

PLANTS AND HUMAN HISTORY

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There is often an impression in the mind of the layman that the study of botany is an innocent pastime peculiarly suited to the female sex because of the nice colours, elegance, and fragrance of flowers and plant parts. They do not soil their nice dresses, nor give out the foul smells characteristic of a laboratory dealing with animals. There is also not much danger of burning the hands, or of having to exert the brain with difficult mathematical problems as in physics and chemistry.

All of these premises are false as botanists will no doubt appreciate and understand at once. As I shall try to show, for obtaining plants men have gone forth with the sword to distant lands, set upon long voyages of discovery, and conquered new lands. In fact, even in the modern world, plant power means as much or more than water power, sea power, atomic energy, and so on.

Quest for Spices

Of considerable significance in this connection are the spices. Common-place though they are today, the history of their cultivation and transport is a romance which includes accounts of geographical discovery, economic warfare, annexations of territories, and all the vices of theft, envy, hatred,

and subterfuge which the human species is capable of.

There was a period in history when India was a prosperous country, flowing with 'milk and honey'. The economy of the people was sound and from the evidence of foreign visitors like Megasthenes it appears that famines never occurred those days. Of its plant resources, pepper (*Piper nigrum*) was among the most important from the international point of view. Two thousand years ago only kings and the wealthiest nobility could afford its use. In Rome during the first centuries of the Christian era it was measured out in balances for its equivalent weight in gold. In 408 A.D. when Alaric the Goth captured Rome and massacred many of its citizens, he demanded as his tribute 5,000 lb. of gold, 3,000 lb. of pepper and 30,000 lb. of silver. Attila (406-453 A.D.), King of the Huns and Scourge of God, as he was called, demanded 3,000 lb. of pepper as part ransom for the city of Rome. In medieval Europe pepper was held in such high regard that landlords readily accepted rents in pepper. It ranked as a commodity of standard value just as tobacco was legal tender in colonial Virginia. Kings presented pepper to each other and it was received most cordially. Hermann (1958) in his book, *The Great Age of Discovery*

writes: 'Custom duties, rents and taxes, even court fines were paid in pepper. It bought ground and land, paid off mortgages, could buy burghership and coats of arms. The most beautiful women, the noblest horses, the most brilliant jewels, precious carpets, rare furs: all these could be had for pepper.' Many other spices were also held in high regard. A single pound of ginger could buy a sheep, and a pound of cloves could buy seven sheep. In Rome, on special occasions, the streets were 'fumigated' with cloves; and it was the custom in China to hold a clove in the mouth if anyone wanted to speak to the Son of Heaven.

At first it was the Persians who took spices from India by caravans and sold them to the Phoenicians of Sidon and Tyre who traded in them all along the Mediterranean coasts from Alexandria to Rome. From the first to the eighth century Indian and Greek traders held the monopoly. Later, the Arabs took up the trade and sold the spices to Venetian traders in the markets of Damascus, Istanbul and Beirut. Arab sailors ventured far out to the East into Ceylon and the Moluccas. The Venetians of those days spoke of the 'spices of Araby' knowing little about their real origin. Later Malacca and Malabar were considered to be the homes of cloves and nutmeg, when in reality they came from farther east and India was only the wholesale shipping agent for some of these products. The Arabs closely kept the secret and obscured their account with tales of terrible sea-monsters and wild animals which not even the bravest of the Venetians dared to see for himself.

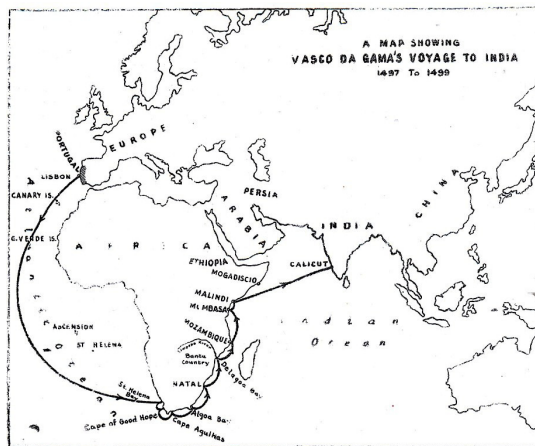


Fig. 1: Map showing route taken by Vasco da Gama for going from Lisbon to Calicut

It was not until Marco Polo (1254-1324?), a boy of 15 years, went with his father and uncle to China, and brought with him an account of the treasures of the Orient (the ginger and camphor of China, cloves and nutmeg of the Pacific islands, cinnamon groves of Ceylon and the pepper vines of Malabar) that the Europeans began to have some idea of oriental geography and the spice treasures of the East. The prosperity of Venice, resulting from her trade with India, was a matter of extreme jealousy to the other European powers who were anxious to get direct to India without the intervention of Venice or Egypt. Columbus (1451-1506) sailed westward but discovered America instead of India. Inspired by Prince Henry the Navigator (1394-1460)¹ the Portuguese sailors were at the same time pushing farther and farther down the coast of Africa. In 1497 Vasco da Gama (1460-1524) rounded the Cape of Good Hope (formerly called the Cape of Storms) and then

1. Henry himself navigated no ships and never went beyond the straits of Gibraltar, but he greatly promoted maritime exploration and was keen to find an all sea route to India with the object of circumventing the Red Sea route which was under the control of the Arabs and the Egyptians.

