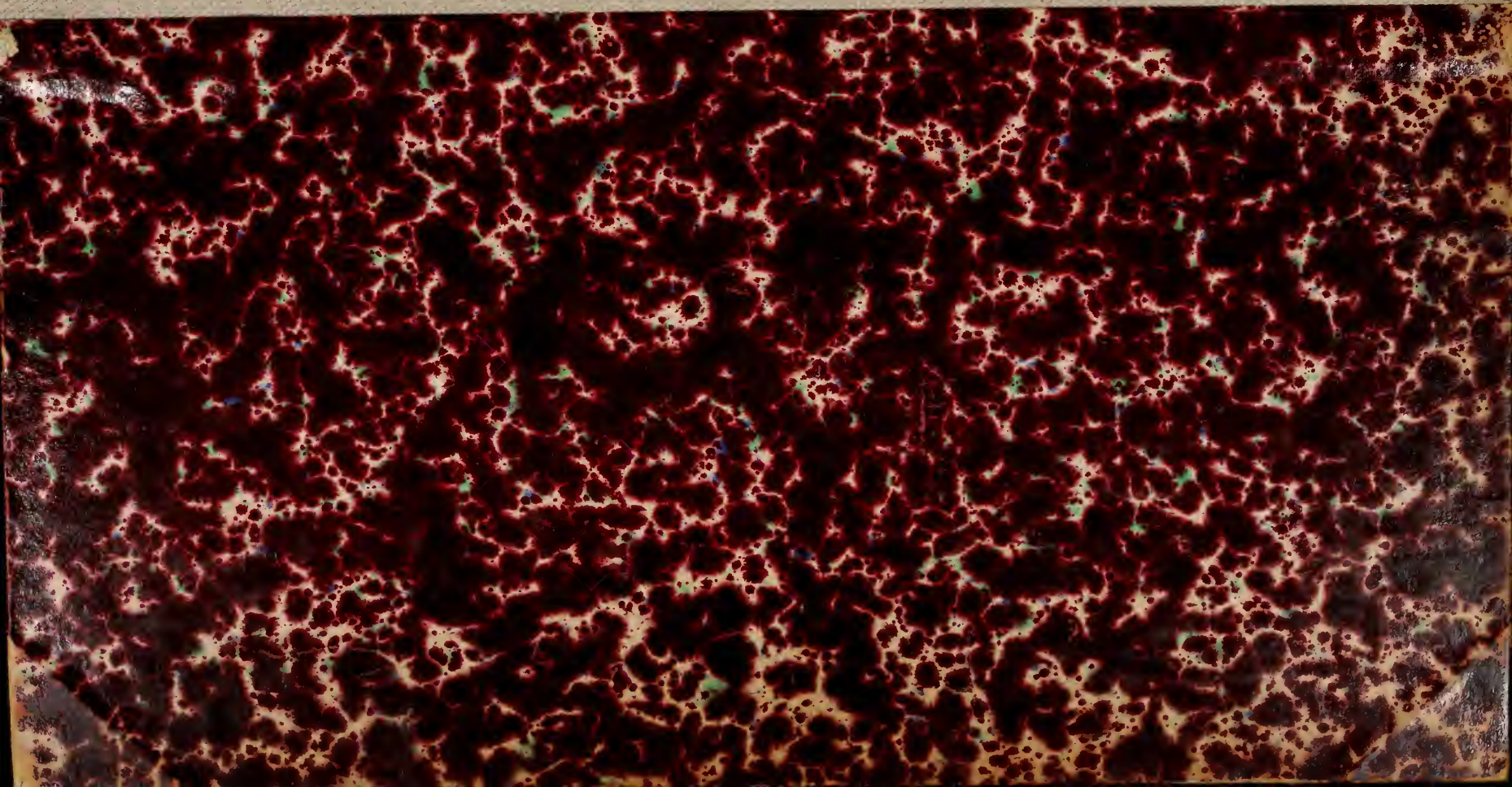

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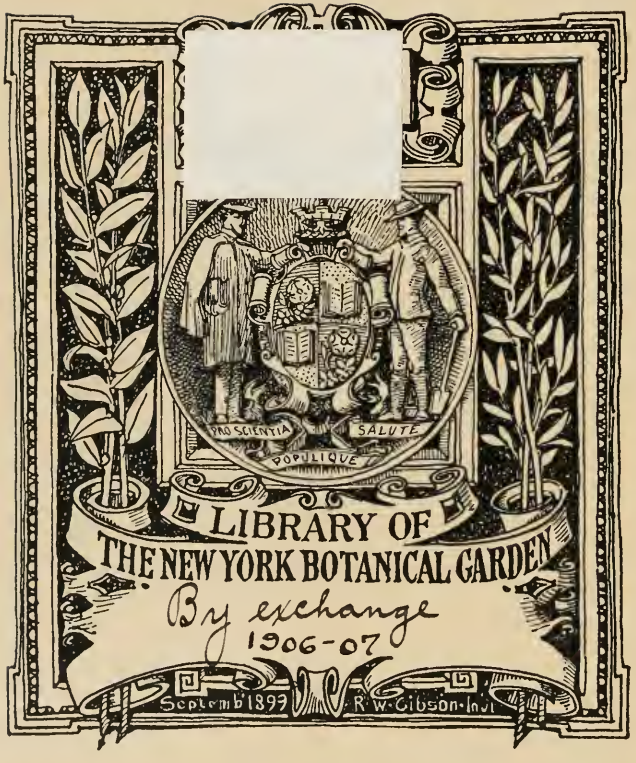
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A Magazine of the International Society of Arboriculture . . .

Connersville, Ind., January, 1906

JOHN P. BROWN, Editor and Publisher

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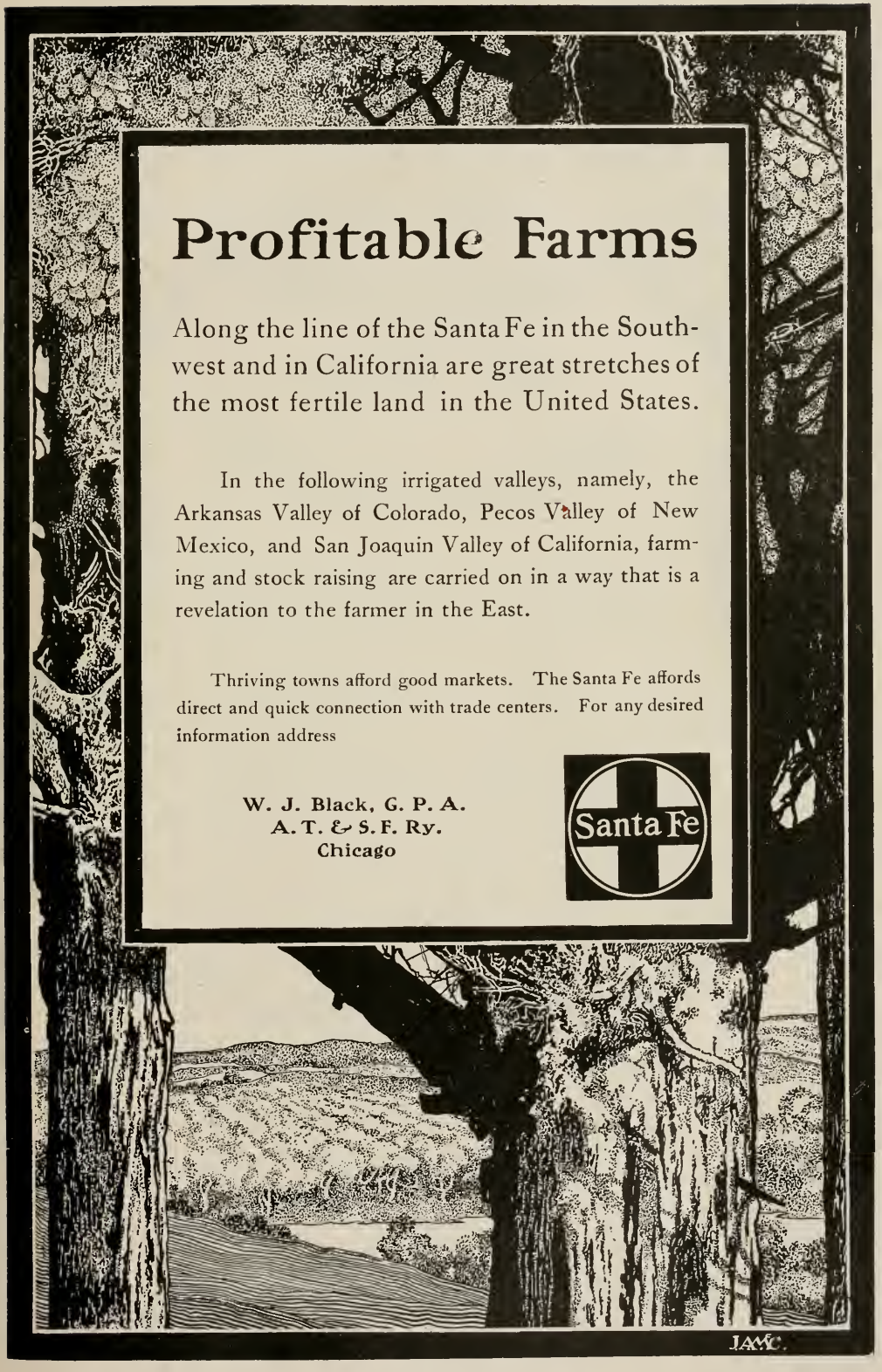
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ARBORICULTURE

A MONTHLY MAGAZINE

PUBLISHED IN THE INTEREST OF THE
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WILLIAM WATSON WOOLLEN.

AN APPRECIATION.

Lying along the quiet, peaceful little stream of Fall Creek, so far away from the States Capitol that none of its hurry and bustle, or dust and soot are present, and yet so near that the top of the monument is visible from the wooded hilltops, is Buzzard's Roost, dedicated to the love of Nature. Here no birds may be frightened as they build their nests and rear their young, and they sing their sweet songs unharmed in the green ravines and shaded nooks; here no other living thing, either beast or plant, is disturbed, and the wild flowers grow in great profusion, covering the hillside in the springtime, and the wild creatures of the woods whisk joyfully among the trees. In this busy twentieth century, when the dollar has assumed so much importance, there are too few places where nature is allowed to garden as she will. It is a common sight to see large farms with no forest reservation, but field after field of waving corn or wheat where once stood the monarchs of the forest, and we have all but forgotten that in these very places the wind once sang her wild, sweet songs through the tree tops, and that wild birds once poured forth their jubilant notes. And so we are led to wonder how it happens that so close to a busy city there is a place where the wild wood folk still have a paradise. It is all because one man is a lover of nature, and a lover of humanity, and because he is anxious to help future generations to this knowledge, because he believes it will sweeten and strengthen their lives and help them to become good citizens.

Mr. Woollen discovered Buzzard's Roost some eight years ago as he tramped along Fall Creek on Easter Sunday. He was surprised to find so dense a forest so near to Indianapolis, and as he stood in its depths he then and there determined to purchase the place, and to some day give it to the city as a place for nature study for the school children. He has since that time been constantly developing it, and he has provided in his will that Buzzard's Roost shall be the property of the city of Indianapolis, for the use of its schools.

We are apt sometime to be skeptical and to believe that the noble things were done only in the past, and we forget that there are to-day men who are la-

boring with little credit and without any financial returns to themselves, for the good of those who come after them,—not rich men, who can easily spare their millions for the accomplishment of great things,—but men of moderate means who deny themselves that they may put all into the pearl of great price. William Watson Woollen belongs to this class of men. He was born in Indiana in the very neighborhood of Buzzard's Roost about sixty-eight years ago. He has practiced law for more than forty years in Indianapolis, and he is the author of several law books which are considered valuable additions to Indiana law libraries. He has held positions of trust and honor, and has always been a respected citizen of Indianapolis, a good neighbor and a firm friend. But amidst all his busy life he has found time for his favorite study. From his boyhood in the old log cabin home, he has been a lover of nature, but for the last ten years he has made a scientific study of the birds, and he has studied them at first hand at Buzzard's Roost. He has written many interesting articles upon the habits of the birds, and these have appeared in Indianapolis newspapers and in magazines and journals. He is regarded as an authority upon the birds of Indiana.

Mr. Woollen is a public-spirited citizen and has labored unceasingly in all efforts to make Indianapolis a more beautiful and a better city. He served most efficiently as chairman of the Park Committee of the Commercial Club, which has been active in improving the city parks and in the building of the new Fall Creek Boulevard.

Long after the deeds of most men are forgotten, the fruits of William Watson Woollen's generous impulse will gladden the hearts of many school children, and future citizens will remember his life and work with gratitude.

Mr. Woollen was one of the original members of the International Society of Arboriculture and has been a firm friend and counselor of the editor of ARBORICULTURE. We are glad to be able to present his picture and give his able article on birds.

We again produce the three engravings of the International Society of Arboriculture exhibit of catalpa at the St. Louis Exposition, 1904, as numerous new subscribers have not seen the pictures before.

In view of the immense number of catalpa speciosa trees now being planted by farmers and by railway companies, and the interest taken in this tree, it is well that all should know how many articles of daily use, cars, house finish, furniture, wood pulp, paper, railway sleepers, fence posts, telegraph poles, etc., may be made from this tree.

A rather curious state of affairs has been developed by the Division of Forestry through the contention of the two Senators from Idaho, one of whom, Senator Fred Dubois, advocates Government reserves in forestry, and the other, Senator Heyburn, opposes it. Senator Heyburn has contended that the withdrawal of forest lands as Government reserves prevented settlement and worked hardship to those who had already settled. To disprove this, the Government has found, through its special agent, that 90 per cent. of the claims which he examined have never been resided on by their claimants, and railroad employees and others whose claims seem very indirect hold the land.—*Exchange.*

The Preservation of Our Birds.

Since the birls first gladdened the earth with their morning song and the beauty of their plumage there have always been those who have loved them, and who have done all they could to protect and care for them. But in this busy, hurrying world of ours, where the dollar has assumed such abnormal importance, we must be able to give a practical reason for their protection as well as an aesthetic one. For many years birds were ruthlessly murdered for the mere love of the sport and because we did not realize that we were harming ourselves by permitting such acts. But the untiring work of scientists has proved beyond a doubt the great value of the birds, and it is upon their economical value that I wish to write for ARBORICULTURE.

Asa Gray, one of the greatest American botanists, has said: "Animals depend absolutely upon vegetables for their being. The great object for which the All-wise Creator established the vegetable kingdom is, that plants might stand on the surface of the earth between the mineral and animal creations, and organize portions of the former for the sustenance of the latter." This statement is but a reiteration of what is recorded in Holy Writ, for there it is said: "And God said, And to every beast of the earth and to every fowl of the air, and to everything that creepeth upon the earth, wherein there is the breath of life, I have given every green herb for meat."

Weed and Dearborn, in their most excellent book, "Birds in Their Relation to Man," say: "A correct idea of the economic role of the feathered tribes may be obtained only by a broader view of nature's methods—a view in which we must ever keep before the mind's eye the fact that the parts of the organic world, from nomad to man, are linked together in a thousand ways, the net result being that unstable equilibrium commonly called 'the balance of nature.'" In preserving "the balance of nature" so that the earth shall yield that vegetation which "shall be meat" for man, three vicious elements must be contended with, namely, (1) the weeds, (2) the insects, and (3) the rodents. The rapidity with which these pests increase and the damage they are capable of doing is almost incomprehensible.

It is also recorded that God said: "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life; thorns also and thistles shall it bring forth to thee; and thou shalt eat the herbs of the field; in the sweat of thy face shalt thou eat bread till thou return unto the ground." Since that record was made a great warfare has been waged in this world between good and evil, and this has been true not only in the world of morals, but also in the vegetable world. By "thorns and thistles" as used in the quotation, thorny and prickly plants alone are not meant, but in a broader sense all useless and troublesome plants are included. One needs only to count the seeds produced by a single plant of purslane, platain or thistle to be convinced of the prodigious reproductive power of our common weeds. But for the warfare that is being waged against them by man and his allies, the weeds would take exclusive possession of our gardens and fields, and we would be without bread. It may be that in that condition we, like the savages, could subsist upon the meat of the woods, wild fruits, and the flesh of wild animals, and be able to clothe ourselves with the skins of the animals, but it would be impossible for us to live the lives of civilized beings under such conditions.

While it is true that man shall earn his bread by the sweat of his brow, it is also true that by his own labor alone he can not have bread to eat. He is a dependent being, and without the allies which nature so bountifully supplies to him, he would be powerless in keeping under control its evil and destructive forces. In this work our birds are our most effective allies and helpers, and notably is this true of our seed-eating birds in keeping the weeds under control. This valuable service to man is, in the main, rendered by the bird family *Fringillidae*, to which belong the sparrows, finches, buntings and grosbeaks, and which contains more than one-seventh of the North American species of birds. Dr. S. D. Judd has made a careful study of the feeding habits of many of

View in Mr. W. W. Woollen's Bird Paradise.

these birds, and in a well prepared report of his observations upon a farm, he says: "The tree-sparrows, fox-sparrows, white-throats, song-sparrows and juncos fairly swarmed during December in the briers of ditches between the corn field. They came into the open fields to feed upon weed seed, and worked hardest where the smart-weed formed a tangle on low ground. Later in the season the place was carefully examined. In one corn field near a ditch the smartweed formed a thicket over three feet high, and the ground beneath was literally black with seeds. Examination showed that these seeds had been cracked open and the meat removed. In a rectangular space of eighteen square inches were found eleven hundred and thirty half seeds and only two whole seeds. Even as late as May 13th the birds were still feeding on the seeds of these and other weeds in the fields; in fact, out of a collection of sixteen sparrows, twelve, mainly song, chipping and field sparrows, had been eating old weed seed. A search was made for various weeds, but so thoroughly had the work been done that only half a dozen seeds could be found. The birds had taken practically all the seed that was not covered; in fact, the song-sparrow and several others had scratched up much buried seed." He made an examination of some four thousand stomachs of sparrows of many sorts, collected all over the United States, and in his report of this work he says that "during the colder half of the year the food of these birds consists almost entirely of the seeds of weeds." Professor Beal has estimated that during the two hundred days in winter in which the tree-sparrows remain in the State of Iowa, reckoning ten sparrows to the square mile and one-fourth of an ounce as the daily ration, eight hundred and seventy-five tons of weed seed are eaten by this species alone in that State. In addition to their great usefulness as seed-destroyers, the family *Fringillidae* do much good in destroying injurious insects. Weed and Dearborn, in their summary of the economic value of the birds, say: "The most striking particulars brought out by a study of their diet are the enormous amounts of weed seed taken during winter, and the extent to which these so-called seed-eaters take insect food in spring and summer, especially in the presence of an unusual abundance of an edible species. For example, in an orchard infested by canker-worms, forty-seven members of this family had eaten 91 per cent. of insects and only 7 per cent. of seeds, canker-worms alone making 40 per cent. of the food."

The rapidity with which the insect pests increase and the destructive powers with which they are possessed is marvelous. Reaumer, in his history of the insects, estimates that one aphis may be the progenitor of not less than 5,904,900,000 during the few weeks of her existence. Theodore Wood, in his book on "Our Insect Enemies," says: "It may seem a widely and extravagant and unjustifiable statement if we say that but for certain opposing agencies, the aphis would overrun the entire world; that it would leave scarcely a green leaf upon the earth, and that it would cause such terrible devastation that all terrestial life would wholly disappear, and the globe become one vast desert, incapable of supporting animation, and utterly without living beings of any kind. Still more impossible would it appear were we to state that this ruin and devastation would be the outcome, not of many centuries of gradual increase, but of only a few short months. Incredible as the assertion may seem, however, such results are no more than must logically follow if the aphis should be allowed to remain perfectly unmolested during the period of but a single year." And this is only one of these destructive insect pests with which we must contend.

Indeed, there are pestiverous and destructive insect pests for every condition, place and plant about us. For instance, in the air, by day, we have flies, butterflies, wasps, moths and winged ants, and at night moths, mosquitoes, bugs and beetles. Upon our shrubs and small fruits we have slugs, leaf hoppers, flea beetles, rose chafers, climbing cutworms and caterpillars. In our gardens we have cutworms, cabbage-worms, root maggots, cucumber, pea and bean weevils and squash bugs. In our orchards we have borers, coddling moths, bark lice, plant lice, cankerworms and leaf caterpillars. In our meadows we have grasshoppers, cutworms, army worms, crane flies, white grubs and root borers. In our corn and wheat fields we have wire worms, ball worms, root worms, Hessian flies, ants and chinch bugs. In our forests we have plant lice, bark lice, trunk borers and leaf caterpillars. In our marshes, ponds and streams we have water beetles, water bugs, mosquitoes and May flies.

Prof. C. R. Marlatte Assistant Entimologist, in charge of the experimental field work of the

W. W. Woollen's Bird Paradise.

United States Department of Agriculture, has prepared a report for the Department, in which he sets out at great length facts to support the assertion that the animal loss on farm products in the United States occasioned by destructive insects aggregate $700,000,000. "In no other country in the world," he says, "do insects impose a heavier tax on the farm products." The losses, it is averred, resulting from the depredations of insects on all the plant products of the soil, both in their growing and in their stored state, exceed the entire expenditures of the national government, including the pension roll and the maintenance of the army and navy. This is a startling and appalling statement, and forces the inquiry, What can we do to prevent this wholesale destruction of that which is essential to our very existence? The first answer of those who have given serious thought to the matter is, Preserve our insectiverous birds. And why?

We have already seen that these insect pests are found everywhere doing their destructive work. It is also true that we have the birds everywhere to hold these insect pests in check and destroy them. As Mr. Frank M. Chapman, who perhaps is our most distinguished living ornithologist, has well said: "In the air, swallows and swifts are coursing to and fro, ever in pursuit of the insects which constitute their sole food. When they retire, the night-hawks and whip-poor-wills take up the chase, catching moths and other nocturnal insects which would escape day-flying birds. The fly-catchers lie in wait, darting from ambush at passing prey, and with a suggestive click of the bill returning to their post. The warblers, light, active creatures, flutter about the terminal foliage, and with almost the skill of a hummingbird peck insects from leaf or blossom. The vireos patiently explore the under sides of leaves and odd nooks and corners to see that no skulker escapes. The woodpeckers, nut-hatches and creepers attend to the tree trunks and limbs examining carefully each inch of bark for insects, eggs and larvae, or excavating for the ants and borers they hear at work within. On the ground the hunt is continued by the thrushes, sparrows and other birds, who feed upon the innumerable forms of terrestrial insects. Few places in which insects exist are neglected; even some species which pass their earlier stages or entire lives in the water are preyed upon by aquatic birds."

The third class of destructive pests to be considered are the rodents. These belong to the large order of animals having two large incisor teeth in each jaw, separated from the molar teeth by an empty space, and are gnawing animals. Rats, mice, woodchucks, rabbits, muskrats and beavers belong to this order. Every well-informed person knows how rapidly these animals increase, and how destructive they are to vegetation. In Australia the progeny of a few pairs of imported rabbits have overrun the country, its vegetation has been threatened with utter destruction, and millions of dollars have been spent on an effort to get rid of the pest, and the warfare yet goes on. In this country, if not kept in check, they are among our most destructive pests, and especially is this so in our vineyards and orchards, where they do so much damage in girdling our vines and trees. Rats and mice are equally destructive. Owls, hawks and shrikes are our most effective aids in destroying these pests and keeping them in check.

It was Gilbert White, of Selborne, the English clergyman and naturalist of the eighteenth century, who directed attention to the fact that the owls destroyed many rodents. Much has been said about hunting with a camera and studying the birds with a field glass. Gilbert White studied them with sympathetic eyes as he tramped through his parish, "an assemblage of hill, dale, woodlands, heath and water." Near by his parish house stood a tree, with a cavity, in which lived a pair of owls. He noticed a large quantity of pellets at the root of the tree which had been regurgitated by the owls. He examined them, and discovered that the owls had destroyed great quantities of mice and other rodents. Since then his observations have been confirmed by many naturalists. In the city of Washington two hundred pellets were taken from beneath the nest of a barn owl and examined, and found to contain four hundred and fifty-four skulls, of which two hundred and twenty-five were meadow mice, two pine mice, one hundred and seventy-nine house mice, twenty rats, six jumping mice, twenty shrews, one star-nosed mole, and one English sparrow. In the Department of Agriculture at Washington, forty-nine stomachs of the red-legged hawk were examined, and it was found that forty of them contained mice, and five of them contained such small rodents as rabbits, gohpers, weasels and shrews. In eighty-eight stomachs of the loggerhead shrike, only seven birds were

Catalpa Exhibit (Grand Prize), World's Fair, St. Louis, 1904.

found, and it was ascertained that mice constituted 50 per cent. of their food. In 1885 the State of Pennsylvania passed what was called the "Scalp Act," offering a bounty for the scalps of hawks and owls. The United States Department of Agriculture has estimated that the passage of that act resulted in killing over one hundred thousand of these birds, and that by their slaughter the State sustained a loss of near $4,000,000 in one year and a half.

Professor Weed says: "After many years' study of the relation of birds to agriculture, I am convinced that the birds are a most potent factor in making crop production possible, and without them we should be overrun with pests—vertebrate and invertebrate—to an extent of which we have no conception." Michelet, the great French historian and naturalist, in his "Insect Life," said: "If all the birds of the world were destroyed, it would be uninhabitable for men in nine years."

Do not all of these facts give us good, sound, practical reasons for protecting the birds?

Birds are unique in their structure. They are the only creatures that are covered with feathers. The structure of these feathers is very wonderful. Notice how light they are, yet how strong. How they are adapted to retaining the heat of the body and the flight of the bird. Examine the vanes on each side of the shaft and see how wonderfully the thin laminae are interlocked. With all our ingenuity we can make nothing like them. We can not counterfeit them. The Indians of the Shasta mountains tell us a beautiful little legend about the origin of birds. The Great Spirit, they say, in looking upon the bright-hued leaves of autumn, thought them too beautiful to die. So he endowed them with new life, and gave to them wings and song:

"Thus from the red-stained oak the robin came
The cardinal, the maple's splendor bore;
The yellow bird the willow's faded gold
In living plumage bore."

This is the reason, so the Indians say, that the birds are so closely allied to the trees, and return each year to build their nests beneath their friendly shelter.

And this is why I love the birds and why I would preserve them.

No other creatures that God has made are so gifted with song as are the birds. As Mr. Chapman says: "Birds' songs are the most eloquent of nature's voices; the gay carol of the grosbeak in the morning, the dreamy midday call of the pewee, the vesper hymn of the thrush, the clanging of the geese in springtime, the farewell of the blue birds in the fall—how clearly each one expresses the sentiment of the hour or season." I have heard many great singers, but the songs of none of them has left in my memory a recollection of such sweetness as that of a robin I heard one evening in the springtime, when I, weary, was returning home from my office. It was perched on the topmost limb of a great maple tree, and there in the rain, with uplifted head, it was pouring out its soul in song to God, its Creator.

"What bird is that? Its song is good,
And eager eyes
Go peering through the dusky wood
In glad surprise.
Then late at night, when by his fire
The traveler sits,
Watching the flames go brighter, higher,
The sweet song flits
By snatches through his weary brain
To help him rest."

Then why should we not do all we can to preserve them?

We have seen that their services to us are invaluable, that without them our storehouses would be empty, and we know that they are the most beautiful creatures in the world. They are beautiful in their symmetrical forms, in their varied colors, in their flight, and, as we have seen, in their song. A study of and association with them develops a love for the beautiful and inspires one to a higher life. And this brings me to the last, but not the least, reason why I love the birds and why I would protect them, and that is this, that God first cared for them and loved them.

"I am only a tiny sparrow,
A bird of low degree;
My life is of little value,
But the dear Lord cares for me.

"I am only a little sparrow,
A bird of low degree;
But I know the Father loves me;
Have you less faith than we?"

WILLIAM WATSON WOOLEN.

Grove of Walnut Trees, Planted 1889 — Mr. J. B. Atkinson, Kentucky.

A PROGRESSIVE MINING COMPANY.

The St. Bernard Mining Company of Earlington, Ky., has a clear appreciation of the needs of the company in the matter of timber, and is planting each year many acres of forests, besides taking excellent care of the forest property which the company owns.

It is well known that a very large quantity of timber is used in various ways in the mines, and each year this timber is procured with greater difficulty and increasing cost.

Mr. John B. Atkinson, President of the company, says their timber property covers from 9,000 to 10,000 acres, yet they propose to plant fifty to one hundred acres of new forest each year, as coal mining is ravenous of timber. The company will plant 20,000 catalpa speciosa and 20,000 locust this season.

The picture on page 14 is from a photograph sent us by this gentleman, and represents a grove of walnut trees now sixteen years old. Nuts planted last fall have made excellent growth, some three feet in height. From 47 to 60 per cent. of the nuts grew (probably some were taken by small animals).

The surface above the veins of coal or other minerals may just as well be made to produce the wood necessary to supply the mines with all timbers, and there is nothing better than catalpa and locust for this purpose. Here is a practical object lesson for the great mining companies of the country.

If the Government can fix the price of transportation, why may it not fix the price of groceries?—Indianapolis Star.

Yes, and every other commodity.

THE SHASTA DAISY.

The ennoblement of flowers from common weeds is another achievement of Luther Burbank. The moon daisy of Europe, the ox-eye daisy, the pretty pest of American fields and roadsides, and another species from Japan, are in nature rather coarse, unsavory things, generally more cursed for aggressiveness than praised for beauty. Hybridization, cultural arts and selection have brought from them a group of forms known as the Shasta daisies, of surprising size and beauty, and of exceptional commercial value. The rays have been enlarged, thickened, and given a dazzling whiteness, the stem lengthened and made more rigid, and the whole growth glorified into an association of grace and serviceability in probably a greater number of lines of decorative demand than any other single blossom. By selection the chosen group includes a great variety of forms, attitudes and arrangement of rays—the type being a grand central tuft of gold, encircled by a zone of brilliant white; the growth combining the grace of one parent species, the size of another, and the whiteness of the third, and all these ennobled and extended.—*Sunset Magazine.*

THE LOOKING GLASS OF LIFE.

Look for goodness, look for gladness,
You will find them all the while;
If you bring a smiling visage
To the glass, you meet a smile.

Do not look for wrong and evil,
You will find them if you do;
As you measure for your neighbor,
He will measure back to you.

Mention this magazine when answering advertisements.

Catalpa Trees Grown from Fence Posts — L. & N. R. R. Co.

Trees Growing From Fence Posts.

A friend in Kentucky sends us photographs of several catalpa trees which have grown from posts which were set on the line of the Louisville & Nashville Railway, one of which is reproduced on page 16. The gentleman writes as follows in regard to this peculiarity:

"I am sending you by mail photographs of sprout growths from your right-of-way fence near here. You will note the sprouts only grow on the St. Bernard side; perhaps do not take kindly to railroad monopolies.

"The incident of the growth referred to is most interesting. The sprouts are larger than the parent post, and within two or three years will cut two posts, each equal to the mother posts. The best I can learn about the right-of-way fence is that it was built in the winter. The location is just south of our Arboretum, and probably you can learn when the posts were set. I presume the posts were cut the previous fall.

"Experiments are now in order to duplicate what two adjacent posts have done. Make each post on your system do what these posts have done, and you will soon have to buy more railroads to use up the crop of posts in fencing new rights of ways. One photo shows distinctly the root of the sprout, now far larger than was the mother post.

"Note other sprouts growing from one post, having escaped so far this year the cleaning-up habit of the section man, who devotes his time to killing sprouts."

The habit of growing from "cuttings" is common to many shrubs and to some forest trees, but by no means all trees. The willows take root quickly when placed in moist earth or sand. The populus or poplar family, quite a large family, too, mostly grow from cuttings, although some varieties require careful manipulations to induce them to take root.

Some years ago, in the city of Topeka, Kan., a cottonwood telegraph pole budded as did Aaron's rod, and took root in the streets, growing into a fine tree.

Probably, however, no species of forest tree grows so readily from cuttings or posts set in the ground or from blocks of wood lying on top of ground, as does the catalpa tree. Throughout the entire range of the catalpa this is a common occurrence. Horse blocks, chunks of wood placed under the corners or foundation of houses, as well as fence posts, have thus produced large trees.

In one locality of Indiana there is a row of catalpa trees half a mile in length, some of them now two feet in diameter, every one of which was produced from the posts set in the fence. One view of this avenue is shown on page 18. Each post in this line may still be seen, the living tree having grown around and partly enclosed the mother post.

Near Hutchinson, Kan., is a large grove of catalpa which were grown from cuttings of the branches. This is a wise provision of Nature where seeds, such as willows and cottonwoods, are so difficult

A Mile Avenue of Catalpa Speciosa Grown from Fence Posts.

to collect. Some species of trees hybridize so readily that they do not reproduce themselves well from seed, but as they grow readily from cuttings they can be produced exactly as the parent in endless numbers without the necessity of budding or grafting.

The scarcity of catalpa speciosa seed and great expense of collecting it makes it desirable to grow these trees by means of cuttings.

Of course for a fence post to take root, bud and grow into a tree it is essential—

(1) That the bark remain on the post.

(2) That the timber be cut during its dormant season—late autumn or winter or very early in spring.

(3) That the sap still remains in the wood; that is, the timber shall not have become dry and seasoned.

For the purpose of securing greatest durability, all timber should be seasoned before being used for posts, ties, etc., and, still better, that the bark should be removed.

Still, the point made by our correspondent, that of growing more posts from the one planted in the fence row, is well taken, and doubtless would be a good investment. There is no good reason why every post so set, under conditions enumerated above, should not live and grow into a living tree. Such a line of trees would be of great value to the farmer as well as the railway company which should adops this method.

AN IMPOSSIBLE IDEAL.

Whenever I buy a suit of clothes
The mirror makes me very sad.
I can not, howsoe'er I pose,
Look like the picture in the ad.
—Washington Star.

ILLUSTRATES POINT ABOUT RATES.

The Trenton (N. J.) *American* gives the following as an illustration: "An ignorant contractor in Albany not long ago failed to shore up one pillar that was a part of the support of the building. This pillar gave way, and the whole building came down. If the Interstate Commerce Commission should change the first-class rate between New York and Chicago, it would affect fully 10,000 other rates, because the New York-Chicago rate is a base rate for practically all the territory east of Chicago, and for more than half of the territory west thereof. Intermediate places take a percentage of the Chicago rate, so that a single change, say from 75 cents per hundred to 70 cents per hundred, would necessitate innumerable other changes.

"When the arguments on rate legislation are divorced from politics, and the situation looked at calmly and honestly from a strictly business standpoint, it is quite difficult to reconcile the statements of some of the members of Congress who are in favor of rate regulation with their acts. A representative is quoted as stating that it is not the desire or intention of the administration to have a rate bill which will enable the Interstate Commerce Commission to make all rates, but that they will only change a rate that is challenged.

"Perhaps this is their intention, but what they did in the Esch-Townsend bill was to give to the Interstate Commerce Commission not only full and absolute control of every rate, but of every method now in force on the railroads that had reference to the transportation of freight and passengers. It is difficult to see how a law could be drawn that would give authority only over certain rates."

Catalpa Exhibit (Grand Prize), World's Fair, St. Louis, 1904.

FORESTRY AT MICHIGAN AGRICULTURAL COLLEGE.

The opportunities for the study of forestry are exceptionally good at Michigan Agricultural College. Facilities are at hand for the instruction and demonstration that should be included in an undergraduate course. The study of languages, mathematics, soils, botany and other branches of science is carried on in departments well equipped for their work. The students in forestry join the classes in other departments for their general instruction. The freshmen and sophomore years are the same as for agricultural students. In these years the student receives instruction in determining tree species; the proper trees to grow in different localities; propagation of trees from seed, cuttings and coppice; the proper management of timber land; how to determine the height of standing trees by several methods; the use of log rules; how to determine the amount of timber on a given area, large or small; how to determine the amount of timber a given area is building up each year, and, therefore, whether the timber is held at a profit or loss; the kind of land that should be kept in timber; the adaptability of certain kinds of wood for certain purposes, and other subjects that go to make up an elementary course in forestry. With the beginning of the junior year the two courses diverge and the forestry student takes up more advanced work in the principles of forestry, forest botany, forest tree propagation, wood technology, silviculture, forest mensuration, economics of forestry, protection and regulation, diseases of trees, forest valuation, and some line of original investigation. These are the technical subjects that occupy his time during the rest of his course. It is expected that at some time during his course the student will visit wood-working factories, pulp mills, alcohol plants, and forested, deforested and reforested areas in the State.

Three acres of land near the campus have been set aside for use as a forest nursery. Planting was begun in the nursery in the spring of 1903. This nursery now furnishes nearly all the planting stock required by the department.

There are two hundred acres of the college farm under the management of the forestry department. This area consists of old pastures, pastured woods, culled timber, burned-over land, and plantations of deciduous and evergreen trees, so that many different phases of forestry are demonstrated right at home. The campus contains over six hundred species and varieties of trees and shrubs. Many of them are of the primeval forest that stood here when the College was established in 1857. One piece of woods containing 55.5 acres is designed for an arboretum. Planting with this object in view has already begun.

Write to President J. L. Snyder, Agricultural College (P. O.), Michigan.

RECLAIMING EVERGLADES.

Preliminary Surveys Show It Is Feasible—Will Be Great Thing.

Fort Pierce, Fla., Sept. 20.—The addition to the cultivable area of the State of Florida in a region almost tropical, almost equal in extent to the kingdom of Holland, and larger by several hundred square miles than that part of Holland reclaimed from the sea, will be an achievement that can not fail to have an immense influence on the fruit and trucking interests of the State.

Surveyor J. O. Fries, a veteran explorer of South Florida, is resting from a prolonged trip through the Everglades to Lake Okeechobee. Mr. Fries made a preliminary survey of the country under instruction from the Commissioners of the Internal Improvement Fund, of which Governor Broward is the chairman. The survey was the first step taken under authority of the State toward the reclamation of this vast and fertile territory. The survey has demonstrated the feasibility of reclaiming the lands by means of drainage canals. When accomplished it will become the most productive section of Florida in the growing of sub-tropical fruits and early vegetables.—*Fruit and Produce News.*

View in West Africa Mango Grove — Natives Building Canoes.

The World's Forests.

It is scarcely possible to over-estimate the importance of the part filled by trees in the history of the earth or in the life and development of its human inhabitants. Ages before man appeared as the chief actor on the world's stage, great forests were in existence, taking their part, whilst living, in the preparation of the earth's surface for the "masterpiece of creation," and in death providing materials to be laid away in nature's storehouse for the use of man thousands of years afterwards. One can only gauge the significance of these forests to us by a consideration of what the state of civilization might now have been without an adequate supply of coal. There is scarcely an industry which does not depend, directly or indirectly, on this for its very existence. To it we are indebted for our means of lighting, heating, rapid means of transport by sea and by land; in fact, for almost all that constitutes modern advance in civilization. Of the amount of coal already consumed, statistics give us but a poor idea. In the little island of Great Britain alone the output of coal in the year 1903 amounted to more than two hundred and thirty million tons; and when one considers what a mass of vegetation must have been pressed together to form such a vast (although comparatively small) quantity of coal, one begins to realize what must have been the luxuriance of the forests which produced it. Of the beauty of these primeval forests one can but draw an imaginary picture, but composed, as they were, of Giant Equisetums, Tree Ferns, Cycads and Lycopods, they must have presented a very striking appearance. As yet, however, there was no intelligent being to admire them; even the bird-life of the forests was as yet absent. Of the above plants, the Lycopods, with their spreading branches rising sixty or seventy feet into the air, were probably the most remarkable, and the most unlike anything now existing. Very few of their present-day relatives, the Club Mosses, rise above nine inches high. During the ages which succeeded the carboniferous period, many changes took place in the distribution of land and water and in the climate of the earth, and amidst these changes the primeval forests passed away, and were in the course of time replaced by trees of a higher development, such as pines, firs, cypress and palms, to which were later added leaf-bearing plants similar to the oaks, beeches, birches, etc., of our own day. As man did not appear on the scene until the last great epoch in the world's history, it is probable that he found trees differing little, if at all, from those now existing, and was no doubt, in his earlier stages, dependent to a great extent on the fruits and products of the forest for his food. Experience, however, must soon have taught him that these formed a very poor and precarious means of existence, and would naturally lead him to the practice of agriculture, which has been the cause of so much forest-destruction ever since. The most striking instance in recent times of how vast forests have given place to fields of food crops is of course that seen in the United States. The same thing, however, has been or is going on in every other country Nothing struck me more forcibly than this when traveling in West Africa, where daily one encountered the skeletons of trees, standing or lying, where the bush had been cleared and burnt, and the ground for two or three years devoted to the cultivation of yams, etc., and then again abandoned.

When, however, agriculture had rendered primeval man less dependent on the forests for his food supply, he would still have to look to them for fuel, and, even more than we have to-day, for materials with which to make his agricultural tools and hunting weapons. As he learned to build houses, the forests would be the most natural source of supply of materials for that purpose also. Each advance in civilization brought new uses for timber. The introduction of copper and iron as substitutes for stone meant the consumption of vast quantities of wood for smelting purposes, and proved in many parts of the world a most potent factor in the destruction of the forests. Ship-building was another industry which called for large

A Catalpa Plantation at St. Leo, Florida.

quantities of timber. The invention of the art is said to be due to the Egyptians, although the first builders of ships on a large scale were probably the Phoenicians, who had the then magnificent forests of Lebanon from which to draw the timber for this purpose. From the time of the Phoenicians onwards, with the discovery of new countries and the increase of commerce and intercourse between different nations, the number and size of ships throughout the world continued to increase. In the year 1840, just before the invention of iron vessels, there were over twenty-one thousand ships registered in Great Britain alone, and when we consider that the construction of a medium-sized vessel meant the destruction of two thousand full-grown trees, we may gain some idea of the influence exercised by this industry on the diminution of the world's forests in the past. Although we are no longer dependent on wood with which to build our ships, in other directions, especially in the construction of railways, the consumption of timber increases with leaps and bounds every year, whilst the sources of supply continue to decrease in an almost equal ratio. Not only, however, have trees in all ages ministered to the material wants of mankind, they have also taken their part in the development of the religious and intellectual life of the human race. Most of the temples of antiquity had their sacred groves or forests attached to them; many of the lower tribes of Africa and other countries at the present day have their fetish groves, which they regard as the dwelling places of the spirits which control the destinies of the people.

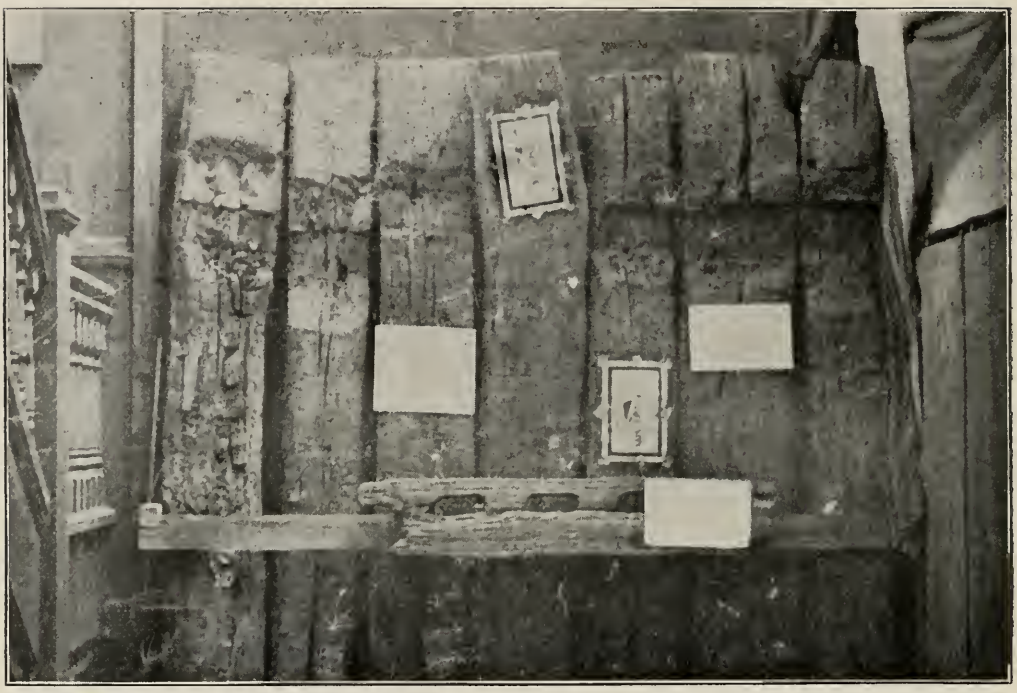
Amongst the ancient Greeks and Romans trees were dedicated to the gods, and from them, modern nations have adopted the bay tree as the emblem of victory and the cypress as the sign of grief and mourning. As the intellectual life of nations increase, trees are, however, regarded for their own beauty more than for any mythological associations, and one may often gauge the refinement of a people very accurately by the numbers of trees around their dwellings. Although it is impossible to say where and when the custom of tree-planting originated, we know that it was practiced by some of the oldest nations. Whilst Solomon must have considerably thinned the forests of Lebanon by the "four-score thousand hewers" which he sent to cut timber there, he, however, did something to repair the destruction. Josephus tells us that Solomon planted cedars in Judea, and in the Scriptures we read that "he made cedars to be as the sycamore trees, that are in the vale, for abundance." Nebuchadnezzar, we know, raised terraces and planted them with trees to improve the naked and flat appearance of the province of Babylon. The Romans also were great tree-planters, and a man who was skillful in the art was always highly honored. They, however, probably confined themselves to planting trees for shade and ornament, elms to support the grape vines, etc., and forestry as practiced to-day was then unknown. It is to Germany that the credit is due of first establishing a system of forestry on a scientific basis, although France has also done a great deal to advance our knowledge of the best methods of afforestation. Both countries have their laws relating to the conservation of existing forests and the planting of waste lands. In Great Britain practically nothing has been done in this respect, although there are thousands of acres of land either lying idle or only used as game preserves to provide sport and amusement for the rich. Now, however, a few of the more intelligent of the landed proprietors are beginning to realize the importance of the subject, and we may hope soon to see tree-planting for profit become as general in this country as it has been in the past to plant trees for ornament.

T. W. B.

CATALPA TREES AT FLORIDA STATE FAIR.

Mr. J. F. Corrigan sends us a photograph of his catalpa speciosa trees and says he exhibited trees at the State Fair, Tampa, which were five feet and three inches high, with diameter of 1⅝ inches at the ground, grown from seed which was planted on April 7, 1905, one season's growth from seed. The seed was sent Mr. Corrigan by John P. Brown.

This demonstrates the success of pure catalpa speciosa in the sands of Florida. Mr. Corrigan is planting large forests of catalpa in Southern Florida.



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The deepest water stillest runs;
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The richest mine the deepest lies;
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The mark of every master-mind.

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John P. Brown, Secretary-Treasurer, Connersville, Ind.

Articles of Incorporation.

ARTICLE I.—Name. The name of this corporation shall be The International Society of Arboriculture.

ARTICLE II.—Purpose. The purpose of the Association is to introduce judicious methods in dealing with forests and woodlands; to advance and advocate a public interest in this subject; to promote the afforestation of unproductive lands; to encourage the planting and care of shade trees in parks, public and private grounds, and along streets and highways; to inspire an interest in our remaining native forests, and groves of ancient trees, and to seek their preservation; to supply information to railway officials in regard to timber culture for railway uses, and incite railway and other corporations to plant trees for economic purposes.

ARTICLE III.—Membership. Any person may become a member of this society by the payment in advance of an annual due of two dollars, and on payment of this annual due shall be entitled to receive, regularly, one copy of Arboriculture, the official organ of the society. Any person who may contribute ten dollars toward the support of the society shall become a patron. Honorary members may be chosen by the executive committee.

ARBORICULTURE

Vol. V No. 2

A Magazine of the International Society of Arboriculture . . .

Connersville, Ind., February, 1906

JOHN P. BROWN, Editor and Publisher

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There are ways and ways — one of them is to sell out, gather up all the money you can, and go West and homestead. This can be done, but there is this fact to remember: Nearly all the best places are taken. One can find any amount of raw land remote from railroads, schools, and churches, out of the world and away back, where, in the course of time, civilization may penetrate. But there's a better way than all that. It is to buy a farm in the Southwest, along the Santa Fe, and start in with all the advantages you left behind, and more

You can buy that sort of a place at from $10 an acre to many times that amount. The difference in price depends on nearness to towns, railroads, the state of cultivation, and all that sort of thing. But a better farm, so far as fertility of the soil and productiveness are concerned, may be had for $10 an acre, than you could get anywhere back East for $50 an acre. Here's another fact: It may seem remarkable, but it is a fact, that the first crop will often pay for the land. It has occurred in thousands of instances, and will occur again.

Where is all this to be done? That's where we come in, willing and ready to help you. You ought to have detailed information, and we will send it to you for the asking. Down in Southern and Southwestern Kansas a $10-an-acre farm is waiting for you, and it is probably better than the one you leave behind, owned by the landlord.

It is not for us to discriminate between sections, but this is undoubtedly true of Southwestern Kansas. Over the line in Oklahoma and Texas the same thing can be done, with the stock-raising idea more prominent. Down in the Pecos Valley, in New Mexico, it is an irrigation proposition, and vegetation of all kinds simply runs riot in its profusion — and people are going there by the carloads. While land is high priced there, you don't need much of it. You couldn't farm a hundred acres, not if somebody gave it to you. Forty acres would be plenty. In Southwest Kansas, with a good team, you can farm 160 acres, but in an irrigation country you can not do this. Everything is intensive and concentrated where water is required. In Arizona the conditions are much the same, and so all along the Santa Fe until you come to California, where everything is different

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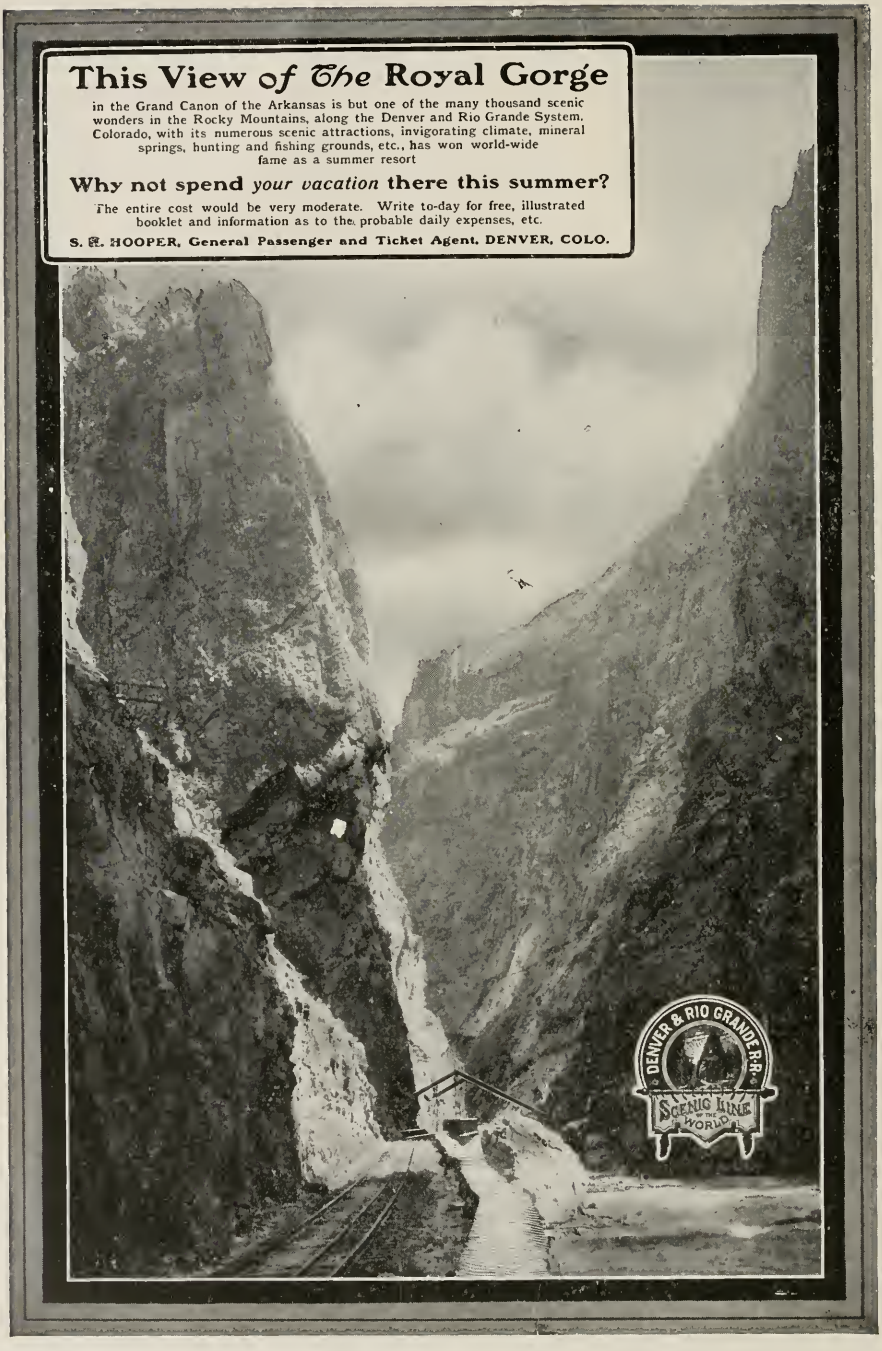
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Subscription $1.00 per annum. JOHN P. BROWN, Editor and Publisher, Connersville, Indiana.
Entered as Second-class Matter January 4th, 1904.

VOLUME V. CONNERSVILLE, INDIANA, FEBRUARY, 1906. NUMBER 2.

History Written in a Tree Trunk.

A WHITE ASH STORY.

LIBRARY
NEW YORK
BOTANICAL
GARDEN.

On New Year's Day, A. D. 1906, there was standing on a side track of the Cincinnati, Hamilton and Dayton Railway, a flat car which was laden with ten white ash logs, a small remnant of the great forests for which Indiana was once noted.

The logs were knotty and badly decayed at the heart, except the one which attracted our attention.

A dozen years ago these logs would not have been looked at by any sawmill operator, but now "anything goes"—mill men are glad to buy even such culls as these.

The larger log was thirty inches in diameter and had grown to this size in 118 years, the seed having started into growth in the spring of 1787. Its average annual diameter increase was slightly less than one-fourth inch.

Had conditions been as favorable during its entire life as they were during the middle period, this tree would have been five feet diameter, instead of thirty inches. But we anticipate.

The annual growth, as shown by the concentric rings at the end of the log, during the first thirty-two years of this tree's life was almost imperceptible, the lines being but one-thirty-second part of an inch apart. Each year it had added one-sixteenth inch to its diameter.

Evidently its struggle for existence during this third of a century must have been very severe, crowded among 2,722 other infantile ash and other trees, each striving to secure its share of the quart of water which fell as rain or snow on a square-foot surface during an entire week of the growing season, as that water contained in solution those elements of fertility necessary for existence, of even a slow-growing tree, it having gathered up this matter while percolating through the six inches depth of soil which the roots of this ash had appropriated. For it is known that even the most voracious members of the vegetable kingdom may partake of that food only which had been dissolved by water.

Resins, gums, varnish, rubber and even camphor may be the product of the sap of various trees which supply these particular substances, and while we are unable to redissolve these articles except

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with alcohol or other powerful solvents, yet the trees can not exist if not supplied with water.

It took this struggling ash a third of a century to reach a height of twenty-five feet and a diameter of two inches.

But at this period of its existence, in the year of 1819, a large majority of its fellows gave up the hopeless task of living without water when the tree before us took entire possession by its natural strength. "The survival of the fittest."

The battle having been won, a marvelous change came over this denison of the forest. History written in its trunk shows the remarkable growth for nearly half a century of half an inch diameter yearly, since it added twenty-three inches in the forty-five years succeeding.

In 1864 another change occurred. The farmer cut away most of the trees in his wood lot, thus destroying all forest conditions, when the fertile virgin soil was soon eroded so that the rains no longer soaked into the earth, but ran quickly away to the streams.

From this time on the increase in growth was reduced to one-eighth inch per annum, and during the last forty years it added but five inches to its trunk, and in 1905 the tree was cut for lumber.

Thus upon the rolling hills of Indiana we find history plainly recorded in the trunk of an ash tree, the life of which connected three centuries. Its greatest value was attained during the American Civil War, at which period the wood was strong, tough, elastic, full of life and vigor, since which time it has been in the process of decadence. From the present scarcity of lumber it may command more money than it would have done forty years ago, when timber was more abundant, yet the quality of the wood has steadily decreased.

MORAL.

We are entering upon an era of artificial forest planting, and it is important that we begin aright. A regular maximum growth may be maintained by giving ample room for root development, as upon this devolves the proper nourishment of each and every tree.

As the trees expand and extend their roots, requiring greater space, the surplus trees should be removed.

If natural forest conditions do not exist, and can not be produced, substitute thorough but shallow cultivation until the trees naturally supply such conditions by strewing leaves and casting a shade.

When timber is ripe harvest it while yet in its prime, and plant other trees to continue the supply, before the soil shall be eroded and lost forever to the owner.

NOTE.—All the water which is precepitated during an ordinary rainfall does not enter the soil, much depending upon the forest floor or mulching of leaves, etc.; usually much of the water flows away to the streams. If this forest floor has been destroyed, the proportion of rainfall which enters the soil is much smaller, and if the surface be hard, with considerable slope, the quantity which soaks into the earth to benefit growing crops is infinitisimal.

A rainfall of twenty inches per annum amounts to 55.39 cubic inches weekly average, a quart being 57.75 cubic inches.

The planting of forest trees 4 x 4 feet as demanded by authorities requires 2,722 trees per acre. Nature is lavish with her seed, and at times sows even more than this number, depending upon time to destroy a vast majority in order that the remaining few shall have sufficient space in which to grow.

American White Elm.

The Ash Tree.

The Ash family is noted for the economic value of their wood. With the exception of the European Mountain Ash, the beautiful clusters of red berries of which are attractive, the Ash is not a specially desirable tree for ornament. Its flowers are small and without beauty. In botanical language the flowers are inconspicuous.

The foliage is of good color, and makes a good shade.

But as timber trees this family *Fraxinus* hold a high value.

The White Ash, *Fraxinus Americana,* is noted for the whiteness of its wood, making excellent lumber for furniture and numerous uses.

Having great strength combined with lightness, it is prized for making agricultural implements, handles of various tools, etc.

This tree prefers rich land, well drained, yet not too rough or steep. It grows rapidly when in good soil, having sufficient water and not too closely crowded.

The wood of Blue Ash has a blueish cast. The young branches are square, hence the name *F. quadrangulata.*

The quality of the wood is also excellent, and is used for the same purposes as the white ash.

BLACK ASH.

F. Sambucifolia is of greater value for making hoops and basket splits, as the wood is pliable, tough, and may be split into layers. It grows on flat land, in swampy locations, requiring much water.

There are several other varieties of Ash, but above are the principal kinds used for lumber.

Much of the cheaper grades of furniture are made from Ash, but it is becoming quite scarce in the market.

In the West some varieties of the Ash are planted for shade and for timber, and with considerable success. Although at times before the newly planted trees gain hold upon the ground and begin a vigorous growth, the sun scalds the bark, and borers enter. Newly transplanted trees should be protected from the sun by hay bands, or tree boxes, or even a board secured to the trunk which will prevent the hot sun from reaching it.

In the City of Mexico are many large ash trees, as also in other Mexican towns, but I found none in native forests of the republic.

HOW TO GROW THE ASH.

The Ash can only be produced from seed, which, however, is produced in greatest abundance. It begins to fall soon after ripening in the autumn as they are loosened by frost, yet many seeds cling to the branches until early winter.

Seed should be gathered before it begins to shatter, as it is quite tedious to pick up from the ground; besides, much is scattered and lost if the wind is blowing.

The seed of all Ashes in America have a general similarity, yet each variety is distinguished by the peculiar form of the winged appendages.

To be sure of having fresh seed and of the variety desired it is necessary to gather it or engage some collector to secure it, and to place an order some time in advance.

The seed may be kept dry until spring, when they should be planted in nursery

rows and given good culture during the season.

By the following autumn they should have attained the hight of 18 to 24 inches, and may be transplanted.

In regions of frost no seedling trees should be planted in autumn as they are liable to be heaved out by frost and destroyed. Heel in the seedlings until spring, covering the roots carefully with fine earth.

The soil should be thoroughly prepared as for a corn or other crop, plowing and harrowing well. It is preferable the trees should be set 7 x 7 feet. While this is too close for a permanent forest it is best the trees should be thus close for a few years, when three-fourths should be removed, leaving the trees 14 x 14 feet.

We prefer to mark off the ground one way by light furrows seven feet apart, and then cross-furrowing as deeply as possible.

Two men operate together in planting, one carrying a bunch of trees, the other a shovel. A tree is placed upright at the intersection of the furrows, and held there while two or three shovelfuls of earth are thrown about the roots. If not too wet, the man firms the earth about the roots and passes on to the next intersection. Two men will then plant two acres in a day, often more than this.

For three or four years the ground may be utilized by planting corn or other crops between the rows of trees. No vines, however, should be so planted.

The same cultivation should be given the trees in a newly planted forest as would be given a field crop. The greater the care and better the cultivation given, the stronger growth will the trees make, and quicker returns to the owner.

We prefer the distance of 7 x 7 feet for a majority of forest trees at the beginning, thinning promptly whenever they indicate that greater space is required for the roots.

QUERCUS ALBA.

"For years we have been trying to introduce the white oak into Colorado as a hardy tree of commercial possibilities, but we are not bragging very much about the success accomplished along this line. As a matter of fact it is a very difficult matter to introduce and acclimate the *alba quercus* in this country, and we often think that the job will have to be given up. It is exceedingly difficult to obtain the seeds in sound condition. Acorns of white and several other species of American oaks naturally start into growth as soon as matured in autumn, making roots several inches long before freezing weather if they lie on or are buried in the soil. The leaf sprout does not appear until spring."—Exchange.

There need be no trouble in obtaining fresh acorns if precaution is taken to ask for them early enough in the season. Millions go to waste and are fed to swine, but no one can afford to collect acorns, walnut and perishable forest tree seeds unless they are engaged in advance.

However, the more elevated portions of the Rocky Mountains are not at all suited for the oak.

Even the dwarf oaks which grow at as great an elevation as 7,000 to 8,000 feet are frost bitten so frequently as to make them stunted, seldom reaching more than fifteen feet in height. Possibly in the valleys the white oak might be acclimated. The same report comes from England. The white oak does not succeed there. It is a splendid tree, and experiments should be continued.

Professional Obstructionists.

A writer in a "professional forestry paper" in New York, ashamed to acknowledge his article, but signs it "B," probably meaning Barnacle, makes a violent attack upon the Catalpa, showing wonderful ignorance and great malice in his production.

The editor of the Ithaca publication, by printing an unsigned paper, thus giving his indorsement, is one whose opportunities during the past quarter of a century have been greater than those of any other person in North America, yet has never created any new woodlands nor caused the perpetuation of any of America's superb forests.

The article begins:

"More than one hundred years ago, when the fear of a timber famine agitated the people of Germany, we find among many suggestions of relief offered a pamphlet entitled, 'The Catalpa a Sure Means of Avoiding the Wood Famine.' History seems to repeat itself, and we seem destined to pass through the same phases of development as other nations, even in this particular."

One hundred years ago the *Catalpa speciosa* had not been discovered by the pioneers of the Northwest Territory, and was totally unknown in Europe or any locality except the very restricted regions about the lower Wabash Valley, it being not until 1818 that General William Henry Harrison found it at Vincennes, Ind., and sent a few trees to his home near Cincinnati, O.

And, further, it was not until sixty years later that Dr. John A. Warder discovered the difference in our American varieties of catalpa and gave the name speciosa to the Indiana tree.

Japan at that period was a closed book, and *Catalpa kempferii* from that empire was also unknown to Europe.

In 1586 Sir Walter Raleigh took *Catalpa bignonioides* from North Carolina, then part of Virginia, to London, and it was planted by Sir Francis Bacon in the Garden of Gray's Inn (See ARBORICULTURE for November, 1905, page 254, also page 287.) From this stock many trees were distributed to Germany and other European countries.

Thus the only variety of Catalpa known to the world when this German pamphlet was printed was the Southern or *Catalpa bignonioides,* a tree entirely useless for economic purposes.

Continuing, Barnacle says:

"The wood of the Catalpa has been credited with having great durability in contact with the ground, combined with rapid growth, and on that account the planting of this tree for the production of railroad ties, fence posts, and like material, has been frequently, and in some cases persistently, advocated. Like all things which possess numerous good qualities, Catalpa has added to the ranks of her ardent admirers many persons who, on account of their *superficial knowledge of this tree* and its real value, are carried away by the striking good qualities possessed by the wood, and have entirely overlooked its limitations, advising its use for certain purposes to which it is but little adapted."

This is admirable for a person who does not even know the *Catalpa speciosa,* never saw one in the forest, and is totally ignorant of its characteristics. *Superficial knowledge* is good.

"Within the past five or six years Catalpa has been quite extensively planted by several railroads for the purpose of producing tie material. That they will not meet with the expected success seems certain, for almost the entire basis of the many varied statements made concerning Catalpa in plantations and its value for railroad ties is founded on theory rather than fact."

The humorous theoretical "Barnacle" wishes to obstruct the practical work of forest planting and the perpetuation of America's forests by making frivolous imaginary objections to the use of a wood of which he knows nothing, yet he offers no substitute, points out no other tree which can be grown in a brief period, and which will be better than the *Catalpa speciosa*. He simply puts a pebble on the track, hoping to stay the progress of forest planting and practical forest extension.

"In support of the statements that the wood is well adapted to the above purpose, we are asked to look at this or that cross-tie, which was in continuous use in some road-bed for twenty years or more. Though this tie may be badly cut by a rail, such cutting, it is stated, can be quite eliminated by the use of proper tie-plates; but such a statement can be made only theoretically, since no actual tests of Catalpa have been made under such conditions."

The ties on exhibition were not badly cut by the rails, but had all been adzed down by the section men to receive larger rails, four successive sets of iron and steel rails having been in use during the period in which these ties were in use, each succession of rails being of heavier weight, the last being ninety pounds per yard, with the heaviest traffic during the past ten years.

"Upon examining farther into the history of this cross-tie, we find that its past is somewhat clothed in doubt, and probably the actual number of years it remained the part of some railroad track can not be accurately stated."

The editor of the journal quoted was at the St. Louis World's Fair, but refused to visit the Catalpa exhibit, which commanded the world's admiration and received the Grand Prix. Had he done so, he would have known how false the above statement is.

Abundant evidence was given that the many Catalpa ties which were in this collection had been in constant use for thirty-two years under most adverse conditions, yet were perfectly sound after all this time, and further, that several thousand Catalpa ties had been in service in these various railway tracks for the same period, and had given perfect satisfaction, being discontinued merely because of exhaustion of the supply of the timber

Besides, the earliest railways of Indiana and Illinois were largely tied with Catalpa cross-ties, these lines being located in the region of the Catalpa forests. The engineers of that period had the greatest confidence in this wood, and advocated the extensive planting of the Catalpa for this purpose.

"Further, it should be remembered that in the earlier days, when Catalpa ties were used, the rolling stock of railroads was much lighter and the weight of the trains far less than at the present time. Can we, then, safely judge from the action of Catalpa ties having an uncertain past, and used under conditions much less severe than are prevalent to-day, what the present value of such a tie will be, even using a tie-plate, when the road-bed is subject to the wear and tear of engines weighing one hundred and ten tons and large freight cars carrying fifty tons burden?"

Barnacle would ostracize Oak, Chestnut, Yellow Pine and Catalpa, since they have not been tested for engines and trains of the weights demanded ten years hence, but he does not say what he would construct ties of. Possibly he is interested in some patent tie, like the one sent

to St. Louis, made of cement concrete, weighing three hundred pounds, and broken in twain on its arrival at the Fair grounds.

"Catalpa enthusiasts in some cases state that a planter may expect to harvest every fifteen years, on various kinds of soil, five ties per tree, besides fence posts and other materials, but strangely enough, though there are Catalpa plantations of an age of thirty years and more, and owned by railways, no ties have so far been cut from such plantations, nor are there records that any plantations so far have produced material in sufficient quantity and of a size suitable for this purpose."

These professional scientists in forestry have always insisted in planting trees 4x4 feet, 2,722 trees on an acre of land, only space enough for rose bushes, sixteen square feet of surface for each.

It was through this insistance upon such close planting that the plantations quoted have been retained for thirty years without making any growth, and when cleared last year were all sold for fence posts. It was scientific obstruction entirely which prevented these plantations from making timber suitable for cross-ties.

Within one mile of these plantations were many Catalpa trees which were of ample size to make five cross-ties, although they were not as old as the groves quoted, but they were not limited to sixteen square feet space.

The editor of ARBORICULTURE, who is the target of Barnacle's wrath, has plainly stated that in the warm regions of the Mexican Gulf trees could be grown in fifteen years of sufficient size to produce five cross-ties, and there is abundant proof for the assertion.

Farther north tree growth is slower, and it will require longer time to grow.

"The rapid growth of Catalpa into material suitable for cross-ties has been greatly overestimated, and it is questionable if under ordinary conditions it will ever prove to be of as great value for railroad ties and similar material as many other woods, especially if the latter are impregnated."

Barnacle here gives himself away. Who knows but he is the agent for some wood-preserving patent and opposes the use of catalpa because it is made antiseptic by nature, and needs no other chemical impregnation to make it enduring.

CHICAGO, ILL., Dec. 28, 1905.

Mr. John P. Brown:

MY DEAR SIR:—I have had the question raised as to the merit of Catalpa lumber secured from a quickly growing tree. Will you not kindly advise me in this regard—that is, what is the comparative value of the wood of slow and rapid growing trees? W. J. A.

CONNERSVILLE, IND., Dec. 29, 1905.

