*Hevea brasiliensis*

[Synonyms : *Hevea brasiliensis* var. *janeirensis*, *Hevea janeirensis*, *Hevea randiana*, *Siphonia brasiliensis*]

**PARA RUBBER TREE** is a semi-evergreen or deciduous tree. Native to Brazil (particularly the Amazon basin) it has small musty-scented, green or creamy yellow flowers.

It is also known as *Arbol de caucho* (Venezuelan), Brazilian rubber tree, Caoutchouc tree, *Capi* (Peruvian), *Jeve* (Peruvian), *Kaučukovník brazilský* (Czech), *Kautschukbaum* (German), *Mapalapa* (Surinamese), *Parakautschukbaum* (German), *Pokok getah* (Thai), *Pokok getah para* (Malay), Rubber tree, *Seringa* (Brazilian), *Seringuera* (Brazilian), *Shiringa* (Peruvian), *Sibi-sibi* (Guyanese), and *Yang-phara* (Thai).

When ripe the fruit still on the tree split explosively to expel the seeds (some authorities say as much as 120 ft.). In dry weather the leaves can turn red and yellow and fall. The whitish wood becomes a pinkish-tinged, light brown upon exposure to air.

The trees are tapped for latex, and a linseed-like oil is extracted from the seeds.

*Brasiliensis* means 'of or from Brazil'.

Some authorities believe that basketball and netball originated in Middle America. Many of them mention that the Mayan people (whose civilization was established by about 2000 BC and was at its height from 250-900 AD) played a game which involved hitting a large, heavy rubber ball through a stone ring on a sidewall of a special court. [And some of those same authorities point out that it is possible that the 'rubber' for this may not have come from *Hevea brasiliensis* but from a species known as Middle American or Panama rubber (*Castilla elastica*) which is a member of a completely different family – and that it was this 'rubber' that the Genoese explorer, Christopher Columbus (1451-1506), first saw and handled.]

In 1492 when Columbus discovered a small colony of Indians in Hispaniola (now Haiti) he saw children playing with small rubber balls and presented Isabella of Castile (1451-1504), Queen of Spain, with several on his return to that Country. About 30 years later when Hernando Cortés (1485-1547), the Spanish conquistador, was conquering Mexico records show that his men followed the example of local people and made their clothing waterproof with rubber latex (although it must have made the material extremely heavy). And later when Europeans penetrated the central Amazon region they found that the South American Omagua Indian tribe used rubber to make many items including footwear and bags. As yet however the significance of these discoveries was lost on the European explorers.

It was not until 1744, after Charles Marie de Lacondamine (1701-1774) had returned to France from his 8-year trip to South America, that scientific interest began to develop. Lacondamine, a French mathematician and scientist, had been sent to Peru ostensibly to measure a degree of the meridian, but he also explored the Amazon and returned with samples of rubber and information on the plant (as well as on platinum, quinine (*Cinchona officinalis*) and other discoveries). In his notes he mentioned the many uses he saw the local Indian tribes apply the tree to, including torches which burnt brightly, waterproof clothing, bottles and syringes (the latter made it would seem with design help from the Portuguese). Records also indicate that an industry that used the latex for

making various objects was centred by then on Pará (now Belém in Brazil) and in 1755 two thousand soldiers' haversacks and some pairs of boots belonging to King Joseph Emmanuel (1714-1777) of Portugal were sent there to be waterproofed with a coating of the latex. Apart from one relevant discovery however no dramatic turn of events occurred until the following century when matters were destined to take a rapid turn commercially. Of all European countries it was the French who maintained the greatest enthusiasm and interest in ascertaining the properties of this latex. In the 1760s they attempted, with some success, to apply their findings to advantage in the medical world and a French surgeon used tubing made from the material. But it fell to an Englishman, Joseph Priestley (1733-1804) who was a chemist of note (elected to both the French Academy of Sciences and the St. Petersburg Academy in the late 1770s), to identify rubber's ability to erase pencil marks from paper. Although seemingly little remarked upon today it was this discovery that is said to have led to the substance being christened with the name of 'rubber'. [Joseph Priestley was also a Presbyterian minister who managed to get himself branded as an atheist in the late 1770s. Public outcry against him was so great that eventually he moved to North America and died in Pennsylvania. Apart from any scientific legacy, he contributed a well-worn word to the English language.]

