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Sargent's Silva.

John Muir

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ional civilization. This will leave its impress upon the literary production of the region. As the lands of the olive and the vine have ever figured prominently in the history of Old World letters, it is not unreasonable to expect that California, with her tropical sun and gorgeous coloring, will add lustre to the literature of America. Perhaps I have dwelt too strongly upon scenic grandeur as a factor of literary growth, but vast forests, icy summits, sombre canons, and beetling cliffs must stimulate the imaginative powers, and lead to creative effort. What has been accomplished thus far by the writers mentioned surely offers glorious promise of future achievement,—of work, if I may be so bold as to prophesy, that shall draw its freshness and color from California's sun-clad hills, and its strength and beauty from the white radiance of her eternal peaks.

Herbert Bashford.

SARGENT'S SILVA.

The fourteenth volume of the Silva of North America, just published, brings a great book, begun about twenty years ago, to a happy conclusion. The first volume, after eight or ten years of preparation, was issued in 1890, and the work has made steady, enthusiastic progress to the end. It is a description of all the trees that are known to grow naturally in North America, exclusive of Mexico, 585 in number, illustrated by 740 magnificent plates. A truly great book on a great subject by a master, marked by perfect uniformity of treatment in all its parts, well proportioned, evenly balanced, like a broad spreading oak standing in sunshine alone. Though scientific, it is in the best sense popular and thoroughly readable, telling almost everything an intelligent reader or traveler would naturally wish to know about our forests and trees, and a great deal besides that he would never be likely to think of. So full and lifelike are the descriptions and illustrations that tree-lovers, however slight their training, are enabled to identify all the trees, learn their distribution, productions, uses, and something of their relatives throughout the world, what kind of forests they make, which are most desirable for parks and homes, and which lend themselves most effectively to the wants of the farmer, forester, and landscape gardener.

And, fortunately, the work was completed just when the need of it was the greatest. After centuries of criminal waste and destruction, our forests are beginning to be appreciated, not only as timber and cover for the fountains of irrigating streams, but for higher uses also. Therefore trees are being studied as never before, and knowledge concerning them is called for by an ever widening circle of workers and beauty lovers. The author, Professor Charles Sprague Sargent, has proved himself the man for the work. With singleness of aim and sustaining enthusiasm, he was also blest with wealth and power of dogged application, of putting things through, getting things done. While all his surroundings were drawing him toward a life of fine pleasure, and the cultivation of the family fortune, he chose to live laborious days in God's forests, studying, cultivating the whole continent as his garden. Into this glorious field he set forth rejoicing, making ways everywhere, consuming obstacles, never counting the cost. All his studies were bent toward this

book, and with unflagging industry for the last twenty years he has labored to make it complete, traveling, studying, writing, determined to see every tree on the continent, known or unknown, growing with its companions in its own native home. And, with few exceptions, he has thus seen them all, most of them in the different seasons of the year, in leaf, and flower, and fruit, or disrobed at rest in winter. His task seemed endless, but glowing enthusiasm carried him on. Flitting from side to side of the continent, he was now in Florida, now in Canada, California, Alaska; traveling thousands of miles every year, mostly by rail of course, but long distances by canoe or sailboat on the Florida coast, through swamps, along lagoons, and from one palmy island to another, jolting in wagons or on horseback over the plains and deserts and mountain chains of the West, now tracing the ways of early adventurers, to identify the trees they first described, now exploring untrodden wildernesses, like Charity enduring all things,—weather, hunger, squalor, hardships, the extent and variety of which only those who from time to time were his companions can begin to appreciate.

While trees were waving and fluttering about him, telling their stories, all else was forgotten. Love made everything light. He thought nothing of crossing the continent to study a single tree in its varied forms, as influenced by soil, climate, companions, etc. Several trips were made to Florida to find a certain species of Palm in flower and fruit. Practically the whole book is based on personal investigation and study in the field, though a great deal of herbarium and library work was done both in our own and in foreign countries, in searching for and studying type specimens of our trees and their early literature, in trying to clear up confused nomenclature.

At the first glance through the book, every one must admire the fullness and beauty of the plates. They were made in Paris, from drawings from life, by Faxon, the foremost botanical artist in America. They show a branchlet of each species, with leaves, flowers, and fruit, almost all of natural size, and sections of leaves, seeds, fruit, stamens, pistils, etc., enlarged. And these are so tellingly drawn and arranged, any one with the slightest smattering of botany is enabled to identify each tree, even without referring to the text. The descriptions, however, seem rather dry and encyclopaedic until we get used to them.

