

CHAPTER XI.

MAHOGANY IN SOUTH FLORIDA AND THE WEST INDIES.



BEFORE describing mahogany wood let me quote some statistics as to the quantity imported into this country and the value of the import. I don't know how reliable these statistics are. They are furnished by the Government and are probably approximately correct.

In 1908 41,678,000 feet of mahogany were imported into this country. Its value is given as \$2,566,954, an average of \$61.56 a thousand feet. This represents the price actually paid for it laid down in our ports, two-thirds to Atlantic and one-third to Gulf ports. Central America, Mexico and the West Indies furnished 65.5 per cent, South America 2.2 per cent, Africa 13.8 per cent, Asia 0.40 per cent, and 18.1 per cent came through Europe, mostly from England.

Mexico, Nicaragua, British and Spanish Honduras, Cuba and Santo Domingo furnish the bulk of the mahogany used in this country, and some which reaches us through Europe may have come originally from one of these places.

The value of mahogany from tropical America was \$51.75, of that from Africa \$51.13, of that from South America \$52.79, all about the same, while that which came through Europe was worth twice as much, \$105.78 per thousand, and that from Asia \$88.63 per thousand. The great difference in the price is probably due to the fact that the wood was of special, selected quality.

Mahogany and other cabinet woods are often shipped to England and then reshipped. Only a hundred miles across the

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Straits of Florida is the island of Andros in the Bahamas, a British possession. The same kind of mahogany is produced there that grows on our Florida Keys and near Cape Sable. This Andros mahogany has been shipped to England from time to time and I have no doubt that some of it crosses the ocean again to New York.

It easily may be seen from the above figures that up to the time the retailer gets hold of it, mahogany is not an expensive wood. It makes a great difference in this world whether one is buying or selling, and the difference between the price the consumer pays and the price the producer gets is very wide, especially on products of the soil. In many cases I have no doubt that there is fully \$50 worth of hard human labor in almost every thousand feet of mahogany landed in American ports. There is small profit in it at this price.

Mahogany is usually scattered in a tropical forest and is often transported with the greatest difficulty over rough roads or no roads with the crudest kind of vehicles and other apparatus to the nearest shipping point. Some small logs are often carried by pack mules over slippery and precipitous trails, while the transportation of a log for a mile or more on the heads of three or four negroes is not uncommon.

One reads statements of the fabulous prices paid for mahogany. No doubt at times special logs will bring a high figure, but for years I have endeavored to trace every such statement to its source and I have found them all unreliable, exaggerated, or out and out figments of the imagination. Four or five months ago a popular American magazine published the statement, under the heading of "Notes," that two mahogany logs had sold in Liverpool for \$1,500. I wrote to the magazine and it claimed it took the note from a newspaper. I wrote to the newspaper and it said it found the statement in a book on timber published in 1870.

Logs sometimes bring high prices, but I think it is safe to assume that it happens rarely. A large part of the tree is usually left in the woods anyway and if the wood had such value it would pay to make a special trip to the spot just to get the stump.

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It will be seen from the statistics quoted above that 34.5 per cent of our mahogany comes from South America, Africa, Asia and through Europe. Just what trees yield this wood I am, of course, unable to say. I am also, I think, quite safe in saying that nobody knows. There is a whole lot of wood which sells for mahogany, which looks like mahogany, and which brings just as much money as mahogany and may be just as good, but it is not all mahogany from a botanical standpoint. Nobody can tell the species of tree that yields a tropical timber by merely looking at the log. Without leaf, flower or fruit, or even bark, the naming of the tree which yielded the timber is simply the purest kind of guesswork.

English tramp ships are running to all parts of the world. They pick up here and there small lots of anything marketable. A mahogany log, using the term "mahogany" in a commercial and not a botanical sense, on the wharf of an English port may come from one of many places and may be the product of a tree which looks no more like the mahogany tree than a peach resembles an apple. Mahogany in a commercial sense applies to any wood that will sell under that head; in a botanical sense it applies only to *Swietenia mahagoni*. I have heard of expert mahogany dealers in England, and I presume we have the same in the United States, who can, as it were, look right through a mahogany log, tell to a surety the kind of grain it will yield and the country which grew it. There is not the man living who from the appearance of the log or the finished wood can tell whether it came from Honduras, Mexico, the Bahamas, Cuba, Santo Domingo, Asia or Africa. It is very much the same with coffees. Java, Mocha and Rio are very often picked from the same tree. Some time ago I sent a sample of Florida mahogany in the form of a block two inches square to a mahogany dealer. He wrote back that the sample "evidently came from a tree five inches in diameter. Please send sample from a tree two feet in diameter." I don't believe the man is living who can tell from a block of wood two inches square without sapwood or bark whether it came from a tree five inches or five feet in diameter or whether it came from the top of a large tree or from a

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limb. The sample above referred to came from the heart of a large branch which had been reserved for boat timber. Close to a tropical seashore the limbs are usually much bent by the prevailing winds, but the wood is of very good quality and especially fine for boat construction.

