to 1807:\textsuperscript{69}}
\begin{tabular}{|c|c|c|}
\hline
Year & Total Sale & £ \\
\hline
1803 & 12,889 & 793 \\
1804 & 22,965 & 1,105 \\
1805 & 44,000 & 2,070 \\
1806 & 22,775 & 781 \\
1807 & 65,347 & 2,425 \\
\hline
\end{tabular}
\end{table}


\textsuperscript{62} The seeds of this plant were sent from Mysore to the Botanic garden at Calcutta by Dr. Buchanan in 1800. William Roxburgh, \textit{Flora Indica or Descriptions of Indian Plants}, Vol. II (Serampore: 1832), p. 341.
\textsuperscript{63} This species were sent from Bencoolen by Dr. C. Campbell in the beginning of 1800. According to Campbell it was one of their most usefull trees in Sumatra. William Roxburgh, \textit{Flora Indica or Descriptions of Indian Plants}, Vol. II (Serampore: 1832), p. 348.
\textsuperscript{64} It was one of the common shrubs on the Coromandel Coast. With the bark the natives commonly tan and dye their leather of a buff colour. Alos the caterpillar of a large species of silk worm feeds on the leaves of this plant. William Roxburgh, \textit{Flora Indica or Descriptions of Indian Plants}, Vol. II (Serampore: 1832), p. 349.
\textsuperscript{65} The telinga and Tamul Physicians said it cures all poisonous bites and other venreal outbreakings, and also strengthen the body. The fresh leaves employed to cure ring-worms.
\textsuperscript{66} Native species of the Carnatic and sent by Dr. Berry to the Botanic Garden at Calcutta.
\textsuperscript{67} Native species of Nepal, from thence seeds were sent by Dr. Buchanan to the Botanic garden at Calcutta, William Roxburgh, \textit{Flora Indica or Descriptions of Indian Plants}, Vol. II (Serampore: 1832), p. 353.
\textsuperscript{68} Native of the interior parts of Bengal, and from there Dr. W. Carry sent in 1799. William Roxburgh, \textit{Flora Indica or Descriptions of Indian Plants}, Vol. II (Serampore: 1832), p. 354.
Melaleuca leucadendron was another very important plant from Cajuput oil or essential oil was obtained. This oil was very much in demand and was very expensive, because of its strong medicinal properties. This oil was highly simulative and was very successful in the treatment of epilepsy and palsy. It had been highly extolled as a remedy in spasmodic cholera. In India and in Europe, the Cajuput oil had a high reputation in maligning cholera. In fact, the first London Board of Health instructed every family to be provided with it. But it was found not more effectual in this disease than other diffusive stimulants. The plant and oil of Melaleuca leucadendron was sent by Christopher Smith from the voyage of Spice Island and Moluccas to Joseph Banks (Smith called this plant as Melaleuca Leucadendron) as well as to Botanical Garden Calcutta in 1797. This plant was the native of the Moluccas Island, and from leafs this valuable medicinal oil was extracted. Before Smith this plant got placed under name Arbor Alba Minor in Rumphius collection. There was some confusion over Melaleuca cajuputi and Melaleuca leucadendron. A paper was published on this issue by the Roxburgh and Henry Thomas Colebrooke. Roxburgh examined the plants and its productive times as given by Rumphius. He concluded, ‘after seeing the growth of plant was very slow, opposite to Rumphius observation, in spite of soil and climate was favourable, so this plant was not Arbor Alba Major but Arbor Alba Minor’. Roxburgh gave name of this plant Melaleuca cajuputi (Cajuputi was local name of this plant).

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70 For the detail see George B. Wood and Franklin Bache, The Dispensatory of the United States of America, second edition (Philadelphia: 1834), p.456
73 Roxburgh was in that time in the Cape for health issues. Dr. John Fleming had charge of the Botanic Garden.
Fever

After discovery of quinine in 1820 by Pelletier and Caventou, the dependency on the bark partially reduced, but the side effect of Peruvian bark and quinine forced to look more alternatives for remittent fevers. In 1820, alkaline nature of cinchona was discovered in the ‘cinchonin’ of Dr. Duncan.