When the first volume was published, it was believed that all our trees could be described in twelve volumes, but during the progress of the work new discoveries caused an overflow into a thirteenth and again into a fourteenth. A fourteen-volume, three-hundred-and-fifty-dollar book on botany may well seem formidable to common mortals, but it is not oversized or dear for the country it covers,—all the forests of America and sketches of the lives of the adventurous explorers and naturalists who first saw and described them, and sketches of all the main features of the scenery. If any tree-book deserves to be big, this one—a continent among island books, a Sequoia among firs and pines—does. And though accustomed to read the trees themselves, not written descriptions of them, I have read it through twice, as if it were a novel, and wished it were longer. The technical parts are scientific enough, and dry enough for the taste and uses of the most exacting botanist. These dry parts, however, are comparatively small, like mere patches of gravel or sand in a fertile wilderness, and you soon learn to see the living trees through the midst of them, waving and swirling in the weather. The first page of most of the descriptions is fairly loaded with synonyms, and however useful they may be in the present condition of the leafy science, one cannot help begrudging the extravagant amount of good wood pulp and type they consume, and the labor spent
in digging and dragging the dead ones out of their graves. Some poor trees seem to have more names than branches. Instead of bestowing so much considerate hospitality on these rapidly increasing name-cairns, and proudly putting them on show in the best places throughout the book, they might, with advantage to readers, have been shoved together back of the index, as a sort of terminal moraine, for the use of systematists, or bravely omitted altogether. Linnaeus consigned many names to oblivion, and surely in these busy days we may begin to expect the arrival of another master, able to help us to forget what must be forgotten.

Though joyfully welcoming each new tree, Professor Sargent never gave way to the prevailing tendency to exaggerate the number of species, by exalting the value of trifling, shifting, accidental characters; while his masterly terminology renders the definition of the main characters sharp and clear to every mind.

On the vexed question of nomenclature there will of course be no lack of conflicting opinion, for the subject is naturally full of it. Most botanists, however, will probably agree with the author. Some may even thank him for the clearings he has laboriously made through perplexing tangles, though such work is usually anything but thankful. Good rules are often followed without any allowance for changes called for in the progress of the science. To the law of Priority, the author, with most scientific botanists, bows down to the ground, or even a little way into it at times, to the astonishment of spectators standing aside in the groves. Prior names founded on ignorance are held fast and defended against those founded on knowledge. Names that are blunders pure and simple, absurdities, barbarisms of every sort, are maintained for the sake of stability, as if anything or any place in this whirling, on-rushing flood of a world can ever be sufficiently stable for nomenclatorial Babels. Common mortals, as well as name-dealers, should be considered; for names have to be read and spoken, and jaws and feelings may needlessly be hurt by mongrel, craggy, unpronounceable names in mixed languages, calling sweet, fragrant trees fetid, or white, black, on account of the namers having seen and smelled only decaying specimens. The law of Priority doubtless tends to keep down the growth of unmanageable nomenclatorial confusion. But in some cases, a too rigid adherence to the letter, instead of to the spirit of the law, prolongs the existence of error, and causes more confusion than it cures; as is strikingly illustrated by the name given to the very first tree described in the book, the noblest of our Magnolias. Linnaeus, from specimens of the "deliciously fragrant" flowers, probably in a decaying condition after their long voyage across the sea, named it, in the first edition of his Species Plantarum, Magnolia f[Oteda, but discovering his mistake, he took occasion to correct it in a later edition, by changing the name to Magnolia grandiflora, by which good name the tree has been known throughout the world for nearly one hundred and forty years. But because the Priority law for species, by general consent of botanists, begins at the date of publication of the first edition, the dead fetid name, buried by Linnaeus himself, is now raised to replace the living one, thus breaking the heart of the law in arithmetical obedience to the letter of it, and causing more confusion in a year than is likely to be put down in a century. Still Stability, Fixity at any price is the cry; and we are gravely told that there is nothing in names anyhow, or ought to be nothing; for sense in scientific names is a confounded bother; while at the same time, the naturalists of every country are trying to put as much as possible into them, and loading them down with meaning. On the other hand, when the difficulties under which nomenclators labor are considered, — the clashing of laws and
their various interpretations, the imperfection of the material on which genera and species are often founded, and the immensity of the number of plant people,—we may well wonder that the present condition of botanical nomenclature is so good. Nevertheless, like everything else, it must grow better with the advancement of knowledge. The world moves, botany and all; blunders will be corrected, crooked names made straight, rough ones smooth, for neither in heaven nor on earth can error be made immortal. These questions, however, soon cease from troubling, for turning over the broad blossoming pages, we quickly find ourselves in the heart of the forests.

Most of our trees were known or partly known and described before this work was commenced. But these descriptions, besides being short and technical, were scattered in many books beyond reach of the general reader. The first book on our trees, as indicated by Professor Sargent, is Marshall’s Arbustum Americanum, published in Philadelphia in 1785, which includes an account of 277 trees and shrubs. The next was published in Göttingen in 1787, by F. A. J. von Wangenheim, a Hessian officer in the employ of England, who fought for the king in the war of the Revolution, and with good German thrift and industry found time between battles to study about 168 of our trees and shrubs, chiefly with reference to their value for introduction into the forests of Germany.

Next came André Michaux’s classical work, Histoire de Chênes de l’Amérique, published in Paris in 1801, in which twenty species of our eastern Oaks are systematically described and figured.

