HUNTED AND PLANTED AT VANDUSEN
A Selection of Stories about Plant Hunters and Living Fossils in our Garden
May 3, 2018

1. Plant hunters (PH)

Ever since the Romans brought plums, walnuts, roses and parsley to Britain the British have been foraging in all corners of the globe for plants that can be put to use back home.

The early American explorers brought back potatoes and tomatoes, and by the 1630s, more than 100 North American species of tree were being grown in England.

However, the 19th century (1800s) in particular saw a huge amount of money invested by nurseries and other patrons in the search for plants that might be popular garden varieties.

It was at this time that the PHs became entangled with politics (unless you had a "mentor" you had no funding) and colonialization – more about this later in our tour.

Also, the PH were not necessarily the discoverers – many assisted with classification (and reclassification). Species concepts and species delimitations often change when new evidence becomes available. Consequently, the names applied to plants and fungi may change. Classification continues to be an evolving science.

2. Definition of Living Fossils and Fossils

Like all living organisms, plants die and most of them simply decay; however, some of them survive as fossils preserved in rocks, and it is these remains which allow scientists to piece together the way plants evolved and when they became extinct.

However, “living fossils” is a contradiction in terms and there is no formally accepted scientific definition for living fossil, which Charles Darwin coined and used to describe organisms that changed very little for millions of years and which still are with us today. Of course, that does not mean that plants and animals have stopped evolving, which is a myth associated with living fossils. All organisms need to adapt to changing climatic conditions, no matter how old they are; we are generally talking about living fossils if a species has survived over millennia and has not produced new species.

There are 2 categories of living fossils: The first are organisms as described above, which have lived for millions of years, have not changed substantially and are still present today, as, for example cyanobacteria, the oldest living fossil which provides the most ancient record of life on Earth dating back 3.5 billion years.

The second category of living fossils are the plants which were believed to have gone extinct and were only known from fossil records and which subsequently were re-discovered in recent years.

3. Gingko and Kaempfer

The *Ginkgo biloba* is a true living fossil, native of China, and which has no living relatives. Fossilized leaf imprints date back 135 to 210 million years ago. The unique fan-shaped leaves and naked seeds of the Ginkgo have changed very little in more than 200 million years.

In 1691 the German naturalist, physician and explorer Engelbert Kaempfer discovered the Ginkgo in Japan while visiting Buddhist monks in Nagasaki and thus became the first western scholar to describe the tree and give it its name, which was then later also adopted by Linnaeus .

Kaempfer worked for the Dutch East India Company and stayed on the small man-made isle of Deshima off the coast of Nagasaki connected by a bridge to the main island, which was the only port open to foreign ships at that time. Japan was closed to Europeans for more than 200 years, because of problems the Japanese had experienced with Spanish and Portuguese missionaries who had been very successful in spreading the new religion in Japan. This caused alarm amongst politicians and local priests which led to the banishment of all foreigners in 1614. The Shimbara rebellion of 1637, which was believed to have been initiated by converted Catholic peasants, led to even stricter isolationist policies. All ports were closed to foreigners, and the Japanese in turn were not allowed to leave the country, and if they did they could not return - even the building of seagoing ships was prohibited. Only the Chinese and the Dutch who had not sent missionaries were allowed certain trading concessions.

Some of the foreign nationals living on this little island were invited to make an annual trip to Yedo (Tokyo) to visit and honour the shogun and present him with lavish gifts. These annual pilgrimages to Court were compulsory also for the native princes and lords. Plant hunters like Kaempfer and others that followed were able to collect hundreds of plants on the weeks-long trip to honour the shogun, although this had to be done secretly, as it was not officially allowed. Kaempfer carried in front of him on his horse a large box which he filled with plants, flowers and branches of trees and a compass concealed underneath it so that he would be able to keep track of the route. The party of 3 to 4 Europeans was escorted by 150 to 200 persons - interpreters, guards, carriers, cooks and servants, and it was thus difficult to make little side excursions from the official route. However, Kaempfer befriended some of his Japanese escorts who were very happy to help him collect plants and so was able to make the most of the 2 trips he made to Tokyo during consecutive years. However, on the flip side, Kaempfer was treated a bit like a performing circus animal

- closely guarded by day and locked in at night. On arrival at court, in his record about the trip, he writes that he was made to dance, sing, jump and mime European manners and customs for the amusement of the emperor and his hidden ladies.