Mr. W. J. A.:

DEAR SIR:—In reply to your inquiry of the 28th, I would say: It is a well-known fact that second-growth timber, which is merely that very rapid growth which succeeds the clearing away of an old forest, while yet the soil is rich from long accumulation of leaf mold and mosses, and before these have been dissipated after many years' cultivation, is far more elastic, firmer, much harder and tenacious than the old wood which has grown slowly. Instance ax and other handles. These are never made from old brash wood, but are invariably made from young, second-growth hickory, pecan, ash and similar woods.

The same positive rule governs *Catalpa speciosa.* In an old, dense forest this tree grows slowly, because it can not obtain

Sugar Maple.

moisture and nourishment to force a rapid growth. This old, suppressed growth is a slow growth, very often requiring ten years to increase as much as the trees which, having ample room and good soil, make in one year. Such slow-growth woods are soft, and by no means so strong as are the rapid-growth trees. The latter are hard, firm, elastic, and full of life, having a much greater value than the slow-growing trees.

It is this difference which makes the wood of *Catalpa speciosa*, when quickly grown, so much more useful than that of *C. bignonioides*, which is of slow growth.

A post exhibited at the World's Fair was broken in twain by powerful machinery. It came apart like two paint brushes, the tough fibers on each stick so resembling the bristles of brushes.

Very respectfully,

JOHN P. BROWN.

"The First County Park System." By Frederick W. Kelsey. J. S. Ogilvie Publishing Company, 57 Rose Street, New York.

No one is more capable of writing about parks and their management than is Mr. Kelsey, who was Vice President of the first Board of Park Commissioners selected to lay out the parks of Essex County, New Jersey.

The history of Essex County parks is but a repetition of the cursed spoils system in politics where men noted as ward heelers manipulate the parks not in the interest of the people, but for political purposes. Cincinnati and almost every large and small city has been through this same ordeal.

This work of 300 pages, fully illustrated, cloth bound, is sold for $1.25. We commend the work to every lover of trees.

PRUNING THE FOREST.

The financial value of timber trees and the uses to which they may be adapted depends entirely upon the length of the trunk, its freedom from objectionable knots, its straightness of body and soundness of the wood, and, withal, the number of available trees on the tract. Small, short-bodied trees, and those which are crooked and knotty have a value for fuel purposes only, and that is the lowest grade of wood values, and which are measured by their bulk, or cord prices, while good, merchantable timber possesses the highest value for lumbering purposes, and are measured by board measure. Hence it is important that the timber land owner should give consideration to the character of his young forest, and not depend upon Nature to perform the work which man only can do economically.

In some things Nature is a most excellent guide, while in other directions Nature can only be followed at the expense of time and a long period of interest accumulating capital.

There are many species of forest trees which under natural conditions will not make long, straight, branchless boles, yet by judicious manipulation, without great expense, may be trained into ideal milling timber. Others require so long a period to accomplish this object, under the methods of Nature, that as a cash investment they become very unprofitable.

There are three methods of obtaining straight trunks, free from knots, in forest trees:

(1) By planting very closely; some advocate 4 x 4 feet, or 2,700 trees per acre.

(2) By giving them considerably

greater space, as 8 x 8 feet, or 7 x 7 feet, the former 680 and the latter 888 trees per acre. After a certain season they are thinned out, leaving 170, or 222 permanent trees per acre to grow into lumber.

(3) By planting as in Method 2, permitting them to grow without pruning, yet cultivating thoroughly, and after the trees have formed a strong root system, in from two to four years, cutting off the entire plantation, leveling the trees with the ground. As young shoots spring from the stump all save one are removed, permitting the entire energy of the roots to push this one shoot forward rapidly.

The first method requires four times the number of trees which serve for either of the other methods. It costs four times as much to plant them, which is a very serious matter where trees and labor are expensive. Worse than all, the owner is tempted to leave them, year after year, in hopes of realizing something for the thinnings, while all become hopelessly stunted in growth.

Of the two latter methods both have their advocates, both may be considered safe methods; either will make a good forest. There is no method of eliminating side branches and preventing the formation of knots, which is so economical or so sure as the use of the knife or chisel.

Side branches may be removed in an instant while they are a half inch in thickness, and none ought to remain to grow much larger, along the trunk to a height of sixteen feet.

In a natural forest where the trees stand irregularly, just as the wind or some bird or animal dropped the seed, many of the trees will be weeds, or trees of little value, and the ground will be covered without regard to man's economy. But with an artificial forest every foot of surface may be made productive, the greatest possible number of trees on a given area.

With straight, regular rows the workman may perform the labor of pruning in a systematic manner with least expenditure of time.

Cutting and hauling out the timber may be accomplished with greater ease than in the irregular natural forest.

There need be no vacancies and no waste land to pay interest and taxes upon.

When the product is to be sold every tree has a value, and the lumberman will pay full value, since he can use economically the entire product.

JIMMY ON THE SYMPATHETIC STRIKE.

Me maw she's had ter go an' scrub—
  She says me dad's a reg'lar fool!—
An' I must help ter earn me grub
  By peddlin' papers after school.
We finds it hard, does maw an' me,
  Wit' Mamie, John an' little Mike,
Fer dad he ain't a-workin', see?—
  He's on a sympat'etic strike.

We finds it hard ter pay der rent,
  An' buy der babies shoes an' tings;
Sometimes we doesn't have a cent—
  Me maw she's had ter pawn her rings.
An' dad he 'tends der meetin' hall,
  Where ever'body calls him "brudder,"
An' where der men don't work at all,
  Dey got such symp't'y for each oder.

Me maw she just gets awful mad
  Ter see der way dat t'ings is goin'—
She often ups an' says dat dad
  Should have some symp't'y fer his own.
She says der men who make der strike
  Are blokes who want ter loaf an' shirk;
She says dey're fellers who dislike
  Ter do some sympat'etic work!

—*From Life.*

ANGRY RATTLESNAKE.

Forest and Stream prints the following story, told by a traveling man:

"'When I was a young man, living on a farm in the mountain region of Pennsylvania, one of the women folks came to call me, stating that there was a large rattlesnake in the barn. I ran up there, and in the manger part of the ground floor of the barn found a rattler about four feet and a half long and as thick as my wrist. I got a hay fork and got over the feed rack and stuck one of the tines of the fork through his body. He thrashed around at a terrible rate, and I was somewhat at a loss to know how to kill him, so I called to the girl to come over and hold the fork, which I had then shoved up tight against the wall, until I could get a stick and kill the snake. The snake was still thrashing around when she took hold of the fork, the handle of which was five or six feet in length, but almost immediately thereafter the snake ceased its struggles, raised its head, opened its jaws wide, and shot out at that girl two streams of liquid, which fell on her dress about six inches apart, and actually trickled down the dress. It was a pink calico dress, and the poison took the color out of the dress and left it with the two streaks showing white.'

"If this story is true, it means that a rattlesnake when it strikes is able to exercise control over his 'hypodermic' and to regulate the dose; that here was a very mad snake who could not get at the person it wanted to poison, and so undertook to administer it at long range.

"And if this is true, it is possible to adduce the proof. For if a poisonous snake can control the ejection of its venom, there is a sort of constrictive muscle attached to or about the poison sac, and the muscle is supplied with a motor nerve with which to set it in operation."

The editor of ARBORICULTURE, while residing in Kansas, some thirty years ago, had a similar experience. In traversing a road crossing a small stream which was skirted with timber, I saw a rattler of monster size. The only weapon to be found was a fence rail, and with that I attempted to kill the reptile. It climbed upon a prostrate log when I struck at the snake, but the rail was too cumbersome for effective work. The rattler thereupon squirted his venom towards me, it falling to the ground six feet from the snake's head, just as a man would spit forcibly. My distance, however, was too great for it to reach me.

FORESTRY AT THE IOWA STATE COLLEGE.

The past few years have witnessed a wonderful progress in the interests of all classes of people in the study of common trees and in the care and protection of forest growth as well as the extension of the forest areas of our country, by planting. Every industry which is dependent upon a permanent supply of crude wood material has been forcibly awakened to the fact that prices are much higher than during the past decade, and that forest areas must be protected and extended if that industry is to remain upon a permanent basis. The feeling is everywhere prevalent that something ought to be done, and yet there have been few in this country who could tell how to go about the planting of forest trees, what trees should be planted, what care given after planting, and how our forests should be protected. This demand for men who can carry on practical forestry operations has caused the establishment of forest schools at several of the leading agricultural colleges and universities.

The Iowa State College is one of the first to recognize this need, and during the past year has established several courses in forestry.

Horse Chestnut.

A four-years' course in Forestry and Horticulture has been established, during which four courses in Forestry are given in connection with numerous courses in Horticulture.

In the Freshman year is given a course in Elementary Forestry which goes into the subjects of the life history and growth of trees; forests and forest influences; distribution of trees native in the United States and in Iowa; trees for planting of wind breaks and groves, with methods of planting and care, and elementary methods of tree measurements. Lectures are given upon the relation of forestry to other sciences and industries, with something as to the history of the work and its present economic importance in this country.

In the Sophomore and Junior years a course in Silviculture continues the outdoor studies of the native tree species. Practical work is given in methods of collecting, storing, testing and planting of tree seeds. The various trees adapted for growth in this State are taken up and discussed at some length. The farm grove or wood lot is studied with regard to methods of formation and care. Work in Forest Measurements is continued with especial attention to the measurement of growth in height, diameter and volume. Protection of woodlots and groves from fire, insects, and gazing is studied and applied to local conditions.

During the Senior year advanced work in the Principles of Forestry, Forest Management, Economics of Forestry, Forest Valuation, Wood Technology, and lines of original investigation are taken up.

FACILITIES FOR PRACTICAL WORK.

Although Ames is located in a prairie region, the presence of several streams and rivers, along which there is a considerable amount of natural growth, affords ample opportunity for becoming acquainted with native trees and their growth under natural conditions.

Students may enter the work in Forestry and Horticulture under the same regulations which govern the entrance into the other courses in the College, and will be given equal advantages in every way.

H. P. BAKER, Forester.

"THE PRAIRIE AND THE SEA."

Doctor William A. Quayle's latest work. Published by Jennings & Graham, Cincinnati, O.

There are no publishers of books who do finer work and better illustrated than this Cincinnati firm.

Dr. Quayle is a born naturalist. He sees more in nature than most of us who pride ourselves in being close to nature. But Dr. Quayle could not live upon the prairies, write about the prairies, and think of the prairies without getting down into the valleys and strolling along the quiet stream which there flows, to dwell among the trees which he so loves.

The Doctor is a true arboriculturist. He writes intelligently of the oak, the ash, the sycamore, hackberry, elm, wild cherry, birch and pines. But he left the prairies and traversed the Rockies to find the pines.

The birds, the animals and the flowers each have their share of attention from the gifted author's pen. How true his criticism of authors who have written of the prairie without understanding them. Only Cooper of our American writers knew the prairies intimately.

Of the prairie wolf the author writes:

"He, too, is a lover of the prairie. Wolf he is, sullen and whelpish. His swinging gallop, with head thrown back waggishly over his shoulder, is free as the blowing of winter winds. His lair is the prairie-paved sky. He is not moral. He cares for no work in ethics. He looks out for No. 1, in which lucrative employment, both on and off the prairie, many are engaged. He is ministerially inclined in his love for chicken, though I truly hope the ministers are more religious in their method of acquiring their favorite edible."

How in a single sentence he describes the tree which is so common in the West, "The cottonwood, a lover of prairie streams!"

Those who read this work will know thoroughly that the author has seen and lived upon the prairies and knows the plants and birds and animals which inhabited them in the days before the great wheat and corn fields had taken from them their individuality. Dr. Quayle writes of the pairies which once existed in the great expanse beyond the muddy Missouri.

Cypress, Carny's, Alabama.

The Incentive to Forest Planting.

No other influence save that of personal profit to the individual land owner will cause the restoration of American forests. Only by seeing a liberal interest upon the investment of time, labor and money, will there be any forests planted.

Patriotism, duty to posterity, National and State necessities, the interest of the lumbermen, perpetuation of manufacturing industries, the requirements of the farm have been the theme for half a century, and every argument within the scope of man's mind has been advanced to induce the United States and various State authorities to restore our forests to a sufficient extent that future generations may be supplied with timber, while individual land owners have been appealed to, but without result.

The reason is apparent. No one wants to plant oak, hickory, elm, sugar maple or any slow-growing trees of our native forests because of the great length of time required for them to mature. Scarcely any forest areas have been planted to continue the wood supply beyond the present generation when American forests, as such, will have become exhausted.

The International Society of Arboriculture, by appealing to the great corporate land owners and to the railways which now see the absolute necessity of providing timber quickly, and by showing these organizations the advantages possessed by catalpa wood, its great value for timber, rapid growth and great usefulness, and by pointing out the financial returns which may reasonably be expected, has secured the planting of more than ten million forest trees, and aroused an enthusiasm among planters of trees which has never existed before in the history of the world, and yet the new era for arboriculture has just begun.

It augurs ill when men, high in authority, with great influence in the world of science and forestry, attempt to dissuade those who are already convinced of its necessity from planting trees, and especially is this true when from errors of their own such authorities have not learned the truth in regard to the tree which they malign.

ARTHUR COWEE.

It is the man who makes a specialty of some line and pursues it with energy who succeeds in life.

Arthur Cowee, of Berlin, N. Y., has made a life study of the Gladioli, among the most beautiful of our bulbous flowers. Acres of these handsome flowers are grown at his Meadowvale farm, while much time is devoted to this improvement by selections of the finest seedlings. There is no plant which gives greater satisfaction and a handsomer showing during almost the entire summer than does the Gladiolus.

At the World's Fair, St. Louis, Mr. Cowee had several acres of his flowers on exhibition, and received the Grand Prize. We saw these Gladioli during the long summer at St. Louis Fair, and can attest the magnificence of his display.

Blue Gum, Tupelo, near Evansville, Ind.

FROM PRETORIA, SOUTH AFRICA.

ENGINEER'S DEPARTMENT.

J. P. Brown, Esq., International Society of Arboriculture:

DEAR SIR:—I am trying to collect evidence as to the effect of tree-planting in causing or increasing the permanency of springs, and I should be extremely obliged if you could, in the interest of science, let me have some information on the subject.

I have a large collection of statistics on the effect of deforestation, but practically no positive facts on the effects of afforestation.

(Signed) C D. H. BRAINE,
Assoc. M. Inst. C. E.

REPLY.

Mr. C. Dimond H. Braine:

DEAR SIR:—I am in receipt of your letter of inquiry, dated November 14, in regard to the effect of tree-planting upon water supply.

You are probably aware that the United States has been a nation of forest destroyers, and have not, until very recently, commenced to plant trees.

It is not likely that one single tree has been planted in the North American Continent for each million of trees removed until within four years past, and no results can be expected from the trees now being planted for a quarter of a century, on account of the small number planted proportioned to the great extent of country and the much larger quantity of timber removed.

The International Society of Arboriculture has secured the coöperation of many of the railway systems and larger land owners, and is now planting several millions of trees, but the work has only just begun, only four or five years since the first plantings. Hence there will be no evidence of any value upon this subject from North America for many years. Very respectfully, JOHN P. BROWN.

RHODE ISLAND FORESTS.

"What would be the adaptability of *Catalpa speciosa* and white pine for the sandy and somewhat denuded and abandoned lands of West Greenwich and Exeter, in this State? J. Q. B."

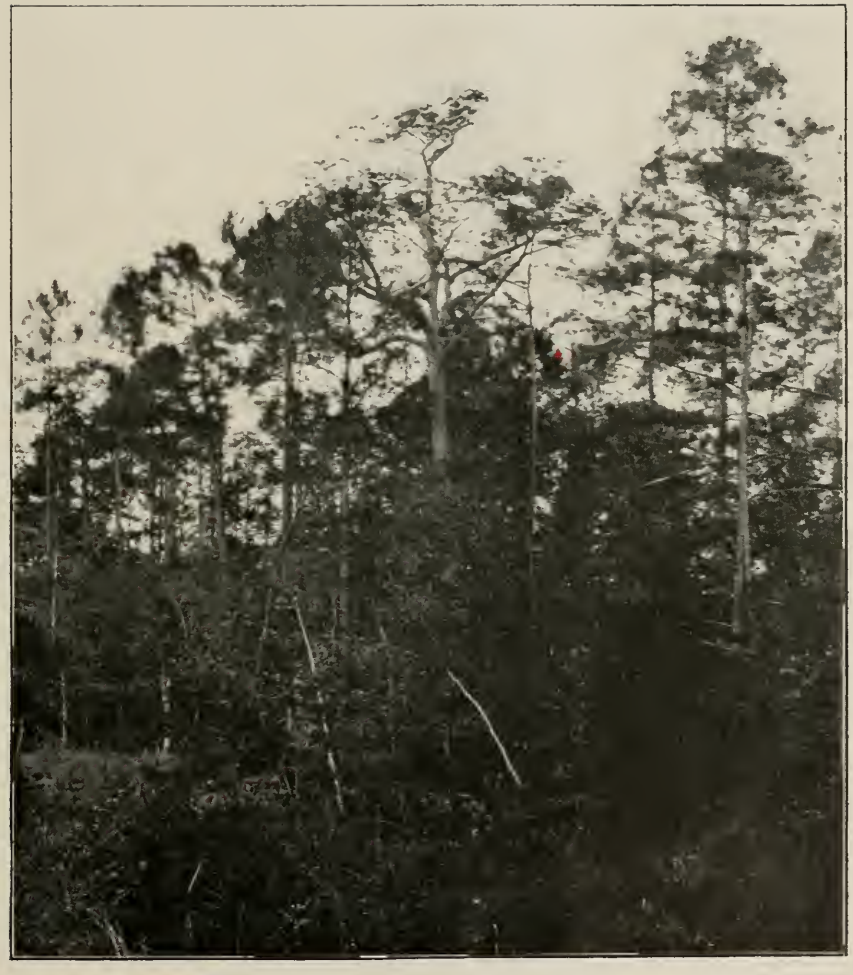
REPLY.

ARBORICULTURE has endeavored to place before the world all possible information in regard to economic forestry. Several times the editor has been called to New England to confer with your citizens, and has addressed large audiences in Massachusetts, Maine and New Hampshire, and has repeatedly urged the planting of white pine, walnut and *Catalpa speciosa* to improve the character of your wooded tracts.

Timber growth in Rhode Island should be as good in the twentieth century as it was in the sixteenth, when all of New England was a dense wilderness of immense trees.

The planting of these larger growth trees in your State will have a similar effect in this direction as the introduction of improved blooded stock has had upon the animal industries.

Sandy soils, where there is a generous rainfall, produce excellent timber growths, and all the trees named will thrive on the lands of Exeter and Greenwich. All these trees are of magnificent proportions, often reaching one hundred and fifty feet in height, with a diameter of four to seven feet, while the dwarf-growing birch, dwarf oak and scarlet maple are of small stature.



Cypress, Alabama Swamps.

Why This Antagonism?

The following letter from Hon. W. G. M. Stone, President of the Colorado Forestry Association, gives the entire cause of the antagonism of many people to the *Catalpa speciosa.*

What is true of Colorado is just as true of Indiana, New York, Washington City, and all European countries.

ARBORICULTURE is kept busy replying to numerous attacks made upon the catalpa tree, often by people and publications of high character, who have been imposed upon by nurserymen and seedsmen, and have planted *Catalpa bignonioides* and hybrids under the name of speciosa.

These people, if they would, could very easily ascertain the facts in the case, but somehow that does not enter their minds:

"THE CATALPA IN COLORADO.

"In what has been said of catalpa trees in Colorado, it has been the aim to show that while the speciosa variety as found in its native woods is a tree of inestimable value, promising a larger degree of usefulness to the people of the United States in the new and coming industry of growing trees for use and profit than any other, yet as seen here, a farmer is not warranted in planting a wood lot of catalpa. In view of this the question arises: If the catalpa as found in Indiana, Ohio or Missouri is so excellent and desirable, why is it in the main so worthless in Colorado? Is the fault in our climate or is it in the tree?

"This brings me face to face with an aggravating feature in this problem. In Colorado we scarcely know the tree catalpa, the *Catalpa speciosa,* or hardy variety. What we have to a great extent is the Southern, tender variety, known in the books as *Catalpa bignonioides.* It should have been named *Catalpa scrubbiosa,* or scrubby catalpa, for that is what it is. It has taken me three years to find out what I am about to tell you — one year to ascertain the reason of the inferiority of so many of our Colorado catalpas and nearly two to discover how it happened. If the reader will take the pains to study the trees individually, noting the bloom and time of blooming; if he will examine the seed pods as to size and number on a twig; if he will examine the seed of different trees and compare them; if he will study the bark and the form of different trees and put his facts together, he will find that a large per cent. of our trees are not the true catalpa.

"One of the astonishing things about it is that they were all purchased for speciosa. It is safe to say that no invoice of catalpa from any nursery ever came to Colorado billed as bignonioides, but tagged *Catalpa speciosa.* They were so designated in the nursery row, and so printed in the catalogue from which they were selected. Talk about deception, imposition or fraud! Here is one of the most aggravating cases of imposition in the history of American sylvaculture, happening at a period most unfortunate, for it is just as men are beginning to think of planting trees and selecting the best things to plant for their own use and necessities. But who is to blame?"— W. G. M. Stone, in *Field and Farm.*

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Within less than a twelve hours' ride over the Iron Mountain Route from St. Louis, in a basin of the Ozark Mountains, lies the greatest all-year-round resort in the country. **Hot Springs, Ark.,** had over 90,000 visitors last season and it is conservatively estimated that fully 100,000 will find their way to the great Valley of Vapors during the coming year.

It is not alone the thermal waters with their wonderful curative properties that attract this multitude of people, but the world-wide reputation which this National Sanitarium has attained as a pleasure resort causes thousands of visitors annually to gather there from all sections.

This season the Iron Mountain Route has retained as part of the excellent equipment of its Hot Springs Special, Through Pullman Compartment Sleeping Cars. This solid vestibuled train of Pullman Sleeping and Free Reclining Chair Cars leaves Union Station every night at 8.01 o'clock, and arrives at the Springs the following morning at 8.00 o'clock, in time for breakfast at one of the great resort hotels there, than which there are none finer in any of the large cities of the country.

Whether the visitor is seeking health or pleasure, rest or recreation, pastime, amusement or sport, he will find them all happily combined at Hot Springs, Ark., or in the immediate vicinity.

For those who prefer a longer trip there are the 2.21 p. m. and 8.20 p. m. trains of the Iron Mountain Route which leave Union Station daily with through sleeping cars for Houston, Galveston, Dallas, Fort Worth, San Antonio, Laredo and the City of Mexico. Along the Gulf Coast in the vicinity of Galveston there is the greatest sport in the world for the ambitious angler, and that is tarpon fishing. He is called the "Silver King" of the finny tribe, and will furnish more genuine sport of a strenuous character than a long string of bass or basket of speckled trout. **San Antonio** is the great cosmopolitan resort in the health belt of the Southwest.

In **Old Mexico** the tourist will find himself in a land so strange and foreign to this, that he will wonder why the tide of travel to Europe every year does not turn in this direction. There is mental pabulum in Mexico for the student, historian, archaeologist and scientist, as well as health and pleasure for those who love to live beneath cloudless skies and dream away the idle hours in a land of sunshine and flowers. The semi-weekly "Mexico-St. Louis Special," solid vestibuled train, makes the run from St. Louis to City of Mexico in sixty hours, leaving St. Louis at 9.00 a. m. Tuesdays and Fridays, beginning January 16th.

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THE INTERNATIONAL SOCIETY OF ARBORICULTURE

OFFICERS:

General Wm. J. Palmer, President, Colorado Springs, Colo.
Henry J. Elwes, F.R.S., Vice-Pres., Colesborne, Cheltenham, England.
John P. Brown, Secretary-Treasurer, Connersville, Ind.

Articles of Incorporation.

ARTICLE I.—Name. The name of this corporation shall be The International Society of Arboriculture.

ARTICLE II.—Purpose. The purpose of the Association is to introduce judicious methods in dealing with forests and woodlands; to advance and advocate a public interest in this subject; to promote the afforestation of unproductive lands; to encourage the planting and care of shade trees in parks, public and private grounds, and along streets and highways; to inspire an interest in our remaining native forests, and groves of ancient trees, and to seek their preservation; to supply information to railway officials in regard to timber culture for railway uses, and incite railway and other corporations to plant trees for economic purposes.

ARTICLE III.—Membership. Any person may become a member of this society by the payment in advance of an annual due of two dollars, and on payment of this annual due shall be entitled to receive, regularly, one copy of Arboriculture, the official organ of the society. Any person who may contribute ten dollars toward the support of the society shall become a patron. Honorary members may be chosen by the executive committee.

ARBORICULTURE

Vol. V No. 3

A Magazine of the International Society of Arboriculture . . .

Connersville, Ind., March, 1906

JOHN P. BROWN, Editor and Publisher

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CATALPA SPECIOSA GROWN IN AN OPEN FIELD, WITHOUT PRUNING.

ARBORICULTURE

A MONTHLY MAGAZINE

PUBLISHED IN THE INTEREST OF THE INTERNATIONAL SOCIETY OF ARBORICULTURE.

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Entered as Second-class Matter January 4th, 1904.

VOLUME V. CONNERSVILLE, INDIANA, MARCH, 1906. NUMBER 3.

LIBRARY
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BOTANICAL
GARDEN.

The Catalpa Tree for Cross Ties.

In July, 1904, we printed the report of Mr. F. I. Brown, Lumber Agent of the Pennsylvania Railway, who, as Chairman of the Committee on Roadway and Ballast, made an exhaustive investigation of the Catalpa tree, visiting the Catalpa exhibit at St. Louis, then going to the Wabash Valley, where he found the trees which have been so often mentioned in ARBORICULTURE.

There have been so many requests for copies of this report, and the issue having been long ago exhausted, we reprint the report for the benefit of very many who did not receive that number of ARBORICULTURE:

CATALPA TREES FOR RAILROAD CROSS TIES.

This subject originated through a reference of Mr. Turner, Third Vice President, under the date of Nov. 20, 1902, calling attention to letter written by Mr. J. P. Brown, editor of ARBORICULTURE, and the question was referred to the Chairman of the Roadway and Ballast Committee for investigation and report.

INVESTIGATION AND RECOMMENDATIONS.

There are at least two distinct varieties of Catalpa trees indigenous to the United States. We have also the Japanese variety, and many hybrids. Bignonioides, the Southern variety, is the most common, growing naturally in all of the Southern States and much cultivated as a lawn tree throughout the North. Owing to its prevalence the opinions of most of us relative to the value of Catalpa trees for cross ties and other commercial purposes are naturally, but erroneously, formed from our familiarity with this variety, which from its low growth and spreading habit is totally worthless as a timber tree.

Catalpa speciosa, the native forest tree of the lower Wabash Valley, is entirely distinct, a much superior variety, and is the only form of the species which should be cultivated for any purpose. All other forms should be avoided.

The value of this tree was known to the early settlers of that region, who preferred it for almost every purpose for which wood is used, even covering the roofs of their houses with shingles split from Catalpa trees. It was extensively used for cross ties and telegraph poles in

FEB 26 1906

constructing the first railways through Southern Illinois. Because of this appreciation the natural forests disappeared very rapidly, and but comparatively few specimens of this natural forest growth may now be found. There are still enough, however, to repay any one interested in the subject to visit the groves still in existence in Southern Illinois.

THE FARLINGTON PLANTATION.

The writer here quotes from a Government report, and gives numerous tables, estimates of values, etc. Continuing the subject, he says:

The average value per acre is seen from the table to be $390.21. This would give for the whole plantation of 400 acres a value of $156,084.

It is very interesting to give in this connection an estimate made on an entirely different basis. In the winter of 1900 the owners of the Farlington forest let a contract for the cutting of 125,000 posts. The specifications called for straight posts, 6½ feet long, measuring 4 inches in diameter at the top. These were sold at 10 cents each, or altogether $12,500. It was estimated that this cut removed one-tenth of the trees. Had all the timber been sold in that way, the return would be $125,000. However, limiting the posts to a diameter of 4 inches at the top, without utilizing the smaller sizes, made the cut needlessly wasteful. Thousands of good, straight pieces only a little below the diameter limit were left on the ground to decay. They might easily have been removed and sold as second-class posts at from 5 to 8 cents each; and had this waste thus been prevented, the returns from the cut would have been sufficiently increased to make the two estimates very nearly equal.

[This tract of 640 acres was cleared during the year 1904 and realized $100,000 for the Frisco Railway.—ED.]

Numerous tables are here quoted showing the percentage of sap and heartwood. This shows that the high percentage of heartwood is found even in the very young trees, and that practically it is uninfluenced by the rate of growth. The five-year-old sprouts on Blocks IX, X and XI of the Yaggy plantation have grown very rapidly, yet they show as much heartwood as the slowest-growing trees (Block I) of the Farlington forest. It permits of but one conclusion. In the early growth of the Hardy Catalpa neither age nor rate of growth affects to any great extent the relative amount of heartwood. It is generally recognized that the sapwood of the Catalpa does not greatly resist decay when used in or on the ground, nor does sapwood of any timber. Numerous instances are known both in the case of young and old timber of the sapwood decaying and leaving the heartwood intact after a few years' usage in the soil. However, since the sapwood forms so small a part of the tree, its decay is of but little importance. The heartwood of both young and old timber shows great longevity in the ground. Bulletin No. 108, of the Kansas Experiment Station, shows a photograph of an eight-year-old fence post which had been in the ground constantly for twelve years. The heartwood was still in a perfect state of preservation. Plate XIX shows a section of a fence post which had been in the ground thirty-eight years. The section was taken right at the surface of the ground where decay is always most rapid. Deeper in the ground this post was perfectly solid. This section, it should be explained, was from an old tree which had made very slow growth.

So far as the durability of its timber is concerned, however, the investigations of the Bureau of Forestry seem to show that

CATALPA SPECIOSA IN FOREST.

it is immaterial whether a Catalpa grows slowly or rapidly. If this is the case, there need be no fear that fence posts or telegraph poles will not be durable because they have grown rapidly. On the contrary, it will give all the more reason for hastening growth by every possible means as to get the earliest returns.

Here Mr. Hall recommends hastening the growth, but his system of close planting defeats such a purpose at the very beginning.

Under the table of products are shown for each of the twelve blocks the number and value of posts in the trees now standing, the number and value of the trees already cut, the total value of each block, and the average acreage value of the different compartments. A glance at the last column of the table will show a great difference in acreage value between the different years' planting. The difference is due not so much to age as to soil. By referring to the description of the blocks it will be seen that the trees on the best soil were planted in 1890, on the next best in 1891, and on the poorest in 1892. Here, as in the other plantations, the more fertile soil gives a marked increase in returns. The difference in value is to be partly accounted for in other ways. It will be remembered that the planting of 1891 was never cut back, so that the trees were limby from the ground up, and never attained satisfactory height. Much of the growth was in the form of side branches, and therefore wasted for all practical purposes. This greatly reduced the number of posts, and likewise the value of the trees.

The great tendency towards low branching and the apparent greater necessity for cutting back in the Yaggy plantation may be partially due to the fact that this plantation is of mixed variety, not pure *Catalpa speciosa*. Mr. Hall nowhere in his report mentions this fact.

Dr. von Schreck, in the introduction to his valuable report, has the following to say relative to the Hardy Catalpa:

"The Hardy Catalpa is, as a rule, a tree singularly free from destructive disease. A number of parasitic fungi grow in the living leaves, where they may do considerable harm, especially during moist, warm summers. They are rarely present in sufficient numbers, however, to cause alarm. The young twigs are rarely attacked by any fungus disease, so far as has been determined. Root rot diseases are likewise unknown The wood of the trunk, under unfavorable conditions, considered more in detail below, is destroyed by two fungi, both of which do considerable harm.

"Catalpa wood, after it is cut from the living tree, is one of the most durable timbers known. In spite of its light, porous structure it resists the weathering influence and the attacks of wood-destroying fungi to a remarkable degree. So far as the writer has been able to determine, none of the ordinary saprophytic wood-destroying fungi grow in Catalpa wood; in fact, no fungus has yet been found which will grow in the dead timber. This is certainly a very remarkable fact and worthy of the utmost consideration. After long exposure to weathering influences, which may mean twenty to thirty years and more, portions of the wood do change and crumble away. To what these changes are due it is difficult to say at this time. It may be that the alternate wetting and drying of the wood fibers, causing expansion and contraction for long periods, finally bring about changes in the fiber. These changes are so small, however, that for practical purposes they can be disregarded.

"There is no longer any question as to the long-lasting of this wood. Engineers who employed the wood in railway construction in Southern Illinois and Missouri, many years ago, when the original groves of Catalpa trees were still standing, were well aware of its valuable properties. In an interesting pamphlet Mr. E. E. Barney brought together, in 1878, a large number of letters testifying to the long life of Catalpa wood. These testimonials might be augmented to-day by hundreds of others, but it is not considered necessary to do so here, for no one doubts this fact at this day. Railway engineers used the wood to some extent for ties, but it has never taken a front rank for this purpose. This has been due not so much to any doubts as to its lasting qualities, but to other factors, chief among which has been the small amount of this timber available and the smaller amount of care and trouble involved in getting other timber close to the railway lines, which served as ties. It may be of interest to note a number of authentic cases of long service. Plate XXI shows a section of a Catalpa tie from the lines of the Louisville and Nashville Railway. The section is taken from the part of the tie situated immediately under the rail. This tie had been in actual service for about eighteen years. It will be noted that the wood is perfectly sound, even at the points where the spikes were driven in. The rail wore down the fiber to some extent, but there is absolutely no decay. Plate XXII shows sections of a post from Southeast Missouri, which served as a fence post for the St. Louis, Iron Mountain and Southern Railway for twenty-three years, and before that, on the farm of Colonel Deal, at Charleston, Mo., for fifteen years. These examples of remarkable durability might be extended indefinitely.

"Without doubt, therefore, one may say that for fence posts this wood has no equal; and in view of the fact that it can be grown so easily, it ought not to require much argument to cause farmers to plant Catalpa wherever it will grow. The same is true for telegraph poles. Wherever trees can be grown tall and straight enough, it will be found that they will

CATALPA SHOWN AT WORLD'S FAIR, ST. LOUIS.

serve as poles, lasting longer than almost any other class of timber.

"For ties the same is true as regards lasting quality. There is only one serious objection to this wood for tie purposes, and that is its soft, yielding character. With the heavy traffic, ever increasing, this becomes a serious matter. It is believed, however, that proper tie plates will do much to remedy this difficulty. The cutting in of the rail in the tie shown on Plate XXI is, after all, not excessive, when compared with the redwood, for instance. There seems to be no good reason why a proper plate will not prevent excessive rail cutting."

I would here call attention to the fact that all of the sample ties quoted are of old forest growth, which, being softer in all timbers, will not offer the resistance to rail cutting as will young trees grown in open plantations.

About twenty-five years ago Mr. J. P. Brown, then a civil engineer on the N. O. and N. E. Railroad, became deeply interested in the subject of the renewal of our forests by the planting and cultivation of trees. Since then, purely from motives of philanthropy, much of his time has been devoted to the study and pursuit of practical methods of forestry. While by no means a man of one idea, his belief in the superiority of the Catalpa tree for economic use and his thorough study of that species has resulted in his becoming generally recognized as the foremost authority upon that particular tree. In his paper read at a meeting of the National Roadmasters' and Maintenance Society, Milwaukee, Wis., September 9, 1902, he has the following to say concerning *Catalpa speciosa* as a railway timber tree:

"1. It is the most rapidly growing tree in America that possesses economic value.

"2. A greater quantity of valuable wood may be produced upon a given area in a specified time than from any other American tree.

"3. The wood is the most enduring of all our trees.

"4. It succeeds over a greater range of territory than any other valuable tree of this continent.

"5. Its habit of growth is upright, with long trunk, where it has an opportunity, thus differing from all other forms of Catalpa.

"6. The chemical constituents of the wood are so resistant of decay as to make expensive artificial wood preservation entirely unnecessary.

"7. The roots are strong, vigorous, large and deep, holding so firmly to the earth that storms do not blow them over I never found a Catalpa to be blown over by the wind.

"8. It is less subject to disease and attacks of insects than any other tree of my acquaintance. Only one worm, the Catalpa sphinx, attacks it and that is easily controlled by spraying, while the trees are never seriously injured by the sphinx.

"9. The wood has the same texture as butternut, firm enough for tie purposes, and holds a spike well.

"10. For inside car finish it is admirably adapted, partakes of high polish, has a handsome grain and is a superb wood for furniture and inside finish.

"11. It is easily manipulated with edge tools.

"12. Its strength is ample for all requirements in railroad work."

THE INTERNATIONAL SOCIETY OF ARBORICULTURE

has an exhibit in the Forestry Building at the World's Fair at St. Louis which should be seen by all engineers and, in fact, by any one at all interested in forestry. The exhibit demonstrates practi-

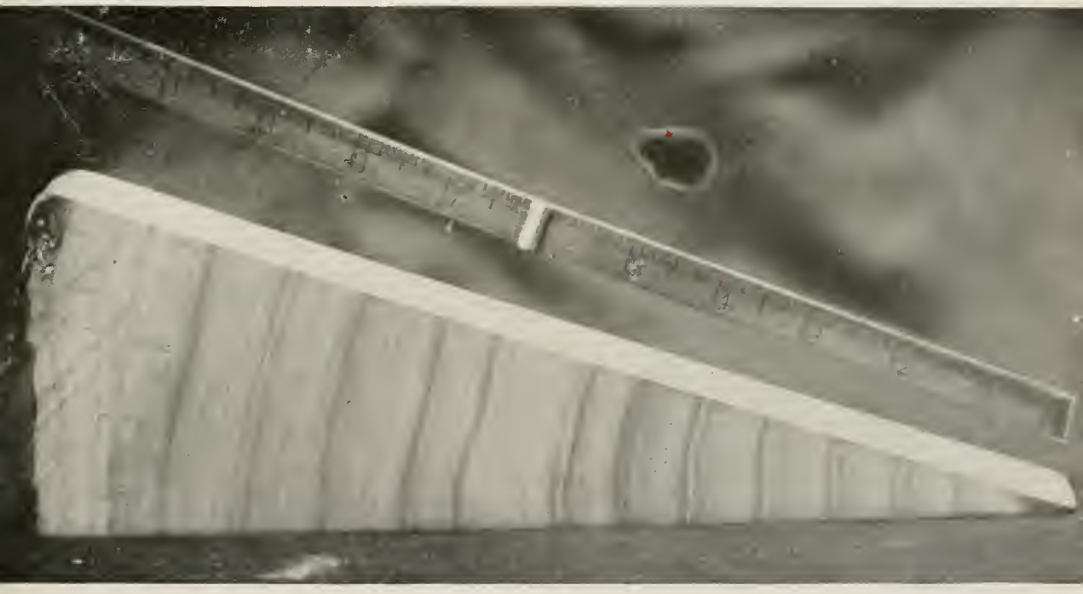
cally every point made by Mr. Brown in this statement. The newel posts, balusters and railing enclosing the exhibit are of Catalpa wood. The Barney and Smith Company have finished a section of a passenger coach entirely in this wood. A handsome stairway gives a fine example of interior finish. Desks, tables, a dressing case, both plain and fancy chairs, and various other articles of household furniture are shown. In the rear are cross ties and telegraph poles in a good state of preservation, which were taken out after a record of thirty-two years' service, fence rails, posts, etc., with records of long service, all proving conclusively the wide scope of usefulness of this wood as well as its lasting quality.

One surprising point developed is the strength and toughness of the wood, which most authorities declare soft and brittle. If they will try to break either a piece of the new wood or one of the ancient fence rails in this exhibit, they will no longer declare Catalpa brittle. The Barney and Smith Company reported Catalpa a better wood for bending than is white ash.

It will be seen from the foregoing that three most eminent authorities agree upon the essential points, *viz.;* that Catalpa trees may be grown profitably as a commercial proposition: that the endurance of this wood is established beyond question, and that it is suitable for cross ties.

The authorities disagree, however upon one most important point, namely; the method of planting and treatment.

Mr. Hall recommends close planting in rows 4 by 4 feet, in order to prevent low branching, and declares that "without severe crowding the Catalpa will not produce the straight pole growth necessary for best use. With plenty of room, it is a spreading, round-topped tree, with almost no tendency toward an elongated, central axis, and pruning, while it may somewhat improve the form, will not sufficiently



SECTION OF CATALPA SPECIOSA. TREE HAD AMPLE SPACE FOR DEVELOPMENT.

change it to make the tree of much use. At best, pruning can only remove the branches within eight or nine feet of the ground. Above that height it is entirely impracticable in a commercial plantation."

Mr. Brown, on the contrary, declares that planting closer than 8 by 8 feet will not give the young trees sufficient root space to afford them necessary nourishment for a vigorous start; that in two to three years all should be cut back in order to get a strong, straight sprout. In eight years three-fourths of the trees should be removed, leaving a stand of one hundred and seventy to the acre. He says that close planting is the chief cause of failure of the several large Kansas plantations to produce large numbers of trees suitable for telegraph poles and cross ties in fifteen to twenty years' growth; that experience has proven that the roots of each *Catalpa speciosa* tree three years old requires sixteen square feet surface space; at eight years, sixty-four square feet; at sixteen years, two hundred and fifty square feet; and that with less space the trees are dwarfed and stunted for lack of food and water; that if close planted, it requires too many years for the more vigorous to overcome and destroy the weaker, and thus secure sufficient space for successful growth; and that *Catalpa speciosa* is upright of habit, with long trunk, when sufficient space is afforded to give it opportunity.

I do not find anything in Mr. Hall's report indicating that close planting has prevented side branches. And my own observation of various plantations which I have visited leads me to the belief that it does not. In plantations 4 by 4 feet, planted eight to ten years, I found many side branches sound and tenacious. Pruning *is* necessary and *is entirely practicable* up to twenty or even twenty-five feet from the ground, if desired.

In looking up information for this report it has been my object to follow practical lines as closely as possible. I have visited various plantations, all of which I found planted 4 by 4 feet or 3 by 6 feet, and the results obtained were found in all cases similar to those so fully reported upon by Mr. Hall. I have never found a tree in a close plantation which had grown large enough to indicate that it will pay any one to plant Catalpa trees with the idea of growing timber suitable for cross ties within a reasonable limit of time.

I have, however, found many trees growing singly upon lawns and along roadways which show a remarkable growth. From many examples I will give the following: Several street trees at Colfax, Ind., planted twenty-six years ago, have attained a growth suitable for saw logs or will make several cross ties to each tree. Five trees growing on a lawn at Charleston, W. Va., have in thirteen years grown large enough to make pole ties from each butt cut. Because of their upright tendency they were cut back at twelve feet from the ground, and the owner informed me recently that a sprout from the tree nearest his house had in five years made a growth of thirty-five feet, and that when he cut this sprout because it towered above his roof, it was found to measure six inches diameter at the base.

In Southern Illinois I found many Catalpa trees still standing in the original forest groves. Two large trees had been recently felled, and the farmer was splitting them up for fence rails and posts. This gave me an excellent opportunity to measure the tree and examine the wood. One tree was cut up as follows:

One 12-ft. log, 28" diam. at butt, 18" at top.
One 18-ft. log, 18" diam. at butt, 14" at top.

One 10-ft. log, 14″ diam at butt, 13″ at top.
One 10-ft. log, 13″ diam. at butt, 9″ at top.

The second tree measured twenty-six inches at the butt, and tapered gradually to a nine-inch top, fifty-two feet up. It was straight and perfectly sound throughout. Several logs from each of these trees had been split once through the center, and all showed up perfectly clear and sound-hearted throughout, the first cut eighteen feet long not even showing a knot.

A larger tree standing near, measured eighty-four inches circumference two feet up; seventy-two inches circumference twelve feet up, the estimated height being sixty feet to forks.

Another of about the same height measured seventy-six inches circumference at butt; sixty inches twelve feet up.

Most of the trees in this natural grove had grown up within fifty years. The growth had never been dense. Many slender, upright saplings were growing fifteen to twenty feet away from other trees, and there is no evidence that this natural growth has ever been crowded. The farmers, who valued these trees and wished them to grow well and rapidly, had seen to it that every tree had sufficient space for its roots to spread.

Our chief interest, however, is not in what the forest has produced, but in what can be done by planting. Very near the natural groves I found rows of trees planted along lanes and about the borders of fields. A tree which had been recently cut from one of these rows was lying upon the ground, affording a fine opportunity for measurements. The first cut was nine feet long and measured sixteen inches at butt, ten and a half inches at the top. The second cut eight feet long measured ten and a half inches at large end and nine and a half at the top, or small end. The third cut measured six

CATALPA SPECIOSA IN WABASH VALLEY.

inches at top end. Sapling measured at butt one inch. Annular rings showed this tree to have been planted fifteen years. The first two cuts would make good cross ties, or the entire tree would make a good twenty-five-foot pole. It was planted in a single row, bordering a cultivated field. The trees in this row were planted eight feet apart, had no cultivation, and were never cut back in order to induce straight, upright growth, as is recommended by all authorities. The tree which had been felled was not an unusual specimen. Hundreds of others just as good, and some better, could have been selected from these rows. I measured one thirty-six inches circumference at butt; thirty inches six feet up; sixteen feet to the first side branch, which will make a twenty-five-foot pole, six inches in diameter. Another growing in single row measured fifty-four inches in circumference at butt; forty-two inches six feet up; ten feet to first small side branch, which will make a twenty-five-foot pole eight inches in diameter. Another in the same row measured thirty-six inches in circumference twelve feet up.

Farmers in this region, which is between Mt. Carmel and Albion, Ill., appear to fully appreciate the excellence of this wood. One man told me he had recently hauled fence posts twenty miles in order to get Catalpa posts. Thousands of Catalpa posts and rails may be seen on every side, and I did not see one broken rail. This struck me as very singular, having recently come from the long leaf yellow pine region of Georgia, where broken fence rails are very common, indeed. These Illinois farmers have a practice of planting Catalpa trees in single rows bordering their fields, utilizing the living trees for fence posts, cutting back at, say, five feet from the ground, and cultivating the upright sprout from this stump, which in a few years produces a growth large enough to be made into several more posts of ordinary size, thus providing a continuous source of supply directly on the ground.

In driving along a public highway between Brown's Station and Albion, I noticed a fine row of trees which had evidently been planted with this purpose in view. In the meantime a telephone company had run their lines along this road, attaching the wires to the trees in this row. A row of living telephone poles probably a quarter of a mile or more in length is pretty conclusive evidence that Catalpa trees do grow straight enough and tall enough to make valuable poles in about fifteen years, if given room enough in which to obtain nourishment from the soil. This row borders a cultivated field on one side and a public highway on the other. It has had no cutting back, no cultivation, the trees standing in fence corners completely surrounded with a heavy sod. The same lack of cultivation is evident with all the farm and street rows I have seen. If trees will grow in this manner in spite of difficulties, it seems probable that Mr. Brown's method is correct, and that much better results may be anticipated from forest plantations if the young trees are not crowded.

Enough has already been said regarding the enduring quality of this wood, but some information upon this point which I chanced to obtain when in Edwards County, Illinois, is of so direct a nature that it seems of sufficient interest to be related in this report. In making some small purchases at a store, I learned that the merchant, a Mr. W. L. Wheeler, had served for twenty-two years, first as a section foreman and later as supervisor, on what is now the St. Louis Division of the

Southern Railway. Mr. Wheeler informed me that when he began service with this company he found thousands of Catalpa ties in the track where they had been since the track was laid, some eight years earlier. He had first laid fifty-two pound rail on these ties. When that was renewed he found many of these ties fit for further service, and laid the new fifty-six pound rail on them. And when renewing recently with seventy-five pound rail, a few were still found serviceable and remain in the tracks under the new rail, where he can identify them at any time. The old ties were taken out because they were too thin for the large spikes now used, but not one was rotten or broken. He lays particular stress upon the fact that he has never seen a broken Catalpa tie, while many of the oak ties were found to be broken when taken out He says that they hold the spike very well, and are not decayed or broken away from corrosion where the metal comes in contact with the wood.

Mr. Wheeler can also point out many telegraph poles still in good condition where they have been since the line was built.

Many prominent railroad men have entire confidence in Mr. Brown, and faith in his methods, among whom I will mention Mr. Fish, President of the Illinois Central, Mr. Smith, President of the Louisville and Nashville, and Mr. Kittredge, Chief Engineer of the Big Four, all of whom have had plantations started on lands belonging to their respective companies.

The Illinois Central has the Harahan plantation of two hundred and fifty acres near New Orleans, and also a plantation of two hundred acres at Duquoin, Ill.

The Louisville and Nashville has established a large plantation near Pensacola, Fla.; another at Newport, Ky., near the mouth of the Licking River; one at

CATALPA SPECIOSA, NATURAL GROWTH.

Shawneetown, Ill.; one at East St. Louis, as well as several others at various points in Southern Illinois. I am not informed as to the acreage of the Louisville and Nashville plantations.

The Big Four has a young plantation near Indianapolis. The B. & M. and the B. & A. have started plantations in New England.

The Southern Pacific has several small plantations in Texas. The N. O. & N. E. has several small plantations on their lands in Louisiana and Mississippi.

The Mexican Central has recently begun a number of small plantations in Mexico.

President Diaz, of Mexico, who is deeply interested in the subject, has ordered several plantations for the Government of Mexico.

All of the plantations just mentioned are under the general direction and management of Mr. J. P. Brown, whose services are free for the advancement of the cause, and all are planted 8 by 8 feet. Unfortunately for the purpose of this report they are of too recent planting to prove what Mr. Brown's method will accomplish in producing trees for cross ties, but it seems evident from the growth of the street trees in various places and those in farm rows, which have in twelve to eighteen years attained both girth and height sufficient for cross ties and poles without the slightest attempt at cultivation, that these plantations, under careful and intelligent management, will show results far in advance of those obtained by methods of close planting, which has proven a failure in every case, save in producing fence posts.

In starting a plantation it is of the greatest importance to secure the right seed or young plants. Neither Bignonioides nor hybrids will produce strong, upright growth, no matter which method is followed. Judging entirely from what I have seen, I believe that proper cultivation and pruning will insure good results.

I give the following estimate of cost and profit, as from ARBORICULTURE:

"The cost of planting will vary according to local conditions. The land should be such as would produce a fair crop of corn:

Estimate Per Acre.

Value of land, say	$20 00
Preparing the land	5 00
Six hundred and eighty trees, 8 x 8 feet.	5 00
Labor, planting and cultivating	5 00
Interest and taxes, eight years	40 00
	$75 00

"At eight years three-fourths of the trees should be removed, leaving permanent trees 16 by 16 feet, or 170 per acre.

"Each tree removed will supply two first-class posts worth 10 cents each.

"Five hundred and ten trees removed make 1,020 posts, worth $100, being original cost with total expenses, leaving the plantation fully paid, including twenty years' interest and taxes.

"The remaining 170 trees will, by twentieth year, produce 850 cross ties worth, at 60 cents, $510, or 250 feet lumber per tree, 42,000 feet b. m., which, at $20 per 1,000, is $850

"The value of the land having been greatly improved, and a permanent income insured from the continued growths (as the trees are quickly renewed from the stumps), equal to a capital investment of $1,000 at 8 per cent interest."

The greatest difficulty to be encountered in beginning a plantation is in obtaining pure seed. The following quotation, also from ARBORICULTURE, bearing upon this point, is of interest:

"The Southern Catalpa is much

branched, of low, scrubby growth, and so far as known has no value in the arts. As a flowering, bushy tree, it has been largely distributed, and is now found in every part of the world. The enormous quantity of seed produced, together with the ease with which the seed are collected, from low spreading trees, has caused thousands of pounds of this worthless seed to be distributed throughout Europe as well as America.

"One prominent seed house in the West, some years ago, collected one thousand pounds of this Southern seed and sold it as *speciosa,* distributing this inferior tree to every part of the United States. Another prominent seed house of an Eastern city sent out a quantity of the seed labeled *C. speciosa,* the present year, a sample of which seed is held by ARBORICULTURE. Not one seed of the lot is *speciosa,* but both the Japanese dwarf, *C. kempferii* and *C. bignonioides* comprise the lot. When such gross carelessness, if not criminality, exists among seed houses professing eminent respectability, the public must suffer.

"The greatest difficulty which this Society has to content with is the erroneous estimate placed upon the Catalpa by the great number of people who have an acquaintance with this Southern tree, and suppose it to be the *C. speciosa* of which we are writing."

A consideration of the various points above brought out indicates that the proper planting and growing of Catalpa trees for use as railroad ties would be not only profitable from a financial standpoint, but would give a most satisfactory supply of cross ties, provided tie plates are used in connection with the same.

It is hardly probable that railroad companies will go into the business of tree planting upon a large enough scale to produce ties sufficient for their requirements, but it appears to be a matter of great importance that they should plant trees in considerable numbers upon lands in their possession to afford object lessons to farmers and others, and that great future benefit will result from such a course.

Respectfully submitted,

COMMITTEE ON ROADWAY AND BALLAST.

HABIT OF GROWTH, CATALPA SPECIOSA.

PAULONIA IMPERIALIS.

We have received several inquiries regarding a blue (purple) Catalpa from the South. This is not a Catalpa, but a Chinese tree, very similar to the Catalpa in many particulars.

The leaves are large and much like the Catalpa. The tree sends up rank-growing shoots from the stump after it has been cut down. The flowers resemble those of the Catalpa, except that the color is purple. The seed vessels, however, are of conical shape, and are held upright upon the twigs, while in the Catalpa family the seed vessels, shaped like elongated cigars, droop or are pendant from the branches. The seed also are very different from Catalpa, though both are winged.

The bark of the Paulonic much resembles that of ailanthus.

It is strictly a Southern tree, thriving at Atlanta, Ga., and southward. This tree is found at Washington City, probably its northernmost limit, but seldom blossoms, the buds being winter-killed.

The trees are quite abundant at Knoxville, Tenn., but seldom bloom. As the flower buds are formed in autumn, they are liable to injury during winter frosts.

So far we have been unable to learn of any economic value of the wood, but yet that might develop if the trees were grown in forest in Gulf States.

The flowers are quite handsome, and for these the trees are grown. The wood is formed rapidly, and might become a profitable investment. Unfortunately the habit of the Paulonia is to form a spreading head and short trunk.

Our object in this brief sketch is only to disabuse the minds of any who think it one of the Catalpa family. It was imported from China about 1850, and distributed by the Botanic Garden at Washington.

The Paulonia is placed by botanists in the Figwort famliy, while Catalpa is classed among the Bignonia family.

PLANTING A MILLION TREES.

The editor of ARBORICULTURE does not confine his efforts to the merely literary pursuit of writing articles for his journal.

He is actively engaged in directing the work of planting forests, to bring them into a successful timber-producing stage.

Swiftly moving from one plantation to another, selecting the lands, procuring the trees, employing labor, planting the forests, his time is fully occupied.

The work is going on in the South all winter, planting ten thousand trees daily. By the 1st of April there will be considerably more than a million trees planted in twenty different locations and in twelve States, besides the great number of trees being planted by individual land owners through his advice, amounting to almost as many additional trees.

A better idea may be had of the quantity by estimating how long it would take one man to count these trees.

Working eight hours a day, and merely picking up one tree at a time, ten each minute, it would require eight months' constant labor to thus handle and count a million trees.

And yet this enterprise has only made a beginning. The land owners, farmers, railways and manufacturers are just awakening to the fact that trees must be planted if we would have lumber and ties and wood to continue the industries of this great country a few brief years hence.

CATALPA SPECIOSA IN FLOWER, RIVERSIDE, (CHICAGO,) ILL.

Scientific Work in Planting Trees.

Creditable Achievement of International Society of Arboriculture — Indiana Man to the Fore — John P. Brown, of Connersville, Ind., Leader in the Movement.

(From Indianapolis Star, February 11, 1906.)

The planting of forests upon an extensive scale in the United States has never before been undertaken either by any State or by the National Government, nor yet by individuals or corporations. True, there have been some local plantings done with white pine in the East, and under the timber-planting act there were many groves planted in the Western States, most of which have failed from lack of proper information, instruction and assistance, and the moral support of the United States authorities, although Congress, in enacting this important measure, intended it to accomplish the re-forestation of the land.

It has been left to a volunteer society, without either financial or moral support from the Government, to inaugurate this most important timber-planting scheme and carry it to a successful conclusion.

The manager of this great international movement is Mr. John P. Brown, editor of Arboriculture, and Secretary of the International Society of Arboriculture, whose life has been devoted to study of economic forestry. By appeals to the presidents of the great railways, and presenting to them the facts regarding the rapidly diminishing forests, and probability of the railways soon being compelled to adopt other materials than wood for railway construction and maintenance, unless speedy efforts are made to provide a continuation of the wood supply; and further, by showing the rapid growth, great durability and usefulness of the *Catalpa speciosa* tree, has induced these railways to begin the planting of great forests of these valuable trees.

OVER A MILLION TREES.

There are now being planted considerably more than one million Catalpa trees under direction of this society by American railways. Fully as many more are being planted by farmers and land owners in various portions of the country, while within the past four years more than ten million trees have been planted, all through the influence of this society.

Mr. Brown has made a thorough study of economic timber trees and rate of growth of all species, and has amply demonstrated the importance and value of *Catalpa speciosa,* its great range of successful growth and utility in commerce, manufactures and the arts.

For instance, the white oak, which is so highly prized for furniture manufacture, interior house finish, cooperage, car building and cross-ties, requires from one hundred to two hundred years to become available and profitable lumber. Yellow

pine, the wood which is now taking the place of oak for many purposes, as the latter timber has become so scarce, grows very slowly, requiring from seventy-five to one hundred and fifty years to mature. The same slow rate of growth prevails with all the woods which are recognized as being of value in the manufactures. The tropic timbers, which have been so highly exploited as productions of the Philippine Islands, and also of Cuba, Central America, etc., are of most extreme slowness in growth, often from five hundred to one thousand years maturing.

A VALUABLE TREE.

In presenting to the world an American forest tree which matures in a fraction of the time required by the commercial woods of the world, and is so durable as to outlast from five to ten successions of other woods, and to be equal or superior to them in many qualities which give value to timber and lumber, it is not to be wondered that railways, land owners and farmers should accept the proof of which this society has adduced, and taking advantage of the knowledge and information given by its management, plant trees in large numbers for the production of cross-ties and car building.

But the influence of this organization does not stop here; it extends to the farthermost portion of the earth. Trees and seed which the society has supplied has produced forests in Australia, New Zealand, Japan, Korea, Honolulu, Mexico, Central and South America, France, Germany, Italy and Great Britain.

In all these countries the *Catalpa speciosa* has proved successful, as reported by the members of the society in these various countries.

What seems marvelous is that an almost totally unknown tree indigenous to a small portion of Indiana and unknown elsewhere, until distributed recently, should be to all appearance so universal in its ability to adapt itself to various soils and climatic conditions, growing now forty degrees latitude south of the equator to forty-five degrees north latitude.

The persistent research of one man in the face of strong opposition for many years has accomplished this achievement.

Prof. Asa Gray and many renowned botanists have been mistaken in describing the *Catalpa speciosa,* and have not understood it, for the reason that original trees are small in number and circumscribed in locations, while many thousands of *Catalpa bignonioides* have been distributed, as well as innumerable hybrids, throughout Europe and America, which have misled experts everywhere.

Catalpa speciosa is a tall, upright forest tree, of magnificent proportions, while *Catalpa bignonioides* is of dwarf habit, crooked and of unattractive appearance.

There are records of *Catalpa speciosa* trees that a century ago were common, which measured twenty-one feet girth, and reached upward one hundred and fifty feet. Canoes and batteaux were constructed of single logs, which measured seven feet across the beam. No one ever heard of *Catalpa bignonioides* or hybrid trees of any size approaching these records.

The States of Ohio and Colorado have taken up this matter, and have distributed many thousands of trees, co-operating with the International Society in this work, the trees being supplied by the society. The Republic of Mexico, Dominion Government of New Zealand and several European countries have also received seed and trees from the society, and are making extensive experiments with this American tree.

Alabama Land for The Catalpa.

The warm, sandy soil of Southern Alabama, with a plentiful rainfall and almost perpetual growing season, makes this an attractive location for growing the *Catalpa speciosa.* Along many of the streams throughout the State are to be found large numbers of the *Catalpa bignonioides,* or Southern form of the Catalpa, which indicates a soil and climatic condition which is well suited to this family of trees; and while the Southern tree is of smaller stature and of inconsiderable importance, yet its presence assures us that conditions are favorable for this peculiar timber growth.

So far as we have any knowledge, the chemical elements which go to make up one variety of Catalpa are identical with those demanded by the other members of the same family of trees. The color of the wood is the same in both, the peculiar odor of the foliage in each are similar, the durability of the wood in each seems equal, so far as I have observed. The difference being that one is a diminutive shrub growth, while the other is of giant stature.

It is recognized that wherever the Southern tree will thrive the Northern will also succeed, although the one, being thin-barked and tender to severe frosts, it will not resist the cold of more northern timber.

In each locality of Alabama where these forests are being planted there have been removed quite recently yellow pine trees of very large size. Soil which has produced such pine timber will undoubtedly produce as good trees of other species, provided they are adapted to the conditions of climate similar to that required by the pine.

This, however, does not prevent the Southern tree from making its customary growth during the summer season in any far Northern region, only this effect of winter's frost which kills it back, the roots survive and sending up fresh shoots in spring.

In the vicinity of Mobile, Alabama, there are being made several large plantations of *Catalpa speciosa.* The one in Baldwin County, planted by Capt. J. A. Carney last spring, has made excellent progress and demonstrated the adaptability of Alabama's rolling, sandy clay loam lands for the cultivation of *Catalpa speciosa.* The trees which were planted here in April have made strong, large roots four feet in length in October, six months' growing season.

The several plantations being made by Mr. Wilber J. Andrews, of Chicago, who owns twenty thousand acres in Mobile County, much of which is to be planted with Catalpa, as a commercial investment, will undoubtedly prove a success not only in growth of timber, but as a financial investment as well.

Then, the tract of 1,040 acres purchased by the Louisville and Nashville Railway Company, and planted with *Catalpa speciosa* trees for the production of cross ties, has been mentioned before in this journal.

This land is slightly rolling. The soil being of a reddish clay loam containing much sand, while in places loose fragments of sandstone having an admixture of iron covers small areas on the hill tops. Four hundred and fifty thousand trees have already been planted upon this tract.

A body of land on the Bay Shore Railway is being planted by the M. & O. and Southern Railways. This consists of 200 acres of land; soil dark, sandy loam, pro-

ducing a rank growth of grass. This land has recently been cleared of its timber, which was rather thin on the ground, but the yellow pine trees were of large size. The location is within from one to two miles of the Mississippi Sound.

Two years ago a company planted a considerable number of Catalpa trees near Perdido River in the eastern portion of Baldwin County, which have been perfectly successful.

Thus in the southern portion of Alabama, within a radius of thirty miles from Mobile, there have now been planted upwards of one million trees for timber purposes. Every shade of soil within this belt is thus being tested, and a movement inaugurated, with ample capital in each case, to guarantee a thorough trial of this Indiana tree, which bids fair to revolutionize the whole timber industry of the South. With the development of this industry there will open to the South a use for large areas of her lands for which they were peculiarly adapted, and which will be productive of a larger revenue than could be realized from these lands by any other method.

Yellow Pine Supply.

The New Orleans *Picayune* and *Times Democrat* both have interviews with Mr. J. Platt Underwood which contain much food for thought, and the owners of timber lands in the South will do well to heed Mr. Underwood's advice.

The subject is made more apparent from the action of the North Carolina Pine Association, at Norfolk, which on February 1 made a sensational advance of $2.00 per thousand feet on all grades, and $5.00 per thousand feet on some grades, a net advance of from 5 to 15 per cent.

"No man can say how many years it will take to exhaust the yellow pine stumpage of the South, but we do know that between thirty and eighty years must elapse before we can cut the second growth," said J. Platt Underwood, of Chicago, an extensive dealer in Southern timber lands, yesterday at the St. Charles.

"Permanency of the lumber industry will depend upon reforestation. To illustrate the disparity of opinion," continued Mr. Underwood, "I attended a conference of lumber men interested in the industry in the South in Chicago one month ago. Three said they believed the Government estimate was as nearly correct as it was possible to get it. Four others declared that the Government was far away from the mark. They firmly believed that the estimate fell fully one-third short. But here is the proposition and the way to look at it: We have a fair idea of how much yellow pine there is standing on the stump. I do not recall the estimate, but for example we will say that there are 10,000,000 bales of cotton in the world. That is all that will be produced for one hundred years. The annual consumption is 1,000,000 bales. What do you suppose the last 3,000,000 bales would be worth, comparing the price with that which the first 1,000,000 brought?

"There you have exactly the yellow pine situation. We know that it will be thirty to eighty years before we will have a second growth. We know pretty close what we have got now The answer only can be that yellow pine is to continue to increase in price. The demand is grow-

ing and the supply is being reduced every year. This year the prices are better than they were last. This has occasioned surprise among some of the millers. It should not. They have something that the world must have, and will continue to consume to the end of time.

"All that we must look out for is keeping the trees coming. The pine supply of the North is very low. The majority of the mills of the Mississippi Valley have been abandoned. Those that are in operation mostly are located closer to the base of supply at the headwater of the Mississippi. *There will be no second-growth pine in that section. The soil will not produce it.* It has been attempted, and the result has been silver leaf poplar or scrub oak. Hence we can see that it is only a question of time when the North will be denuded of its pine forests, and they will never return again. We do know that a second growth can be produced in the South, for here we have the soil containing the necessary essentials. I have been interested in the South for thirty years, and the timber outlook is brighter to-day than it ever has been."

The expressed opinion that the white pine of the North will not be reproduced is true, but not for the reason given by Mr. Underwood. It is a mistaken idea, which should not go undisputed. The soil of Wisconsin, Michigan and Minnesota, as well as that of New England, which has produced such vast quantities of white pine and maintained innumerable great saw milling industries until the final end has come from exhaustion of the supply of trees, will if practically and earnestly replanted, grow as grand forests as it ever did. The soil has not changed. Trees do not exhaust the soil of its fertility, but constantly increase it.

It is simply this. The grasping, heartless, thoughtless corporations, whose sole object has been to destroy those great forests as quickly as possible and get as much money out of the timber as possible, stripping away every tree which might produce seed and reforest the land, have destroyed the young growths, cutting even baby sapplings which could be cut into a 2 by 4 stick, which, if left for a few years, would produce profitable sawing timber. They have been so powerful, politically, as to control both State and National legislation, and have stripped the land and *made it forever barren.*

By proper distribution of seed and the planting of pine tree seedlings systematically, the land will again become productive. But who is to do this? Certainly not the men who made it barren.

A similar situation exists in the South in the yellow pine region. The saw mills take the large trees, and turpentine operators ruin the small growths, while every man feels it a part of his duty to burn over the forest, killing the young seedlings and destroying the seed which falls.

So long as legislators fail to take any action toward forest perpetuation, and neglect to protect the rights of posterity, and land owners refuse to consider their perpetual interests, only thinking of how soon they can clear the land and bank the money, just so long yellow pine will increase in price and the trees disappear, never to return.

If the lumber men and timber owners want their industries to become permanent they should use the influence they have with State legislature to secure protection to the young pine growths, keep down annual fires, and forbid the boxing of immature trees for turpentine. Otherwise it will be but a very brief period that American lumbermen will supply the world with forest products.

SENATOR A. R BEARDSLEY.

AN ACKNOWLEDGMENT.

Ever since the organization of the International Society of Arboriculture, Mr. A. R. Beardsley has been a financially contributing member, and we were pleased to see a gentleman who was so thoroughly interested in the question of our forests and forest trees elected as Senator to the Indiana Legislature two years ago.

Senator Beardsley is the Business Manager of the Dr. Miles Medical Company of Elkhart, Indiana, and when that company determined upon sending out nine million almanacs we were asked to supply a photograph from which an electrotype could be made, and also grant the privilege of printing some selection from ARBORICULTURE, which, of course, we were happy to do.

So in this immense edition of Dr. Miles Almanac for 1906 there was given an excellent description of the Catalpa tree, and a very prominent page was devoted to the subject, with a reference to our society and journal.

During the last month of the year 1905 letters began pouring in from every quarter of the land, and have been increasing ever since. Requests for copies of ARBORICULTURE and for information upon forestry are now being received, an average of forty per day. Our stenographer is kept busy, as replies are made to each letter. The interest in ARBORICULTURE has thus been awakened as never before, and we are thus enabled to interest many thousands of farmers and business men whom we could not reach before.

We are pleased to make the acknowledgment and to thank the Dr. Miles Medical Company for their appreciative and voluntary advertisement.

ADDITIONAL INSTRUCTION AND EXPERIMENT IN FORESTRY.

Prof. S. B. Green has prepared a bill, which has been introduced in Congress by Representative Davis, of Minnesota, and has received approval of Mr. Gifford Pinchot, Chief of the Federal Forestry Service. It provides for an appropriation by Congress of $3,500 for each State and Territory, $1,500 of which is to be used for instruction in the agricultural colleges and $2,000 for experiments in forestry in the agricultural and experiment stations. The money is to be used exclusively for instruction and experimentation in forestry, and the Secretary of Agriculture, by the terms of the bill, has the power to withhold the appropriation from any institution which he thinks is not properly using it.

It is Professor Green's idea that a measure of this kind should be made a part of the national forestry policy, and in

this he received the hearty indorsement of the convention of delegates of Agricultural Colleges and Experiment Stations that recently met in Washington, as well as of the American Forestry Congress, which met in Washington one year ago.

The bill provides that the money used for this purpose shall come from the sale of timber in the forest reserves. It would seem as though no better use could be made of money derived from such source than to use it for the purpose of showing how forests may be perpetuated and made a continual source of wealth for the nation.

EXTRAVAGANCE OF AMERICANS.

In a speech before the St. Paul (Minn.) Commercial Club James J. Hill said: "The nation at large is prosperous. We are cutting a wide swath; there is no doubt of that. If we get down, however, to a closer examination, we will readily see that the nation is living profligately. We are selling out our natural resources —exploiting them as fast as we can, without building up industries and trade relations to take their place when exhausted. Where are the immigrants rushing to our shores to end up? Not on the land. We have no more to offer them. They must crowd into the cities."

Mr. James J. Hill is a competent authority to speak upon this subject.