The wood of the mahogany tree, in fact of every tree that I know of, varies very much, depending upon the conditions under which the tree grew. It must be borne in mind that the mahogany tree, although it cannot stand frost, will grow under other very adverse conditions. It will grow on hot coral rock on the Keys of Florida. Sometimes it is so close to the sea that its foliage is sprinkled with ocean spray. It will grow in parts of the West Indies where there is hardly a drop of rain for over six months at a time, and it will grow on steep mountain sides high up in crevices of the rock. In such places where the growth is slow, the wood is heavy and rich in color and grain. In warm, tropical valleys where there is an abundant and constant supply of moisture and where the tree is actually intoxicated with the very richness of the soil, its growth is rapid and the wood is light and of less value. In Florida it usually grows in hardwood thickets called "hammocks."

Some say that much of the mahogany on the market is really *Cedrela* or Spanish cedar. This may be so, since Spanish cedar from a tree which grows very slowly is hardly distinguishable from the wood of a mahogany tree which has grown quickly. Spanish cedar and mahogany trees are closely related, although they do not look alike. The mahogany looks something like a live oak, while the *Cedrela* or Spanish cedar looks like a *pecan*. From my own observations in the American tropics (Mexico, Honduras, Cuba and the Bahamas—there is no mahogany in Porto Rico) mahogany logs are cut for shipment at Atlantic and Gulf ports from the mahogany tree *Swietenia mahagoni*.

Color is perhaps the first quality in wood which attracts attention. We have in the tropics white, red, yellow and black woods—the same as in races. Many tropical woods are dark in color, in fact I think dark colors predominate, especially reds and browns. Mahogany is usually a rich reddish brown not

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unlike the color of the skin of a good healthy red Indian. According to an official color scale, 25 parts red, 64 black and 11 orange produce the shade called "acajou;" 85 of black to 15 of orange "mahogany," and 83 of black, 4 of red and 13 of orange form "mahogany brown."

There are floors in parts of the tropics made of plank cut from the log by hand and from such woods that the colors alternate red, white and black. I believe that a good, rich, reddish brown is a normal color at least for the tropics. In the races pure white is just as abnormal as jet black. At any rate a reddish brown color is a good characteristic. There are more bay horses than any other color, and in Spanish America they say, "A tired red horse is a dead horse," meaning, of course, that a red horse is so tough that he never gets tired. In my own experience red poultry and red pigs do better in the tropics than those of other colors. The tips of very tender foliage are usually red. This is especially so in the tropics, but is not uncommon in the North, as with roses, Virginia creeper, etc. There is a red liquid in the outer cells of the plant which probably serves the purpose of screening out the actinic rays of the sun.

Unless one has strong race prejudice, and one usually gets over that if he lives in the tropics long, a rich, healthy, brownish red complexion is the handsomest of all. Of course mahogany wood varies in color, but reddish brown is the standard. It must not be dull but full of luster. In some cases when finished it has a satiny look which adds much to its beauty. Its color should be a rich red, darkening with age. In some woods this luster reaches a stage called "fire." Cape walnut, called also cannibal stinkwood, for instance, according to Stone, "exhibits much 'fire' or phosphorescent luster." Mahogany is cold to the touch. Birdseye mahogany is not uncommon and is produced by scars due to sap-suckers. In the Bahama Islands the mahogany is often badly ringed by sap-sucker holes.

We look upon mahogany as a cabinet wood. In the countries where it grows it is used for every purpose that a wood can be put to, not excepting fuel. It makes excellent shingles

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and was once used for this purpose in Jamaica. I believe that defective trees, limbage, etc., might still be profitably used for this purpose. A house shingled with mahogany would be handsome without paint or stain. It would surely last as long as any wood and might not cost much more than first-class cypress. Shingle billets could be easily carried from the forest on the heads of negroes. Although often used for floors it becomes very slippery.