reached Mozambique in March 1498. His ships reached Malindi at the end of April. Guided from there by a Gujarati pilot he landed a few miles north of Calicut on May 17, 1498, after a strenuous voyage of nearly 11 months in which more than half of his men died of scurvy (see Fig. 1 for route followed by Vasco da Gama). The importance of Vasco da Gama's discovery lay in that it broke the monopoly which the Egyptians and Venetians held for several hundred years in the trade with India. Very soon the Portuguese came into conflict with the Arabs whom they ousted from the Indian shores, and later with the Indian princes who were silenced by gunfire. Encouraged by their successes and the superiority of their arms the Portuguese seized the coastal areas of Ceylon with its great cinnamon forests and founded 'a brave little empire over half a year's journey from the homeland.' They made a law—the disobedience of which was punishable by death—that no native could cut a single foot of cinnamon bark or sell it except under the orders of the conquerors. On the Malabar coast they captured Goa and built a large warehouse and fort. Among the articles they took from India, were pepper, cardamom, cinnamon, ginger and coir for making ropes for their ships. Portugal was then at the zenith of her power. She was mistress of the seas and the maritime capital of Europe. On the western side she had discovered Brazil; on the eastern side she went further, seized Malacca, key city of the Indian seas; and then the Moluccas or Spice Islands. As Peattie says in his fascinating book entitled, *Cargoes and Harvests*, 'Great was the wealth of the Portuguese East India Company and exorbitant the profits it reaped. With slaves to gather the precious spices, without a rival in the

Indian seas, the company poured into the lap of Lisbon such wealth as that old city had never dreamed of'.

However, the small country was not able to hold its far-flung possessions for a long time. The Dutch and the British mercilessly attacked its fleets everywhere and in 1581 the Portuguese crown was united with that of Spain. The Spaniards preferred the Atlantic and the rubies and gold plundered from the Aztecs and the Incas than the spices of the Orient.

In 1594 the leading merchants of Holland held a meeting at Amsterdam and decided to send a Dutch fleet to India. A company was formed and a fleet of 4 ships left for India in 1595. In 1599 the Dutch had already established an eastern trade and then came the British. Like ants following a cube of sugar, the Dutch sailor trailed around the Cape of Good Hope to India, and then went on to Malacca and finally to the Spice Islands. One by one the Portuguese possessions fell. As Panikkar (1929) says: 'Challenged on the sea both by the Dutch and the English and hated by the Indian powers, the Portuguese fought a losing battle'.

Ruthless and inhuman in their relations with the native inhabitants, the Dutch did the job even more thoroughly than the Portuguese. Wealth poured into their little country as it had done before into Portugal. Large and beautiful buildings were erected, fashionably dressed men and women paraded the streets, men lived in ease and idleness and 'there sprang up in Holland a galaxy of painters, musicians, scientists and poets'. Persia, Phoenicia, Arabia, Damascus, Venice, Lisbon and now Amsterdam flourished by turns under the Midas touch of spices.

Holland's genius burned for a century. Other European nations were jealous, and in 1770 Poivre, the French Governor of Mauritius, smuggled cloves and nutmeg out of Moluccas to his own province. From there the plants were taken to Zanzibar and the West Indies. The Dutch monopoly was broken, although they continued in Indonesia until 1947 and still made great profits in various ways.

The British were at first friendly to the Dutch but after the Portuguese were put out of action, they changed sides and for many years there were naval and land clashes between the British and the Dutch. In 1786 the British got a grip on Penang, then on Singapore and later on Hongkong. The British East India Company conquered almost the whole of India which passed on to the British Crown in 1857 and remained a part of the British Empire until 1947.

Mutiny on the Bounty

Many people have heard of Captain Bligh's voyage to the island of Tahiti and the rebellion of the crew of his ship *Bounty*. This has figured in several novels and even a cinema film has been made of it. Not all know the object of Bligh's expedition, however. In the 18th century the British planters in the West Indies had devoted large areas to the growing of sugarcane. For their slaves it was necessary to have some cheap food and the planters thought that they had found an answer in the breadfruit (*Artocarpus incisa*), news of which had been brought to England by various south sea explorers including Captain Cook. Like the jackfruit, this is a large tree and the fruits grow on boughs like apples. When ripe they are yellow and soft with a pleasant taste. Being in

season for eight months in the year, the tree formed an important food for the natives in the South Pacific islands. The planters of the West Indies were attracted. Sir Joseph Banks, then President of the Royal Society and himself a botanist, persuaded King George III to charter a ship under Captain Bligh who had once accompanied Cook and took a keen interest in natural history. Two horticulturists of the Kew Gardens were sent with him to tend the plants on the return journey. The *Bounty* sailed from England on October 15, 1788. Due to wind and currents she failed to round Cape Horn and had to be turned eastward reaching the Cape of Good Hope on May 22. From there it went to Tasmania and it was only on October 24, 1788, after a full year, that it reached Tahiti. Bligh gave to the natives the seeds of melon, cucumber, some stone fruits and almonds, and took from them young plants of the breadfruit. On April 4, 1789, five months after its arrival at Tahiti, the *Bounty* set off for the West Indies. However, the sailors had taken native wives and begun to enjoy life on the island. They were most unwilling to return. Bligh's treatment of his men had been rather high-handed and he used to award stern punishments for comparatively small offences. This had caused resentment in the minds of many. At the same time it appears that he had not chosen his crew carefully. A good proportion of them were an irresponsible lot who preferred a life of ease and luxury rather than face the danger of the sea. On April 28 the bubble burst and the famous mutiny broke out. The rebels threw the precious cargo overboard and in a few hours the breadfruits were floating in the Pacific. Turned out by the mutineers alone Bligh, along with a score of loyal followers, performed a voyage miles in an open boat. This has become one of the epics of the sea (Fig. 2).