Every article which nature has bestowed upon this country with such lavish lands is being wasted Especially is this true with reference to the forests, which are being reduced at a rate which will leave America, or at least the United States, bankrupt on timber in two decades, while neither Congress nor any State Legislature are taking any adequate steps to prevent it.

The immigration should be checked speedily. It is true we have no public lands left which are available for settlement, while the cities are growing beyond the ability of the country to support them.

STRENGTH OF CATALPA.

An eingineer writes, "What is the strength of Catalpa wood? Is it hard or soft?"

We made several efforts at the World's Fair to have a test of strength made by the United States Forestry Bureau, but was emphatically refused.

We then took a round post, 3½ inches diameter, to Machinery Hall, where it was given a practical test more severe than any other wood has ever withstood.

With a power equaling 20,000 pounds this stick was bent at right angles six successive times without breaking. Next, bending in opposite direction, it partly broke. Not until it had been bent quartering both ways, that is, it was bent at right angles in four directions, when it pulled apart like two paint brushes, so completely did the fibers, four inches long, separate, proving its extreme toughness.

In regard to hardness, which term is always comparative, it is not so hard as white oak, but much harder than white pine.

Old wood from forest which has made a suppressed growth is somewhat soft; but young, second growth, or rapid growth wood, is very hard.

Think of friends when you are happy:
Keep for them one little spot;
In the garden of affection
Plant a sweet forget-me-not.

Replies to Correspondents.

"Mansfield, Ohio.

"Can Catalpa be grown on steep hillsides without plowing the ground? I have moist land too steep to plow that I would like to plant in timber.

"J. P. W."

It is not advisable to plant Catalpa trees in such locations. They would grow, but not profitably. Better plant black or honey locust or walnut. We presume there is no timber on the tract at present. If the land is in brush or young timber, and forest conditions prevail, Catalpa may well be planted in such locations.

"Marshall, Mich.

"Will the Catalpa do well on the Michigan pine lands? If not, have you anything that you can recommend for this purpose? H. J. C."

The *Catalpa speciosa* is well suited to the southern portion of Michigan, including Marshall, Grand Rapids, Lansing and Detroit. It has not been possible for me to examine the northern portion of the State, and I do not know whether or not it has been tried. *Catalpa bignonioides* would not be hardy so far north, but we believe speciosa would do well. Considering the importance of the subject and the small expense and trouble of making the experiment, some of your patriotic citizens should make a thorough trial, being sure of procuring true *Catalpa speciosa.*

The next tree which should be planted for trial would seem some form of the poplar family — Cottonwood, Balm of Gilead, Aspen, etc. These all make good paper, and would probably succeed.

"Frankfort, Ind.

"In setting one-year-old Catalpa trees, should they be tended to keep out sod, or will they do well in sod if set six feet apart? R. A."

There are no trees which will thrive in a grass sod. Labor and money would both be lost in the attempt.

Young trees of all kinds require to be cultivated, unless forest conditions prevail, with shade and mulching from fallen leaves.

"Jacksonville, Ill.

"What is the feasibility of planting *Catalpa speciosa* trees on fence line? Is the foliage heavy? Would it shade the ground to interfere with the growing of corn to a great extent? Do they sprout from the root? Will cattle browse them?

"S. B. G."

There are many lines of Catalpa trees in Illinois and Indiana. It is a common practice, while any trees will shade the ground somewhat, yet the benefits far exceed the little injury to crops. No two things can occupy the same space at the same time.

Trees and farm crops obey this law. If a row of corn is of greater importance than a row of trees, then omit the trees.

Catalpa never sprouts from the roots. I never knew cattle to browse Catalpa, but they may break them down while brushing off flies.

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CATALPA HONEY.

A correspondent in California writes us: *"In Trees and Planting,"* by General James S. Brisbin, at page 142, the statement is made that honey made from the flowers of the Catalpa is very poisonous If true, this is fatal to the use of the tree in this section of the country. What is the real fact of the matter?"

REPLY.

I venture to say that General Brisbin does not know anything of Catalpa honey. What would be poisonous to the human family would be death to the bees.

My impression is that the Catalpa blossom contains very little nectar.

Vast numbers of insects visit the Catalpa blossom and convey the pollen from flower to flower. This is the method adopted by nature to effect polinization.

In all my observation I have never seen any dead insects about these trees, which would certainly be the case if they contain a poison.

There are numerous apiaries about Cincinnati and on the Wabash River, as well as in other localities, where there are thousands of Catalpa trees. If people have died from eating honey poisoned by Catalpa blossom, the doctors have not yet found out the alleged cause.

Don't be afraid to plant trees because of a silly story which some indiscreet person has circulated

A Farm for You, Southwest

ONE CROP MAY PAY FOR IT

The Eastern tenant (and you who read may be one) rents his farm, and, by getting up early and working late, succeeds at the end of the year in having made a fair living, with the bulk of the farm products belonging to the landlord. He can keep this up, year after year, and, at the end of any term of years, he is about where he started, with this difference — both he and the farm have perceptibly run down. The longer he keeps at it, the poorer he is. There's a better way. There's nothing new or strange about it. Thousands have tried it and "won out." Why not you? Let us tell you how.

There are ways and ways — one of them is to sell out, gather up all the money you can, and go West and homestead. This can be done, but there is this fact to remember: Nearly all the best places are taken. One can find any amount of raw land remote from railroads, schools, and churches, out of the world and away back, where, in the course of time, civilization may penetrate. But there's a better way than all that. It is to buy a farm in the Southwest, along the Santa Fe, and start in with all the advantages you left behind, and more

You can buy that sort of a place at from $10 an acre to many times that amount. The difference in price depends on nearness to towns, railroads, the state of cultivation, and all that sort of thing. But a better farm, so far as fertility of the soil and productiveness are concerned, may be had for $10 an acre, than you could get anywhere back East for $50 an acre. Here's another fact: It may seem remarkable, but it is a fact, that the first crop will often pay for the land. It has occurred in thousands of instances, and will occur again.

Where is all this to be done? That's where we come in, willing and ready to help you. You ought to have detailed information, and we will send it to you for the asking. Down in Southern and Southwestern Kansas a $10-an-acre farm is waiting for you, and it is probably better than the one you leave behind, owned by the landlord.

It is not for us to discriminate between sections, but this is undoubtedly true of Southwestern Kansas. Over the line in Oklahoma and Texas the same thing can be done, with the stock-raising idea more prominent. Down in the Pecos Valley, in New Mexico, it is an irrigation proposition, and vegetation of all kinds simply runs riot in its profusion — and people are going there by the carloads. While land is high priced there, you don't need much of it. You couldn't farm a hundred acres, not if somebody gave it to you. Forty acres would be plenty. In Southwest Kansas, with a good team, you can farm 160 acres, but in an irrigation country you can not do this. Everything is intensive and concentrated where water is required. In Arizona the conditions are much the same, and so all along the Santa Fe until you come to California, where everything is different

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The Louisiana Purchase Exposition has awarded the GRAND PRIZE to the International Society of Arboriculture for TREE PLANTING. And GRAND PRIZE for the Catalpa Exhibit.

THE INTERNATIONAL SOCIETY OF ARBORICULTURE

OFFICERS:

General Wm. J. Palmer, President, Colorado Springs, Colo.
Henry J. Elwes, F.R.S., Vice-Pres., Colesborne, Cheltenham, England.
John P. Brown, Secretary-Treasurer, Connersville, Ind.

Articles of Incorporation.

ARTICLE I.—Name. The name of this corporation shall be The International Society of Arboriculture.

ARTICLE II.—Purpose. The purpose of the Association is to introduce judicious methods in dealing with forests and woodlands; to advance and advocate a public interest in this subject; to promote the afforestation of unproductive lands; to encourage the planting and care of shade trees in parks, public and private grounds, and along streets and highways; to inspire an interest in our remaining native forests, and groves of ancient trees, and to seek their preservation; to supply information to railway officials in regard to timber culture for railway uses, and incite railway and other corporations to plant trees for economic purposes.

ARTICLE III.—Membership. Any person may become a member of this society by the payment in advance of an annual due of two dollars, and on payment of this annual due shall be entitled to receive, regularly, one copy of Arboriculture, the official organ of the society. Any person who may contribute ten dollars toward the support of the society shall become a patron. Honorary members may be chosen by the executive committee.

ARBORICULTURE

Vol. V No. 4

A Magazine of the International Society of Arboriculture . . .

The United States Government Opposed to Forest Planting

The Gulf and Atlantic Coast for Great Forests

Arbor Day Exercises

Connersville, Ind., May, 1906

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A FARM FOR YOU

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The Eastern tenant (and you who read may be one) rents his farm, and, by getting up early and working late, succeeds at the end of the year in having made a fair living, with the bulk of the farm products belonging to the landlord. He can keep this up, year after year, and, at the end of any term of years, he is about where he started, with this difference — both he and the farm have perceptibly run down The longer he keeps at it, the poorer he is. There's a better way. There's nothing new or strange about it. Thousands have tried it and "won out." Why not you? Let us tell you how.

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ARBORICULTURE

A BI-MONTHLY MAGAZINE

PUBLISHED IN THE INTEREST OF THE
INTERNATIONAL SOCIETY OF ARBORICULTURE.

Subscription $1.00 per annum. JOHN P. BROWN, Editor and Publisher, Connersville, Indiana.
Entered as Second-class Matter January 4th, 1904.

VOLUME V. CONNERSVILLE, INDIANA, MAY, 1906. NUMBER 4.

The United States Government Opposed to Forest Planting.

LIBR
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BOTAN
GARD

A BUREAU DETERMINED THAT TREES SHALL NOT BE PLANTED.

VAST SUMS OF GOVERNMENT MONEY MISAPPLIED TO PREVENT THE EXTENSION OF FORESTS.

A CAUSE FOR CONGRESSIONAL INVESTIGATION.

The people in the United States have the disgraceful spectacle of an important branch of the Government, organized for the special purpose of encouraging the perpetuation of our forests, subverting their purposes, and actually engaged in discouraging corporations and individuals from planting trees.

During the past six years the International Society of Aboriculture has been obliged to expend

FORTY THOUSAND DOLLARS

in efforts to overcome the evil influences caused by the publications and personal attacks by the United States Forestry Bureau officials in their antagonism to the work of this society, mostly caused by the gross ignorance of employes of the Bureau.

Moneys appropriated by Congress for the sole purpose of protecting our forests and extending them by planting trees, misappropriated, the officials of the Forestry Bureau advancing arguments against the planting of Catalpa speciosa trees, of which they are as totally ignorant as they are of many other practical matters pertaining to forest growth and management. This has now been going on so long, and with such disastrous results, that forbearance ceases to be a virtue, and we are compelled to make this exposé of the United States Forestry Bureau methods.

The American Congress has been very liberal in providing the Forestry Bureau with unlimited funds to carry out the work of forest perpetuation. An army of clerks, apprentices, professionals and sinecurists are employed by the Bureau in various ways and at very high salaries. Large numbers of young men, just out of college, are maintained in the field as professional foresters, with hotel

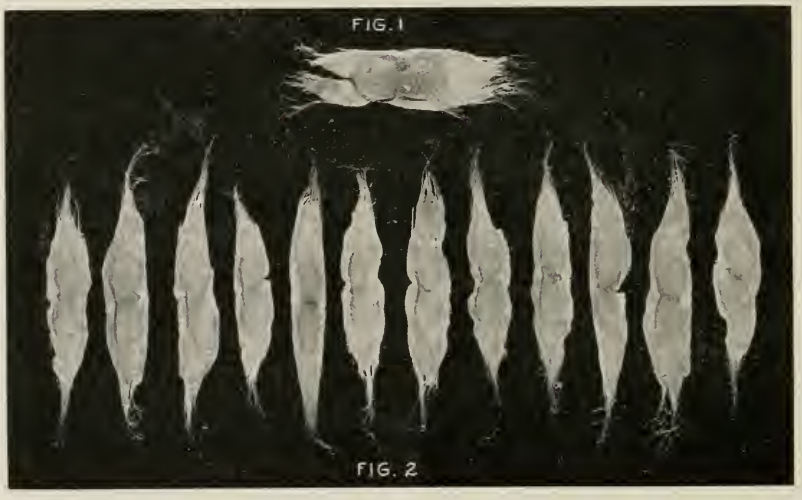
MAY 9 - 1906

bills and traveling expenses without limit.

But, strange to say, this army neither plants trees nor encourages others to do so, but has played the role of obstructionists, advising individuals and corporations not to plant trees, and has in many ways antagonized the work of the International Society of Arboriculture, which society has planted many millions of forest trees in America, and also in Europe, Asia, Africa and the Australian archipelago.

But we have to deal with the many dishonorable acts of the Bureau of Forestry toward the International Society of Arboriculture, and the work of this Society among the railway systems.

Officials of the Forestry Bureau have undertaken to persuade railway companies which had employed the International Society of Arboriculture to plant trees, not to follow the advice of this Society, but to turn the work over to the



SEED OF CATALPA BIGNONOIDES FROM TREE ON PAGE 104. THIS SEED WAS CERTIFIED BY FORESTRY BUREAU TO BE SPECIOSA. ONE SEED OF SPECIOSA IS SHOWN AT TOP.

The Forestry Bureau is one of absorption, reaching out with its tentacles to grasp everything in sight, and gain control of every organization, State or independent, which undertakes to promote the planting, care, management and perpetuation of American forests. It is well known how the Bureau attempted to secure control of finances of the State of New York, and to displace the most excellent forestry service of that State, in order that it might give employment to its own army of employees, and secure

United States Forestry Bureau. These officials have advised the railway companies that the trees recommended by the Society would not grow in their territory, and by such misrepresentations have endeavored to prevent the planting of trees, and in some cases have succeeded in prejudicing some railway officials, so that the plans for forest planting have been entirely abandoned.

The Department of Agriculture has sent out men to make alleged soil analyses, to determine whether trees could be

grown in certain sandy lands, and these experts, with a work on chemistry in one hand, and a vast amount of inexperience in the other, have certified to land owners and railways that such trees could not grow in these soils. Yet ten thousand instances are known where the Catalpa speciosa trees are growing thriftily in exactly identical locations.

The Bureau called into session the American Forestry Congress, and selected only such speakers as were known to be opposed to the Catalpa speciosa. Some of these speakers had been coached by Forestry Bureau officials, and much misinformation given them in order to be sure of destroying the influence of the International Society of Arboriculture at one blow. No member of this Society—numbering three thousand members—was permitted to say a word in behalf of the Catalpa speciosa, but the secretary was invited to send delegates who might listen to abuse without the privilege of reply or correcting wrong statements.

HISTORICAL.

The writer has been engaged actively in the study and practice of Arboriculture for fifty years. During the past quarter of a century he has traveled 500,000 miles in this work with special reference to the study of a certain tree, and observation of the habits, growth, range of its adaptability to climatic and soil conditions, character of its wood for economic purposes, and of the possibilities of its becoming a substitute for the many forest timbers of the United States which are so soon destined to become exhausted.

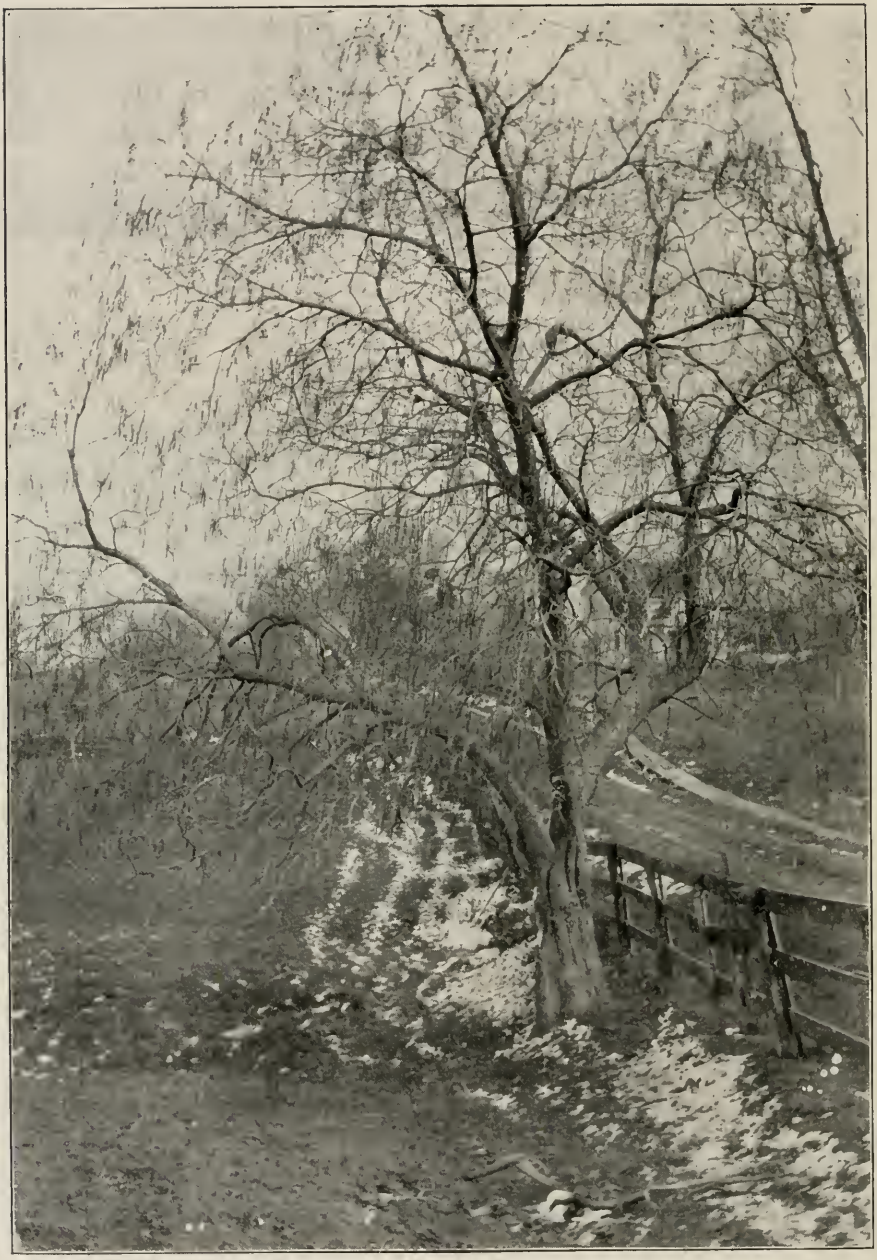
The Catalpa speciosa he has found to be growing thriftily in forty States, and in such a variety of soils that soil analysis is absolutely valueless. In Great Britain, France, Germany, Italy, Japan, Korea, Australia, New Zealand, Canada, Mexico, and elsewhere, the trees planted by members of this Society are growing as well as in their Indiana home. Notwithstanding this, the officials of the Forestry Bureau, studying an entirely different variety of Catalpa, in the city of Washington and on the grounds of the Department of Agriculture, and never having observed the real Catalpa speciosa in its home, the Wabash Valley of Indiana, and unable to distinguish the tree any place, have taken a violent dislike to the tree of which they are so ignorant, and have used every effort to prevent their being planted.

THE WORLD'S FAIR.

When it was determined by the International Society of Arboriculture to make an exhibit of the Catalpa speciosa for the education of the people, application was made for space, but this was refused, and months were consumed in correspondence with the Forestry Department of the Exposition, without results, until after continuous refusal we appealed to a score of railway presidents, whose demands were quickly acceded to. The head of the Bureau of Forestry of the United States was also the head of the Exposition Forestry Department.

After installing our exhibit, officials of the Forestry Bureau made light of our efforts and persuaded many people that the Catalpa was an unworthy tree. Yet, the world saw, and was convinced, and the Grand Prize was awarded this Society for its exhibit.

We made numerous efforts to have tests of strength of the wood made by the Forestry Bureau which operated a testing plant at the Exposition, but were as often repulsed, absolutely refusing to make any tests of wood which we should provide of true Catalpa speciosa, but tests were made of Catalpa bignonioides, an inferior wood, and these reports were



A CATALPA BIGNONOIDES TREE AT WESTWOOD, CINCINNATI, OHIO, FROM WHICH SEED WAS OBTAINED, AS SHOWN ON PAGE 102, CERTIFIED BY FORESTRY BUREAU TO BE SPECIOSA.

given to the world as being of Catalpa speciosa.

The Engineering Department of the Wabash Railway sent specimens of timber to the Bureau for tests and expert opinions. Certificates were made by the Forestry Bureau that Catalpa speciosa was Catalpa bignonioides, and the reverse, bignonioides specimens were declared by the experts to be speciosa. Absolute proof of this is in existence.

WRONG SEED.

Samples of seed of Catalpa bignonioides were sent to the Bureau, which were certified to as being Catalpa speciosa, thus encouraging the vast distribution of spurious Catalpa seed by seed dealers.

We then had a member of this Society to gather some seed from a well-known tree at Westwood, Cincinnati, O., which was sent the Department at Washington for identification. These were pronounced by the officials in an official letter to be Catalpa speciosa.

We have photographs of the tree and the seed which are retained as proof.

Trees which require many years to mature become a total loss to the planters and discourage future efforts, if fraudulent seed is sold by ignorant dealers and planted under the supposition of their being Catalpa speciosa. This spurious seed has been distributed throughout the world in enormous quantities, and this fraud is sustained by the official acts and certificates of Forestry Bureau officials.

CATALPA BULLETIN.

The demand which this Society created throughout the United States and abroad incited the Forestry Bureau to prepare a Bulletin on the Hardy Catalpa, which purported to be friendly to the tree, but there were innumerable mistakes and blunders in this Bulletin, which made it of no value. Within a month from the issuance of this authoritative Governmental publication, prepared at great expense to the people, and printed under Congressional sanction, letters began pouring into this office from all directions, saying the writers had read this report and had decided they would not plant Catalpa trees as they had intended.

There is no doubt but several million trees which would have been planted but for this Department of Agriculture Bulletin No. 37 were left unused by its readers, and no other trees have been planted in their stead. Great space was occupied by this Bulletin describing a large plantation of hybrid Catalpa in Kansas. The trees were described as the "hardy Catalpa," but in no place was the public informed that the trees in this forest were not Catalpa speciosa. Nor has this fact been mentioned that there were other varieties of Catalpa, nor any warning to the public of the danger of planting spurious seed or trees.

ADVISE RAILWAYS NOT TO PLANT CATALPA.

Several railways which have asked the advice of the International Society of Arboriculture relative to the planting, and some roads which have employed the Society to plant large forests, have been approached by emissaries of the Forestry Bureau, and urged to dismiss the Society and place the work under the direction of the Forestry officials, after severe criticism of the work of the Society intended to discredit its efforts with the railways.

Railway companies which intended to plant forests have been demoralized by the efforts of the Forestry Bureau, and have delayed the planting of trees or abandoned the project entirely.

While ignorantly opposing the planting of Catalpa speciosa, the Forestry Bureau offers no substitute, and simply demoralizes the people who would plant trees, and the railways and corporations of lumber men whom they can influence.

The Bureau plants no trees of consequence, and what few it has planted have cost the Government enormous sums of money.

REASON FOR THE ANTAGONISM.

The well-known ambition of the head of the Forestry Bureau to control every organization and individual who is engaged in the work of forest restoration and thus claim the honor of everything done in this line. Also to increase the army under his directions and provide them with work at high salaries, by crowding out and absorbing independent foresters and organizations and thus secure control of all Government, State and private forestry work.

The Forestry Bureau maintains a "Press Bureau," through which it secures the publication of press items in the country papers of America, lauding the acts and policies of the Bureau with the view to creating public opinion in its favor. Some of these newspapers may be surprised to learn of the inside workings of the authorities in their efforts to prevent forest tree planting.

The Bureau employs several inexperienced youths, just out of college, with an overflowing surplus of theory, and a corresponding paucity of experience, who are sent out to instruct mature men, born and brought up in the forest, and familiar with every tree and shrub, if not acquainted with their Latin nomenclature, how to manipulate forest operations so as to provide paying jobs for the greatest number of Government employees for the largest period of time at the joint expense of the Government and the timber owners.

The extreme difficulty of arousing a public sentiment favorable to the planting of trees, and of inducing the great railways and lumbering companies to invest funds in large enterprises which comprehend the planting of forests, is made far more difficult by the antagonism of the Government.

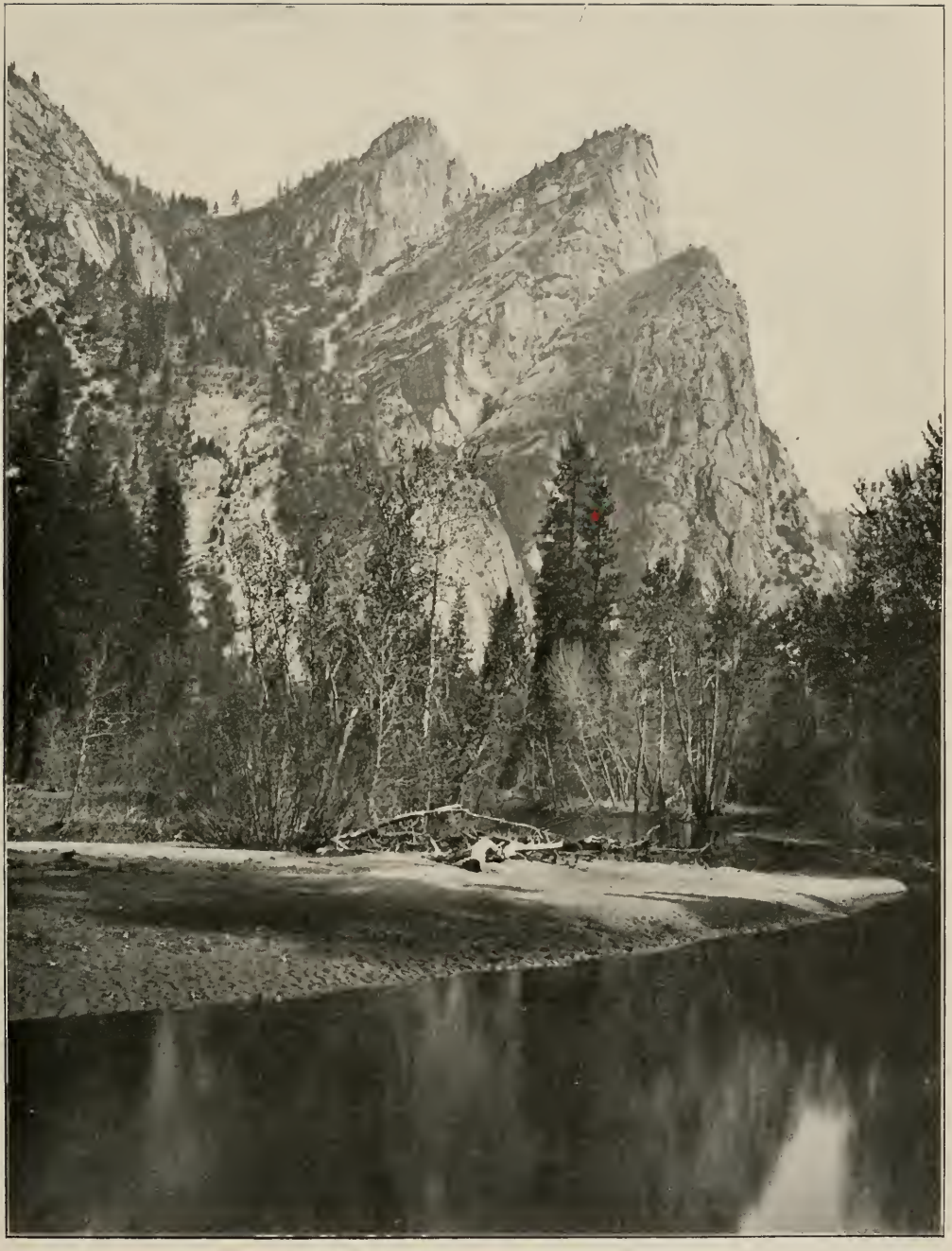
While *several million trees* have been planted by and through the influence of the International Society of Arboriculture, yet there can be no doubt but these millions would have been greatly multiplied but for such violent opposition from the Government authorities.

It is impossible to conceive how such universal antagonism among officials in the United States Forestry service could be possible without the direction of some one high in authority in the Bureau, while on the contrary a single word uttered by the head of the Bureau would most effectively check such efforts by the subordinates if he so desired.

Every principal clerk or head of a division is *de facto* the Government, and his acts bind the Government to such policy as he may dictate, until it may be overruled by a Cabinet officer or the President.

Hence Pinchot's domination and dictation that forests shall not be planted is in fact a declaration of the Government, and decides its policy.

"To denude a State like Vermont of the forests is like the act of a spendthrift who, coming into his father's fortune, prudently saved for over a half century, runs through it in a decade, and has neither means nor character on which to found a new prosperity. No crop at the end of life is bad farming.—*Joseph A. De Boer.*



VIEW IN YOSEMITE VALLEY, CALIFORNIA.

The South for Forests.

GREAT STRETCHES OF SANDY LANDS ALONG THE COAST, WHERE FORESTS SHOULD BE MAINTAINED.

WHERE THE CATALPA BEST SUCCEEDS.

Experience has clearly shown that the Catalpa speciosa tree adapts itself to a great variety of soils, growing in fact upon every soil of the United States, but observation demonstrates that its preference is for sandy locations where its roots can revel, drawing its nourishment from great depths.

THE GULF AND ATLANTIC COASTS.

From the mouth of the Alabama River eastward along the Gulf and Atlantic coasts, terminating at Cape Cod, Massachusetts, there are extensive tracts of land composed largely of ocean sand and the silt from sand formations in the mountain ranges. In places this is pure sand, while in other locations they are clay and sand admixtures. Here and there we find a single tree or a small group of trees of the Wabash Catalpa which have been planted for ornament.

There has been a sufficient number of trees planted in every State so that we may now determine upon what soils and under what conditions the trees have succeeded best, and thus draw our conclusions as to where we may hope to succeed with large plantations.

Enough have been found to assure us that the Catalpa tree will thrive in all these sandy locations.

It is true that soil analysis experts may not find nutriment in these sands to produce timber growth, but the trees do find it. So we take the evidence of the trees.

Very much of this sand area possesses slight agricultural value. Corn, cotton, cane, grasses, grains, are produced with great difficulty, while sweet potatoes, peanuts, some early vegetables and certain fruits thrive and are largely cultivated here.

But the limit to which any of these crops may be profitably grown is quickly reached, for with our present population the consumption of early fruits and vegetables can be supplied from a comparatively small proportion of these lands.

Nearly all, if not this entire coast region has produced wonderful forests of pine timber, and the fertility of the soil for timber growing is as great now as it ever was, and it may again grow timber if only the trees are planted and cared for.

The shifting sand dunes of Cape Cod, Massachusetts, the broad, flat sand tracts of Delaware and Maryland, a large area in New Jersey, all of Long Island, vast stretches in North and South Carolina, much of South Georgia and Southern Alabama, the entire State of Florida, may be included in this description, and all are suited for the growth of forest trees, and in all of them the Catalpa speciosa is growing thriftily.

This region is all in the belt of frequent rains with an abundance of water for wood growth, with soft, sandy soils for the roots to revel in, while heat is graduated from a constant growing season in the Gulf region to the bitter cold

of bleak Cape Cod. Yet all of it will grow trees.

Now let statisticians figure out how many acres can be maintained in cotton to find a profitable market. An increase of ten per cent. area beyond what is now devoted to this staple will surely bring the price down to below a profit. In the same manner estimate what area can be used for each and all of the minor crops for which this belt of territory is adapted, and it will be found that a very large majority of these areas of the Gulf and Atlantic Coasts must remain unproductive of farm crops.

Forest products are in demand in the world's markets, while the supply will never again equal the demand. Examine the forest resources of the various countries of the world, and you will find that very few localities have a surplus of timber for export. British America and the United States have the largest areas, and they are being rapidly reduced. Twenty years hence, at the present rate of clearing, the United States will be out of the market unless an era of forest planting upon a very extensive scale shall be quickly developed.

Thus we conclude that under no circumstances could the production of forests in all this coast region become so great as to influence the revenue injuriously.

China, Africa, the greater part of South America are treeless; Japan has no wood to spare; Russian forests are mostly inaccessible. The excellent system of forest management of Germany may sustain her manufactories from her woodlands. Other nations of Europe must import largely of wood.

Will the South make an effort to supply the enormous demand for timber which must come when the yellow pine forests have ceased to exist?

TRANSVERSE TEST OF CATALPA SPECIOSA.

The University of Nebraska has made a test of the transverse strength of Catalpa, using a post 3.5 inches in diameter and eight years' growth. The post was supported at each end and the load applied in the center. The post was turned and bent in a different manner each time. After bending the post eight times, the distance between the supports was shortened and the post bent as before. After bending it three times in this manner, we found it was impossible to break the post, but it slivered like a brush.

First Bending, Four Feet Between Supports.

No.	*Load.*
1	1,112
2	790
3	850
4	730
5	740
6	750
7	680
8	710

Second Bending, Two Feet Between Supports.

No.	*Load.*
9	1,500
10	1,230
11	1,000

Deflection, 4.5 inches.

This test is a confirmation of the test made at the World's Fair in the Machinery Hall, the wood pulling apart like two paint brushes. APRIL 10, 1906.

The trade of the United States with Panama is showing a very rapid growth, and will amount to approximately $12,000,000 in the fiscal year which ends with June, 1906. The total trade in the fiscal year 1905 was less than $6,000,000.

What Shall We Do With The Trees?

ADDRESS OF JOHN P. BROWN, ARBOR DAY, APRIL 27, 1906.

AN EXTREMELY ABLE AND INSTRUCTIVE DISCOURSE—ELOQUENT TRIBUTE TO THE MEMORY OF J. STERLING MORTON.

[*From the Connersville, (Ind.,) Evening News.*]

John P. Brown's lecture this morning before the High School students covered many valuable points, among which were the care and culture of trees, the importance of trees in contributing to the needs and wealth of a nation, and the great work that has been done by the different organizations for the planting and preservation of forests. From such an address much good will result in directing the minds of young people toward the vital necessity of preserving the forests and the birds.

After the lecture Miss Hazel Sisco sang a beautiful solo, accompanied by Miss Grace McKee on the violin, and Miss Helen Stoops on the piano.

Mr. Brown spoke as follows:

"J. Sterling Morton, the author and promoter of Arbor Day exercises by the public schools of America, founded a most beautiful custom which has come into almost universal practice throughout the United States.

"It was my privilege to be associated with Mr. Morton in the organization of the International Society of Arboriculture, of which he was the first President, and for which organization Mr. Morton suggested the name *Arboriculture*.

"I was also his guest at Arbor Lodge for many days upon various occasions. One could not be intimately acquainted with this statesman without very soon learning the trend of his thoughts, and that he preached and practiced the planting of trees. His motto, 'Plant trees,' was on his correspondence papers, headed his newspaper, the *Conservative*, and was stained in the glass of his Nebraska mansion.

"Mr. Morton took up a claim in treeless Nebraska half a century ago, but when he died that home farm was a veritable paradise of forests, fruit and ornamental trees. Ten thousand white pine trees, planted by his hand, protected his dwelling from the north-wind blasts and made the home of thousands of birds.

"The memory of J. Sterling Morton will grow brighter and brighter as time goes on, and when the American people learn to appreciate the worth of the forests which they have so ruthlessly destroyed, and shall be incited to plant forests through the influence of the Arbor Day exercises.

"Young ladies and gentlemen, I would impress upon your minds a few thoughts regarding the vast importance of forests and trees to a nation. The United States is repeating history in her destruction of the forests.

"Germany learned three hundred years ago that the forests were being devastated by individual owners to the serious injury of the German people, and wise provision was made for the retention of a large area in forests forever.

"So highly does the German Nation esteem their woodlands, no owner may remove a tree without the sanction of the Forest Department, and other trees must be planted in their stead to preserve the relative proportion of woodland to farm areas. Spain has never learned this lesson, and as a result of destruction of her forests that nation has been reduced from a foremost agricultural people to a third-class power. The rich soil has been eroded from her farms and agriculture has become unprofitable.

"Spain has also been a despoiler of her numerous colonies and of the provinces which came under her rule.

"Prescott relates that great forests occupied the tablelands of Mexico at the time of the Cortez invasion during the early part of the sixteenth century, only four hundred years ago. There must have been generous rains and a balmy climate to promote tree growth on these plains, 8,000 feet above the sea, and twenty degrees from the equator. But to-day there is a desert with but a few cacti where Prescott's forests flourished, and rainfall would be gladly welcomed in the table lands of the Mexican Republic.

"China, the oldest nation, and once the richest and most advanced in letters, has no forests, and is the slave of every other nation on the earth.

"The rainfall and various meteorologic and electric conditions are controlled largely by forests, while climatic conditions are favorable or otherwise in proportion to the area of a continent which may be retained in woodlands.

"Those who look back fifty to sixty years will bear me out in the statement that the climate of Indiana has changed greatly since the middle of the last century, and that the change has been caused by felling the forests.

"The Ohio River then maintained a depth of twelve feet in summer, permitting an all-the-year navigation by largest steamboats. Now it is often so low that boats drawing two feet of water must be substituted for those of larger size during several months of the year.

"Springs have been dried up which were formerly permanent. Heavy rains occur; but the water quickly flows to the streams which are swollen for a season, and as quickly become dry beds.

"I can remember well when peaches and all fruits were abundant every year, wherever there were trees. With the removal of the forests, thus lessening the number of birds, insects, which are destructive to farm crops and fruits, have increased immoderately.

"From the Rocky Mountain summits to the sea level delta of the Mississippi is a great distance, and it would seem conjectural to look to those distant mountains for the cause of floods and disaster to inundated fields, or shallow waters and sand bars, obstructive to natural commerce; yet this is the sole reason for both conditions. Upon the slopes of this high mountain range, where the moisture is precipitated as snow, the retention of the snow by forest growths may permit a gradually melting and slow, steady stream, while without the forest protection the hot sun of June melts the frozen water rapidly, and all runs off quickly, causing floods in the delta, soon to be followed by another extreme of low water and indifferent navigation.

"The manufactures of a nation are its greatest wealth.

"Ores may be present in great profusion, but their value lies in the labor which converts them into articles possessing a material value.

"But the manufactures of a country are dependent upon the products of the forest. The many thousands of articles

manufactured from wood, giving employment to very large numbers of citizens, supporting the families of these artisans, maintaining the public schools, providing materials for builders and other mechanics, make our Nation which was favored with forests to revel in wealth, while others possessing few forests remain in poverty.

"The printing press would cease to give us books and papers were the trees from which the wood pulp and paper is made, to become exhausted.

"The planting of a few trees on Arbor Day can have but slight effect on the economic problem of the Nation, but if the lessons inculcated upon that occasion are remembered in future years, the result may have a greater bearing than any of us can realize at the present time.

"What does it concern you, young people, these forest influences of such vast import?

"Of course it does, as does every influence which affects this Republic.

"You may reside in a city and have a business entirely foreign to woods or any of the wood productions, but every business interest in the great cities and smaller villages is so intimately related to every other trade or occupation that every one is concerned in whatever injures or benefits the Nation as a whole."

THE FARLINGTON PLANTATION.

I went over the Farlington (Kansas) tree farm and found the stumps with sprouts two years old without ever having the surplus sprouts removed. The "sprouting" they should have done in July, 1904, they are doing now; also burning the brush and limbs and clear it so rabbits will not harbor in it.

There is only about two acres left standing, and found a percentage of trees that had lost out in the struggle for existence.

These were standing 4 by 4 feet apart.

At Farlington they were sawing the trees into posts, and the select trees were reserved for telephone poles. I found the posts and poles much straighter than I had been led to expect.

By the way, I will put Girard, Kansas, (and vicinity) against any town in the world, large or small, containing the most Catalpa trees. There are all three kinds in abundance. Of the thousands of trees in the town I did not see one Catalpa of either variety that had been topped or with the top blown out.

SOIL ANALYSIS FOR FORESTS.

One of the great humbugs supported by the United States Department of Agriculture is the soil analysis for certain forest trees.

The entire country east of Illinois extending to the Atlantic Ocean on the east, and half of Mexico on the south, has produced immense forests of great trees, and so existed until within a brief period. This soil has not degenerated, except upon mountains, where it has been eroded. The chemical constituents have not changed, save as by continuous cultivation some of the humus has been consumed, and the land which has produced the most magnificent of timber trees will, if given a chance, reproduce timber in the future.

The subterfuge of the Department in sending out an inexperienced youth with a book on Chemistry in one hand and a bundle of nonsense in the other to defeat a great project of tree-planting by announcing that trees will not grow in Virginia, is too plain to be hidden and too ridiculous to be of more than temporary effect.

How Spurious Seed is Disseminated.

A STATE OFFICIAL'S INVESTIGATIONS

Editor Arboriculture:

DEAR SIR:—If ever a publication had a visible, tangible mission it seems to be ARBORICULTURE. The strenuous plea it has made for the hardy Catalpa and the prodigious amount of labor it has performed, during the few years of its life, to place this tree at the head of the list, in the realms of utility, reveal its purpose to an unmistakable degree. It has accorded to the Catalpa speciosa an intrinsic value beyond the merit of any other for certain purposes of pressing importance.

Any one who visited the St. Louis Exposition and examined the Catalpa exhibits made by the International Society of Arboriculture, in the Forestry Building, must have been impressed with the wonderful longevity of the timber of this tree, and its special adaptability to railroad and other kindred uses. It was also shown to be adapted to many of the demands our civilization is making upon the forest.

It being a fact that there are other varieties of Catalpa of great inferiority and worthlessness for economic purposes, that are far more abundant, that bear seed more prolifically, and whose seeds are much easier to gather, there arises the temptation for honorable men to buy and sell this worthless stuff to nurserymen as the pure, hardy variety, who in turn plant it, grow it, and label it "Catalpa speciosa," and then sell the young trees broadcast over the land, to the permanent injury of all planters who plant for utility and profit—a loss of time and money irreparable in this life.

At the present time, when railroads and other corporations are casting about for some species of timber suitable for their purposes, when our forests are so nearly depleted, when our necessities are demanding 70,000,000,000 feet of timber annually, when we are menaced with a timber famine at no distant day, it seems simply criminal for any seedsman or nurseryman to participate in frauds, fraught with so much loss, as is being entailed by the seed and nursery trade in the matter of Catalpa speciosa.

The statements made at times by ARBORICULTURE have been very strong; sometimes startling, and almost past belief as relating to Catalpa seed and nursery conditions—so startling as to lead the writer to turn his attention in the direction of the seedsmen and nurserymen to see what he himself could see and find.

You have asked me, Mr. Editor, as a member of the Society of which ARBORICULTURE is the organ, to give you the results of my investigations. In compliance with that request I herewith present you with samples from nineteen firms dealing in Catalpa seed. The packages are all distinctly marked, with the names and addresses of Smith, Jones and Robinson. You will note the wide range of these firms, extending from the Atlantic to the valleys of the "Kaw" and Arkansas, embracing names than which no better known can be found through-

out the country. I lay them upon your table and assure you that every package was obtained as "speciosa." I ask you, as an expert, to take them, examine them and tell your readers what you find.

Hoping the many weary hours I have spent in this investigation to help rescue this priceless tree indigenous to my native State from the grasp of ignorance, I am, as ever,

Yours respectfully,

WM. GALLOWAY.

Accompanying Mr. Galloway's letter we received twenty-one samples of seed from the following firms of nurserymen and seedsmen:

1. D. S. Lake, Shenandoah, Ia. (Kempferii seed almost entirely.)

2. Mount Arbor Nurseries, Shenandoah, Ia. (A fair grade of seed, but not pure.)

3. German Nurseries, Carl Sondereggar, Beatrice, Neb. (Bignonioides; low-grade seed.)

4. Thomas Meehan, Philadelphia. (Bignonioides.)

5. Ross Brothers' Seed House, Wichita, Kan. (Some speciosa, some hybrids.)

6. Youngers & Co., Geneva, Neb. (Speciosa.)

7. D. Hill, Dundee, Ill. (Some show speciosa type; much hybridized.)

8. State Agricultural College, Manhattan, Kan. (All kinds, mixed.)

9. Robert Douglas' Sons, Waukegan, Ill. (Crop of 1904. Messrs. Douglas have withdrawn from handling Catalpa seed since learning of the character of the seed bignonioides.)

10. Forest Nursery and Lumber Co., Ashland, O. (Crop 1904. Excellent sample of speciosa seed.)

11. Hart Pioneer Nurseries, Fort Scott, Kan. (Bignonioides, very low grade of seed.)

12. A Willis, Nurseryman, Ottawa, Kan. (Bignonioides.)

13. Geo. W. Tincher, Topeka, Kan. (Almost pure speciosa. Some little hybridization in some seeds.)

14. J. M. McCullough's Sons, Seedsmen, Cincinnati, O. (Crop 1904. This firm has discontinued the sale of Catalpa seed. Sample bignonioides.)

15. J. Jenkins' Nurseries, Winona, O. (All bignonioides.)

16. Forest Nursery and Seed Company, J. H. H. Boyd, Irving College, Tenn. (Seed badly mixed. All kinds present.)

17. Irving College, Tenn. (Crop 1904. Bignonioides and Kempferii.)

18. Phoenix Nurseries, Bloomington, Ill. (Crop 1905. Much hybrid stock present. Some speciosa type.)

19. Phoenix Nursery Co., Bloomington, Ill. (Crop 1904. All Kempferii.)

20. Barteldes & Co., Lawrence, Kan. (Crop 1904. Sample all bignonioides.)

21. Barteldes & Co., Lawrence, Kan. (These are supposed to be the same as 1904. Both claimed to be from the Farlington plantation. Sample is of hybrid, a few types of speciosa and of bignonioides are present. None worthy of being planted.)

MILITARY RESERVATION FORESTRY.

The forest service has prepared by request of the War Department a set of plans for the management of various military reservation forests to be carried out by the army posts. This work requires an examination of the Ft. Wingate (N. M.) reservation, and those located in Montana at Ft. Assiniboine and that at Ft. Keogh. The plan will cover the method of protection from fires and general cutting.

THE DESTRUCTIVE TEREDO.

In the warm waters of sub-tropic countries ocean piling, wooden ships, and various articles of wood are soon destroyed by the work of the teredo, a boring worm which is classed as a mollusk or shell-covered worm in saline waters. These borers are very abundant in Pensacola Bay, where the great ocean docks become undermined, the piles being eaten and hollowed out by their boring, while great expense must be met in frequent replacement of these foundation timbers, or in some way protecting them from the mollusks.

But few woods will resist the attacks of teredos; palms, which have little strength to support great weights, being the principal wood which is exempt.

Some years ago we conceived the idea that a timber which resisted the efforts of borers on land, and which was antiseptic by nature, would also be able to resist the gnawings of the teredo in the ocean, and so we arranged with the officials of the Louisville & Nashville Railway Company to make a practical test beneath the company's coal docks in Pensacola Bay.

We procured a small tree of Catalpa speciosa in the Wabash Valley, Indiana, and sent it to Mr. M. E. Batts, Roadmaster of the Pensacola Division, L. & N. Ry. Co., who placed it in the water underneath the coal docks in the spring of 1904, where it has remained ever since, in company with many other specimens of wood. In April, 1906, Mr. Batts wrote me that so far the wood had not been penetrated by the teredo.

Usually timbers are attacked within six months, during the warmer season, and as this Catalpa tree has safely passed through two seasons of hot weather, it is fair to presume that our theory is correct, and that the wood will prove exempt from puncture by worms of land, or worms of the sea, as it is from the subtle fungus germs of decay.

Should this eventually prove to be correct, it will add another most valuable quality to this important Indiana tree which the United States Government is spending so much money to dissuade railways from planting.

SOUTHERN SWAMP JUNIPER.

The juniper family is quite a large one, comprising several trailing varieties, the savin, etc., which never rise to a height greater than four feet. The red cedar, or *Juniperus virginiana*, is well known, and has often been mentioned in ARBORICULTURE. In the Dismal Swamps of Virginia and North Carolina is a valuable swamp growth of the juniper.

In Southern Alabama and Western Florida we find the swamp juniper in considerable quantities, which is being cut for telegraph poles. At Flomaton Fla., recently we examined a large number of these poles, the trees being along the Escambia River near by.

One pole, 11 inches diameter at butt, and 6 inches at top, 22 feet in length, we found to be 40 years old; another, 12¾ inches at butt, was 35 years' growth. One, 10 inches diameter, 25 feet long, had grown in 30 years, while in 38 years another had grown to 12½ inches diameter, making a pole 25 feet long. This tree, at 10 years, was 4½ inches diameter. Several 60-feet poles, 24 inches diameter, had grown in 50 years.

Here we have the data for a problem in timber planting: given a swamp of little value, how much money can be profitably expended in planting Juniper trees for a thirty- to fifty-year invest-

ment? These poles are probably worth $5 net. In thirty years they would have no less value than they bring at present. Two hundred trees may be estimated as a stand for each acre, or $1,000 per acre income three decades hence. Presuming that the seed may be collected, sown, grown and planted at a cost of $30 per acre, which is possible, we have a cost, including interest for thirty years, of $84, against which we place the increase in thirty years of $1,000. There are many good investments possible in forest culture.

DEFORESTATION AND CLIMATE.

In an address delivered before the German Meteorological Society at Berlin, Dr. Hennig spoke of the influence of forests upon climate, and he called attention to a number of coincidents where the depletion of forests appears to have been attended by drier conditions. According to Consul-General Gunther, of Frankfort, who has summarized the address for the Consular Reports, Dr. Hennig said that the climate of Greece, where to-day only 16 per cent. of the area is covered with forests, has become drier. An increase of temperature and decrease of rain are noted, as compared with ancient times. This is especially noteworthy in Attica, which was thickly covered with forests about 3,000 years ago, and where hardly any rain now falls; while the heat in the open air attains a degree of intensity that would make the indulgence in athletic sports, once famous, now almost an impossibility.

Similar conditions exist in the peninsula of Sinai, where thousands of years ago the people of Israel found a luxuriant and fertile country, though to-day it is a desert. Palmyra, also once a flourishing oasis in the Syrian desert, presents to-day only a waste of stones and ruins. In Mexico, where the Spaniards cut down the forests in the mountains, droughts changing to devastating floods are now noticeable, especially in the neighborhood of the City of Mexico. In Algeria, where, since the middle of the last century, the forests have been cut down on a large scale, dry weather has increased; and in Venezuela the level of Lake Tacarigua, to which Alexander von Humboldt drew attention, has been lowered in consequence, it is said, of deforestation.

Geological investigations prove that arid deserts are not permanent features of the earth's surface. The most level expanses have once formed part of the ocean bed, or great inland seas. The orographical changes that have cut off these seas and created inland drainage areas, probably at the same time modified the rainfall of the locality. Excessive evaporation dried up the great lakes, leaving at present a series of receiving rivers that dwindle down by evaporation as they flow.

RAISING GOOD TIMBER.

About thirty years ago I bought an eighty-acre farm. At that time it contained about thirty-five acres of timber, consisting of a few old trees, saplings, brush, etc. I cut the old trees out and used the wood for fence posts and firewood. That gave the saplings a better chance to grow. By planting a mulberry on vacant places and by planting blacknuts in the fall there will be no need to look after them until some years later, when they may need a little pruning. I have black walnut trees that were

planted some years later which are about forty feet high and would make four posts to the cut. About that time I sent to a nursery for one hundred hardy catalpa seedlings, which were being sold at a cent apiece delivered. The seedlings were sent by mail, and to-day some of these trees would make four to eight posts to a cut. Some time ago it was necessary for me to replace a plate on my stable, and as I wanted a perfectly straight piece of timber I went to my woodlot. It took quite a little time to find it, but I found one that was as straight as a line for twenty-five feet. I think it pays to take care of our good timber, as good dimension timber is getting scarce. G. F. Wiegand.

Jersey County, Ill.

THE TREE PLANTING EXPERIMENT.

Too much can not be said, at this time, in commendation of the experiment in tree planting that the State Agricultural Experiment Station is taking up with farmers over the State. It may be a matter of regret that it was not done years ago, so that no time should be now last along lines of experimentation. One man writes to the station that he wants to plant trees, but does not wish to spend any time in experimenting.

The era of tree planting is already at the door, as seen in the fact that so many persons want to take up the experiment with the station. There are nearly three times as many applicants as the station can supply with trees, which shows the attitude to which people are coming. The tree planting idea is also seen in what many are already doing. One gentleman, in business on Champa Street, owns a small tract of land in Southern California which he has planted entirely to eucalyptus. He also owns 200 acres at Lamar, Col., and has planted 100 hardy catalpa and 2,200 black locust, which is only a beginning of what he has in mind. At Cope, in Washington County, one farmer has planted nearly 2,000 trees on the bare plains with no ditch in sight, and stands ready to demonstrate what can be done without irrigation if men will do as he does to conserve the rainfall. W. E. Wolfe & Co., at Wray, in Yuma County, have started tree planting on a large scale and are putting out osage orange, hardy catalpa, ash, elm, Russian mulberry, sugar maple, red locust and black walnut, thus leaving cactus and cottonwood far in the rear. One of our citizens on Seventeenth Street will set 10,000 utility trees in the spring.

Such men are ahead of the station experiments. They see the approaching demand for poles, posts and ties, and are awake to the trend of things. Although many are ahead of the station, yet the experiment will be vastly valuable. It will lead to the issuance of bulletins based on facts for future guidance. It will arrest the immediate attention of many farmers and lead to the planting of wood lots for purposes of utility and profit, and this should be encouraged in every possible way.

Further, it may possibly lead capitalists to question whether any farm land, as such, is too valuable for trees, and induce them to invest large sums in tree planting for the production of poles and ties as a certain and permanent source of revenue and profit greater than any other farm crop can offer. For Colorado this may appear speculative, but in Kansas they are finding such dreams to be surprisingly true.—*Denver Republican,* Feb. 20, 1906.

FOREST LANDS NOT NEEDED FOR FARMS.

It is a fact which can not be too often emphasized that in this broad Union of ours there is no necessity whatever for taking for ordinary agricultural purposes any land which, for the general weal, had better be left in forest. Good lan for farms can be had in every State without resort to the destruction of forests.—*Maxwell's Talisman.*

A BI-MONTHLY.

Owing to the increased calls upon the Secretary of the International Society of Aboriculture for field work, requiring much travel, and in correspondence from those wanting information upon forest subjects, the publication of a monthly journal is too much of a drain upon his time and energies, and it has been found expedient to make the periodical bi-monthly.

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The Louisiana Purchase Exposition has awarded the GRAND PRIZE to the International Society of Arboriculture for TREE PLANTING. And GRAND PRIZE for the Catalpa Exhibit.

THE INTERNATIONAL SOCIETY OF ARBORICULTURE

OFFICERS:

General Wm. J. Palmer, President, Colorado Springs, Colo.
Henry J. Elwes, F.R.S., Vice-Pres., Colesborne, Cheltenham, England.
John P. Brown, Secretary-Treasurer, Connersville, Ind.

Articles of Incorporation.

ARTICLE I.—Name. The name of this corporation shall be The International Society of Arboriculture.

ARTICLE II.—Purpose. The purpose of the Association is to introduce judicious methods in dealing with forests and woodlands; to advance and advocate a public interest in this subject; to promote the afforestation of unproductive lands; to encourage the planting and care of shade trees in parks, public and private grounds, and along streets and highways; to inspire an interest in our remaining native forests, and groves of ancient trees, and to seek their preservation; to supply information to railway officials in regard to timber culture for railway uses, and incite railway and other corporations to plant trees for economic purposes.

ARTICLE III.—Membership. Any person may become a member of this society by the payment in advance of an annual due of two dollars, and on payment of this annual due shall be entitled to receive, regularly, one copy of Arboriculture, the official organ of the society. Any person who may contribute ten dollars toward the support of the society shall become a patron. Honorary members may be chosen by the executive committee.

ARBORICULTURE

Vol. V No. 5

A Magazine of the International Society of Arboriculture . . .

Connersville, Ind., July-August, 1906

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VOLUME V. CONNERSVILLE, INDIANA, JULY-AUGUST, 1906. NUMBER 5.

LIBRA
NEW YO
BOTANI
GARDE

Address of John P. Brown

To Students of Wabash College, Crawfordsville, Ind., May 31, 1906.

YOUNG GENTLEMEN:—You are living in a transitory period. The great forests which covered all our State and the entire eastern and southern portions of the United States are passing away, and a future period is not far distant when all this territory will be practically treeless.

Probably none of you have been obliged to enter the wilderness of forests and with the axe open a clearing within which to build a home and farm, as did your fathers only half a century ago. Yet you will see the last of the disappearing forests, and learn the absolute necessity of planting trees upon a far more extensive scale than has ever been dreamed of in order to check the disastrous climatic changes which even now are becoming more apparent from the removal of so great areas of timber.

If you have been observant of passing events, you have seen vast manufacturing establishments and numerous extensive sawmilling industries cease operations, obliged to abandon their business and to discharge many thousands of employees because of exhaustion of timber supply with which to operate their plants.

A score of years hence, not a very long period in a nation's history, and five thousand times as many laborers will be out of employment, obliged to change their occupations, and vast enterprises which are now engaged in manufacturing wood products will be abandoned for the same reason.

There will be no other forests to conquer, no other land to clear of trees, make lumber, manufacture wagons, furniture, farm implements, and to build houses, unless they shall be planted by man.

Indiana, which has so prospered by her great industries in wood manufactures, and which only a third of a century since was the chief manufacturing and producing center of hardwood timber of North America, to-day brings all her timber from other States far distant, and ere two more decades shall have passed every wood manufactory in our State will have ceased to operate as such, while the machinery will lie rusting in the ruins, the vacant smoke stacks monuments of a former greatness, lost forever. The State once possessed nineteen million acres of magnificent forests.

You may now realize more vividly than ever before how important it is to the

JUL 17 1906

State of Indiana and to the entire nation —yea, to all the world—that the young men who are about to take up the reins of government and the various business and political interests of this nation should be informed of the true situation regarding the forests, how little yet remains, how very soon it will become exhausted, and what course should be pursued to avoid the calamities which must result from the wasteful destruction of so much of the nation's forest.

Let us take a glimpse of the forests of the United States as they exist at this time.

In New England the principal forest areas remaining are in Maine. This State was so densely wooded that it received the appellation of the Pine Tree State; but lumbering operations have been on such an extensive scale that every county has been cut over, the original forests removed, and a second growth having taken its place. The prospects are for a continuance of the forests of this State through the wisdom of Maine's excellent Forest Commissioner.

The remainder of the New England States do not possess enough timber to supply the needs of their manufacturers.

Very large areas of abandoned farm lands are covered with shrubby growths, but possessing no material value for commercial purposes.

The mountain regions of New York and Pennsylvania have considerable timber remaining, in certain localities, but not enough to supply home demands, and all will be exhausted in a brief period.

None of the Middle States have large forests remaining. Here and there are small tracts, but the trees have almost disappeared.

Michigan, like Indiana, formerly densely wooded, has exhausted her pine and other timber. Her sawmills have removed to other States or are left to decay.

In the South, where transportation has been somewhat more difficult, the greatest bodies of timber are left, and these are being removed rapidly.

Wherever a stream exists capable of floating logs, or along lines of all railways, the commercially valuable logs have been removed. Export lumber is accumulated at every Southern seaport.

The denser forests lie in the rain-belt region of Northern California, Western Oregon and Western Washington. And here lumbering operations are on the most extensive scale which the world has ever known.

Between forest fires, export and domestic demands, and the waste in clearing forest lands for agriculture and in logging, there will be little timber remaining a quarter of a century hence on the Pacific Coast.

There seems to be no interest in all the Pacific Coast region in the perpetuation of the forests, but only the intense desire to dispose of the trees as quickly as possible.

Practically all the timber land of this region is in the hands of speculators, each anxious to convert their property into cash within the briefest possible time.

Where else shall we look for timber with which to continue our manufactures? It does not exist in any part of the United States.

The United States has 2,968,700 square miles of land area, of which 1,730,000 square miles are arid plains and treeless prairies, sixty per cent. of our entire area being treeless originally, while forty per cent. of the forests have been destroyed, less than fifteen per cent. of our area being now in woodlands.

It is not likely that any large propor-

tion of Indiana will ever again be re-forested, nor will any of the high-grade farm lands of the Middle States. Still, a portion of every farm should, as a matter of economy, be planted with forest trees.

The income derived from our exports of lumber is a very attractive theme of our statesmen, who can only see the immediate benefits in ready cash for governmental expenditures, but this income from duties on lumber exports is simply the life-blood of the forests being rapidly withdrawn from the patient, and in two more decades it will leave a corpse, with many bitter memories of our terrible extravagance and waste in the natural products of the land.

CLIMATIC CHANGES.

In the world's recorded history, extending over four thousand years, every historian of all this time informs us of forests which once existed, and having been destroyed, there resulted such changes in climatic conditions that the welfare of the inhabitants was seriously affected. In some instances nations have become depopulated, and in others they were greatly reduced in numbers and unable longer to stand against their powerful enemies. Thus they were subjugated and their identity as a people lost.

Look to-day at the countries which have protected their forests; see their greater prosperity, their abundant manufactories, world-wide commerce, and their influence among the nations of the earth. Then observe those nations which have destroyed their forests, and have become subservient to their more intelligent neighbors.

Wind, rain, temperature, storms, floods, droughts — all are controlled by forests through the electrical influences which masses of trees exert.

Thus agriculture is quickly affected by reason of irregularity in precipitation, for too much rain may be as disastrous to farm industries as too little.

And while it is essential that we should have breezes for the purification of the atmosphere, yet when from the absence of trees these become violent storms, there is always great damage resulting.

LABOR.

One-fifth of our laboring population is engaged in wood manufactures and the industries connected with the lumbering trades.

What occupation must these five million citizens engage in as they are dropped from the rolls of wood manufactures and kindred industries? Will part of them come into close competition with you gentlemen a dozen years hence, or will many of them be forced into poverty in the great cities and become a charge upon the community?

NAVIGATION.

This nation is compelled to increase its very great expenditure for river and harbor improvement with every recurring session of Congress, and in future this must be still more greatly increased, as the silt, washed from a million farms, is deposited in the many streams, raising the bottom of rivers higher each year, causing low waters for many months during the rainless season and obstructing navigation, while with the floods entirely uncontrolled overflowing the river banks, causing great destruction along its course.

ADVANCING PRICE OF LUMBER.

All kinds of lumber, building materials, boards for manufactures, cross-ties, etc., have advanced each season as the forests have gradually diminished, until now they are double in price what the same grades were sold at a very few years ago. This must continue, as *without the absolute removal of duties on lumber* and a free competition with Canadian forest pro-

ducts permitted, our native trees will be exhausted, and the United States will be obliged to import lumber from other ports.

INCREMENT OF GROWTH.

There is no question but the annual increment of growth of our remaining forests, including all the areas of immature brushwood, is very far less than the destruction each year by fire, by the axe, and the boxing tools of the turpentine operator.

Over a remarkably large portion of the United States, especially through the South, the evil practice of annual burning of the weeds and grasses in open forests prevails, destroying the natural increase by seeding.

The result can only be that in about twenty years the mature timber will be gone, and only the small brush covering some of the rougher mountains will remain.

This will require fifty to seventy-five years to grow into merchantable timber. Thus, there must be a period of fifty or more years in which this region will be practically without forest property. What shall be the supply during this interim?

I have endeavored to make this fact plain in all my writings, and to urge the very extensive planting of various trees which possess a high value, and which, at the same time, mature quickly.

TREES OF EARLY MATURITY.

In twenty years from planting we can grow willows and cottonwood trees. In thirty years forests of soft swamp maples may be produced of sufficient size for sawing into lumber. In a quarter of a century the abele and several of the populus family can be grown, from which boards may be sawn In the same time black locust will produce fence posts and several minor articles, yet having considerable utility. But none of these trees possess a very high commercial value. The tulip tree, yellow poplar, which is not a poplar at all, but a liriodendron, and the black walnut are of fairly rapid growth, and if largely planted in the brush lands of New England and the Middle States, would revolutionize the forest productions, as they should outgrow the dwarf growths of those lands.

Black locust succeeds on very rough, rocky, mountainous lands, where other trees do not thrive. It should occupy such lands, and can scarcely be too extensively planted. But locust will not make lumber. It can not be sawn into any timber profitably, and its uses are restricted.

A majority of Indiana and Middle State forest trees, however, are of such slow growth as to discourage our impatient American farmers.

White oak in one hundred years will make good saw logs. Ash in eighty years, yellow poplar for best lumber one hundred years, although of value for small logs at forty or fifty years. Deciduous cypress of the Southern swamps require three to six hundred years. Beech one hundred and fifty years, but never gains a very high commercial value.

Some of the sequoias of the Sierra Nevada Range are thirty centuries old, having come into existence while Solomon was on his throne.

CATALPA SPECIOSA A TREE FOR THE PERIOD.

A natural product of Indiana, growing in the slashes or wet bottom lands along the lower valley of the Wabash River, gives promise of being the tree for the times, the one tree of the entire world which combines all the essential qualifications for the re-foresting of this land.

Extreme durability in contact with soil; great beauty of grain, taking a high pol-

ish; strength beyond that of a majority of woods, and elasticity equal to that of hickory, a fiber peculiarly adapted to the manufacture of wood pulp and paper; making lumber suitable for carpentry and building, telegraph poles equal to the best in one-fourth the time required by the white cedar now used so extensively for poles, and cross-ties outlasting five sets of white oak, the standard now for sleepers; and withal making such rapid growth as to be a marvel to all who know this tree.

Are any other qualifications desired, or could they be imagined in any other tree of which the world has knowledge? If more be demanded, we can point to the successful culture and growth of this tree in forty States of the American Union; in every portion of Europe and America from forty-eight degrees north latitude to forty degrees south of the equator; in both hemispheres; in the distant islands of the Pacific; yea, in Asia, in Japan and Korea, where a hundred thousand trees may be found growing satisfactorily from seed distributed by the International Society of Arboriculture.

Twenty degrees north of the equator within the Republic of Mexico, both in the hot tropic lands of sea level and at eight thousand feet elevation on the colder tablelands, it is growing with equal success.

In Brazil, Argentine Republic, Guatemala, Hawaii, Australia and New Zealand are several hundred thousand trees, planted by members of this Society resident in those various lands. In South Africa as well, in Great Britain, France, Germany, Sweden, Italy, members of this Society have forests growing, not a few, but by hundreds of thousands.

And everywhere the *Catalpa speciosa* is reported as being successful.

Within our own country in Virginia we have them, where the Bureau of Forestry of the United States declared they could not grow.

In the Carolinas and throughout the Southland. In Florida they have been largely planted, growing well in the Everglades, as testified by the editor of *The Homeseeker*, at Miami. And so far north as Saginaw, Michigan, Niagara Falls, and in Central Maine, as well as in California. Idaho, Colorado, Utah, and all the region between.

Of what other tree known to the botanist through the entire world can it be said to possess such a wide range of adaptability of growth and such a variety of qualifications? What tree is there in any country which can be used for so many useful purposes?

Some of you gentlemen may have seen the catalpa exhibit at the St. Louis World's Fair. Those who did see it could not fail to be convinced of its value.

DISTRIBUTION OF WRONG TREES.

There is one very unfortunate circumstance. There are other varieties of catalpa, all of which are of inferior worth. These have been broadly distributed, and their general inferiority, together with the slight information which the world has upon the subject, and the serious blunders made by government botanists, have given the public the wrong impression regarding the *Catalpa speciosa*.

So long ago as 1586 a catalpa tree was taken to London and planted in a noted garden, the resort of scholars and the wealthy and titled people of that time. This was a *bignonioides Catalpa* from North Carolina, then a part of the State of Virginia. The tree attracted marked attention from the beauty of its flowers, and seeds were distributed from this tree to many botanical gardens and private grounds throughout Europe.

The crooked trunk, decaying wood and small growth of this variety of catalpa are not conducive to a high regard of the catalpa for timber planting.

In our own country serious mistakes were made during the early part of the nineteenth century in the distribution of many thousands of these Southern catalpa trees throughout all our States and in all our cities.

As a consequence, a very large proportion of scrub trees adorn our city streets where it was supposed the Wabash catalpa was being planted.

Catalpa speciosa produces but one pod for each cluster of flowers, while the seed are scarce and difficult to collect. *Bignonioides* produces fifty times as much seed, which is very easily gathered.

Thus the public have been impressed that the catalpa is a very inferior tree, and it is extremely difficult to overcome prejudice.

IMPROVEMENT OF FORESTS.

It is a very important matter in forest perpetuation that the character of the timber be constantly improved.

Our farmer friends have practiced the other method, selecting the best walnut, oak, ash or sugar tree for the sawmill, and leaving the dogwood, grapevine, beech, gum and other trees of lesser worth to occupy the land.

As a consequence, what few wood lots remain in the Middle and Western States have been greatly reduced in character. The forester will find ample room for improving the character of the forest placed in his charge.

Much of the scrub growth, the very inferior and decaying trees, all that are beginning to show that their time of usefulness has passed, should be removed, but not so rapidly as to destroy all forest conditions.

Nuts, acorns and seeds of various trees may be planted to advantage among the present growths, and by care these may in a few years form the principal forests.

Of course the financier who holds timber lands for an income wants to see the money coming in. He must be shown that more money will be produced by a rational course of forest perpetuation and by its improvement than by clearing it quickly and then its abandonment.

Walnut, hickory, chestnut, tulip tree and pines, and many of our better trees, may be introduced by the systematic planting of seed or young plants.

If the original forest has long since been removed, the leaf mold with all humus decomposed and absorbed by many successive growing crops, the impoverished soil baked and hardened, as in a majority of instances, there is no semblance of forest conditions so necessary for tree growth, especially in the earlier stages.

Under such circumstances a substitute for these natural conditions of the forest must be provided.

A crop of lumber, requiring from twenty to fifty years to mature, is of greater importance than is a crop of grain which may be perfected in eight months. This being the case, it is doubly important that the land be placed in the best possible condition by deep and thorough plowing, rolling if necessary, to reduce the clods, and harrowing to give a mellow surface for a seed-bed.

The depth to which seed should be covered must be governed by the size of the seed. An old rule is to cover the seed to a depth equal to its thickness.

In the tropics we should bury a cocoanut six inches deep, while eucalyptus would perish if covered even half an inch.