It is a combination of useful qualities with beauty which has made mahogany famous. Its popularity is founded upon true worth. It is heavy, very hard, close-grained, very durable and takes a fine polish. It seldom warps, cracks or shrinks under trying conditions if properly seasoned. Many tropical woods crack badly when taken north, but mahogany stands all climates and lasts well under water if kept constantly wet. It is seldom attacked by wood-eating insects, but is invaded by wood-boring crustaceans if left too long on the seashore. It is mostly all heartwood. It usually has only a thin yellow zone of sapwood. Its only fault is the fact that it is hard to work. The annual rings which ordinarily make the grain of wood are often very indistinct in mahogany. In many cases they are not "annual" at all. Several rings or additions of wood may occur in a year. Many times what appear at first sight to be rings in tropical woods are merely bands of color.

Mahogany must dry a little in order to float well. Sometimes the trees are girdled on the stump, some time before cutting, and sometimes they are left to dry in the shade of the forest. In case one wants a fine grade of wood for boat building, "mud seasoning" is good. Thus buried in mud a slow osmotic seasoning takes place which produces a wood of very superior grade. The wood has no special taste or smell. It colors water red.

It was the first tropical cabinet wood used in Europe and for two centuries has had unabated popularity. It has figured more or less in literature but never more conspicuously than in the following short and charming ballad by Thackeray:

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"Christmas is here;
Winds whistle shrill,
Icy and chill,
Little we care:
Little we fear
Weather without,
Sheltered about
The mahogany tree.

Once on the boughs
Birds of rare plume
Sang in its bloom;
Night-birds are we:
Here we carouse,
Singing like them,
Perched round the stem
Of the jolly old tree."

The mahogany tree is strictly tropical. It can endure only a small amount of frost. Tropical Florida, south of Lake Okeechobee, is its Northern limit. It grows in the Bermudas, which are farther North, but owing to the position of these islands in the ocean, separated from the mainland by the warm water of the Gulf Stream, their climate is tropical.

It is of course a waste of time and money to try to grow mahogany in Northern regions. I mention this because I have received requests for seeds or young plants from Northern people. Although frost-tender, it is otherwise a hardy tree. It grows in all kinds of soils high in the mountains and so close to the seashore that it is sometimes killed by floods of salt water during severe storms. During a hurricane in Florida in the fall of 1906, mahogany trees a foot in diameter on the Keys were killed by the salt water which poured over all the lower portions of these islands.

In speaking of its hardiness, Rea, a surveyor of the British War Department, says: "The tree is of comparatively rapid growth, reaching maturity in about 200 years, the trunk exceed-

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ing 40 to 50 feet in length and 6 to 12 feet in diameter. It is very handsome, with enormous branches of solid timber; and rather strangely, when it springs from low levels and rich soil the wood is most inferior, being poor in color, soft and spongy, and consequently almost valueless.

"That, however, which has been grown without nourishment on high levels, save what it derives from the atmosphere, is hard, figured, densely close in texture, as well as rich and deep in color, all qualifications which enhance its worth. It is also a curious fact that the tree does not seem to have any partiality, as it will flourish in low, marshy ground, or in a deep alluvial soil, or even on rocks to all appearance barren of earth; in fact wherever the seeds chance to drop. Its development is more rapid in the shade than in the open."

The above corresponds with my own observations, although I have never seen mahogany trees 12 feet in diameter. There are trees now standing on Key Largo, Florida, from 4 to 5 feet in diameter and I have seen trees in Cuba 9 feet in diameter. Many of these tropical trees are heavily buttressed and only carry such size a short distance up the stem. Such trees are often cut ten feet from the ground. Mr. Rea lived for four years in St. Lucia and his observations are probably correct.

Mahogany seldom grows alone in pure stand except perhaps in small clumps here and there scattered among a great variety of other trees. It seems quite able to hold its own and abandoned clearings usually show many young mahogany trees. The fact that it endures some shade permits it to grow where many other trees would never start.

In the forest it grows, of course, taller than in the open, but it nevertheless likes to spread as does the beech. Some mahogany trees which have been left for shade in pastures in the West Indies, especially in Jamaica, are truly magnificent in their spread, having a stately and sturdy look defying even the fierceness of tropical gales. Strange to say there is no mahogany in Porto Rico. I have heard of one or two trees on the island, but in the unsettled Luquillo Forest, now a federal reservation, I could not find a single tree. It grows in the island of Culebra,

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only a short distance to the eastward, and in abundance in Santo Domingo, only a short distance to the westward.