In October 1790, the mutineers were court-martialled; and in December, 1792, Bligh started on a second breadfruit voyage. His ship, *Providence*, arrived at Tahiti on 8 April 1793. On July 18, it left with 2,126 potted breadfruit trees and about 590 other plants. Only a fraction of these survived and could be delivered in the islands of the West Indies. Bligh was made a Fellow of the Royal Society in 1801 in consideration of his distinguished services to navigation and botany and later promoted to the rank of Vice-admiral. Although the breadfruits thrived in their

South Seas, it forms a basic part of the diet of the people of West Indies.

George Mackaness, biographer of Bligh, concludes that while at one moment he 'could abuse an officer roundly, in language hot and stinging' at the next, his anger cooling as rapidly as it boiled, he would invite the offender to supper with him. He never spared himself in the discharge of his duties, possessed unimpeachable integrity, and had a mind capable of providing its own resources in difficulties. His chief fault was

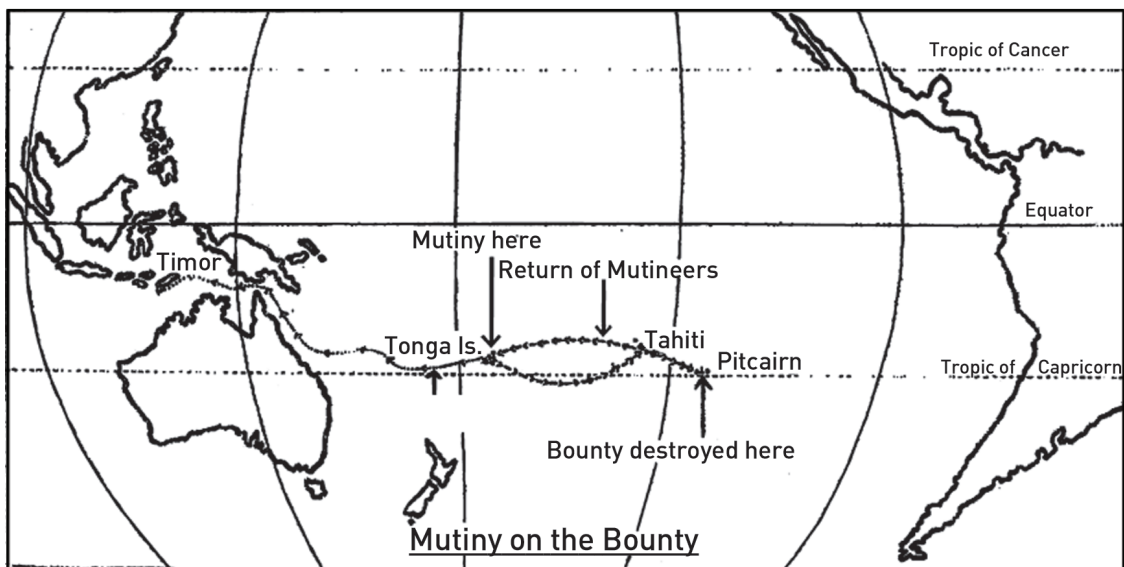


Fig. 2: Map to show part of the route followed by Bligh on his return journey from the Tahiti Islands. The mutineers left him in an open boat and returned to Tahiti. From there the *Bounty* was taken to the Pitcairn Islands and destroyed there.

new setting, the planters' dreams remained unfulfilled for the negro slaves did not relish them.

However, now it has undergone a revival in the West Indies. Although not so popular as in the

an absence of tact and a failure to realise that wounds caused by the sword may heal but those caused by a sharp tongue are remembered forever.

Essential Oils

References to Sanskrit literature, including *Ramayana* and *Mahabharata*, show that the distillation of essential oils and the preparation of perfumes, was one of the most ancient crafts of India and in past she had the leading position in perfumery. In Mughal times the Emperor Babar (1483-1530 A.D.) was very fond of roses and we read in the *Ain-i-Akbari* that he always encouraged the art of preparing perfumes and scented oils. The Empress Noor Jehan used to bathe in water scented with roses. For many years Indian perfumes were the rage in foreign lands. Queen Elizabeth (1533-1603 A.D.) as well as Mary, Queen of Scots (1542-1587 A.D.) extravagantly used Indian perfumes. At the French Court of Versailles, the King himself supervised the proper blending of essences for the royal bath, for which there was designed a different formula for each day of the year. In banquet halls it was not uncommon to have perfumed doves fluttering about so as to fill the room with aroma (Fig. 3), and slave girls used to comfort guests with scented fans. Nobles used to have the horses drawing their coaches anointed with perfumed oils so that the backward breeze brought an aroma to them.