Here we cover walnuts about two

inches, but the delicate seeds of sweet gum, deciduous cypress, *Catalpa speciosa*, etc., should have less than half an inch of covering.

As soon as the tiny seedlings appear above ground, they should be carefully hand-hoed, and if much young grass appears and the season is wet, hand weeding will be necessary.

After the plants are up a few inches above the surface, horse cultivation may be adopted.

Under no circumstances must grass and weeds be allowed to choke the young plants.

In autumn such plants as are to be transplanted may be taken up, tied in bunches, usually one hundred to a bunch, and heeled in for the winter.

It is not advisable that young plants be set in forest in autumn in regions of frost, where they may be heaved out and destroyed.

In the spring the land intended to be planted should be prepared with the same care as directed for the seed-bed. The tract may be marked off lightly one way and furrowed deeply in cross direction.

In order that trees may quickly shade the ground, we plant much closer than the trees can remain and mature.

My observation in many forests in all portions of the country has given me the clue to distance, and I feel assured that 14 x 14 feet, or about two hundred square feet space to each tree, is the proper distance.

This, however, will largely depend upon the fertility of the soil and quantity of moisture obtainable.

I thus decided to plant 7 x 7 feet, or nine hundred trees per acre, at which distance trees may remain for seven to ten years, depending upon the rapidity of growth of various trees.

Two men thus plant two thousand trees in an ordinary working day.

It is preferable that forest trees should not exceed one year's growth when planted; larger trees are more expensive, take more time to plant, and are too bulky for long-distance transportation.

Oaks and nut trees will thrive better if the nuts be planted where they are to remain permanently.

Under no circumstances should oats, any small grain, clover or grasses be sown in the young forest.

In a recent visit to the Indiana State Forest Reserve at Henryville, Clark County, we found a remarkably untidy state of affairs. One young plantation of hickory, oak and walnut, the plants six inches high, had been sown to oats, which will smother the trees and may destroy many. In other fields the trees were uncultivated, the weeds thickly covering the ground. A little hoeing had been done immediately about some of the trees, but no such cultivation as any thrifty nurseryman would consider absolutely necessary to produce any growth.

A nurseryman would quickly starve to death if he undertook to grow trees as the State of Indiana is doing at this reservation.

The falling leaves in a forest, together with the shade, maintain a soft, penetrable soil, where the roots may revel and gather energy with which to push the trunk upward and maintain a healthy growth.

This must be imitated by frequent stirring of the surface soil, but never to a great depth. After a rain, if the crust hardens, it should be torn up with a harrow, thus breaking the capillary attraction and checking too rapid evaporation of moisture.

PRUNING.

There is little to do in the way of

pruning for two or three years, as most trees naturally shoot upward if they have the opportunity.

Later, some pruning of side branches will be necessary.

This is cheaper than the old method of extremely close planting, which dwarfs the trees and stunts them by suppressing the growth.

The first important matter is to create a strong, healthy root system.

What the vital organs are to the animal world, the roots are to the plant world.

Every artificial plantation made under the 4 x 4 system has come to naught, because the roots in six years occupy all the space, and can not extend or gather moisture or nutriment to support the growing trees; their suppression thus results.

Certain trees are renewed from the stump; others grow from pieces of the roots. The latter make many suckers, as is the case with locust and abele. Chestnut and catalpa are instances of stump growth.

Examine a catalpa tree with a microscope; you will fail to find the adventitious buds which exist along the bark; but if the trunk be broken off at a height of fifty feet or cut at the ground, these buds are forced into growth and a new trunk formed. Thus a catalpa forest once planted becomes permanent.

CATALPA SPECIOSA IN THE EVERGLADES.

[From *The Homeseeker,* Miami, Fla.]

In the January number of *The Homeseeker* we made a note of planting and distributing quite a quantity of the above named trees in the lower portion of Dade County. We have watched with interest the growth of these trees, and have made careful inquiry of those to whom we sent trees, and there is but one report, and that is that they are doing magnificently. We planted several on the back portion of our home lot in the city, where we could have the opportunity to study their growth, condition, etc. When we planted them they were no larger than a lead pencil, and now the largest measures three and one-quarter inches in circumference and is now growing like a weed. We also planted a few on the edges of the Everglade, where water stands when high. These trees have also made a most wonderful growth, and to every appearance they are perfectly adapted to both soil and climate. We notice also those planted on the high pine lands are doing equally as well. We planted several on the bay front, within a few feet of the shore. While these trees are growing, the salt spray from the bay affects the leaves more or less, and the trunks are not developing as rapidly as those planted on higher ground or those farther away from salt water.

While we know that it takes "more than one swallow to make a summer," we realize that it is yet too soon to come to any correct conclusion regarding the future growth of this valuable tree in this climate and soil. But it is true that should the catalpa continue to grow as rapidly for several successive years, the problem for railroad ties, fence posts, etc., will be solved.

There are thousands of acres of low, flat pine woods along the east coast of Florida where the catalpa could be successfully grown.

To our Florida readers we would advise planting catalpas on portions of the farm that are not available for other purposes.

A Premium on National Suicide.

The National Hardwood Lumber Association, recently in session in Memphis, Tenn., accepted the committee report that, from the best estimates possible to be had, "there now stood in the United States approximately 1,475,000,000,000 feet of lumber, but that 45,000,000,000 feet were being cut every year."

At this rate our forests would last nearly thirty-three years, at which time the production of commercial lumber must cease altogether.

But there are several other contingencies which must be considered in such calculations. The annual fires in forests destroy an incredible quantity of standing timber, including all the younger growths which have started and the seed as well, and seed trees from which future forests must be produced.

Including the consumption of wood for pulp and paper, lumber cut for export and for domestic use, telegraph poles, cross-ties, piling, and fuel, of which much is still used in many locations, the timbers used in mining operations and that destroyed by forest fires, there are seventy-five billions feet of timber consumed each year, with an increased quantity yearly. It is evident, therefore, that we have not enough timber standing to continue commercially for more than twenty years in all the United States, including the Pacific Coast forests.

In estimating American forest areas, a Washington City publication recently made ridiculous claims by States, tending to prove that our forest possessions were so great as to be inexhaustible. In this estimate millions of acres were included which are brush lands, from which all commercial timber has been removed, and farms which have been cleared for forty or fifty years.

There are, in the Allegheny and Blue Ridge Mountains, and other rough localities, large areas, which are to some extent covered with scrubby growths, but which will not mature for more than a century.

Other localities have swamps, in which an inferior timber growth remains, giving the appearance of a forest, yet the commercially valuable trees have been removed.

Under the best conditions there must be a long interval of seventy-five or more years from the year A. D. 1925, when the bulk of our trees will have been consumed, and the beginning of the twenty-first century, when, if protected, these brush lands may become matured timber, during which long period the United States will be destitute of native lumber.

It is none too soon, therefore, "that something should be done, and done immediately."

We have urged repeatedly in ARBORICULTURE that quickly maturing trees be planted in immense quantities to forestall the coming timber famine, and we now emphasize these statements, and again urge government, States, lumbering companies, land corporations, and above all the farmers, to plant trees as extensively as possible and without delay.

So long as Congress insists upon placing a high premium upon national suicide by retaining the prohibitory duty on lumber, the only remedy lies in the planting of hundreds of millions of trees, of such species as will grow in the briefest possible time, and which possess the qualification demanded for lumber, cross-ties, and all commercial purposes.

An Object Lesson at Louisville.

In passing through Louisville, Ky., some time since, walking along Seventh Street, between Chestnut and Green, I found upon one side of the block a row of scrubby, deformed *Catalpa bignonioides* trees, which are seen pictured in these pages (No. 1).

Upon the north side of the street are three trees of *speciosa,* while in the grounds near by are two others, fine, large, straight, handsome *Catalpa speciosa.*

There are the same kinds of trees, of both species, in almost every city and hamlet throughout the land, but seldom in such a prominent location and in such proximity as here, and the contrast here is very marked.

It is needless to say that seed of these scrub trees will never grow and develop into trees like these shown on another page (No. 2), nor would we expect the reverse to occur.

AN OBJECT LESSON AT LOUISVILLE, KY.

Row of Scrub Catalpa trees, Seventh street, near Chestnut.

AN OBJECT LESSON AT LOUISVILLE, KY.

Five fine trees of Catalpa Speciosa, north side of Seventh street, near Chestnut.
Two of the trees are in the lot near by.

Forests Without Seeds—Bricks Without Straw.

"Go therefore now, and work; for there shall no straw be given you, yet shall ye deliver the tale of bricks" (Exod. vi. 18).

It has been but a third of a century when the principal mountain slopes of Colorado and other Rocky Mountain States were clothed with coniferous forests, but a very large proportion of these mountain sides are now practically bare of vegetation.

During the same period Michigan, Wisconsin and other Northern forest regions have become equally bare of trees, the pine forests having become exhausted. The Gulf and South Atlantic region is rapidly becoming treeless, as are the prairies of Kansas and the West.

Nature is continually making efforts to cover up the bare spots of the earth, and may in the course of centuries provide some methods for planting trees and restoring some kinds of forests on all these barren places; but nature can not "make bricks without straw." In other words, trees can never be produced where no seed exists, not even by nature.

If the lumbermen, mine owners and spoliators of Colorado forests have taken away every seed tree, if the sawmill has made lumber of the last white pine tree of Michigan, and if the turpentine operator persists in making resin of baby pines in the South, while fires annually burn the young seedlings, from whence are forests to be produced for this nation during the coming generations?

Bricks without straw — trees without seeds. Some things are impossible, even for nature.

Then how can man aid nature in her work of forest restoration?

To re-clothe the Rocky Mountains by the most approved methods of the forester—that is, growing trees from seed in nurseries and then transplanting them to the slopes from which the trees have been removed—is a work of such vast magnitude that even the combined work of government, State and nation could never accomplish the gigantic task.

And to re-forest the Michigan sands with white pine by the same process is an impossible accomplishment by any human power, if this process is insisted upon. Still, unless there be seed provided, centuries must elapse ere other forests will be produced.

There is, however, a method by which nature may be aided and encouraged to perform the work which she is anxious to do, and that is, to supply the seed.

The national government expends half a million dollars annually, and Congress would cheerfully appropriate a million if the question of forest perpetuation could be accomplished, or if some means could be shown which could promise to perform this work, and could win the confidence of the people and Congress.

It is a self-evident assertion that without seed no trees can be grown.

And with an abundance of seed, unless it be properly distributed where it is needed, no forests will ever be produced.

It is also well known that the country possesses many millions of acres of land which are unsuited for any other use than for the production of forests.

It is further known that an ample supply of seed exists and is produced each year, in the locations where trees exist, to furnish seed for all the land upon which forests should be grown.

But by whom, or by what agency, are

these surplus seeds to be collected in enormous quantities and properly distributed over the lands on which trees do not now exist?

The Creator has planned for squirrels and small animals and birds to distribute these seeds, yet even the Creator will not compel these agents to do this work immediately; this will take time; possibly centuries.

The proper method is for the governmen tto embark in this enterprise; have the seeds collected, scattered, and protected, so that in time the forests will be renewed.

This is also a work for the States, through their established organizations, forestry societies, agricultural experimental stations, agricultural colleges, or whatever organization may be in existence, totally freed of politics, and thoroughly equipped for business.

Seeds of all kinds are abundant, and not extravagantly expensive to gather. And if they are not collected, they are wasted.

Let the people awaken to the necessity of prompt and vigorous action. There is no time to lose, either in experimentation or collection of statistics, but actual planting of various kinds, suitable for the various locations and purposes.

Hundreds of millions of trees should be planted at once—and each year—and seeds provided for still greater numbers. The nation will need them long before they shall be grown.

NUT-GROWERS.

The fifth annual convention of the National Nut-Growers' Association is called to meet at Scranton, Miss., October 31st and November 1st and 2d, 1906. The outline of program promises a meeting of unusual practical interest. Jackson County, Miss., of which Scranton is the county seat, enjoys the distinction of being the place of origin of many of the largest and finest pecans known, while her area of orchards of bearing budded and grafted trees surpasses at present all other sections of country producing the pecan.

Special railway rates. For particulars address J. F. Wilson, Secretary.

Poulan, Ga.

A MODEL FOREST.

The Chicago, Burlington and Quincy Railway has planted a large forest of *Catalpa speciosa* at Pacific Junction, Iowa, a few miles south of Council Bluffs. The trees were supplied by John P. Brown, and were grown from seed collected in the Wabash Valley, Indiana. The location of the forest is in the broad bottom land of the Missouri River, a mile from the river's edge. The soil is of black, rich prairie, with a large proportion of sand, while the subsoil is the formation of sand and silt deposited by the river in its various changes. Probably the United States does not possess a more fertile soil than here exists in the Missouri bottoms.

While the large quantity of sand in its admixture makes it easily tilled and very productive, this farm, a square mile in extent, produced last year ninety bushels of corn per acre. Thus it is an ideal spot for catalpa growth.

On this tract a cottonwood tree had been recently cut which was five feet in diameter, and a count of the annual growth of rings showed it to be fifty years old.

Many walnut trees planted twenty years ago are now sixteen inches in diameter. The trees are planted 7 x 7 feet.

The Bureau of Forestry.

While at the Capital, June 8 and 9, we had a lengthy conference with the Secretary of Agriculture, Mr. Wilson, who plainly expressed his thought, saying, "There ought to be hundreds of millions of trees planted as quickly as possible, and the great problem is how to procure the trees and how to plant them in such numbers."

Mr. Wilson has an able assistant in Mr. Willett N. Hays, himself an educated forester.

Mr. Wilson introduced the editor of ARBORICULTURE to Mr. Gifford Pinchot, with whom we had a pleasant interview, and quickly came to a harmonious understanding.

As Secretary Wilson truly said, "There are too few earnest advocates of forestry in America to have any differences in regard to methods," and we are satisfied that hereafter the International Society of Arboriculture will have an ally in the Forestry Bureau.

TEACHING INDIANA FARMERS FOREST ECONOMY,

AT THE INDIANA STATE FOREST RESERVATION.

This Indian Block House, recently erected, yet unfinished, awaiting another pull at the Legislature, is built of solid hewn logs, showing the economy over sawn lumber. One way of squandering the people's money.

WANTED.

A liberal price will be paid for a copy of ARBORICULTURE for February, 1904. Address Editor ARBORICULTURE, Connersville, Ind.

Examination of Catalpa Grove at Balfour, Iowa.

BALFOUR, IOWA, May 1, 1906.

With Mr. J. D. Besler, I visited a grove of catalpa trees which the Chicago, Burlington and Quincy Railway Company had come into possession in buying lands for changing grade and lines in Western Iowa.

The trees are of mixed, "hybrid," stock. Some show distinctly Japanese *(kempferii)* origin, the pods being very small and numerous, and the seed quite small, with characteristic pointed filaments at each end. Others were of *bignonioides* stock, as shown by thin, scaly bark, seed and seed pods, unmistakably those of the Southern catalpa.

None of the trees were of *speciosa,* nor do they seem to have any *speciosa* stock, from all the examinations of trees, seed, pod or bark.

The trees were planted twenty years ago by a Mr. Pitzer, who is now in California. Evidently the gentleman purchased these trees for *speciosa,* planted them systematically, 7 x 7 feet, cultivated thoroughly, but did not prune the trees of their side branches.

The average diameter of the tree is eight inches, ranging from five inches to nine inches, the height being twenty-five to thirty feet.

In the main, the trees are fairly straight, and will now make fence posts. The lower side branches, remaining even within two feet of the ground, are dead from overhead shade, but are persistent. They do not fall away, nor can a man break them, although but one or two inches in thickness.

In many of the trees these dead side branches have conveyed rains and germs of decay into the trunks of the trees, which have thus rotted, the trunks being hollow and the trees worthless. This is characteristic of *Catalpa bignonioides* in its natural Southern home.

Very few weeds and no grass exist in this grove; the leafy tops shading the ground keep down all growths, except a few box elder and dogwood, which have sprung up from seed dropped by birds. There is probably about ten or fifteen acres in the grove.

The gentleman who owned this farm also planted large numbers of Scotch pine, white pine, Norway spruce, and some cedar, for protection to his home. These trees are now thirty feet to forty feet high, and beautiful as well as useful in protecting from wind.

People who see this grove of Southern catalpa, and the unsatisfactory growth which the trees have made, and presuming them to be *Catalpa speciosa,* for which they were purchased and planted, very readily denounce the planting of catalpa trees, and are hard to convince that *Catalpa speciosa* is a tree worthy of any attention.

The great injury done by the conscienceless seed distributor, which can not be rectified in a score of years, is shown here in a prominent manner.

THE INDIANA STATE FAIR,

Always full of interest, offers some special attractions for the season of 1906. Five full days, September 10th to 14th inclusive.

CHARLES DOWNING, Secretary.
INDIANAPOLIS, Ind.

DUTY ON TIMBER.

The sticklers for high tariff in and out of Congress seriously injure the future prospects of this Nation by refusing to reduce or abolish the excessive duty on lumber and logs, as by this means we are rapidly disposing of our forests with no compensating advantage except to the comparatively few speculators who have secured titles to practically all the timber lands on the Pacific coast, and who have built up a combine which controls legislation both in Congress and the Pacific States. We are offering a premium for the speedy removal of all our timber, for which we shall pay very dearly a score of years hence.

The action of the San Francisco lumber interests, recently, shows the slight regard these speculators have for the best interests of the Nation, and also how little concern they have for their suffering fellow citizens.

Congress proposed to remove the duty on all iron and lumber which would be required in rebuilding the stricken city. But not so: the lumbermen, all powerful in politics of the Pacific coast, indignantly rejected this liberal offer of the American people, preferring that all other interests should suffer, than that the poor should be aided by materials for building on which the duty should be removed. In other words, the lumbermen demand that every one who erects a house in San Francisco, to replace those destroyed by fire and earthquake, shall contribute to the lumberman's fund by being compelled to buy the lumber of these same lumber manufacturers.

There is entirely too much selfishness and too little patriotism in the lumber camps of the Pacific coast.

Refusing to modify the excessive tariff rates on certain necessary articles will result in creating a whirlwind which will sweep away the entire high tariff laws of the country.

CRITICISES THE FOREST SERVICE.

The following letter from John P. Brown, editor of ARBORICULTURE, Connersville, Ind., contains several suggestions of essential value to lumbermen, on the subject of forest and mill economy and the planting of timber for future supply. Mr. Brown is a confirmed advocate of the planting of *Catalpa speciosa*, which he regards as the ideal tree for quick growth for a future supply of posts, poles, ties, etc. His observations concerning the real timber conditions existing in Eastern Tennessee and Western North Carolina are verified by the facts. It is with much satisfaction that *The Record* prints this letter from Mr. Brown, and it is hoped that he will contribute much more information on re-forestry and kindred topics, with which he is so familiar.—EDITOR.

"ON TRAIN EN ROUTE SOUTH, June 5.

"Editor Hardwood Record:

"I shall be very glad to give you, from time to time, some suggestions in regard to forest policy. I am perfectly independent; do not fear to attack any policy which seems vicious or unwise, and having no aspirations politically, shall not hesitate to criticise the government or State policies. I consider the government forest policy as extremely dangerous and tending to the speedy destruction of American forests.

"Two things are highly essential: First, to warn manufacturers, lumbermen

and timber owners of the near approach to exhaustion of our timber supply and the necessity of economy in its use. Second, the planting of immense forests to provide a quick supply of timber. The area destroyed each year is very far beyond what any man has yet told. The government authorities seem to wish to create the impression that we have a never-ending supply.

"In the eight years of Mr. Pinchot's administration of the Forestry Bureau he has only spent $2,741.25 in planting trees, the total number of which is 1,275,000 trees in eight years, out of an appropriation of nearly a million dollars yearly. I have myself in this same time spent $50,000, and planted, or caused to be planted, 20,000,000 trees, through the society which I represent. My book on *Practical Arboriculture* will tell you why I am 'possibly a *Catalpa speciosa* crank,' as *The Record* states. If any man can point to any tree which has so many valuable qualities as the catalpa,—one which will grow in a brief period into lumber, and a tree which is so cosmopolitan in character, growing everywhere,—I shall be glad to learn of it.

"I am impressed more and more, in my observations in the North Carolina mountains, with the fact that little timber of real value exists. Here are hundreds of square miles of mountain land, all covered with what looks to be forest. The general impression upon the average traveler is that inexhaustible forests of heavy timber cover these mountains. But let a practical lumberman go into the woods seeking trees for lumber, and the real situation will be learned. Most of the alleged forest consists of brush, which will require a hundred years to mature; all of present value has been culled and removed. Hemlock, birch, sycamore, chestnut, black locust and oak thickly cover the land, but the very density of the stuff prevents growth. Yet the forestry experts at Washington include all these thousands of acres of scrub brush in their valuable (?) estimates of forests of which the United States is the proud possessor.

"There are positively no estimates made by any individual of the quantity of commercial timber existing which have any value whatever. I question if any man living has had better opportunities for observation than I, or has traveled over more territory, or been more observant, and I would not pretend to even guess at the number of feet board measure existing. But I do know that it is only a fraction of the quantity generally supposed. And I also know that men sitting in their offices in Washington talk and write very unintelligently about the vastness of our timber possessions. The rapidity with which lumber has advanced in price, the difficulty in obtaining supplies of good lumber, the great number of very inferior logs being sawed—all demonstrate the nearness of the end.

"We can not depend upon the natural forest growth longer than to the end of the first quarter of this century, and I can see no other solution of the problem than the planting of vast areas to trees. Meantime greater economy than has ever been thought necessary among owners of timber lands will be necessary to make our supply last even as long as I have predicted.

"When timber land owners come to see the lumber prospects as they really exist, and learn that forest planting is so simple and of so little cost, its returns coming in so short a time, then I trust they will rise to the emergency and their privilege and plant new forests on their cut-over lands.

"JOHN P. BROWN."

VICINITY OF HAGERMAN'S PASS, MOUNT MASSIVE IN DISTANCE. COLORADO MIDLAND RAILWAY.

Colorado Springs and Pike's Peak.

The tourist finds ample opportunity to satisfy his cravings for novelty in the world's famous convention city, Colorado Springs, and the many attractive mountain resorts so easily reached from this center.

The Antlers' Hotel has no superior in any portion of the West, yet the larger majority of visitors find homes with private families.

The system of electric roads is very superior, reaching most of the near-by resorts.

North Cheyenne Cañon, a free park belonging to the city, contains many very beautiful rock and cañon views and handsome trees.

Manitou, with its celebrated springs, are well known, while a trip over the Cog road to the summit of Pike's Peak is one never to be forgotten.

Thousands each year ascend this mountain either to its summit or to the delightful camping place, the Half-way House, walking all the way or riding burros, if not by the Cog road trains.

This region is rich in botanic specimens, in trees and shrubs and flowers.

The water used in Colorado Springs is brought from the highest valleys of Pike's Peak, the supply being collected in several lakes, which form a chain of fine reservoirs.

No country in the world possesses more beautiful coniferous trees than Colorado, specimens of most of which are found in the slopes or cañons of Pike's Peak.

The Continental Divide has great interest at all times for the tourist whose home life is in the large cities or among the arable lands of more Eastern States.

AT HAGERMAN'S PASS.

The wonderful formations of the giant rock masses, whose crevices are filled with hidden minerals, are attractive to the prospector who searches for coal or iron, or else for the precious metals. The lakes and mountain streams have a fascination for the sportsman in search of the speckled trout. The rarefied atmosphere, and pure water, trickling over the granite rocks, aerated in its rapid passage from the banks of snow on the slopes, give health and strength to the invalid who here seeks their curative powers.

While the snow-covered peaks, broken into numerous shapes, and the piles of rock of massive dimensions and thrown into many fantastic forms by the upheaval forces of nature, or left high above the surface while the surrounding softer masses have been washed away by centuries of storms or the action of former glaciers, and the precipitous, many-colored rocks, stained by iron oxide and other mineral solutions, give a never-ending panoramic change, delightful to the seeker for picturesque views.

All of these things are enjoyable to the editor of ARBORICULTURE, who, during a part of June, again visited Hagerman's Pass, and with two of his family spent a night and day in this high altitude, eleven thousand feet.

Of course the forest problems of the region were uppermost in his thoughts and examinations.

The red spruce *(Abies Douglasii)*, various forms of Colorado blue spruce

(Picea pungens), and silver fir *(Abies concolor)* are found in favorable locations in which they have not been destroyed by axmen. I was greatly interested in the high-line white pine. This very beautiful and unique pine of high altitudes, with its plume-like, flexible branches, has proven its great value here as a quick-growing tree for re-clothing the higher slopes of the Rockies.

In 1865-6 I first saw this tree in Southern Nevada, on the eastern slope of the Sierra Nevada Range, or rather in the White Mountains, which break away from the Sierras, and in a beautiful grove of these pines, about eighty-five hundred feet altitude, we camped for one night while surveying the State line between California and Nevada. It was the only group of this pine which we encountered, and I did not see it again for forty years, when I found it near Sierra Blanca, in New Mexico and Colorado, and a few years later at Ward, on the C. & N. W. line, north of Boulder, Col.

Now, a few miles west of Hagerman Pass, and also at Leadville, we saw it, where it has grown since the fires and lumbering operations swept away everything about twenty-four years ago.

This is one of the species of conifers which should be most extensively cultivated, as it grows at as high altitude as any of the spruces and firs, is a much more rapid grower, seeds well, and can be readily propagated.

The tree grows to a diameter of twenty to twenty-four inches and a height of one hundred and fifty feet, the wood being of high value as the Eastern white pine, *P. strobus.*

For some reason, probably because the seeds are devoured by birds and animals, this tree does not spread naturally with the rapidity desired, and hence the seed should be gathered, and either nursery-grown or scattered where mountains are bare of timber.

About the western slopes of the Continental Divide there are many old charcoal pits, where thirty years ago so much charcoal was burned for the manufacture of iron before the modern Bessemer process of steel manufacture was discovered.

In lumbering, the larger trees were cut into lumber, some of the smaller trees were used in the mines, and some vegetation was left to mature, but the devil in human guise constructed these conical pits, and every vestige of tree and shrub was gathered from mountain slopes and consumed in these furnaces.

Very large areas remain to this time absolutely barren of vegetation where the charcoal burner operated, and unless some human agency supplies the seed, they will remain brown and bare for centuries.

A moderate appropriation by Congress and by the State Legislature for the special purpose of collection and distribution of seed would enable the authorities to carry out a great scheme of afforestation, which alone will provide the mountain forests so essential to the future welfare of this nation.

It is of interest to see the reproduction of spruce, fir and aspen on the slopes, which were bared a third of a century ago, among the stumps, fallen logs and burned stubs still standing. These young growths record the date of the forest fire, enough trees having escaped destruction to furnish seed in certain locations.

Here, as in other mountain districts, may be seen the invaluable protection which is afforded conifers by the aspens.

The seeds of the aspen, like those of the cottonwood and populus family, as well as those of the willow, are borne by the winds for great distances, germinating where soil, moisture and congenial con-

ditions are afforded at proper altitudes. Thus the aspen is not so dependent as the conifers upon the caprice, as it were, of birds and animal life for the distribution of its seed, and it thus becomes the pioneer, and when once established, becomes the nurse and protector of the more valuable as well as more delicate pines, firs and spruces. As with all the populus family, the aspen grows readily from cuttings. Thus it may be produced easily, quickly and cheaply in the higher altitudes by cuttings, and so protect the tiny evergreen seedlings as they appear above the ground. The aspen fertilizes the soil by annual deposit of leaves, and seeds of conifers are hidden or covered by the aspen leaves, and thus escape the eyes of small animals, which otherwise might devour them.

The Rocky Mountains are filled with scenes of grandeur, but none more beautiful, more enchanting, or of greater interest, than exist in a distance of thirty miles from Hagerman Tunnel westward down the Frying Pan River, along which the Colorado Midland Railway winds its rapid descent of 3,644 feet, extending from the rugged, precipitous walls at Hell Gate, over the beautiful falls of the Horse-shoe Valley, between ranges of high, rock-founded mountains, past beautiful groves of fir and spruce, in the deep river valley, to and through the picturesque walls of Red Rock Cañon.

While the views from the train are a continuous, beautiful and ever-changing panorama, yet for a closer study of nature we left the train and strolled leisurely down the mountain, stopping at frequent intervals to photograph some of the peaks, rocks, or water-falls for our readers.

There is no such water in all the world as the crystal liquid fresh from the snow-banks, which flows amid mossy banks and pours over granite boulders deep in a cañon which the sun never reaches.

Champagne may sparkle from the carbonic acid gas with which it has been charged, but these mountain rivulets have absorbed health-giving ozone in great quantities as they leaped from rock to rock, dashed into spray at one moment and gathered again into a channel the next.

ARBORICULTURE EDITOR CONFERS WITH PALMER.

John P. Brown, of Connersville, Ind., editor of ARBORICULTURE, a magazine published in the interests of the International Society of Arboriculture, arrived in Colorado Springs late last night, coming here to interview General William Palmer in regard to the affairs of the Society of Arboriculture, of which General Palmer is President. The purpose of the Society is to encourage the growth of trees and to protect the forests of the country.

According to Mr. Brown, over twenty million trees have been planted during the last five years as the direct result of the efforts of the Society. At the present rate at which the forests are being cut off, they will entirely disappear in less than twenty years. It will take a hundred years for the underbrush to grow into trees of a size suitable for commercial use.—*Colorado Springs (Col.) Gazette.*

It is unfortunate that there should be any controversy in regard to the nomenclature and utility of the catalpa tree, and it is peculiarly unfortunate that a great Bureau of the United States Department of Agriculture should be involved in such a dispute. If the hardy catalpa, so-called, is what it is claimed to be, no amount of intentional confusion can prevent the public from finding it out in the end.

A Typical Catalpa Scrub,

Common in every city of the World. The cause of all opposition to the Catalpa Speciosa, which it in no wise favors.

Planting Needed to Avert Danger.

Destruction of Vegetation Due to Absence of Trees Cut Down by Woodmen—Arboriculturists Urge Propagation of Catalpa, a Rapid Grower, to Remedy Grave Situation.

Fortunately the interest of many who can be of great service has in late years turned toward the art of arboriculture; in simpler language, the art of growing trees.

The necessities of the situation have prompted this new interest, as the rapidly disappearing forests have told of many perils besides that of the scarcity of timber for various purposes.

This situation justifies the issue of a handsome work, entitled *"Practical Arboriculture,"* by John P. Brown, C.E., of Connersville, Ind.

"Practical Arboriculture" comes before the public just when such a work is most needed. It not only tells of the vast harm which has resulted from the destruction of forests, but tells in a clear way the steps which should be taken toward the re-creation of what has been destroyed.

He shows that some of the great railroad interests have taken up the matter, as they are vitally interested, and that trees by countless thousands have been already planted, and are making excellent progress.

SOIL IS SHIFTED.

An important feature of the work of Mr. Brown is found in the treatise upon the bearing of forests, or, rather, the absence of forests, on the great floods which cover the country at times. He says:

"With this radical change in clearing up so vast an area of timber there have come several evil results.

"Lands which were rich and mellow with accumulated vegetable mold have been washed by beating rains, the soil transported to the delta of the Mississippi, leaving rocks, stiff and hard clay for the husbandman to waste his labor upon, with scant remuneration.

"Springs and rivulets have long since ceased to flow, except for a few hours during a heavy rainfall. Rivers rise with great rapidity and as quickly return to their low-water stage.

"The Ohio becomes so low that wagons cross with farm produce along the usual channel for steamboats, and again it rises to the height of seventy-one feet, spreading for miles over cultivated lands and submerging cities along its banks.

"The soil no longer absorbs sufficient moisture during the season of rains to support vegetation in the time of drought."

SITUATION CRITICAL.

In reality, the situation is somewhat critical. Some nurserymen have planted trees, and farmers in a few cases have taken up the work.

The national government has done something, but nothing commensurate with the magnitude of the problem.

In a number of States something has been done in encouraging the work undertaken by the nation, by the States and by individuals, but not near enough. This book by Mr. Brown deserves a wide circulation simply because it will interest where none exists at present. If that is done, it will help much toward proper and liberal legislation.

Of all the trees mentioned by Mr. Brown, it is plainly to be seen that he strongly favors the *Catalpa speciosa*,

which must not be confounded with the ordinary catalpa found in many towns and along many country roads.

FOUND EVERYWHERE.

They vary greatly. The rapid growth of this tree and its value after growth commend it as an ideal tree to be used in starting new forests.

A century ago it was known only on a circumscribed area near the mouth of the Wabash, in Indiana. It has proved its true worth by spreading, until now it is to be found in almost every State of the Union, in Mexico, and even in Canada.

That it grows with almost marvelous rapidity is shown by the fact that catalpas in the South have increased two inches in diameter in a single season.

Objections have been raised to the catalpa by reason of its rapid growth, but the author shows the fallacy of the argument by several conclusive reasons.

The rapid increase in size is explained by the greater number of cells added in a given period; each cell is the same as another, and they have no especial bearing upon the hardness of the wood.

EXAMPLE TO FARMERS.

Catalpa has been used with great success by railroads as ties, and those who have experimented now have forests growing from which their tie supply will come twenty-five or thirty years hence, or even sooner.

Other trees claim much space, and their virtues are dwelt upon at length. In fact, Mr. Brown is not a specialist.

He loves his mission, and is endeavoring to carry it out without fear or prejudice. The book should be of great value to farmers and others owning large tracts of land.

It will show these men that there will be a big return at a small expense of labor, and that done, a great step has been made in the right direction.

Great Planter of Trees Visits City.

John P. Brown, of Indiana, Has Done Much for Country—Recognized World Over as an Authority on Arboriculture—Comes to Colorado to Study Trees and to Consult with General Palmer at the Springs.

Hon. John P. Brown, of Connersville, Ind., the man who has caused more trees to grow than probably any person that ever lived, was in the city yesterday for a few hours. He was on his way to visit General William J. Palmer at Colorado Springs, who, with Mr. Brown, has had the distinction of doing a great work in the fostering of agriculture. General Palmer is the President and Mr. Brown the Secretary of the International Society of Arboriculture.

"I have been at this work fifty years," said Mr. Brown yesterday, "and for thirty years kept steadily at it. Our society has caused to be planted more than twenty million trees, ten times as many as the government has planted. I come to Colorado frequently to study the trees and the mountain forest conditions, but this time I am largely on a tour of pleasure. I want to consult General Palmer, and am en route to Colorado Springs."

Mr. Brown is familiar with the plans of General Palmer and Dr. W. A. Bell regarding their gift of Manitou Park to Colorado College as the basis of a department of forestry in that institution. For

years past he has been consulted professionally by railroad companies and others interested in protecting and replanting the forests. Mr. Brown recently has issued a very handsome book dealing with the subject, which is dedicated to General Palmer. It treats on all practical subjects of forestry, such as how the forests influence climate, control the winds, prevent floods and sustain national prosperity. It is a complete text-book for railway engineers, manufacturers, lumbermen and farmers on subjects of a practical nature. It discusses how to plant for rapid production of lumber, cross-ties, telegraph poles, and other timbers.

Mr. Brown has decided views on the subject of proper trees for this semi-arid region, and is particularly attracted to the Northern species of catalpa. The Southern varieties are not suited to the climate, and he advises great care in seeking seed and planting. It should only be planted under a six thousand feet elevation. At Grand Junction the results with the catalpa have been splendid.

The subject is so vast and the book treats it so critically that it must be examined to be fully appreciated. The illustrations are very fine, and the most beautiful colored plate was made by a Denver firm.—*Denver Republican.*

IN A RAILWAY WRECK.

A VERY UNUSUAL CIRCUMSTANCE FOR THE EDITOR OF ARBORICULTURE.

It was not in a boastful spirit that, in a recent issue of this journal, I stated that, after five hundred thousand miles' travel I had never been in an accident on the railway. I then called attention to the many thousand trains loaded with passengers, leaving each of the great cities, at terminal points, every day in the year, and the enormous number of passengers safely carried in the course of a year, the proportionate number of accidents of serious character, and the comparatively small number of people killed and injured, was a wonderful and creditable achievement by the American railway companies.

On June 6, however, we were in a wreck on the Southern Railway, ten miles from Asheville, N. C.

Our train was making forty miles an hour along this beautiful French Broad Line when, in rounding a point, or a rather sharp curve, we felt a sudden jar, which could not be mistaken. Instantly there was another shock when the train stopped.

I looked out the window and saw our engine and three baggage cars overturned and lying in the river.

Hastening forward to see if assistance was needed, we found that the engineer and fireman had been thrown far out into the river, and had safely swam ashore, no person having been seriously hurt.

Beyond a few hours' delay there was no inconvenience to any of the passengers.

For a man whose business has for several years compelled him to travel more than a thousand miles every week, and often double that distance, and in more than fifty years of travel to see but one wreck, and no one seriously injured on that occasion, speaks words for the safety of American railway service. However, as Americans are starving for exciting news, and wood pulp is so freely used in daily papers, which must be filled, of course every accident, highly magnified, is told to everybody.

A Chestnut Tree of Indiana.

American Wastefulness.

The French people—that is, the peasants and middle class—are commonly regarded as the thriftiest people in the world. Perhaps they do not possess this trait in greater degree than the Japanese, but there is sufficient evidence that they know how to make the most of their opportunities. France is only about twice the size of Colorado, and considerably smaller than Texas, and its soil has been cultivated for nearly twenty centuries, yet it supports a population of forty millions. If its people were not both frugal and industrious, they never could have become one of the greatest and richest nations in the world, with money to lend to all comers. The French public debt of six billion dollars is all held at home, and in addition the people own foreign securities aggregating the stupendous sum of fifteen billion dollars. It is further estimated that an equal amount is placed in home securities, and practically all of this money comes from the savings accounts of the lower classes. It was they who supplied the one billion dollars to pay off the German indemnity in 1871, and who furnished the millions which de Lesseps squandered in his Panama Canal enterprise, but despite this drain they seem to have plenty of money left.

These conditions are particularly interesting in contrast with the wastefulness and improvidence of our own people. A statistician estimates that the whole French nation could live on what the Americans waste. Certain it is that if forty million Americans were huddled together in an area the size of France, they would be reduced to the verge of bankruptcy, national and individual, in a few years, if they practiced the same wastefulness that prevails here now. It is true that France is blessed with a tremendously fertile soil and a climate more salubrious than that of any part of this country except Florida or Southern California, but this accounts only in part for the wealth and prosperity of the French people.

Instances of American wastefulness abound on every hand, but there is no better example than is afforded by the devastation of the forests. Untold millions of board feet of timber are left every year by lumbermen to rot on the ground or in stumps, and quantities almost as vast are destroyed by forest fires. It was scarcely a decade ago that the forests of the United States were believed to be inexhaustible, but now everybody who knows anything of the subject is aware that they are going so rapidly that their complete extinction is a matter of only a few years. This fact is realized by the railroads, the great lumbering concerns, and other extensive users of timber, and some of them are taking steps to replace the forests already destroyed. But from the planting of the seed to the cutting of the matured tree is a long time to wait—from twenty to thirty years—and in the meantime where is the country to look for its lumber supply? This condition never would have been brought about if ordinary care had been used to protect the forests.

The deposits of minerals and metals are going the same way. In an address to the Columbia University graduates in science the other day, Dr. James Douglas said that the "monstrous wastefulness" of the mining methods in vogue in this country would soon bring about the exhaus-

tion of "those resources which we have fondly regarded as inexhaustible." But in this case the threatened exhaustion is not due so much to waste as to increased demand for the product. Two or three generations ago it was believed that there was enough iron ore within the confines of the United States to supply the world for all time to come, but at that time the enormous increase in the uses of iron could not be foreseen. Nobody had an idea of the extent to which the railroads alone would use steel, or of the part it would play in the construction of modern buildings. The development of electrical science has created uses for copper which have many times multiplied the demand for that metal, and our modern industrialism has changed coal from a luxury to a vital necessity, a thousand tons of which must be consumed now for every one that found its way to market fifty years ago.

The natural resources of this country can not forever continue to be as rich as they are now. Perhaps the next generation, realizing the necessity for the economy which ought to be practiced now, will adopt the frugal habits of the French, the Germans, the Japanese, and other peoples, who are forced by conditions to live on less than we waste, and who not only do it, but get rich at it. But it is a great pity that the lesson must be learned at so dear a price.—*Colorado Springs Gazette.*

SHADE TREES IN A GALE.

On Saturday, June 9, while we were in Washington, a severe windstorm, with much rain, passed over the city. Subsequent reports told how extensive the storm had been throughout the East. After the storm had subsided we traversed several street car lines, and everywhere the streets, parks and private grounds were strewn with large branches broken from the trees, with numerous trees uprooted.

Probably no less than a thousand trees within Washington were broken down or badly mutilated from loss of larger branches.

It is quite important, as well as of interest, to know what trees were injured, and which escaped mutilation.

The soft or silver maple, *acer dasycarpum,* suffered by far the greatest loss, while the Carolina poplar, or cottonwood, was also badly broken.

Norway maple, sugar maple, all the oaks, Oriental plane, or European sycamore, honey locust, most of the coniferous trees, and ginkgo, were among those which were able to withstand the beating and bending which the storm caused for an hour or two.

This experience is of value as warning planters of street and shade trees to avoid such trees as silver maple and Carolina poplar, the trunks and branches of which are extremely brittle, and break with even a moderate windstorm or the accumulation of snow and ice in winter.

Here are two trees which are more popular with the mass of tree planters than all other shade trees of America. Both have one *fatal* qualification, that of rapid growth. Fatal, yes, because it is the temptation which is irresistible to most planters, and in choosing this one quality, losing sight of permanency and many more excellent qualifications, these two inferior trees are planted to the exclusion of all other trees.

Both these trees are short lived, very much diseased, attacked by innumerable insects, while both are seriously damaged by windstorms. Both require

much water, and send their roots into sewers, wells and cisterns, which they frequently destroy. Both were pioneer trees, and as such have been of service in supplying shade quickly in the treeless West, but their time of usefulness has passed, while the oaks, hard maples, and other more valuable trees should replace them.

It is extremely unfortunate that in our Capital City, where the shade trees, system of management, and everything connected with the parks and shade trees of the city is under Government control, and is looked upon as a model to be followed, these trees should be retained in such numbers even when almost dead with disease.

OWLS, HAWKS, EAGLES, MICE, SNAKES.

In a recent visit to the "Pocket" of Indiana, inspecting forest plantations, we were informed that field mice were extraordinarily numerous in Southwest Indiana, and were very destructive to grain and other crops, and had destroyed many fruit and other trees by girdling and eating the tender bark of the roots. We were shown four-year-old trees which these rodents had killed, the entire bark having been gnawed and eaten from the collar down to the depth of a foot beneath the surface, all the roots being stripped of their bark.

During the autumn of 1905, on account of excessive rains, the annual grasses grew very rank, and provided harbors for the field mice, where their work was unobserved until the destruction had been accomplished.

Walking along the railway track where fires had burned the dead grass, we were amazed at the number of runways where the mice had made beaten roads for great distances. Evidently these animals were of large size, as half-grown rats. Young orchards have suffered severely from their ravages.

From the skins of "rattlers" which were shown us, and the stories of snakes which we heard, it is evident that vermin of all kinds are unusually abundant.

Americans have an insane desire to kill something, and no eagle, hawk or owl is safe when the farmer's rifle or shotgun is within reach. It is as great an accomplishment to kill an eagle as for an army to win a battle, and the press heralds the capture or killing of an eagle an honorable feat by our fellow citizen, Jim Jones. Thus encouragement is given for the destruction of all kinds of prey.

Some years ago the State of North Carolina was overrun with rabbits to such extent that the Legislature was called upon to offer bounties for rabbits' scalps.

Many States have offered bounties for hawks and eagles, ignorantly supposing them to be public enemies which should be exterminated.

Thus by equilibrium established by the Creator between animal, insect, bird and plant life, the enormous increase of noxious insects and various kinds of vermin causes terrible losses in crops to the husbandman.

It is important to know that the benefit received from birds of all kinds are very far in excess of any injury, actual or imaginary, which they may cause.

In regions of heavy snowfall, field mice, being unable to secure sufficient grain food, are driven to gnawing the bark of young trees for food. Farmers protect young fruit trees by tramping the snow solidly about the trees, and they are thus prevented from girdling the orchards.

Rabbits girdle above the ground, often

reaching up a foot or eighteen inches high, but mice confine their work to points under cover, being protected by trash, rubbish, grass, weeds and turf. By removing these there will be nothing to afford them a harbor.

Poisoned grain will destroy them if their numbers justify this precaution, or a few ears of grain left to supply them food will prevent attacks upon the trees.

It has long been the practice of an old and successful nurseryman to place shocks of corn throughout his nursery as food for rabbits and mice, and thus he preserves his more valuable apple and other nursery stock.

However, the most effectual remedy is a campaign of education among farmers for the protection of all birds, especially birds of prey, against which there is such unreasonable enmity.

GOVERNMENT CONTROL OF RAILWAYS.

There seems to be a wave of public opinion demanding control of the railways by Congress, which assumes forms of various methods. Some have advocated the purchase of all railways and their operation by governmental employees. Others again simply demand control of passenger rates of fare, while the more popular form which this fallacy assumes is the freight-rate legislation.

The folly of building up a huge governmental army of employees for the purpose of strengthening whatever administration may be in power, and the perpetuation of such administration, is the beginning of a monarchy and the end of a republican government.

The railway transportation question, in a country of so large an area as the United States, is full of perplexing and complex problems, which demand the best judgment of able managers to solve.

Two or more lines of railway connecting any two distant points must necessarily vary greatly in distance traversed, in character of grades and curves, and also in density of population and quantity of materials produced for shipment. It will thus cost one line less favorably located a far greater sum to operate and maintain its line than it costs another company which is more favorably situated. Yet, as there is strong competition, the one line moves its trains at a loss, or very small margin, while its competitor may make money.

Still, the rates must be the same, or one road will be forced into idleness and consequent loss on the capital invested by its stockholders.

One commodity may be purchased in a certain locality, yet be consumed in a region many hundreds of miles distant.

To charge the same rate on articles thus shipped for long distances as are charged, proportionately, for short hauls would be prohibitory, and many industries would thus be destroyed.

It is by no means a safe plan for Congress to assume to know what rates will be just and pay a fair interest upon the very large capital invested in railways, when so few of the members of Congress have any practical knowledge of railway matters, or the expense of maintenance and operating of railway lines, this requiring an intimate knowledge of railway construction and business management.

That there are excessive rates, at times and under some circumstances, can not be denied, but these are being corrected by the railways, and will gradually disappear.

View on Colorado Midland Railway.

Press Notices of Practical Arboriculture.

[*From Chicago Inter-Ocean.*]

A Text-Book on Forestry, by John P. Brown.

John P. Brown, C.E., editor and publisher of Arboriculture, has brought out a useful work with the title, "Practical Arboriculture: How Forests Influence Climate, Control the Winds, Prevent Floods, Sustain National Prosperity." The work is "A text-book for railway engineers, manufacturers, lumbermen, and farmers," and sets forth "how, where, and what to plant for the rapid production of lumber, cross-ties, telegraph poles, and other timbers." It is profusely illustrated with original photographs by the author, and portraits, and is a sturdy volume of four hundred and sixty pages.

In justifying the publication of "another book," the author says, among other things:

"Probably no people in the world are more extravagant and wasteful of things which may for the time be abundant. In no case is this more marked than in the disposal of American forests. Once very abundant, now practically gone in most regions.

"Books have been written and printed at government expense to prove our vast possessions in forests, which have lulled Congress to sleep upon the matter of forest protection, while interested capitalists have obtained possession of all timber land, and are destroying the nation's wealth.

"Climatic changes are occurring, greatly detrimental to the agricultural and other interests of the country, from the removal of timber from the great mountain ranges.

"Manufacturing industries representing many million dollars ceased operations, while others will soon close down from the exhaustion of timber supplies as the forests are being exterminated.

"Several million laborers dependent upon the continuance of the wood industries are obliged to find other occupations as the wheels of machinery become silent from the same cause.

"The inland commerce of the nation is borne upon one billion cross-ties, while two hundred millions are required annually to renew those exhausted from decay. In a quarter of a century five billion ties will be demanded for such renewals.

"It is time for America to stop and think what we are going to do when the forests have become exhausted, and this after the first one-third of the twentieth century has passed.

"The era of extending the American forest area by extensive planting of trees has come, and we are beginning none too soon. If we can aid the American people and those of the old world as well in providing a supply of timber for the coming generation, and show them how we of the present generation may also be benefited, indicating what to plant, where to plant, and how to plant, and incite those who are indifferent and careless as well as those who have a care for the future, and especially if we can bring this matter to the attention of our lawmakers in Congress and various State Legislatures, thus we may be justified in thrusting another book upon the public."

Mr. Brown's work considers a great variety of subjects in connection with the

forests. He discusses many of our forest trees, such as the oak, hickory, black walnut, and cottonwood, paying particular attention to the catalpa. He considers the relation between disastrous river floods and forest destruction; the influence of forests upon a people; the waste of the loggers; management of forest plantations; erosion; the petrified forests and their lesson, and many other phases of the forestry question. Some of the author's photographs are very effective in illustrating his points.

Mr. Brown does not confine his efforts in the cause of arboriculture to the editing of his magazine and the writing of books. He is actively engaged in the work of directing the planting of new forests. He moves about the country, selecting lands, procuring trees, employing labor, and putting the trees into the ground. He is directly responsible for the planting of more than a million trees in twenty different localities in twelve States, to say nothing of another million planted by individual land owners acting upon his advice. In these circumstances Mr. Brown should certainly speak with authority on most phases of arboriculture. (Published by the author, Connersville, Indiana. $2.50.)

University of Minnesota, St. Anthony Park, Minn., June 6, 1906.

Mr. John P. Brown, Connersville, Ind.

DEAR SIR:—I have just received a copy of your work, "Practical Arboriculture," and have looked it over with lots of interest.

You certainly have taken a broad view of the situation, and yet there is sufficient detail for the general reader. The illustrations are particularly good, and serve to lighten up the text. In fact, if they were bound by themselves, they would form a very suggestive book. I am very glad to have been favored with a copy of this volume, on which you must have put a great amount of time and thought. I congratulate you upon getting out so useful a publication, and hope it may have a wide circulation, which it merits.

With kind regards,

Sincerely yours,

SAMUEL B. GREEN.

Your work, *"Practical Arboriculture,"* came in due time, and I thank you warmly for preparing it. It is beautifully gotten up. J. F. CARRIGAN, M.D.

ST. LEO, FLORIDA.

SPECIAL NOTICE.

TO THE MEMBERS OF THE INTERNATIONAL SOCIETY OF ARBORICULTURE.

We wish it to be fully understood that John P. Brown, the editor of ARBORICULTURE, is also its sole owner and publisher. He alone is responsible for all its utterances.

No officer or member of the International Society of Arboriculture is morally or financially responsible for anything which appears in this magazine, unless it appears over his own signature. Nor is any member responsible for any financial dealings of the publisher of this magazine.

We shall continue to advocate such measures and practices as will improve the forests of this and other lands, and shall never hesitate to criticise or praise the acts of our public servants, who so often think they are the people's masters.

When we are obliged to defend ourselves, or the Society of which we are the Secretary, we shall do so with all the vigor which we possess.

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The Louisiana Purchase Exposition has awarded the GRAND PRIZE to the International Society of Arboriculture for TREE PLANTING. And GRAND PRIZE for the Catalpa Exhibit.

THE INTERNATIONAL SOCIETY OF ARBORICULTURE

OFFICERS:

General Wm. J. Palmer, President, Colorado Springs, Colo.
Henry J. Elwes, F.R.S., Vice-Pres., Colesborne, Cheltenham, England.
John P. Brown, Secretary-Treasurer, Connersville, Ind.

Articles of Incorporation.

ARTICLE I.—Name. The name of this corporation shall be The International Society of Arboriculture.

ARTICLE II.—Purpose. The purpose of the Association is to introduce judicious methods in dealing with forests and woodlands; to advance and advocate a public interest in this subject; to promote the afforestation of unproductive lands; to encourage the planting and care of shade trees in parks, public and private grounds, and along streets and highways; to inspire an interest in our remaining native forests, and groves of ancient trees, and to seek their preservation; to supply information to railway officials in regard to timber culture for railway uses, and incite railway and other corporations to plant trees for economic purposes.

ARTICLE III.—Membership. Any person may become a member of this society by the payment in advance of an annual due of two dollars, and on payment of this annual due shall be entitled to receive, regularly, one copy of Arboriculture, the official organ of the society. Any person who may contribute ten dollars toward the support of the society shall become a patron. Honorary members may be chosen by the executive committee.

ARBORICULTURE

VOL. V NO. 6

A Journal of the Forests

SEPTEMBER - OCTOBER, 1906

CONNERSVILLE, INDIANA, OCTOBER, 1906

JOHN P. BROWN, - Editor and Publisher

C. H. & D.

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Genuine

Catalpa Speciosa

I will be able to supply seeds gathered under my own supervision, and these will be sent out with my guarantee seal.

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CONNERSVILLE, IND.

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J. P. BROWN, PHOTO.

THE INSIDIOUS INDIA RUBBER TREE IN FLORIDA

The seed was deposited in an Oak 50 feet from the ground

ARBORICULTURE

A BI-MONTHLY JOURNAL

PUBLISHED IN THE INTEREST OF THE
INTERNATIONAL SOCIETY OF ARBORICULTURE

Subscription $1.00 per annum — JOHN P. BROWN, Editor and Publisher, Connersville, Indiana

Entered as Second Class Matter April 16, 1906

Volume V — Connersville, Indiana, October, 1906 — Number 6

The Production of India Rubber

THE phenomenal increase in the demand for rubber, the variety of uses in the manufacture of electrical apparatus, automobile and carriage tires, and innumerable articles in which this material is now employed, has incited many people to attempt its production.

The Ubero Plantation and other questionable schemes devised by sharpers, has served to warn the public against investing in wildcat schemes, but there are many regions where legitimate investments may be made with excellent prospects of profitable results in the growing of rubber trees and the production of this valuable material.

There are some varieties of the *Ficus* family native to southern Florida, growing in the edge of the Everglades, and it would doubtless be a practical undertaking to engage in the growing of rubber trees in the vicinity of Miami, and after a system of drainage has been put in operation, within the Everglades and adjoining swamps.

In ARBORICULTURE for February, 1905, we gave a brief account of the manner of growth of the Ficus, and produced a photograph which we reproduce here, The Insidious Rubber Tree, of a tree at Miami, Florida.

The seed of the *Ficus*, lodging in the scales of the palm, and the branches of other trees, send their roots out into the air, mere threads apparently, which in time reach the earth and quickly gain a foothold, eventually becoming the principal tree, but having its support from the tree which it has robbed.

Mr. E. M. Coventry, Deputy Conservator of Forests for the Government of India, has recently compiled a work on FICUS ELASTICA, Its Natural Growth and Artificial Propagation, which is timely, and from which we take the following notes, and also reproduce two photographs from Mr. Coventry's pamphlet.

Ficus Elastica is found in the foot-hills of the Himalayas, from Nepal eastward. In Assam are the greatest numbers growing among other forest trees.

It is found in regions having excessive humidity of atmosphere. In India, a hot country, the altitude preferred is from 2,500 to 3,500 feet above sea level, but farther north, as in south Florida, sea level would give similar temperature to the mountains of India.

Severe winter frosts occur here, and upon rare occasions the Ficus and many other trees have been killed.

The Ficus demands light, and if surrounded by trees giving dense shade, it escapes by growing to an enormous height, towering above every other tree.

Seedlings grow in the crevices in the bark of other trees, at a great height from the ground, and the plant remains an epiphyte for years, until its aerial roots touch the ground, when the little epiphyte roots gradually envelop the tree on which it first began life. Seedlings growing on the ground are extremely rare.

The roots of several trees become self grafted or anastomosed, so that a plantation has become one huge tree.

The seed is contained in a fig-shaped fruit, the size of a pea, many seeds the size of a pin-head being contained in one fig.

PROPAGATION

The requirements of young trees are, perfect drainage, and looseness of soil:

OCT 19 1906

plenty of light; heat and moisture combined, a close, steamy atmosphere preferred. Drainage is insured by planting on mounds. It does not grow well in swampy ground.

The tree can be grown from cuttings, but this is not considered a satisfactory method.

GOOTIES

Are used to some extent. Vigorous young branches 12 to 20 feet long are selected and a ring of bark is removed. The bared wood is covered with wet clay mixed with cow-dung, and this kept in place by gunny cloth; roots are soon emitted, when it is severed from the tree, and planted in the mound of earth.

SEEDLINGS

Are grown in nurseries. The figs and the seed contained in bird droppings are collected daily while ripening as they fall to the ground. Those which have passed through the alimentary canal of birds germinate best.

By mixing the seed with pounded charcoal it may be preserved several months.

Light movable shades are put up over the seed beds to intercept the rays of the sun and protect from beating rains.

The seed bed must be kept clear of weeds and watered when necessary.

PLANTING IN THE FOREST

Lines are cleared through the forest, all trees and shrubs being cut level with the ground over a width of 20 feet, at intervals of 100 feet, and trees planted on mounds 50 feet apart.

This has been changed to 66 x 66 feet, or 10 plants per acre.

Climbing vines, so abundant in hot countries, must be suppressed, and all undergrowths as well.

RATE OF GROWTH

Measurements of rubber trees in Chardnar Plantation as follows:

AGE	HEIGHT	GIRTH OF CENTRAL BOLE
22 years	88 feet	6 inches to 12 feet
19 years	81 feet	9 feet
14 years	67 feet	5 feet
13 years	55 feet	4½ feet

TAPPING THE TREES

All undergrowth below the trees is cut level with the ground, and a path cleared. All climbers covering the trees must be cut so that they will die.

Every tree is numbered to maintain a register of operations.

The cuts are made with a V shaped gouge 1¼ inches in greatest breadth. This is held in the left hand and a small wooden mallet in the right.

The tapper climbs to the highest point intended to tap. He then gouges out the bark, giving horizontal cuts on alternate sides, 15 inches apart.

The latex, or sap, exudes from the surfaces of the cut bark and coagulates in the cuts. When dry it is stripped off the tree, when a milky residuum runs from the wound down the tree. Bamboo mats are spread under the trees to catch this overflow.

The third day after tapping, the latex is dry enough to be pulled from the tree. It is then hand picked and cleaned by women, then dried and packed for export.

Trees require one year's rest before being again tapped.

The yield per acre varies from thirty to sixty pounds, the yield from a single tree, the largest, was eight pounds.

Persons interested and expecting to invest in rubber plantations will find Mr. Coventry's pamphlet very instructive, and it is probably limited. Numbers of the book may be obtained from the Government of India.

We again point out to the people of Florida that the Everglades, when drained, will be their most productive and most valuable lands for many purposes, and the growing of india-rubber trees should receive the attention of statesmen in that Peninsular State.

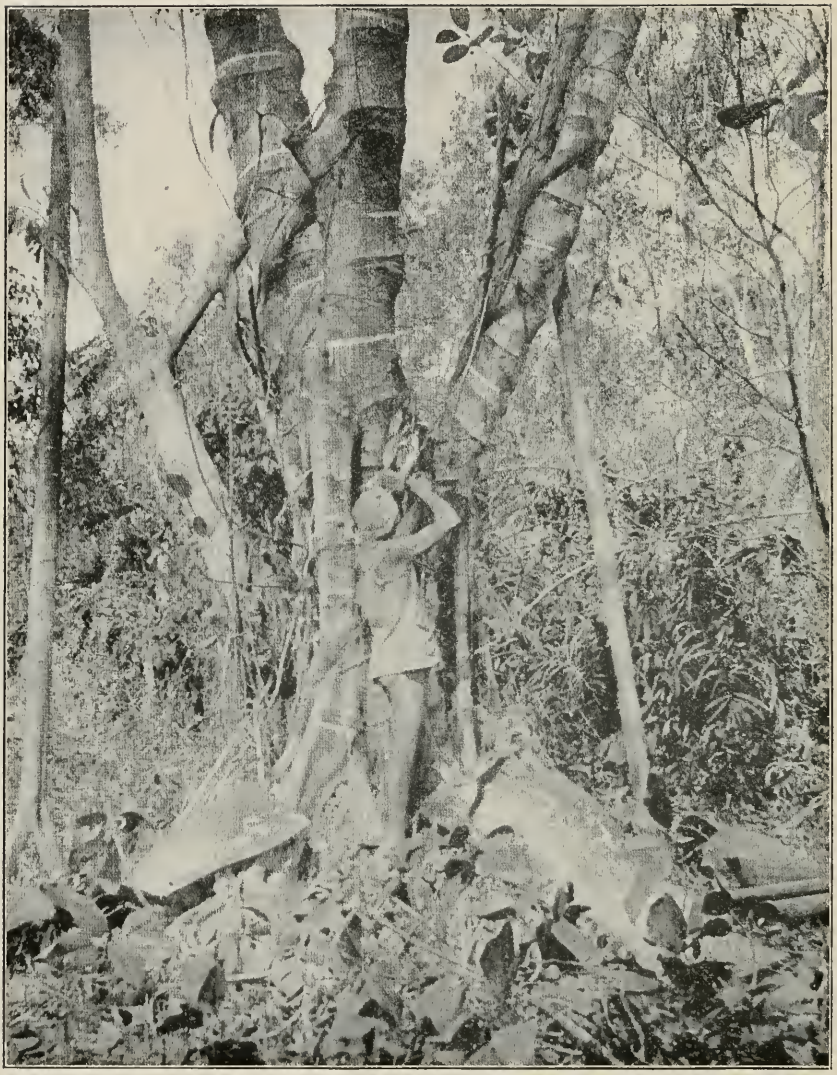
The Ficus elastica grows in Mexico upon the high table-lands, 6,000 to 7,000 feet elevation, but it is not cultivated except at much lower altitudes. In all the Central American States, Brazil, Cuba, and generally in tropical regions, it may be cultivated to advantage: and unless steps are taken soon to augment the supply of commercial rubber, by encouraging its production, manufacturers will find it difficult to maintain their factories and business.

Like many other products of the forest, there is no substitute for india rubber.

E. M. COVENTRY

NATURAL RUBBER TREE—120 FEET HIGH

This Tree Yielded 80 Pounds of Rubber at One Tapping



E. M. COVENTRY

FICUS ELASTICA

Method of Tapping Practiced in India

Prison Labor Utilized for Forest Planting in New Zealand

SPECIAL REPORTS TO ARBORICULTURE

Extracts from the Annual Reports of the Lands and Survey Department concerning the Employment of Prison Labor on the Work of Tree-planting

Extract from Report of Chief Forester for Year 1900-01 (Page 138)

The proposal to employ prison labor at plantation work has been given effect to, with, so far, excellent results. Some twenty-five prisoners (first offenders) commenced work during February on a 1,280 acre reserve at Waiotapu, twenty-two miles from Rotorua. They are accommodated in eight specially constructed huts (containing four bunks each), which can be removed on skids to a new camp as the area they are now engaged on is completed. The men have shown a keen interest in the work, and their behavior has been good. From the report of Mr. Pearson, under whose immediate direction the work is being carried out, it will be seen that the amount of work done has been fully equal to what would be expected from free laborers. The men have expressed their appreciation of the change from the dismal walls of a prison to the practically free and open life they are now enjoying.

Extract from Report of Chief Forester for Year 1902-3 (Page 88)

Tree planting by prison labor continues to be satisfactory, as will be seen from the report in connection with the Waiotapu Plantation. Some provision, however, seems desirable for Forest officers supervising this class of labor to be authorized to issue orders to the men in place of through prison officials in accordance with the Prisons Act. The difficulty is at present gotten over by appointing a Forester as an officer of the Prisons Department, but this arrangement is not altogether satisfactory, by reason of divided authority in issuing instructions. The words "or any officer of the Forest Department" inserted in the clause dealing with this subject in the Prisons Act would meet the case. Arrangements are in progress to employ prison labor in connection with the nursery and plantation at Hanmer Springs, where some twenty-five men will be sent on the 1st of August. It is also proposed to commence operations by prison labor at Dumgree Plantation, Starborough, South Marlborough, at an early date. A start has already been made in planting a portion of Somes Island, in Wellington Harbor, where some fifteen prisoners are now employed. No suitable land has yet been selected in Wellington District for the establishment of a nursery and plantation to be worked entirely by prison labor. Inquiries are, however, being continued with this object in view.

Extract from Report of Nurseryman in Charge Waiotapu Plantation for Year 1902-03 (Page 98)

The employment of prison labor on this forest reserve has now got beyond the experimental stage, and, judging by the work done during the last two years and a half, it can be said with confidence that the system is a pronounced success. In valuing the work done by prison labor, the cost of similar labor done on the plantation at Whakarewarewa was taken as a basis. This is the only method in which a fair estimate, both of actual labor and the success obtained amongst the trees planted, can be arrived at, as the soil and climatic conditions of each place are very similar.

Extract from Report of Chief Forester for Year 1903-04 (Page 102)

The employment of prison labor in preparing land and tree-planting has, on the whole, been fairly satisfactory. As mentioned in the report of Waiotapu Plantation, "some of the men are almost as industrious as free men, whilst others do just a sufficient amount of work to escape the displeasure of the officer in charge."

As indicated in last year's report, prison labor has been provided at Hanmer Springs, where both the nursery and plantation are worked by this class of labor.

A considerable amount of work has been undertaken and completed at Somes Island, Wellington Harbor, where about twenty prisoners were employed for some months in planting native trees and shrubs for shelter purposes on this exposed islet.

Arrangements have now been completed for the employment of thirty-seven prisoners at Dumgree Plantation, Marlborough; thirty-three at Waipa Valley, near Rotorua; and forty additional men at Waiotapu Plantation. This department will then have 175 prisoners distributed over four stations.

Extract from Report of Assistant Forester, Hanmer Springs, for Year 1903-04 (Page 108)

During last spring the employment of prison labor was commenced at this plantation. Twenty-five prisoners, attended by three officers, arrived here between the 5th and 16th of September, but as a certain amount of preliminary work was necessary in connection with the prison camp it was not until the 21st of September that actual forestry work was commenced. The prison camp is situated on the banks of the Dog Creek, about half a mile distant from the township, and consists of eight huts, six of which accommodate twenty-five prisoners, and two are occupied by the warders in attendance. The employment of prison labor has so far proved very satisfactory, the men employed taking considerable interest in their work, and, although hardly to be compared with free labor in point of speed, the works undertaken have been carried out in a thorough and workmanlike manner. From the 21st September until the end of the financial year the average daily number of prisoners employed on forestry work was 19.14. Three men were also employed at cooking and other work in connection with the prison camp. During the year 1903,350 trees were permanently planted.

Extract from Report of Nurseryman in Charge, Waiotapu, for Year 1903-04 (Page 112)

The average daily number pf prisoners employed was thirty, and the value of each man's work averages £30⅕ for the year. It must be noted, however, that some of the men are almost as industrious as free men, while others do just sufficient amount of work to escape the displeasure of the officer in charge.

Remembering that tree-planting operations, owing to the shortness of the planting season, require to be carried out as expeditiously as possible, the question of remunerating the industrious prisoner is worthy of consideration, and if an incentive was offered in the shape of more "marks" and more liberal rations it is our opinion that much better results would be obtained. The class of prisoner who is equally happy in or out of gaol, would certainly place very little value on the extra "marks" which would go to reduce his sentence, but this man would no doubt strive to obtain more and better food if he thought such were procurable by industry. The majority of prisoners, however, are anxious to have their sentences shortened; but under the existing circumstances, where every man is treated alike, provided they do not misconduct themselves, it is hardly to be expected that a man will strive to do more work than his indifferent neighbor.

Extract from Report of Chief Forester for Year 1901-02 (Page 62)

The experiment of utilizing prison labor for tree-planting in the Waiotapu Valley has so far been a pronounced success. A good class of men have been employed — men who apparently take

considerable interest in the work. During next year other plantations and possibly a new nursery will be established by prison labor, the matter being at present under consideration.

Catalpa and the Timber Shortage

(W. D. GRAVES IN WOODCRAFT)

That in catalpa there is balm for those who dread the exhaustion of the timber supply seems past contradiction. As a matter of course, there are extremists among the exponents of this wood who with the best of intent do as much to hinder the dissemination of a true estimate of its value as do the many biped barnacles who, seeking selfish gain through the efforts of others, sell the seeds and seedlings of an inferior variety while representing them to be of the best.

Much misunderstanding as to the value of this unquestionably valuable tree has been caused by the fact that the variety which is by far the most common, the Catalpa bignonioides, is of comparatively little value, and its seed, closely resembling that of the Catalpa speciosa, being easy to obtain, has been largely sold for that of the latter tree. The Catalpa speciosa is of straighter and taller growth, making a millable tree in comparatively few years.

The International Society of Arboriculture publishes a photograph showing a section of wood from one of these trees which attained a diameter of about 22 inches in fourteen years. The annual ring, in one instance, attained a thickness of almost an inch. This growth is, it is true, very unusual; but there seems to be ample evidence that trees of this variety may, with no excessive amount of care, be brought to a diameter of a foot or more in a dozen or fifteen years. They are naturally long-bodied and straight; in every way well adapted to use for telegraph poles, ties, posts and lumber.

A substantial discount from extreme claims for Catalpa speciosa still leaves it immeasurably in advance for profitable propagation, of any of the better known timber trees; its growth being, at the least estimate, ten times as rapid as that of pine. A conservative estimate, based on data which one can hardly question, indicates that land planted to this tree will have paid at the end of fifteen years a return of $60 per acre, per year, and will continue to pay fully that amount, annually, without replanting. This return is insured even though the prices of timber do not advance. A great many farms, probably a majority of them, are being tilled for a smaller gross return.

The tree seems to flourish in about the same belt that corn does; and while, like corn, it has been grown in Northern Maine and Minnesota, it does best in the latitude between that of Central Illinois and Oklahoma.

The texture of the wood much resembles that of butternut, though it is claimed that it is much stronger. While men who have worked white pine at its best cannot readily adjust their vision to any other wood for all-around purposes, coming generations will doubtless find catalpa applicable to most of the purposes for which lumber is desirable.

The Catalpa Speciosa in England

Letter from Marquis of Ailesbury

SAVERNAKE FOREST,
MARLBOROUGH, ENG.,
Sept. 17, 1906.