It is hard to believe that it could have been completely exterminated on the island. I believe such must have been the case, however, since place names often give one a clue to the character of the primeval woods. For instance, there is a place called "Mangler Caoba Laguna Soroco y Grande." Mangler refers to mangrove, caoba to mahogany, and I presume mahogany once grew on the edge of the mangrove swamp or on islands in the swamp just as it does on the south coast of Cuba, Florida Keys and in the Bahamas. Although Cuba and Santo Domingo have been settled for about the same length of time, they have never had the population of Porto Rico. The scarcity of Spanish cedar on the island tends to strengthen the belief that both of these trees have been practically exterminated.

The mahogany is a prolific seed bearer and will grow in almost all locations with sufficient warmth and moisture. It is these qualities which enable it to hold its own in the majority of places where it grows. Browne in his "Trees of America," published in 1857, describes the tree fairly well as follows: "The *Swietenia mahagoni* is one of the most beautiful among inter-tropical trees. Its trunk is often 40 feet in height and 6 feet in diameter, and it divides into so many massy arms, and throws the shade of its glossy foliage over so great an extent of surface that few more magnificent objects are to be met with in the vegetable world. Its summit is wide and spreading, sub-evergreen, and adorned with abruptly pinnate, shining leaves. The flowers, which are produced in handsome spikes not unlike those of the lilac, are whitish, sometimes reddish or saffron color and are succeeded by fruit or capsules of an oval form about the size of a turkey's egg. The fruit ripens in early summer, bursts into five parts, and discloses its winged seeds, which are soon after dispersed by the winds; some falling into the crevices of rocks, strike root, then creeping out on the surface, seek other chinks or crevices, re-enter, and swell to such a size and strength that at length the rocks are forced asunder, to admit the deeper penetration of the roots and in this manner, in process of time,

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increase to large trees." The flower is not conspicuous but the large brown hard capsule incites curiosity. It splits in five segments from the under side and the seeds, which are winged like maple seeds, flutter to the ground. On the Florida Keys these ripen in midwinter.

How the tree can get a foothold on some of these coral islands is wonderful. The rock is hard and hot at times and the soil is so scant in some places that I believe it would be difficult to scrape together a wagon load on an acre. Mahogany may be easily grown from seed and the young plants may be easily transplanted. Last winter was a great seed year (1908-09). Trees ten feet in height were full of seed. In places on the Florida Keys one could collect seeds enough in a few hours to plant hundreds of acres. It is a common saying that trees fruit heavily a year or so after a severe hurricane.

The State of Florida is now engaged in draining the Everglades. If this project is successful, and I can see no reason why it should not be, a large amount of land will be reclaimed and although much of this land will be too valuable for tree planting, there will, no doubt, be many acres better fitted for forest trees than for field crops. This land would probably produce mahogany to perfection. Some trees should be planted for shade at any rate. The mahogany trees frequently grow on islands in the mangrove swamps.

Florida mahogany has been shipped to New York. The trade did not like it, in fact they found all kinds of fault with it. The logs were too small, which was due to the fact that the big logs were too heavy to handle. They claim it had black specks in it, but Honduras mahogany often has gray specks in it. In truth Florida Key mahogany is just like the Andros Island product. If we were to ship it to Liverpool and then reship it to New York it would sell no doubt to better advantage. Andros Island is only about fifty miles away and very similar in almost every respect to the Florida Keys.

In speaking of Andros mahogany Rea says: "It grows to a large size but is generally cut to small dimensions owing to the want of proper roads and other means of conveyance. It is

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principally used for bedsteads, etc., and the crooked trees and branches for ship timber. It is a fine, hard, close-grained, moderately heavy wood, of a fine rich color, equal to that of Spanish mahogany, although probably too hard to be well adapted for the purposes to which the latter is usually applied." The above description applies exactly to the Florida variety.

It is commonly thought that hard, heavy woods grow slowly. This is not always the case. The northern black locust is a hard, heavy wood, but it grows very quickly. The same is so of some species of eucalyptus. On the other hand some soft light cedars grow very slowly. Mahogany is usually considered a slow grower.

If one counts the rings of a tropical tree and allows a ring to a year, as is common in the North, he is very apt to get fooled. He should first of all make sure that they are rings and not merely bands of color and then make sure that the tree in that special locality makes only one ring a year. Whenever a tree drops its leaves growth stops and a ring is formed. When a tree is rooted in a rich moist soil in a warm climate, it has no struggle except against its neighbors. It seems to do very much as it pleases.