In the 18th century the export of Indian perfumes to England went up to such an extent that the British Parliament took the matter rather seriously. Very likely quite a few of its members had discovered to their chagrin that the lovely creatures whom they had wedded were not all they had seemed, and every night each of them shed a good part of her beauty much as a caterpillar sheds its skin. The following Act passed by the Parliament in 1770 speaks for itself:

‘That women of whatever age, rank, profession or degree, whether virgins, maids or widows that shall, form and after such act, impose upon, seduce and betray into matrimony, any of his Majesty’s subjects by the scent paints and other such artificial means shall incur the penalty of the law in force against witchcraft and like misdemeanours and that the marriage upon conviction shall stand null and void.’



Fig. 3: Scene showing a royal banquet with perfumed doves fluttering in the hall. Indian perfumes were exported in large quantities to Europe during the middle ages.

Sugarcane and Sugarbeet

It is generally agreed that South-east Asia, more especially India, is the original home of the sugarcane. According to Hindu mythology, Vishwamitra is said to have created the plant in the temporary paradise of King Trishanku, and it became available to the inhabitants of this earth only after the destruction of that paradise. According to some it is the bow of Kamadeva, the God of love. The word Ikshu occurs in the Atharva Veda (1,000 B.C.) and some royal families used the

epithet 'Ikshwaku'. Alexander and his soldiers were perhaps the first Europeans to see sugarcane and wrote back to their friends in Greece that the barbarians across the Indus grew a reed from which they obtained all the honey they wanted. In the 5th century A.D., cane cultivation spread to Iran, and in the 7th century to Egypt and Spain. By the 16th century it had extended even to the New World which had been found by Columbus.

Now-a-days we are selling and buying of sugar as an ordinary thing, but for centuries the only sweetening material known to Europeans was honey. When Indian sugar first became available to the West, it was a prized commodity. Nations contrived, struggled, plotted, and fought for trade supremacy in it.

In 1747 a German scientist, Marggraf, noted the presence of sugar in the roots of the beet but no serious notice was taken of this discovery except in Germany. During the days of Napoleon, the relations between England and France were strained for a long period. While Napoleon ruled the land, the British Navy had command of the seas. The cessation of maritime trade had a paralysing effect upon the sugar refineries of Europe which had been importing raw sugar for many years and selling the finished product to Germany, France and other countries. Everywhere there was dearth of sugar. On March 25, 1811, Napoleon issued a decree subsidising the establishment of the beet sugar industry. The beet was launched as a new crop in France. The British ridiculed the whole idea and published cartoons in their newspapers. One showed the great Napoleon sitting at coffee and squeezing a big beet root in his cup. In another (Fig. 4) a nurse had thrust the thin end of the root into the mouth of

Napoleon's little son, the King of Rome, and was saying "Suce moncheri, suce, ton pere dit que c'est due sucre" (Suck, my dear, suck, your father says it is sugar).



The nurse to Napoleon's son.
The king of Rome : Suck dear suck.
Your father says, "It is sugar".

The Great Napoleon
squeezing a beet root to
sweeten his cup of coffee.

Fig. 4: Two old but famous cartoons showing how the British ridiculed Napoleon's idea of obtaining sugar from beet root.

The encouragement, which King Frederick of Germany and Napoleon gave to the beet, together with the work of selection and breeding, undertaken by botanists, has made it one of the most important crops of modern times. A mediocre in productivity has been transformed into one of the greatest of our agricultural crops through the joint efforts of kings and scientists.

The Opium War

Opium was exported from India to China even in the 15th century, but this trade was responsible many years later for a war followed by serious

consequences. After the sea-route to the East had been opened and the British had occupied parts of India, they tried to extend their influence to China. However, there was some difficulty about the ceremonial to be observed, and in 1793 the Chinese Emperor refused to see the British envoy. The ceremony to be performed was called the 'kotow', which is a kind of prostration on the ground. In reply to the British King's request for trade facilities, the Chinese emperor simply answered: "We possess all things and have no use for your country's manufactures."

However, the East India Company, ever ready for profits, continued to take a keen interest in exporting opium partly as a method of payment for silk and tea which they purchased from China. The Dutch in the East used to mix it with their tobacco and then smoke it as a preventive against malaria. The Chinese had gone one step further and used to smoke pure opium. The Chinese Government wanted to stop the habit because of its bad effect on the people, and also because the opium trade took away a lot of money from the country. However, it had little success.

In 1800 the Chinese Government issued an edict prohibiting all imports of opium. Unwilling to lose its profits, the East India Company persisted with the smuggling of opium into the country and bribed Chinese officials to overlook this. In 1834 matters became worse as the British Government put an end to the monopoly of the East India Company in the China trade, and threw it open to all British merchants.

There was a sudden increase in opium-smuggling, and the Chinese Government at last decided to take strong action. In 1839 they appointed one, Lin Tse-hsu, as special

Commissioner to suppress the smuggling. He acted promptly. He went personally to Canton in the south, which was the chief centre for this illegal trade, and ordered the foreign merchants there to deliver to him their entire stock of opium. Since they refused to obey, Lin cut them off in their factories, made their Chinese workers and servants leave them, and allowed no food to go to them from outside. This vigour and thoroughness resulted in the seizure of 20,000 chests of opium. Lin destroyed all of them and told the foreign merchants that no ship would be allowed to bring opium to Canton. If this promise was broken, he threatened to confiscate the ship and its entire cargo. Lin played his part well, but did not foresee the effect of his policy.