On many of Michaux’s adventurous excursions through the eastern wildernesses during his thirteen years’ residence in America as botanical agent for the French government he was accompanied by his son, F. A. Michaux, who afterward wrote the best book on North American trees that had yet appeared. It was published in Paris in 1810, includes descriptions of 155 trees founded on his own observations in the forests, and is illustrated with beautifully colored plates.

This magnificent work, covering only the trees found east of the Mississippi River and in some parts of western Louisiana, was supplemented in 1842 by three volumes from the pen of the celebrated naturalist, Thomas Nuttall.

A second edition of Nuttall’s Supplement was issued with the third reprint of Michaux’s Sylva under the general title of The Sylva of North America, the only illustrated descriptive work on North American trees in general which preceded the present Silva.

The above mentioned works and others of less note which followed them covered only sections of the country great or small, like patches of sunlight on a cloudy landscape, while the present work sheds light on nearly all the trees of the continent alike.

"Many years ago," says Professor Sargent, "when I first realized the difficulty of obtaining any true knowledge of the trees of this country, I formed the plan of writing a Silva which should contain an account of all the species that grow spontaneously in the forests of North America. The books which had been written on this subject related only to the trees of comparatively limited regions, and therefore presented no general or systematic view of the composition of our forests. Such works as existed were long out of date, too, and included none of the information collected by recent explorers and observers, and no account whatever of the trees discovered in late years west of the Mississippi River.

"Many of our trees have never been fully described. All that can be learned about them from books is contained in a few words of purely technical description of little value to the general reader; and these descriptions are widely scattered in American and foreign libraries beyond
the reach of the general reader. . . . Books, however, are only guides towards obtaining a knowledge of trees. To be understood they must be studied in the forest; and therefore, since the plan of writing this Silva was formed, I have examined the trees of America growing in their native homes from Canada to the banks of the Río Grande and the mountains of Arizona, and from British Columbia to the islands of southern Florida. I have watched many of them in the gardens of this country and in those of Europe, and there are now hardly half a dozen of the trees which will be described in this work which I have not seen in a living state.

Through every forest of the country he leads you, and from the very first you feel you are following a sure guide with eyes seeing to the heart of things, overcoming difficulties with the ease of strength, clearing, explaining, composing, systematizing, pointing out every tree in a good steady light. And what a glorious multitude they are!

The masterly descriptions of the genera include an estimate of all the known species, with general views of the principal forests of the world. Thus in the description of Pinus we learn that about seventy species can now be distinguished.

"The genus is widely distributed through the northern hemisphere from the Arctic Circle to the West Indies and the highlands of Central America in the New World, and in the Old World to the Canary Islands, which are inhabited by one endemic species, northern Africa, Burma, and the Philippine Islands, where one species occurs, and to the mountains of the Indian Archipelago where a single species crosses the equator. The principal centres of distribution of Pinus are the western United States, where twenty-one species are recognized, the eastern United States, where thirteen species grow, and the highlands of Mexico, which are often covered with grand forests of Pine trees. Five species are found in the regions bordering the Mediterranean, and constitute great forests on the mountains of Central Europe and the plains of northern Europe and Asia. In southern Asia the genus is comparatively ill-represented in number of species, although on some of the outer ranges of the Himalayas the forests are largely composed of Pine trees. It is widely distributed with a few species through eastern continental Asia, and Pine trees are common in all the elevated regions of Japan.

"Among the Pines of North America one species braves the arctic winter, and Pine trees are found at the timber line on all our high mountains, maintaining a foothold where no other tree can live; they bear uninjured the fiercest ocean gales, and flourish in the arid valleys of the interior, where neither cold nor drought is able to check their vigor.

"The type is an ancient one. Represented by a few species in the cretaceous flora of North America and Europe, it became abundant in the Miocene period, when at least one hundred species of Pines are believed to have existed.

"The most valuable timber trees of the genus are the eastern American Pinus echinata, the western American Pinus Lambertiana, Pinus ponderosa, and Pinus monticola, the tropical American Pinus heterophylla, Pinus sylvestris of northern Europe and Asia, Pinus laricio of southern Europe, the Himalayan Pinus Nepalensis, and the eastern Asiatic Pinus Thunbergii and Pinus densiflora. The seeds of several species are important articles of human food, the best being produced by the Nut Pines of western North America, by Pinus Pinea of the Mediterranean region, Pinus Cembra of Europe and Asia, and Pinus Gerardiana of northwestern India. Pine wool, a coarse fibre manufactured from the leaves of Pinus laricio, Pinus sylvestris, and other European species, is used to stuff mattresses and cushions, and, woven with animal wool, is made into hos-
pital and military blankets and into underclothing which is believed to possess valuable medicinal properties. In some of the countries of northern Europe the inner bark and branchlets of *Pinus sylvestris* are used to feed cattle and hogs, or in time of famine the bark serves as human food.