In a paper read before the British Association for the Advancement of Science on "Foliar Periodicity in Ceylon" by Herbert Wright there is the following statement: "In studying the behavior of our deciduous trees, the most usual conclusion is that no law and order prevails and any tree drops its leaves how and when it chooses. There are, however, certain features which point to a climatic response, and others which indicate that the personal or internal forces are the chief agencies at work."

It seems strange to speak of the "personal" forces of trees, nevertheless the study of trees in the tropics, which is biological headquarters, leads one to the conclusion that they have, to say the least, many idiosyncrasies. Some trees will drop their leaves before and after the rainy season, some during the wet weather, some will throw out new leaves at certain seasons of the year regardless of the weather, and so on with similar peculiarities in

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reference to flowering and fruiting. I have never seen a mahogany tree drop its leaves all at once unless when injured by flood or fire. Its foliage always looks the same. Sometimes it may be a little greener and there may be more young shoots at one time than at another, but its growth, judging from the appearance of its leaves, is practically continuous.

"When M. de Charnay visited Palenque in 1859 he had the eastern side of the palace cleared of its dense vegetation in order to get a good photograph; and when he revisited the spot in 1881 he found a sturdy growth of young mahogany, the age of which he knew did not exceed twenty-two years. Instead of making a ring once a year, as in our sluggish and temperate zone, these trees had made rings at the rate of about one in a month; their trunks were already more than two feet in diameter; judging from this rate of growth the biggest giant in the place need not have been more than two hundred years old, if as much." (The Discovery of America, Fiske, Vol. I, page 156.) The rings indicated that those trees were over two hundred and fifty years old, while in reality they were not over twenty-two and possibly younger.

In Vera Cruz wires are run from one tree to another on which the vanilla vine is grown. The vanilla vine grows wild in the hammocks of South Florida. It has never been developed commercially, but it resembles very closely the vanilla of Mexico. The mahogany tree is a favorite for this purpose. Cook, in his report on "Shade in Coffee Culture," thus speaks of mahogany: "It has been used for shade in cacao plantations in the Island of Guadeloupe, and according to Guerin, is preferable to *Erythrina Indica*, since it resists parasites, and the wood is valuable after thirty or forty years."

In Trinidad the planting of mahogany under forest conditions has been advocated by Superintendent Hart of the Botanical Gardens, who finds that under favorable conditions the annual average increase of thickness in the trunk is about one inch, and even in trees sixty years old or over is about nine-tenths of an inch. American mahogany has been successfully planted

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in India. Even in Africa the mahogany forests are under the control of foresters.

A. H. Unwin, Forester, Benin City, West Africa, estimates that there are about 400 trees and 1,200 logs per square mile. This is less than one tree to the acre. In this region the mahogany is big, with large buttress-like roots, so that the tree is cut from platforms 10 to 15 feet from the ground. The ground is so soft and trees scattered to such extent that the logs after being squared are pulled by man power on rough rollers to the nearest stream. The timber is then rafted to the coast.

An important part of the forester's work in the Benin region is the planting and raising of seedlings to be planted to replace the trees cut. According to the old rule twenty seedlings are allowed for each tree felled.

A group of young trees is made near and around the stump of the old tree and seedlings are also put in along the hauling roads. In this way a future growth is assured. In three years one of the plants has attained a height of 20 feet and the average is even 15 feet. There is also a diameter limit but the figures are not given by Unwin.

The firms working these lands pay a royalty and export duty which is sufficient to pay the cost of the Forestry Service.

I once had the pleasure of traveling on the steamship *Sokoto* now running from Halifax to Mexico. She was formerly in the West African trade, oil nuts, mahogany, etc., and her officers told how the naked natives propelled these logs through the breakers to where they could be reached by the ship's launch. All this labor after dragging the logs from the forest to the shore by man power alone, then the long journey to England and perhaps to America, is evidence of the labor required to supply the market with this valuable wood from regions where men do the work of oxen and machines.

I have a sample of African mahogany secured in a wood-working establishment in Ottawa, Canada. It seems so light and soft and dull in color that I can hardly imagine how it could pass for mahogany.

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In case any enterprising person desires to grow mahogany I would suggest that any of the following trees be planted with it at the same time, since the returns would be quicker. The planting of the following on suitable soil in a favorable location would no doubt in time yield handsome returns. Since mahogany endures some shade the mixture would be an advantage.

Cedrela toona—The "toon tree" of India and the "red cedar" of Australia. Wood light, soft, red, very rapid growth, a very valuable wood used for furniture, carvings, boxes, canoes, shingles, etc.