Kaempfer noted that the seeds of the Gingko were roasted and eaten as a delicacy and for health and longevity and they were also on occasions painted red and served as a wedding gift. Engelbert brought seeds to Holland, and in the Utrecht Botanical Garden, one of the first Ginkgo trees was planted and is still there today.

Another interesting fact about the Ginkgo is that recently researchers working in China discovered an insect that lived 165 million years ago that they believe used its wings to mimic the leaves of an ancient Ginkgo tree. The specimen had been overlooked previously, as it had been interpreted as a five-lobed leaf sample embedded in ancient rock; but then it was discovered that it was actually a fossilized scorpion fly. Most likely the insect developed its mimicry abilities to evade predators or to help it hide from prey. They also noted that it might have been possible that the insect formed a partnership with the tree where the tree provided shelter and the hanging-fly ate bugs that might have eaten the trees' leaves. This was an interesting discovery, as most insects going back 100 million years tend to mimic flowering plants.

4. Gunnera

These amazing architectural plants which are also referred to as giant rhubarb, or Chilean Rhubarb, are native to Brazil and were originally brought to Europe by Belgian horticulturalist Jean Jules Linden. JJ Linden was invited by the Belgian government of the time to make an exploration of Latin American in the mid to late 1830s. He went on to make several expeditions. Although his personal passion was for orchids, he gathered many plant specimens for horticultural purposes, and he is informally recognised as having introduced *Gunnera manicata* to Europe. This giant semi-hardy perennial is named after *Johan Ernst Gunnerus,* the renowned Norwegian botanist of the 1700s.

In 1837, during the heart of plant-hunting fever in Europe, the first *Gunnera manicata* specimens were grown in the UK, and the first sighting of this plant having escaped landscaped gardens and begin flourishing in the wild was in 1935. These prehistoric-looking plants are incredible for their sheer size and stature, and landscape architects of the period readily included them in their grand planting schemes for the large estates.

Guaranteed, because of its gigantism, to be a show-stopping specimen attraction, Gunnera was irresistible to the Victorians, and colonies of *Gunnera manicata* can still be found today in the grounds and surrounding the lakes of many stately homes in Great Britain. Gunnera fits into our theme of plants having been

eagerly hunted and introduced to Europe for their exotic appeal and for also being considered living fossils as they were around at the time of the dinosaurs.

They are host to a cyanobacterium (Noctos punctiforme) that lives in its glands and provides the plant with fixed nitrogen, which the plant needs as it grows in nitrogen-poor soils usually at water's edge or in very damp and swampy environments. The plant provides the bacterium with fixed carbon, which it obtains through its photosynthesis.

This unique interaction happening between the cells rather than in the cells may provide insights to allow the creation of new symbioses between crop plants and cyanobacteria, allowing growth in areas lacking fixed nitrogen in the soil.

5. Araucaria

Another fascinating living fossil is the Monkey Puzzle Tree (*Araucaria araucana*), called Pehuen in Chile, and the native tribe who used to live around it were the Pehuenches, the people of the trees. The Pehuen stood at the centre of their lives. The tree was their religion, their sustenance both physically and spiritually. Nowadays it is the national tree of Chile and is protected.

Unlike other native tribes, the Pehuenches, a subgroup of the Mapuches, used the seeds of the Pehuen for most of their dietary needs. They were usually toasted and taste similar to chestnuts. They were also ground into flour for bread and fermented to make beer. When the tree was discovered by Westerners, they most likely were taken by surprise as the tree looks like no other tree. Its closest relatives, such as Kauri trees and Norfolk Pine, are all located in Australia and other nearby Pacific Islands. This is because their common ancestors date back to a time when the landmasses were linked into the supercontinent Gondwana.

Petrified forests in Patagonia show that they have been in the area since the late Jurassic, for nearly 200 million years. Jet, a type of lignite, precursor to coal, is a gemstone that forms from decaying wood under extreme pressure, basically fossilized Araucaria wood. It can be used to make highly polished ornaments and jewelry. In recent years wood carvers in the south of Chile have been digging the ground for semi-fossilized Araucaria wood, called picoyo, which is an amber-like material taken from the resin-rich knot between the main branches and the trunk of the tree after the tree has died, decomposed and left over a period of 1,500 to 2,000 years. This material is very hard to work with but results in beautiful works of art.

Archibald Menzies, a Scottish physician and botanist (1754 - 1842) was appointed by the British Government in 1790 to accompany Capt. Vancouver on the HMS Discovery on a voyage around the world. This was exactly 100 years after Engelbert Kaempfer was in Japan.