It was the belief that plant which contains astringent was the good febrifuges. If we refer the action of astringents to the laws of the living system, it is evident that they can only act as stimulants. But it is requisite to draw the distinction among astringents, stimulants, and tonics. Therapeutically and practically, astringent, when administered on proper principles, were a valuable class of remedies. In intermittent fever, the vegetable astringents were successfully employed in the same manner as like of simple tonics. No remedies were as important in the haemorrhage as astringent. But in profluvie, the employment of astringents was often injurious, in dysentery; in particular, it required much caution. In diarrhoea, whether arising from debility of the whole system, or causes acting on the intestines alone, astringents were administered with great freedom. The best for this purpose were those that contained tannin and Gallic acid, for example the essential oils of cinnamon or of Cassia in the state of oleosaccharum. In the time of plant exploration, naturalist or botanist never forgot to mention the astringent properties of particular plants and Roxburgh was no exception. After discovery of cinchona or quinine, Europeans prompted a search for other specific medicines and for different varieties of febrifuge outside the domain of the Spanish-American Empire. The motive for this search was partly economic by breaking Spain’s profitable monopoly of the cinchona trade. The use of local plants was also recommended.

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76 The distinct vegetable principle in the cinchona bark was inferred by Dr. Duncan in June, 1803, who ascribed to it the febrifuge virtues of the plant and proposed for it the name of cinchonin.
because of continuing doubts over the efficacy and safety of cinchona. After widely recognition of this plant, there were some side effect recognised by the mid of the eighteenth century. Patient treated with bark, experienced the problem of nausea and constipation. So there were demand to reduce the dependencies over this bark by the search for efficient alternatives. Also the bark failed to dominate medical practise in India, because natives were commonly using local febrifuges. Samuel Browne, an East India Company surgeon at Fort St. George, Madras, sent the details of the therapeutic powers of different local plants which were used for fever and other diseases.78 Some of the plants were already mentioned in the *Hortus Malabaricus* (Van Rheede). Spices and condiments were other remedies for fever and pepper, ginger, and other spices were useful for stomachache and fever. Company’s surgeons were recommended to carry Spices and condiments for being cure from stomachache and fever.79 In 1713, a Jesuit priest’s remarked to Royal Society that he had “seen them (practitioners of Ayurvedic medicine) cure fever which begin with a shivering Fit, by giving the Patient three large Pills made of Ginger, Black Cumin and long Pepper.”80

Roxburgh discovered a bark as a substitute for Peruvian bark and to fewer side effects. The bark name was *Swietenia febrifuga* and it gave a better result in a fever and stomach produced less irritation.81 The plant became known as *Soymida febrifugam*, as its Sanskrit name was Seymida. He saw the doctor of a local hospital in Tranquebar, who was using this more frequently for the treatment of fevers. Roxburgh forwarded Plants Seeds and

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78 He published seven books on medicinal virtue’s plants of East India Company in *Philosophical Transaction* from 1700-01 to 1702-03. For detail see Sam. Brown and James Petiver, An Account of Part of a Collection of Curious Plants and Drugs, Lately given to the Royal Society by the East India Company, *Philosophical Transaction 1700-1701.22*, 1 January 1700, pp. 579-594.


Figure: 4.1 Swietenia febrifuga

samples of Hemp with the newly discovered Fever Bark. However, this plant was the native of the West Indies, and was first cultivated in England in 1739 by Mr. P. Miller, who then considered it as a species of Cedrus. But Jacquin discovered the Mahagony to be a distinct genus, and called it Swietenia, in honour of Gerard L. B. a Swieten, whose influence with the House of Austria led to the establishment of a botanic garden at Vienna. The bark of the Swietenia had the medicinal virtue as a febrifuge. Every species of this genus contained a certain share of febrifuge property or power, but in different degree. The nine species of chinchona lately described by Vahl and Roxburgh, added another new species of Swietenia or Mahogany. The numerous experiments which he made from Swietenia febrifuga, drew the following conclusions:

1) “The active parts of the bark of Swietenia febrifuga are much more solubile than those of Peruvian bark, particularly in watery menstruums.”

2) “That it contains a much larger proportion of active (bitter and astringent) powers than Peruvian bark.”