Cedrela odorata—"Cedro hembra," "Cuban cigar-box cedar" or "Spanish cedar." Wood similar to the above. Highly odorous and supposed to keep insects out of cigars.

Cedrela Brasiliensis—"Acajou." Wood soft, fragrant, red, easily worked. Trees of this species planted in Dr. Franceschi's garden in Santa Barbara, Cal., have grown with great rapidity.

Gaurea trichilioides, called "Gauraguao" in Porto Rico. This species closely resembles the above mentioned trees but the wood is not fragrant.

When the countries of the American tropics get over the revolution habit, when trunk lines of railroads get established and freight rates decrease, and when wood gets scarcer and of more value, there will be stronger incentive toward the proper utilization and regeneration of these tropical forests. There will be more careful exploitation with the future in view and not merely the utilization of a product which nature has given us. We are in the habit of looking too much to the Government to do things. In consequence they are never done. If on the average one man in every ten owns and properly cares for ten acres of timber land, there will never be any danger of a timber famine. It is up to the Government, however, to arrange conditions of protection, taxation and even transportation in such a way that private parties may feel safe in such an enterprise. The main function of government is to afford protection to property and life and to hold in check the greed of great corporations so that individual incentive, initiative and industrial activity may

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have full encouragement and progress without interruption or onerous restrictions.

But when one tries such a commendable enterprise in the land of the mahogany tree he usually comes into sudden contact with high taxation, with sole concessions granted to other parties, thievery, incendiarism, shipping fees, brokerage, graft, high freight rates, dishonest commission agents, local uprisings and a host of other difficulties which the producer has to struggle against before his product reaches the consumer. There is the producer who with the help of nature makes the product at a small profit and there is the consumer who uses it, is glad to get it and pays high for it, but between the two is always a group who by hook or crook usually carry off the lion's share of the spoil.

Mahogany is quite common in Florida south of Biscayne Bay and the Everglades. Much of this territory extending southward to Cape Sable is little known. There is an area as big as the State of Delaware in a condition of pristine wildness. It is usually marked the Big Mangrove swamp on the maps and is not unlike the big Zapata swamp on the south coast of Cuba.

When I use the term "swamp" I mean it in the Southern sense, namely, a low, wet, but wooded area. Here and there in these swamps are slightly elevated portions or islands. On these islands there is usually a rich hammock growth. In these hammocks mahogany is common, in fact in one place it predominates to such extent that the place is called "Madeira Hammock" or "Island."

Forest land in tropical Florida may be divided into pineland, hammock and mangrove swamp. There are hammock islands in the Everglades, there are patches of hammock here and there in the pine woods, and some of the Florida Keys are covered or were originally covered with a heavy hammock growth. The hammock in this part of Florida consists almost entirely of trees of the Antillean flora, trees which grow here and are native here, but many of them do not reach their optimal growth in this section. This part of Florida corresponds very closely with the Bahama Islands.

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The presence of hammock growth here and there may be explained in two or three ways. The hammock may be the climax forest. Suppose we have a bare parcel of land; suppose the various forces of nature scatter seeds over this area; suppose there are no retarding influences of any kind such as flood or fire or insect invasion, this land would according to some authorities become in time and remain a hammock growth.

If fire swept over the territory, it would soon be covered with nothing but pines and a few other trees able to withstand some fire. If floods of fresh water covered it frequently, it would remain a saw-grass country with perhaps clumps of cypress, saw palmetto and a few other trees here and there. If floods of salt water covered it, it would become a mangrove swamp. It is true that hammock growth is gradually working into the pine land and into the mangrove swamp, but I lean to the opinion that the soil where the hammock grows is richer—richer at the start mainly because of the nature of the rock which disintegrates to make the soil.

In many parts of the tropics there is a so-called limestone which, when it disintegrates, yields a poor soil. This is in truth not a limestone but a sandstone, the sand being cemented together with a little lime. Wherever a pure limestone disintegrates it yields a rich, reddish soil on which hammock grows. When a calcareous sandstone disintegrates it yields a poor soil on which the Caribbean pine predominates. A limestone soil is usually good. Grain and fodder from such soil is rich in bonemaking ingredients and in turn the people of such soils are usually big-boned and rugged.

