

CHAPTER III

NATIVE RUBBERS

There are few trees of more spectacular and at the same time scientific interest than the many odd species belonging to the fig or rubber family. There is only one species of this great genus which yields edible fruits of fine quality. I refer to the commercial fig so common in our South.

The common fruit fig is one of the oldest of all fruits. It furnished food to the primitive peoples of the East ages ago. The word *sycamore*, another name for *Pharaoh's-fig*, means fig-mulberry; in fact, a fig is a mulberry turned inside out. Almost all species of the genus *Ficus* may be easily reproduced from cuttings. Much could be said of many of these figs, such as *Ficus religiosa* the sacred-fig, the *Spanish-laurel*, and many others famous for various reasons. The wood of these trees is usually of little value, although it is recorded that the wood of *Pharaoh's fig* was used for mummy cases in Egypt. Those ancient embalmers knew how to preserve wood as well as other things. The forester is interested in the edible fig only as a dessert, but *Pharaoh's fig* may prove a wonderful wood producer. It grows with great rapidity in climates free from frost, is free from disease, wind resistant, and withal a very beautiful shade tree.

Many species of this genus have the *banyan* habit. The world has known the East Indian rubber for years. As a pot plant it was in every vestibule. The leaves were wiped clean of dust by every housewife. The rubber in the hallway was usually attended with the same scrupulous care as the canary or the cat. It yielded rubber in India in the early days, but better

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trees of another kind were found in Brazil. The sacred-bo resembles a poplar, in fact is called in Mexico the "Cuban-poplar."

Our great interest in the banyan is botanical. It forms a forest in itself—a forest that is not easily uprooted and a tree which really never dies unless killed by accident. The true banyan is called *Ficus banian*. The common East Indian rubber is *Ficus elastica*. The leaves of several species are cut in great quantities for camel and elephant fodder.

The Hindu word for trader is banyan, and the merchants no doubt spread their wares in the shade of these trees for sale. They were probably the first market places.

The largest banyan tree that I know of is on one of the Howe Islands in the Indian Ocean. It covered nearly seven acres. One near Calcutta lost a couple of acres in a hurricane. In referring to the banyan the poet Milton quotes from Pliny the following words:

"Branching so broad along that in the ground the bending twigs take root; And daughters grow about the mother tree, a pillared shade, High over-arched, with echoing walks between."

These trees have really reached a high state of development. First they start as an epiphyte high above the ground where they are safer from molestation. They seek the shelter and protection of another tree. An epiphyte is a plant which lives upon another plant without stealing any of the sap from the living tissue. It prefers a hollow place where the tree is injured—a place where a limb has been broken or in a crotch where moisture and humus have accumulated. The hollow at the base of the fronds of a palm is a favorite starting place. The seed is carried by birds. These rubbers therefore have developed the habit of starting above ground and use birds for distribution.

In many tropical forests especially Brazil, there are

zones or layers of living creatures varying as you ascend. There is a series of floras and faunas in every tropical jungle.

The roots of these figs are delicate creeping tendrils at first. Like tender threads they descend to the earth where they gain a footing. Then the tree becomes a terrestrial plant and is no longer an epiphyte. These air-roots soon grow thicker and stronger. They envelop the tree trunk. They anastomose or grow together and the tree which is now a host is strangled to death. The roots, now stems, graft together. The dead host rots, the strangler feeds upon its decaying body which is soon consumed. The roots have become trunks and finally one trunk. Then the tree trunk begins to form rings of wood like other trees but a section of the tree will show several small trunks all joined in one or encased in another trunk. This **strangler-fig** habit is exaggerated in the **banyan**. The roots drop down from the limbs and the tree in time becomes a forest in itself.

This banyan habit seems to me like a very high state of plant development. Although the flowers of this tree are insignificant they are usually fertilized by insects of some kind and birds are utilized to carry the seed. Strangest of all is this development of longevity, because the tree or parts of the tree can live on for ever unless killed by accident. It can usually withstand typhoon or hurricane. It is a natural slat-house. The tree produces forest effects. Instead of many trees growing together crowding one another this tree possesses the land and joins the whole into one congenial formation. If the main trunk is not in a fertile spot some of the minor trunks better located will in time supercede it and thus feed the whole. Any one of these trunks separated from the rest would go on growing. It is usually rated as a weed—a strangler. It is really a cooperative colony. They are cut with machetes by foresters and checked in their strangling habit but if a use could be found

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for their wood they ought or might prove the strongest and best of all our trees. They all contain rubber but not enough for commercial purposes. This rubber, however, was put there no doubt by nature to protect the tree from injury. It forms a scab over wounds. It is also fireproof. The soggy wood when green refuses to burn.