"*Pinus Thunbergii*, the Kura-matsu or Black Pine of Japan, inhabits northern China and Corea. In Japan it is extremely rare except in cultivation, if it ever grows naturally, but has been extensively planted, and appears as a tree frequently eighty feet in height, with a trunk three feet in diameter... It is with this tree that the plantations on the sandy coast plains of Japan are chiefly made; it shades many of the principal highways of the country, and is used to cover arbors with its artificially elongated branches, or to hang over the sides of moated walls; it is to be seen in every garden... and by the Japanese is the most revered of all trees." And it is interesting in this connection, now that forestry is just beginning to be studied and practiced in our own country, to learn that "the planting of Pines and other conifers for the production of timber has been practiced in Japan for at least twelve hundred years, and the wood used in the empire is nearly all obtained from planted forests which cover sandy coast plains and other lands unfit for the production of agricultural crops.

"*Pinus Cembra* inhabits the mountains of Central Europe, where, mingled on the lower slopes with the upper Spruces and Firs, it ascends above the Mountain Pine and the Larch, and with Alders, Rhododendrons, and alpine Willows forms scattered groves along the timber line... it is common in northern Russia and in Siberia, where it sometimes forms pure forests of great extent. The seeds are used as food, and oil employed as food and for illuminating purposes is pressed from them in Europe.

"*Pinus Roxburghii* often forms open forests on the outer ranges of the Himalayas, where it is distributed from Afghanistan to Bhutan at elevations of from 1500 to 6000 feet above the sea. *Pinus Nepalensis*, the Himalayan representative of that group of five-leaved Pines of which the North American *Pinus Strobus* and *Pinus Lambertiana* are the best known members, inhabits mountain slopes from Afghanistan to Bhutan between elevations of 5000 and 12,500 feet above the sea, where it is scattered through forests of deciduous-leaved trees, or is mixed with other conifers, or sometimes covers considerable areas nearly to the exclusion of all other trees.

"*Pinus Gerardiana* has stout cones from six to nine inches in length, and cylindrical seeds an inch long. It inhabits the arid inner valleys of northwestern India, growing usually at altitudes varying from 5800 feet to 12,000 feet above the sea, often on dry, steep, rocky slopes; and, although gregarious, it does not generally form pure forests. The seeds are so valuable for food that the trees are rarely cut, and the hard, resinous, dark, yellow-brown wood is little used.

"*Pinus Pinaster*, usually called the Maritime Pine, is a tree sixty or seventy feet in height, with a stout and often more or less inclined or crooked trunk, covered with very deeply fissured dark bark, a dense, round-topped head, stout, rigid, dark green leaves in clusters of two, and from five to eight inches in length, and large, ovoid, cylindrical, lustrous, dark brown cones borne in whorls in close many-coned clusters. It inhabits sandy plains, generally near the coast in western and southern France, Spain, and Portugal, Corsica, Italy, Dalmatia, Greece, and Algeria, and has been largely planted to protect the shifting sands of the coast dunes, and to cover the Landes of southwestern France. These plantations, commenced by Bremontier in 1789, now extend over at least three hundred square miles, and stretch along the shore of the
Bay of Biscay from the Gironde to the Adour.

"The little round-topped *Pinus Halepensis* is distributed from Portugal and northern Africa to Syria, Arabia, and Asia Minor. On the Taurus it ascends to elevations of 3500 feet above the sea, and here, in Greece, on the rocky hills of Attica, on the shores of the Gulf of Lepanto, and on the islands of the Archipelago, and on the mountains of southern Spain, it forms great open forests."

The species are described in the same large, far-seeing way. Here are a few characteristic paragraphs from the eastern White Pine:

"A tree usually growing under favorable conditions to a height of 250 feet, with a trunk six feet in diameter, and with long, stout, tapering, horizontal, durable roots, clothed with thick, gray bark covered by irregular, rectangular plate-like scales, and in old age often rising above the ground near the trunk into low buttresses, and furnished with a few long, tough, pliable, wand-like rootlets. During its youth the branches of the White Pine are slender and horizontal, or slightly ascending, and are arranged in regular whorls, usually with five branches in a whorl, clothing the stem to the ground for many years, or until destroyed by the absence of light, and forming a broad, open, conical head. When the tree, uncrowded by others, enjoys an abundance of light and air, the lower branches often grow to a large size, the trunk remains short and becomes much thickened at the base, and the breadth of the picturesque open head often equals the height of the stem; but as the White Pine grows naturally in the forest, the lower branches die at the end of a few years, and the trunks grow tall and straight, bearing branches only near the top. When it is pressed upon by trees of equal height, the branches remain short and form a narrow head; but when the White Pine, which is the tallest inhabitant of the forests of northeastern America, rises above the surrounding trees, the lateral branches lengthen, sweep upward in long, graceful curves, the upper ones ascending, and form a broad, open, irregular head.

"The most valuable timber tree of northwestern America, *Pinus Strobus*, has played a conspicuous part in the material development of the United States and Canada. Great fleets of vessels and long railroads have been built to transport the lumber sawed from its mighty trunks; and men have grown rich by destroying it, building cities to supply the needs of their traffic, and seeing them languish as the forests disappear.

"Fifty years ago the pineries of Maine and Lower Canada, of northern New York, of Pennsylvania, Michigan, Wisconsin, and Minnesota, contained stores of White Pine which were believed to be inexhaustible; but the best has already been cut, and the great trees which were once the pride of the northern forest no longer exist.