In 1818 James Syme (1799-1870), a Scottish surgeon, announced a new method of waterproofing which used the rubber latex. This was patented in 1823 for various rubber-proofed fabrics by Charles Macintosh (1766-1843), a Scottish manufacturing chemist. (The waterproof coats made with this fabric came to be known as 'mac(k)intoshes'.) During the same period an Englishman, Thomas Hancock (1786-1865), who had obtained a patent in 1820 for the 'application of a certain material (rubber) to render various parts of dress and other articles more elastic' was experimenting with a rubber preparation. He devised a machine that would chew up the compound and with it in this state he then invented a way of moulding it into blocks that were easier to handle in manufacturing processes. In the 1830s he and Macintosh were in partnership for a time. Their ventures led to an influx of rubber articles on the European markets ranging from driving belts, billiard-table cushions and surgical instruments to waterproof clothing, pillows and sheets. One particular problem continued to haunt them however. This rubber went sticky in sunshine.

Then in 1844 Charles Goodyear (1800-1860), an American inventor, discovered the secret of vulcanized rubber (sulphur added to and heated with rubber produces an elastic but relatively temperature resistant compound that was enhanced when associated with white lead) – a process fundamental to the production of all modern rubber products. Meanwhile back across the Atlantic another Scot who was an inventor and engineer, Robert William Thomson (1822-1873), was working on the form of a tyre that, to this date, had been solid. In 1845 he patented the principle of an inflated rubber tube or hose. Yet another Scot, John Boyd Dunlop (1840-1921) who was also an inventor, fitted such hoses to his child's tricycle in 1877 and two years later established a company, which was the forerunner of the Dunlop Rubber Company Ltd.

Roughly from 1880 to 1911 demand for rubber rapidly increased and at the same time the brutality meted out to the American Indians who tapped the felled trees (and were themselves overseen by further slave labour from Barbados) spiralled – and deforestation proceeded apace. The ugly régime led to thousands of deaths. Within six years in the Putumayo region alone it is estimated that about 40,000 American Indians died – while the proceeds of the rubber made many Europeans and North Americans extremely wealthy and with this built edifices such as a baroque opera house in Manaus in central Amazonia that was to attract some of the world's leading operatic luminaries of the period.

The Brazilian Government banned the export of seeds and plants but their monopoly of the lucrative rubber trade was not readily accepted by other nations. The British in particular wanted to establish their own plantations in south-eastern Asia. With this in mind they made several abortive attempts to grow seeds and plants, some of which were said to have been smuggled to England by an Englishman named Farris. Then in 1876 Sir Joseph Hooker (1817-1911), the then Director of the Royal Botanic Gardens at Kew, received a visitor in the dead of night. 70,000 seeds transported from South America, packed in banana skins (*Musa*), were delivered by Henry Wickham who is said to have chartered a small ship in Brazil and smuggled out the precious specimens in among seeds and plants labelled 'delicate specimens for Queen Victoria's gardens at Kew'. 2397 of the seeds were successfully germinated and most of these were sent to Ceylon (now Sri Lanka). 22 seedlings were grown in Singapore and, with improved tapping techniques, these became the parents of plantations and smallholdings that from a slow beginning in 1876 covered 200 million acres in Malaysia by the mid- to late 20th Century and, by the 1960s their latex was meeting 97% of world demand.

Initially Singapore is believed to have taken much convincing before participating in rubber production. The credit for ultimately achieving this is laid at the door of the then Director of the Royal Botanic Gardens in Singapore, Sir Henry Ridley (1855-1956), who probably did much to win his case when at the end of the 19th Century he devised the basis of techniques still used today for tapping the trees. (Until that time latex collection involved felling the trees.) Since the adoption of the initial tapping methods, these techniques have been further improved over the years and are now a highly skilled procedure. (If tapping is carried out inadequately it will not only affect the life of the tree but the latex yield.) The elements of it involved sloping incisions, or today punctures, that have to be treated chemically to encourage the flow of latex. These punctures are made in the bark to a precise depth and the latex is collected in suspended cups. The flow lasts 3-4 hours and the tree is able to renew this within the same area in a day. Well cared for trees have a 20-25 year life and can be tapped many, many times. By the 1960s, despite synthetic alternatives, worldwide rubber production had reached 2 million tons annually and this, at the end of the 20th Century, had escalated to about 5 million tons.

Today authorities note that rubber's greatest commercial demand lies in tyres for both aircraft and land vehicles, and it is also used amongst other things for sticking plasters. The seedoil can be used in soap.

In Malaysia very tender leaves are used for flavouring food. After shelling, boiling and several days of steeping and standing, the seeds have also provided food locally in Java (now part of Indonesia).

The hard seeds have been made into beads that have been used in ornaments and hatpins.

The sour-smelling wood has been burnt locally as fuel and has also been made into charcoal. It has also been used for manufacturing various boards, and for general construction and pulping for paper, as well as for making parts of furniture.