MR. JOHN P. BROWN,

MY DEAR SIR:—You will be glad to hear that the catalpa speciosa plants I procured from you at the St. Louis Fair have done remarkably well. Those I planted in rich soil especially so. I don't think I lost one single catalpa out of the one thousand you sent me. They were also admirably packed. Please also accept my hearty thanks for the beautiful book you sent me, "Practical Arboriculture;" the photographs are lovely. Our government is very like yours as regards forestry. They take but little interest in it and tax it the same as agricultural land, although in forestry we only get one crop in twenty-one years. We have had several forestry commissions but they have never come to anything. The French and Germans are far ahead of us as regards the management of forests. It is too sad to see a great industry like this neglected. With kind regards and every good wish.

Believe me,
Very truly yours,
AILESBURY.

Russian Forests to be Sold

Ruler of Russia Takes Steps to Save Land from the Peasants

It is correctly reported in St. Petersburg that the administration of the imperial appanages is negotiating with a Berlin syndicate for the sale of the imperial forests under its jurisdiction for $25,000,000.

This is to forestall possible confiscation of the estates by the people.

The imperial appanages consist of estates set aside by the Emperor Paul I, the revenues from which are drawn by more than forty members of the imperial family not in the direct line of succession. These estates cover 33,000 square miles, being 2,000,000 acres larger than Scotland, and the total revenue derived from them was recently estimated at $10,000,000 yearly.

Before the emancipation of the serfs 800,000 peasants were attached to these estates, and were included in the valuation of the property.

Hardy Catalpa is Difficult to Get

Correspondent Describes the Deceptions Practiced by Seed Men and Proprietors of the Nurseries

DENVER, COLO., Sept. 20.

EDITOR REPUBLICAN:—A letter, received a few days since, from a prominent citizen of Kiowa county, asks where he can get Catalpa Speciosa—true to name—as he is informed that it is very difficult to get the genuine. He wants 2,000 for next season's setting. A gentlemen owning lands in Elbert county wants a like number of the same tree. Different parties are wantiug hardy catalpa in considerable quantities at Lamar, Pueblo, Elizabeth, Wray and other points, and most of them are finding it hard to procure the right kind.

If pure speciosa could be obtained, and a little pains taken to let the people know, it is altogether probable that forty to fifty thousand could be set next spring, There were 7,200 of the hardy catalpa set by the agricultural station, over the state, last season. Numerous private parties also set various quantities, running the planting up to ten or twelve thousand. By this means popular attention has been so specifically called to this particular tree that it is now prominent in the public mind. But is it a fact that the hardy catalpa is difficult to obtain? My correspondent says he has been so informed and appeals to me to know where he can get it true to name.

"True to name?" What does that mean? The fruit grower who orders a thousand Jonathan apple trees and finds a few years later that he has a thousand worthless seedlings knows what it means. In every nurseryman's catalogue that lists forestry trees we find "catalpa speciosa;" and yet I do not know so many as five I would dare to trust in this matter of hardy catalpa.

A few nurserymen gather their own catalpa seeds or have it done by experts, while most of them buy their seeds of seed houses, and here is where the danger lies.

Now that this matter is up it seems proper to divulge a few secrets—things not generally known, and things some people would not wish to have made known. Bnt as the state agricultural experiment station at Fort Collins has selected the hardy catalpa as one of the utility trees to be tested, and furnished 7,200 of them to various farmers for that purpose, it is time the Colorado public should be informed of some facts.

Aboriculture magazine for some time has been accusing the tree seed men of selling large quantities of inferior varieties of Catalpa seed for pure speciosa; and the nurserymen of imposing upon the public in the same fraudulent manner. The charges were so open and serious, and often so seemingly past belief, that I set out to test the statements to see for myself to what extent they were true.

EIGHTY PER CENT. OF THE SEED WAS SPURIOUS

I ordered seeds of more than a score of firms, including several of the largest and best known tree seed houses and nurserymen in the United States. In every instance my order was for Catalpa "speciosa."

I procured seeds of twenty-two firms. What did I find? Were the charges true? "True?"—the half had not been told by the magazine. It gave no names. I had both names and seed.

More than eighty per cent. were not true to name. Seeds from old houses, reputable beyond degree, well known from ocean to ocean, were as bad as the worst. Not willing to depend entirely on my own diagnosis, I sent samples from the twenty-two lots obtained to an expert, who reported that only four of the number were genuine and pure. These four came from nurserymen who gather their own Catalpa seeds, or have it done by experts. I have all of them still. They can be seen by any one at any time and identified with the firms from which they came. If photographed they would be highly educational. By them one could learn to distinguish between the true and the false; of whom to buy, and of whom not to buy.

With my subject scarce begun space bids me close by saying that the catalpa situation is lamentable—due to ignorance, cupidity and fraud. Some do not know the difference; others do not seem to want to know.

But let no Colorado man order catalpa to plant without advising with Prof. W. Paddock at the Agricultural college, Fort Collins. No one can afford to plant inferior trees. Any assistance I can render the planter, the nurseryman or seed merchant to help extricate the catalpa speciosa from the mire into which it has been plunged will be most eagerly afforded.

W. G. M. STONE.

Pure Seed of Catalpa Speciosa

Collected in original forests under my own supervision, and a very limited number of trees, all genuine.

JOHN P. BROWN,
Connersville, Ind.

Planting Needed to Avert Danger

Destruction of Vegetation Due to Absence of Trees Cut Down by Woodmen—Arboriculturists Urge Propagation of Catalpa, a Rapid Grower, to Remedy Grave Situation.

(COMMERCIAL TRIBUNE, CINCINNATI, O.)

Fortunately the interest of many who can be of great service has in late years turned toward the art of arboriculture; in simpler language, the art of growing trees.

The necessities of the situation have prompted this new interest, as the rapidly disappearing forests have told of many perils besides that of the scarcity of timber for various purposes.

This situation justifies the issue of a handsome work, entitled "*Practical Arboriculture*," by John P. Brown, C. E., of Connersville, Ind.

"*Practical Arboriculture*" comes before the public just when such a work is most needed. It not only tells of the vast harm which has resulted from the destruction of forests, but tells in a clear way the steps which should be taken toward the recreation of what has been destroyed.

He shows that some of the great railroad interests have taken up the matter, as they are vitally interested, and that trees by countless thousands have been already planted, and are making excellent progress.

SOIL IS SHIFTED

An important feature of the work of Mr. Brown is found in the treatise upon the bearing of forests, or, rather, the absence of forests, on the great floods which cover the country at times. He says:

"With this radical change in clearing up so vast an area of timber there have come several evil results.

"Lands which were rich and mellow with accumulated vegetable mold have been washed by beating rains, the soil transported to the delta of the Mississippi, leaving rocks, stiff and hard clay for the husbandman to waste his labor upon, with scant remuneration.

"Springs and rivulets have long since ceased to flow, except for a few hours during a heavy rainfall. Rivers rise with great rapidity and as quickly return to their low-water stage.

"The Ohio becomes so low that wagons cross with farm produce along the usual channel for steamboats, and again it rises to the height of seventy-one feet, spreading for miles over cultivated lands and submerging cities along its banks.

"The soil no longer absorbs sufficient moisture during the season of rains to support vegetation in the time of drought."

SITUATION CRITICAL

In reality, the situation is somewhat critical. Some nurserymen have planted trees, and farmers in a few cases have taken up the work.

The national government has done something, but nothing commensurate with the magnitude of the problem.

In a number of States something has been done in encouraging the work undertaken by the nation, by the States and by individuals, but not near enough. This book by Mr. Brown deserves a wide circulation simply because it will interest where none exists at present. If that is done, it will help much toward proper and liberal legislation.

Of all the trees mentioned by Mr. Brown, it is plainly to be seen that he strongly favors the *Catalpa speciosa*, which must not be confounded with the ordinary catalpa found in many towns and along many country roads.

FOUND EVERYWHERE

They vary greatly. The rapid growth of this tree and its value after growth commend it as an ideal tree to be used in starting new forests.

A century ago it was known only on a circumscribed area near the mouth of the Wabash, in Indiana. It has proved its true worth by spreading, until now it is to be found in almost every State of the Union, in Mexico, and even in Canada.

That it grows with almost marvelous rapidity is shown by the fact that catalpas in the South have increased two inches in diameter in a single season.

Objections have been raised to the catalpa by reason of its rapid growth, but the author shows the fallacy of the argument by several conclusive reasons.

The rapid increase in size is explained by the greater number of cells added in a given period; each cell is the same as another, and they have no especial bearing upon the hardness of the wood.

EXAMPLE TO FARMERS

Catalpa has been used with great success by railroads as ties, and those who have experimented now have forests growing from which their tie supply will come twenty-five or thirty years hence, or even sooner.

Other trees claim much space, and their virtues are dwelt upon at length. In fact, Mr. Brown is not a specialist.

He loves his mission, and is endeavoring to carry it out without fear or prejudice. The book should be of great value to farmers and others owning large tracts of land.

It will show these men that there will be a big return at a small expense of labor, and that done, a great step has been made in the right direction

Press Notices of Practical Aboriculture

Chicago Inter-Ocean

A TEXT-BOOK ON FORESTRY, BY JOHN P. BROWN

John P. Brown, C. E., editor and publisher of ARBORICULTURE, has brought out a useful work with the title, "Practical Arboriculture: How Forests Influence Climate, Control the Winds, Prevent Floods, Sustain National Prosperity." The work is "A text-book for railway engineers, manufacturers, lumbermen and farmers," and sets forth "how, where and what to plant for the rapid production of lumber, cross-ties, telegraph poles and other timbers." It is profusely illustrated with original photographs by the author, and portraits, and is a sturdy volume of four hundred and sixty pages.

In justifying the publication of "another book," the author says, among other things:

"Probably no people in the world are more extravagant and wasteful of things which may for the time be abundant. In no case is this more marked than in the disposal of American forests. Once very abundant, now practically gone in most regions.

"Books have been written and printed at government expense to prove our vast possessions in forests, which have lulled Congress to sleep upon the matter of forest protection, while interested capitalists have obtained possession of all timber land, and are destroying the nation's wealth.

"Climatic changes are occurring, greatly detrimental to the agricultural and other interests of the country, from the removal of timber from the great mountain ranges.

"Manufacturing industries representing many million dollars ceased operations, while others will soon close down from the exhaustion of timber supplies, as the forests are being exterminated.

"Several million laborers dependent upon the continuance of the wood industries are obliged to find other occupations as the wheels of machinery become silent from the same cause.

"The inland commerce of the nation is borne upon one billion cross-ties, while two hundred millions are required annually to renew those exhausted from decay. In a quarter of a century, five billion ties will be demanded for such renewals

"It is time for America to stop and think what we are going to do when the forests have become exhausted, and this after the first one-third of the twentieth century has passed.

"The era of extending the American forest area by extensive planting of trees has come, and we are beginning none too soon. If we can aid the American people and those of the old world as well in providing a supply of timber for the coming generation, and show them how we of the present generation may also be benefited, indicating what to plant, where to plant, and how to plant, and incite those who are indifferent and careless as well as those who have a care for the future, and especially if we can bring this matter to the attention of our lawmakers in Congress and various State Legislatures, thus we may be justified in thrusting another book upon the public."

Mr. Brown's work considers a great variety of subjects in connection with the forests. He discusses many of our forest trees, such as the oak, hickory, black walnut and cottonwood, paying particular attention to the catalpa. He considers the relation between disastrous river floods and forest destruction; the influence of forests upon a people; the waste of the loggers; management of forest plantations; erosion; the petrified forests and their lesson, and many other phases of the forestry question. Some of the author's photographs are very effective in illustrating his points.

Mr. Brown does not confine his efforts in the cause of arboriculture to the editing of his magazine and the writing of books. He is actively engaged in the work of directing the planting of new forests. He moves about the country, selecting lands, procuring trees, employing labor, and putting the trees into the ground. He is directly responsible for the planting of more than a million trees in twenty different localities in twelve States, to say nothing of another million planted by individual land owners acting upon his advice. In these circumstances Mr. Brown should certainly speak with authority on most phases of arboriculture. (Published by the author, Connersville, Indiana. $2.50.)

University of Minnesota

ST. ANTHONY PARK, MINN., June 6, 1906.

MR. JOHN P. BROWN,

Connersville, Ind.

DEAR SIR:—I have just received a copy of your work, "Practical Arboriculture," and have looked it over with lots of interest.

You certainly have taken a broad view of the situation, and yet there is sufficient detail for the general reader. The illustrations are particularly good, and serve to lighten up the text. In fact, if they were bound by themselves, they would form a very suggestive book. I am very glad to have been favored with a copy of this volume, on which you must have put a great amount of time and thought. I congratulate you on getting out so useful a publication, and hope it may have a wide circulation, which it merits.

With kind regards,

Sincerely yours,

SAMUEL B. GREEN.

Your work, "Practical Arboriculture," came in due time, and I thank you warmly for preparing it. It is beautifully gotten up.

J. F. CORRIGAN, M. D.

ST. LEO, FLORIDA.

Indianapolis Morning Star

PRACTICAL SCIENCE OF TREE CULTURE

"Plant trees" was the motto of the late J. Sterling Morton, at the time of his death president of the International Society of Agriculture, and to promote the application of this injunction has been the life work of John P. Brown, secretary of the organization. Mr. Brown is an enthusiast on the subject of forestry, his interest being the broad one that looks to the future as well as to the immediate benefit of the country. He has devoted many years to the study of trees, climatic conditions, soils, the adaptability of varieties to different regions, their manner of growth, and other characteristics, and has embodied the results in a substantial volume just issued, entitled "Practical Arboriculture." Many of the chapters in this volume have first appeared in the magazine, ARBORICULTURE, of which he is editor, published at Connersville, Ind. Others were originally given to the public in the form of public addresses, while certain matter has been prepared especially for this volume.

He deals with trees in relation to their large uses, the need of them for the protection of the soil, for their uses to manufacturers, railroads lumber men and farmers, not with the individual in mind who may wish to plant half a dozen trees for shade or decoration. At the same time such individual may get the information he wants as to the merits of the different varieties and their special uses. One who takes up the book even with no special purpose will find in it much interesting lore, that relating, for instance to the process of soil making, the importance of apparently useless shrubs and plants in aiding forest growth and the uses of birds in protecting trees from insects.

Mr. Brown's advice concerning tree planting has been sought in many quarters. He has traveled all over the United States, Mexico and Canada while engaged in this work, and is familiar with the general needs and conditions, so that what he says is authoritative. He draws this distinction, not commonly understood, between forestry and arboriculture: the first pertains to the management of forests; the latter comprises forestry and also includes everything, every subject relating to the growth of trees and their influence. His purpose in issuing the volume is not only to give instructions regarding the planting of forests and the choice of trees, but to stimulate a sentiment in favor of protecting and increasing the forest area. The excuse he makes for "thrusting another book upon the public" is the hope of aiding the American people, as well as those of the old world, to provide a supply of timber for the coming generation and of showing them how we of the present generation may also be benefited. The book needs no excuse for its being, however. There is need for such a volume and it may be hoped that it will reach the right hands and its influence go far.

Herald and Presbyter

Cincinnati, Ohio, July 25, 1906

Practical Arboriculture. By John P. Brown, C. E. Cloth 8vo. Pp. 358. Published by the author, Connersville, Ind.

This is a very valuable, interesting and attractive volume. Mr. Brown, the author, is editor and publisher of ARBORICULTURE, a periodical devoted to the proper care and culture of trees. This volume is a text-book for railway engineers, manufacturers, lumbermen and farmers. It tells how forests influence climate, control the winds, prevent floods and sustain national prosperity. It gives information as to how, where and what to plant for the rapid production of lumber, cross-ties, telegraph poles and other timbers, and is fully and finely illustrated from original photographs by the author. The subject of forestry is one of exceedingly great value to our country. It can not have too prompt and intelligent consideration. If we are not careful, we shall find our resources exhausted, and ourselves at the mercy of elements which will be for our great injury if we are not protected by forests. We are glad that the subject of reforestation has so intelligent and persistent an advocate as the author of this valuable book.

Make a Lawn Now

A fall sown lawn has a much better chance of succeeding than one sown in the spring. Lime is a very good fertilizer for grass. The reason that there is a blue grass region in Kentucky is because it is also a limestone region. The best method of procuring lime for use on the lawn is to purchase from a local dealer in the spring a sufficient quantity of new lime. This should be placed in the cellar of the dwelling in barrels which should be only half filled or partly fili some boxes. As the lime absorbs moisture from the air it will help to keep the cellar dry during the summer, and by fall the lime will become thoroughly slacked. Apply this air-slacked lime to the lawn, any time after the ground has frozen, at the rate of one bushel to each thousand square feet of lawn, or at the rate of forty bushels to the acre. Lime sweetens soil, and if it is applied each year will rid the lawn of many plants that thrive in sour soil, such as moss and sorrel. It is not advisable to top-dress a lawn with any kind of stable manure, they all contain weed seeds. Bone meal is just as cheap and more lasting in effect.—*Garden Magazine.*

The Nashville American

September 9, 1906

PRACTICAL ARBORICULTURE

BY JOHN P. BROWN, C. E., CONNERSVILLE, IND.

This is an extremely important book on an extremely important subject, issued at a very opportune time. The purpose of the book is to show in how many serious ways the welfare of the entire country has been adversely affected by the wholesale cutting of timber in all parts of the country, and how little effort, of an organized kind, has been or is being made to restore it. No one can read the book without feeling that the author has the well-being of his country at heart, and that, in a very patriotic way, he wishes to arouse his countrymen to the necessity of taking necessary steps to stop the waste and to begin to recover as far as possible, the wealth which these destroyed forests, in so many ways, represented. His message reads somewhat like the warning of one of the prophets of the olden times; in fact, the author says that the inhabitants in and around Tyre and Sidon may be said, by the cutting of the timber of their country to have brought upon themselves the fulfillment of the prophecy hurled against them, because the utter destruction of the timber of that region resulted in rendering the land, theretofore very productive, incapable of supporting them, and made its practical abandonment a necessary thing.

When we come to consider nature's purpose in putting trees on the earth and then realize that we have ruthlessly ignored these, we have little ground for sympathy. Only within the last generation has it become fully apparent what changes the devastation of forests brings about. Now, the inconvenience, not to say suffering, which is being undergone, is arousing us somewhat to the evils we are inflicting upon ourselves, and bringing sharply to our attention the urgent necessity of at once putting on foot, not only well considered legislative plans for pursuing a better course, but awakening individuals also to the good sense of doing what they individually can to stem, if not to turn the evil tide. Think for a moment what some of the purposes of trees are; they have an influence in controlling moisture from above and a very decided power to retain this moisture for the productivity of the soil. The leaves of trees, by absorption, hold the water and prevent it, to a certain extent, from rushing, all at once, into the streams coursing through our valleys. These leaves also in decay enrich the soil and render it what nature intended it to be—the productive means for man's support.

"The tree sucks kindlier nourishment
From a soil enriched by its own fallen leaves."

When these vast forests are cut away, the water rushes headlong over the bare ground to the streams and causes these to overflow their banks and inflict untold damage on the country at large. Not only this, but there being no leaves to retain the moisture, severe drouths follow and these streams at one time flow out of their banks and at another cease to supply water enough to render them navigable or otherwise as serviceable as nature intended them to be. The soil not being protected by the leaves is washed away, and the bare rocks, or hard clay, neither of much value, alone is left.

Illustrations of these evils are easily found throughout older parts of the country. It is not an unusual thing to read that the mills of the New England States are at one time submerged and at another without sufficient water to enable them to run. Such was not the case before the vast forests of New England were cut away. Aside from the evils inflicted on the land, the serious question is beginning to present itself as to what will be done in decades to come when the timber of the country is practically exhausted. Already things formerly made of wood are now being made of iron because of inability to get wood, but the reckless use of iron and steel equals that of wood, and there is no telling how long this substitute can be depended upon, because thoughtful persons are also beginning to figure on the reserve supply of ore. When we reflect how very short a span a generation is in the course of a nation's life, and then have to admit that a shortage is beginning to make itself felt in articles as necessary as are wood and iron to the well-being of mankind, is it not about time legislators of the Nation and States, who profess to be looking after the material welfare of the people, should, with vigorous, strong hands, take hold and formulate some plan whereby ruthless destruction, at the hands of man, at least, may be stopped?

It is apparent that the prosperity of this country is dependent upon railroads to transport the people and crops of one section to those of the other and give to everyone the comforts of life. No satisfactory substitute for wood for railroad ties has yet been found. The number of these alone required each year involves an enormous consumption of timber. Some of these railroads are already beginning to appreciate how serious a problem a shortage of timber will present to them and are endeavoring to find out what trees can be planted which will furnish as soon as it will be needed timber suitable for making ties. This book describes the length of time required by trees of all kinds to replace themselves, and gives excellent advice along these lines.

It has been demonstrated that the catalpa speciosa, a tree well suited for the purpose, will grow more quickly to the necessary size than any other tree. This tree-growing is practically a new business. If owners of lands in the South will begin they will soon find that it will become a paying business.

In a review of this kind, it is almost impossible to cover all that should be said, but

IF EVERY CONGRESSMAN WILL READ THIS BOOK AND QUIETLY CONSIDER THE FACTS SET FORTH AND RESOLVE TO GIVE THE SUBJECT SERIOUS THOUGHT IN FORMULATING SOME GENERAL PLAN, FREE OF ANY POLITICS WHATEVER, WHEREBY THIS GREAT SOURCE OF WEALTH CAN BE HUSBANDED, MUCH GOOD WILL HAVE BEEN ACCOMPLISHED. THE BOOK IS BEAUTIFULLY ILLUSTRATED AND ASIDE FROM THE INSTRUCTION IT GIVES, WILL BE FOUND TO BE MOST ENTERTAINING.

Worcester (Mass.) Evening Gazette

PRACTICAL ARBORICULTURE

By John P. Brown, C. E., editor of ARBORICULTURE. Cloth, 460 pages; illustrated. Published at Connersville, Ind.

"Practical Arboriculture" is a text-book for the use of railway enginneers, manufacturers, lumbermen and farmers. Its main features are discussions on how forests influence climate, control the winds, prevent floods and sustain national prosperity in a general way. As stated on the title page, the editor tells how, where and what to plant for the rapid production of lumber, cross-ties, telegraph poles and other timbers. Superb illustrations, mainly from photgraphs by the author, make the book interesting to any reader.

As the title of the book indicates, the discussions are eminently practical and straight to the point. There is no uncertainty in the facts presented by Mr. Brown, who has evidently tried out his own theories before recommending them to others. The book is of the utmost value to any man desiring authoritative information on the subject of tree growing.

University of Wisconsin

MADISON, Wis., July 18, 1906.

MR. JOHN P. BROWN, Editor Arboriculture,

Dear Sir:—I have read with much interest several copies of your publication and am delighted with the same. Your idea of forestry I believe to be a correct one, and will sooner or later come into prominence it demands in this field of work. What is needed nowadays more than anything else is Arboriculture or Silviculture. This side of forestry is too often overshadowed by technical discussions on forest management and the like.

Wishing you abundant success in your work, I remain,

Yours respectfully,

E. P. SANDSTEN, Horticulturist.

Sentinel Free Press

Sank Rapids, Minn.

John P. Brown, secretary of the International Society of Arboriculture, states that in a generation the timber supply of the country will be exhausted. Many railroads have planted Catalpas which they expect to use, when the trees have matured, as material for telegraph poles and crossties. The wholesale destruction of the forests by many factories that use wood, such as paper mills, furniture factories and railroads, led to the organization about eight years ago of this society, whose object is to induce the planting of vast forests and to interest the citizens of the United States in arboriculture.

The Methodist Recorder

Pittsburgh, Pa., Aug. 11, 1906

PRACTICAL ARBORICULTURE

We have read this book with great interest and profit. It deals with a subject of vital interest to the American people. It tells how forests influence climate, control the winds, prevent floods and sustain national prosperity. It gives information as to how, where and what to plant for the rapid production of lumber, cross-ties, telegraph poles and other timbers, and is fully illustrated from original photographs by the author. The subject of forestry is one of exceedingly great value to our country. The study of the subject ought to be introduced into our public schools and taught in our colleges. It cannot have too prompt and intelligent consideration. Unless something is done speedily for the preservation of our forests, we shall find our resources exhausted, and ourselves at the mercy of elements which will be for our great injury. We are glad that the subject is being taken up, especially the subject of reforestation, and has found such a splendid advocate as the author of this book. This is a text-book for railway engineers, manufacturers, lumbermen and farmers. We hope every person who reads this notice will secure a copy of this book and study it. The volume is neatly and attractively bound.

Boston Evening Transcript

BOSTON, July 14, 1906.

MR. JOHN P. BROWN,
Connersville, Ind.

Dear Sir:—Your volume received. It will be a valuable thing to have all your material thus collected. I shall enjoy particularly the pictures, including the excellent one of yourself. With many thanks,

Very truly yours,

E. H. CLEMENT.

"Practical Arboriculture" came yesterday. It is certainly a magnificent volume, an ornament for any library, and a library of practical service to any one interested in trees and their growth.

There are several books in our public library upon trees, but nothing to compare with this in completeness and practical suggestion. The book will certainly be a fitting monument to your knowledge of the subject and your self-denying, patriotic activity.

JOHN N. MILLS, Evanston, Ills.

VICTORIA, TEXAS, June 8, 1906.

MR. JOHN P. BROWN,
Connersville, Ind.

Dear Sir:—I have just received your book, which I am delighted to have.

J. H. FLEMING

Republican

Springfield, Mass., Sept. 2, 1906

A VALUABLE BOOK FROM CONNERSVILLE, IND.

Zeal for a cause, that has gathered with years of thought and study and unflagging devotion, burns in every page of "Practical Arboriculture," a book of exhortation, persuasion, advice and practical facts, by John P. Brown, published by himself at Connersville, Ind. It is a volume of value, and that it is needed any thinking person must admit, for the wasteful destruction of our timber is to be seen in every part of the country, accompanied by a lethargy of conscience and a lack of business sense that are equally apparent to the ordinary observer. Mr. Brown, with excellent moderation, avoids calling the average American a fool, yet it is the only word which fits his case in this regard, and as we are all concerned in the matter, and are all fools together in our neglect of the subject, the wonder is how the writer is able to keep his tone of patience. The book is made up of more or less loosely strung chapters, some of which have appeared as single contributions to the press on specific subjects relating to the topic, others have been delivered in many states, and are not without some repetition in consequence. They deal with the effect of forests upon climate, soil and water supplies, and the results in these and kindred directions of forest destruction, the question of cloudbursts, floods and drouths under the opposing conditions in this country, the problems relating to special sections such as the lowlands of Florida, the western deserts, the headwaters of the great river systems, are treated with emphasis as not matters for those regions alone to consider, but for the nation to deal with as of general and vital importance. Mr. Brown shows no prophetic insight, but simple common sense when he says:—

Manufacturing interests representing many million dollars have ceased operations, while others will soon close down from the exhaustion of timber supplies. Several million laborers dependent upon the continuance of the wood industry are obliged to find other occupations. The inland commerce of the nation is borne upon 1,000,000,000 railway cross-ties. While 200,000,000 are required annually to renew those exhausted from decay. In a quarter of a century 500,000,000 ties will be demanded for such renewals. It is time for America to stop and think what we are going to do when the forests have become exhausted and this after the first one-third of the century has passed.

Tree-planting on a large and intelligent plan must be undertaken as a national enterprise: what is now being tried in a tentative and small way, must be practiced extensively, and immediately in order to provide a continuance of supply, for we now face a famine of oak and pine, we have already suffered the loss of black walnut, and nothing but prompt measures can cope with the situation. Of course Mr. Brown urges national reservatiou of the mountain ranges where planting is impossible, and barrenness results from our axes and our annual great fires, but even if this destruction should be controlled, the supply of wood in the near future will be inadequate to our necessities without a widespread interest in arboriculture. For quick growth Mr. Brown favors extensive planting of catalpa; nearly half of his book is taken up with interesting reports of the plantations of this tree, now established in various parts of the country, of its progress and mode of growth, its culture, and its uses. These he finds to be sufficiently varied and valuable to merit unqualified approval, and the international society of arboriculture made a special exhibit of articles made from the catalpa speciosa, in the forestry building at the Louisiana purchase exposition in 1904. This exhibit proved that "firm, straight telegraph poles may be secured in a dozen years," that it is strong enough for cross-ties and mine timbers, desirable enough for fence posts, excellent for furniture, susceptible of high polish, and altogether is a good substitute for many sorts of timber that take much longer to produce. It also included some specimens of railway ties that had been in use on the main trunk lines for 25 years, and were still sound. This exhibit obtained the grand prize from the exposition jury.

For catalpa speciosa Mr. Brown is an enthusiastic advocate, but it must not be confounded with the catalpa bignonioides, a variety greatly inferior in several essentials, chief of which is the fact that it is dwarfed and crooked in growth, though beautiful in bloom and fruit. There has arisen a widespread confusion in the minds even of forestry experts and at government stations between the speciosa and other varieties, and also in regard to a Japanese variety, the Kempferi, while many worthless hybrids have been cultivated under the mistaken belief that they were speciosa. Mr. Brown devotes a great deal of care to a minute discussion of the differences between these varieties, and gives plates to illustrate his points, among them a color-plate which shows the blossoms of the different sorts. He says seeds of this bignonioides variety have been widely distributed as the speciosa; and it is his assertion that "no specimen" of the valuable catalpa is to be found in the agricultural department grounds or the botanical gardens of the capital; "this solves the question of such violent opposition to the catalpa by the United States forestry bureau, whose observations have been confined to the two varieties which are so abundant in Washington." The international society of arboriculture is making every effort to distribute seeds of the speciosa, and endeavor to supply European countries as well as our own. Mr. Brown finds the carelessness of the government department to this matter due to the fact that inferior varieties bear many more seeds than the valuable kind, and are much easier to gather, being produced by low-growing trees. The cost of collecting seed of the pure speciosa is from $3.50 to $5 a pound; the inferior kind may be gathered for about 10 cents a pound.

The society of which Mr. Brown is so earnest a member, has induced several railway companies to make plantations of this useful tree for their own consumption. Being a civil engineer, the needs of the transportation interests have been especially evident to him, and he is satisfied that the rapid, straight growth of the catalpa, with its peculiar natural immunity to fungus, and its tough grain fiber, makes it the ideal timber for this use.

He has tested its quality thoroughly, and avers it will grow in 16 years large enough for railway ties, and "last twice the length of time required to grow."

Other trees, of course, claim this writer's attention, and he urges the culture on an extended scale of many other sorts of timber, but for daily serviceableness he considers the merits of his favorite should be carefully studied.

There are many excellent photographs offered as illustrations, some very interesting pictures of scenery as affected by forests and the lack of them, many portraits of individual trees, and numerous textual illustrations of woods and seeds and barks. Altogether this is an earnest and useful tract, and heartily to be commended for its altruistic aims and its practical advice.

New York Sun

July 14, 1906

The title "Practical Arboriculture," which Mr. John P. Brown gives to his book, is rather misleading, as is the further description, "a text-book" (John P. Brown, Connersville, Ind.). Forestry has become a systematic science nowadays and has furnished many handbooks of instruction. Mr. Brown's volume consists of a great many articles and addressess, exhortatory of the good work of planting trees. The author, we infer, is a pratical man. He describes particular trees and particular problems and gives sound advice as to what should be done. In each article he seems brought into contact with a difficulty to be dealt with and in so far his title is justifiable, but the sum of the articles is one great problem for which, we fancy, more general solutions would be more useful. The volume has the interest that attaches to men who are doing pioneer work.

Chicago Tribune, August 7, 1906

John P. Brown, a civil engineer of Connersville, Ind., who has been interested since childhood in trees and who is said to have been responsible for the planting of 20,000,000 of them, has written "*Practical Arboriculture*," which he publishes himself at his home. In it he discusses how forests influence climate, control the winds, prevent floods, and sustain national prosperity. The book is a text-book for railway engineers, manufacturers, lumbermen, and farmers. It tells them how, where, and what to plant for the rapid production of lumber and timber of all sorts. By states and by trees he tells which is best suited to the other and he gives a great deal of useful information put in the most practical way. He devotes a great deal of space to the catalpa, for which he seems to have an unbounded admiration. The book is illustrated with many fine photographs.

Portland, Ore., Oregonian

August 14, 1906

OUR DISAPPEARING FORESTS

"Arboriculture," a journal whose name indicates its specialty, says that the timber of the United States, fit for commercial lumber, will not last, even on the most conservative estimate, more than thirty years; but that, in fact, it will not last so long. Taking the estimates of careful and competent persons, that there are now standing in the United States 1,475,000,000,000 feet of lumber, and figuring that, including the consumption of wood for pulp and paper, lumber cut for export and for domestic use, telegraph poles, cross ties, piling and fuel, of which much is still used in many places, the timber used in mining operations and that destroyed by forest fires, there are 75,000,000,000 feet of timber consumed each year, with an increased quantity yearly; it is evident, then, says Arboriculture, "that we have not enough timber standing to continue commercially for more than twenty years in all the United States, including the Pacific Coast forests."

Till recently we were accustomed to think our Pacific Coast forests inexhaustible. So they would have been, practically, under old conditions. But the enormous and constantly growing demand for lumber, in these times, wholly unforeseen in former years, causes reversal of all former opinions and calculations.

It is true that under climatic conditions on the Pacific Coast timber grows with astonishing rapidity. Our pioneers have seen great forests appear, within the space of fifty or sixty years; not the greatest timber, it is true, but timber fit for good lumber—trees 100 feet high and two to three feet in diameter. Natural reforestation is rapid, where the growth is protected. More and more the conservation of our forests will become an economic question of highest importance. To preserve the younger growths against destruction by fire, to which they are specially exposed during the annual dry season, is among the most significant of all things necessary for conservation of the interests and resources of our Pacific States.

In very many places our "logged-off" lands never will be fit for cultivation; but if protected against fire they will repeat their growths of timber; and this is about the only use to which large areas of our rough lands can ever be devoted. The settler must have some areas which he can plow and plant, for his support; but he should always take care to protect the trees and promote their growth, on the parts that never can be subjected to actual cultivation.

Letter from a Prominent Lumber Dealer

Cincinnati, Ohio, Sept. 6, 1906.

Editor Arboriculture.

Dear Sir:—I am in receipt of your two copies and thank you for the same.

I am acquainted with the catalpa wood, my attention having been called to it by the superintendent of the Baldwin Piano Factory of this city (Mr. Perry). He has shown me samples of it and praised its qualities, also told me of making some wall bookcases out of catalpa which were placed above the steam radiators in his flat at Norwood. If it stands that, it certainly must be a remarkable and neglected wood. I was surprised to learn that such wood existed so close to the markets, and predict a large demand if it could be brought to the attention of the lumber industries.

I believe it would replace butternut or chestnut, which are becoming extinct. It does not seem to be subject to worms like the chestnut.

At the present time there is five times as much veneering done in quartered oak as there ever has been in the last twenty-five years.

Quartered oak is now cut on a slicing machine to 1-20, 1-30 and 1-40 part of an inch. It is veneered a great deal on poplar, chestnut and basswood. This catalpa wood I think would be adaptable for this work, having a straight grain and of such texture required for building up woodwork of all kinds, such as panels, wainscoating, car ceilings, pianos, organs, coffins, sewing machine cases, desks, etc.

I often suggest timber owners to replant their lands, knowing the waste that is now going on, in our desire to get sufficient timber for the market. Some I have referred to the nurseries of Tennessee, but the trees shipped from the South do not seem to prosper as well as those shipped from the northern and cooler climate.

I have been all through Mexico, from Progresse Yucatan to Western Terminos at El Paso, and am just now wondering what the catalpa would do in a tropical climate. It seems to me it would assume immense proportions in a short time, especially in the region at Tabasco and Laguma, Mexico.

In the last few years we have been receiving red wood from the west, showing that the lumber trade is now being forced to reach out further to obtain lumber of wider and clearer proportions than we are able to obtain here. I think from what I saw that the catalpa is equal to the redwood of California.

At the first Cincinnati Fall Festival I had an exhibit of all the woods used in this vicinity, but the wood you advocate seems to be one that I missed. I hope and believe it will be cultivated to a greater extent.

Yours truly,
(Signed) R. E. Becker.

Young Trees Need Tillage

GROUND SHOULD BE WORKED TO HOLD THE MOISTURE

The younger the trees the more often should they be tilled, they have especial need of a vigorous growth when young, and are more affected by lack of water than older trees, says the *Garden Magazine*. Obviously, trees loaded with fruit should be tilled more often and later in the season than barren trees; the fruit is mostly water. The dryer the season, the greater the necessity for tillage.

I have seen a thrifty and profitable unirrigated home orchard in a region which had only eight inches of rainfall; it was tilled until the surface soil was like road dust. No good gardener tills his fruit trees the same number of times each season. The infallible guides are the dryness of the soil and the growth of the trees. The only general statement worth making is that most home orchards in the humid sections of the country should be tilled from five to ten times during the season. Wherever a crust is formed on the surface, especially after a beating rain, it is a sign that water is escaping and tillage is necessary to break it up and restore the mulch.

Florida is a Great State

The distance from Chicago to Mobile is 910 miles.

The distance from Pensacola to Key West via Jacksonville is 944 miles, or 34 miles greater than from the Lakes to the Gulf. Did you know it before?

Only 3 per cent. of the land in Florida is under cultivation.

This 3 per cent. yields a larger net return per acre annually than in any other State.

Her orange crop the past season was 1,500,000 boxes, which means over $2,000,000 returns to the growers.

The pineapple crop on the East Coast the coming summer is estimated at least 450,000 crates, which means another half million dollars poured into the pockets of the growers.

A little settlement in St. Johns County, on the East Coast, has over 3,000 acres in Irish potatoes, which the farmers will market in a few days. New potatoes are quoted at $8 per barrel in Chicago to-day. These farmers average 40 barrels per acre Figure it out yourself. They will net $3 to $5 per barrel, after deducting all expenses.—*The Homeseeker*.

Ninety-seven per cent. of this great State is better suited for forests than for anything else, and if this could be retained in timber of suitable character, it would be productive of a greater income than that of any State in the Union.

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Plant Trees

ENDOWED FORESTRY

Some philanthropic millionaire ought to make a bequest or donation for the teaching of forestry by a regularly established periodical. A column every week upon arboriculture and forestry might, however, be provided for from a fund yielding $2,500 a year.

WHY?

Why not establish by will or gift while living a large fund, from the interest of which a propaganda for planting trees may be supported? Who will now make a bequest or a donation for the continued and intelligent teaching of the utility of orchards and groves, without which all animal life must perish from the earth?—J. STERLING MORTON.

Rockford, (Ill.) Gazette

Wednesday, July 11, 1906

FIRE PATROL

The state of New Jersey has set the rest of the country a good example in establishing a permanent patrol to protect its forests from the ravages of fire. It is not a region of immense forests, like some of the western states in their original condition, but it has had losses of millions from forest fires. It is proposed to do everything possible to check this public loss, by employing a force to have supervision of the forests and see that precautions about fires in camps and other conditions are duly observed. It is considered probable that the example will be followed in other parts of the country. Many states which suffer successive losses of millions from this source have the same reason to avert the waste that has led New Jersey to set this notable example.

Preservatives for Wood

The Technical Bureau of the Austrian army has made tests of various preservatives for building materials. It is stated that not the depth of penetration, but the concentration of the preservative is essential. Painting with sufficiently strong and concentrated antiseptics protects against rot even when fungi are already established in the interior; the stronger the antiseptic the more superficial may be its application; the weaker the antiseptic the deeper it must penetrate to secure results.

Fluoric acid (50 per cent. concentration) and fluorine compounds are specially recommended, besides the phenols, which for building materials can be used by painting and dipping; the former being not only more effective but cheaper. A mixture of ferric fluor or zinc fluor with fluoric acid is recommended. Antinonnin, antigermin and antipolypin were found satisfactory materials.

Fire Losses in Puget Sound Country

In 1902 eighteen lives and $12,000,000 were lost in fires in Oregon and Washington, and the next year the East had a visitation, from Maine to Virginia, which had its worst example in the Adirondack regions of New York, where there was a loss of no less than $4,000,000 over a burned area aggregating 1,000 square miles.—H. M. Suter, in The Chautauquan for June.

Tree Planting by Canadian Railway

The Canadian Pacific Railway Co. has begun tree planting on quite an extensive scale along its western lines. A contract has been let for a small acreage of breaking near Wolseley on which it is the intention to experiment with tamarack for ties. A piece of ground is also to be planted at Medicine Hat with jack pine and tamarack for the same purpose. Over 100 miles of trees are to be planted between Winnipeg and Calgary, for snow breaks, and at several stations trees are to be planted around the station grounds, and prizes are to be offered the section foremen who make the best showing. This work, if carried on successfully, ought to encourage tree planting among the farmers of the West.—*Canadian Forestry Journal.*

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There are ways and ways—one of them is to sell out, gather up all the money you can, and go West and homestead. This can be done, but there is this fact to remember: Nearly all the best places are taken. One can find any amount of raw land remote from railroads, schools, and churches, out of the world and away back where, in the course of time, civilization may penetrate. But there's a better way than all that. It is to buy a farm in the Southwest, along the Santa Fe, and start in with all the advantages you left behind, and more.

You can buy that sort of a place at from $10 an acre to many times that amount. The difference in price depends on nearness to towns, railroads, the state of cultivation, and all that sort of thing. But a better farm, so far as fertility of the soil and productiveness are concerned, may be had for $10 an acre than you could get anywhere back East for $50 an acre.

Here's a further fact: It may seem remarkable, but it is a fact, that the first crop will often pay for the land. It has occurred in thousands of instances, and will occur again.

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It is not for us to discriminate between sections, but this is undoubtedly true of Southwestern Kansas. Over the line in Oklahoma and Texas the same thing can be done, with the stock-raising idea more prominent. Down in the Pecos Valley, in New Mexico, it is an irrigation proposition, and vegetation of all kinds simply runs riot in its profusion—and people are going there by the carloads. While land is high priced there, you don't need much of it. You couldn't farm a hundred acres, not if somebody gave it to you. Forty acres would be plenty. In Southwest Kansas, with a good team, you can farm 160 acres, but in an irrigation country you can not do this. Everything is intensive and concentrated where water is required. In Arizona the conditions are much the same, and so all along the Sante Fe until you come to California, where everything is different.

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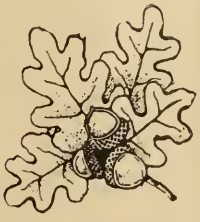

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Connersville, Indiana, December, 1906

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PUBLISHED IN THE INTEREST OF THE
INTERNATIONAL SOCIETY OF ARBORICULTURE

Subscription $1.00 per annum — JOHN P. BROWN, Editor and Publisher, Connersville, Indiana

Entered as Second Class Matter April 16, 1906

Volume V — Connersville, Indiana, December, 1906 — Number 7

Serious Accident to General William J. Palmer

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The many friends of General William J. Palmer, President of the International Society of Arboriculture, will regret to learn that he was thrown from a stumbling horse as he was returning home on October 27th, and so seriously injured that for many days his life hung by a slender thread. The spine was fractured, causing paralysis of the limbs. Physicians were hastily summoned from Colorado Springs and Denver, and later Dr. M. Allen Starr, one of the most eminent nerve specialists of the world, was called from New York City, and made a special diagnosis.

The bulletin issued by the physicians at 7:30 P. M. Nov. 18th, was the most favorable since the accident. It reads as follows:

"General Palmer shows a gain in the power of using all his muscles, and his general condition continues good. He is cheerful and attending to some business affairs. While the improvement must necessarily be slow, that made so far is most satisfactory."

General Palmer is now able to move his arms and legs moro freely. His general health continues good. He has a good appetite and suffers no pain whatever, probably from the paralysis.

General Palmer was born in Philadelphia on Sept. 18, 1836, and is of English, German and Irish lineage. During the Civil War he was an officer of cavalry, becoming colonel and then brigadier general, serving in the Army of the Cumberland with General George H. Thomas.

After the war he resumed the business of railway construction and operation. In 1865, as managing director of the Kansas Pacific Railway, he constructed the last division of that road from Kit Carson to Denver, constructing one hundred and fifty miles of road in as many days, under most adverse circumstances.

General Palmer has endeared himself to the people of Colorado by his many generous gifts to numerous educational institutions and various worthy enterprises.

His interest in forestry is large. He is maintaining several estates in the West, planting and perpetuating their forests in a magnificent manner.

To General Palmer belongs the credit for whatever this society has accomplished or may do in the future.

Cement Concrete as a Substitute for Wood in Constructions

Inventive genius has been active during several years past, seeking for some substitute for wood, as advancing prices of lumber, with greater scarcity, has given fair warning of approaching famine in American timber.

For many years wood was almost the only material used for houses, bridges and structures of every kind, because it was the most abundant, and easily attainable at low cost in nearly every locality: but conditions have changed; wood is no longer abundant, and must be transported thousands of miles in many instances, while prices have doubled and trebled within a brief period.

On the other hand, the manufacture of Portland cement has grown to mammoth proportions, while the abundance and cheapness of the minerals entering into its composition, together with the general abundance of gravel, crushed stone, sand and water, for making concrete mortar, makes this an inexpensive material which in many cases has taken the place of wood.

Besides, unless protected from the elements, wood is of comparatively short duration, while concrete soon becomes as firm as the natural rocks and will last for centuries.

FOUNDATIONS, CULVERTS AND BRIDGES

In railway construction and repairs, concrete is being used in lieu of natural stone, for all foundations, retaining walls and many culverts, some of which are of size approaching small bridges.

In parks and on roadways quite long spans of bridges are built of reinforced concrete, where formerly wood alone was used.

CONCRETE BUILDINGS

It is interesting to note the evolution in house construction since the settlement of the new world. From the rude cabins of the pioneers, built of round logs, the ends notched in for strength, with blocks of wood or stone used for chinking, to fill the spaces between the logs, having mud plastered upon these chinks; immense broad fireplaces to take logs for fuel, floors of puncheons or logs split in twain, the flat upper side hewed smooth, roof covered with clapboards, the pioneer saw mills supplying but limited quantity of lumber at first.

As the numbers and capacity of the mills increased, boards and dimension stuff afforded the frame buildings, which were improved and made more comfortable as time passed on.

Then brick became common, although not entirely supplanting the frame wooden building.

A year or two since iron and steel were in general use for many purposes of building in the large cities, and it was predicted that these metals would entirely supplant wood for house construction. But the supply of iron is growing less with the immense drain upon the mineral beds, and there will be few buildings constructed of iron, except as it is used to reinforce concrete, and in the sky-scrapers to bind the walls together.

To-day cement concrete enters largely into the construction of dwellings, either in the foundations or in hollow concrete blocks for the superstructure.

Sixty years ago, Fowler, a noted educator of New York, published directions and plans for farm houses, barns, and numerous buildings were thus erected in various portions of the United States.

But waterlime or portland cement is very far superior to the mortar made from carbonate of lime.

The objection to concrete walls for houses was the dampness of the walls, but that seems to have been overcome by the hollow blocks, which have large air spaces within the walls.

The blocks are usually 8x8x16 inches, equivalent to the space occupied by twelve bricks; their cost varies according to abundance of materials, sand, gravel or crushed stone, and distance which these articles must be transported; probably the average cost is ten cents per block. Their manufacture is easily

accomplished by any ordinary labor, in a simple and inexpensive machine.

While the enormous skyscrapers of ten to thirty stories high must of necessity have the framework of steel, thoroughly tied together with a network of steel, yet the exposed portions have a casing of brick, tile, stone or concrete, the foundation being of concrete.

This, by the way, is but man's improvement upon nature's methods in the matter of time. Nature taking thousands of years to complete the manufacture of limestone, sandstone or granite, while man, by using practically the same materials, makes as solid stone of cement, sand and water in a few days' time.

There are evidences of some of the Egyptian structures, erected thirty centuries ago, which were in part made of concrete. So it is not exclusively the invention of the twentieth century, although many of the processes are quite modern.

CONCRETE PILING FOR FOUNDATIONS

We were greatly interested recently in observing the method of placing the concrete foundations under a large business block at Louisville, Ky.

Wooden piles, as is well known, do not decay after being driven deep below the action of the atmosphere, air being essential for the propagation of fungi or rot. But wooden piles are becoming very scare, and with long distances for transportion, hence concrete is taking the place of wood for this purpose.

The hardest of granite gives way under the blows of the chisel and mallet of the stone mason. The best natural stone is fractured by concussion also; while artificial stone made of concrete will support an enormous weight of superstructure in a quiet load, it may easily be crushed by concussion.

PLACING CONCRETE PILES

These piles are thirty or more feet in length or depth, and eight inches diameter at bottom, increasing in size to about eighteen inches at surface of the ground. A steel pile, or core, as it is termed, just the shape of an ordinary pile, is encased in a sheet steel casing, having a rounded cap at bottom of the core.

These are driven together by huge steam pile drivers until a solid foundation is reached The core, which is collapsable, is then withdrawn, leaving the steel casing in the ground.

Machine-mixed concrete, in a semi-fluid condition, is then dumped into the cavity from wheelbarrows made for this purpose, one man after another pouring his load into this form until it is filled, it being tamped all the while.

After the material has set and become sufficiently hardened, concrete walls are built in the ordinary forms or frames, which retain the mass while being hardened.

Metal stays, twisted strips of steel, are placed in the forms and encased in the concrete for reinforcement and to prevent its cracking. Thus no concussion occurs in placing the piles or in any subsequent operations.

CONCRETE FENCE POSTS

Near the editor's home there lives a farmer upon whose land are some excellent ledges of limestone which by careful manipulation may be quarried into long rectangular blocks. This farmer has used these limestone blocks for fence-posts, thus enclosing his property.

Imitating this method, there are being made concrete fence posts, reinforced with metal, binding the material and giving added strength.

But sometimes both the stones and concrete posts are broken, besides being quite expensive, especially so when compared with wooden posts, so long as these are obtainable.

CONCRETE TELEGRAPH POLES

The Pennsylvania Railway Company, by their Engineer Maintenance of Way at Ft. Wayne, Indiana, Mr. F. M. Graham, has constructed and erected a mile of reinforced concrete telegraph poles, ten miles east of Ft. Wayne.

The poles are octagonal, and are placed one hundred feet apart in the line, to better sustain the increasing number of wires and prevent the frequent breakage of wires from ice and sleet.

A remarkable feature in these concrete poles is their flexibility. They bend 18

inches out of plum with the weight of the repair linemen, yet return to upright position on being relieved of the weight.

The action of the wind, therefore, in storm does not break the concrete poles, as it often does the best wooden poles.

It is more than probable that this material will be used in the future for all the company's telegraph poles.

CONCRETE FOR RAILWAY SLEEPERS

Numerous plans and patented appliances have been prepared, in hopes of securing a cross-tie of concrete, and some isolated experiments have been made with such materials, but so far nothing definite has been proven.

One tie set between other ties of oak, and the rails being mainly supported by the wood, may last for several years, but there is probably no engineer who would risk his reputation and the lives of the traveling public together with the risk of property loss for his company, by constructing a railway upon a foundation so inapt as concrete sleepers, no matter how reinforced, where the blows of a heavy freight train as it swerves from side to side with incredible force, could not fail to crush and fracture the ties by concussion.

The one sleeper which was sent to the Louisiana Purchase Exposition, although not finally placed on exhibition, demonstrated the inaptitude of such fragile material for so important a foundation. This cross-tie came by express, weighed 300 pounds, and was broken in transit. Its cost was not ascertained.

Where wooden ties may be grown in less than two decades, at a cost of ten cents each, and which will endure for three decades, it is folly to consider concrete for such purposes.

Wood is a natural material for railway sleepers, is the cheapest material known for the purpose, as well as the most enduring, provided the right kind of wood is used.

Second-Class Mail Matter

We are in receipt of several communications asking our cooperation in efforts to prevent any change in the postal rates on second-class matter; that is, pound rates for newspapers and various publications.

ARBORICULTURE believes the present rate, one cent per pound, to be somewhat too low; one and a half or two cents per pound would not be excessive, and should not be objected to by publishers.

If there could be proper discrimination between honest, well-intentioned journalism and the innumerable periodicals of a vicious character, whose sole object is to circulate catch-penny advertisements, often vile and degrading, it would result in great good to the public and of real benefit to correct journals, and this alone would go far toward reducing the annual deficit in postal revenues.

Undoubtedly the real cause of the very large deficits is the close proximity of the Bureau of Printing and Engraving, with the Capitol at Washington.

In other words, the quantity of useless matter printed at government expense, which is never read, and often finds its way to the paper mills, exceeds the knowledge of the general public.

There are very few of the costly books, reports, etc., turned out by the government printing office which possess any merit worth the cost of publication. Yet these by the thousand tons weigh down the postal cars, pay no revenue, and create a deficit in postal revenues, increasing each year.

Let congress pare down these government publications, stop the free seed abuse, and the public mail matter will keep the revenues up to the proper standard.

An Alleged Lumber Trust

Interstate Commerce Commission Will be Asked to Investigate the Case

United States District Attorney Robert T. Devlin has decided to forward to Washington the evidence presented before the federal grand jury during the investigation into the acts of the alleged San Francisco lumber trust. This evidence, according to Devlin, implicates Oregon and Washington lumbermen as well as local members of the alleged unlawful combination. The trust is therefore an interstate organization and the further investigation will be conducted from Washington.—San Francisco, Nov. 2, 1906.

Forest Plantation of Pennsylvania Railway

The Pennsylvania Railway West of Pittsburgh has entered upon a careful experiment on forest planting in Indiana.

The company owns a farm of sixty-five acres, in Kosciusko County, two miles east of Winona Lake, six miles east of Warsaw, which has been appropriated to the purpose of a thorough experiment with the catalpa speciosa for the production of timber for railway purposes.

The tract is about three-fourths of a mile in length along the north side of the Pittsburg, Ft. Wayne and Chicago tracks, and adjoining the right-of-way grounds.

In topography this tract presents a variety of interesting features. At the east end is a gravel plateau sloping to north and west. In the center is a broad ridge of gravel, while a broad, deep ditch extends along side this ridge, where gravel was excavated some years ago. For the most part the remainder is level, quite flat, a portion being covered with water during the wet seasons, and grown up with water grasses, cat tail flags, and swamp growths.

A public highway crosses the railway and passes through the land from north to south, near the center of the tract.

In soil there is an equal diversity. The knolls are of course gravel accompanied with sand. The slopes have had sand washed down and it has covered the surface, while the level ground varies from a sandy loam to that of pure muck of great depth, formed by ages of vegetable growths in the basin of former lakes.

It will be of special interest to the land owners of northern Indiana, where so much of these wet lands and muck deposits exist, to know how well the catalpa speciosa succeeds in such moist localities.

In the summer of 1905 I was requested by the Pennsylvania Railway officials to make an examination of this Kosciusko County farm and report upon the practicability of planting it with catalpa speciosa trees. After a critical examination I advised in favor of the project. In consequence the land was plowed and preparation made for work. In the spring of 1906 sixty thousand yearling trees were secured and they were planted 7x7 feet apart. Upon the outer edges of the tract, three rows were doubled, being three and one-half feet each way, to serve as a wind break. They were thoroughly cultivated during the season, and the worst of the weeds and grass sod were destroyed.

On November 5th, in company with Mr. Graham, Engineer Maintenance of Way, and Mr. F. I. Brown, lumber agent, I again visited the tract to inspect the plantation and decide upon the treatment of the trees in the future.

We found that excepting a remarkably small number of trees broken down and torn out by the plow, all the trees were living and had made a very satisfactory growth. Many which we measured were three inches diameter at the ground, the average height being five to six feet. Upon the gravel knolls the height was quite regular and about four feet growth during the season, while the muck lands showed an average of about six feet.

Probably one-third of the trees were straight, upright with single stems, while the remainder had sent out several branches which divided the strength of the trees and will require considerable pruning of side branches to make them grow into straight stems.

As in the Wabash Valley, where these

trees are indigenous, the best and straightest growth is in the moist muck lands often growing in swamps where water stands during several months of the year. Locally these swamps are called catalpa slashes. At the same time the trees growing on rolling land, especially if sandy, make substantial progress if properly cultivated for two or three years.

The catalpa speciosa as well as walnut, elm, ash, and in fact all trees, when growing at a distance apart, are inclined to form side branches with a low stem.

Three methods are advocated for obviating this natural propensity. One is to plant very closely, allowing nature, by crowding, to force them into tall slender stems. Another method, as practiced with the catalpa, is to permit this branching, and after the trees have become thoroughly established, with a strong root system, to cut off the tree at the ground, allowing the new shoot which results, to make the permanent trunk, which will be straight and with a surprisingly rapid growth. A third method is to prune away the side shoots, confining the early growth to one stem.

The first method requires long and patient, or rather impatient, waiting, with serious impairment of the capital invested through interest and accumulated taxes. The second is the more economical method, while the third plan requires good judgment in its manipulation.

The catalpa speciosa is provided with numerous adventitious buds situated in the bark. The eye cannot discover these adventitious buds, so minute are they, yet they exist, and when a tree is broken off by accident or by storms, or is cut by the axeman, they push forward to reproduce a new tree. Of course, the older the tree, and thus having a stronger root growth, the more rapid progress will the new tree make.

In a forest plantation I prefer to cut the trees back after the third year.

As many of the trees will make a straight stem naturally, the use of the knife in removing small side branches and extra shoots inducing a concentration of all the energy of the tree into one stem, is the most satisfactory treatment, and is by no means an expensive operation. An intelligent workman will traverse a very large area of land, removing objectionable branches while they are half an inch thick, the expense being so small as to be unnoticeable.

The Pennsylvania officials at Pittsburgh and at Ft. Wayne are to be congratulated upon the success thus far in the Indiana experiment, and it is to be hoped that it will result in a very large area of land being set aside for the production of timber, which is each year being so much more difficult to obtain and so much greater in cost.

Government Free Seeds

The United States Government, during the early years of the republic, adopted a very wise policy of collecting rare plants and seeds from every portion of the world for the purpose of determining what plants, not indigenous to this country, might be introduced to increase our farm productions.

All our ambassadors to foreign countries were instructed to be on the alert and to secure every new plant which might be valuable in some portion of this country. Numbers of our most valued trees and vegetable products were thus imported from Japan, Russia and other distant lands.

This policy has in recent years degenerated into a political distribution of the commonest seeds which are purchasable in any country store throughout the land. A host of people in the city of Washington were kept employed by the Department of Agriculture, in putting up and mailing tons of these cheap seeds, mostly upon orders of congressmen, and many dishonest practices have been connected with this abuse of a time-honored custom.

The entire scheme, as practiced during the past twenty years, is a disgrace to the nation.

Many efforts have been made to break up the free seed distribution, but politicians in Congress cling with tenacity to what they believe to be a powerful leverage toward an increase of popularity among their constituency.

It is an injustice to a large number of business men who are engaged in seed trade. It is a species of bribery which is degrading to farmers and others who receive the seeds. It is unjust to the great majority of citizens who must pay for these seeds in which they have no interest.

It occupies the time and attention of the Department of Agriculture, which has great fields of investigation to follow, all of which are hampered by having so large a portion of the appropriations expended in the seed distribution.

The money squandered in the purchase of common and often very inferior seeds and in their distribution would go very far toward the afforestation of the treeless regions of our country, if wisely and properly managed.

The practice should be discontinued.

PHOTO BY JOHN P. BROWN

GLEN EYRIE — COLORADO

Home of General Wm. J. Palmer

The Oak for City Streets

A song to the oak, the brave old oak,
Who hath ruled in the greenwood long;
Here's health and renown to his broad green crown
And his fifty arms so strong.

There's fear in his frown when the sun goes down,
And fire in the west fades out;
And he showeth his might on a wild midnight,
When the storms through his branches shout.

Then here's to the oak, the brave old oak,
Who stands in his pride alone,
And still flourish he, a hale green tree,
When a hundred years are gone.

In street planting oaks have been used but little. The few that grace the avenues of northern cities are there as the result of accident rather than of deliberate planting. This condition is not due to any fault of the trees, other than that they are known to be slow growing and that they bear acorns. Housekeepers have a deeply seated prejudice against litter on the sidewalks, and blowing oak leaves and falling acorns are sufficient to condemn the most stately tree.

Oaks may be classified into white oaks, chestnut oaks and the evergreen live oaks, all of which bear acorns that ripen within the year; next the black and red oaks, whose acorns take two years in which to mature; and finally the leather-leaved oaks, some of which are evergreen in the South, likewise requiring two years to ripen their acorns.

All these oaks do not take kindly to civilization. In our own locality on the shores of Lake Michigan the scrub oaks which stand along the sand dunes and crown low hilltops refuse to live when brought within inclosing fences and the ground about the roots becomes hard from the tramp of many feet and the air above their branches heavy with soot and gases.

Others among the scarlet, black, bur, chestnut and pin oaks change character entirely when cared for by intelligent hands. The leaves take a vivid coloring and the foliage becomes denser; the tree that once looked as ragged as the "raggedy man," spruces up like a gentleman.

The avenues of live oaks of New Orleans and other southern cities are never forgotten by one who has seen them. These are trees indeed, growing luxuriantly, with a dignity that is magnificent. The live oak is, however, essentially different from our common oaks and will not survive northern winters. The leaf is evergreen, thick and leathery, without lobes or divisions and is rarely if ever toothed. They remain a dull green all winter, turning yellowish brown in spring, falling when the new leaves push them off. Live oaks are picturesque features of the southern and Californian landscapes.

The Village of Flushing, L. I., is noted for the beautiful oaks that shade some of its streets. Different species, including pin oaks and scarlet oaks, have been used to good effect. The scarlet oak deserves to be more popular than it is. Its leaves are uncommonly graceful, sharply toothed with rounded curvings—a pattern that charms the eyes of the decorative designer. Being of a brilliant green, the tree presents a handsome appearance all summer long. The hard polish of the upper leaf surface sheds the dust and the leaves have the power of persistence to a high degree, clinging fast through dry weather and storms and turning scarlet at the approach of autumn, presenting a gorgeous mass of color amid the October display.

The red oak is the most rapid in growth of all the oaks. It has fine proportions—the best of the acorn-bearing species, and has adopted fewer of the gnarled habits and contorted fashions peculiar to many of its relatives.

While the conservative tree planter does not recommend oaks for a grand boulevard—at least oaks that are native to this particular locality—there is no reasan why they should not be given a trial. Still, by its very nature the oak of the West seems better adapted to rural suburbs and short streets and parks, where they impart a hint of the forest wilds and grow into the affections of those who watch them from the early spring days, when the velvety clawlike leaves push forth, veiling the naked branches in an atmosphere of rosy and violet tints, until the glossy brown leaves rustle in the December winds, clinging fast to the parent tree through winter storms until the swelling buds of spring push them off to make way for the garments of spring.

Of all the tree families the oaks are among the most interesting, and anyone taking the trouble to examine the specimens in Lincoln Park, or in any one of the public parks, and making a collection of leaves of those growing in the suburbs and in vacant lots—will be astonished at the variety and the individual distinction of the native collection. In addition to well-known varieties listed in the average books are many with ornamental foliage and dwarf species adapted to lend themselves to the decorative features of landscape gardening.

America has no exact counterpart of the English oak, which is regarded with reverence and honor among our British cousins. The English oak (quercus robur) is a relative of the American willow oak, frequently found shading the streets of southern cities and distributed in the wet districts from New York south along the gulf States and west to Missouri. The English oak has existing specimens of an age estimated from 1,200 to 1,800 years, with girths measuring from sixty to seventy-eight feet. America does not offer a rival to enter the lists against the giants of this species.

Fortunately oaks are exempt from many insect pests, though haunted by leaf beetles and the familiar "oak gall insect." Common-sense care speedily routs the pests and the oak will respond gratefully to attention.—*Chicago Evening Post.*

English Opinion of "Practical Arboriculture"

"PRACTICAL ARBORICULTURE"

Here is a large work on a large and important subject. It has reference particularly to the forests of America, but is applicable to forestry everywhere. There was a time when the greater portion of the United States was covered by a dense forest, then supposed to be inexhaustible; but now, after the passing by of a hundred years or so, the supply of timber in many regions may be said to be practically gone. The extravagant and wasteful destruction of forests, not only in the United States but apparently all over the world, is having its effect. Manufacturers of paper, for example, are now crying out for pine forests no longer attainable. Other manufacturing industries are closing down from the exhaustion of timber from the great mountain ranges. "It is time," says the author, "for America to stop and think what we are going to do when the forests have become exhausted, and this after the first one-third of the twentieth century has passed." The author's object is to counteract this continued exhaustive process by extensive planting; and to aid the American people, and those of the Old World as well, in providing a supply of timber for the coming generation by showing them what to plant, where to plant, and how to plant, more especially for the rapid production of lumber cross-ties, telegraph poles, etc. The author has a full grasp of his subject, he writes well, with great modesty and good sense, and his work deserves the attention of Governments everywhere, and of all those who take a serious interest in a subject which affects the future well-being of all countries. The volume is well printed and contains numerous illustrations of trees and scenes taken by the author.

Practical Arboriculture. How Forests influence Climate, Control the Winds, Prevent Floods, Sustain Natural Prosperity. A text-book for Railway Engineers, Manufacturers, Lumbermen, and Farmers. Roy 8vo. pp. 454, cloth extra. (Connersville, Ind.) Agents for Great Britain etc.; Wm. Dawson & Sons, Ltd., Cannon House, Breams Buildings, London, E. C.

An Iowa Letter

DEWITT, IOWA, October 20, 1906.

MR. J. P. BROWN:

I wish you could see my trees you sent me in 1905. I think they have done remarkably well; have some that have made a growth of ten feet and some three inches in diameter. Plenty of six and eight feet and two inches in diameter. There was quite a number broken last winter, and where they have sprouted from the root have made a growth of four to six feet. Now I would like some 200 plants to replace where they are gone, and I do not know of any one that will be as likely to get me the genuine speciosa as you. Now if these prove to be the hardy variety, they will be a joy forever and the neighbors will stop laughing about Oatman's freak. Now wouldn't you let them grow another year before cutting off; get a strong root growth now? I was gone all the fore part of the season, so they did not get the care they should have had; the man on the farm did not have time to care for them. I have been all through, trimmed all side branches off, but some are quite crooked; but on the whole, they are fine.

If you can send trees, let me know, and obliged.

A. G. OATMAN.

Yes, it will be as well to let them grow another year before cutting off, and then only those which are deformed.

Boston Transcript

Aug. 27, 1906

We had occasion some time ago to call attention to the good record made in the West by the catalpa speciosa, as a timber tree, and the efforts that were making to introduce it into New England as a part of the redemptive forces to be applied to our old and abandoned farms. The special qualities which recommend the tree are its quick growth and its availability for all sorts of purposes, among them being the manufacture of furniture and easy conversion into durable crossties for railroads. In this latter respect the railroads are being considerably embarrassed. The engineer of maintenance of way on a West Virginia railroad announces that he has just been authorized by the company to plant from 50,000 to 70,000 of these trees by way of experiment. This is significant because the railroad is located in the center of the white oak region that has furnished crossties, not only for the local roads but for those of Ohio and other nearby States. But the supply is beginning to show signs of exhaustion, hence the movement in favor of catalpa speciosa.

A Righteous Judge

Fined for Mutilating Trees

MEN EMPLOYED BY TELEPHONE COMPANY PUNISHED IN CRIMINAL COURT

Thomas Hood and Jesse Imbler were fined by Judge Alford of the Criminal Court yesterday for cutting down three trees on Emerson avenue, Irvington, to make way for telephone wires. The New Long Distance Telephone Company engaged them to trim the trees, but it was shown that the company did not authorize the cutting of the trees and that it later refused to pay a bill for cutting them. Hood, who was in charge of the work, was fined $30, and Imbler, who actually did the cutting, $10 and costs.

Judge Alford said that he would have given the men the limit under the law but for the fact that he knew that they were poor men and that the fines assessed would be hard for them to pay. He said that an example should be made of somebody.—*Ind. Star*, Nov. 14.

A Candid Lumberman

1111 Union Ave., St. Louis,
Nov. 11, 1906.

Mr. John P. Brown:

Thanks for sample copies. Unfortunately for you, I am not in the rebuilding of forests business. On the contrary, I *destroy* forests, cutting even the undergrowth, to put land into cultivation. Your paper gave me the first intimation that something was being done in this country in the way of forest rebuilding. I agree with you that it will have to be done on larger scale, but only national and state governments can do sufficient good. See our European countries, especially Switzerland and Germany, planting forests with as much care as orchards are planted here.

Truly,
C. Grand Pierre.

The eyes of lumbermen are gradually being opened to see the necessity of some prompt and effective planting, with better care of the forests, if lumbering shall be continued in America.

For the information of our correopondent, we will state that through the influence of this Journal, more than twenty million forest trees have been planted, its influence being felt in many countries of Europe, in Asia, in South Africa, in the Australian Archipeligo, and in both North and South America.

What the government refuses to do, the International Society of Arboriculture is doing effectively.

The Evil of Turpentining

Is fairly shown by the following item from an Alabama paper, showing the effects of the recent storm on the gulf coast:

TIMBER AND LUMBER SITUATION

Throughout this section practically all of the timber which had been boxed for turpentine, whether recently or years ago, is down. The young, unboxed timber, while it has suffered greatly, in places clumps of several trees going down together, is by far the most of it standing. The *Herald* quotes Hon. T. S. Howell of Gulfport, a reputed authority on timber and lumber matters, as saying:

"The small trees stood except where they had been boxed for turpentine, and these trees will reach timber size in eight or ten years." This corresponds with the judgment of those who opposed the turpentining of the young trees on Fairhope's land.

Mr. Howell also said that the fallen timber would keep all of the big mills working night and day for two years. Opinions of well posted men differ greatly as to the effect of the wrecking of the timber on the lumber market. Some think that the hastening of so much timber to market will bring down lumber prices, and others that the increased demand for rebuilding purposes, with the difficulty of getting extra men and teams to increase the output, will hold prices up.

One thing seems quite certain: Land with standing timber of saw-log size, or which will reach it in a few years, is much more valuable than it was.—*Alabama Newspaper.*

Save the Falling Leaves

The Colorado Springs Gazette in a lengthy article urges the citizens to rake up the fallen leaves which the street commission will have hauled away.

In most towns of Indiana they are raked up and burned.

In Florida and other Southern States they are burned, together with all seedling pine trees, each year.