In the name of national honour and for the right of forcing opium on China, Britain declared war on the country in 1840. China could do little against the British fleet which blockaded Canton and other places. After two years she was forced to submit, and in 1842 the Treaty of Nanking laid down that five ports were to be opened to foreign trade which at that time meant especially the opium trade. These five ports were Canton, Shanghai, Amoy, Ningpo, and Foochow. They were called the 'Treaty Ports' in which British merchants had the right to 'reside and carry on trade'. Britain also took possession of the island of Hongkong, near Canton and extorted a large sum of money as compensation for the opium that had been destroyed, and for the costs of the war which she had forced on China.

The Chinese Emperor made a personal appeal to Queen Victoria, pointing out with all courtesy the terrible effects of the opium trade which had been forced on China. There was no reply from the Queen.

Only fifty years earlier his predecessor, Chien Lung, had refused to meet the British envoy.

Potato

The potato is one of the most important food crops of the world. Believed to have originated in Peru and Bolivia, it was introduced into Spain in 1570 soon after the discovery of America. About 1586-1588 it was taken to Ireland by Sir Walter Raleigh. The French gave it the name 'pomme de terre' or apple of the earth. There was a lot of opposition in Europe to potato in the 16th and 17th centuries and most persons held it at an arm's length. Some said it caused leprosy; others said it gave rise to scrofula, rickets and tuberculosis. Still others denounced it on the ground that it was not mentioned in the Bible. The credit for promoting potato culture in Prussia goes to Frederick the Great. In 1744 he caused seed potatoes to be distributed free and compelled the peasants to cultivate them under threats of cutting off their noses and ears. The scarcity of food, caused by the Seven Years' War gave much encouragement to the industry. However, even as late as 1774 the hungry people of Prussia rejected a load sent by Frederick the Great: "The things have neither smell nor taste, not even the dogs will eat them, so what use are they to us?" England was not far behind in such nonsense and one man standing for election to the Parliament used the slogan: 'No potatoes, no Popery'. Potato was regarded as the badge of servility, utterly unfit for free men and specially Englishmen. Many farmers fed potatoes even to pigs and horses with great reluctance lest they may poison the poor animals.

The introduction of potatoes into France was largely due to Antoine Auguste Parmentier who, while a prisoner in Germany during the Seven Years' War, was fed upon potatoes and had learned to like them. Parmentier planted them on a piece of land obtained from Louis XVI (1754-1793). This was at first a sandy waste but the potatoes turned it into a blooming garden. A military guard in full uniform was stationed near the field during the day (Fig. 5) but was withdrawn at night, whereupon a number of people came



Potato field near paris, guarded by soldiers

Fig. 5: When potato was introduced into France in the 18th century no one liked it. A Frenchman, named Parmentier, planted a field near the King's palace. The field had military guard in daytime to arouse the curiosity of the people as to the kind of food that was being grown for the king.

secretly to steal the tubers (Fig. 6). They ate them with relish and planted them in their own gardens—the very object which Parmentier had in view.



Fig. 6: In the night the guard was removed, and plenty of men and women went with picks and shovels to collect the potato tubers.

At one time, when his plants were in full bloom, Parmentier presented a bouquet of the flowers to the King who placed one in his buttonhole and gave the rest to his Queen, Marie Antoinette (1755-1793). She appeared in the evening wearing them in her hair. All the court tried to imitate their example. When Parmentier died, potatoes were planted on his grave. In England too it was the peers who first ate potatoes and the common people followed. Hot baked potatoes soon began to be hawked by vendors in London streets. It

was, however, in Ireland that the potato was especially popular and became the staple food of the people.

In 1778 there was a war between Germany and Austria which is commonly known as the Potato War or 'Kartoffel Krieg'. Frederick the Great invaded Bohemia, and the Austrian army and his own faced each other on the Elbe near Koniggratz. Partly because of shortage of supplies and partly because of the strength of the Austrian position, Frederick realised that the campaign, as he had conceived it, was not likely to succeed. 'Both the Prussian and the Austrian armies thenceforth confined themselves to the 'potato-war', -that is, they consumed the resources of the enemy's country, till the cold weather set in and forced them to terminate their inglorious campaign by evacuating Bohemia'. (*Cambridge Modern History*, vol. 6: 706, 1909).

In Cromwell's campaign against Ireland, the potato played a different part. After subduing the chief urban centres, the invader wanted to punish and overawe the peasants by sending harassing bands to villages. Here the potato proved a source of great strength to the Irish, for the underground crop still remained intact when overland crops were open to destruction and loot by the soldiers.

Blights, Rusts and Mildews

As already mentioned the potato enjoyed special popularity and became the staple food of the Irish people. However, this dependence on a single crop later became the cause of great trouble and suffering. There was a terrible failure of the crop in 1845 and again in 1846. Father Mathew, a Catholic priest wrote: On the 27th of the last

month (July 1846) I passed from Cork to Dublin, and this doomed plant bloomed in all luxuriance of an abundant harvest. Returning on the third instant (August) I beheld with sorrow one wide waste of petrifying vegetation. In many places the wretched people were seated on the fences of their decaying gardens, wringing their hands, and wailing bitterly the destruction that had left them foodless.