3) “That this bark in Powder, and preparations, are much more anticeptic than Peruvian bark, or similar preparations of it.”

Swietenia febrifuga was more extensively used by the surgeon than anything in India.

Dr. Roget communicated to P. Breton that he discovered this tree in the vicinity of Omedurah in Hazareebaugh region and examined the properties of this bark with different situation and gave better result than Peruvian bark. He added further:

“If the bark shall be ultimately proved, (as I am almost certain it will), equal in effect to the cinchona, the benefit that will result from it to Great Britain, and her vast dependencies in the East, especially in the present precarious state of our actual relations with America, will be incalculable.”

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82 Public Letters from Madras 28th January and 5th February 1793. [Link](http://archiver.rootsweb.ancestry.com/th/read/INDIA/2003-08/1060662548)


Soon after its discovery, Roxburgh sent the samples of Swietenia bark to his trusted Danelahle missionary friend, Christopher Samuel John, in Tranquebar to know the outside laboratory’s reaction. In 1792, John reported to Roxburgh that he had given the bark to the mission doctors, T L F Folly and J G Klein to try on the patient in their hospital, as he commented “Your Bark *Swietenia febrifuga* gets here highest reputation by these two doctors”.  

Folly also described the findings of this bark in his paper *Bemerkungen der von Dr. Roxburgh entdeckten Fieber-Rinde Swietenia Febrifuga* (1792) in 18 pages.  

Roxburgh mentioned that the Swietenia has been tried at Batavia, and found useful in curing the fevers. He mentioned in his *Plants of the Coromandel Coast* about another local variety of Cinchona Excelsa from the mountainous parts of the Northern Circars. The two inner coats of the bark possessed both the bitterness and astringency of Peruvian bark.

Konig had mentioned a cinchona which grew in Malacca, opposite to the coast of the Coromandel. There were confusion on this species, as Aylmer Bourke Lambert described in his book:

“Retzin communicated by Konig, mentioned a Cinchona which grown in Malacca, opposite to the coast of Coromandel, and which produced the genuine *terra japonica*, called *Cotta Cambar*, a vegetable produce, which for a long time was erroneously ascribed to *Mimosa spicata* Pluk. Might not this Cinchona from Malacca be a different species from C. Excelsa?”

Later John Broughton did the chemical analysis of Cinchona excelsa (that time it was called *Hymenodictyon excelsum*). The inner coat of the bark, according to Roxburgh, possessed the bitterness and astringency of Cinchona. In all future inquiries into the subject

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87 Pratik Chakrabarti, “Empire and Alternatives: Swietenia febrifuga and the Cinchona Substitutes”, *Cambridge Journal of Medical history*, v.54 (1); 2010 Jan.


89 Plants of the coromandel coast. Vol. 2, pp. 4-5.


of Indian antiperiodics, attention on this bark was directed. After discovery of this plant as the better option to Peruvian bark, Britain, Dutch, and Dane, also started the experiments on this alternative. Because Tranquebar was the settlement of Dane and Moravians missionaries, so it was easy to being touch with the discoveries of Indian East Indian company. Samuel John and Rottler asked to Roxburgh for the seed of the plant to send Copenhagen. Johann Ludwig Schulze asked to Christoph Samuel John for arrangement of the plant Swietenia febrifuga for producing medicine in Halle. Another letter reflected the value of this plant:

“Receipt of the Swietenia Febrifuga and it’s handed over to the apothecary's shop. There was the order of this plant for making medicines.”

Scopolia Smith plant was another source of native medicine. In Roxburgh’s *Flora Indica*, he describe that this was one of the most common bushes on the coast of Coromandel and every part of this shrub had a strong pungent taste. The fresh bark of the root was administered by the Telinga physicians for the cure of that sort of remittent, commonly called the hill fever. And he strongly suggested the proper management of this plant that might prove a valuable medicine.