"The most beautiful Pine tree of eastern America; our silvan scenery owes the peculiar charm which distinguishes it from that of all other parts of the world to the wide-spreading, dark green crowns of the White Pine, raised on stately shafts high above the level of the forest roof, and breaking the monotony of its sky-line."

The following is one of the many interesting footnotes relating to this tree:

"The Pine-Tree challengeth the next place, and that sort which is called Board-pine is the principal; it is a stately large Tree, very tall, and sometimes two or three fathom about: of the body the English make large Canows of 20 foot long, and two foot and a half over, hollowing of them with an Adds, and shaping of the outside like a Boat. Some conceive that the wood called Gopher in Scripture, of which Noah made the Ark, was no other than Pine, Gen. 6, 14. The bark thereof is good for Ulcers in tender persons that refuse sharp medicines. The inner
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bark of young board-pine cut small and stampt and boiled in a Gallon of water is a very sovereign medicine for burn or scald, washing the sore with some of the decoction, and then laying on the bark stampt very soft: or for frozen limbs, to take out the fire and to heal them, take the bark of Board-pine-Tree, cut it small and stamp it and boil it in a gallon of water to Gelly, wash the sore with the liquor, stamp the bark again till it be very soft and bind it on. The Turpentine is excellent to heal wounds and cuts, and hath all the properties of Venice Turpentine, the Rosen is as good as Frankincense, and the power of the dried leaves generateth flesh; the distilled water of the green Cones taketh away wrinkles in the face being laid on with Clothes.”

Like the White Pine, the famous Long-leaved Pine of the Southern states, towering in stately beauty above forests of Palmetto and Live Oak, is rapidly passing away. “Invaded from every direction by the axe, a prey to fires which weaken the mature trees, destroy tender saplings and young seedlings, and impoverish the soil, wasted by the pasturage of domestic animals, and destroyed for the doubtful profits of the turpentine industry, the forests of Long-leaved Pines, more valuable in their easy access than any other pine forests in the world, appear hopelessly doomed to lose their commercial importance at no distant day.”

Of the grand Pinus ponderosa of the west side of the continent, the strongest and the second in size and nobleness of port of the world’s Pines, Professor Sargent says: “Possessed of a constitution which enables it to endure great variations of climate and to flourish on the well-watered slopes of the California mountains, on torrid lava beds, in the dry interior valleys of the north, and on the sun-baked mesas of the south, and to push out boldly over the plains, where no other tree can exist, the advance guard of the Pacific forest, Pinus ponderosa is the most widely distributed tree of western North America. Exceeded in size by the Sugar Pine of the Sierra Nevada, it surpasses all its race in the majesty of its port and the splendor of its vitality; and, an emblem of strength, it appears as enduring as the rocks, above which it raises its noble shafts and stately crowns.”

The following paragraphs are from the description of the glorious Sugar Pine, the King of all the Pines in the world: — “A tree usually from 200 to 220 feet in height with a trunk six or eight or occasionally ten or twelve feet in diameter. During the first fifty years of its life the slender branches, arranged in remote regular whorls, frequently clothe the tapering stem to the ground and form an open pyramid; later some of the specialized branches near the top of the tree grow more rapidly than the others, and, becoming fruitful, bend with the weight of the great cones; and long before the tree has reached maturity many of the upper branches lengthen faster than the lower ones, which eventually die from absence of light, and the tall, massive trunk is surmounted with an open flat-topped crown, frequently sixty or seventy feet across, of comparatively slender branches sweeping outward and downward in graceful curves.

“The Sugar Pine, the noblest of its race, surpassing all other Pine-trees in girth and length of stem, tosses its mighty branches, bending under the weight of its long, graceful pointed cones, far above the silvan roof, and with its companion, the great Sequoia, glorifies those Sierra forests that surpass in majesty all forests of coniferous trees.”

Among the copious footnotes, references, critical remarks, biographical sketches of the discoverers of genera and species, and of the tree-lovers for whom they were named, there is a great variety of curious and interesting informa-

1 Josselyn, Account of Two Voyages to New England, p. 64.
tion drawn from early writings. Here is a note from Kalm's Travels which brings an old day back into light of magical vividness:

"Crab-Trees are a species of wild apple-trees, which grow in the woods and glades, but especially on little hillocks, near rivers. In New Jersey the tree is rather scarce; but in Pennsylvania it is plentiful. Some people had planted a single tree of this kind near their farms, on account of the fine smells which its flowers afford. It had begun to open some of its flowers about a day or two ago; however, most of them were not yet open. They are exactly like the blossoms of the common apple-trees, except that the colour is a little more reddish in the Crab-trees; though some kinds of the cultivated trees have flowers which are very nearly as red; but the smell distinguishes them plainly; for the wild trees have a very pleasant smell, somewhat like the rasp-berry. The apples, or crabs, are small, sour, and unfit for anything but to make vinegar of. They lie under the trees all the winter, and acquire a yellow colour. They seldom begin to rot before spring comes on. The Crab-trees opened their flowers only yesterday and to-day; whereas, the cultivated apple-trees, which are brought from Europe, had already lost their flowers."