There are many strange things in the vegetable world too numerous to mention. Many things apparently are working to no purpose along lines that are leading nowhere, perhaps even to the plant's destruction, but here is the one tree that is going forward, developing a sure method of future forest control, vigor, ease of reproduction, in fact everything pointing to its perpetuity. I have heard it referred to as the octopus of trees. Some trees that start with corkscrew roots apparently choke themselves to death. They appear to commit suicide. Not so with the rubbers. All manner of twisting and turning seems to in no way interfere with the flow of sap and active growth.

There is a lesson worthy of careful study in the banyan. The way to learn the right way is to study nature's way. She has been experimenting a long time. Plants in man's hands lose their personal initiative. Many of nature's experiments have been failures, many still existing are failing. The banyan experiment looks like a success.

In Florida there are two native species of fig, *Ficus aurea*, the strangler-fig and *Ficus brevifolia*, the poplar-leaved fig, but over in Mexico and Central America there are many species. Out in the Everglades region, wherever the land is a few inches above the general level, these wild rubbers grow. On canal banks, in fact every where the seeds can find a lodgment they grow with great vigor. Standley, who is an authority on the wild-figs or rubbers of Mexico and Central America, calls some of them hemi, or half, parasites. He speaks of their clinging with snaky

roots to rough rocky cliffs. These snaky roots are in search of food. From the bark of these trees the Indian manufactured a fine lasting quality of paper. Perhaps some day we may grow these trees, grind the wood into pulp for paper and then reclaim at the same time the rubber which is present in almost every species. The common name in Mexico is "amate" meaning paper. This word is retained in several very beautiful place names, such as Amatitlan, meaning "among the fig trees" and Amatepec, "the hill of the figs." Some species of these strangler-figs may serve us yet. Their marvelous vigor or vegetative power may be guided by the hand of man to do his bidding.

The roots of some of these rubbers are often of such shape that they penetrate clefts in rocks which in their process of growth, they pry apart or flatten themselves out over the surface of the rock. They accomodate themselves to all kinds of situations. There is one species, *Ficus repens*, at first a delicate vine clinging close to rock walls. As soon as it establishes itself it thickens into a sturdy shrub and later on if its supports are removed, it may actually develop into a small tree.

It would pay us well to study carefully the uses to which the Indians of North and Central America put certain trees. Much that we have used is already of Indian origin. Careful study of ancient records and archæological relics might yield some very valuable hints—in fact these Indians were many centuries in one location and their use-knowledge of the things around them was equal to that of today; in fact many of these uses have been neglected and forgotten. In history and archæology, you cannot separate the plant, the place and the people. They must be studied together.

In tropical America there are many species of *Ficus*, little known, with their roots in strangling embrace of others resembling the writhing of a mass of

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serpents or constrictors which live in the tree tops. The Indians called them the snake-fish or eel trees, because in the wetness of the tropical forests, these tortuous slippery roots resemble a mass of wriggling slimy eels.

They all yield rubber of some kind and the great quality of rubber which gives it a prominent place among our daily needs, is its elasticity. When vulcanized, however, into hard rubber by union with sulphur, it is formed into countless articles of daily use.

Even when robbed of its main quality it still remains one of the most useful of modern articles and in many ways one of the most subtle.

Except for the fact that American Indians played ball with round masses of tree gum, it is a very young industry. Millions have been won and lost in the rubber industry. Millions of people ride in rubber tired vehicles and some have recommended its use in road construction in preference to asphalt or concrete. A thousand years or more ago it was used to waterproof fabrics by a Central American race of Indians. Its old name was *caoutchouc*, which sounds like a sneeze or a cough and no doubt cooking rubber had this effect. The best name of all is the Dutch name "*gomelastiek*," in common use in Dutch possessions in the Far East.

It is in the milk of close to one hundred species of plants, trees, vines and bushes. It is found in small quantities in many species of plants even in the beautiful goldenrod, so common in northern fields and by northern roadsides.