*Menispermum verrucosum* plant was the native of Sumatra, as well as of the Mollucas. From Sumatra, Captain Wright brought some plants to Bengal. The whole plant was employed by the Malays for the cure of intermittent fevers. Captain Wright said that it was as powerful a febrifuge, as the Peruvian bark. The *Menispermum verrucosum* (Roxb.) was introduced into Bengal, from Malacca, by the Captain Wright about 1789. It was the remedy generally employed, in the Malay countries, for the cure of intermittent fevers, and

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92 Pratik Chakrabarti, “Empire and Alternatives: Swietenia febrifuga and the Chincona Substitutes”, *Cambridge Journal of Medical history*, v.54 (1); 2010 Jan.
94 Letter from Johann Ludwig Schulze to Christoph Samuel John. 10.02.1795
from Captain Wright’s account, “is as powerful a febrifuge as the Peruvian Bark.”\textsuperscript{97} The *Menispermum Cordifolium* (local name Gurcha, described in Van Rheede book) was the indigenous in most parts of India. The decoction of the leaves was prescribed by the Hindu physicians as a febrifuge, and as a tonic in gout.\textsuperscript{98}

*Caesalpinia bonduc*\textsuperscript{ellia’s} (commonly known as Catcaranja) pills (made with the paste of the seed of the plant, water, and black pepper corn) with *Gentiana Cherayita* (Roxb.) was the successful native remedies for the intermittent fever. This method of curing intermittent was so generally successful, that it was adopted by many European practitioners; particularly in those cases, which so frequently occur, in which the patients had an aversion to the Peruvian Bark, or could not able to retain it on the stomach.\textsuperscript{99} It was equally powerful in exciting and strengthening the action of the stomach, and obviating flatulence, acidity and redundancy of phlegm, in dyspepsia and gout.\textsuperscript{100}

By the late eighteenth century, medical texts, catalogues and dispensatories regularly referred at length to the plants and herbs from different parts of the world.

Here are some other medicinal plants examined by William Roxburgh and plant had a great demand in the treatment of tropical diseases.

*Calumba Wood* and its therapeutic value and uses amazed European. Berberine, C20H18NO4, was present in the wood in about 2.5 percent, intensely yellow and bitter alkaloid.\textsuperscript{101} It was used as an antiperiodic, alterative in remittent types of fever, in treatment of leprosy, snake-bite, and jaundice. The root bark was believed to be as powerful as quinine. Berberine and its compound were used by Indian physicians in the treatment of Malarial

\textsuperscript{97} John Fleming, *A Catalogue of Indian medicinal Plants and Drugs* (Calcutta: 1810), p. 27.


\textsuperscript{100} John Fleming, *A Catalogue of Indian medicinal Plants and Drugs* (Calcutta: 1810), p. 22.

Fever. Pharmacopeia or pharmacologic oriented book cited Calumba Wood, its nomenclature and uses. Daniel Hanbury included wrote an article entitled as, ‘On an article imported as Calumba Wood, Supposed to be the produce of a Menispermum’. Roxburgh also investigated this wood and its peculiar feature to know real calumba wood in European markets. General Macdowall sent him wood specimens from Ceylon. As Roxburgh wrote:

“Should this prove the celebrated Colombo Root, I believe a great quantity of it might be collected and sent to Europe, where it is in great request, but I can scarcely presume to think, after all the labour of the learned Thunberg in particular, who denies its existence here, that I shall be so fortunate as to discover it. Your opinion shall be decisive with me, and although it may not be that valuable medicine, I suppose it yet may possess many excellent qualities.”

Uncaria Gambir obtained from the former trees, was commonly called Cutch, and was made extensively on the Malabar Coast, in Pegu and other places. The quantity said to be exported from Rhio annually, amounted to 80,000 peculs, most of which found its way into Java, where it was used as a dye. It yielded a good revenue to the Uncar Government, as the import duty in Java was 8 guilders per pecul, if brought from a Dutch settlement and by Dutch vessels; and 12 guilders, if buy British vessels. The extract obtained from leaves, was known as Gambier, or the official ‘pale catechu’ of the pharmacopieas of India and the United Kingdom. Much confusion existed in early literature regarding this substance, which to a great extent was not separated from some of the forms of ‘true catechu’. The first authentic account of Gambier dates from 1780, and was made from its leaves, and names several sorts of drugs and their prices. Dr. Campbell of Bencoolen described the drug and the

process of making it to Dr. Roxburgh, who also mentioned that he had seen its making in the “the parts to the eastward of the way of Bengal”. Based on the size and shape, medical botany divided gambir in three main subcategories. First was small, circular ornamented gambir, second gambir was in angular pieces, and circular or cylindrical gambier. One verity Catechu, from the Areca Catechu, was described by Benjamin Heyne in his Tracts Historical and Statistical on India. In Diarrhoea, pyrosis, and other cases in which astringents were indicated they were employed.