The strange and peculiar mode of growth of the Mangrove tree and the shell-fish which clustered on its stems attracted the attention of some of the earliest travelers who landed on the shores of the New World, and it is mentioned in many of their narratives.

"Store of oysters (grew) upon the branches of the trees, and were very salt and well tasted. All their oysters grow upon those boughs and spraies, and not on the ground." 1

"The Mangrove is a tree of such note, as she must not be forgotten, for, though she be not of the tall and lusty sort of trees, yet she is of great extent; for there drops from her limbs a Kinde of Gum which hangs together one drop after another, til it touch the ground, and then takes root and makes an addition to the tree. So that if all these may be said to be one of the same tree, we may say that a Mangrove tree may very well hide a troop of Horse." 2

Most readers will be surprised to learn how important a tree the Diospyros (Persimmon) is. About one hundred and sixty species are now known. "In Japan it is the universally cultivated fruit-tree; it is found in every garden and by every cottage, and in the early autumn, when the trees are covered with their luscious leaves and brilliant fruit, they form the most striking feature of the rural landscape, and are not equaled in beauty by any fruit-tree of cold temperate climates."

In our own forests there are only two species.

"They have a plomb which they call pessemmins, like to a medler, in England, but of a deeper tawnie culour; they grow on a most high tree. When they are not fully ripe, they are harsh and choakie, and furre in a man's mouth like allam, howbeit, being taken fully ripe, yt is a reasonable pleasant fruict, somewhat lushious. I have seene our people put them into their baked and sodden puddings; there be whose tast allowes them to be as pretious as the English apricock; I confesse it is a good kind of horse plomb." 3

About six hundred species of Ficus (Fig trees) are known to botanists, two of which, Ficus aurea and Ficus populnea, are inhabitants of our tropical Florida forests:

"What is probably the largest speci-
men of *Ficus aurea* in the United States grows on a wooded hummock, locally known as The Hunting-Ground, about ten miles west of the mouth of the Miami River and close to the shores of Bay Biscayne. This remarkable tree covers about a quarter of an acre of ground with its numerous distinct stems formed from roots developed from the branches of the original trunk, and its dense wide crown of foliage.

“The noble tree in front of the United States barracks on Key West, which is an object of interest to all visitors to the Island, is of this species.”

Hicoria is peculiarly a North American genus; all the twelve species, except one in Mexico, are our own:—

“No other trees give greater dignity and character to the forests of eastern North America or surpass the Hickories in vigor and beauty of appearance.”

“Hicory Nuts have very hard Shells, but excellent sweet Kernels, with which, in a plentiful Year, the old Hogs, that can crack them, fatten themselves, and make excellent Pork. These Nuts are gotten, in great Quantities, by the Savages, and laid up for Stores, of which they make several Dishes and Banquets. One of these I cannot forbear mentioning; it is this: They take these Nuts, and break them very small betwixt two Stones, till the Shells and Kernels are in-different small; And this Powder you are presented withal in their Cabins, in little wooden Dishes; the Kernel dissolves in your Mouth, and the Shell is spit out. This tastes as well as any Almond. Another Dish is the Soup which they make of these Nuts, beaten, and put into Venison-Broth, which dissolves the Nut, and thickens, whilst the Shell precipitates, and remains at the bottom. This Broth tastes very rich.”

“I have seen above an hundred bushels of these nuts belonging to one family.”

The Oak volume, filled from beginning to end with the tough all-enduring race, is the largest of the fourteen, and in it the author is seen at his best.

Nearly three hundred species of Oak have been described, fifty-two of which dwell in our own forests.

Of his favorite White Oak Professor Sargent says: “The great size that it attains in good soil, its vigor, longevity, and stately habit, the tender tints of its vernal leaves when the sunlight plays among them, the cheerfulness of its lustrous summer green and the splendor of its autumnal colors, make the White Oak one of the noblest and most beautiful trees of the American forest; and some of the venerable broad-branched individuals growing on the hills of New England and of the Middle States realize, more than any other American tree, that ideal of strength and durability of which the Oak has been the symbol in all ages and throughout all civilized countries.”

The great White Oak groves of the Central Valley of California surpass all other Oak woods of the world in wide, serene, romantic beauty:—

“Since the eyes of the white man first looked upon these natural parks, which surpassed in grandeur of broad effect and in the dignity of their graceful trees all the creations of the landscape gardener’s art, fields of wheat have replaced the wild grasses which covered their open glades, and many of their noblest trees have been sacrificed to satisfy the demands of civilization. No other region in North America, however, presents today anything that compares with their park-like beauty, the nobility of their individual trees, or the charm of the long vistas stretching beneath them.”

“*Quercus* in its different species is known to afford support to a much larger number of insects than any other genus of trees whose insect enemies have been studied,... Packard enumerates about four hundred and fifty identified species

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as living upon Oak-trees in North America exclusive of those found in their decayed wood." Magnificent pasturage for large flocks and herds of very small cattle!