Commander George Vancouver had been instructed to take over from Spanish officers the property at Nootka claimed by Britain and to survey the northwest coast. They left England in 1794 and passed by the Sandwich Islands (Hawaiian Islands) on route to North America. Later, in 1834 when David Douglas visited these same islands he reported that the Hawaiians remembered Menzies as the “red-faced fellow who cut off the limbs of men and collected grass”.

After they had surveyed the coast south from Cook Inlet (Alaska), while heading home they stopped in Valparaiso, Chile where the officers of the Discovery were invited to a banquet in their honour by the local Governor. Some seeds were served as dessert, which Menzies found interesting. He proceeded to pocket some of these almon- sized pods and plant them aboard the Discovery. They reached England in October,1795, and by this time some of the seeds planted in Chile had sprouted into tiny little trees, which were initially simply called the Chile Pine.

However, Menzies did not really discover the Araucaria, as it had been discovered long before by the Spanish invaders and explorers in the 16th century. It was another famous botanist and plant collector, William Lobb, who hunted in South America for the firm of Exeter nurserymen Veitch who was instrumental in making the Pehuen widely available in Europe. Between 1840 and 1844 he collected plants in Brazil, Argentina and Chile where, in a province inhabited by the Mapuche Indians in Araucania he recognized a tree first introduced to England by Menzies years earlier. The five saplings Menzies had brought to England were considered a scientific curiosity and nothing more than that. Lobb, as a gardener, judged that this tree could be a big hit in Europe. He called it Araucaria and proceeded to send vast amounts of seeds back to England. His instincts proved right, and among botanists he became famous for having introduced the only known conifer from south of the equator to grow to timber size in a West European climate.

6. Umbrella Pine

This beautiful evergreen conifer was introduced to Europe by John Gould Veitch (1839 - 1870) in 1860 - he was a horticulturalist and traveller and one of the first Victorian plant hunters to visit Japan. He was the great grandson of the founder of the famous firm of Veitch of Exeter . He returned to England in 1866 and died of tuberculosis at the age of 31.

He had arrived in Japan in 1860 but was bound to keep within a certain distance of the treaty ports, and his movements were under constant surveillance, which greatly limited his plant-hunting activity, which was confined to a small area. Most of his collections were made in Japanese gardens and nurseries, but the enterprise was still highly profitable.

The Umbrella Pine is one of Japan’s five sacred trees and is known there as “Koya-maki”. Its Latin name is *Sciadopitys verticillata* (shadow pine with whorls). This tree

provides a glimpse into the pre-historic Japan and its history. In the Kyoto prefecture it was designated the “official tree”. Evidence suggests that the Umbrella Pine has a lengthy association with temples in Kyoto where it was the centre of worship roughly around 1300 CE.

The Umbrella Pine can be traced to the Triassic period, some 250 million years ago when the continents were joined and much of North America was near the Equator. At that time, the Japanese Umbrella Pine and its then numerous relatives flourished in what is now Eurasia, northern Europe and northern North America. But as the continents moved and flowering plants replaced conifers, the Umbrella Pine range and species diversification shrank. Today, this once successful family is reduced to just one species growing in the cool cloud forests of central Japan at elevations of 1,500 to 3,000 ft.

There is a debate on what plant family Baltic amber was produced by, with macrofossil and microfossil evidence suggesting a Pinus relative while chemical and infra red micro-spectroscopy evidence suggests relatives of either Agathis (Kauri Pine belonging to the Araucaria family) or Sciadopitys.

7. Rose Garden busts

Three influential men in the plant hunting world – Linnaeus for his contribution to taxonomy; Menzies – associated with the Araucaria; and Douglas – the tree guy – like our Roy Forster. Douglas, fortunately was noticed early by JD Hooker which provided him support to join the 3 expeditions to North America. On his 3rd trip to NA and Hawaii he "dropped off" citrus fruit (from South Africa) to provide for future travelers to restock. He introduced Douglas-fir into cultivation in Britain in 1827. Also introduced (not just about the discovery) Sitka Spruce, Noble Fir, many Pines and other conifers that transformed both the British landscape and timber industry

8. Davidia involucrata

The Dove tree or *Davidia involucrata* ("with a ring of bracts surrounding several flowers") is the only species in the genus. The oldest fossils are 100 Million – 66 million yrs ago. There are two varieties (one with short hairs underside, the other without hairs), but each has differing chromosomes therefore cannot hybridize.

The fruit is a very hard nut surrounded by a green husk which hangs on a stalk. The nut contains 3-6 seeds.