In 1876, an Englishman succeeded in getting a consignment of rubber seeds out of Brazil, labeled "scientific specimens." They were rushed to Kew Gardens, where they were tended and then the little plants were shipped to Ceylon and Singapore, and from these the great rubber industry of the Far East has developed. The greatest rubber producers of

today are species of the genus *Hevea*, of Brazil, especially in the great Amazon Valley, where there are still many wild trees which cannot be profitably tapped in competition with the cultivated plantations and cheap labor of the East. Perhaps it is possible to produce rubber as a by-product in the manufacture of paper pulp from any of the wild rubbers that grow in the Caribbean region. There ought to be a better way than mutilating the bole, to secure the product. The removal of the latex from any tree, whether caoutchouc, chicle or balata surely arrests its growth; in fact, trees may be easily killed from excessive tapping. It seems to me it is a good silvicultural rule to let a tree mature, then tap it and then use it for lumber or pulp. Maybe some day, gums will be successfully extracted from leaves and twigs of many species of trees.

Rubber tree culture becomes more and more of a horticultural than a silvicultural operation. When horticultural methods begin and man digresses from the silvicultural or natural method of cultivation under forestal conditions, many other troubles will also start which might in time kill the industry. Trees are living things and when grown out of their natural environment will stand only a certain amount of culture. The huge previous profits in this business have led many plantation owners to many extremes in order to produce the largest possible amount of rubber and the largest possible dividends to stockholders. There are still many rubber yielders of many kinds in the western hemisphere. There are still many rubber plants in our jungles which have never been investigated. By the time they have all been thoroughly studied, the chemist will be producing rubber and then only as a pulpwood byproduct, will natural rubber be able to compete. Rubber from the common *Ficus elastica* was at one time boomed and extensively planted in the Orient. The rubber was of low grade, but it might still come back if the

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trunk and limbs of the tree could be used for paper pulp. The demand for pulp for various purposes is so enormous that even sugar from cane may become a byproduct.

The chemists have worked on rubber close to fifty years and there is a lot about it which is still not clear to the layman. Some species of a genus may have rubber, others may not. It is not a resin or a starch or a sugar or an oil. It is a gummy hydrocarbon. It joins readily with sulphur and other elements. The little globules are suspended in the liquid, in the form of an emulsion which gives it the white color like milk. These globules settle and join together to produce the substance called rubber. Take the milk of almost any of these plants, drive off the water with a little heat, and the residue will be a stretchy mass called rubber. This rubber floating in the milk is easily coagulated in several ways. Just what happens in this process of coagulation, nobody seems to positively know. This latex or milk in plants is not the sap. It is a special substance produced in tubes or ducts for some special purpose. Resin is produced in resin ducts. Latex or milk is produced in latex tubes in many plants, such as the fig, the dandelion, the milkweed and countless others of the Tropics. This latex in some instances contains sugar, oil, starch, tannins, gums, resins, and salts of magnesium and calcium. The milk of the cow-trees is consumed by the natives. Some think they are for food storage; others that they are simply reservoirs of waste materials; others a pad so that the roots can twist without choking; others for resistance; and others admit that they are guessing. It would form a scar over the wound in case of injury. It rarely deters animals because the foliage of many milky plants is relished by horses and cattle. Although because of the great amount of money involved in the industry the latex of rubber trees has been carefully studied; no one has discovered its purpose. It is there because it is there

and may have no purpose, though it probably has its purpose; otherwise the tree would not suffer if excessively tapped. If all this rubber in plants has no real purpose it is surely a lucky break for mankind, since fully half of the population of the world is riding on it in some form or other every day.

After many years, I watched them raise the Maine. The rubber rugs were as good and as bright as new, although covered with mud and salt water for years and the tire on the rear of your car will go bad even if never used. It is saved by use and although dead is called live according to its stretchability.

Perhaps years hence, these native rubbers or better species from nearby countries may be planted in the Everglades to yield both paper pulp and rubber, two of the most necessary of modern products. All the limbs ten feet long and as big as your arm, may be stuck in the ground and they will root and grow. Like the plan of the pine trees, they may have even less than a five-year rotation. Regardless of the synthetic chemist, he must have crude, cheap materials as a basis and there are few things cruder and cheaper than wood.