"The American Beech, with its noble habit, its smooth, pale, bluish gray bark and its cheerful foliage, is one of the most beautiful inhabitants of the forests of eastern North America. It is delightful in early spring when the lengthening buds display the closely folded leaves between their delicate, lustrous, brightly tinted scales, and when, a few days later, it is covered with graceful drooping clusters of staminate flowers. The tender green of its vernal leaves enlivens the forest when the Oaks and Hickories are but just beginning to awaken from their winter slumbers; and the contrasts of light and shade, as the sun plays through its wide-spreading branches, increase its beauty when it is clothed with the deep green foliage of summer or with its brilliant yellow autumnal garment. But it is in winter, when the color of its bark is brightest, when the structure of its head is plainly seen, and the fine spray of its slender shining branchlets is thrown into clear relief against the sky, that the Beech displays its greatest beauty; and then the charm of this tree is unsurpassed by that of any other inhabitant of the forest or the park."

The following is from Gerard's celebrated Herball: "The kernels or mast within are reported to ease the paine of the kidneies proceeding of the stone if they be eaten, and to cause the granell and sand the easier to come forth: with these, mice and squirrels be greatly delighted, who do mightily increase by feeding thereon; swine also be fattened herewith, and certaine other beasts: also deer do feede thereon very greedily. They be likewise pleasant to thrushes and pigeons."

1 Hooker f. Fl. Antarct. ii. p. 345. See, also, P. Parker King, Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle, i. pp. 22, 37.

Fagus betuloides "forms the prevailing feature of the scenery of Tierra del Fuego, especially in winter-time, from having persistent evergreen leaves, and from its upper limit being sharply defined and contrasting with the dazzling snow that covers the matted but naked branches of Fagus antarctica, which immediately succeeds it." 1

"The glory of the maritime forests of the south, and one of the most valuable and interesting trees of the continent, the Bald Cypress, with its tall massive trunk rising high above waters darkened by the shadows of its great crown draped in streamers of the gray Tillandsia, is an object at once magnificent and mournful."

"The Cupressus disticha (Bald Cypress) stands in the first order of North American trees. Its majestic stature is surprising, and on approaching them, we are struck with a kind of awe at beholding the stateliness of the trunk, lifting its cumbersome top towards the skies, and casting a wide shade upon the ground, as a dark intervening cloud, which, for a time, precludes the rays of the sun. The delicacy of its color, and texture of its leaves, exceed everything in vegetation." 2

The biographical sketches, of which there are about one hundred and fifty, form an attractive feature of the book, both to roving methodless readers and to students, bringing to view so many joyful old nature-lovers wandering alone through the vast wild woods, men whose names shine like crystals on mountains, — Bartram, Catesby, Kalm, Michaux, Menzies, Mackenzie, Raffinesque, Nuttall, David Douglas, and many a later worthy, dear to the hearts of tree-lovers and trees, blessed Torrey and Gray, Mohr, Engelmann, Parry, Kellogg, etc., who spent their lives studying our plants and helping Nature to scatter them abroad.
With fullness of knowledge the leafy story goes on from section to section, from volume to volume, in easy, orderly development. The descriptions of the species are so full and clear, he must be a careless reader who fails to see the trees through them standing before him in the flesh, alive and communicative. They always begin with a sketch of a representative tree in its prime, showing its height, size of trunk, habit, how it wears its branches, etc. Then the distinguishing characters are described,—the bark, winter buds, branchlets, leaves, flowers, fruit. All these are given in the first paragraph and in the same sequence, so that one knows exactly where to look for them. In the second the geographical distribution of the species is pointed out, the places where it grows in greatest vigor and abundance, the forests it makes, its companions, and how they are associated, etc.

In the third the wood is described, its color, weight, strength, durability, uses, etc. In the fourth what is known of the history of the tree is given, when and by whom it was first discovered or cultivated, its distribution by the agency of man, its value for shade and ornament, timber, fruit, etc.

The closing paragraph consists usually of a general appreciation of the tree, with remarks on its name, homes, etc. Here, for example, is the last paragraph of the description of the Engelmann Spruce (Picea Engelmanni):—

“In its specific name, this tree, the fairest of its race, braving the fiercest mountain blasts, the fiery rays of the southern sun, and the Arctic cold of the northern winter, with tall and massive shafts brilliant in color, and graceful, spire-like crowns of soft foliage of tenderest hue, keeps green on a thousand mountain-tops the memory of a good and wise man.”

Each species is thus displayed at home and described to the life, whole trees as our fellow inhabitants of the world, and whole forests instead of fragmentary herbarium specimens, standing out in bold relief, scarce at all obscured either by rhetoric or technical terms, while the great wealth of footnotes is like varied and picturesque underbrush.

The author, too, is seen hard at work, able, indomitable, studiously calm, abstaining from fine writing or display of any sort not essential to the matter in hand, concealing emotion even in the midst of the Indian summer glory when the whole face of the country is aglow with divine enthusiasm. Therefore we get only hints and glimpses of his warm poetic imagination in bright lines which glow here and there in his massive prose like the first spots and patches of autumn-colored leaves in the general summer verdure. Most readers will probably feel that in thus hiding his heart he has in some measure diminished the inspiring value of his book. To those unable to read between the lines some of the descriptions may seem formal and monotonous where the color naturally belonging to them would have made them shine.