D. involucrata was named for Père David (https://en.wikipedia.org/wiki/Armand_David) who first described the tree in 1869 as a single tree found at over 2,000 m (6,562 ft) altitude. He sent dried specimens to Paris where, in 1871, Henri Baillon

(https://en.wikipedia.org/wiki/Henri_Ernest_Baillon) described it as a new genus and species.

Oldest fossils of the Davidia are from the Cretaceous period.

Scottish plant hunter Augustine Henry (https://en.wikipedia.org/wiki/Augustine_Henry) again found a single tree, this time in the Yangtse Ichang gorges and sent the first specimen to Kew Gardens.

The PH associated with the Davidia is Ernest Henry "Chinese" Wilson (1876 –1930) who introduced a large range of about 2000 of Asian plant species to the West; some sixty bear his name.

Wilson left school early to work at a local nursery. At 16 he worked at the Birmingham Botanical Gardens; then the Royal Botanic Gardens, Kew, where he won the Hooker Prize for an essay on conifers. He then accepted a position as Chinese plant collector with the firm of James Veitch & Sons (one of 12 plant hunters)

He was advised to "Stick to the one thing you are after," by Harry Veitch, who also said "every worthwhile plant in China has now been introduced to Europe". It's worth noting that many of the plant hunters did stick to one geographical area, for example Siebold in Japan and Linden in South America. Wilson did not stay in one area although his moniker suggests otherwise.

Wilson was first sent to China by Veitch specifically to bring back specimens of the Davidia. On his way to China for the first time, he stopped in Boston to learn how to pack plants from American botanist Sargent. Sargent also recommended that he go to Yunnan province in China to talk to Augustine Henry, who had seen the unique dove tree twelve years previously.

Though the tree had been recently cut down when Wilson reached it, he rediscovered the specimens first noticed by Père David 600 km away in Yichang, Hubei province. Wilson collected for two years in Hubei, reaching isolated mountain valleys with an intrepid spirit that has made him legendary.

He returned to England in April 1902 with seeds of 305 species including 16 Rhododendron species; 35 Wardian cases of bulbs, corms, rhizomes, and tubers; and dried herbarium specimens, representing some 906 plant species. Sir Harry Veitch presented him with a gold pin shaped like a *Meconopsis* flower encrusted with 41 diamonds.

As well as the Davidia, Wilson introduced to western cultivation the *Acer griseum*. It was discovered in the forests of central China and the seeds brought to England in

1899 and to the United States in 1901. The original specimens are still alive today. Seeds are still imported from its native area of China.

Also as a result of his first trip, Wilson introduced kiwi fruit, berberis, clematis, jasmine, primula and 25 species of wild rose to the West. From his second trip Wilson returned with 305 species and 36 Rhododendron species.

Wilson made a total of 8 trips to China, Japan, Korea and Formosa. He was an early western visitor to the Yaku-sugi stump (Wilson stump). This Yakusugi (old growth cryptomeria) cedar, (national tree of Japan) was the tallest ever and was cut in 1586 with an estimated age of over 3,000 years. Yakusugi is reserved for trees of 1000 yrs plus. Google it.

It was on his 1910 trip to the Min Valley in SW China that he broke his leg collecting the *Lilium regale.* After this severe injury he continued travelling to Australia, New Zealand, India, Central and South America and East Africa.

Wilson and his wife died in Worcester, Massachusetts, in 1930 in an automobile accident.

9. *Magnolia sieboldii* or Oyama Magnolia

Gardeners who grow plants of Japanese origin sooner or later come across species bearing the name ‘sieboldii’ or ‘sieboldiana' in honour of their collector Philipp Franz von Siebold (1796 - 1866). Some plants so named include *Acer sieboldianum*, *Viburnum sieboldii*, *Primula sieboldii*, *Prunus sieboldii*, *Malus sieboldii* and *Magnolia sieboldii*.

Philipp von Siebold followed in the steps of Engelbert Kaempfer just about 100 years later. He was also a physician, botanist and traveler who attained fame for his studies of Japanese flora and fauna and the introduction of Western medicine in Japan.

Siebold started his career as a military physician on a Dutch ship sailing to the then Dutch colonies of Batavia (Jakarta) in the Dutch East Indies (Indonesia) in 1823. The Governor-General there was so impressed by his knowledge not just medical but also botanical that he thought that Siebold might be a worthy successor to Engelbert Kaempfer, the former resident physician at Dejima, a Dutch trading post in Japan. Once there, Japanese scientists invited Siebold to share with them his knowledge of Western medicine while in return he learned their language and culture. After he had cured an influential local official, he obtained permission to leave the trading post which enabled him to roam the country side for new plants to send home.