We advise Colorado Springs people to rake them up and preserve them in a compact heap, to be used as a fertilizer. The soil of that city is of almost pure sand, without any vegetable matter. These leaves are invaluable in such locations, as the humus which they form is very essential for the successful growth of grass on the lawns and various plants in the gardens.

Florida has lost many millions of dollars by the suicidal policy of burning the annual growths, pine leaves and with them most of the seedling trees which should be preserved to renew the forests, as the greatest income the State can have is from the timbers, since the largest portion of the State, by far, is now agricultural.

Years ago the farmers of Indiana and other neighboring States raked their corn stalks into wind rows and burned them. They don't do it now—they have learned better—and the sooner all people learn that forest leaves and the leaves from shade trees is of great fertilizing value, the better it will be of all.

New Jersey's Fire Patrol

The State of New Jersey has set the rest of the country a good example in establishing a permanent patrol to protect its forests from the ravages of fire. It is not a region of immense forests, like some of the western States in their original condition, but it has had losses of millions from forest fires. It is proposed to do everything possible to check this public loss, by employing a force to have supervision of the forests and see that precautions about fires in camps and other conditions are duly observed. It is considered probable that the example will be followed in other parts of the country. Many States which suffer successive losses of millions from this source have the same reason to avert the waste that has led New Jersey to set this notable example.

J. P. BROWN, PHOTO

PECULIAR SANDSTONE CLIFFS OCCURRING IN GLEN EYRIE

Hybridization of Forest Trees

Mr. Robert W. Douglas:

Replying to your inquiry regarding the hybridization of the Catalpa family. There is no family of trees more affected by cross pollenization than is the Catalpa family.

In general terms, no stock breeder considers the crosses between thorough bred and scrub or ordinary stock as valuable as the higher bred parent. Still, grade animals are usually superior to the inferior parent.

Just so the hybrids in plant life are often far improved over the wild, and may gradually be brought up to a higher standard.

Catalpa speciosa has certain valuable qualities, while bignonoides may be considered as being almost entirely without these qualifications, and kemferii, the oriental variety, differs materially from both.

Crosses between speciosa and bignonoides are largely prone to follow the defects of the Southern or wild form, although occasionally partaking of the better qualities of the Northern variety, speciosa.

As a rule all inferior plants seed more freely and are distributed in much greater numbers than are the higher bred or cultivated kinds. Plants which are termed weeds produce a thousand fold more seed than cultivated plants of the same species.

This is peculiarly the case with the catalpa. Kemferii often produce thirty pods, each containing a hundred seeds, from one cluster of flowers, and as many flower clusters as other varieties. This also occurs with its hybrids. Bignonoides, while not so fecundate as the former, still far surpass speciosa in fruitfulness.

Pure kemferii has an upright stem, its wood is valuable, being used in Japan for blocks in wood engraving and for many other uses. There are very few pure Kemferii trees in America, almost all having been hybridized with bignonoides, and partake of all the bad qualities of the Southern tree with none of the natural good of the oriental, original. Bignonoides crossed with speciosa make the millions of scrub trees which are found in every locality.

I do not know of a single hybrid catalpa in this country which is equal to the genuine speciosa.

It has been asked how speciosa originated and why it is so superior, and why confined to a remarkably small area in the Wabash Valley of Indiana and extending into the edge of Illinois, while bignonoides cover a territory equal to one-fourth of the United States.

An answer to this can only be a conjecture, but I would say that bignonoides was the original or wild form of American catalpa, and that by some accidental means one plant was produced of a superior character, and being isolated from the wild trees continued to propagate itself and to fix permanently the peculiar qualities which it had inherited.

Pecularities of bark, flowers, upright habit, seed, seed pods, wood growth, are all inherited and transmitted by pure speciosa and are all, to greater or less extent, changed to resemble the inferior variety when hybridized.

A Live Telephone Company

Mechanicsburg, Ohio, Oct. 11, 1906.

Mr. John P. Brown,

Dear Sir:—Enclosed please find check for $2 00, subscription for Arboriculture for 1906-1907.

The telephone company of which I am secretary and manager is a $40,000 corporation, and is the first telephone company in the world to provide a future supply of poles for its own use. We purchased twenty acres of land and planted 20,000 catalpa trees this year. I planted 28,000 on my own land this year and thousands of them grew six-foot new wood and one and one-half inches in thickness this first summer's growth.

I believe I can make claim to have the best per cent. of stand of trees of any large planter in the union. Out of the 28,000 trees planted, less than twenty-five trees are missing, and most of them were jerked out by the cultivators. I am

Yours truly,

H. C. Rogers.

Engineering News

220 Broadway, New York

PRACTICAL ARBORICULTURE—How Forests Influence Climate, Control the Winds, Prevent Floods, Sustain National Prosperity. A Text-Book for Railway Engineers, Manufacturers, Lumbermen and Farmers, How, Where and What to Plant for the Rapid Production of Lumber, Cross-Ties, Telegraph Poles and Other Timbers. By John P. Brown, C. E., Connersville, Ind.: The Author. Cloth; 6½ x 10¼ ins.; pp. 454; many plates and text illustrations. $2.80.

Mr. Brown is well known to many as an apostle of tree planting in general and of planting the Catalpa Speciosa in particular. He here brings together a large number of articles and addresses, principally articles, on two main classes of subjects indicated in his sub-title: forestry in its broader aspects and tree-planting for specific purposes. Interspersed with his essays on these topics are a number of others on particular species of trees and still others on such subjects as a trip to the Yosemite Valley and a trip to Old Mexico, having more or less relation to the main topic of the book. The volume abounds with illustrations, most but not all of which are pertinent to arboriculture, all of which are interesting and some of which are particularly handsome half-tone plates, reproduced from well chosen photographs. Most if not all of the matter composing the book has appeared in "Arboriculture," but some of it was originally prepared for addresses before public gatherings.

The work can in no proper sense be called a text-book, since it is utterly lacking in systematic arrangement, but it will doubtless prove of no little educational value. Its useableness if not its usefulness would have been increased by a proper classification of its contents, but perhaps the preseut arrangement, or lack of arrangement, will appeal more strongly than any other to the general public, and it is there that its mission chiefly lies.

As would be expected, the one subject that receives most attention is the Catalpa Speciosa, its merits, uses and propagation. On this subject the author speaks with the authority of great experience.

It is a pity that the book has no index, what is called such being merely a table of contents.—Nov. 15, 1906.

Vincennes, Indiana

Our readers who may have occasion to visit Vincennes, Ind., will find a charming home at the Union Depot Hotel, where all trains of every railway entering Vincennes stop. The Hotel is under Management of our friend Edward Watson, who makes all his guests comfortable. The cuisine is excellent and rooms cheery and well furnished.

California Will Gain Ground

One million acres! An area larger than the State of Rhode Island—quite a block of land, isn't it? And it means a fortune in valuation of at least $24.000,000. Such is the territory involved and such the estimate of cost to entirely reclaim the lands aujacent to the Sacramento and San Joaquin rivers in California, more or less subject to annual overflow. At the same time the work will render the Sacramento navigable to deep water craft. This vast territory includes a great area now useless except during the late summer and fall months for grazing purposes, but which once freed of the menace of overflow will yield abundant and certain crops. Add to this, the land along the river banks, and the river islands, varying in size from 1600 to 43,000 acres, than which there is no more wonderfully productive land in the world, and we have a principality in itself capable of supporting a population scores of times greater than is now scattered over it. The value of this work may be judged from the fact that much of this river bank and island is paying good interest on a valuation of from $300 to $500 per acre, frequently bringing $25 to $30 a year cash rental.—G. K. Swingle, in Sunset Magazine for October.

Forests Inexhaustible?

The people of Michigan who thirty years ago thought they had an "inexhaustible" supply of timber, are to-day shingling their houses with shingles from the Pacific coast, finishing the interior of their homes with Georgia pine, and getting their moldings from California. The oak for their chairs and tables comes from Mississippi. Incidently, they are paying $250 a carload for the freight on the lumber they import from other States.—Allen L. Benson, in Appleton's Magazine.

California Plants

A new work on California botany, by Charles Russell Orcutt, editor of the West America Scientist, of San Diego, Cal., is announced. The title is "California Plants," and it is being issued in parts—each containing descriptions of about one hundred species of the native trees and flowers. The price is $3 for 12 numbers. Four parts are now in press and the first volume of 12 parts will be completed, it is hoped, during 1907.

The American Lumberman

EDITORIAL IN ISSUE OF NOV. 3RD

"Miss Santa Fe Railroad, after a summer engagement with J. Catalpa Speciosa Brown, now is reported to be flirting with Eucalypti. This shows inconsistency, but then possibly Catalpa Speciosa did not make good. The railroad company has made arrangements to plant 16,000 Eucalyptus trees in southern California. This probably is the fastest growing tree in the world. Whether the rate of growth will prove satisfactory to the railroads remains to be seen. The Eucalyptus is said to have been used for ties largely in Australia for twenty-five years. Based on results secured in that far-away country, the experiment is being made."

For the information of these I will state that Miss Santa Fe has not taken any interest in Catalpa Speciosa during the existence of the present management and certainly has not flirted with the editor of ARBORICULTURE.

Thirty-five years ago S. T. Kelsey planted several groves of various forest trees in Kansas for the Santa Fe under a former management, and although they have been greatly—yes, totally neglected, the Catalpa Speciosa is making an excellent showing in these groves. We have made several efforts to obtain some information regarding the story going the rounds of the press, in which this railway was preparing to plant an enormous area with Eucalyptus, but have been unable to secure any confirmation.

It is extremely unfortunate that but a very limited area of the United States—southern California and part of Arizona—are suited to the growth of tropical trees such as the Eucalypti.

Of the 300 varieties composing this family of trees, only a few have been thoroughly tested in the United States. The well-known blue gum, Eucalyptus globulis, the most numerous of these trees in California, is not durable in contact with the soil, while some varieties supposed to be suited to tie making are of remarkably slow growth.

We have repeatedly advocated the planting of the Eucalypts, and hope the Santa Fe will make this experiment for the benefit of the whole country.

Along these lines we append an extract from a private letter from a gentleman who is well informed upon the subject.

"OFFICE OF THE CONSERVATOR OF FORESTS
"CAPE TOWN, SOUTH AFRICA,
"OCT. 16, 1906.

"The points to be remembered about introducing Eucalypts to California are these:

"The Californian coast region where the Eucalypts grow has a purely winter rainfall, and to fit these conditions, the Eucalypts climatically suited are those from West Australia, from South Australia and from Victoria, as far east as Melbourne. Between Melbourne and Sydney you get into a range of country where there are most of the finest timber Eucalypts, many of which may be grown in California, but where the rainfall, being pretty well distributed throughout the year, gives some little climatic risk for the Californian coast. However, it will be sufficient to remember that for Eucalypts coming from the area between Melbourne and Sydney, localities where there is subsoil moisture in summer should be selected.

"The best Eucalypts are the two Ironbarks—Eucalyptus paniculata and E. sideroxylon—and such choice timber Eucalypts as E. microcorys, E. pilularis and E. resinifera.

"The dry-country Eucalypts depend so much on subsoil moisture that rainfall distribution does not much matter.

"Signed, E. HUTCHINS."

Poplar for Wood Pulp

(REPLY TO A WISCONSIN CORRESPONDENT)

CONNERSVILLE, IND., Aug. 17, 1906.

EVERGREEN NURSERY CO.,
STURGEON BAY, WIS.

GENTLEMEN:—A dozen years ago at the time of the great furore accompanying the extensive introduction of the Carolina Poplar, as a new and valuable shade tree, I opened correspondence with Mr. Wm. Sanders, one of the most eminent Scotch gardeners in charge of the parks and grounds at Washington, D. C., and with hundreds upon hundreds of other botanists and specialists among my acquaintances. It was the unanimous verdict that Carolina Poplar was nearly a sport from a cottonwood, Populus Monilifera, sometimes called deltoides, from the shape of the leaf. It was also agreed that the tree possessed but one advantage, that of non seed bearing. That it possessed all of the bad qualities of the cottonwood, including more than one hundred insect enemies and more than one hundred and fifty fungoid diseases. My object then was to attempt to prevent its so extensive planting on American streets, as it was at the expense of all other good trees. Oaks, Maples and a host of fine trees were totally ignored by the American public while planting this very worthless cottonwood. While young the tree possesses vigor to make rapid progress in almost every location, notwithstanding the continuous attack of the innumerable insects and fungus diseases.

As the tree increases in age it loses that vitality and is gradually overcome by its numerous enemies.

In the cities the roots of the cottonwood penetrate the sewers, there finding rich feed, pushing these roots farther and farther into the sewers, choking them entirely. It often finds its way into walls, springs and even cemented cisterns, destroying their usefulness. You will please note that in all of my writings I make plain distinction between trees for shade and ornament and those for forest purposes. And therefore I advocate the planting of this tree in close forests, principally for paper stock, since the growth is perfected for paper before the gradual destruction by insect and disease. Under no circumstances should the Carolina poplar exceed twelve inches in diameter before being cut for use. It decreases in value thereafter.

IN REGARD TO THE CATALPA

For fifty years seedsmen and nurserymen in the United States have distributed the Catalpa in vast numbers throughout the United States and in Europe. Out of every one hundred of these trees ninety-nine are the Southern bignonoides or some of its hybrids.

It is evident from your letters that you have been a recipient of these Southern trees. The thin scaly bark, small flowers, tender shoots, killing back more or less each year, will be found in great contrast with speciosa, the bark of which registers the age of the tree, the same as the annual circles of growth in the wood. Thick, rough, ridged bark adhering year after year characterizes this hardy tree.

In the past few years I have distributed gratuitous five thousand dollars worth of catalpa speciosa trees. These have gone to the far north and to Mexico and all over the world. In the course of time the world will learn the value of this tree. But all of this you will find in "Practical Arboriculture," thoroughly treated.

Preserving Our Forests

One of the most hopeful signs of the times is the changing attitude of the lumbermen toward the science of forestry as fostered by the federal government. They are beginning to see that their industry is doomed to an early extinction unless the wastage is checked and the forest is renewed for future generations. And, more than this, unless the forests are preserved, vast tracts of fertile and prosperous America will become desert in the next century. This is a lesson taught by such countries as Tunis, now a part of the African desert, which in old times was a smiling and populous garden. An Arab chronicler relates that "in those days one could walk from Tunis to Tripoli in the shade." The Arab conquest destroyed the forest, and the desert swept over the face of the land.

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The Christmas Delineator

The December DELINEATOR is a typical Christmas number. It is sufficiently premature to assist Christmas-makers with its hints for Christmas gifts and holiday entertainments, besides containing an abundance of seasonable literature calculated to fit in from now until New Year's Day. Maud Ballington Booth contributes a most touching description of the work of the volunteers, "Christmas Sunshine in the Shadows." Christmas stories for adults are "The Evergreen Tree" by Marion Ames Taggart, and "The Shoplifter at Satterthwaite's," by William Hamilton Osborne, and those for children, "The Blue Kimono," by Virginia Woodward Cloud, and "Betty Evolves a Christmas Idea," by Elizabeth Preston Badger. Agnes and Egerton Castle's romance, "A Young Conspiracy," and Anthony Hope's short story, "The Duke's Allotment," seem especially suitable for reading on winter evenings. But the crown of the Christmas literature is Edwin Markham's splendid poem, entitled "The Great Guest Comes." It is illustrated in colors by J. C. Leyendecker. The serial stories, "Fraulein Schmidt and Mr. Anstruther," by the Countess von Arnhim, and "The Chauffeur and the Chaperon," by the Williamsons, are continued, while Barry Pain's "The Diary of a Baby" is concluded. Essays for every-day are, "The Slavery of Superstition," by Lilian Bell, "Eliminating Non-essentials," by Lida Churchill, and "Pulling Together Through a Crisis" by William George Jordan. David Belasco contributes a most interesting description of "Making the Play Seem Real."

The usual amount of space is devoted to up-to-date fashions in garments and millinery, and practical papers and departments for housekeepers.

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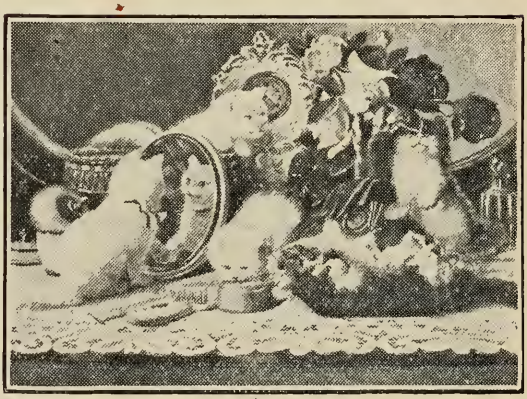
Largest Pecan Grove

Is Located Near Charleston and Consists of 600 Acres

Maj. John S. Horibeck, near here, is harvesting his pecan crop. It is the largest grove in the world, consisting of 600 acres of nut-bearing trees. The main grove consists of 550 acres. In one lot are 10,000 trees which are just beginning to return a good yield on the money invested in the enterprise, although they are now fifteen years old.

The American public has developed a considerable taste for the pecan nut, and fine ones bring a good price. Maj. Horibeck concluded many years ago that there was money in raising these nuts, and his present splendid grove is evidence of the faith that is in him.

Last season he shipped ten tons of fine nuts in one lot and found ready demand for them at excellent prices.—Charleston, S. C., Nov. 20, 1906.

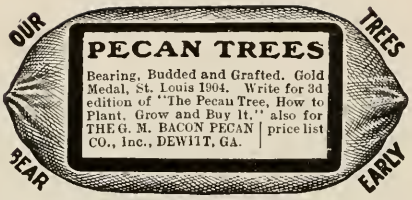


FARM AND HOME

The Old Plane Tree of Cos

In the Island of Cos, on the Egean Sea, there stands, jealously guarded, a huge plane tree measuring nearly eighteen yards in circumference. It is surrounded by a podium, or raised platform, breast high, doubtless built to support the trunk of the tree after it had become hollow and weak from age. The lower branches are still well preserved and have been shored up by pieces of antique columns, over the upper ends of which the branches have grown like caps in consequence of the pressure of their own weight.

Close by the tree is a solid marble seat, which is said to be the chair of Hippocrates, the father of medicine, and it is supposed that he taught the art of healing from that seat. He was born at Cos 460 B. C. This gives a clew to the age of the celebrated plane tree, which must be considerably more than 2,000 years old.—London Times.



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There are ways and ways—one of them is to sell out, gather up all the money you can, and go West and homestead. This can be done, but there is this fact to remember: Nearly all the best places are taken. One can find any amount of raw land remote from railroads, schools, and churches, out of the world and away back where, in the course of time, civilization may penetrate. But there's a better way than all that. It is to buy a farm in the Southwest, along the Santa Fe, and start in with all the advantages you left behind, and more.

You can buy that sort of a place at from $10 an acre to many times that amount. The difference in price depends on nearness to towns, railroads, the state of cultivation, and all that sort of thing. But a better farm, so far as fertility of the soil and productiveness are concerned, may be had for $10 an acre than you could get anywhere back East for $50 an acre.

Here's a further fact: It may seem remarkable, but it is a fact, that the first crop will often pay for the land. It has occurred in thousands of instances, and will occur again.

Where is all this to be done? That's where we come in, willing and ready to help you. You ought to have detailed information, and we will send it to you for the asking. Down in Southern and Southwestern Kansas a $10-an-acre farm is waiting for you, and it is probably better than the one you leave behind, owned by the landlord.

It is not for us to discriminate between sections, but this is undoubtedly true of Southwestern Kansas. Over the line in Oklahoma and Texas the same thing can be done, with the stock-raising idea more prominent. Down in the Pecos Valley, in New Mexico, it is an irrigation proposition, and vegetation of all kinds simply runs riot in its profusion—and people are going there by the carloads. While land is high priced there, you don't need much of it. You couldn't farm a hundred acres, not if somebody gave it to you. Forty acres would be plenty. In Southwest Kansas, with a good team, you can farm 160 acres, but in an irrigation country you can not do this. Everything is intensive and concentrated where water is required. In Arizona the conditions are much the same, and so all along the Sante Fe until you come to California, where everything is different.

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Arboriculture

VOL. VI NO. 1

A Journal of the Forests

Evils of the Lumber Trust

JANUARY

Connersville, Indiana, January, 1907

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Photo, AUGUST WOLF.

ARBORICULTURE

A BI-MONTHLY MAGAZINE

Published in the Interest of the International Society of Arboriculture.

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VOL. VI. CONNERSVILLE, INDIANA, JANUARY, 1907. NUMBER 1.

The Great Lumber Trust of America.

LIBRARY NEW YORK BOTANICAL GARDEN

THE GREAT LUMBER TRUST OF AMERICA.

That there is a lumber trust in the United States is true beyond a question, and that it is the greatest of all trusts can scarcely be doubted.

The Cosmopolitan Magazine contians a remarkable article from the pen of Charles P. Norcross which relates so much of history that it demands the attention of the American public and an investigation by Congress.

The article is headed **Weyerhaeuser Richer than John D. Rockefeller,** and shows how one man, an alien, in fifty years has become possessed of a hundred thousand square miles of the best timber land of the United States, and is cutting the timber as fast as more than a score of the largest sawmills in the world, working night and day, can convert the trees into lumber.

We extract from the "Cosmopolitan" some of the statements:

"Weyerhaeuser's wealth and opportunity grew out of a national crime. One of the most wanton wrongs ever committed in this country has been the spendthrift waste of forests." "It was only recently that the nation awoke to the vandalism that has been going on unhindered for years." "Weyerhaeuser, born in a land where forestry is an exact science, realized that the methods in vogue, left unchecked, would in time exhaust even the prodigal wealth of the land and bring on a timber famine that would cause forest lands to appreciate in value." "The question naturally arises as to how much timber land Weyerhaeuser owns. He won't tell and even his closest lieutenants admit that they can only speculate.

There are fifty thousand square miles of timber land in the state of Washington alone—thirty-two million acres."

"In the territory around Wisconsin, Minnesota and the Mississippi River district he has reigned for years undisputed. It is estimated by those who have studied Weyerhaeuser's wide spread business interests that fully thirty million acres of timber land are under his control—fifty thousand square miles, an area six times as large as the state of New Jersey."

"Weyerhaeuser is of German birth. Born at Neidersaulheim in southern Germany in 1834, he tilled the vineyard on the farm until eighteen years of age. In 1852 he decided to emigrate to America." "Was in 1872 that Weyerhaeuser began to branch out and started in to create the indefinite all-powerful organization which has be-

FEB 6 - 1907

come known as the Weyerhaeuser syndicate." Weyerhaeuser was elected president of the Mississippi River Boom and Logging Company. "Some of the powerful companies under his control may be named as follows: Atwood Lumber Company, Rutledge Lumber Company, Mississippi River Logging Company, Northland Pine Company, Pine Tree Lumber Company, Chippewa Valley Logging Company, Musser-Sauntry Company, Weyerhaeuser and Denckman, Colquet Lumber Company, North Wisconsin Lumber Company, Bonner's Ferry Lumber Company, Superior Timber Company."

Unquestionably the frauds perpetrated upon the nation by the great lumber corporations are appalling and call for their condemnation by all good citizens.

However, since the title to these immense tracts of timber land have passed from the nation to the various lumber corporations and, on account of the indifference of our people and of the statesmen who control legislative affairs, have become legal transfers, it is in most cases too late to be remedied.

Still there is a power in Congress, if Congress will only act, which can prevent the utter destruction of the remaining forests and make them perpetual.

It is not the policy of Arboriculture to deal with personalities but rather to appeal for an improvement in methods of lumbering and the restriction of annual output of the great mills in order that the forests may be perpetuated, and that this Nation shall not be cursed as are those countries which destroyed their forests.

National Legislation.

It is fully realized how almost hopeless is the prospect of securing efficient legislation where Corporate power, such as exists within the great lumber trusts of America possessed of vast wealth dominates legislative bodies and even the policy of the government.

The old world has learned centuries ago that forests are essential to the prosperity and well being of the people, and have enacted wise laws for the government of private owners of forest lands as well as the forests belonging to the Nation.

Duty of This Nation.

The adoption of National laws governing the remaining forests of the country.

The Reservation of all lands upon which timber is growing, that yet remain unsold, the trees to be sold under direction of the government.

Prohibiting the transportation of lumber and timbers from one state to another where these regulations are not complied with.

Removal of all duties on timber.

Restricting the output of every quarter section of forest, to make the forests perpetual.

Requiring the systematic planting of trees where necessary to maintain a perpetual forest.

SEVERAL REASONS FOR CONGRESSIONAL ACTION FOR THE CONTROL OF FOREST PROPERTY.

(1) The influence which forests exert on precipitation.

(2) The influence upon water storage; refrigeration being the best means of retaining water in the mountain valleys.

(3) Effects of forests upon wind movement.

(4) Disastrous effects of floods and added costs of levee system caused by forest destruction.

(5) Menace to river navigation from droughts caused by too rapid melting of snow because of removal of protecting woodlands.

(6) The future supply of timber for this nation depends upon the conservation of the remaining forests.

(7) Transportation between the states will be greatly injured by the sudden removal of the forests.

(8.) No appreciable effects occur within the state in which forests are located to compare with the damage done in other states, often far removed.

(9) On account of local corporate power, individual states are unable or unwilling to control the trust.

(10) National interstate legislation is the only remedy.

(11) The recent ruling of the supreme court in the case of the state of Kansas vs. Colorado, regarding irrigating waters, is applicable to this subject, id. est., forest influences.

(12) The abandonment of many thousand square miles of former forest areas by lumbermen, after removing all the timber, forces the worthless remaining land upon the state, which can realize no income from it, but must maintain it at great expense to the people.

(13) The loss to the nation from the existence of so large an area of nontaxable, barren property.

(14) Necessity of importing from abroad the timber required after removal of our forests.

(15) The greatest curse possible is a treeless nation.

Navigable rivers flowing through many states have their volumes increased immoderately, at times, and are again shrunken so as to obstruct navigation, from the rapid melting of the ice and snow upon the mountains in far distant states, which has been caused by the removal of the forests upon these mountains and valleys. For this the injured localities have no recourse except by National legislation.

River and Harbor improvement are increasing annually because there are no forests to retard the flow of water, while the levees of many states have frequent crevasses and must be maintained at great expense from the same cause. Yet no state is afflicted by the injuries caused within its borders, and cannot alone control the cause which exists in another commonwealth.

Under existing circumstances it is impossible to induce great lumbering corporations to adopt conservative methods in their operations, the cream is skimmed from the property, immense waste occurs, the continuation of the forests being farthest from their aims.

Under these conditions the land is being rapidly denuded of all that gives it value, the time rapidly approaching when the entire forest area will disappear.

The rocky, mountainous lands thus stripped of the timber will be thrown back upon the nation, or state in which they are situated, the soil soon eroded, leaving the property valueless for taxation and productive of no income for the support of the nation.

These are ample reasons for stringent restrictive laws under which the forests may continue productive to the country.

THE POLICY OF FOREST RESERVES.

Senator Hepburn, of Idaho, is making a determined assault upon the President's policy of establishing Forest Reserves.

In a recent address at Spokane, Washington, he said:

"I purpose to urge the adoption of my bill, introduced at the last session, when the next Congress convenes. This is designed to take out of the hands of the president the right to establish any more forest reserves. No one in Idaho indorses the administration's forest reserve policy, as applied in our state."

A correspondent in Spokane, in a letter to **Arboriculture**, says:

"The creation of four new forest reserves in Northern Idaho and the extention of two others, adding to the reserve area of that state 7,406,556

acres and the recent addition of more than 800,000 acres of forest land in Stevens county, Washington, is looked upon by the people of the northwest as exemplifying the administration's disregard for the protests of Senator Hepburn and others.

The contention of the forestry department is that the trees are necessary to conserve the water and timber supply to the great mining industry in the Coeur d'Alene country, since the Coeur d'Alene river finds its source in the wilds of northern Idaho, where the Shoshone reserve has been created in connection with the Coeur d'Alene reservation, adjoining it on the north, and to others to be known as the Coeur d'Alene reserve. Their aggregate area is 2,250,000 acres. They are in Shoshone and Kootenai counties and extend northward to the middle of Lake Pend d'Oreille. The Lemhi reserve embraces 1,346,460 acres and is in three strips adjoining the Montana line, while 165,240 acres of timber lands have been set in the extreme northeastern part of Idaho on the British Columbia and Montana lines, a small segment of the reserve being in Montana. The Salmon river reserve in Lemhi and Custer counties embrace 2,201,120 acres, the entire area between Salmon river and the middle fork of that stream. The Raft River reserve, in Cassia and Oneida counties, embraces 291,976 acres and additions aggregating 1,371,760 acres, have been been made in Sawtooth reserve.

Timbermen say there is little foundation for the contention that there is danger of the forests being denuded at the present rate of cutting. It is estimated there is more than 700,000,000,000 feet of standing timber in northwestern states and at the present rate of cutting, it will take 350 years to utilize the merchantable trees."

I have personally talked with quite a number of Idaho citizens recently, some engaged in mining and others in ranching, all of whom fully endorse the Forest Reserve policy.

I am creditably informed that the opposition comes from lumber companies who are grabbing the forests and are cutting the timber which is greatly needed for the future use of the mines and for the protection of the water supply.

No intelligent person would for an instant consider our correspondent's statement of the centuries which the timber of the northwest will last.

Instead of 350 years, it will be practically used up in less than twenty-five years.

There are large and influential corporations as well as numerous individuals who have no regard to the interests of others, so long as they can make large sums of money from the destruction of our forests. Such corporations have for many years dominated Congress, elected senators and controlled legislatures.

It is full time the government should assert the rights of this people and those who are to come after us.

With but a trifle of America's magnificent forests remaining, the duty of Congress is to withdraw every acre of timberland still held by the government from public sale.

This should be held as a sacred trust to be forever retained, only removing such trees as can be spared and those which have exceeded their allotted age, carefully reserving all young trees and those which will continue to grow into valuable lumber.

To which should be added a more efficient system of forest planting by the government, seeding the bare spots with trees suited to the locality.

All the interests of this nation demand the perpetuation of the remaining fore ts, agriculture, the mines, navigation, commerce, the builders' trades, all will require timber twenty, fifty and a hundred years hence as urgently as we of the present generation, and the greed of the lumber operators must not be permitted to devastate the forests which are still owned by the government.

IOWA TIMBER TREES.

In the western portion of Iowa there are considerable bodies of inferior timber upon some of the higher hills and some narrow fringes along the streams.

How certain tracts of wood lands occur in prairie regions, or rather why such areas are prairie, is frequently asked. The only reply which can be made is—fire.

The Indians who annually burned the country over, primarily to drive the game into ambush, thus destroyed the young timber and prevented the formation of forests. Along the moist valleys, borders of streams and marshy tracts, the dead grass was moist enough to check the advance of the flames, while upon rocky hillsides poorer tracts, high rolling prairies and on favorite feeding grounds of the buffalo, where the grass was kept cropped very close or naturally made little growth, the fires were not of sufficient heat to destroy the brush, and here timber has grown.

Trees Not Valuable.

About Red Oak and over much of Western Iowa the trees are very short-bodied and low in stature. While the effect of constant winds is to induce low, stubby growths, still this is by no means the only cause of Iowa's inferior timber growth. Much of this timber is post oak, a semi-dwarf variety which under no condition would equal the red oak of the Middle States in magnitude of tree. Accident caused the distribution of acorns which can only produce small trees. At the same time the abundance of willows and cottonwood is due to the small, downy seeds which are produced in such immense numbers and are blown by the winds to every portion of the west. Only the seeds which alight in moist lands can take root—all others perish.

The average hight of trees here is but thirty to forty-five feet, few attaining to more than forty feet, and trunks ten to eighteen feet only, and these not of large size.

Remedy.

If the farmers of Iowa, Nebraska and other prairie states would plant seeds, nuts or trees of large-growing trees and give them proper protection, cultivating the young trees until they have become established, then the character of this timber may become immensely improved.

Compared with Mountains of Kentucky.

The rough mountains of Eastern Kentucky and East Tennessee are not very dissimilar in soil to that of the western portion of Iowa, a reddish clay, with more or less stone contained. The rain fall is no greater and most of the water runs off, so that the soil does not absorb as much as does that of Iowa. The elevation being greater, offsets the climatic difference and temperature. Yet the white oak, chestnut oak, true red oaks, tulip trees, cedar, etc., are of normal hight 80 to 120 feet, and of ample size for profitable milling.

The only explanation of the difference in the timbers is the accidental dropping of dwarf-growing oak, etc., in Iowa.

Legislation.

If the legislative bodies of the various prairie states will give proper encouragement to the land owners by reduction of taxation upon timber lands and aid by distribution of seeds and through the experiment stations and Agricultural colleges, give to the people suitable instructions and literature, very much good may be accomplished for the states.

Timber growth in eastern Iowa is of entirely different character and much larger trees.

In the middle states the hight of trees formerly ranged from one hundred to a hundred and fifty-feet, with diameter from three to seven feet. The trees remaining are the cullings and are less imposing. There is no good reason for trees being of low stature other than that given.

CAPTIVE TIMBER LINE, MOUNT SHASTA, CALIFORNIA.

Timber Line on Mt. Shasta.

Special for Arboriculture by Mrs. Stephen A. Jones, San Jose, Calif.

One of the noblest mountains in California is the regal peak, Mt. Shasta, which "lords all cloudland" near the northern boundary line of the state. Nearly fifteen thousand feet high, and rising far above all the neighboring summits, it is visible for hundreds of miles and wears forever the ermine of a royal race.

"Far off, the old snows, ever new,
With silver edges cleave the blue,
Alone, aloft, divine."

Much might be written of its geologic past, and of the place it holds in the history and literature of California, but my purpose in this sketch is to give a brief account of our climb to timber line upon its mighty flank.

Early in the morning of a mid-summer day, three of us left our camp at its base and set our faces mountainward. We had two wiry horses, good mountain climbers, provided with Mexican saddles. By changing frequently, now walking, now riding, we relieved each other, so that no one was on foot very long. The first few miles of the way was over a gently ascending stretch of country, covered with chaparral.

A dense forest of sugar and yellow pine once stood here, but it was cut off more than twenty years ago, and only huge stumps now mark its location.

The pulverized soil was dry and light as ashes, for, with the ancient forests vanished also the springs and running streams, while the dust rose at every step.

At the base of the mountain we struck an old logging road, and followed it as it wound through a scattering growth of pine and fir trees, the largest timber having been cut out years before, when the region below was denuded by lumbermen.

After a mile or more, the climb grew steeper, the road ended in a narrow trail which wound over rocks and fallen logs, and through underbrush so dense that we often lost sight of one another when only a little way apart.

Our horses were good travelers and picked their way carefully; when in doubt as to the trail we gave them loose rein, and they always found the right path. Not many travelers go up Mt. Shasta and the trail is dimly defined, being only marked by hoof prints here and there. It was hard climbing, and to the one toiling along on foot, it was a welcome sight to see, around a bend, the bay horse or the buckskin, with its bridle hitched over a bush and its saddle empty.

We stopped often to breathe our horses and to look back, when the view was clear, upon the world below. The far off plain, where stood the homes and haunts of men sank and sank, while beyond it, to the west, mountains rose and rose, new ranges coming into view, one behind another, the nearer ones distinctly wooded, the farther ones blue, violet, amethyst, until they melted into the sky.

Mt. Eddy seemed to rise with us, and Castle Crags stood up in prominence, but we looked down on a host of lesser peaks. We came to virgin forest, where neither ax nor fire had marred the stately, thick-growing ranks of trees. The ground here was clear of underbrush, and we could see down the long vistas of dark-green firs; the pines had ceased, perhaps had reached their limit.

We had gained the true wilderness, and already breathed that tranquility and peace which nature has in store for those who love her.

Little patches of snow were lying in sheltered spots, not light and flaky, like new-fallen snow, but granulated, hard packed, with twigs and cones scattered over its surface and sinking into it. The edges of these patches were melting, and tiny streams issuing from them, sank into the porous soil.

After climbing for four hours we reached an open space, bare of trees, about half a mile long and nearly as wide. This is called Horse Camp, and is so named because parties who come up from below, with a view to ascending the summit of the mountain, leave their horses here while they climb the rest of the way on foot. This was as far as we intended to go.

Much of the way on our upward journey we had been in woods so thick that we had obtained only occasional glimpses of the summit of Mt. Shasta. Now it stood out before us in startling distinctness, nearer at hand, but still towering far above us, barren, bleak, with great fields of dazzling snow, white in the midday sunshine, outlined against the cloudless azure of the sky.

In the open level of Horse Camp were wild flowers, short of stem and growing close to the ground, all unlike those we had left so far below. We had climbed from summer up to spring, and these were the flowers of a higher altitude, another season. There were great patches of Alpine phlox, blooming in such dense masses that they resembled mats of delicate blue and lavender stretched upon the sandy soil. There were tiny red flowers, and there were yellow violets. We thought at once of Bryant's poem on "The Yellow Violet;"

> "And I have seen thee blossoming
> Beside the snow bank's edges cold."

We were nearly ten thousand feet above the sea, and miles of snow fields stretched around us, but it was warm in the sunshine, and flies, like ordinary house flies, settled thickly upon the crumbs of lunch we threw away.

On the farther side of Horse Camp, on a ridge where the fir trees made their last stand, we unsaddled our weary horses and sat down to rest.

We were at timber line, but contrary to our expectation, the trees did not dwindle to mere shrubs; up to the very last they were sturdy and vigorous and of average size. They ceased their upward march with dignity and stood like an advance column, awaiting further orders. We were impressed by the resemblance to an army advancing to scale a height. Here, on the left flank, whole regiments supporting each other in dense ranks, were marching vigorously to the attack; there, to the right, was a reconnoitering party, following each other in single file up the ridge, while farther away, out of a little canon, peered the head of a solitary scout.

And what is old Shasta doing while these combined assaults are being made on its stronghold? It has a way to repel invaders, it has means of defense, all its own, and cares little for the details of this battle above the clouds.

Let me show you its artillery: Look at this avalanche, three hundred feet wide and fifty deep, with soil scattered over its surface, and a terminal moraine of uprooted and broken trees. It has come down recently, for the trees, some of them two feet through where their trunks are broken are yet green, their branches yet unwithered.

That tells the story of attack and repulse; the trees climbed upward for many years, the avalanche swept them down in a few seconds. Trees, as well as men, can make a gallant stand, can lead a forlorn hope, can plant themselves in the "imminent deadly breach."

In sheltered vales and sunny glades, as they stand thickly, protecting each other, they are like society; but up here on the wind-swept ridges of the mountain, with storms around them and avalanches ready to fall upon them, they are like heroes.

SHALL THIS NATION BECOME A MONARCHY?

Arboriculture is in receipt of a communication, with platform of the Roosevelt Third Term National League, as follows:

"We, the members of the Roosevelt Third Term National League, having at heart the great social and political problems now confronting the people, and in order that the rights of the masses be protected and that national harmony be preserved, deem it imperative that Theodore Roosevelt be re-elected to the Presidency in 1908. Etc. etc."

The editor of this journal, a life-long republican, and a veteran of the Civil War, strongly opposed the nomination of General U. S. Grant for a third term, although the notable 302 delegates upheld him during the entire convention.

For the same reasons we shall always oppose the nomination and election of Mr. Roosevelt, or any other person who has held two terms as president, for a nomination or election for the third term.

This unwritten law of the land must be maintained in order that the United States shall not become a Monarchy.

If a president can continue his office for three terms, he can force the politicians to perpetuate his official life.

The appointive power of the president, increasing each year, is far too great, and has become a menace to this nation.

With this power he commands Congress, controls politicians, who in turn have vast powers in every political ward of each state, city and hamlet.

"The King can do no wrong" is the cry of his office-holding supporters, and measures which he advances are proclaimed by all adherents to be the will of the people.

It is an insult to American patriotism and American statesmanship, for a clique of office-holding politicians, or those who expect by this course to receive official patronage, to assert that General U. S. Grant was, or that Theodore Roosevelt is, the only man out of Eighty Millions of population, who is capable of filling the office of president.

With the recurrence of each session of Congress more offices are created, and greater power given the chief executive, which now far exceeds the power of any monarch throughout the civilized world.

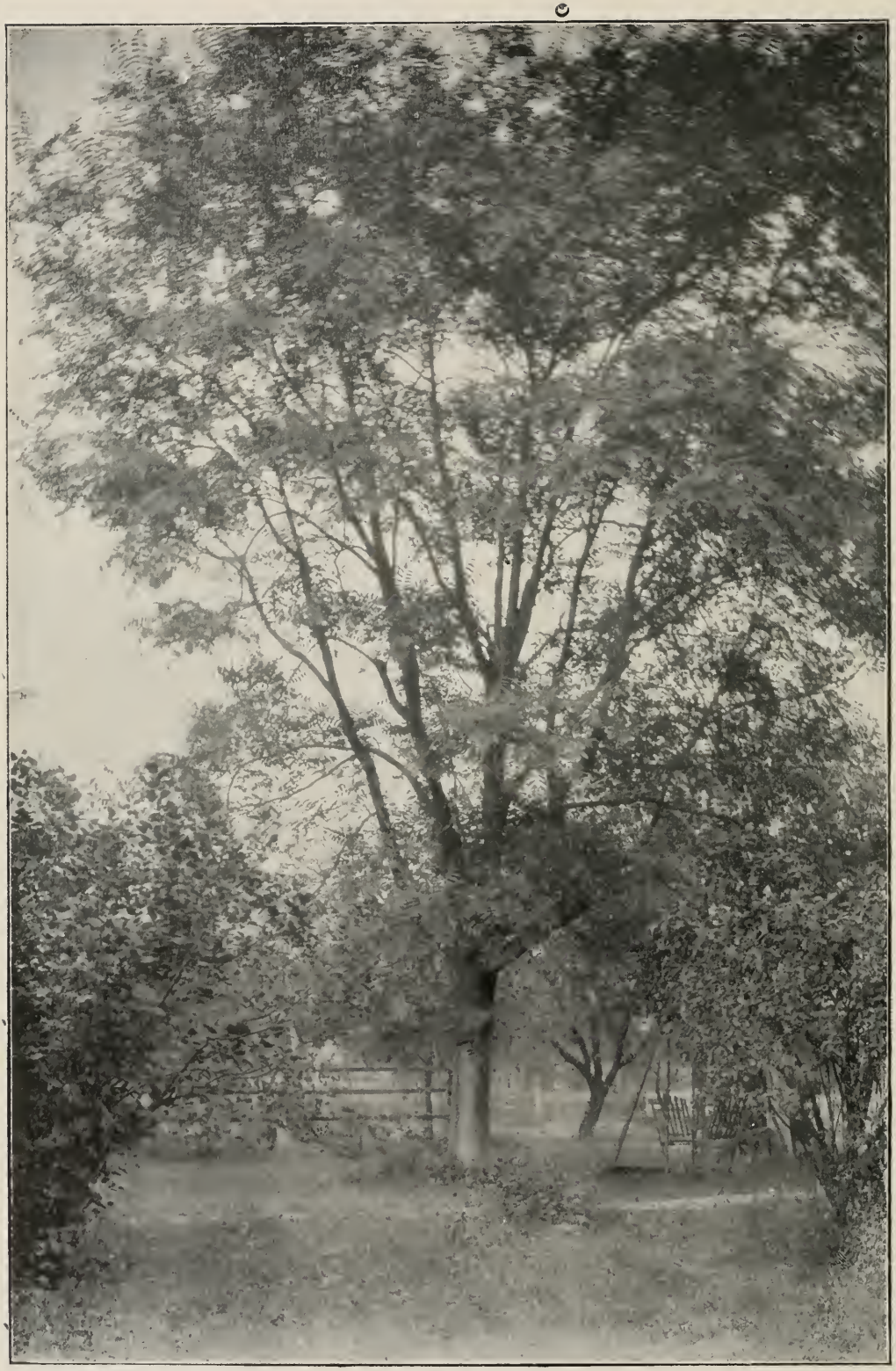
The president's authority should be curtailed, and his rule limited to one term, which should be extended to six years. Otherwise, we may anticipate a monarchial government and the rule of an emperor. By the votes of officials who are directly under the president's appointment, and the influence they exert in convention, it is now almost impossible to secure the nomination of any opponent of the president in power.

This is not a partisan view, but will be the case under the administration of either of the political parties.

PETRIFIED FOREST RESERVED.

Order of President Roosevelt Made Public at Los Angeles.

Los Angeles, Cal., Jan. 5.—Copies of President Roosevelt's proclamation setting aside thirty sections of land and the petrified forests of Gila and Apache counties, Arizona, as the "petrified forest national monument," have been received here. The Proclamation, which is based upon an act of Congress of June 8, 1906, declares that the Mesozoic forests, commonly known as the "petrified forests," are of the greatest scientific interest and value and it appears that the public good would be promoted by the reserving of those deposits of fossilized wood as a national monument, with as much land as may be necessary for the proper protection thereof.



THE AILANTHUS TREE.

The Ailanthus Tree.

Among the several forest and shade trees imported from Asia, the Ailanthus, at the present time offers to America greater inducements for its culture than other exotic forest trees.

The terribly disagreeable odor from the staminate flowers, sickening in the extreme, condems the Ailanthus as a shade tree for the home garden or in the proximity to human dwellings, and for this reason it should be outlawed in every city and hamlet of the land.

But we discuss the tree from the forest standpoint, their value for lumber, for fuel, for manufacturing purposes, and not solely their qualifications for shade, odor or beauty.

Thirty years ago I urged the planting of the Ailanthus upon the plains and prairies of the west, where this trees has since proven amply successful to warrant its extensive cultivation.

Dr. Asa Gray says of it: "**Ailanthus glandulosus,** Dest., the only species known here, from China, is a common shade tree, tall, of rapid growth, with hard wood, very long pinnate leaves."

I exhibited at the St. Louis Fair a pannel veneered with Ailanthus veneer which attracted much attention and from the special request of an author of note it was sent to Europe.

The wood is quite hard, remarkably so for so rapidly growing a tree. The grain very much resembles a beautiful specimen of White Ash.

As a lumber tree it would surpass the Ash in rank, while the wood can be produced in one-third the time of the Ash, which is a valuable asset as we so rapidly approach the treeless age.

The Ailanthus resembles a tropical tree from the graceful appearance of its foliage, while it is of tropical origin.

On account of this tree having only been planted for shade, and at considerable distance between trees, it usually forms a head quite low, with too short a trunk to possess a lumber value; this may be overcome by closer planting or by pruning away side branches.

As a village tree its numerous suckers condemn it, while under forest conditions this suckering propensity would be an advantage.

The Ailanthus seeds very freely and plants may be grown either from seed or suckers, or from cuttings of the roots.

A gentleman usually very observant and well informed told me recently of a Kentucky farmer who had used Ailanthus fence posts and recommended them. While I have been of the impression that the wood was of little durability in contact with the soil, yet I am unable to either confirm or deny this statement. If others have had experience in this matter **Arboriculture** will be glad to have the information.

The hardiness of the Ailanthus, its very extensive distribution, great abundance of seed, ease of propagation, hardness of wood, beauty of grain, ability to withstand drouth, give this tree a very large list of excellent qualifications.

It has few insect enemies, is not subject to serious disease, and should receive the attention of forest planters in all portions of the United States and of the world at large.

Rough hill and mountain lands and semi arid sands will produce Ailanthus trees in abundance in a brief period of time.

The Ailanthus as a Nurse Tree.

There are many of our finer foliaged trees, and especially the Conifers, which do not transplant readily into new soils and make satisfactory progress without the protection of some shade. Nurserymen grow evergreen seedlings under screens which are sometimes made of lath. In a forest, this would be impractical, on account of great area to be protected.

The hardy, rapid-growing Ailanthus meets this requirement perfectly, cuttings of the roots may be had in unlimited quantities, and planted in tolerably close rows, say six feet apart, would in two or three years be of sufficient size to completely shade and protect intermediate rows of small evergreens.

Not only would the Ailanthus protect them from the summer sun and the wintry blasts, but the abundant foliage, falling to the ground would supply a much-needed mulch, and decaying, enrich the soil for the weaker confers.

This is especially important in the sandy, semi-arid districts in western Kansas, Nebraska, Colorado, Wyoming and Texas.

Farmers and ranch owners in the western states, particularly those whose lands are sandy and where water for irrigation is not over abundant may, with a very small quantity of water, keep the Ailanthus growing and under its protection secure a forest of more important or more desirable trees.

In the Moluccas, which are almost under the equator, the Ailanthus becomes a tall tree with long, straight trunk, because of its environments, growing in close forest, and although the tree is thus of tropic origin, long cultivation in far northern localities in Asia, Europe and America, it has ceased to require a hot climate and has adapted itself to conditions existing in temperate regions.

This ability of adaptation to various conditions of soil and degree of temperature makes the Ailanthus, Catalpa Speciosa and a comparatively small number of forest trees of very great value to the general planter.

For Sand Dunes.

There is no doubt but the Ailanthus may be made very useful in checking the sand movement on the ocean shores and borders of lakes where the wind shifts the mountains of sand, driving them inland.

Once getting a foothold and covering the surface, the wind would be powerless to continue the sand movement, and in time other forest trees could be planted under protection of this pioneer.

There is no good reason why the Ailanthus should not be planted solidly in forests and form straight, tall trunks which would be useful for timber and lumber.

Saw mill men fear to cut trees which have grown in towns because these usually have spikes driven in the wood and these obstacles, having become overgrown with new layers of wood, are not seen until cut by the saw.

The Ailanthus tree shown in our illustration is as large as the average forest trees of Indiana, being 90 feet high and 30 inches diameter, but having been grown as a single tree for shade, with branches low, is thus unfitted for the timberman.

Certain writers have pronounced the Ailanthus to be a soft wood. This is purely fiction. The wood is quite hard and solid, very white and suited for almost every purpose of the manufacturers.

At the same time few varieties of timber trees will make wood as rapidly as does the Ailanthus.

One of the synonyms by which it is known, the Tree of Heaven, is certainly a misnomer. It was formerly planted quite largely in church yards and cemetries, but probably the banks of the river Avon, where it was formerly quite common, gave the name Tree of Avon, from which the popular synonym degenerated into Tree of Heaven.

PAULONIA IMPERIALIS.

The Purple Catalpa of the Orient.

Taiku, Korea, 11-1-'06.

My Dear Mr. Brown:

I am sending you, under separate cover, a few pods of the Korean Catalpa. As you will see, the seed is not at all like the Speciosia; nor is the pod or seed at all like the Bignonoides. I have never seen the Speciosia pod. This tree is a very rapid

grower and, if properly pruned carries a fine upright stock. I have been unable to ascertain with regard to its enduring qualities when put in the ground, although Koreans have told me that it will last for many years. The pods grow in large, branching bunches—twenty or thirty in a bunch. I send them on the chance that they may be interesting to you. Will you be so kind as to send me another package of seed such as you sent last year?

Yours very sincerely,
J. E. Adams.

Mr. J. E. Adams, Taiku, Korea.

My Dear Sir:—

Your letter of November 1, with package of seed, has arrived. I have sent a small package of Catalpa Speciosa seed for yourself and will send a pound package also, which you may distribute among your friends.

The seed you send is a Chinese tree, quite a number of which have been distributed throughout our southern states, "Paulonia Imperialls." In some respects it resembles the catalpa family, but still has no connection. The Paulonia belongs to the Figwort family, while catalpa is classed with the Bignonoides.

In leaf and flower the two species are similar, but the Catalpa has white, while Paulonia has purple flowers Paulonia seed are in pods which stand upright, while Catalpa seed pods are pendant, shaped like cigars, and are often called "lady cigars."

The seed of Paulonia are extremely minute, being winged. I return a few of the seed of Paulonia taken from your packet.

The catalpa is hardy in any portion of the United States, while Paulonia is a subtropical tree, growing as far north as Washington City, but seldom flowering so far north.

Wherever the Paulonia will grow you can be assured of success with Catalpa.

Both trees grow rapidly. If you can ascertain from natives anything in regard to the use of the Paulonia wood, durability, appearance, etc., I shall be glad to know of it. The tree is merely grown for ornament in the United States. John P. Brown.

DENUDING OF WOODED HILLS IN NEW ENGLAND AND SOUTH IS MENACE TO IMPORTANT SECTIONS.

From Chicago Evening Post:

Washington, Jan. 3.—Unless pressure from the people is brought to bear the leaders of the House may refuse to pass the bill establishing national forest reserves in the White Mountains and in the southern Appalachian range. The excuse of lack of time to put the measure through at this session is being urged by the leaders. The necessity for enacting the legislation is crying, but for some inscrutable reason the congressional chieftains do not seem to care to give heed. Postponement will mean further unbridled destruction of the forests and the threatened ruin of many industries. The country should demand that the bill be passed.

"This measure has passed the United States Senate unanimously; it has been recommended unanimously for passage by the House committee on agriculture; the President is strongly for it; the majority of the members of the House are believed to favor it—yet grave doubts exist as to whether it will come to a vote."

Plea by Edward Everett Hale.

Dr. Edward Everett Hale, chaplain of the Senate, wrote recently:

"With these eyes I have seen forests demolished in which were trees centuries old and now the region is given over to sumach and blackberry bushes. It is no mere matter of botanical curiosity for which we are pleading. It is the preservation of a water supply which affects five of the six New England states. It also affects the very existence of whatever makes the region attractive to persons from every part of the nation. It is easy to see, on mere economic grounds, that the destruction of forests has been the ruin of many a nation which did not have the wisdom to keep them."

Dr. Hale was writing specifically of the White Mountains. Included in the measure before Congress is a plan for a national reserve in the mountains of seven southern states in which lumbering operations have been conducted in such a manner as to show a reckless disregard for future growth. It was of this section that a forest service official wrote: "A clean lumber job is seldom seen." It is there that trees have been felled without regard to the young growth; that logs have been dragged out with mule teams to the annihilation of seedlings, and that tree tops and branches are left to rot and to become breeding-places for swarms of insects which attack the still struggling growth.

CATALPA SCRUBBIOSA

The Kind of Tree Which is Grown from Cheap Seeds.

How Did It Happen?

There is what seems to be a great mystery in the occurrence of many trees in certain localities while they are not found in others; and when a forest of one variety is removed other species come in to take its place.

The white pine occurs over a large area of country, yet does not exist in other regions of much greater area.

Hemlock is found in a score of our states, while it is not found in other states.

Walnut is common throughout the middle and southern states, but not in New England.

The giant Sequoias occupy a remarkably small territory in the higher Sierra Nevada mountains, in California, only ten small groves in all the world.

Its relative, the redwood, (sequoia sempervirens) is confined to a narrow strip about twenty miles wide along the Pacific Coast north of Santa Cruz, California.

The Monterey Cypress was only found in a little group at Monterey, California.

And thus with a large number of tree species originally found in restricted localities in various portions of the world.

As the pine has been removed birch, oaks, and various species of so-called hardwoods succeed the pine. **Why does this happen?**

In case of these trees when they are removed to other localities or the seed distributed, they succeed in their new homes, if surrounded with suitable environments.

The walnut grows in New England as well as in Indiana. The Sequois Gigantea finds it convenient to become a large tree even in localities many thousands of miles distant, and upon other continents.

The Monterey Cypress has become a weed in many places.

The experience of the United States authorities at the Botanic Gardens in Washington, and, in fact, all botanic gardens of the world; yes, and of every prominent nursery of the whole world, demonstrates that ten thousand species of trees unknown in their localities have been successfully adopted, and it is probable there is no tree or plant but which may be grown in other localities, provided it be given proper care and supplied with nearly similar conditions to which it has been accustomed.

In the American system of total destruction of native forests, in the craze for the almighty dollar which takes possession of lumbermen, all seed trees being removed, Nature supplies what is most convenient, either the edible berries and nuts which may be distributed by birds and small animals, or the light winged seeds of birch, willow, poplars, etc., which the wind can send for long distances. Pine is too heavy for the wind and is seldom taken very far by birds or animals; thus the succeeding forest is of different character.

Likewise the Catalpa Speciosa, originally confined to a few square miles along the Wabash river in Indiana and Illinois, could only be transported by flowing water for very short distances before the film covering of the seed should become water-soaked and sink, to be quickly destroyed.

Nature, however, gave this tree a very beautiful flower, which, in its appeal to the human heart, has caused its distribution to the most distant lands throughout the world. Thus has a most valuable timber tree of greatest economical importance been saved from total destruction.

Indian children gathered walnuts and hickory nuts, and also chestnuts, some of which were dropped at the

various camping places and becoming trees have established groves.

An argument has been advanced by a certain professional writer that seeds will not germinate and produce trees except those taken from the same latitude. Just as well add longitude, for vast quantities of seeds of Eucalyptus and other semi-tropic trees are gathered in Australia and sold all over the world, wherever the climate is warm enough. While seed from Catalpa Speciosa, gathered by the writer in South Western Indiana have made millions of trees in New Zealand, in Asia, Africa and all of Europe.

What folly to say Catalpa seed must be secured from far northern sources for planting in New England, or from southern localities when they are to be grown in South Carolina.

The only locality in the world where the seeds can be had in purity is the lower valley of the Wabash. Nature did not plant them further north or further south..

The same objector says the price is too high. Very well, nature only can be blameed for not making them more abundant and more easily collected.

The professor has the privilege of buying cheep seeds and of producing trees of like character.

EIGHT HUNDRED ACRES IN PECANS.

We beg to advise that a New edition of "The Pecan Tree, How to Plant It, How to Grow It, How to Buy It," (Illustrated,) is now ready for distribution. If you own any land or have any idea of planting any Pecan trees during the coming winter or spring you cannot fail to be interested. We have a very superior lot of trees for sale this season, but as the demand for them is large we would appreciate an early order, so that we may select and reserve them for you. Those who have given the Pecan the closest study are today the heaviest investors. Many trees sold by us in 1903 and 1904 are bearing this year. Upon receipt of postal card we will at once mail the book. State number of trees wanted and quotations will be sent. The G. M. Bacon Pecan Co., Inc., DeWitt, Ga.

A DOZEN YEARS MORE OF SCRUB CATALPA.

The same gang who for many years have been spreading broadcast seed and trees of Catalpa Bignonoides and hybrids, selling them to the public for Catalpa Speciosa, are still at work.

A prominent eastern seed firm, with a world-wide reputation, and in other respects of high character, has purchased 100 pounds of this seed from the most notorious distributor of impure seed—enough to produce two million scrub Catalpa trees—and the public will buy this stuff because it is of lowest price, only to find, after many years, that the stuff is a disappointment in every particular.

It will be several years before the inferior character can be known. Interest on investment, taxes, hopes for good trees, years of patient waiting and all the labor, lost for the sake of saving a few cents in the purchase of genuine seed.

A score of prominent firms are thus deceiving the public by sending out seed and trees which should be prohibited by law, since they are not what they are sold for.

Not a firm in the world will sell this stuff under its proper name. One cannot buy Bignonoides Catalpa seed; it is all sold for Speciosa.

OFFICE OF THE ENGINEER MAINTENANCE OF WAY.

Ft. Wayne, Ind., Dec. 11, 1906.

Mr. John P. Brown, Editor, Connersville, Ind.

Dear Sir:

Referring to an article in your last number of Arboriculture, in which you refer to the use of concrete telegraph poles on the Western division on the Pennsylvania lines west of Pittsburg, I would be glad if you note in your next number a correction stating that these poles were designed by J. B. McKim, superintendent of the above division.

F. M. Graham,
Engineer M. of W.

FOREST RESERVES.

As has often been stated in Arboriculture, we are strongly in favor of the reservation of all forest lands remaining in the hands of the government.

The President should withdraw from sale all forest property. The timber and stone act should be repealed, and speculation in timber lands cease where the government has the title.

There are large numbers of men in the United States whose only care is to make money by destruction of the forests, regardless of the rights of the nation in the retention of the forests. These men are soulless and use money and influence to purchase the aid of senators, congressmen and politicians. In a country rather sparsely settled the employment of some in the mills and milling operations they secure their aid and thus a very few individuals control the local situation.

The greater number of people who require water for irrigation, timber bodies for climatic modification, and the needs of the tens of thousands who will occupy this land a very few years hence, receive no consideration from these fellows.

The only way to prevent the entire destruction of the remaining forests is the course pursued by President Roosevelt, the withdawal of all these lands from sale, and under intelligent supervision by special officers of the government, have the timber sold according to stump measure, carefully preserving all immature growths, keeping down forest fires and the proper regulation of campers and workmen to prevent fires.

Congress and the State Legislatures should go farther: Laws should be enacted and enforced, preventing the clearing of private forests, requiring that these be retained as forests forever, cutting only a portion of the trees year by year.

POWER OF A STATE TO INAUGURATE WAR.

Influence of a rabble, dominating local politicians, may embroil the entire nation, unless held in check with the strong hand of the government.

Respect for foreign nations must be maintained and treaty rights upheld.

The attitude of the State of California through her politicians and large numbers of citizens, toward the Japanese emphasizes the great danger this country is in from the prejudice and jealousies of a comparatively few in any locality who may mob and maltreat the subjects of foreign countries and thus humiliate this entire nation, even forcing a war which may cost the lives of vast numbers as well as untold losses to business.

But a few years have passed since a mob of irresponsible rowdies in Louisiana attacked and murdered several Italians, and but for the friendship of King Humbert for this nation would have caused a war at a time when we were little prepared for a conflict.

So long as the United States maintains the doctrine of the right of the majority to rule, this principle must be enforced, that no minority in any part of the country shall be permitted to perform any act which can be construed as to enforce the remainder of the people to defend such acts by force of arms against a friendly nation.

There is no room in this country for unjust discriminations against any peoples because of race prejudices or other cause. This is not a state right, no more than it is of a small locality.

On this the World's Work, London, comments.

"That many recent difficulties which have necessitated national legislation, such as the Federal Anti-Trust Laws, the Railroad Rate Law, the Meat Inspection Law, and the Pure Food Law, are examples to show how the Federal Government has been compelled to make good the negligence of the several States."

THE SPRUCE AND PINE OF WASHINGTON

Soon to be Exterminated from Onslaughter of Lumber Corporations.

Photo from A. WOLF.

TREE PLANTING BY SANTA FE RAILROAD.

Los Angeles, Calif., Dec. 26, 1906.

Mr. John P. Brown,

Dear Sir:

A marked copy of "Arboriculture" for December has been sent me in which special attention is called to the planting of Eucalyptus trees in California by our company, for railroad purposes. Had I known before that you desired information on the subject I would have been glad to furnish it, as I have done to a number of inquirers who have written our people about it, and the letters referred to me.

We have for nearly two years, been investigating the growth and value of this wood for practical purposes, it having so far been grown in this country almost exclusively in California, and there, more for fuel and shade trees than anything else.

Our inquiries have been from a railway standpoint; that is, the life service to be obtained from timber in contact with the ground; ties and bridge piling, for instance, and of this we find in different parts of the state ample proof that the necessary varieties can be grown fully as well, if not better, than in their native home, Australia.

I will not burden you with measurements, but there is ample proof that in good soil and in the right location, we can reasonably hope to expect six standard ties from each tree in twelve to fifteen years, or eight in fifteen to eighteen, from varieties which will give us an estimated twelve years' service. This is much less than they get in Australia, but there the ties are cut from matured trees, which undoubtedly lengthens the life, and they use Ironbarks largely (also Eucalpyti), but of much slower growth and giving a life of twenty-five years.

Later on when the venture shall have proven a success, the railroad officials of the future may see fit to plant varieties taking fifty years to mature, and get ties giving twenty-five years service, but for the present, we will be content if we can get twelve years' service out of trees grown in eighteen.

We have selected about ten varieties, nearly all of which are found to thrive excellently in California, so that we are taking little or no chances, and the plan is to set out several hundred acres each year until our ranch of 7,000 acres is fully planted.

The land purchased for the purpose is in San Diego county, within three miles of the coast, but protected from the ocean winds, although near enough to get full benefit of the damp atmosphere generally found so near the water.

It is not intended to irrigate in the usual way, but for the first two years the young trees will be thoroughly cultivated and watered once or twice from tanks during the season, depending upon conditions; the third year, only cultivation will be given, and after that they will be let alone, as ample proof is at hand that irrigation is not necessary where other conditions are favorable.

The trees will be planted in eight-foot rows, five feet apart in each row, so as to prevent branching; and after the tree has formed itself, say in four years, every alternate one will be cut out and fence posts made of them, leaving the rest eight feet by ten feet, to mature. With one or two varieties we may vary a little from this program.

As I have said, the best are the Ironbarks, but they are too slow growth for us. If you desire the names of those we intend planting, I give the botanical name herewith and also the local one under which they are generally known in Australia:

E. Corynocalyx (Sugar Gum), E. Corymbosa (Bloodwood), E. Citriodora (Lemon-Scented Gum), E. Goniocalyx (Spotted Gum), E. Hetnephloia (Graybox), E. Microcorys (Tallow wood), E. Pilularis (Blackbutt), E. Resinifera (Red Mahogany), E. Rostrata (Murray Red Gum), E. Teretecornis (Forest Red Gum).

Nearly all of these are useful for other purposes, and in the future users of hardwoods in nearly all branches, including furniture, will have to fall back largely on Eucalyptus for a supply, as the wood is almost as hard as the best grade of American Hickory.

We expect to try some in Southern Texas, in order to experiment in extending the territory in which they can be grown.

In Kansas, Indiana, or states in those localities, for tree planting, I should certainly say Catalpa Speciosa, but where the Eucalyptus will grow successfully, that is unquestionably the tree to plant.

I had not known before of the forest trees planted by S. T. Kelsey for the Santa Fe, but will inquire about them and see how they look. Mr. Merritt told me about some Catalpas planted near Bakersfield and Fresno, which I shall be glad to look over as soon as I can find the exact locality.

If you desire any further information as to our Eucalyptus planting or any reference to the wood itself, I shall be glad to furnish it if possible.

Yours very truly,

E. O. Falkner,

Manager, tie and timber department.

Note.—It must be understood by readers of Arboriculture that all varieties of Eucalyptus are sub-tropical, and can only be grown in a few localities in the United States, the southern part of California and part of Arizona, being practically the limit.—Editor.

THE PILGRIM.

That bright, cherry, ever-welcome magazine, The Pilgrim, for January, is already before us. The cover represents a trapper hard at work at it in the north woods, and is a beautiful piece of color work—one of the very best we have ever seen. It is certainly a delight to sit down with this sane, wholesome magazine and get a right perspective of life again.

The magazine proper has many things of peculiar interest this month. This is a sort of anniversary number with The Pilgrim—the first issue of Volume XV—and is another advance step, of which this "magazine for the home" has made many during the past year.

The leading article, "When the President Goes to Church," by Allen Day; "From Kindergarten to College," by Florence Milner; "Brain Surgery to Cure Criminality," by Frederic Blount Warren, is another entertaining article. "Why American Shipping Declined," by Wiliam W. Bates, is of peculiar interest just now.

There are four pages of advance fashion styles—toilets for indoors and out, gowns for the schoolgirl, dresses for the little tots, etc. "Our American Club Women" has three strong features. "The Mount and the Multitudes" is the first of a series of addresses by the noted Welsh preacher, Rev. Gwilym O. Griffith. $1 per year, 10c per copy. Pilgrim Publishing Co., Detroit, Mich.

THE VILLAGE.

We are in receipt of "The Village," a new publication devoted to Village Life. This journal is well prepared, finely illustrated with many excellent engravings, one article "Our Forest Fires," by Clifton Johnsen, is of special interest, as it illustrates the origin of fires in the woodlands and methods of combatting them. So long as Americans are so extremely careless of the disposition of matches and cigar stumps, and have so little thought of the value of our forests, there will be fires; and until the railways have better trained section men who will extinguish fires which have spread from their engines, there must be serious fire losses in forest lands adjoining the track. It must depend upon the vigorous action of communities to compel railways to perform this duty. Any man who loses property by such fires may collect a small amount of damage, but not sufficient to influence railway companies in taking care of the fires which they have caused.

Some roads use every precaution to prevent the spread of flames, but a majority do not. The land owner, however, who strews

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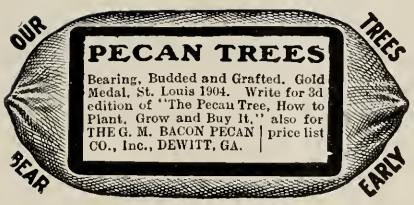
powder along the track, in shape of leaves, is more to blame than the enginemen whose sparks touch off this inflammable material.

A greater respect for the forest, a higher regard for the young trees which are to be the future forests, will go far to prevent destructive fires in timber lands. "The Village" is published at Hyde Park, Mass., $1.50 a year.

FOREST LAND WITHDRAWN.

Four Large Tracts Set Aside as Reserves by order of Acting Commissioner at Washington.

Washington, Dec. 28.—The acting commissioner of the general land office today announced the withdrawal of 537,920 acres for forest reserve purposes within the Sacramento range of mountains in south central New Mexico. The lands are in Otero and Chaves counties, south and east of the Mescalero-Apache reservation. The acting commissioner announced the withdrawal of 318,720 acres in Routt county, northwest Colorado, west of the continental divide, for similar purposes. He also withdrew for forest reserve purposes 483,000 acres in southwestern Colorado north and east of the southern Ute reservation, near Durango, and 155,580 acres in northwestern California, lying in Del Norte county, adjoining the Klamath forest reservation on the west and the Oregon border on the north.



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ARBORICULTURE

Vol. VI No 2

A Journal of the Forests

The Lesson of the Ohio River Flood

Connersville, Ind., March, 1907

JOHN P. BROWN, Editor and Publisher

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OF

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References, John P. Brown, Editor Arboriculture, W. J. Green, Ohio State Forester, Wooster, Ohio.

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JOHN P. BROWN, Editor and Publisher.

Entered as Second-class Matter, January 4th, 1904.

VOL. VI. CONNERSVILLE, INDIANA, MARCH, 1907. NUMBER 2.

LIBRAR
NEW YO
BOTANIC
GARDEN

A Great Flood and a Greater Folly.

Practical Aboriculture gives a vivid description of the great flood in the Ohio and other rivers during 1884 and 1885, when the gauge at Cincinnati showed a depth of 71 feet 3 inches, fully 60 feet greater depth than the normal condition at the same season in other years.