When I said above that the land in South Florida between the Florida East Coast Railroad and Cape Sable is unexplored, I meant that it had never been surveyed and properly mapped. The islands are indefinitely marked and the water courses are merely indicated by dotted lines. Men have been all through it over and over again. Some new travelers go into the region now and then, and when they look around and see no human beings or signs of human beings they conclude that they are discoverers



IN THE MANGROVE SWAMP. THIS TREE GROWS IN SALT WATER AND IS A GREAT CONSOLIDATOR OF MUDDY SHORES AND A PROTECTION IN TIMES OF STORM. (PHOTO BY HOMER SAINT-GAUDENS.)

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walking on land where the foot of white man has never trod before. But plume hunters, prospectors, scientists, etc., have been there.

It will be a long time before mahogany is exhausted in this region owing to the unsettled nature of the country and its inaccessibility. The drainage of the Everglades may some day lower the level of the water throughout this whole region. Even if it lowers it only a few inches it will increase to a great extent the area where mahogany can grow.

Over in the Bahama Islands, what we call the hammock is usually referred to as "bush" or "scrub." This land is the "provision land" where the bulk of the crops is grown. Here the terms bush and scrub are applied, very much as in Africa and Australia, to forests of considerable size, especially when there is a thick undergrowth.

The Bahamas belong to Great Britain and there is mahogany on almost every island, but the largest quantity is on the largest and least settled island of Andros. These people have made good use of this mahogany at home in furniture and boat construction. Labor is cheap there, but if the negroes continue to emigrate to Florida as fast as during the past winter it will soon be scarce.

Mahogany is seldom shipped north from Florida or the Bahamas because it is worth at home as much as it would bring in Northern markets. There is no mahogany in Porto Rico, and there is very little in Jamaica, so that Cuba and Santo Domingo are the two islands which have the most of it and which ship the bulk of all the West Indian mahogany in the market.

I have been over a large part of Cuba several times and I believe Cuba has very little timber of any kind to spare. There are great areas devoid of timber. One hears of vast tracts of virgin timber, but they usually dwindle in size and density the closer one comes to them. The Spanish and American ideas as to quantities of timber are often at variance. I know of no place where forestry is more needed. Cuba exports mahogany and imports yellow pine. She practically trades mahogany for yellow pine.

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Cuba is not all a tropical land of luxuriant vegetation. There are miles after miles of pine-covered sand land in Pinar del Rio. The time is practically at hand when Cuba can use every stick of timber she cuts right at home. With a population of over 2,000,000 and a strong emigration from Spain there is necessity for conserving all available timber. The houses of the well-to-do are now mostly made of brick, stone and tile, while the natives depend almost entirely on poles and palm thatch for building material.

Santo Domingo is therefore left as the main source of West Indian mahogany for the future. In this beautiful island is concentrated all that is good and bad in the West Indies. It has the highest mountains, the deepest valleys and the richest soil and vegetation of the Antilles. It was the first place to be settled in this continent, the last to be developed. It is here that mahogany is most abundant and of fine quality. The land is rich in minerals, with a fine climate, or in fact many climates, with a thin population, with some poor pine land, but much of it is rich soil and as virgin in appearance as when Columbus landed. It consists of the famous Haitian Republic and the Republic of Dominica. Conditions in this island are by no means as bad as painted, and even Haiti, the Black Republic, has not been as complete and dismal a failure as is often represented.

Some very valuable timber concessions have been granted by the Haitian Government within the past few years. The following quoted from the *New York Sun* corresponds exactly with what I have heard from travelers who have visited the interior of the Black Republic:

"That the country is sadly misgoverned by her politicians there seems, however, no reason to doubt. On the other hand Haiti pays the interest on her bonds, encourages education by liberal grants, protects foreigners, and of late has welcomed the exploitation of her natural resources by American, English and German capital. The hospitality of the country people, their sterling honesty and natural kindness, are vouched for by all travelers who have disregarded the ogrelike reputation of the

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people and penetrated the interior. In the cities the stranger can always look to his consulate for protection. In short, Haiti is not as black as it has been painted, but we would not venture to predict that the feuds of her politicians will not ultimately compel intervention for the general good and the interests of other nations."

I have never visited the interior of either Haiti or the Republic of Dominica, but judging from what I have seen merely from the coast towns and in sailing along its shores, it is one of the most beautiful and varied spots of earth. Both Haiti, now a republic in control of negroes, once a French colony, French being still the common language, and the Republic of Dominica, once a Spanish possession, now independent with the United States Government in charge of its custom houses and with Spanish the common language, have had the most checkered history possible to imagine.