Siebold lived together with Kusumoto Taki and had a daughter with her who later on would become the first Japanese female physician and the court physician to the Empress in 1882. Siebold amassed over 1000 native plants that he cultivated in a specially built glasshouse to prepare them for the Dutch climate. Amongst hundreds of plants he also introduced the Japanese knotweed, which would become highly invasive in Europe and North America. All of these derive from a single plant collected by Siebold. However, his luck ran out after either bribing or otherwise convincing the court astronomer Takahashi Kageyasu to give him several maps of Northern Japan and Korea, an act strictly forbidden by the Japanese government. When this was discovered by accident, he was accused of high treason and of being a spy, placed under house arrest and afterwards expelled from the country in 1829. He returned to the Netherlands with a total of 458 Japanese plants, among then this beautiful Oyama Magnolia with fragrant white flowers and crimson stamens that open in late Spring. Once the flowers fade, the 3” long seedpods show up in bright pink and later open to reveal brilliant orange seeds.

About 30 years later in 1859 Japan lifted the ban, and Siebold was once again able to travel to Japan from where he brought home Cryptomerias, Japanese Hornbeam, Hazel, Chestnut, Pines and much more.

Only a plant hunter with the prestige of Siebold was able to roam the countryside and collect from wherever he wished, while John Veitch, who had arrived in Japan at about the same time (1860), was bound to keep within a certain very limited radius of the treaty ports and his movements were under constant surveillance.

10. Rhododendrons and Joseph Dalton Hooker

The Rhododendron was described as early as the 1500s. By 1656 the Rhododendron seed was being introduced to Europe from North America. Linnaeus described 5 species in 1753, and by 1800 Rhododendron seed was shipped from Eastern Europe, Asia and the Far East. Still the Rhododendron remained rare in British gardens until the arrival of Joseph Dalton Hooker's collection of 45 species - from his 3 years (1848-51) in the Himalayas. This opened the flood gates for British plant hunters. The number of cultivated species of Rhododendron doubled by the late 1800's, largely due to these new discoveries from Hooker’s expedition to Sikkim.

The plant hunter associated with Rhododendrons (along with Forrest) is Sir Joseph Dalton Hooker (1817-1911) - an unsung hero. Outside horticultural circles, he is little known although his legacy is quite remarkable. As well as a writer, illustrator, taxonomist and botanist, Joseph Hooker can be considered the ultimate plant hunter. His father was a renowned botanist at Glasgow University and a director at Kew Gardens. Studying medicine rather than botany, Joseph Hooker used this qualification to get work as a junior surgeon on Royal Navy ships. Unlike his close friend Charles Darwin, Hooker was not personally wealthy and needed to find a way

to fund his plant hunting travels to far-flung lands. His ultimate aim on these expeditions was always to explore and record botanical life in little-known lands.

He gained experience on expeditions to Iceland and to the Antarctic before embarking on his famed plant-hunting mission to the Himalayas. The Himalayan trip lasted four years from 1847 to 1851 and yielded what has become known as the Hooker or the Sikkim Rhododendrons. This was his first funded plant hunting mission.

Hooker travelled to Nepal but also to Sikkim (between Bhutan and Nepal on the northern border of India), which at the time was a closed and secretive country. Gaining entry was no easy feat. In this and many of the more remote areas, he was the very first western traveller and at times he experienced trying and dangerous conditions, including imprisonment. The expedition proved to be a resounding success. Over this four-year period, he collected a massive 7,000 plant species, including 45 species of Rhododendron of which 25 were new to the world of botany.

Hooker was the first of the plant hunters to send large quantities of seed back to Britain. It is this fact that eventually made the Rhododendron widely accessible rather than a rarity. Shipping was a huge challenge. The seeds were collected by groups of local Indians who were specially trained by Hooker himself. The seeds were cleaned, sorted, labelled and packaged in readiness for the long journey by ship from Calcutta to England. The first batch of seeds arrived in Kew safely in 1849 and from there made their way around the country. Some propagation took place in Kew's own nurseries but also in commercial pl nurseries and private estates throughout the UK. These Rhododendrons mostly proved excellent garden plants and many went on to become the basis for breeding today's growing stock of rhododendron hybrids. Many of these Joseph Hooker Rhododendrons (or Sikkim Rhododendrons) are still "alive" in the Rhododendrons in the lost garden of Heligan, Cornwall and at Kew Gardens, planted in the late 1850's.