The causes are set forth in the article and methods pointed out by which such floods may be minimized in the future. But neither the public nor our legislative bodies take interest in matters of great concern unless there is political notoriety to be gained by so doing, and thus, in 1907, we have another disastrous flood, with even greater loss of property and interference in business affairs in the Ohio Valley than ever before.

A repetition of this great overflow has occurred in January, 1907, in which a great amount of property has been lost, some lives destroyed, much sickness has resulted from exposure while the raging waters surrounded homes, an incalculable amount of damage done to farm crops, stock drowned, towns and cities along the river valley flooded, navigation suspended, railway tracks flooded, stopping the shipment of freight, and interfering materially with commerce.

At Cincinnati, on January 22, the water stood at 65 feet 6 inches, being about six feet less depth than the flood of 1884; but lower down the river, from Louisville to Evansville, and below the mouth of the Wabash, the water was higher, and greater damage resulted.

The daily papers of the Ohio Valley have been filled with details of the flood, while numerous photographic views of river scenes have pictured the story graphically.

Now let us see some of the causes of these periodical overflows of this great river. Consider the methods which have been employed to increase the depth of water at low tide, and their effects upon waters during flood time.

Possibly a remedy may be devised which, if not preventive, may help to control the stream.

It will be understood that, one hundred years ago, the entire territory which comprises the water shed of the Ohio River, being two hundred square miles in extent, was a forest with a deep soil, having all the mosses and wild vegetation to retard the flow of water which percolated through this forest verdure and spongy soil, and floods occurred only

MAR 2 - 1907

when, at very long intervals, extraordinary conditions prevailed.

As in 1832 and 1847, while forest conditions existed, both were in midwinter, immense bodies of snow were quickly melted by heavy warm rains, while the ground was solidly frozen and could not absorb the water.

For all practical purposes we may now compare this water shed to an immense roof covered with slate, and all water must find an outlet in the briefest possible time.

ERRORS OF UNITED STATES ENGINEERS.

The War Department, which controls the *improvements (?)* of the inland rivers, has undertaken to assist navigation by building many expensive dams throughout the length of the Ohio River, with the object in view to concentrate the body of water, at low stage, into a narrow channel, so that the action of the water may scour out a deeper channel where sand or gravel bars have obstructed the flow of water and caused it to spread over a broad area, and thus form shallows in the stream.

To a certain extent this has resulted in considerable gain in depth of channel at these obstructed passages during the very lowest stage of the river.

BUT HOW OF FLOOD TIME?

A river bed will convey away a certain body of water in a certain given time, according to the transverse area of the stream and the fall per mile of the bed or the velocity of the current.

Decrease the width and depth of the bed without increasing the fall, and the surplus water in flood time must overflow the banks and spread out over the fertile fields on either side of the stream. The engineers of the War Department have attempted to cure the symptoms, but have neglected the disease.

They have raised the bottom of the river bed, and in places obstructed the width of the bed by piers, restricting the flow of water at flood time, in order to preserve a greater depth of water at low tide.

A notable instance of this obstruction to a river bed is seen at Lawrence, Kansas, which we illustrate on page 239.

Beneath a bridge across the Kansas River the authorities have permitted the construction of a dam six feet in height, of solid masonry, while the bed of the river has been greatly narrowed by piers of masonry at either bank, with a long fill of earthwork upon the north side.

These obstructions, a few years ago, caused the river to back over the bottom lands above the city, and probably influenced the stream greatly as far as Topeka, where the water rose to an unprecedented stage, causing vast injury to property, and serious loss and inconvenience to the people.

But the cause, if ever mentioned, was not seriously considered, and still remains a menace to the people and property above the city.

The steep hills bordering the Ohio River are formed of limestone, while the surface soil is clay. The trees have been removed, all brush and shrubs cleared away along the margins of every rivulet and stream, so that in time of continuous rains the erosion is very great, while so large a proportion is too heavy for water to carry very fast down the stream; but it is deposited as silt in the bed of the river, raising the bottom each year by these deposits, destroying the utility of the Ohio as a navigable river, and in time of flood causing it to over-

flow its banks. In places during 1907 it became thirty miles wide.

AT EVANSVILLE, INDIANA.

The Wabash, White and Patoka Rivers join near Evansville, and here great damage was wrought by the back waters. Numerous instances are mentioned where farmers lost all their crops, stock, implements, and even many houses. The city of Evansville is situated in a sharp and long bend of the river, the Louisville and Nashville Railway Bridge crossing the Ohio some ten miles below the city. The river cut across the long, narrow point of land opposite the city, threatening to make a permanent channel five miles away, and fears are entertained that Evansville may then become an inland city.

There is a greatly-increased volume of water which must be quickly removed after each storm of rain since the removal of the forests over so great an area of territory as the entire valley of the Ohio River and its affluent tributaries, an area of no less than 231,000 square miles. The tributaries having their sources in thirteen States, and the resulting erosion of all the spongy materials, the accumulation of a thousand years, which covered all this area to a great depth and held back a large proportion of the water from every fall of rain, allowing it to percolate slowly, feed a million springs, afford a constant flow of water in every rivulet and stream, and maintain a regular flow throughout the year in the Ohio.

The greatly-increased volume of water which must be removed in a brief period after each rain, since the removal of the forests with their mass of spongy material which covered all the surface, taxes the capacity of the river's bed to the utmost; and when a long protracted storm of rain occurs, the banks are totally inadequate to hold the vast quantity of rushing water.

Every dam, sand bar, abutment of masonry, and ledge of limestone rock projecting from the hills on either side, helps to obstruct the flow of water and forces it back upon the farms, which it soon covers, creating havoc to the agricultural interests along its course.

Now this is all changed: the springs are gone, rivulets are dry in summer, the volume of water in the Ohio is so reduced during the droughts of summer that navigation must be suspended for many months.

The clay is eroded from every farmer's field; the limestone rocks torn from the river hills all along its course unite to fill the river bed, obstruct its channel, and destroy navigation.

There could be no other result when the torrential rains come than to fill this river bed and overflow the banks in its mad effort to find a speedy outlet.

DEMANDS OF STEAMBOAT INTERESTS.

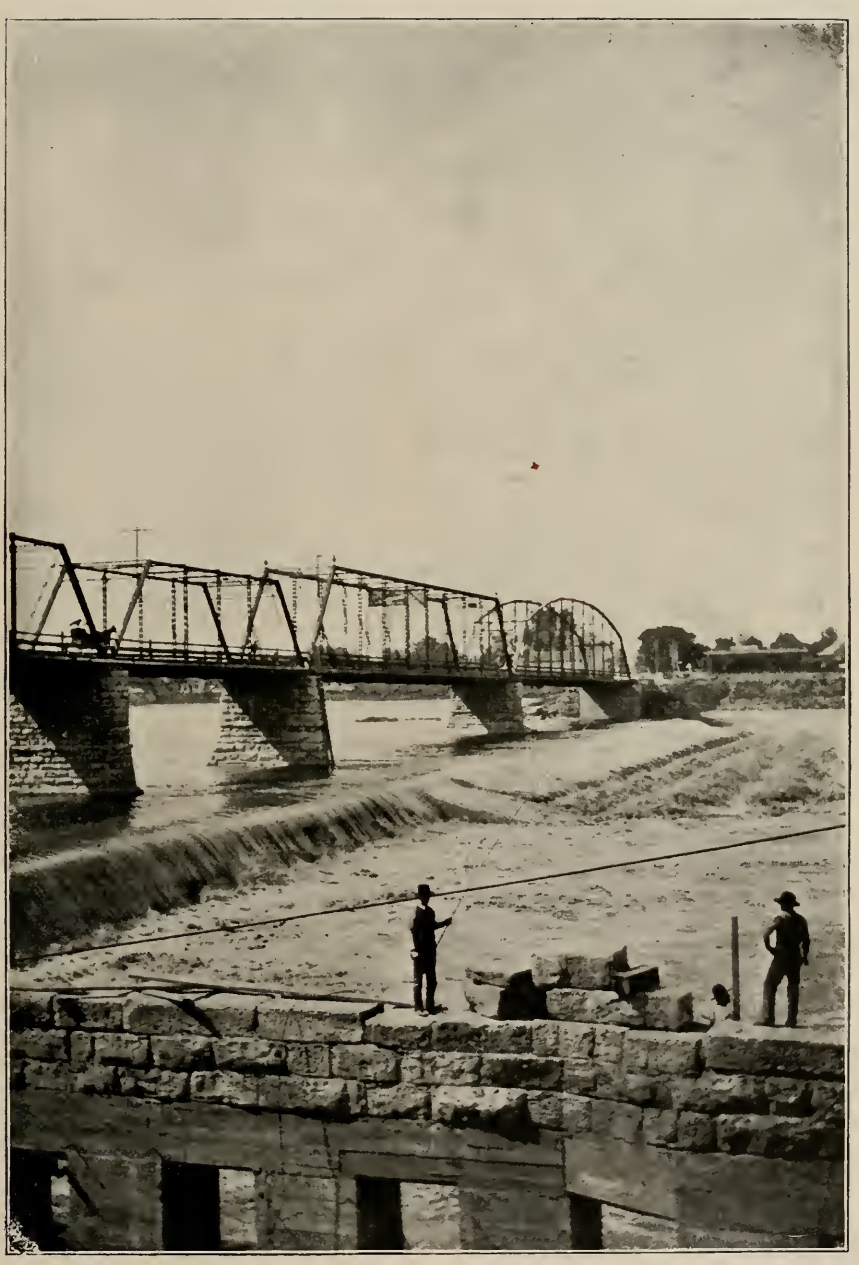
The citizens of Evansville, one of the stricken cities, and the steamboat interests especially, have been persistent in urging the Government to build more dams, and raise the bottom of the river ten feet higher, in order to create a nine-foot stage of water, with slack-water navigation during the summer season.

How little do they think of the terrible results of such a course, when in time of floods each obstruction must raise the entire body of water so much higher and cause the overflow of a still greater area of farm land and destruction of a much greater quantity of property!

THE TRUE REMEDY.

The proper course to pursue, now that

VIEW IN THE EAST END OF CINCINNATI, OHIO



BRIDGE AND DAM AT LAWRENCE, KANSAS
THE KANSAS RIVER CONFINED TO NARROW CHANNEL

conditions have become fixed, with the removal of the forests, is to provide for the excavation of the channel in the river bed by deep dredging.

By the use of dynamite, blow up the limestone ledges which project from the hills on either side into the river.

Dredge out the gravel and sand bars, so that the concentrated current will be enabled to scour it deeply, and thus maintain an even depth throughout the length of the river.

Then, instead of appealing to the Almighty to interpose a miracle, as was proposed by a resolution passed by the Indiana Legislature, let all legislative bodies take proper action toward the encouragement of forest retention by the land owners of the various States.

By planting willows and various trees along the margins of streams where erosion is constantly removing the fertile lands of the farms, much of this will be overcome, and a less quantity of mud be deposited to fill the river bed.

CONDITIONS AT LAWRENCEBURG, INDIANA.

A complicated series of conditions arises at Lawrenceburg. The Whitewater and Miami Rivers join the Ohio some twenty miles below Cincinnati, the junction point having been adopted as the initial starting point for the line separating the States of Ohio and Indiana, and is but two miles or so from the town of Lawrenceburg. Between the town and the junction of the rivers is an extensive, low-lying tract of river bottom. The Miami enters the Ohio at an acute angle, almost parallel with the larger river, and when the Ohio is very high, a freshet coming out of the Miami pours its volume over that of the Ohio, striking the levee above Lawrenceburg with terrific force, impelled by the great weight of water behind. Thus the ordinary height of the main flood is largely increased upon the Indiana side, and the impact is very great as this current strikes the embankment above the city.

For more than a quarter of a century I have urged the planting of a heavy belt of timber along the base of this upper levee, to assist in diverting the current of this Miami overflow, but no impression could be made upon any of the citizens to whom I appealed.

Many thousands of dollars would have been saved to the citizens by thus strengthening the upper dyke.

ILLUSTRATION OF CULLOM'S RIFFLE.

This is one of the most noted points on the Ohio River as an obstruction to low-water navigation.

It is situated but a few miles below Cincinnati. The river here is broad, with a gravel bar extending entirely across the river. The water is thus spread out into a thin sheet, with a very shallow channel, which has for many years given great trouble to pilots and boatmen.

The dredging-out of a main channel eight feet in depth would draw the current from the shallow portion, and maintain a deep channel where greatly needed. The Ohio has during the centuries cut its channel through the limestone ledges which formerly extended entirely across the valley, until now the abrupt hills on either side of the river are from four to five hundred feet above the river.

As this process occurred, simultaneously every tributary stream cut through the various strata, leaving their borders high above the water.

But it has been solely the force of rushing waters which has plowed out the deep channel and the bed in which

the river flows. And the same force of flowing water, if properly guided, and aided by modern dredging machinery, will cut the channel to proper depth, and maintain it there, giving the desired depth of water for river navigation.

RIVER BARS.

The limestone ledges extending entirely across the river bed are softer in places than others, and more easily disintegrated.

In such places the bed is deeper than where the stone is of greater hardness. Thus there may be spaces of several miles extent where the low-water depth is ample for all navigation purposes. But where these harder strata still remain, the ledges form an obstruction, around which, usually in the eddies, the gravel and sand accumulate, and in places bars are formed often a mile or two in length and half to three-quarters of a mile in width, flat, and raised but a few feet above the surface of the waters flowing in the channel.

In order to control the low-water gauge, the stream must be confined by dredging, blasting out the rock ledges to facilitate the scouring operation of the current.

THE QUEEN CITY, CINCINNATI.

The city of Cincinnati, like Rome, is situated upon many hills, and for the most part is from one to three hundred feet above the highest flood of the Ohio. Yet there are many business houses which occupy that portion of the city which lies near the river; this, many years ago, having been the business heart of the city. Yet all the coal business, numerous extensive coal yards and landings must of necessity be upon the river margin. Many of the largest manufactories also are located within the flooded area. The principal depots, both passenger and freight, are in this portion of the city and were surrounded by water, shutting off nearly all trains and stopping freight traffic for several days.

The money loss from destruction and injury to merchandise which could not be moved was quite considerable, while the losses to manufacturers are always great when high water occurs.

Laboring men, dependent upon the constant daily income, invariably suffer, as their source of income is totally cut off so long as the water remains in the factories, or stops transportation to and from their place of labor; while the railway companies are very heavy losers, and must be at great expense in trying to maintain traffic relations. Besides, the many thousands of business men and citizens throughout the entire country are inconvenienced, and suffer losses from the stopping of traffic, delays, and injury to freight in transit.

Upon the other hand, there are numerous persons along the Ohio River who are loudly demanding a nine-foot stage of water, with dams, locks, and slack-water navigation, in order that steamboat traffic may be continued during the low-water stage of the river.

Owing to causes which are fully explained in *Practical Arboriculture,* pages 26 to 32, the depth of water varies very greatly, often in midsummer being as low as two or three feet, and then suddenly rising within a fortnight perhaps to the height of 65 to 71 feet.

The immediate bed of the Ohio varies greatly in width. The two ranges of limestone hills which border the river throughout almost its entire length, in places approach the channel, being within three-quarters of a mile of each other,

THE LEVEE AT LAWRENCEBURG, INDIANA, BEING STRENGTHENED WITH BAGS OF SAND

while again they separate to a distance of three or four miles.

Originally they occupied the valley as a great plain, the strata on either side being identical; and through this plain the river bed has been plowed by the force of ice and water until at present the bed is from 400 to 500 feet below the hill tops.

Usually, where the abrupt hills approach the stream upon one side, there is a broad fertile valley upon the opposite side of the river; but at Cincinnati the hills are but a mile apart, confining the water to quite a narrow valley.

If the rainfall throughout the entire 200,000 miles comprising the watershed of the Ohio Valley was an average of ten inches in a month's time, it would be equivalent in volume to a column of water one mile square and thirty-one miles in height, all of which would, under our present condition of treeless country, be forced with great rapidity through the present bed of the Ohio River in order to reach the Mississippi and, finally, the Gulf of Mexico.

It is plain that every obstruction placed in the way of this enormous body of water, as narrowing the channel with piers, or raising it by dams, must necessarily raise this surface proportionately; consequently the important question is, Will the advantages afforded to the steamboat interests by increasing the low-water stage by additional obstructions, equal or surpass the injury to the many thousands who are affected in various ways when the flood waters flow over their farms, enter their houses, drown their stock, cut off supplies, interfere with all manner of land and water transportation and the general demoralizing of business?

It may not be an easy matter to regulate the flow of the Ohio so as to secure free navigation in low stage for boats drawing nine feet of water; but that is not at all necessary; a seven-foot stage may be secured by dredging and blasting, and there is no real necessity of an all-the-year stage of more than six or seven feet.

If the channel can be excavated to con-

CAVING OF THE LEVEE AT LAWRENCEBURG, INDIANA—BIG FOUR ENGINE IN DANGER

vey all the water in a narrow space, instead of flowing over a broad, flat bar, there will be no obstacle in the way for larger vessels during any portion of the year.

Depth of water in the Ohio River at Cincinnati, Ohio, at flood time during the past seventy-five years:

Year.	*Date.*	*Feet.*	*In.*
1832	February 18	64	3
1847	December 17	63	7
1866	September 26	42	6
1867	March 14	55	8
1868	March 30	48	3
1869	April 2	48	9
1870	January 19	55	3
1871	May 13	40	6
1872	April 13	41	9
1873	December 18	44	5
1874	January 11	47	11
1875	August 6	55	4
1876	January 29	51	9
1877	January 20	53	9
1878	December 15	41	4
1879	December 27	42	9
1880	February 17	53	2
1881	February 16	50	7
1882	February 21	58	7
1883	February 15	66	4
1884	February 14	71	¾
1885	January 20	46	
1886	April 9	55	9
1887	February 5	56	3
1888	April 1	39	11
1889	February 22	38	3
1890	March 26	59	2
1891	February 25	57	4
1892	April 25	43	8
1893	February 20	54	11
1894	February 15	35	6
1895	January 14	48	4
1896	April 4	47	8
1897	February 26	61	2
1898	March 29	61	4
1899	March 8	57	4
1900	December 1	40	
1901	April 27	59	7
1902	March 5	50	9
1903	March 5	53	1
1904	March 9	45	9
1905	May 16	48	2

These views are by no means the spasmodic effects attending the excitement from one high-water stage of the river, but were formed by a mature study of the subject during many years.

The writer as a boy waded, swam and rowed about the several sand-bars which obstruct the flow of the current of the Ohio River at Rising Sun, Ind., and has seen numerous steamboats fast aground upon these bars, and held there for a week or longer, and was familiar with the reefs and shallows and the changing, tortuous channel. In after years as a steamboat officer he plied the western rivers for several years.

In a communication printed in the *Cincinnati Gazette* as long ago as 1880 he briefly presented the same arguments, that deep dredging was the true method of securing a proper depth of water.

MR. WILSON'S TRIP TO CHINA.

Mr. E. H. Wilson, who will spend the next two years on a botanical exploration tour in China in the interests of the Arnold Arboretum, sailed from San Francisco for Shanghai on January 8. He will proceed at once to Ichang, at the base of the gorges of the Yangtse, where he will establish his permanent base for the first year. This will be devoted to the exploration of the Tapashan, the great mountain range of Hupeh, that separates the waters of the Yangtse from those of the Han. In February or March of 1908 Mr. Wilson intends to ascend the Yangtse and Min Rivers to Kia-Ting-Fu, in Ssu-chuan, which will be his base for the second year. From Kia-Ting-Fu he will travel overland, by the way of Mounts Omei and Wa, to Ta-Chein-lu, the Chinese frontier town on the highway from Central China into Thibet. After exploring the great forests of conifers and rhododendrons in this mountainous region, he will travel north from Ta-Chein-lu in an attempt to penetrate a part of Northwestern Ssu-chuan not before visited by Europeans, then descending the Min River valley he hopes to reach Ichang in February, 1909, and return to Boston the following April or May.

By an agreement with the Department of Agriculture of the United States, Mr. F. N. Meyer, who has been in China during the last two years as an agent of the Department, is to collect for the Arboretum during the spring and autumn of 1907, under the direction of Mr. Wilson, on Mt. Wuti, in Sansi. *This is one of the five sacred mountains of China, and, owing to its holy character, it is believed to be still covered with the original forest growth. Although Wuti has been visited by Potanin, and later by H. Mayr, little is known of the mountain flora of this part of Northern China.*

China has long been a treeless nation. All nations which have destroyed their forests are laboring at a great disadvantage in the battles of life as compared with more advanced countries which protect and perpetuate a goodly proportion of timber. While China maintains an immensely greater population than many other nations, her soils are more difficult to cultivate, requiring the strictest economy of all fertilizing material, every particle of human and animal excrement being carried to the farms and gardens to maintain their fertility, while erosion is very great when rains occur, and frequent floods sweep the valleys of the larger rivers, causing immense loss of life at brief intervals.

The religious belief of the people causes great superstition as regards burial places of their ancestors, and as in Korea as well, these sacred burial places are the only spots in which have been preserved the native trees of their ancient forests.

A thousand reasons may be given for the benefits of ample forests, and the injurious effects of their annihilation, as has been the case in China.

Shall America follow their example? The lumber operators and paper manufacturers say yes.

DRY FARMING.

This is a term employed in recent years, to designate the method employed in the semi-arid regions where water is not available for irrigation, and consists in frequent stirring of the surface soil, keeping it pulverized, to retain and to conserve the moisture which has been deposited, usually as snow, in order that vegetation may receive the benefit of this moisture during the summer or growing season, instead of permitting it to escape by evaporation into the atmosphere.

The theory upon which this moisture is made available for the roots of plants is, that water absorbed by the soil during the winter rains or snowfall as it melts, remains in the soil until during the hot, dry months, when it is raised by capillary attraction to the surface, and is absorbed by the drier atmosphere, and carried away by the winds.

So long as there is a hard surface the capillary attraction continues to lift the water from the lower subsoil to the surface soil and thence to the atmosphere.

Pulverizing the surface, especially after it has been compacted by rain, breaks up the capillary attraction by destroying the cells or tubes in the soil, and prevents the escape of the moisture.

This is practically upon the same principle that water in the earth enters the millions of mouths of the fibrous roots of a tree, and ascends to the trunk, and through that medium to the branches, finally reaching the leaves at the topmost branches of the tree—a living pump, by which tons of water are lifted a hundred or more feet by the action of the capillary attraction.

Where there is a slight annual rainfall, say 15 inches during the year, there falls upon the earth, and may be absorbed into the soil, upon each square mile of surface, 1,115,136 tons of water, enough, if properly conserved, to enable the soil to produce a good crop in any season.

By using a common harrow, and running over the land frequently during the growing season, the greater portion of this moisture may be conserved, and if the surface soil is broken up to a good depth, it will absorb practically all the water which falls. Yet, if the plowing be very shallow, or the surface is permitted to become solidly compacted, the sponge which the soft soil becomes is lost, and the greater portion of the precipitation runs off to feed the rivulets, streams, and thence to the sea.

There are various implements recommended for summer cultivation in dry farming, but while any will answer, there is nothing better than a harrow or light-running cultivator.

Deep plowing in autumn and spring, with frequent shallow cultivation, is the best. This method was frequently advised by the editor of ARBORICULTURE forty years ago, and has steadily grown in favor by farmers, although in the arid West it is better understood. In planting forest trees upon Western lands where water is scarce, this method will produce excellent tree growth, but the fact must not be lost sight of that the crust must not be allowed to form or remain, but at once go over the plantation with the harrow.

Near Denver, Col., by this method, excellent tree growth of both fruit and forest trees has resulted in pure sand without one drop of irrigation water.

A CATALPA PLANTATION ONE YEAR OLD, MECHANICSBURG, OHIO

Timber Planting by a Progressive Telephone Company.

MECHANICSBURG, O., Feb. 10, 1907.

John P. Brown, Connersville, Ind.:

DEAR SIR—The photograph of catalpa trees I am sending you was taken in the field of twenty-six acres, which I planted to catalpa in April, 1906. These trees were one-year seedlings, and were planted during the latter part of April, 1906. They were cut back to near the ground after being planted, and, as the photograph shows, some of them grew fully seven feet in height during their first summer's growth.

Some of these trees grew two inches in thickness the first season, but the most of them run from one to one and one-half inches in diameter.

Out of the twenty-six thousand trees planted last spring, I lost less than twenty-five trees.

Last spring there were planted in this immediate vicinity sixty-one thousand and nine hundred catalpa trees, and this

coming spring I am preparing to plant one hundred and twenty-five acres to catalpa trees of my own land.

I think that twenty-five thousand trees, besides those I shall plant, will be set in this vicinity the coming spring, so that we will have growing some two hundred and eleven thousand trees from two years' setting.

I believe we, as a community, can lay claim to being the largest planters of forest trees in the whole country, on high-priced farming land. This land is all worth from sixty to one hundred dollars per acre.

I am not going into this wholesale planting of trees from any sentimental reasons, but as a good business proposition.

My investigations have convinced me that I can expect to make more than twice as much, during a ten-year period of time, from the trees as I could hope to make from farming this land, and it is good corn and wheat land, too.

Continue your good work for pure trees and seed. I believe three-fourths of the trees offered for sale as pure "speciosa" are hybrid or scrub stock. Yours truly,

H. C. Rogers.

We have received the very neat and instructive pamphlet of Messrs. Chittenden & Patterson, Consulting and Contracting Foresters, Law Building, Baltimore, Md. From a perusal of their letter we should think the firm eminently fitted for practical management of forest estates.

This work is of great importance to owners of timber tracts and wood lots.

"Waiting for a rise"

COAL TRANSPORTATION SCENE ON THE YOUGHIOGHENY RIVER, HEADWATERS OF THE OHIO

American Forest Trees.

Hardy Catalpa (*Catalpa speciosa*)—Warder.

This tree is found throughout Southern Illinois and Indiana, and in other localities under cultivation, particularly through Southern Arkansas, Western Louisiana and Eastern Texas.

It is known as hardy catalpa in Illinois, Iowa, Kansas and Michigan; as western catalpa in Pennsylvania, Ohio, Kansas, Illinois and Nebraska; as catalpa in Rhode Island, New York, Louisiana, Illinois, Indiana, Missouri, Wisconsin, Iowa, Nebraska and Minnesota; as the cigar tree in Missouri and Iowa, from the fact that children use the pods to smoke; as *bois puant* in Louisiana, and as Indian bean and Shawneewood in Indiana.

The bark of the tree is dark grey and broken. The leaves are large and simple; broad and ovate, with pointed apex; in color they are light green; the under side is pubescent, especially along the ribs. The flowers bloom in June or July, and are white, with the inside showing streaks of rich purple and yellow. They grow in erect, terminal panicles, and are very large and fragrant. The fruit is a slender pod, a foot or more in length, which contains sweet-scented, winged seeds, and matures in September or October.

In shape the tree is tall, slender and symmetrical, with spreading branches. In native forests the specimens are tall, straight, and have few branches along the trunk.

When it is considered that only a hundred years ago catalpa speciosa was strictly confined to the district about the mouth of the Wabash and parts of States contiguous to Indiana, it is wonderful to what a variety of soils and climates it has since adapted itself under cultivation — the rich alluvial soils of the Mississippi Valley as well as to the arid plains of the Western States. However, pure sandy soil is its ideal habitat. Where abundant moisture and long, hot seasons furnish the proper stimulus for rapid growth, the tree often increases two inches in diameter within a year. It is frequently contended that this rapid growth will not furnish as substantial timber as more slow-growing trees. This argument, however, has been successfully refuted by prolonged and careful tests. Timber lands which have been cut over and are not of great value may be profitably planted with catalpa.

There is such a close resemblance between the different species of this genus, both those of Asiatic and American nativity, that it is only within the past few years that distinctions have been carefully and correctly drawn. Virginia, the original home of catalpa bignonoides, has large areas well adapted to the cultivation of speciosa, but most of the trees found there, as well as in the city of Washington, are the former, planted under the impression that they were speciosa, and almost without exception crooked, deformed, scrubby and worthless, naturally exciting the contempt of forestry experts, and explaining the violent opposition offered the catalpa by

the Forestry Bureau. This mistake has frequently occurred, causing great confusion among botanists and the laity, who have thus been led to believe and propagate the doctrine that the catalpa is a valueless and unimportant tree. The Rio Grande Western Railroad planted 65,000 trees, supposedly speciosa, at Provo, Utah, in 1900, a large portion of which turned out to be bignonoides, which in equal time and under the same treatment will attain a height of only four or five feet, while speciosa will range from twelve to sixteen, and show a girth of perhaps eight inches.

Numerous hybrids are raised by intermixture of the several varieties, none of which are the equal of the great forest tree of the Wabash, which is an entirely distinct and much superior type — the only form which should be cultivated for any purpose. All other forms should be avoided, particularly the bignonoides, which is the most common, and hence fosters the general belief that the value of all catalpa for commercial purposes is practically nil. This variety, from its low growth and spreading habit, is indeed totally worthless as a timber tree.

There are several means of identifying speciosa, not the least important of which is examination of the bark of an old tree. It is thick, heavy and deeply furrowed, while that of other kinds is inclined to scale off, and does not form such prominent ridges. Speciosa usually blooms earlier, and continues later than do others in the same locality. The flowers have a broad border of white, which makes the color tone considerably lighter than that of other varieties. It develops fewer seed pods, and longer ones from the same-sized cluster of flowers, and the seed has a broad pencil of filaments at each end, while the inferior species have these filaments drawn together and even twisted. The low-spreading trees of hybrid or Oriental origin are so prolific in the production of seeds, and they may be so easily gathered, that many thousand pounds have been scattered broadcast throughout the country, to the serious detriment of nurserymen, and the great disadvantage of the catalpa speciosa, causing it to be condemned utterly because mistaken and unknown.

Of this tree as a timber producer, a leading authority and enthusiast says: "It is the most rapidly-growing tree in America that possesses economic value. A greater quantity of valuable wood may be produced upon a given area in a specified time than from any other American tree. The wood is the most enduring of all our trees. It succeeds over a greater range of territory than any other valuable tree of this continent. Its habit of growth is upright, with long trunk, where it has an opportunity, thus differing from all other forms of catalpa. The chemical constituents of the wood are so resistant of decay as to make expensive artificial wood preservation entirely unnecessary. The roots are strong, vigorous, large and deep, holding so firmly to the earth that storms do not blow the trees over. It is less subject to disease and attacks of insects than any other tree of my acquaintance. The wood has the same texture as butternut, firm enough for tie purposes, and holds a spike well. For inside car finish it is admirably adapted, partakes of high polish, has a handsome grain, and is a superb wood for furniture and inside finish. It is easily manipulated with edge tools. Its strength is ample for all requirements in railroad work."

This last-named fact is well recog-

OHIO RIVER OVERFLOW, CINCINNATI, OHIO

nized by railroad men. A prominent official of the Illinois Central stated as long ago as 1871 that the catalpa will make a tie which will last forever; that it is easily cultivated, of rapid growth, and will hold a spike as well as oak, and will not split. An expert with the Iron Mountain wrote that a railroad once tied with catalpa will find its annual expenses for repairs diminished $200 per mile.

Telegraph and telephone companies will speedily welcome relief from the increasing expense of obtaining poles, and this tree, with its tall, straight bole, is peculiarly adapted to this purpose, quickly grown, and an admirable substitute for the rapidly-diminishing cedar. For mining purposes, canoes, fence posts, rails, cabinet work and interior finish its lumber is desirable; it is suitable for the medium grades of furniture, and as a base for veneering it neither warps, swells nor shrinks unduly, and holds the glue well.

The heartwood is brown, the sapwood lighter, nearly white; it is coarse-grained and compact, with the annual layers plainly indicated. Its open grain absorbs filling readily, and it may well be employed for the purpose of imitating more expensive woods.

The *Hardwood Record* is indebted to John P. Brown, of Connersville, Ind., author of "Practical Arboriculture," for much of the information contained in this article, and for the photographs with which it is illustrated. Mr. Brown is the highest authority on this subject in the United States, and is in charge of a number of plantations which have been established by railroads in this country and Mexico for the purpose of growing this wood in commercial quantities.—*Hardwood Record.*

OHIO RIVER FLOOD—MISSION RESCUE BOAT CARING FOR HOMELESS FLOOD SUFFERERS

MANY BUGS, AND SOME HUMBUGS.

We clip from an exchange the following item:

"From the statements of the horticulturists it would seem that the San Jose scale was about to get away with everything vegetable except the catalpa speciosa and the 'jimson' weed."

More truth than humor in this brief comment of our exchange. The poplar family is preyed upon by no less than one hundred distinct species of insects, and one hundred and fifty varieties of fungoid diseases.

The oak has galls in profusion, and insects without number.

The soft maple has untold numbers of scale and other insects, many of them very obnoxious.

To produce apples the farmer must spray with poisonous compounds, and fight from January to December to prevent insects from gathering his crop.

There is not a tree, plant or vegetable product in the entire world but which has some one or more insect enemies and various diseases to live upon its tissues.

Oh, yes, one — the "jimson weed." No one cares to investigate that. It smells too loud, and is of too slight value. Then, it is poison.

The catalpa speciosa has but one insect enemy — and that is big enough to be seen and easily destroyed. Besides that we sometimes want to go fishing, and here we look for bait.

But, seriously, there is no forest tree on earth which has so few enemies as has the catalpa. Its foliage is not tasteful to the San Jose scale or other entomological property.

PEACE vs. WAR.

ARBORICULTURE fully indorses the protest as outlined below, believing that the United States can better use the means and influence in interests of peace rather than this militarism. We had our share of war in the Civil War, and have no desire for more.

INTERNATIONAL JUSTICE VS. "THE SPLENDORS OF WAR."

Protest against the Diversion of the Jamestown Exposition to the Service of Militarism—by Hon. Carroll D. Wright, Edwin D. Mead, Rev. Edward Everett Hale, Cardinal Gibbons, John Mitchell, Miss Jane Addams, Miss M. Carey Thomas, William Couper, Prof. James H. Dillard, Joseph Lee, J. Howard McFarland, Frederic Allen Whiting, Prof. C. M. Woodward, Prof. Charles Zueblin, and other members of the Exposition Advisory Board.

The extravagant militarism of the program of the coming Jamestown Exposition, as developed and disclosed during the last few months, is a profound shock to a great body of the American people. In one of the issues of the official organ of the Exposition there is published conspicuously a list of the "attractions" of the coming Exposition. There are thirty-eight items in the list, and eighteen of these are as follows:

Greatest military spectacle the world has ever seen.

Grandest naval rendezvous in history.

International races by submarine warships.

Magnificent pyrotechnic reproduction of war scenes.

Reproduction of the famous battle between the "Monitor" and "Merrimac" at the place where that battle was fought.

Great museum of war relics from all nations and all ages.

Greatest gathering of warships in the history of the world.

Prize drills by the finest soldiers of all nations and by picked regiments of United States and State troops.

Races of military airships of different nations.

The largest military parade ground in the world.

Contests of skill between soldiers and sailors of different nations.

Daily inspection of warships in the harbor and troops in camp.

The greatest military and naval parade ever witnessed.

More naval and military bands than were ever assembled in time of peace.

Greatest array of gorgeous military uniforms of all nations ever seen in any country.

More members of royalty of different countries than ever assembled in peace or war.

The grandest military and naval celebration ever attempted in any age by any nation.

A great living picture of war with all of its enticing splendors.

The tendency of our country is toward militarism, and the efforts of both naval and military officers are to enforce upon our people the greatest navy and army of any country in the world.

False rumors have been circulated, and the press of the country, hungry for news of an exciting character, has spread these rumors broadcast, that one country or another was preparing for a descent upon our coasts and ill-gotten islands, with vast navies, for the purpose of conquest — the object, in every case, being to frighten Congress and the people into a frenzy, the Hague and peace forgotten.

The proper encouragement, by Congress and each State Legislature, of the art and practice of planting forests, would assure a never-ending supply of timber and lumber for all purposes, which will continue the great manufactories of the Nation, give employment to five millions of people, and support their families, numbering twenty million souls, educate the children, and guarantee a taxable income to States and Nation of ten thousand million dollars, *at a fraction of the cost of war.*

What will war insure?

Ruination of national prosperity, great increase of war indebtedness, a million homes destroyed, many killed or shattered

in health, with widows and orphans innumerable, all for the glory of a few army and naval officers.

Let us have peace. This country will never be attacked so long as we act the honorable part toward other powers.

GENERAL FEDERATION OF WOMEN'S CLUBS FORESTRY COMMITTEE.

CHICAGO, ILL., February 5th, 1907.

A noble work has been taken up by the Federation of Woman's Clubs, and the greatest beneficial results may be expected from the discussion of forest subjects. Literary entertainment is an excellent object for the very many clubs of American ladies who have thus organized to elevate womankind above the round of drudgery on the one hand, and the search for pleasure and pursuits of fashion upon the other, by the systematic training of the intellect.

There is no subject discussed which possesses more far-reaching effects upon our people than is that of the many forest problems and their influence upon the material prosperity of the nation, than that of forest perpetuation.

Here are some of the suggestions made to all club women by the chairman, Mrs. P. S. Peterson, of Chicago:

SUGGESTIONS.

In speaking of forest reserves, both State and National, emphasize the utilitarian side in preference to the esthetic. Urge the need of forest preservation, protection, and scientific handling.

Aim to have every club in your State give one day or more each year to the subject of forestry, and assign it a place in the programs of the State and district meetings.

Have a definite presentation of this most vital topic, which affects the health of the people as well as the rainfall and climatic condition of the country.

Ask the clubs to study forestry, and see that books on forestry are included in traveling libraries and brought to the notice of clubs.

Have books on forestry added to all local libraries and periodical literature secured for reading-room, etc.

This circular letter was sent out to all women's clubs:

CHICAGO, January 19th, 1907.

Dear Madam—Will you kindly answer the following questions in spaces indicated, as fully as you are able, and return the same to me at your earliest convenience? I shall be pleased to explain further any questions which are not understood:

1. How many clubs in your State coöperate with you?

2. Are there other associations doing work germane to forestry? Name them.

3. Have you tree and forestry laws in your State, and laws relating to forest fires? Have you studied them?

4. Have you a State Forester or a Forestry Commission?

5. Does any institution of higher learning in your State provide for education in forestry? How many? Where located?

6. Is there an experimental school or station doing forestry work?

7. Is any movement on foot to secure forest reservations in your State? Have you any? How many acres?

8. How many acres of forest are being managed under the supervision of the forest service?

9. What proportion of your State was formerly forested? How much now?

10. Is an *Arbor Day Manual* published in your State? By whom?

11. Does the Educational Department issue publications on tree and bird lore?

12. Is anything being done in your State for the preservation of birds?

13. Are you trying to save historic trees and those which have been ancient landmarks?

14. Have you any plans for the study of forestry in the clubs, or for advancing the work in your own State?

15. What are the special needs in your State?

16. What have the women's clubs in your State done for forestry?

NOTICE.

The Indiana State Fair will be held at Indianapolis, Ind., September 9, 10, 11, 12, and 13, 1907.

SID CONGER, *President.*

CHARLES DOWNING, *Secretary.*

Room 14, State House, Indianapolis, Ind.

"Too deep to wade, too cold to swim"

A MOUNTAIN TROUT STREAM ON COLORADO & SOUTHERN RAILWAY

FORESTRY CONVENTION, FREDERICTON, N. B.

The editor of ARBORICULTURE regrets his inability to attend this convention, to which he was invited. There is evidence of an awakening in the subject of forest perpetuation and forest influences in New Brunswick, as shown by the subjects discussed:

The General Need of Forest Preservation.

Attitude of Educational Institutions toward Forestry.

Dependence of Business Interests on Forests.

The Lumbermen's Interest in Preservation of Forests.

The Development of Water Power as Related to Forests.

The Forest Policy of the United States and Other Countries.

Addresses upon the subjects relating to Forestry Protection.

COURSE IN FORESTRY AT THE OREGON AGRICULTURAL COLLEGE, CORVALLIS.

It is well that the splendid State of Oregon, with her great wealth of timber, which is fast disappearing, should begin the education of her young men in all that is known of forestry. It will all be needed before these students shall have graduated.

It is well to know all that three hundred years of old-world experience has taught in regard to the importance of forests to the State, Nation, and to every individual and every business. After learning all that is possible of German forestry and methods and sciences of European nations, then if Professieurs Forester can forget, for the time being, all that they have learned and take up American ideas and pursue their calling in a common-sense, practical manner, which we believe they will do, they can make their services extremely valuable to their employers. The tendency of the highest education in scientific forestry, so-called, almost invariably detracts from the practical, every-day, common-sense, utility methods.

TELEPHONE POLES AN AGRICULTURAL PRODUCT.

The growing of poles for the use of the telephone companies is now becoming of some importance to those farmers that have pieces of forest so situated that the poles can be produced at a profit. The value of a telephone pole at place of setting is about $5. There are now in the United States over thirty million telephone poles, and the average life of these poles is about eight years. It requires for the maintenance of the present lines alone about 2,650,000 poles, and this does not take into consideration the enormous increase in the use of poles that is sure to materialize from year to year.

The certainty that there is to be a great dearth of telephone poles has led to extensive experiments in treating poles to increase their time of usefulness. If the butt of the pole from two to eight feet from the end is treated with preservatives, the length of life is increased four years. If the butts are soaked in tanks to a distance of eight feet from the end, the length of life is increased eight years.

In growing trees for telephone poles the farmer must grow a very large number on an acre, as otherwise side limbs will develop to too great a degree. When the trees are grown close together, they send all their substance into their tops, which stretch up rapidly. The side limbs are small and do not interfere much with the bole of the trees. This means, also, that a great many can be grown on an acre, and at current prices the annual return is quite satisfactory, though one must wait many years for the returns.—*Farmers' Review.*

What kind of trees *The Farmers' Review* would recommend for this purpose is not stated, nor can it be guessed.

The Michigan cedar, so largely used, a product of swampy locations, will grow in the course of 200 years to make poles.

The Idaho pine, now taking the place of the almost exhausted cedar, will grow in from 150 to 200 years.

The Tennessee red cedar, largely used in the South, requires 250 years to produce trees large enough for first-class poles.

Chestnut, if already growing, that is, the sprouts in the natural forest, will grow in forty years, probably, but if from planted seed, not less than fifty to seventy-five years.

We will have to fall back upon concrete poles or plant Catalpa speciosa, unless we build underground conduits.

DISTRIBUTING FOREST TREE SEEDS.

The International Society of Arboriculture each year distributes large quantities of forest tree seeds and many thousands of trees, sending them gratuitously to governments and individual planters in portions of the world.

This year it has provided *one thousand dollars' worth of seeds and trees,* which are being sent to foreign botanical gardens, societies of silviculture and the experiment stations of this country, for the purpose of encouraging the planting of economic forests.

Forty years ago the secretary of this society was a pioneer farmer on the frontier prairies of Kansas, and in common with other pioneers wished to surround the homes with forest trees, but was unable to procure anything but cottonwood and box elders.

The United States Government has never appreciated the necessity of providing seeds with which forests may be planted, and this pioneer experience of the editor of ARBORICULTURE has stimulated him to organize a society which will perform this service.

AN INFAMOUS LAW.

"PRISON LABORERS MAY NOT LEARN TRADES.

"Under a recent decision of the Michigan Supreme Court, Attorney-General Bird ruled that contracts under which State prisoners are employed at cigar-making, broom-making and stone-cutting may be continued only as long as there are convicts already skilled in those trades, it being held illegal to teach mechanical trades in prison. This decision and ruling will bring the question of providing work for prisoners before the State Legislature this winter in acute form."—*American Industries.*

A shame upon a State which would place such a law upon the statutes. Hold men in prison for years, then turn them out without a knowledge of any manner of making a living except stealing.

Repeal such laws quickly, and educate the wards of a State to enable them to make an honest living.

AN AMERICAN TREE IN ITALY.

While we have so many doubters, fault-finders, and those who demand impossible proofs before trying anything which to them is unknown, it is highly refreshing to know that in Europe, Australia, Asia, in Africa, and throughout the world, are those who have confidence, and having experimented upon a large scale are willing to testify to the success of the Catalpa speciosa many thousands of miles distant from the little territory in Indiana where this tree originated. We recently published letters from New Zealand and from Great Britain attesting to the wonderful success with the Catalpa speciosa in these lands, and now print a letter from a lady in Italy to whom we sent seeds some years ago.

PALAZZO ORSINI, MONTE SAVELLO, ROME, ITALY,

December 16th, 1906.

Dear Mr. Brown—"Bosco Brown," as my husband has christened his plantation of *Catalpa speciosa* at "I Veli," near Brindisi, is doing the greatest credit both to the soil and to the seeds. My husband says the trees have grown splendidly, already yielding fruit. Every plant has thriven, none having died, and the experiment has been extended to some other plantations, by the gift of a few striplings to Count Giusso for his nurseries near Naples, and to the Onorable Pavoncelli, near Foggia. These two, being the foremost agriculturists in Italy, have been so delighted with the *Catalpa speciosa* that they have asked my husband for seeds. Will you, therefore, kindly send a small quantity of seeds addressed to my husband, Monte Savello, Rome, Italy? We intend also trying the seeds from our own catalpa trees, as it will be interesting to see whether the growth from this second generation is like the original plant.

THE RAPE OF MICHIGAN.

"Michigan was seventy years old Saturday, and in many respects promising for her age, but there are about six million acres, or a fifth of her territory, worth much less than at her birth as a State, owing to the voracity of the tree butchers."—*Cincinnati Times-Star.*

What a commentary upon the millionaires and multi-millionaires whose money has been made by the destruction of a State's forests, and who now refuse to aid in the reforesting of the lands which they have ravished!

Wake up, ye legislators of Michigan, and begin a system of reforestation, taxing these millions to restore some of the wealth which only forests will bring to your Northern sandy wastes!

THE CATALPA SPECIOSA FOR MICHIGAN.

I have been very conservative in advising the extensive planting of the catalpa in far northern regions. The trees are indigenous to such a small tract between latitudes 37½ and 38½° North that only after thorough investigation would I advise the planting, except as a matter of experiment, so far north as the lower peninsula of Michigan. I had found how successful the tree had proven in the Gulf States, and even in the tropics of Mexico, but how about the Northern States?

Recent correspondence with residents of Michigan has settled the question most thoroughly. Seeds have been received from trees twenty years old at Big Rapids, almost lat. 44° N., where speciosa is quite hardy, yet the temperature was 22° below zero at the time the letter was written, February 6, 1907. They are on the grounds of Mr. George A. Roof, who writes: "I have four catalpa trees that I bought twenty years ago for *speciosa*. There has been so much talk about spurious stock, and I was intending to plant a lot of the seeds, but wanted first to know whether I could recommend them as genuine. I therefore sent two seed pods, about eighteen inches long, to the experiment station at Ft. Collins, Colorado, for examination. Professor Longyear wrote me they were genuine speciosa, and referred me to Mr. W. G. M. Stone, of the Colorado State Forestry Association.

"The pods hung on the trees until we had pretty severe zero weather. I inclose a few seeds, but they may not germinate. The bark on my trees is very rough. Are the trees genuine speciosa?"

There is not a particle of doubt as to the genuine character of the seed, and from description the trees are true. Three of the trees are but nine inches in diameter; the fourth tree is fourteen inches, and is forty feet high.

Evidently, from the correspondence, the trees have been very much neglected, in fact, have had no care whatever; but they have lived for twenty years, while the temperature becomes extremely severe.

Other correspondents report a number of trees growing well at Traverse City, which is nearly 45° North lat.

At Saginaw, lat. 43½° North, there are many trees, while about Detroit, Grand Rapids, Kalamazoo and Muskegon we have reports of other trees.

It would seem, therefore, that the residents of the lower peninsula of Michigan have great encouragement, and need not hesitate to plant the catalpa in large numbers, providing the true speciosa variety is secured. The sandy soils of Michigan are specially favorable to the production of catalpa timber as it was in pine growth.

It is not expected that any tree will grow so rapidly where the summer growing season is very short, as the same species will do where the season is nearly all summer, as in the Gulf States. However, the importance of the subject is so great that no opportunity should be lost in securing sufficient data and in planting groves in every portion of the State.

A SERMON IN A NUTSHELL.

If a bale of cotton won't buy as much meat now as a bale of cotton would ten years ago, better raise feed crops, fatten meat, and let the old bale of cotton go to thunder. It breaks backs, anyhow; and it breaks pockets, and it keeps the children out of school and cheats them out of their education. There's a whole lot to be said against a bale of cotton before much can be said for it.—*Shipper's Guide.*

Not five per cent. of the Cotton States' total area is devoted to the production of that staple, and when the area planted to cotton is increased with greater rapidity than the increase of population in the United States, then of necessity the price of the staple must be reduced proportionate to the quantity of cotton once produced. It is so with all agricultural products of the South.

There is, however, one product of the soil within the Southern States which can never be supplied in too great quantities, and for which the demand will for all time increase more rapidly than the supply, and that is the *forest.*

IN SUMMER LAND, LOUISIANA—A LIVE OAK TREE DRAPED WITH SPANISH MOSS—ON LINE OF LOUISVILLE & NASHVILLE RAILROAD

The Great Lumber Trust of America.

[Reprint from January.]

Owing to an error, several hundred copies were omitted. We thus reprint the principal article in this issue.

That there is a lumber trust in the United States is true beyond a question, and that it is the greatest of all trusts can scarcely be doubted.

The *Cosmopolitan Magazine* contains a remarkable article from the pen of Charles P. Norcross which relates so much of history that it demands the attention of the American public and an investigation by Congress.

The article is headed "Weyerhaeuser Richer than John D. Rockefeller," and shows how one man, an alien, in fifty years has become possessed of a hundred thousand square miles of the best timber land of the United States, and is cutting the timber as fast as more than a score of the largest sawmills in the world, working night and day, can convert the trees into lumber.

We extract from the *Cosmopolitan* some of the statements:

"Weyerhaeuser's wealth and opportunity grew out of a national crime. One of the most wanton wrongs ever committed in this country has been the spendthrift waste of forests." "It was only recently that the nation awoke to the vandalism that has been going on unhindered for years." "Weyerhaeuser, born in a land where forestry is an exact science, realized that the methods in vogue, left unchecked, would in time exhaust even the prodigal wealth of the land and bring on a timber famine that would cause forest lands to appreciate in value." "The question naturally arises as to how much timber land Weyerhaeuser owns. He won't tell, and even his closest lieutenants admit that they can only speculate."

"There are fifty thousand square miles of timber land in the State of Washington alone—thirty-two million acres."

"In the territory around Wisconsin, Minnesota and the Mississippi River district he has reigned for years undisputed. It is estimated by those who have studied Weyerhaeuser's widespread business interests that fully thirty million acres of timber land are under his control—fifty thousand square miles, an area six times as large as the State of New Jersey."

"Weyerhaeuser is of German birth. Born at Neidersaulheim, in Southern Germany, in 1834, he tilled the vineyard on the farm until eighteen years of age. In 1852 he decided to emigrate to America." "Was in 1872 that Weyerhaeuser began to branch out and started in to create the indefinite all-powerful organization which has become known as the Weyerhaeuser syndicate." Weyerhaeuser was elected president of the Mississippi River Boom & Logging Company. "Some of the powerful companies under his control may be named, as follows: Atwood Lumber Company, Rutledge Lumber Company, Mississippi River Logging Com-

pany, Northland Pine Company, Pine Tree Lumber Company, Chippewa Valley Logging Company, Musser-Sauntry Company, Weyerhaeuser & Denckman, Colquet Lumber Company, North Wisconsin Lumber Company, Bonner's Ferry Lumber Company, Superior Timber Company."

Unquestionably the frauds perpetrated upon the Nation by the great lumber corporations are appalling and call for their condemnation by all good citizens.

However, since the titles to these immense tracts of timber lands have passed from the Nation to the various lumber corporations, and, on account of the indifference of our people and of the statesmen who control legislative affairs, have become legal transfers, it is in most cases too late to be remedied.

Still, there is a power in Congress, if Congress will only act, which can prevent the utter destruction of the remaining forests and make them perpetual.

It is not the policy of ARBORICULTURE to deal with personalities, but rather to appeal for an improvement in methods of lumbering and the restriction of annual output of the great mills in order that the forests may be perpetuated, and that this Nation shall not be cursed as are those countries which destroyed their forests.

NATIONAL LEGISLATION.

It is fully realized how almost hopeless is the prospect of securing efficient legislation where corporate power, such as exists within the great lumber trusts of America, possessed of vast wealth, dominates legislative bodies and even the policy of the Government.

The old world has learned centuries ago that forests are essential to the prosperity and well-being of the people, and has enacted wise laws for the government of private owners of forest lands as well as the forests belonging to the Nation.

DUTY OF THIS NATION.

The adoption of national laws governing the remaining forests of the country.

The reservation of all lands upon which timber is growing, that yet remains unsold, the trees to be sold under direction of the Government.

Prohibiting the transportation of lumber and timbers from one State to another where these regulations are not complied with.

Removal of all duties on timber.

Restricting the output of every quarter section of forest, to make the forests perpetual.

Requiring the systematic planting of trees where necessary to maintain a perpetual forest.

SEVERAL REASONS FOR CONGRESSIONAL ACTION FOR THE CONTROL OF FOREST PROPERTY.

(1) The influence which forests exert on precipitation.

(2) The influence upon water storage; refrigeration being the best means of retaining water in the mountain valleys.

(3) Effects of forests upon wind movement.

(4) Disastrous effects of floods and added costs of levee system caused by forest destruction.

(5) Menace to river navigation from droughts caused by too rapid melting of snow because of removal of protecting woodlands.

(6) The future supply of timber for this Nation depends upon the conservation of the remaining forests.

(7) Transportation between the States will be greatly injured by the sudden removal of the forests.

(8) No appreciable effects occur within the State in which forests are located to compare with the damage done in other States, often far removed.

(9) On account of local corporate power, individual States are unable or unwilling to control the trust.

(10) National interstate legislation is the only remedy.

(11) The recent ruling of the Supreme Court in the case of the State of Kansas vs. Colorado, regarding irrigating waters, is applicable to this subject, *id. est.*, forest influences.

(12) The abandonment of many thousand square miles of former forest areas by lumbermen, after removing all the timber, forces the worthless remaining land upon the State, which can realize no income from it, but must maintain it at great expense to the people.

(13) The loss to the Nation from the existence of so large an area of non-taxable, barren property.

(14) Necessity of importing from abroad the timber required after removal of our forests.

(15) The greatest curse possible is a treeless nation.

Navigable rivers flowing through many States have their volumes increased immoderately, at times, and are again shrunken so as to obstruct navigation, from the rapid melting of the ice and snow upon the mountains in far-distant States, which has been caused by the removal of the forests upon these mountains and valleys. For this the injured localities have no recourse except by national legislation.

River and harbor improvement are increasing annually because there are no forests to retard the flow of water, while the levees of many States have frequent crevasses and must be maintained at great expense from the same cause. Yet no State is afflicted by the injuries caused within its borders, and can not alone control the cause which exists in another commonwealth.

Under existing circumstances it is impossible to induce great lumbering corporations to adopt conservative methods in their operations; the cream is skimmed from the property, immense waste occurs, the continuation of the forests being farthest from their aims.

Under these conditions the land is being rapidly denuded of all that gives it value, the time rapidly approaching when the entire forest area will disappear.

The rocky, mountainous lands thus stripped of the timber will be thrown back upon the Nation, or State in which they are situated, the soil soon eroded, leaving the property valueless for taxation and productive of no income for the support of the Nation.

These are ample reasons for stringent restrictive laws under which the forests may continue productive to the country.

THE POLICY OF FOREST RESERVES.

Senator Hepburn, of Idaho, is making a determined assault upon the President's policy of establishing forest reserves.

In a recent address at Spokane, Wash., he said:

"I purpose to urge the adoption of my bill, introduced at the last session, when the next Congress convenes. This is designed to take out of the hands of the President the right to establish any more forest reserves. No one in Idaho indorses the Administration's forest reserve policy, as applied in our State."

A correspondent in Spokane, in a letter to ARBORICULTURE, says:

"The creation of four new forest reserves in Northern Idaho and the exten-

sion of two others, adding to the reserve area of that State 7,406,556 acres, and the recent addition of more than 800,000 acres of forest land in Stevens County, Washington, is looked upon by the people of the Northwest as exemplifying the Administration's disregard for the protests of Senator Hepburn and others.

"The contention of the forestry department is that the trees are necessary to conserve the water and timber supply to the great mining industry in the Cœur d'Alene country, since the Cœur d'Alene River finds its source in the wilds of Northern Idaho, where the Shoshone reserve has been created in connection with the Cœur d'Alene reservation, adjoining it on the north, and to others to be known as the Cœur d'Alene reserve. Their aggregate area is 2,250,000 acres. They are in Shoshone and Kootenai Counties, and extend northward to the middle of Lake Pend d'Oreille. The Lemhi reserve embraces 1,346,460 acres, and is in three strips adjoining the Montana line, while 165,240 acres of timber lands have been set in the extreme northeastern part of Idaho, on the British Columbia and Montana lines, a small segment of the reserve being in Montana. The Salmon River reserve in Lemhi and Custer Counties embrace 2,201,120 acres, the entire area between Salmon River and the middle fork of that stream. The Raft River reserve, in Cassia and Oneida Counties, embraces 291,976 acres, and additions aggregating 1,371,760 acres have been made in Sawtooth reserve.

"Timbermen say there is little foundation for the contention that there is danger of the forests being denuded at the present rate of cutting. It is estimated there is more than 700,000,000,000 feet of standing timber in the Northwestern States, and at the present rate of cutting it will take three hundred and fifty years to utilize the merchantable trees."

I have personally talked with quite a number of Idaho citizens recently, some engaged in mining and others in ranching, all of whom fully indorse the forest reserve policy.

I am credibly informed that the opposition comes from lumber companies who are grabbing the forests and are cutting the timber which is greatly needed for the future use of the mines and for the protection of the water supply.

No intelligent person would for an instant consider our correspondent's statement of the centuries which the timber of the Northwest will last.

Instead of three hundred and fifty years, it will be practically used up in less than twenty-five years.

There are large and influential corporations as well as numerous individuals who have no regard for the interests of others, so long as they can make large sums of money from the destruction of our forests. Such corporations have for many years dominated Congress, elected Senators and controlled Legislatures.

It is full time the Government should assert the rights of this people and those who are to come after us.

With but a trifle of America's magnificent forests remaining, the duty of Congress is to withdraw every acre of timberland still held by the Government from public sale.

This should be held as a sacred trust to be forever retained, only removing such trees as can be spared and those which have exceeded their allotted age, carefully reserving all young trees and those which will continue to grow into valuable timber.

To which should be added a more efficient system of forest planting by the

Government, seeding the bare spots with trees suited to the locality.

All the interests of this Nation demand the perpetuation of the remaining forests, agriculture, the mines, navigation, commerce, the builders' trades, all will require timber twenty, fifty and a hundred years hence as urgently as we of the present generation, and the greed of the lumber operators must not be permitted to devastate the forests which are still owned by the Government.

"PRACTICAL ARBORICULTURE" AND THE "LUMBER TRUST."

I have not given your book the examination that it deserves. Its value appears to me to be in that it is a study of one of our forest trees from a sylvicultural standpoint. That is where we are weakest. Our forest trees have never been studied from the point of view of artificial reproduction, nor have the conditions and laws governing their growth been worked out, that is carefully observed and noted down. All we have done so far is to try certain rules that have been in use in Europe. Now, if some one will do for our other trees what you have done for *Catalpa speciosa,* we shall have progressed on sure and certain ground. The family that interests me most is the birches of New England. When I have studied the birch more, I intend to try to write something about them that will be an addition to our knowledge of American sylviculture, I hope.

I do not know whether you ever saw the article on the Lumber Trust or not. I have written another, in which I individually treat the same subject, and sent it to *The New York Sun.* Whether *The Sun* will publish it or not I do not know. But if it does, I shall see that a copy reaches you. So long as the "Lumber Trust" controls the national and State forest jobbing, we shall not advance one step, and practically all that the Government is now doing is so much money wasted and so much energy misdirected.

Yours truly,

(Signed) THOMAS P. IVY.

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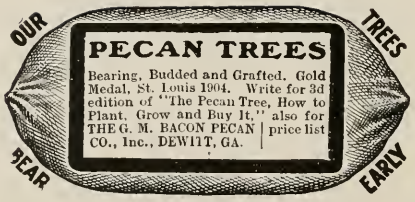

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ARBORICULTURE

Vol. VI No. 3

A Journal of the Forests

Connersville, Ind., May, 1907

JOHN P. BROWN, Editor and Publisher

TREES AND SEEDS

OF

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THE WRECK OF THE PENNSYLVANIA FLYER—STEEL TIES, TWISTED AND TORN, BEING REMOVED TO BE REPLACED WITH WOOD.

ARBORICULTURE

A BI-MONTHLY MAGAZINE

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VOL. VI. CONNERSVILLE, INDIANA, MAY, 1907. NUMBER 3.

Steel Ties Unsuited for American Railways.

PENNSYLVANIA RAILWAY ACTS PROMPTLY AFTER THE DISASTER AT MINERAL POINT—RECOMMENDATION OF SPECIAL COMMITTEE OF INVESTIGATION.

Timber Must Be Provided By Planting Forests.

L
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"Philadelphia, Pa., Feb. 26.—General Manager Atterbury, of the Pennsylvania Railroad Company, has ordered the removal of all steel cross-ties now in use on the line of the Pennsylvania Railroad. This order is the result of the recommendation of the special committee appointed by the General Manager to investigate the wreck of the Chicago special near Mineral Point on Friday night."

The editor of ARBORICULTURE, himself a civil engineer, has, during the past thirty-five years, endeavored to induce the railway companies of America to make preparations for providing wooden cross-ties by planting immense forests upon the cut-over lands of former timbered tracts.

Ten years ago I appealed to the civil engineers and managers of the great railway systems not to waste valuable time and spend large sums of money in experiments with metal ties.

(Extract from J. P. Brown's Catalpa Booklet of 1898.)

METAL TIES

Have been devised in countless numbers; some have been used upon European lines with apparent success, but they are costly, from $2 to $4 each, reaching about $9,000 per mile, as against $1,500 for white oak.

Were all American railways as straight as those of Europe, with their minimum grades, and as substantially constructed, metal ties would not be so objectionable, save for their expense; but none of these conditions exist in America.

Given a mountain railway with abrupt curves, often reversed, with the outer rail elevated, a heavy freight train, with half a mile length of cars, an engine at each end or a double header, what engineer can compute the complex forces exerted against the rails in many directions as successive portions of the

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train are forcibly thrown from side to side?

Wooden ties are elastic; every spike is held in place by a cushion of wood fibers, every strain and blow being reduced by their elasticity.

How will it be with 100-pound steel rails rigidly bolted to inflexible metal ties with these forces pounding continually?

Accidents from broken rails and fastenings must reduce profits materially; and when they occur, the slow process of unscrewing nuts, replacing rails, ties and bolts, can only result in tedious delays and great expense.

It would seem, therefore, that wood is far preferable to anything else, so far devised, for cross-ties; but wood is fast disappearing, and trees must be grown for supplying this need.

Besides, oxidation must be considered, and in contact with moist earth, or even in rock ballast, bolts, nuts and wedge fastenings rust rapidly. Electrolysis, now that the use of electricity is increasing on every railway, the current reaching the earth through rails and ties, if the latter be metal, greatly aggravates the process of decomposition and weakening of fastenings.

(Extract from ARBORICULTURE, Vol. I, No. 1, 1902.)

THE CATALPA SPECIOSA AS A RAILWAY TIMBER TREE.

Paper of John P. Brown, read at a meeting of the National Roadmasters and Maintenance Society, Milwaukee, Wis., Sept. 9, 1902.

It must now be patent to every railway official that within a few years some form of cross-ties other than wood will become a necessity, unless special efforts be made to grow trees suitable for this purpose.

For a third of a century I have studied the problems of railway cross-ties; even at that early day the disappearing forests showed that grave results would follow the wasteful methods of Americans in wood-craft.

In 1876 plans for metallic ties were prepared by my attorneys, but upon a fuller investigation of the subject these were withdrawn, as I had become convinced that the long lines of our railways, the sharp mountain curves, maximum grades, increasing loads and heavier trains, together with their excessive cost, would make metal ties impracticable; and this has been proven to be correct.

The various native woods were next considered, white oak being the standard wood for ties. But white oak must soon become exhausted, and a new supply could only be produced in a century. At that time only the choicest timber was accepted, and a critical inspection rejected large numbers which would now be eagerly seized upon.

General William Henry Harrison had, in 1818, called attention to the catalpa tree of the Wabash Valley, as being of extreme durability. Mr. James M. Bucklin, a civil engineer, in 1826 had advocated the use of the catalpa for ties.

Several railways in the early part of the past century made use of a limited number of catalpa ties, but the great abundance of timber prevented any general use of this wood, changes in management contributing to this result, and causing as well the loss of most records of its use.

Mr. Barney, the car builder, of Dayton, O.; Dr. Warder, of North Bend, O., and Robert Douglas, of Waukegan, Ill., about 1876 created considerable interest in the catalpa by various publica-

tions. I became convinced that these gentlemen were right, and now, after a quarter of a century of investigation, am assured in regard to Catalpa speciosa:

1. It is the most rapidly-growing tree in America that possesses economic value.

2. A greater quantity of valuable wood may be produced upon a given area in a specified time than from any other American tree.

3. The wood is the most enduring of all our trees.

4. It succeeds over a greater range of territory than any other valuable tree of this continent.

5. Its habit of growth is upright, with long trunk where it has an opportunity, thus differing from all other forms of catalpa.

6. The chemical constituents of the wood are so resistant of decay as to make expensive artificial wood preservation entirely unnecessary.

7. The roots are strong, vigorous, large and deep, extending far in every direction, holding so firmly in the earth that storms do not blow them over. I never knew a catalpa to be blown over by wind.

8. It is less subject to disease and attacks of insect enemies than any other tree of my acquaintance. Only one worm, the catalpa sphinx, attacks it, and that is easily controlled by spraying, while the trees are never seriously injured by the sphinx.

9. The wood has the same texture as butternut, firm enough for tie purposes, and holds a spike well.

10. For inside car finish it is admirably adapted, partakes of high polish, has a handsome grain, and is a superb wood for furniture and inside finish.

11. It is easily manipulated with edge tools.

12. Its strength is ample for all requirements in railroad work.

Thus it will be seen that from the first inception of the idea of using steel ties on American railways, I have pointed out the serious difficulties and dangers from the use of metal ties, and have repeatedly urged the planting of forests.

It is yet not too late for this work to be accomplished, and just now is an excellent time to consider what may be done.

WHAT MAY BE ACCOMPLISHED WITH ONE MILLION DOLLARS.

Replying to a prominent railway official, recently, in regard to cost of growing timber in the Southern States for the railways north of the Ohio River, I said:

The best lands in the United States for growing timber, particularly the Catalpa speciosa, are the sandy soils of Florida, South Carolina, Georgia and Alabama.

WHY?

(1) With a long growing season the climate of the Gulf and South Atlantic States causes an extremely rapid formation of wood cells, and double the annual growths which can be secured in our Northern States.

(2) The wood is of equal solidity as that grown in more Northern regions, there being no deleterious effect from this rapid increase of cell growth.

(3) The antiseptic materials which the Catalpa appropriates from all soils, and makes a part of its fiber, is present in the rapidly-maturing wood in just as

COLORADO BLUE SPRUCE, DENVER, COLORADO.

AVENUE OF LIVE OAKS NEW ORLEANS, CENTURIES OLD.

large quantities, or larger, than in the slower growths.

(4) Lands suitable for forest plantations in the Middle States are held at from $60 to $150 per acre, while those in more southern States are purchasable at from $3 to $10 per acre.

(5) The weight of Catalpa lumber, seasoned, is 2¾ pounds per foot, B.M.

(6) Weight, average cross-tie, 115 pounds.

(7) Interest on investment, 1,000 acres, costing $100, per annum, $4,000; eight years, $32,000; total cost, land and interest, 8 years, $132,000.

(8) Interest on 1,000 acres, costing $10, $400; eight years, $3,200; total cost and interest, $13,200.

(9) Difference in favor of Southern land, $118,800.

(10) Estimate of preparation of land, planting, etc.:

Plowing 1,000 acres, $2.50 per acre $2,500.

Purchase of trees, 900,000, at $10, $9,000.

Planting, $1.50 per 1,000. $1,350.

Cultivating, two years, $3,000.

Pruning and care, $2,000.

Superintendent, two years, $1,500.

Total, $19,350.

Total cost, less than $20,000.

INCOME THE EIGHTH YEAR.

From trees removed in thinning plantation, 1,320,000 mine timbers, at 5 cents net, $66,000. Estimating two props, 6 feet long, to each tree. Permanent forest remaining, 222,000 trees.

INCOME THE TWELFTH YEAR.

Three cross-ties per tree, 666,000 ties, value estimate at 40 cents on the ground, $266,400.

CITATION.

A Catalpa speciosa tree at Jacksonville, Fla., 9 years old, is 18 inches diameter at six feet from the ground.

Catalpa speciosa in New Orleans, age, 17 years; 26 inches diam.; length of trunk, 20 feet, equal to four ties first cut, four ties second cut, two ties top; 10 ties in seventeen years.

Trees, Pensacola, Fla.; age, 5 years; 6 inches diam.; height, 24 feet. Other actual growths could be referred to.

TIMBER REPRODUCTION.

Upon cutting the first crop of trees in twelve years, another springs up from the stump, and having all the root system established, pushes forward with great rapidity.

It is safe to estimate that a crop may be obtained every twelve years, and fully as many ties can be anticipated at the end of the second, and again of the third and succeeding periods of twelve years.

Requirements of a railway system, with mileage of 8,000, with additions probably 9,000 miles:

Ties in use, 24,300,000.

Annual renewals, 4,000,000.

Annual cost, $3,000,000.

What can be done with a million dollars, which is one-third the cost of one year's tie renewals:

This sum will purchase 30,000 acres of land, plant and care for it, pay interest, taxes, and all expenses for eight years.

This is approximately 47 square miles. There are many tracts of cut-over land in the South of larger dimensions which can be purchased.

In eight years enough fence posts and mine timbers can be grown to load 20,000 railway cars, with a value of $1,980,000.

The Frisco Railway sold $100,000 worth of fence posts as a result of one cutting on 640 acres of land.