Nobody knew the real reason for the failure of the crop. Many believed it to be a scourge from God to punish the sins of the people. One writer said that the trouble was due to volcanic action within the earth. Other blamed the weather. Lindley, the editor of the *Gardener's Chronicle* of London, who examined the infected leaves under the microscope, considered the fungus to be an excrescence from diseased tissue and not the cause of it. The price of ignorance was terrible. "With startling rapidity, shortage passed to famine, famine to starvation, and starvation to death, which, if it brought peace to its elect, augmented the suffering of those it spared." [Salaman, 1949].

In their helplessness many of the Irish people immigrated to the United States. As Salaman says in his book on the *Origin of the Potato* the emigrants carried with them 'into their new life overseas an inverted love of their old home, in the form of a deep anger and a bitter hatred of England, to whom they ascribed not only the old historic grievances, but the cruel misfortunes which had overtaken them in consequence of the potato famine'.

To mention another example, at one time coffee cultivation was to Ceylon what maize is to North U.S.A. or wheat is to the Punjab. The little island

had taken to this crop with great enthusiasm and was making good profits through it. In 1869 M. J. Berkeley described a pretty microscopic fungus on some coffee leaves received from the Botanical Gardens at Peradeniya and named it *Hemileia*. At that time neither the planters nor the Ceylon Government bothered, but within the next 10 years the disease spread over the whole island. The fungus did not kill the host outright but there was a frequent shedding of the leaves so that the productive capacity of the plants was reduced to less than half. The Ceylon Government now woke up and wrote to England for help. In 1880 the authorities at Kew recommended to them the services of H. Marshall Ward. He made a thorough study both in the field and the laboratory but it was already too late to save the coffee. The productivity of the trees continued to go down. It was a losing battle and coffee cultivation no longer remained profitable. Ruined and discouraged, the planters turned to quinine, rubber, cocoa and finally to tea. The centre of coffee production shifted to Brazil where sometimes there was so much overproduction that the coffee berries were burned to keep up the prices.

The cloves, which we use in cookery and to sweeten the breath, are the dried flowerbuds of a tree known as *Syzygium aromaticum* belonging to the guava family. Shredded cloves are often mixed with tobacco to make scented cigarettes, and the oil is used to make vanillin, a substitute for pure vanilla. Formerly most of the cloves of the world came from the Molucca Islands and the Dutch held a monopoly for many years. Later, the plants were grown in Mauritius. One of the Sultans of Zanzibar introduced it into his kingdom and the adjacent Pemba. It is these two islands which now

supply 80 per cent of the cloves of the world and for many years they have lived largely on the export of this fragrant commodity. During recent years the clove industry of Zanzibar has faced grave peril because of the so-called 'sudden death' disease.

Then consider the cocoa industry of Ghana. The first fruit of *Theobroma cacao* was imported into the country and the owner could sell each pod for more than two dollars. Later the industry began to grow. During the five years from 1892 to 1896 the total production was only 12 tons, but in 1951 it had already climbed to 2,75,000 tons. During the last ten years the crop became afflicted by a disease called 'swollen shoot', which is caused by a virus and spread by an insect known as mealy bug. The eastern part was the worst affected and it was believed that the disease came from Togoland in 1930. It was feared that the cocoa industry of Ghana might have the same fate as the coffee industry of Ceylon. When orders were given to the farmers a few years ago to destroy the infected trees and burn them, they at first refused to do so. However, the government acted with vigour and firmness. The disease subsided and once again cocoa has had some big booms.

The Indigo Satyagraha

Dyes have long been used to (1) ward off evil spirits; (2) to frighten enemies; and (3) to make oneself more attractive. The world would be a drab affair without the multicoloured dresses of women and the neckties of men. Krishna and Baldev were called 'nilambara' and 'pitambara' because of the blue and yellow dresses they wore. In the *Mahabharata* we read about Prince Uttara removing the coloured dresses of the Kauravas

after they had been rendered senseless by Arjuna. The mummies in Egyptian tombs have been found clad in clothes coloured with indigo, madder and saffron. In the Bible there is a reference to the coloured dress of Joseph and how his brother envied him because of it.

Indigo was the king of all ancient dyes and was being grown in India from times immemorial. The dye was greatly in demand by the Greeks and Romans. After the Roman Empire broke up, indigo as a colouring matter was lost to Europe for centuries. But the Dutch reintroduced it in the middle of the 16th century and Bengal became the chief centre of the indigo industry. In 1631, on a single day, three Dutch ships took some 333,000 lb. of indigo from India to Holland. None of the Europeans had any knowledge of the source of the dye and even till 1705 they thought that it came from mines.

When the British occupied India, they found the crop so profitable that some of them established themselves as landlords in order to carry on the trade in indigo. They exacted from their tenants many kinds of fines and 'begar' (forced labour), and levied a tax on every marriage, hearth and oil mill. If the *sahib* needed an elephant or wished to pay a visit to the hills, the tenants had to bear the cost. The peasants had to grow indigo on a fixed proportion of the land they rented and this was never less than 3/20 of its area (the so-called *tin-kathiya* system). The planters also fixed their own price for the crop. When labour was hired, the wages were on starvation level—10 pice for a man, 6 pice for a woman and 3 pice for a child, working nearly 11 or 12 hours per day.