Tidbits

- Rhododendron is a genus of approximately 1,024 species of woody plants in the heath family (Ericaceae).
- Most species are found in SE Asia from Tibet to New Guinea with 28 species in N America and 4 in Europe.
- In the language of flowers Rhododendrons mean danger and to beware
- The honey from Rhododendrons is toxic to some people
- *R. macrophyllum* is the state flower of Washington state
- In terms of height, the shortest is 4 inches, largest = 100 feet
- Leaves range in size from .5 inch to 20 inches
- The large pinky-white Rhododendron in the Japanese area is yet unidentified – even by experts.

The taxonomy of the Rhododendron has been historically complex. In the beginning there were too few species to analyze the many variables. Then as more species became available the taxonomy was sorted in various ways, such as:

- Flower bud position and relationship to leave buds
- Scaling on the underside of leaves. These scales, unique to subgenus *Rhododendron*, are modified hairs consisting of a polygonal scale attached by a stalk.
- Grouping species into series by structure
- Habitat
- Chemicals produced by the plant

Much of the early taxonomy investigation was done by the Royal Botanic Garden in Edinburgh. The most recent taxonomy updates were in 2005 and 2011 as a result of nuclear genetics.

At present there are 8 sub genera (1 being "Rhododendron" and having 400 species) based on structure. Two of these are commonly known as Azaleas, having 5 anthers (part of the stamen that contains the pollen).

11. *Camellia sinensis* and Robert Fortune

It's all about addiction.

First a little history: Queen Elizabeth I granted charter to East India Company (EIC) in 1600 and by 1683 opium was a conscious investment of the company.

Tea became popular in Britain in the 1700's as elsewhere in Europe but it was expensive because it was grown and processed in China and the Chinese didn't need trade with Britain.

If Britain had control of opium and if they could trade opium for tea.... All they needed was someone to want it → addiction. Despite the Chinese Emperor's best efforts to prevent incoming opium on British ships ("opium wars") the British prevailed. Following the Treaty of Nanjing in 1842, (when Hong Kong was established), China was forced to trade with Britain. This is where "gun boat diplomacy" got its name. Opium was used to balance the trade of tea.

However, tea from trade wasn't enough and Britain wanted to secure tea long term and to avoid future interruptions (funny to think about Britain's need for the Chinese to be addicted to opium to ensure a supply of their addiction – tea). Robert Fortune had previously been sent out by the Royal Horticultural Society to collect plants in China. Having written a book on his travels he came to the attention of the EIC. Tea had already been introduced to Assam, India in the 1830s, but the crops lacked resilience. Fortune was recruited with others to "find" tea plants as well as information on propagation and processing.

Tea is complicated to process – the recipe was unchanged for 2000 years. Drying, firing, rolling and then for black tea fermentation (see Smithsonian.com "The Great Tea Heist").

In Fortune's early travels he discovered that local producers of green tea were doctoring their product with toxic additives to make it look more attractive for the export market. This must have spurred on his hunt.

In May 1849, he reached the remote black-tea country of Fujian province. Remember that this was still the time where westerners (perhaps rightly so) were forbidden to travel inland. Similar to other European travellers, Fortune disguised himself as a Chinese merchant. His purchase of tea plants was of course also forbidden.

He also illegally brought a group of trained Chinese tea workers who would facilitate the production of tea leaves. This was the key part of his mission; black tea was considered more valuable because it was more popular in the West. Often mixed with milk and sugar grown in the colonial plantations of the Caribbean, black tea had become a staple of the new urban populations of industrialized Britain. No one outside the traditional tea growing areas of China had the first idea about how it was processed until Fortune reached the Wuyi Mountains, in July 1849.

Fortune introduced 20,000 tea plants and seedlings to the Darjeeling region of India. With the exception of a few plants which survived in established Indian gardens, most of the Chinese tea plants Fortune introduced to India perished. However, the technology and knowledge that was brought over from China may have been instrumental in the later flourishing of the Indian tea industry and within a generation, India’s Himalayan tea industry would outstrip China’s in quality, volume and price.

In subsequent journeys Fortune visited Formosa (now Taiwan) and Japan. He described the culture of the silkworm and the manufacture of rice. He introduced many trees, shrubs and flowers to the West. Most of the roses failed in England but the *Rosa fortuniana* serves as a valuable rootstock in Australia and the southern USA.

Many plants are named after Robert Fortune, most notably the *Rhododendron fortunei*. He also was an early user of the Wardian cases.

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