I think the time is near at hand when there will be established a West Indian trunk line of railroad. The people of Florida are beginning to realize this when they see trainload after trainload of Cuban pineapples pass their doors. The Florida East Coast Railroad will soon be completed to Key West. If the car ferry from Key West to Havana is successful, sugar and other products will come direct from the plantations along the Cuban lines to our Northern markets without breaking cargoes. A trunk line of railroad now runs to the eastern end of the island. Another short car ferry would reach Haiti. By using lines already constructed Haiti and the Dominican Republic could be tapped at slight expense. By making another car ferry to Mayaguez, Porto Rico, and using the railroad already in operation to San Juan, this West Indian trunk line would be complete. When this happens, and I can see no reason why it should not happen, many fine forests of rich tropical woods will become available and will be shipped direct by rail into this country. Owing to the lack of roads, etc., it is impossible to get much of this timber to the coast. Even in the Dominican Republic, where timber is still comparatively plentiful, it costs \$30

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per thousand or thereabouts to deliver mahogany at the ship's side.

The largest portion of the Dominican and the Haitian republics is covered with forest. According to an official report there are over 6,000,000 acres of hardwoods in Santo Domingo, among which mahogany ranks first, and mahogany from this island ranks first in quality.

Santo Domingo has broad, high plateaus with cool climate where it is claimed wheat, oats, rye, apples, pears and strawberries thrive. Loma Tina, 9,420 feet above sea level, is the highest peak in the West Indies. There are large quantities of Spanish cedar, also pine and "sabina," sabina being the Spanish name for our Florida pencil cedar. The silva of Santo Domingo is undoubtedly richer than that of any other West Indian island. These forests yield gums, resins, medicines, etc., and I have been told that cinchona, the tree from which quinine is made, grows in the mountains. Our vice consul from Puerto Plata writes as follows in reference to the hardwoods of Santo Domingo:

"Those chiefly exported are cedar, mahogany, *lignum vitae*, lancewood, fustic, greenheart and mora. The largest diameters procurable are, in cedar, 60 inches; mahogany, 35 inches, and in *lignum vitae*, 10 inches. On the northern side of the island quantities of large timber can be procured about 10 miles from the railroad. It is expensive to draw out the wood. There are no roads, and paths have to be cleared through the forests. The people usually drag the logs with bulls, but the more intelligent use two large wheels on an axle, on which they hang the timber. Roads could be made in the woods for wagons, but as this would be expensive it would all depend on the extent of the enterprise.

"In some sections there are rivers on which the logs may be floated, but one has to wait for a freshet, which often delays three years. The facilities and price of getting out the wood depends entirely on the location. Where one owns the trees, the medium cost of felling, squaring, hauling from forest, railroad freight, and delivering alongside ship is about \$30, Ameri-

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can money, per 1,000 feet (mahogany or cedar). Trees can be bought standing at from 25 cents to \$1 per tree, depending on the size, condition and location. It is preferable to purchase the right to fell over an extent of land, first going over same to estimate the amount of timber that can be gotten out, or one can buy it at the rate of \$5 per 1,000 feet.

"A foreigner who attends to his own business is perfectly safe, both in life and property. The only inconvenience that would be experienced is that his laborers will leave him when a disturbance is going on in the district where he may be working, to avoid being impressed either in the government or revolutionists' ranks. After this danger is past they will return to their work. For this kind of work, laborers can be procured at \$1, American, per day. The price of labor is higher in this class, for it is considered harder than the ordinary run and as requiring more skill."

Some time ago I sent a sample of Florida mahogany to Herbert Stone, a wood expert and an officer of the Association of Economic Biologists. Aside from his scientific knowledge of the subject Mr. Stone has operated a business in Birmingham, England, in which many varieties of wood were handled. The following is his reply in reference to the sample sent. The sample was cut from a tree on Elliott's Key, Florida. The tree grew close to the sea, in fact was killed by a severe storm in October, 1906:

"The piece of mahogany is most interesting and valuable. It is precisely the same as the specimen I have, named Caoba, except as regards depth of color."

The specimen he refers to marked Caoba is described in Stone's "Timbers of Commerce." This specimen came from Mexico and is a type specimen received from the Royal Gardens, Kew, being one of the series of Mexican woods exhibited at the Paris Exposition of 1900 by the Mexican Government. The specimen was marked, "Caoba: Nombre Cientifico, *Swietenia mahagoni*." The alternative common name given is "Bois d'Acajou à Meubles," seeming to indicate according to the French view that this wood is especially fitted for furniture construction.



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