The tenants found conditions so difficult that sometimes they refused to fulfil them. However,

the British Government, which was more interested in the landlords than the tenants, passed special laws to terrorise the latter. Any cultivator, who was audacious enough to defy the planters, was harassed and subjected to all kinds of cruelties. His house would be looted, crops destroyed and stray cattle let loose on his lands. He would be dragged into false cases, made to pay fines or even beaten up. Sometimes, in sheer despair, the cultivators revolted and killed a planter or two. However, they were no match for the organised strength of the planters with the British Government behind them. Repression would be let loose and every revolt only worsened the peasants' condition. The late Dinabandhu Mitra wrote at that time a Bengali drama known as *Nildarpan* depicting the inhuman oppressions to which the cultivators were subjected. The man who translated the drama into English lost his job; the planters denounced it as grossly obscene and libellous, and the printer, Rev. J. Long, an English clergyman, was promptly prosecuted. He was sentenced to pay a fine of ₹1,000 and to serve one month's imprisonment. The fine was paid then and there by one Kali Prasad Sinha, a citizen of Calcutta.

Meanwhile Perkin (1856) synthesised indigo in England and the dye industry was developed to such an extent by German chemists that indigo plantations became unprofitable. The



Fig. 7: The indigo trade had such an diverse effect on the life of the peasants of Bihar, that Mahatma Gandhi started his first Satyagraha movement at Champaran in 1917.

planters now adopted the expedient of freeing their tenants from the obligation to grow indigo but charged them an enhanced rent or gave the land in return for the payment of a good sum in cash.

In 1914, World War I broke out in Europe and the import of foreign dyes stopped. The prospects for indigo brightened, and the planters again began forcing the tenants to grow indigo. Partly due to this and partly due to the damage caused to their economy by the war, their condition became more and desperate, and the situation was brought to the notice of Mahatma Gandhi (1869-1948) soon after he returned from Africa to India. The Lucknow session of the Indian National Congress adopted, in 1916, a resolution of sympathy with the peasants on the indigo plantations at Champaran at the foot of Bihar Himalayas. A villager, who attended the congress, went after Gandhiji from place to place and succeeded in bringing him to Champaran for an inquiry that made a turning point in Gandhiji's career (Fig. 7). Gandhiji agreed to conduct the inquiry with the late Dr Rajendra Prasad (Later President of the Indian Republic) and Mahadev Desai as his helpers and assistants. The Commissioner served him a formal notice under the notorious Section 144 of the Indian Penal Code, requiring him to leave Champaran. Gandhiji refused to comply and was put on trial. He read a statement in the court saying that his presence could not possibly disturb the public peace and that his sense of duty bade him remain where he was. This respectful but firm defiance took the magistrate by surprise. The Lieutenant Governor, Sir Edward Gait, ordered the case to be withdrawn, and made Gandhiji a member of an official inquiry committee. This committee stood

up for the peasants. The planters had to repay one-fourth of their unlawful exactions, the *tin-kathia* system was declared illegal, and land revenue was reduced. This was Gandhiji's first act of civil disobedience on Indian soil and, he immediately became a national hero. The Champaran struggle was a sort of small scale rehearsal in the technique of *Satyagraha*. Bigger things were to follow.

Cotton, Negro* Slavery, England and India

Among the most interesting discoveries in the excavations at Mohenjodaro (Now in West Pakistan) (3.000 B.C. ?) were some pieces of silver wrapped in a fabric which was found to be cotton, the counts of yarns and the structure of the cloth indicating the attainment of a high degree of skill in the arts of spinning and weaving even in those distant times. This achievement may well be considered as more noteworthy than that of the Egyptians who were using the much longer stem fibres of flax.

Herodotus, the Greek historian and traveller, wrote in 445 B.C. that, 'there are trees growing in India, the fruit of which has a wool exceeding in beauty and goodness the wool of sheep'. Some writers concocted tales of a lamb sitting inside the fruit. The Greeks learnt of the cotton plant through the group of explorers who accompanied Alexander the Great and his immediate successors. From that time onwards the cultivation of cotton, its use for the manufacture of various fabrics, and their dyeing and finishing

progressed steadily until in the Middle Ages the fame of India's cotton materials spread far and wide and she had a roaring trade in them not only with the adjoining countries but also with far distant lands through Venice. Marco Polo mentioned the Coromandel Coast as producing 'the finest and most beautiful cottons in the world'. The softness, fineness and beauty of the Dacca muslins is legendary. It is said that when such muslin was laid on grass to bleach and the dew had fallen, it was virtually transparent. A whole garment could be drawn through a ring. There is also the oft repeated story of a Moghul princess who was putting on seven layers of muslin and still the contours of her body were so visible that she had to be admonished by her father.

Those glorious days were followed by a period of decline during which India's textile industry was discriminated against by the East India Company and later by the British Government. The revival came only in comparatively recent years.