Had the bright lines outside of the technical parts been doubled or trebled, they could have done no harm any more than light and flowers on mountains, or on the trees themselves.

The author’s energizing enthusiasm burning out of sight beneath the cool dignity he wears is well known to his friends, and often brings to mind a hot-hearted volcanic mountain clad with snow.

But “for a’ that and a’ that,” style and methods are quickly lost to view, and, forgetting that we are reading a book, the trees themselves seem to be speaking, saying, “See how tall and beautiful we are, how strong our branches, how leafy and flowery and fruitful. With cooling shadows we guard the fountains, and to all comers spread tents and food,” each in turn telling its wonderful story.

In the very beginning we are charmed away into the glorious forests of the
Alleghanies, among the Magnolias, large trees with great, creamy white, fragrant flowers, a foot wide some of them, and with leaves more than two feet long, growing with a host of noble companions where the stream-banks and openings are embossed with Rhododendrons, and Kalhmia becomes a tree fifty feet high, laden with rich purple flowers. We see the Palms and Pines and Oaks of the South assembled together, forming forests above forests; the giant Sequoias and Pines, silvery Spruces and Firs in glorious array on the mountains of the West; Oaks in the valleys and on the hills rejoicing in their strength; and Poplars and Willows waving and fluttering in lithe, graceful beauty beside lakes and streams from sea to sea.

There is so much large scenery in the book, such strength and steadiness in its broad sweeping currents, however cool at times they may seem, that we are borne smoothly along, hardly realizing that we are not actually out of doors in the woods, traveling unwearied, free as the winds. We fancy we feel the weather, hear the wind in the trees, see them budding and blooming and ripening their fruit, enjoy their fragrance and the light on their leaves and bark, smell the peaty reek of tamarack and cedar swamps, and the balsam of resiny evergreens. Passing from climate to climate enchanted, we are now on sun-baked deserts, now far north on ground ever frozen, now wandering in sunless forests, pushing our way through dense tangled underbrush, vainly trying to find an opening where we can look up and see the trees in full proportion; now climbing an eastern hill overlooking Oaks and Elms, Maples and Hickories, with round bossy heads modeled like cumulous clouds packed together in glorious colors, swelling and dimpling and fading around the horizon. Anon we are on a lofty peak of the Rockies, contemplating a boundless sea of dark conifers innumerable as grass panicles in a meadow, every spire pointing true to the zenith as if thinking only of the heavens. Turning a page or two, we are in the natural landscape gardens of Dakota, sauntering through sunny flower-painted spaces among Spruces and Yellow Pines; or on the rim of a crater in Arizona, overlooking strange black dwarf woods of Nut Pine and Cedar, or groves of lily-flowered Yucca and Cactus trees.

In another volume we are among the giant trees of the Pacific, wading through tall ferns and Rhododendrons and Ceanothus chaparral beneath the Redwoods, wandering among the colossal brown pillars of the Sierra Sequoia, Libocedrus, and Sugar Pine, or far up the gray summit ridges and peaks, walking over the tops of Dwarf Pines beside the glaciers.

Of all the nature-books I have ever read, the Silva is the largest and best, everywhere breathing the peace of the wilderness, restful, yet inciting to action, infinitely suggestive and picturesque. How magical is the stillness of its deep lonely woods, how sublime its landscapes, and how wonderful the contrasts displayed to awaken imagination! What sylvan scenery, for example, can be more impressive than the billowy Appalachian forests so often described in these pages, stretching away in boundless exuberance of varied leaf and flower and color; limb meeting limb, overarching, embowering a thousand broad ridges and hills and streams; compared with forests of Cereus giganteus, blooming in the tremulous haze of hot deserts, the strange trees but little more than fluted cylindrical trunks, leafless, and almost branchless and motionless, standing apart on bare sun-beaten ground like architectural columns crowned with flowers; or the dark majestic forests of the West compared with those of the North, whose hardy Poplars and Spruces, dwarfing and straggling, push bravely on and on into the frozen realms of silence and mystery.

Think of a forest of Tree-lilies in bloom, not another tree in sight over all the wide desert, the whole top of each tree a
Voices of Rain.

The mountain world is very still to-day,
Shadowed, and hushed, and gray.

All yesterday a mad wind shrieking past
Harried the cañon’s silence old and vast,
Lashing the yellow grass in billows deep
Against the parching steep.
Hot glare of sunlight smote the walls that stand
Purple with pines heaven-high on either hand,
Hot glare of sunlight to the splendid blue
Where driven cloud-fleets flew.
Black cedars goaded clung against the edge
Of yonder granite ledge,
And far below where white-chafed waters run
The stinging gravel spun,
Whirled in the gusts that snapped the alder’s crest,
And crushed the willows cowering to the west.
But with the night came cloud, and rain, and rest.