*Nauclea ovalifolia* was forest tree of Cachar and Silhet, where it was known by the name of Shal. The bark, which was said to possess bitterness equal to that of Cinchona, was in common use among the order tribes of Cachar in the treatment of endemic fevers and bowel complaints.

*Gynocardia Odorata* was first mentioned as Chaulmoogra by William Roxburgh in his catalogue Hortus Bengalensis in 1815, but by name only. It was described as *Gynocardia odorata*, by Robert Brown after four years. In leprosy, it had excellent effects: it was also been advantageously employed in scrofula, skin diseases, and rheumatism. In flora Indica, it was described as a cure of cutaneous disorders.

*Flemingia congest* was a woody shrub, met with everywhere throughout the thickets and forests of the warmer parts of India. It is remarkable that, while this was one of the commonest plants of India, but neither its dye nor its medicinal virtues was appeared to be

110 In Flora Indica (1832) description of three pages had given on Chaulmoogra.
112 For more detail see Rod Edmond, *Leprocy and Empire: A Medical and Cultural History* (Cambridge: Cambridge University Press, 2006).
known to the natives of India. It yielded the valuable African medicine known in Arabica as *Waras*.

Roxburgh described *Acacia catechu* in his book *Plants of Coromandel Coast*. In diarrhoea depending on a relaxed state of the intestinal mucous membrane, *Acacia catechu* was of much value. It had like-wise been employed with alleged benefit in intermittent fevers, scurvy. Locally it was used with advantage in ptyalism, ulceration and sponginess of the gums, relaxation of the uvula, hypertrophy of the tonsils and in the form of injection in leucorrhcea and atonic menorrhagia.

In these ways, Roxburgh contributed to the medical botany by describing plants and its medical value. Sir Whitelaw Ainslie took most of the information for his book *Matria Medica of Hindoostan* from Roxburgh account. As described in table number 4.7, basically, most of the Indian plants had their own demand in medicinal market.

**Table: 4.7 Rates of Tonnage, according to the usage of the company, at which the following articles, commonly constituting the Cargoes of their Ships, are calculated at per Ton.**

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Cwt.</th>
<th>Commodities</th>
<th>Cwt.</th>
<th>Commodities</th>
<th>Cwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aloes</td>
<td>16</td>
<td>Extract</td>
<td>20</td>
<td>Spikenard</td>
<td>10</td>
</tr>
<tr>
<td>Cicotrina</td>
<td>16</td>
<td>Rhubarb</td>
<td>20</td>
<td>Suga</td>
<td>20</td>
</tr>
<tr>
<td>Aloes</td>
<td>20</td>
<td>Green Ginger</td>
<td>16</td>
<td>Sago</td>
<td>16</td>
</tr>
<tr>
<td>Hepatice</td>
<td>20</td>
<td>Gum Arabic</td>
<td>16</td>
<td>Sapan Wood</td>
<td>20</td>
</tr>
<tr>
<td>Asafoetida</td>
<td>8</td>
<td>Ginger</td>
<td>8</td>
<td>or Sandal</td>
<td></td>
</tr>
<tr>
<td>Alum</td>
<td>15</td>
<td>Mace</td>
<td>15</td>
<td>Turmeric</td>
<td>16</td>
</tr>
<tr>
<td>Bark</td>
<td>12</td>
<td>Nutmeg</td>
<td>15</td>
<td>Tea, Black</td>
<td>10</td>
</tr>
<tr>
<td>Camphor</td>
<td>16</td>
<td>Nux Vomica</td>
<td>16</td>
<td>Tea, Green</td>
<td>8</td>
</tr>
<tr>
<td>Cloves</td>
<td>8</td>
<td>Pepper</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Columba Root</td>
<td>8</td>
<td>Pimento/All spice</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinnamon</td>
<td>11</td>
<td>Long Pepper</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


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