India was, however, not the only country which grew cotton in the past. In the New World also cotton fabrics have been found in ancient Peruvian tombs. The Spanish discoverers of the Americas found cotton in the region from the West Indies to Mexico, Brazil and Peru, and in some of these countries the art of making cloth was highly developed.

The introduction of cotton into the south-eastern area of the USA came much later. In 1621 some seeds were planted as an experiment and a coarse cloth was manufactured on a small scale towards the end of the century. In another hundred years

*The term Negro started to be considered derogatory and offensive around 1900s due to social changes. However, it has been retained in this article as it helps in understanding clearly the slavery prevalent long ago.

this textile furnished most of clothing of the poorer classes in the southern states. In 1747 some cotton was exported from America to England. In 1794 came Whitney's invention of the cotton gin which gave a tremendous impetus to the cotton industry. Henceforth, cotton became an important crop in the U.S.A.

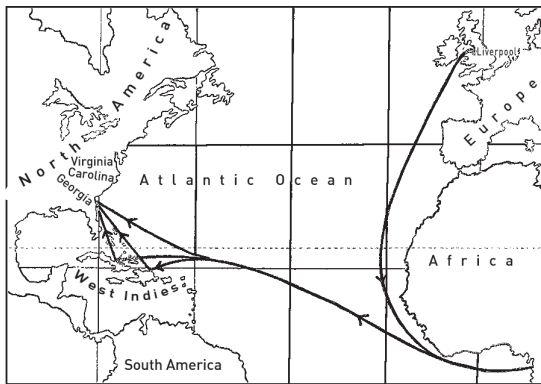


Fig. 8: Route taken by the slave ships in the 16th and 17th centuries. The ships left Liverpool and touched the West Coast of Africa. After that they sailed west with their cargo of slaves, who were sold in the Caribbean Islands and south-eastern states of the U.S.A., to help in the cultivation of cotton and sugarcane.

It is to this extension of cotton cultivation in the U.S.A., that the negro problem of America must be traced. In the cotton growing areas the summer temperatures are rather high and there was an obvious need for cheap labour was necessary to bring more profits. The American Indians were a rather independent type of people who refused to co-operate with their white conquerors. Since a good proportion of the cotton for the Lancashire mills went from the southern states of the U.S.A., British ships found it a profitable business to capture negroes from the West African coast and sell them in America for work on the cotton fields (Fig. 8). To

economise space and transport of the largest number of negroes, the ships were specially made with galleries between decks. In these the unhappy negroes were made to lie down, all chained up lest they may try to escape by jumping into the ocean. The space allowed to each was five and a half feet long by sixteen inches wide. Later they also captured negro women and the State of Virginia made special efforts to breed negroes, for this was cheaper than carrying them across the ocean. Towards the end of the 18th and the beginning of the 19th century as many as 100,000 slaves were carried every year from the African Slave Coast. Having discharged their human cargoes, merchants loaded their ships with tobacco, sugar, rum and molasses and returned to England.

Differences arose about 1830 between the North and the South with regard to the slave trade and the legality of slavery. Apart from slavery their economic interests were also different. In 1860 Abraham Lincoln (1802-1865) was elected President of the U.S.A. He was opposed to slavery and his election was a signal for the South to break away from the North. He tried to bring about a compromise but failed. Eleven states of the South broke away from the North. Lincoln refused to recognise the right of any State to withdraw from the Union and a Civil War followed in 1861. All the early victories went to the South, but the North had much greater resources and in 1865 the South had to accept defeat. The negroes were made legally free and although incidents still occur sometimes, generally their condition is reasonably satisfactory and no worse than that of many untouchables in this country.

In the Old World the import of cotton cloth from England into India was one of the principal

reasons for the strained relations between the two countries. England took raw cotton from this country and sold the finished product to India. Lancashire grew fat, while the Indian peasant became poorer and poorer. Gandhiji, with the spinning wheel, emerged as a world figure, and the boycott of British cloth made the occupation of India unprofitable.

The Europeans came to India because of its rich plant resources particularly spices. When spices were no longer so important, it was still profitable to retain India as a market for British goods. Once India refused to buy them, it no longer remained the gold mine it was. Gandhiji's method was simple but sure, and India gained its independence in 1947.

Recent Times

In recent times everyone will remember that the chief reason for military aggression by Germany was not so much the *Lebensraum* or living space, which Hitler spoke of, but a consuming desire to occupy the wheat fields of the Ukraine and certain other areas to obtain more food for his crowded

population. A major reason for Japan's Blitzkrieg against Sumatra, Java and Malaya was her desire to close these, the world's most important rubber-producing areas, to the western powers and thus stop their supplies of a strategic material in war. Along with rubber, also went cinchona which was needed for the manufacture of quinine. This too was an important commodity for soldiers fighting in malarial areas.

Conclusion

In ancient times wars were fought for women. Sita, Helen, Padmini and Samyukta are well-known examples. Later they were fought for the spread of religious faiths. In the sixteenth and seventeenth centuries gold, spices and perfumes made history. Present day wars are not fought for women, or religion, or even gold, but for cereals, rubber, petrol (a plant-animal product), coal, iron ore, beryllium, thorium, etc. Who knows that in future also the desire of countries and nations to control plant and mineral resources may lead to major events in the history of the human race? Indeed, plant power is world power.