In twelve years this will produce 20,000,000 ties, almost enough at one cutting to tie this entire railway system.

JOHN P. BROWN.

STEEL TIE'S DOOM IN FLYER WRECK.

DERAILMENT OF 18-HOUR TRAIN BELIEVED TO HAVE SETTLED ITS ADAPTABILITY — TWISTED LIKE STRAWS — PENNSYLVANIA ORDERS WOOD USED IN REPAIRING THE TORN-UP TRACK.

(The Chicago Tribune, Monday, Feb. 25, 1907.)

Although the Pennsylvania Railroad continues to insist, in its statements for the public, that the wreck of the eighteen-hour flyer near Johnstown, on Friday night, was caused by a broken brake hanger, the opinion is almost firmly fixed in railroad circles that the steel ties were to blame.

Railroad men who examined the damage to the roadbed assert this. So does the conductor of the flyer. And that the company itself leans to the same view is shown by the fact that it has demanded that the Carnegie Company make good on its claims for the new tie.

Still another indication that the Pennsylvania officials, far from believing the wreck was an act of Providence, as they profess in public, privately blame the ties is the fact that Conductor M. W. Forbes of the flyer yesterday reported the cause as follows:

"Cause of wreck, spreading rails."

This message was wired to Pittsburg and Philadelphia headquarters from a little signal tower on the mountainside, near the scene of the crash. It was inadvertently allowed to become public.

SEE FINISH OF STEEL TIE.

It is believed that the wreck of the flyer signals the passing of the steel tie, yet only in the experimental stage. Its use by the Pennsylvania was at the solicitation of the makers. The company consented to try the ties on some of its heavy mountain grades. Mineral Point Curve, known as the most dangerous on the mountain, was one of those so equipped. But the bolts by which the heavy rails were attached to the ties would not hold the heavy flyer at its speed of perhaps a mile a minute.

That the railroad people are more than satisfied that the steel ties were responsible for the wreck was shown by orders which came as soon as repairs began on the track to use wood ties wherever they could be gotten—this in spite of the fact that there was piled on the mountain grade, within easy reach of the workmen, enough steel ties to have fitted up the track again.

The Carnegie Steel Company, which furnished the ties, sent men to the scene to see what could be done. It is understood that a hard fight will be made to have the blame placed on something else than the tie.

The story given out by the railroad people that a rod on the engine broke and snapped a rail, or that a brake beam broke, does not seem to hold good, as neither the engine nor the car on which it is said the accident occurred left the rails.

TIES BENT LIKE STRAWS.

A glance at the wreck, this evening, more than forty hours after it occurred, shows that the damage wrought by the steel ties was beyond computation. Most of them were bent and twisted like straws, many of them still holding the iron clamp from which the 100-pound rail had been torn.

The way in which the ties and rails

had been bound together gave an inkling as to why so much havoc was wrought. Instead of five-inch spikes, which are used with a wooden tie on either side of the rail, the rails were attached to the steel tie by small square plates bolted through the tie, the edge of the plate catching the under flange of the rail.

When the train left the track, one of the Pullmans dragged along the tracks for some distance before toppling into the river. This Pullman smashed the steel ties like so much kindling wood.

It is now certain that the Aolia and Whitford, the Pullman sleepers, when the spread came, left the rails so quickly that they turned over in the air before they hit the embankment, and fell on some scrubby pine trees below. That is the only explanation as to how two trees were driven directly through the Pullmans from roof to floor. These cars then rolled over and carried the trees out by the roots. There they yet remain.

BRAKE HANGER OFFICIALLY BLAMED.

Philadelphia, Pa., Feb. 24.—The Pennsylvania Railroad Company to-day issued a statement in explanation of the accident on Friday night near Johnstown, Pa., in which many passengers on the Chicago special were injured. It is declared "that the only tangible evidence of the cause of the accident found was the broken brake hanger, as stated by the manager yesterday.

"The investigating committee," the statement continues, "was informed by the superintendent of motive power at Altoona that the engine on the Chicago special was carefully inspected before it left the round-house, and was in perfect condition. The gauge of the wheels of the engine was measured by the committee after the accident and found to be exact.

"With reference to the steel ties which form part of the track where the accident occurred, the committee informed General Manager Atterbury that the three-quarters of a mile of steel tie track west of the derailment and a small stretch east of it were found to be in perfect condition. This led the committee to believe that the entire length of track equipped with steel ties was in excellent condition before the accident occurred."

AMERICAN FORESTS DISAPPEARING.

MANY TREES REQUIRE FROM TWO HUNDRED AND FIFTY TO THREE THOUSAND YEARS FOR THEIR REPRODUCTION.

They are being ruthlessly slaughtered by lumber corporations whose sole object is to get money.

WHAT WILL TAKE THEIR PLACE?

Apropos of the warfare which the exclusive "400" set of forestry professionals is attempting to make upon the planting of trees which mature within one generation, we offer the following list of prominent American forest trees which are in common use, but nearly exhausted of their supply, and the time required for their reproduction:

Cypress of commerce *(Taxodium distichum)*, six hundred years.

Cedar of Washington *(Thuja gigantus)*, one thousand years.

Redwood *(Sequoia sempervirens)*, one thousand years.

Sequoia gigantea, three thousand years.

Live oak, several centuries.

Among the "infants" in commercial use:

American white oak *(Quercus alba)*, one hundred and fifty years.

THE CEDAR OF WASHINGTON. (THUJA GIGANTEA.) OFTEN 60 FEET GIRTH AND A THOUSAND YEARS OLD.

American beech, seventy-five to one hundred and fifty years.

American elm, one hundred to one hundred and fifty years.

American hickories, one hundred to one hundred and fifty years.

Tupelo, sour gum, one hundred to two hundred years.

Southern yellow pine, seventy-five to one hundred and fifty years.

Sugar maple *(Acer saccharinum)*, one hundred to one hundred and fifty years.

Can these Forestry Professors, educated under Mr. Fernow's tutorage, bring back these sequoias and century-old trees within the limited time for the final extinction of American forests? They are to be commended for the wonderful display of patience in "waiting" for these long-lived trees to grow, and we extend an earnest invitation to all officers and stockholders of American railways to be present upon the occasion and recommend that all railway operations be postponed for the benefit of these "experts."

(From the Forestry Quarterly, March, 1907.)

WANTS JOBS FOR THE *TECHS.*

"For a number of years there has been considerable discussion on the part of railroads about the decreasing supply of cross-tie and construction material. In most cases they have taken no active steps to provide for a future supply, and when measures were taken, these were usually misdirected, costly, and unsatisfactory.

About thirty years ago, as a result of a propaganda work conducted by ardent enthusiasts of forestry, some interest was aroused among railroads. The conservative management of woodlands *was unknown,* and advocates of forestry urged the people to plant trees to replace the forests which were being recklessly exploited by lumbermen.

It is only during the past year that a prominent railroad, for the first time in the history of forestry in the United States, has determined to acquire and manage forest lands for the production of cross-ties.

The interest of the individual railroads has, with a few exceptions, been enlisted through the personal efforts of *enthusiastic but non-technical men,* who have placed before railroad men, busy with the conduct of a road, a scheme which was neither adapted to their needs nor practical. In other business matters men who conduct the affairs of railroads have shown business ability, but in matters pertaining to forestry they usually have shown poor business judgment, and have engaged in forest work under impossible conditions, because they have allowed themselves to be influenced by men who do not come to them *as properly accredited foresters.* Quick results are desired, and the man who comes before them with a proposition to plant trees which in fifteen years will produce several cross-ties and fence posts per tree can secure their attention and enlist their interest far more easily and quickly than a named forester who tells them that such results can be secured only after a longer period has elapsed. Time and dearly-bought experience have proved to some of the railroads that satisfactory results can not be secured from the plantations in a few years.

In general, it may be said that satisfactory cross-ties can not be produced in the United States in less than thirty or forty years."

The natural forests of the United States will become extinct by 1925. What are the railways to do from that time to 1945, when the properly *accredited technical* youths sit upon the stumps watching saplings grow into cross-ties?

"Many tree species in the various parts of the United States are adapted, to a certain degree at least, for the production of cross-ties. Notwithstanding this, in making the majority of railroad plantations, only two species have been used, and for various reasons they are among the least desirable of the species eligible for this purpose.

These two species are catalpa and black locust, and the reasons for their selection are not difficult to discover. The selection of the first species may be attributed largely to the wide advertising the tree has received at the hands of ardent admirers who had, and apparently still have, unbounded faith in the possibilities of the tree. Unfortunately, they were able to convince certain railroad officials that

catalpa cross-ties possessed all the good qualities which cross-ties should possess, and none of the faults; and that in a period of fifteen years each tree planted would produce five cross-ties and other valuable material."

Only a technical knowledge of tree species will avail in watching the hourly increment of growth of forest saplings to be used forty years hence.

An American farmer, however, knows enough to plant trees and cultivate them. Hence the "tech. unions" object to the planting of trees. No job in it.

BLOWING HOT AND COLD.

"Under favorable soil and climatic conditions, catalpa, when properly cultivated, makes a rapid growth, but so far has never produced the cross-ties within the period named. Catalpa has been planted for many years, on a great variety of soils and on a wide range of territory, and although many plantations have reached an age of twenty-five years or more, so far as known, the trees in none of the plantations have reached a size suitable for cross-ties. The tree is well adapted for pole and fence-post production in a short rotation. In regions where fence posts are high in price, farmers may profitably devote a very small portion of the richer soil of their farm to such purposes, but past experience has well demonstrated that on the class of soils usually devoted to forest growth, catalpa can not be grown, advantageously, for cross-ties."

The Harahan tract is too rich. Du Quoin tract entirely too poor. Eastern Virginia too wet, all others too dry. The catalpa is a choice feeder, and must have much petting, else it will refuse to grow.

No one but a *technical expert* (no matter how slight a beard he has been able to grow) can tell just where to plant a catalpa. Still millions of them exist somehow in every sort of location except where the *tech.* sat while listening to Fernow's lectures.

"A number of the large catalpa plantations made by railroads have failed of their purpose because the silvical characteristics of the tree and their relation to the physical character of the soil were not understood.

The plantation of the Illinois Central Railroad at DuQuoin, Ill., offers a good example of this. The plantation was established some years ago on a fine, poorly-drained silt soil. A portion of this site was covered with pin oak *(Quercus palustris)*, post oak *(Q. minor)*, sweet gum *(Liquidambar styraciflua)*, and other trees capable of enduring the existing soil conditions. Land in the vicinity is poorly adapted for agricultural purposes, and only small crops reward the diligent efforts of the farmer.

The site is totally unfit for catalpa because of the excessive soil moisture, and the trees have made a very poor growth. The trees in this plantation, the latter about two hundred acres in extent, were planted at a large expense, and will never reach cross-tie size. The only yield which can be secured will be a comparatively small number of posts."

The *sole object* of the Du Quoin plantation was to demonstrate to operators in the coal fields of that locality that, while mining coal far beneath the surface, trees would grow upon the surface, even in such poor lands, to maintain the timber supply of the mines. It is fulfilling its mission quietly but effectively. Railway cross-ties were not expected here.

"Ignorance of the silvical characteristics of the tree has also been displayed in Eastern Virginia, where the Norfolk & Western Railroad owns several thousand acres at Ivor, along its right of way. These lands were acquired for fuel purposes many years ago when wood-burning locomotives were in use on the railroad. Although good cross-ties can now be secured by this railroad at a reasonable price, the officials, because somewhat interested in the production of cross-ties and having heard much of the rapid growth of catalpa, determined to establish small experiment plantations. The land is largely covered with an excellent growth of loblolly pine *(P. taeda)*, a tree extensively used for cross-ties in Texas and other Southern States, but not yet in demand for this purpose in Virginia. The permanent water table is only eighteen to twenty-four inches below the surface, making the site an unfavorable one for catalpa."

AN ANCIENT LOCUST TREE, MT. VERNON, IND.

Tech. ought to move the watertable. It is of no use anyhow. One with the higher *technical* education ought to be able to accomplish this much.

May be, if allowed to grow, the catalpa will do this. They have a habit of making swamps dry up, drain away, or, failing in this, they just grow.

SOIL TOO RICH FOR THEIR BLOOD.

"A further instance may be cited of the plantation made by the Illinois Central Railroad at Harahan, La. The soil consists of a rich alluvial deposit, and was formerly employed for agricultural purposes. Louisiana is outside the natural range of catalpa, and the tree when planted in this region, where the growing season is long and the soil very rich, made such rapid growth that the wood was so weak and "cheesy" that it was unable to support the heavy foliage of the tree. Winds have broken the weak stems, and many trees in the plantation have become mere broken poles. On less fertile soil the tree might have grown successfully, but under existing conditions the plantation is not a success."

Tech. had better go into the swamps of Louisiana and Texas and see some of the *native* catalpa groves; he would not blunder so in his assertions. It is unfortunate for Louisiana that the Delta soil is so fertile as to displease a *technical* student.

ERROR IN JUDGMENT OF C. D. ROBINSON.

"Various other instances where extremely poor judgment has been exhibited might be mentioned, and in nearly all cases the significant fact is evident that the physical character of the soil has been disregarded in the selection of sites for catalpa plantations."

What a misfortune that C. D. Robinson had not called a professional *tech.* to advise him before planting his twenty-acre catalpa farm! We never should have had the privilege of recording the financial success of the Pawnee City plant.

THE TRAINED FORESTER.

"It is scarcely credible that a body of men usually conservative in business affairs should be ready and willing to expend, freely, large sums of money upon projects about which they are not properly informed. A study and analysis of the propositions placed before them, or consultation of any *trained forester*, would have saved them from needless expense and costly mistakes, because any one acquainted with tree growth, and especially with the catalpa, could have informed them that the latter can not be grown profitably on all classes of soil and over a very wide range of climatic conditions. Some railroads have discovered the mistakes they have made, and now appreciate that the large profits and quick returns promised from catalpa plantations partake too much of the nature of our present 'get-rich-quick' schemes to place much reliance upon them."

The recorded statements of many thousands of most reliable people in every State of the Union and throughout the world at large proves that the catalpa tree does succeed under the greatest range of climate and soil of any tree known among men.

AN ANCIENT LOCUST TREE.

Recently, while visiting an old friend, Tom J. Erwin, at Mt. Vernon, Indiana, I took a photograph of probably the oldest locust tree in Indiana, if not the West.

This tree, as a little switch, was planted by Mr. Thomas Mills in the spring of 1829, and has just completed its seventy-eighth year's growth. The old gentleman who planted the tree is still living, to give its history.

This tree stands on the grounds of Mr. Elijah M. Spencer, corner of Main and Fifth Streets, Mt. Vernon, Posey County, Ind., which city is near the point where the Wabash River joins the Ohio.

The tree branches a few feet from the ground. At one foot from the ground its girth is 15 feet 2 inches. The largest branch is 9 feet 3 inches, and the smaller

one 8 feet circumference, the tree being about 60 feet in height.

It is estimated that the larger branch will make thirty-five fence posts, and the smaller one twenty-five posts, or, in all, sixty ordinary-sized fence posts.

At the customary price of posts in the locality, after deducting the cost of labor in making them, the tree would sell for about ten dollars. It is evident that, as an incentive to forest planting upon American farms, this tree would not be very encouraging, being an interest upon the investment, say one hundred such trees on an acre, of one-seventh of one per cent. per annum, which sustains our argument that no locust trees should be allowed to stand more than a dozen years, as at that age they are of greatest value; and since the trees are quickly reproduced from both roots and stump, after cutting, the grove should be thinned frequently for most economical results.

The average diameter increase has been about one-half inch per annum, at the ground. Our engraving shows the characteristic shape of old locust trees, crooked, irregular and much branched.

Farmers who have rough land may make it very profitably productive by planting locust trees upon it; but as we have often mentioned, the locust grove is of greater value to the owner if the trees are cut when about ten or twelve inches diameter, as the increase up to that time is far greater than any subsequent increase.

No timber, not even locust, should be used for posts or poles when freshly cut. Their durability is greatly enhanced by being dry and thoroughly seasoned.

Our engraving shows a tree of slight value for posts, and of no value for other purposes, because lacking in straightness of bole, as are most locust trees which are grown singly. In a grove this is overcome to a certain extent, at least during the first twelve or fifteen years of its growth.

Limestone bluffs, steep hillsides, and tracts which can not be profitably cultivated with annual crops, may be made to produce an excellent revenue if maintained as a permanent locust grove, cutting out a part each year and allowing the suckers to grow into post timber.

The shade from locust trees is not so dense but that blue grass will thrive and make good pasture, which is not the case with most other trees.

A variety of small articles are made from locust, among them are insulator pins for cross-arms of telegraph poles. Some policeman sticks are made of locust. In a small way the knees and parts of small boats, but no lumber is or can be cut from locust, owing to the peculiarity of growth, which we have often explained.

The wood becomes remarkably hard when dry, and is very difficult to drive nails into, as farmers have often found, nor to draw them out when once driven in.

We are glad to see many hillsides and broken ground planted with locust, as this tends to check erosion, which is ruining so many hill farms, while the climatic effect of the timber is the same as with other kinds of trees. But when railway companies are persuaded to plant good land with locust by young, inexperienced engineers, in hopes of obtaining cross-ties, they are spending good money in efforts which must always prove futile.

The wood is totally unfit for cross-ties, and, while a few ties may be made and used, the extensive use of this wood for tie purposes can never be a success.

PERNICIOUS INFLUENCE OF A WASTED LIFE.

For half a century there have been a handful of earnest, patriotic men laboring among the people of the United States in the interest of the forests, appealing to lumbermen to be more conservative in their operations, and to the legislative authorities for protective forest laws, and to those who constantly consume large quantities of wood that they should plant trees in order that a continuous supply could be maintained. These advocates of forestry have urged the planting of trees for both economic and climatic reasons.

At times these efforts have been measurably successful and many have become convinced of the necessity of providing for the approaching famine in timber, and begun the planting of forests.

During all this time there have been certain blundering obstructionists who have persistently opposed all these efforts, and for unaccountable reasons have placed every obstacle possible in the way.

One of these individuals, an alien, with high-sounding titles, became chief of the United States Forestry Bureau. He was at the head of this bureau while that magnificent Congressional Timber Culture act, intended to help the pioneers of the Western prairies and plains in covering these treeless wastes with forest verdure, was in full force.

This individual, deploring anything American, unable to rise to the occasion and give counsel and assistance to the pioneers, refused to assist in the planting of American trees.

Sitting in his office in an upper story of the Agricultural Building, he piled up statistics in quantities, but planted no trees.

He lost the greatest opportunity ever offered by this Government to any man, through his obstinacy, while one of the most important efforts of the American Congress became a total failure—since the only man in the authorized forest service of the Government failed to perform a simple duty, that of giving instructions and advice to the struggling pioneers, who, from inability to procure seeds or plants of forest trees of value, were compelled to plant what they could most readily obtain, cottonwood and box elder, trees unsuited to high-land conditions in a semi-arid region.

Later, when supplanted, and receiving from the State of New York large areas in the Adirondacks for experimental forestry, he again lost a great opportunity and made a gigantic failure, destroying large tracts of forests without restoring them.

While occupying a chair in Cornell University, he repeatedly lectured his pupils against the terrible wickedness of planting catalpa trees, of which American tree he was and is yet in the darkest ignorance.

A succession of pupils have been poisoned against the work or the men engaged in urging the planting of trees, and against that wicked, worthless Yankee tree, the catalpa.

Later, in his quarterly journal of *professional* forestry, he has employed these pupils to dilate upon the great mistake railways and people were making in planting trees, especially the American catalpa tree.

A forestry professor fighting against the planting of trees. What a spectacle! and how contemptible! Poor, blind, misguided and misguiding mortal. Do you

THE ROBINSON TRACT.

HARVESTING THE C. D. ROBINSON CATALPA PLANTATION, PAWNEE CITY, NEB.

think your mutterings can stop the great national and important work of planting forests?

Cease gazing at distant stars; they are entirely out of your mortal reach, and come down to earth; learn the real character of the trees in America of which you are so ignorant, and possibly your wasted energies may be yet of some benefit to the country which has afforded you protection and a home.

PLANTING LOCUST SEED.

About the middle of May or first of June prepare seed bed as for a garden. Pour hot water on the seed, to soften the horny shell; next day plant in rows, mixing sand or loam with the seed for convenience of dropping; cover half-inch deep quickly; cultivate thoroughly. Transplant when one year old.

A PROFITABLE CATALPA FARM.

The *Nebraska Farmer* for March 27, 1907, contained a lengthy article which is good reading for farmers everywhere. We reproduce most of the article.

The most serious error which Mr. Robinson made, so far as we can judge from the article, was in following the antiquated system of many professional foresters in distance of planting.

The same result is seen in this Nebraska plantation, as was learned from the Farlington (Kansas) experience.

If a person aims only at small things he will never reach the greater.

In planting for fence posts and cord wood, two of the lowest grades of wood products, and thus planting 2,722 trees on an acre of land, 16 square feet of surface for its development, each tree would have been 17 inches diameter instead of 6, and cross-ties, valuable lumber and telegraph poles would now be marketed, instead of fence posts and cord wood.

By reference to our article in this issue, "*Steel Ties Abandoned,*" it will be seen that higher ideals in forest planting are the more profitable, and bring greater results.

This Pawnee City tract should have produced a gross income of 13,320 railway cross-ties having a value of 75 cents net, bringing $10,000, whereas the owner received $5,238.10—more than $4,760 difference.

A PROFITABLE CATALPA FARM.

"Mr. C. D. Robinson, a prominent merchant at Pawnee City, Neb., has recently completed a very interesting experiment in the growing of hardy catalpa. In 1889 he purchased a small tract three miles northeast of Pawnee City, and immediately put plans under way to plant twenty acres to catalpa.

The land is of the rolling-prairie type. The soil is sandy loam, with a small admixture of gravel, and underlain with a clay subsoil. Seven acres were planted in the spring of 1889, on ground which had been carelessly farmed for some years, and was very much run down. The remaining thirteen acres were planted in the spring of 1890. This portion of the tract had been in virgin prairie sod until the spring of 1889, when it was broken out and allowed to stand idle until the following year. The ground in both cases was put in a thorough state of cultivation immediately before the trees were planted. The trees, which were one year old when set out, were spaced four by four feet, thus requiring twenty-seven hundred and twenty-two trees per acre. The plantations were cultivated the same as corn the first two years. After that no further care was given them, except that a few acres were pruned several years later. The plantation was always protected against fire and live stock.

The entire plantation was harvested in January and February, 1906. Since seven acres were planted in the spring of 1889 and thirteen acres in the spring of 1890, the average age of the grove was approximately sixteen and one-third years. The owner has kept a strict account of all expenses incurred in establishing,

maintaining and harvesting this plantation, as well as of all proceeds, and the figures following are taken from his records:

EXPENDITURES PER ACRE.

Interest on $21.59 for sixteen and one-third years at 5 per cent. compounded.	$26 34
Cutting and marketing	61 90
Total expense for growing and harvesting the plantation per acre	$109 83

RECEIPTS FROM THE TWENTY ACRES.

The actual material sold and receipts from the same are as follows:

31,397 third-class posts, at 5c	$1,569 85
17,340 second-class posts, at 10c	1,734 90
4,268 first-class posts, at 12½c	533 50
270 first-class posts, at 15c	40 50
211 eight-foot posts, at 20c	42 20
9 ten-foot posts, at 25c	2 25
4 ten-foot posts, at 30c	1 20
258 ten-foot posts, at 35c	90 30
41 twelve-foot posts, at 40c	16 40
167 fourteen and sixteen-foot poles, at 50c	83 50
Total for posts and poles	$4,114 60
214 cords of wood, at $5.25	1,123 50
Total income from twenty acres	$5,238 10

The total of $5,238.10 as the proceeds from twenty acres is equal to $261.90 per acre for growing, etc., and if the cost of $109.83 per acre for growing and marketing is deducted, we have $152.07 as the net proceeds per acre. Allowing 5 per cent. compound interest for deferred payment, the $152.07 as the net income at the end of sixteen and one-third years is equivalent to an annual net income of $6.24 per acre. In other words, if the land had been rented, it would have had to bring an annual cash rental of $6.24 per acre for this period to equal the income derived from the plantation. Any one acquainted with the conditions that have prevailed in Eastern Nebraska, and the reverses farming has suffered for the period included in the life of this plantation, knows that this would be a splendid showing for any sort of crop. It should be remembered that one-third of this grove was on poor land, and because of the impoverished condition of the soil, the trees were only just reaching post size when they were cut. This portion of the plantation would have been much more profitable had it been allowed to stand a few years.

The old stumps have sent up a vigorous growth of sprouts the past summer, and the owner expects to harvest a second crop in ten years. During the summer the sprouts were thinned out to the one, or in a few cases to the two, most promising sprouts at each stump. These have made a growth of from four to nine feet the past summer.

The cordwood sold readily at home, and is giving splendid satisfaction. There was a good sale for the fence posts among the farmers of the vicinity, though most of them sold in carload lots to farmers and ranchmen in the western part of the State.

Mr. Robinson, writing in regard to his grove, says: 'I am well pleased with the result. It has been a source of a great deal of pleasure and very little bother or worry—yes, I did worry some last fall for fear I might not find a market for my stuff, but now I worry because I can not supply the demand for my posts. I could sell sixty thousand this season if I had them. If I had it to do over I could realize quite a little more from the same timber. I should have had fifteen cents for the posts which I sold for twelve and one-half cents. They were a fine post, and would have sold readily at fifteen cents. I also found a good sale for ten-foot posts for stables and sheds, and could have sold several thousand fourteen and sixteen-foot poles for sheds and cross-country telephone poles.'"

OUR FORESTS DISAPPEARING.

According to the reports given in the latest issue of the Bureau of Statistics that while "practically the whole world is asking for American wood and its products," it is our national misfortune that we can not respond to the requests. We really need all the timber we have, and if we do not promptly take some effective steps toward reforestation it will in all probability be only a short time before conditions will be reversed; the United States may become the importer. Within the last ten years we have exported about $500,000,000 in forest products. The greater part of this was

Poles from C. D. Robinson's Catalpa Plantation, Pawnee City, Neb.

Catalpa Speciosa Tree, Minneapolis, Minn.
Minnehaha Falls in the distance.

shipped in the form of lumber. Such trade is of more than doubtful advantage to the country. It is true that our exports are only about 10 per cent. of our total cut, but that 10 per cent. is needed right here at home. The total value of our lumber and timber products in 1900, the latest census year, was $566,000,000. It is probable that it is now largely in excess of that amount. At the present pace our timber resources will soon be exhausted, and we shall have no wood for export, and only a limited and costly supply for domestic use. Already we are looking around for other building material than wood, so costly has the price become. As far back as the year 1700 the Earl of Bellomont, then Governor of New York, suggested that every one who cut down a tree should be compelled to plant five or six young trees to restore the forest growth. Such a law prevails in Germany. It would be a good law for the United States, if practicable.

[And it is practicable.—Ed. ARBORICULTURE.]

CATALPA SPECIOSA IN NORTHERN LATITUDES.

From Albert Lea, Minnesota, we have correspondence which settles the question of the hardiness of the Catalpa speciosa in the far North, as the following letter shows:

"Your book duly received, and with great interest by more than one of us. We spent several days last week looking up trees, and send a photograph which we took of a fine Catalpa speciosa tree standing within fifteen rods of Minnehaha Falls. It is 18 inches in diameter and 40 feet high, and in perfect health. It stands quite alone, so has spread out instead of getting up. There are several trees here of about this size. None appears to have suffered by winters of our latitude. I also send seed for you to pronounce upon. You will see that this tree had a very unusual crop of seed, but it was not in clusters, while some of the pods were of gigantic size. Catalpa of this strain has done well here, uniformly for the past eight years. We approve your plan of 7-by-7-feet planting.

"I mail you a photograph taken in a grove of mixed trees near here. The five large trees at the right hand are Catalpa. These are 33 feet high and have a girth, measured a foot above the ground, of 30, 33, 21, 31 and 36 inches. They retain their diameter well up.

"This grove is a mixed plantation of black walnut, butternut, soft maple and catalpa, which latter has stood as well as any others. CLARENCE WEDGE."

CATALPA SPECIOSA.

"We have pleasure in calling attention to the excellent work being done by Mr. John P. Brown, editor of ARBORICULTURE, Connersville, Ind., in popularizing the valuable hardy catalpa. Mr. Brown is distributing gratuitously to the various botanic gardens, arboricultural societies, experiment stations and public grounds in foreign countries packets of seed of this valuable tree. In addition to the above institutions, Mr. Brown has sent out some two hundred and fifty packets to nurseries in the United States. This latter distribution is for the specific purpose of giving them an opportunity to compare the tree with the type which is ordinarily grown under the name of *Catalpa speciosa*. This distribution covers practically half of the seed collected by Mr. Brown last season. There is no question at all about the value of the hardy catalpa, but nurserymen probably understand that a great deal of confusion exists, and they more often secure a comparatively worthless variety than the true type. This is an opportunity whereby they can secure a start of the valuable form, and we commend Mr. Brown's work very heartily."—*The National Nurseryman.*

CATALPA SPECIOSA.

By W. G. M. Stone,

President of the Colorado Forestry Association, in *The Scientific Farmer*, February, 1907.

Whatever is done in Colorado in the way of tree-planting for use or profit, the hardy catalpa *(Catalpa speciosa)* is likely to play an important part. The black locust will probably lead, at least for the present. It is safe to recommend it, but it is not safe to recommend catalpa, unless one knows where and of whom to buy. Black locust is always one and the same thing. If one orders that, he gets that. There are no spurious species.

Not so of catalpa. A very large proportion of the orders sent to nurserymen for *Catalpa speciosa* are filled with something else. This is a bold and harsh accusation to make unless one has proof of its truth. With the writer it is neither guess-work nor hearsay, but an experience of fact, for which the reader is referred to the October number of this magazine, page 27. Now, why is this so? Why is it difficult to secure pure speciosa? Some say it is not difficult, but the writer finds it is. Let me cite a case, deeply to my regret: A Philadelphia seedhouse said to me they found no difficulty in obtaining speciosa, and yet when my order to them for speciosa was filled they sent to me the very seed from which this cut was made.

There are various species of catalpa. Besides speciosa there are bignonioides, kæmpferi, and various hybrids, all of which hybridize one with another, as it is said by experts. For any economic purpose not one of these is worth a fig except speciosa, which, from present indicatoins, if I mistake not, promises more for American sylviculture, on the farm, than any other tree; provided it can have an opportunity.

Those who attended the World's Fair at St. Louis and visited the catalpa exhibit in the temple of forestry will remember the telegraph poles and railway ties that had been in use more than thirty years, and fence rails that were over eighty years old. They will also recall the chairs and office furniture made from hardy catalpa; nor can they have forgotten the staircase, and the section of a palace car, to say nothing of many other articles, both ornamental and useful, that were manufactured of this timber. They will doubtless remember the color, the grain, the polish, the tints and tones as exquisite. The furniture and the section of the palace car were fit for a king.

Now, to think of a wood so well adapted to fine cabinet work, and also, in railway service, capable of lying in the ground for more than thirty years without decay, bearing the stress and strain, the wear and tear of heavy traffic for the third of a century, must lead to the conclusion that the *Catalpa speciosa* is a tree of wonderful promise. It will last longer in the soil, endure more hard service, make up into more things for use, and cover a wider range of human wants, both indoors and out, than any other tree of my knowledge.

Its rapid growth, its fine color, its great longevity, its wide range of usefulness, mark it as the most promising tree in America for the tree-planting era which is at the door.

IT FIGHTS FOR EXISTENCE.

I refer to these remarkable and valuable characteristics in order to emphasize the deplorable fact that it is beset with so many obstacles and dangers—such as no other tree has to contend with. Between it and the tree-planter stands an almost irresistible phalanx of other species and varieties disputing its passage. These inferior trees reach the planter, no matter what he orders. Now, why is this?

The answer is simple, but complex. There are four cardinal reasons: Nature, ignorance, cupidity, and trade conditions. Nature is seldom inharmonious, but here she seems against her own interests. The speciosa variety is scarcer than the bignonioides. The latter has a much stronger footing. Again, the speciosa is a shy bearer—a very shy bearer. The other bears profusely. If the reader will go to the southwest corner of Colfax Avenue and Emerson Street, in the city of Denver, he can see the truth of this statement. On the Emerson Street side he will note two catalpas, about a dozen feet apart. The one nearer Colfax is a bignonioides and (December 25) hangs full of pods; the other, a speciosa, contains comparatively few. This is the invariable habit of these two trees.

Then, too, the speciosa is a taller tree and the few pods it bears are more difficult to reach, and besides it often fails to fruit, or so nearly so that but few seeds can be secured. Yes, nature is against the speciosa. It is an unequal race, and one can readily see where the professional seed-picker would look for his harvest.

The next thing to observe is ignorance.

Catalpa Speciosa, near Albert Lea, Minn.

Many pickers, many seedmen and nurserymen, do not know one seed from another. A prominent seedhouse of Cincinnati said to me: "How can we tell the genuine from the spurious?—we don't know the difference." And so it is. A large proportion of the seedmen either do not know, or do not care. The pickers gather whatever comes first and easiest and sell it for *"speciosa."* They know that is what is wanted. It is then and there so labeled; and so goes to the nurseryman, and he plants it and sells the seedlings and young trees for speciosa.

IGNORANCE IS COSTLY.

If the Robinsons, the leading forest seedhouse of the country, buy five hundred or one thousand pounds of such seed, as they often do, and Philadelphia, and Bloomington, Ill., and Shenandoah, Ia., and Beatrice, Neb., and forty other towns order five, ten, twenty-five, fifty or one hundred pounds, more or less, as they are likely to do, the reader can see at what shrine of mercy the tree-planter must bow—ignorantly bow, till in after years, like thousands of others, he wakens to find that he has been defrauded of his money.

SEEDS COMMONLY SOLD AS CATALPA SPECIOSA. NOTE WIDE DISTINCTION AS COMPARED WITH TOP SEED.

The following incidents will show the difficulty nurserymen have in procuring genuine seed: The Donaldson Company last year bought twenty-two lots of "speciosa," guaranteed pure. At planting time, the past spring, it was discovered that but one lot out of the twenty-two was genuine. Even the Douglasses have trouble. Two or three years ago they bought three bags of "pure speciosa." When the third bag was opened it was found to be spurious. The firm ordered it to be destroyed. The foreman said to himself, "That's too valuable to be thrown away," and in a few days he quietly placed it on sale. About that time John P. Brown wanted some seed, and as the Douglasses had the best reputation of any firm in the country as to genuine speciosa, he placed his order there. The seed was sent. Its character was at once discovered. Brown reported and protested. Douglass insisted on the purity of stock and said that no bad seed was going from the house. Brown knew that it was spurious and said so. Douglass was firm and resented Brown's charge. There was a racket. Two dauntless warriors—both on the same side, in fact, each fighting for pure speciosa. An investigation was had. Explanations followed. A foreman lost his job.

I have seed out of that same bag, and I wonder how many others procured seed out of it and are to-day looking forward with hope of fine plantations of pure speciosa in the dear by-and-by.

GOOD SEEDS AND BAD.

Again, I tell you it is difficult to procure genuine seed, and he who says he has no trouble in doing so does not know the difference be-

tween the good and the bad. The reader can find the same difference shown in a valuable bulletin on the hardy catalpa published in 1902 by the Kansas State Agricultural Experimental Station (Bulletin 108).

To show the reader the vast range over which the fraud prevails, I will give a list of the States from which the spurious seeds came, and if any one desires the name or names of any house or houses selling such seed, if he will write me he shall be informed.

There are a few of the seedhouses making an honest effort to reform. They can drop the catalpa feature of their business, as one or two houses have already done. There can be no reform until trade conditions are changed. The professional seed picker must be dropped from the catalpa list. He can gather hickory nuts and white-oak acorns acorns honestly, but he can not gather *Catalpa speciosa* honestly at the prices fixed heretofore. Nurserymen must either pick their own seed or know absolutely who did it and where it was done, which will be difficult. The situation demands study, determination and nerve. Some strong seedhouse should make a bold dash and shatter the present system to shreds. The forest tree, seed and nursery business is about to become one of the most important and gigantic in the country, with *Catalpa speciosa* in the lead, and the men in it should square themselves for it.

The attention of the people of Colorado has been called to the *Catalpa speciosa* by the State Agricultural Experiment Station, and it stands every tree-planter in hand to exercise extreme caution as to where and of whom he procures his stock. Every nurseryman between here and the Atlantic Ocean will embrace you, fall on your neck and assure you that his stock is pure.

If you have any regard for the years of your life and do not wish to waste them raising worthless trees, then before you buy of anybody, advise with the State Agricultural College, or with John P. Brown, Connersville, Ind., who, by the way, is doubtless the best-posted man as to catalpa now residing on this planet, and the safest man of whom to buy either seed or seedling.

This article is not an advertisement, nor is it a bid for commissions from any one. The writer is not in the commission business. On such a score he owes no man anything; never has and never will; nor will any man owe the writer a penny for anything he may ever say on this subject. But, dear reader, the American people are under profound and lasting obligations to John P. Brown and to General Palmer, the latter of Colorado Springs, as president and secretary of the International Society of Arboriculture, for what they have done to prepare the way for the new era in arboriculture now dawning, and to clear the path for the triumph of *Catalpa speciosa*, which, when freed from its environment of fraud, will be found the most valuable all-around utility tree in the United States.

THE PASSING OF THE HICKORY.

The manufacturers of many varieties of tools, agricultural and other, find themselves facing a serious calamity in the rapid disappearance of that most valuable of American hard woods, the hickory. For certain uses, like ax helves and hammer handles, almost no satisfactory substitute can be found. One of the hardest, it is naturally one of the slowest-growing trees, and many years must elapse, if plantings are undertaken, before the trees can be made available for timber. Some can yet be found in Missouri and in parts of other States in the same latitude, but from New England, New York, Pennsylvania, Ohio, Kentucky, Michigan and Wisconsin the hickory has almost disappeared. Yet not long ago it was burned as the best of firewood!—thousands of cords every winter.

The nuts, too! how the "shellbarks" are missed!—*Exchange.*

At a meeting of the American Paper and Pulp Association, held at the Waldorf-Astoria Hotel, New York City, on February 7th, 1907, the resolutions which are given below were read and adopted:

"*Resolved*, That this Association calls upon all pulp manufacturers in the United States to adopt, to the fullest extent possible, conservative methods in lumbering according to the approved principles of the science of forestry; and, further

"*Resolved*, That this Association urges State governments to adopt more efficient means for the prevention of forest fires.

"*Resolved*, That a copy of these resolutions

be sent to the Forestry Associations of the United States and to the Governors of the New England States, New York, Pennsylvania, West Virginia, Michigan, Wisconsin and Minnesota."

LOUIS CHABLE, *Secretary.*

PAYING NATURE'S PENALTY.

As all men know, says the *Chicago Evening Post,* of March 15, 1907, we are a clever and a daring people; next to the inhabitants of Mars we probably have taken more liberties with the face of nature than any other race: now our annual day of reckoning has come. Within the last thirty-six hours the Ohio River flood has caused $15,000,000 damage at and near Pittsburg, and has made idle more than 100,000 workmen, besides claiming a number of lives and placing thousands in danger. It is called the spring flood; it might be termed Nature's revenge.

The causes of the high water in the Ohio, it is stated, are unusually heavy rains coming with a sudden rise in temperature that, almost in a night, melted the deep snows in the mountains. That is the immediate cause, back of which stands the "tragedy of the trees." Years ago the hills, whence flow the streams that unite to make the Ohio, were covered with dense forest growth. In those days the snow, protected from the direct rays of the sun, melted slowly in the springtime, and the soil, absorbing a great part of the water, robbed the freshets of much of their menace. Heavy rains, of course, brought high water and sometimes floods, but not such a one as that which is sweeping down the Ohio Valley to-day.

But the coming of the white man sealed the doom of the forests. To-day the trees have all but gone from the mountains, and the result is told in the telegrams from Pittsburg. Of recent years the Government has been aroused to the necessity of saving what is left of our forest lands East and West. Strange as it may seem, this wise plan, championed by President Roosevelt, has been opposed in and out of Congress. How many more floods in the river valleys; how many more droughts on the plains will be needed to teach us that, clever as we are, Nature's plan can not be changed entirely without disastrous results?

DISASTER MENACES TRUCKERS.

SOME HAVE LOST NEARLY ALL, AND NOW FEAR A SECOND FLOOD.

"CINCINNATI, March 22.—Desperate circumstances in the loss of their means of livelihood menace hundreds of truck gardeners who eke out an existence in the Millcreek valley. After losing thousands of dollars in the January flood, the small farmers between the C., H. & D. Railroad and Spring Grove Avenue had just fixed up new frames for the hotbeds, replenished the broken glass, and gotten their new crops fairly started, when the water again threatens to wipe out the small capital they have invested. Another two months of labor will be completely lost. The relief committees do not reach these people, for it is money with which to rebuild their shattered fortunes, and not food in most cases that they need.

"Business was paralzed in the Pennsylvania produce yeard Thursday and Friday of last week. The yard looked like a lake, and the only method by which the yard men could reach their cars was by skiffs and small naphtha launches, which were brought into requisition. No selling was done out of the cars, with one or two exceptions where they stood in the high part of the yard, but it was necessary for the men to reach the cars to observe the condition of the stocks. The water was so deep in the yard that it stood on tracks nearest the river and reached the bottom of the beds of the cars in other places. The water in Twenty-first, Twentieth, Nineteenth and Eighteenth Streets extended almost up to Penn Avenue, which is

about three squares back from the river. After the water receded the yard looked like a lake of mud, and part of Saturday and all day Sunday the railroad employes were engaged in cleaning and putting it in condition for business Monday. It was the worst flood ever experienced in Pittsburg, and many firms lost thousands of dollars."

And yet river men want to raise the bottom of the Ohio River by dams, which will increase the height of water many feet at the surface, as shown in our last issue.

RICE-STRAW-PAPER PULP.

While the demand for that class of paper used in the printing of newspapers is continually increasing and promises to be in greater demand as the years go by, the material from which it is manufactured is rapidly disappearing. The wood from which the pulp is made is fast being exhausted, and it would require years of forest cultivation to supply the trees which have been used in the manufacture of the tons of papers daily consumed in this and other countries. Unless vast forests of the wood are discovered in some remote quarter of the globe within a very short time, a new material must be used to supply the presses of the world.

Wood pulp has made printing so cheap that it will not be possible to return to the fibers used before the discovery that wood pulp would make a satisfactory quantity of "news." In the search for a substitute for the wood many different materials have been suggested, but for one reason or another obstacles have presented themselves to its manufacture. The material to be used must be cheap and be of almost unlimited quantity to meet the demands of the market. The leveling of forest after forest to supply the demand indicates the necessity for a bountiful supply of the material before capital will be invested in mills to turn it into paper. It is gratifying, therefore, to know that a corporation has been organized in the East to go into the manufacture of paper pulp from rice and wheat straw. There is no obstacle whatever in the way of the manufacture of paper from these materials, or at least one of them, for paper has been manufactured from rice straw for years. The only thing to be considered in this connection, so far as rice straw is concerned, is the financial problem of making a paper at such cost as to be able to compete with wood-pulp paper. Twenty years and more ago one of the principal papers in this country was printed on rice paper, and the quality of the material was the envy of other competitors. It would appear to the uninformed that if rice straw can be used for this purpose, wheat straw might also be utilized, and there is grown annually enough of this material to supply the demand of the world. The quality of the paper is better than that made from wood pulp, and if it can be manufactured at about the same price, the new company will soon have all the customers it can supply. Besides, the advantages to the printing trade growing out of the "news" consumed in this country will be manufactured from straw, the supply of which is constantly increasing.

We have before us now a specimen of the pulp made from rice straw, the process of producing which required but a few hours' time. The pulp is as near a sample of that made by wasps and hornets—the original and perfect papermakers—as anything could well be. Mr. L. La Trobe-Bateman, of New York, who is the representative of the capitalists owning the patents which make the production of this pulp from rice straw possible, has been in the Texas and Louisiana rice belt some time, talking up the matter of papermaking with the rice people. The purpose is to establish pulp mills at various points in the belt, to be in the hands of local manufacturers, the parent company selling them the machinery and charging a royalty on the patent rights. It would seem that at last a means has been devised to dispose profitably of the vast mounds of rice straw that now have no use, and must be given to the torch.—*Exchange.*

Oriental countries make most excellent paper from rice straw. There is no reason for not using all this material, which Texas, Louisiana and the Carolinas produce, in making paper.

TIME TO REVISE THE TARIFF.

Ten or twenty years ago, though there was a great popular demand for a reduction of tariff duties and an enlargement of the free list, the powerful manufacturing interest was almost solidly against any such policy. Since that time there has been a great change. For now the manufacturers themselves are many of them warm advocates of tariff reform. As long as

it was simply a question of imposing burdens on the individual the great tariff doctors were indifferent to the cry for reform. But now, when great industries, hitherto believed to be the beneficiaries of protection, are beginning to protest against high taxes on their trade and industry, we have a very different situation. There is not an industry in the United States that uses steel that would not favor a practical elimination of the duties which now serve to enrich the steel trust. And so of the lumber duties, which are a heavy tax on industry. Secretary Root, in his recent plea for the ship-subsidy proposition, admitted that our high tariff had been, and was, bad for our shipping industry. The agricultural-implement men are earnestly in favor of tariff revision. So are the manufacturers of furniture. And, as we have said, every manufacturer who is forced to buy, at almost prohibitive prices, his raw material of a protected trust is convinced that the time has come for a readjustment of our tariff.—*The Indianapolis News.*

The stand-patters in Congress will do well to heed the demand of the people and speedily modify the unjust discriminating tariff. ARBORICULTURE indorses the sentiment as expressed in *The News.*

OBITUARY.

Thomas H. Douglas, son of the late R. Douglas, nurseryman of international fame, died at Los Angeles, Cal., March 25, 1907, where he had been in poor health for some time. Mr. Douglas was born in Waukegan, Ill., July 31, 1852, and from early manhood took a deep interest in forestry. He assisted in planning and planting the largest plantation of *Catalpa speciosa* in the world, located at Farlington, Kan. In 1887 Mr. Douglas went to California as State Forester for the Board of Forestry, and was located at Santa Monica; this office he resigned to take charge of the planting on the grounds of the Leland Stanford University, after which he returned to Waukegan. In 1892 he accompanied his father on their memorable trip through the mountainous sections of the Northwest, gathering seeds of the evergreen trees. An accident which befell Mr. Douglas on this trip so impaired his health that he never fully recovered from its effects, and it is thought was indirectly the cause of his fatal illness. Mr. Douglas was an ardent student of nature; he possessed one of the largest collections of birds' eggs in this country, and was a frequent contributor to the Smithsonian Institution at Washington, D. C. His remains were taken to Waukegan, where they were buried Sunday, April 7th. A widow and two brothers survive him. The latter will continue the business of R. Douglas' Sons.

Mr. John P. Brown, Connersville, Ind.:

MY DEAR MR. BROWN: The five hundred *Catalpa speciosa* arrived in splendid condition. They were much larger specimens than I expected, and will form a nucleus for the introduction of this species in this section. I sincerely hope it will stop all sale of the useless *Catalpa bignonioides.* I have tried to get them so started as will insure their distribution into valuable quarters in this part of the United States.

The enthusiasm, earnestness and self-sacrificing spirit you show for the good cause of the reforestration of our country is a perfect marvel to me. The opposition from the Government, some of the leading railroads and some of the nurserymen has only stirred you up to such an extent as to make you irresistible. I feel now that you are past the "divide," and that the future will be "down hill" and easy to you, and that the country in general and railroads in particular will have learned the needed lesson. The terrible accident near Pittsburg, where they were experimenting with metal ties, ought to help the cause.

We not only need the trees for lumber purposes, but much more for climatic conditions. When we get fully awake we will have laws—and better than that, laws enforced—which will stop all destruction of all grown trees except where other trees in sufficient numbers are planted in their stead.

Thanking you most heartily for the trees sent, and wishing and hoping for the greatest success in your ardent labors in behalf of the good of America, I am,

Sincerely your friend,

AUSTIN C. APGAR.

TRENTON, N. J.

SMALL FARM FOR SALE.—Thirty-five acres good land, three miles from Indianapolis; small house, well, good fences. Address JOHN P. BROWN, Connersville, Ind.

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Capital Stock, $25,000.00

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CATALPA SPECIOSA

and offer for subscription 150 shares of Treasury Stock at $50.00 per share, which is being taken rapidly.

References, John P. Brown, Editor Arboriculture, W. J. Green, Ohio State Forester, Wooster, Ohio.

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WRITE FOR CATALOGUE

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LITTLE SNAKE RIVER VALLEY.

THE LITTLE SNAKE RIVER VALLEY, in Routt County, Colorado, is the magnet which is attracting the attention of farmers throughout the country, as well as all others who are interested in securing a good irrigated farm at a cheap price.

Fifty thousand acres of what is described as "The Best Land in the New Empire" are to be opened by the State of Colorado under the Carey act this summer. A large canal, sixty-five miles long, with a big reservoir, is being built by the Routt County Development Company, 814 Seventeenth Street, Denver, Colorado, to irrigate the land, the price of land and perpetual water rights being fixed by the State at $25.50 per acre.

Preliminary contracts, insuring the holders the choice selection in the tract, can be obtained by a deposit of $5.00 per acre in either the International or Continental Trust Company in Denver. This deposit draws interest at 3 per cent. until the tract is thrown open. If the depositor is not satisfied with the selection of land he is able to make under his option, his deposit is returned with interest. This relieves the settler of the necessity of examining the land until the time comes for definite selection.

The Little Snake River Valley is in the center of the greatest stock-raising and stock-feeding country in the West, and the Moffat Road and the Union Pacific are both building into the valley. The tributary country is very rich in mineral. Extensive coal fields, which will attract thousands of people, lie north and south of the valley.

Under the Carey act, one person can select 160 acres, or a legal subdivision — 40, 80 or 120 acres. This right can be exercised, even if a person has exhausted his homestead, timber and stone, or other government land rights.

One-eighth of the land must be reclaimed within three years or less from the time the canal is completed. The State then gives the settler a patent to the land. The settler owns a proportionate interest in the canal system. When 90 per cent. of the water rights are sold, the canal system is turned over to the settlers as their property.

Work on the canal was started last year, and will be resumed on the extensive scale May 1st. Many preliminary water-right contracts are being sold to farmers with teams, etc., who will go into the valley and work on the canal, examining the land at their leisure, so they will be ready to make their selection when the land is thrown open.

All water-right payments will remain in escrow until the canal is completed.

The Little Snake River Valley is very fertile, as is shown by the products of the farmers under small ditches in the valley.

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ARBORICULTURE

Vol. VI No. 4

A Journal of the Forests

Connersville, Ind., July, 1907

JOHN P. BROWN, Editor and Publisher

TREES AND SEEDS

OF

CATALPA SPECIOSA

The supply of both seeds and trees of Catalpa Speciosa has been exhausted for this season.

I expect to have a sufficient quantity of both in October.

As soon as the crop prospects are known I will give prices.

JOHN P. BROWN

CONNERSVILLE, IND.
U. S. A.

WALTER H. MAXWELL, Manager — R. E. LEE, Asst. Mgr.

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A BI-MONTHLY MAGAZINE

PUBLISHED IN THE INTEREST OF THE
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VOL. VI. CONNERSVILLE, INDIANA, JULY, 1907. NUMBER 4.

The Monument of a Nobleman.

On the "Old Elm Farm" adjoining the city of Connersville, in Fayette County, Indiana, is a remarkable grove of forest trees which were planted by Hon. Samuel W. Parker a few weeks before his death, which occurred in 1859.

All members of Mr. Parker's family are gone, and few of the oldest citizens have any recollections of the man who did much to make Indiana and his home, Connersville, during the early years of the past century.

We briefly sketch his life, and offer a tribute to his memory, as we deduct some valuable lessons from the grove, which is his living monument.

Samuel W. Parker was born September 9, 1805, at Watertown, New York. At the age of 10 years, with his guardian, he removed to Cincinnati. In 1825 Parker entered Miami University, at Oxford, Ohio, graduating in 1828, soon afterward settling at Connersville.

In 1830 he became principal of the old seminary, which was on the site of the present Fifth Street school building. While in this capacity, Parker showed his taste for forest trees by planting many as shade trees about the seminary grounds. He was admitted to the Bar in 1831, practicing in various courts throughout the State.

In 1830-31 Parker edited the *Clarion* supporting the Whig candidate, Henry Clay.

From 1834 to 1836 he edited the *Watchman*. In 1849 he was elected to Congress from the Sixth Indiana District as a Whig, and served from 1851 to 1855.

At the time of his death, in 1859, Mr. Parker was President of the Junction (C., H. & D.) Railway and also the White Water Canal Company, both of which improvements he was instrumental in carrying to a successful termination.

Mr. Parker's home for ten years was the Old Elm Farm, so called from the solitary giant elm tree which stood in front of his elegant residence.

On a slight elevation at the rear of his former home he was buried. A simple marble shaft, on which is inscribed the one word *Parker,* marks his grave.

But this splendid grove is a far more fitting monument to his memory than is the marble, which gives no information or history, while the trees record the tastes and character of the noble planter.

Mr. Parker, selecting the old elm as a center, surrounded it with one hundred forest trees, together occupying half an acre area. This was the crowning act of his life.

From a colleague in Congress Mr. Parker obtained information regarding

JUL 8 - 1907

a tree native to the Southwestern corner of Indiana, which was of giant size and great usefulness to the settlers about the Wabash River, and as soon as seeds could be obtained he planted them on his farm.

One tree from this planting remains, and is remarkable as being the largest *Catalpa speciosa* tree in the world which has been planted by human hands. This tree is seen in the center of our illustration.

There are other large Catalpa trees in the forest bordering the Wabash River, but these are indigenous and of native growth, while Fayette County is 250 miles from any natural-growth Catalpa trees.

From a study of the measurements of all the trees in this grove we find that the *Catalpa speciosa* has exceeded all others in rate of growth, having increased 1.85 inches girth per annum.

In the grove are fifty-four trees remaining, about half having been removed:

Three tulip (yellow poplar), 16, 20 and 20 inches diameter respectively.

Three sugar maple, 14, 15 and 16 inches diameter respectively.

One Norway spruce, 10 inches diameter.

Three black walnut, 20, 22 and 24 inches diameter respectively.

Five white ash, 14, 16, 18, 20 and 24 inches diameter respectively.

Three American linden, 18, 18 and 20 inches diameter respectively.

Twenty white pine, ranging from 10 to 24 inches diameter; mean diameter of white pine, 18 inches.

Two sycamores of older growths.

One hackberry, 14 inches diameter.

One black locust, 14 inches diameter.

One silver maple, 24 inches diameter.

Five elm, American white, 24 to 30 inches diameter.

One original forest elm, 300 years old, 14 feet girth.

One wild black cherry, 21 inches diameter.

One balsam fir, 10 inches diameter.

One *Catalpa speciosa,* girth one foot from ground, 90 inches; 30 inches diameter. Girth 20 feet from ground, 78 inches; height, 90 feet.

This grove was never closely planted; all the trees have grown into upright, natural shape without the so-called forest conditions of overcrowding. The Catalpa tree is as straight and upright as any of its neighbors, as may be observed in the engraving.

The trees stand from 16 to 20 feet apart, or at the rate of 100 trees per acre.

Estimating by Doyle's and Scribner's rules, this tree will make 725 feet lumber, board measure. An acre, containing 100 trees, producing in forty years 72,500 feet, while a thousand acres would supply 72,500,000 feet of lumber, worth even now $60 per thousand feet, or in the aggregate $4,350,000.

The "Old Elm Farm" has been the home of several notable personages, first by Oliver H. Smith, a prominent lawyer, well known through the State as the head of his profession, who three times was elected to Congress, serving from 1827 three consecutive sessions, and 1836 was elected United States Senator.

After the death of Mr. Parker the place became the property and home of Hon. James N. Huston, who was Treasurer of the United States under President Benjamin Harrison. Mr. Huston now resides in New York City.

The farm is at present owned by Mr. Geo. B. Markle, who makes it his home during a portion of the year.

Extinction of American Hickory.

I recently had occasion to call upon a large carriage manufactory for shafts to my buggy, to repair an accident. The proprietor remarked that it was almost impossible to longer obtain good hickory, which was getting to be very scarce.

This complaint drew from me the reply that no one was more to blame for this situation than the manufacturers themselves. That for a score of years I had warned the public of the probability of the supply of hickory timber becoming exhausted, and had urged those whose interest it was to continue this supply to take some steps toward its protection, but not a single vehicle manufacturer in the country has ever given ARBORICULTURE any encouragement to continue its work of forest perpetuation. Strong words these, but true, nevertheless.

About ten years ago I was in Virginia during the apple-gathering season, and saw a remarkable occurrence which ought to attract the attention of manufacturers.

Barrels were scarce in the region, every cooper shop and every cooper was working night and day to supply the demand for barrels, while men were scouring the mountains for hickory poles, with which to make hoops. Nearly all these barrels were then hooped with hickory poles.

Commission men buying apples sent to other States, and barrels were hurried into the apple region in vast numbers.

I saw an entire train of forty cars arrive upon one occasion, which was entirely laden with hickory-hooped slack barrels.

Three hundred and twenty barrels to each car, and ten hoops on every barrel. Here at one time was seen twelve thousand eight hundred barrels, for which there had been sacrificed sixty-four thousand living hickory trees.

In a few years' time these trees would have been capable of supplying twenty-five million carriage spokes, the price of which now, $35 per 1,000, would realize $875,000.

The farmers who permitted this sacrilege of cutting out the young hickory which had made rapid strides toward salable lumber trees, received for this trainload of their trees less than $400.

More recently elm flat hoops, made from large timber, has to great extent supplanted the round hickory poles, although a very large number of hoop poles are yet made.

We called attention to this fact last year, having seen many carloads of hickory poles shipped from Southern Indiana.

When will farmers learn to keep their young trees, which will soon grow into valuable lumber and timber?

We reproduce the following from ARBORICULTURE of February, 1905, which many have not yet seen:

AMERICAN HICKORY, THE WORLD'S VEHICLE TIMBER.

Without going into a scientific dissertation of the botanical characteristics of the large number of varieties of the hickory family, we may state a few facts regarding this valuable wood. The pecan is well known as one of our superb edible nuts, each year becoming in greater demand; the finer, improved sorts, as the paper shells of Texas, and others being

far superior to the small, common nuts, yet the pecan is a hickory.

The great sweet hickory nuts, while seldom found in commerce, are sought for by those who know them in the region where they are grown. The small shellbark is another favorite nut, usually found on sale in country stores, but seldom at the fruit stands, where pecans and other thin-shelled nuts are preferred on account of the ease with which they may be opened.

The mockernut — bitternut — pignut, and a host of hickory fruit of various shades of quality are well known. Some varieties of the hickories are common to the Northern and Eastern States, although the pecan and a larger number of varieties are peculiar to the South. The size, shape and flavor of the nuts, the number of leaflets and their shape, as well as the peculiarities of the bark and the size which the trees attain to, are variously used to determine, botanically, where the variety stands; but when the trees have been cut into lumber and placed upon the market, it all goes for hickory, no discrimination being made in commerce. The manufacturer buys hickory, and only asks if it is second growth or old timber.

Hickory wood is quite dense, and grows very slowly. While young it is remarkably strong, flexible, elastic, and, when kept from continuous moisture, is very durable, although it decays quickly when exposed to moisture or in connection with the earth.

There is no wood known which is quite so well adapted to the manufacture of light vehicles as second-growth hickory. The spokes of most carriage wheels, the bent rims, axles, and bolsters, as well as the running gears, poles and shafts, and the foundation frame work of carriage bodies, as also the singletrees and doubletrees, are, or should be, of hickory.

Ax handles and many large and small tool handles are of second-growth hickory where that is obtainable.

Ash, and even maple, has been substituted for certain lower-grade work, and, when covered with several coats of paint and varnish, can not be distinguished from hickory, yet a little hard usage will soon determine which timber has the toughness, strength and elasticity requisite for good vehicle material.

Second-growth timber is that young, quick growth which springs up in rich soils after clearing away the old timber. Second-growth woods, or quick-growing woods, are far superior to old or slow growths, because more elastic, stronger and harder.

The changed conditions which now exist since the removal of so great a proportion of American forests, has reduced the number of birds, there being fewer resting places and a less quantity of wild fruits for food, which has resulted in a vastly-increased number of noxious insects. The balance maintained in nature has also been destroyed by the same forest destruction. Many parasitic insects and those which prey upon other noxious insects have been reduced, and the destructive worms, caterpillars, borers, etc., have greatly increased.

Now the hickory, chestnut and many other nut trees are threatened with extermination from the damage done by these various destructive insects.

So serious has this injury become, the carriage manufacturers have asked the Government for some relief, that the depredations may possibly be checked, as will be seen by the following press dispatch:

Exterminating the American Hickory.

HICKORY FORESTS OF THE UNITED STATES ARE BEING DESTROYED BY INSECTS.

Chicago, December 21.—"Increasing scarcity of hickory wood in the United States has alarmed the manufacturers of wooden vehicles to such an extent that at a meeting here to-day of over 200 representatives of these manufacturers the advisability of taking the matter before Congress was discussed. Hickory trees recently have been attacked by an insect which, it is said, is fast destroying that class of timber. At to-day's meeting it was declared that, unless the Government took action in devising means whereby these insects can be kept from breeding, in ten years practically all the hickory trees in the United States will have been destroyed."

"There are now but three States from which we can draw our supplies," said P. F. Van Behren, of Evansville, Ind., "and hickory trees are becoming extinct in these States. The shortage in this article, which is the most essential component of a wooden vehicle, probably will necessitate a general rise in prices of all wooden vehicles."

Just what the Government may be able to accomplish is not very apparent, although presumably the Entomological Bureau is expected to perform this heroic task.

It is strange the Forestry Bureau can not make some efforts toward planting more hickory and other economic forest trees. Certainly Congress would provide funds for such work if it were asked for by the forestry officials.

There is some effort being made in Texas and other Southern States toward pecan culture, but this is only for the nuts. There is absolutely no planting being done by either State or National Government, and but little by private individuals, except that New York has planted some spruce and pine, but carriage woods have been neglected.

The serious condition of the hickory supply has largely been brought about by immense quantity of young hickory poles of from ten to twenty years' growth which have been cut for cooperage stock, as it takes five trees to make the hoops for one barrel, while a lard or pork barrel requires ten or more trees. By this practice there is no young stock of hickory left to grow into lumber trees, while the price obtained for cooperage stock is infinitesimal.

Hickory will grow on almost any soil and upon mountain and rough lands, while such locations have a very low value, being unprofitable for cultivation in farm crops.

So long as carriage manufacturers absolutely refuse to consider the future prospective of lumber, and will not encourage the work of forest planting, they must not complain when the supply finally ceases and their business must end.

ARBORICULTURE has brought this question to the attention of manufacturers during many years past, and urged the restricting of the hoop-pole cutting and the planting of timber trees. One prominent carriage builder met the proposition with the argument that "in future vehicles will be built of compressed paper," but he forgot that the paper must be made of wood, and the wood must first be grown.

Automobile wheels are made of steel wire and rubber, but these are very expensive, while farm vehicles and road wagons, carriages, etc., would become very costly if made of these materials, and by no means as strong or satisfactory as when made of good hickory wood.

Improving the Appearance of Factory Surroundings.

The vicinity of a railway is seldom a place of beauty. On the contrary, it is usually the most forlorn part of any community. So, as a rule, beauty is seldom sought in the vicinity of great factories.

It is refreshing to know that there are exceptions to the general conditions, and we are pleased to give two views of the *Atlas Engine Works* of Indianapolis, which show how handsomely the walls are adorned with vines and creepers, and the admirable landscape gardening which is practiced on the company's grounds.

Workmen who come to these shops for their day's labor are greeted with a view of nature improved by art. Their thoughts are elevated, and work is a pleasure amid such surroundings. When they leave in the evening they carry away pleasant memories, and are thus induced to make their own homes more attractive by surrounding them with plants and flowers.

The Indianapolis News recently said:

Civic improvement societies here, as well as elsewhere, have been urging upon manufacturers and the owners of factory buildings the value—the practical value—of a "building beautiful." They have had little to say on the subject of architecture, for that, in recent years, seems to have displayed a disposition to take excellent care of itself, but they have argued the advantages to be obtained by planting vines, shrubs, trees and flowers wherever there is ground enough to supply root food. Whether the building be old or new, they have disclosed the possibilities it presents for such treatment, and they have contended, rightly enough, that, while it is well to look after the physical comfort of employes by providing lunch rooms, recreation halls, gymnasiums and baths, it is also of importance to provide something green and growing and blossoming for the development of other and better instincts in the hearts of the workmen.

These same societies have said, also, that were factories more frequently so beautified there would be fewer untidy lawns in front of workmen's cottages and fewer dirty backyards. There would be cleanliness and health, even a better moral atmosphere. These things would be brought about by the example the factory itself sets before its men, for gardening on large or small scale is contagious.

The Atlas engine works, in this city, is a splendid illustration of what can be done by vines and shrubs and trees. To those who look only upon the surface of things, this planting may all seem a waste of time, or at best only ornamental. But it has a deeper value, and one which the officers of the company have come to appreciate. "It has never been our purpose," said one, "to undertake welfare work or anything that has in it an element of paternalism. Many laudable results have been accomplished by that sort of effort in plants employing women and boys, but in building heavy machinery our employes are grown men, amply able to take care of themselves in matters of recreation, social intercourse and moral growth. We have, however, considered it a matter of good business policy, as well as of pleasure, to make our workshops, inside and outside, as agreeable as it is possible to make them. To this end we look after a thorough system of sanitation and cleanliness. The shops are kept just as clean as possible at all timse. The wash rooms, closets, lockers and other conveniences are up-to-date and are always kept clean and in good repair. The next consideration is light, and lots of it. The shops are so built in the first place as to let in all the daylight possible, and we have been able to increase this light by using aluminum paint and white paint on our machine tools, beams, crane runways, walls and woodwork. This flood of light not only makes the shops more agreeable to work in, but is a great help in the matter of accuracy, and where measuring is done to the thousandth of an inch, accuracy is a most important consideration. On the exterior of our

Shrubbery Hedge Borders Walk to Office Door at Atlas Engine Works.

Hardy Vines Clamber Up the Brick Walls and Clothe the Atlas Buildings in Green.

plant we have made no effort toward imposing architecture, but have made free use of vines, flowers, green lawns and trees to obtain beauty. These things are not very expensive, but every man, either consciously or unconsciously, is a lover of flowers and foliage, and we find that our employes delight in the plants and the bloom.

"Has it paid? We think it has over and over again. It is one of the things that make men like to work at the Atlas, one of the things that help us to obtain and hold men of the highest grade of mechanical ability. Men are influenced by their environment. If the environment is slovenly and disagreeable, it is not surprising if the man who must work for years under such conditions becomes slovenly and careless in his work. On the other hand, we believe that if he finds everything about him neat, clean and trim, simple and beautiful, he is quite apt to carry that clean spirit into his work and into his own home."

We commend the Atlas people for their advanced ideas upon this subject, and for carrying out civic improvement upon so large a scale.

At Connersville, Ind., a large manufactory, the Wheel Works, owns a full block of land besides that which the buildings occupy. The company have this spring planted some three hundred fine forest trees, covering this block, which are now making a handsome appearance, and will soon afford shade as well as ornament to the grounds.

These efforts upon the part of factory managers will always pay by the influence it will have upon their employes and the public as well.

NOTICE.

The Indiana State Fair will be held at Indianapolis, Ind., September 9, 10, 11, 12, and 13, 1907.

SID CONGER, *President.*
CHARLES DOWNING, *Secretary.*
Room 14, State House, Indianapolis, Ind.

SELLS LAST WALNUT TREE.

MAN SAYS TEN YEARS WILL SEE END OF WABASH LUMBER INDUSTRY.

Wabash, Ind., June 10.—The last of Wabash County's giant walnut trees came with the selling of thirty trees from the George and Elmer Bowman farm, south of this city, to E. L. Aukerman. There is not a walnut tree in Wabash County now that is over twelve inches in diameter. From several trees six logs were sawed twelve feet in length.

The trees were all seventy-five years or more old. The price paid for the walnut trees is kept a secret. Mr. Aukerman says that within five years sawmills will have passed from Wabash County, and within ten years from Indiana.

BAITING

OF RAILROADS OPPOSED BY PHILADELPHIA BOARD OF TRADE.

(Associated Press Dispatch.)

PHILADELPHIA, April 16.—The Board of Trade of Philadelphia has placed itself on record as opposed to legislation inimical to railroads. The Board unanimously adopted a report which reads: "While the questionable financial methods of some railroad managers have invoked merited criticism, yet there is no justification for a continuing policy prompting antagonism merely for retaliation, either by the Government or the people. It must be remembered that without corporations and kindred combinations of capital it is impossible to conduct the business of the country."

SMALL FARM FOR SALE.—Thirty-five acres good land, three miles from Indianapolis; small house, well, good fences. Address JOHN P. BROWN, Connersville, Indiana.

THE WHITE PINE.

Throughout New England, in Northern Michigan and Wisconsin, and many other localities of the United States, the white pine is, or was, the more abundant timber tree, and is yet the principal tree from which lumber is obtained, although greatly reduced in quantity from what it was originally.

ARBORICULTURE has not thought it necessary or expedient to make frequent reference and descriptions of *Pinus strobus,* because the tree is so widely known, and little could be said that would be information to the public, but rather has endeavored to educate the people by advocating some of America's trees which were not so widely distributed and were practically unknown to the world, even to the educated and trained foresters.

But nevertheless we have at various times called attention to the white pine, and urged that it be extensively planted.

For reasons which we have often explained, the white pine forest, when cleared away, does not readily reproduce itself; but hardwood trees, whose light-winged seeds, as the birches, are borne far and wide by the winds, and nut trees, the seeds carried by birds and animals, take the place of the pines.

These trees are of much less value than the pine, and for this reason the various States, the Government, and corporations owning lands, as well as individual farmers, should plant the pine, in order that they may have a profit and produce a better grade of lumber.

An exchange says:

NEW ENGLAND WHITE PINE.

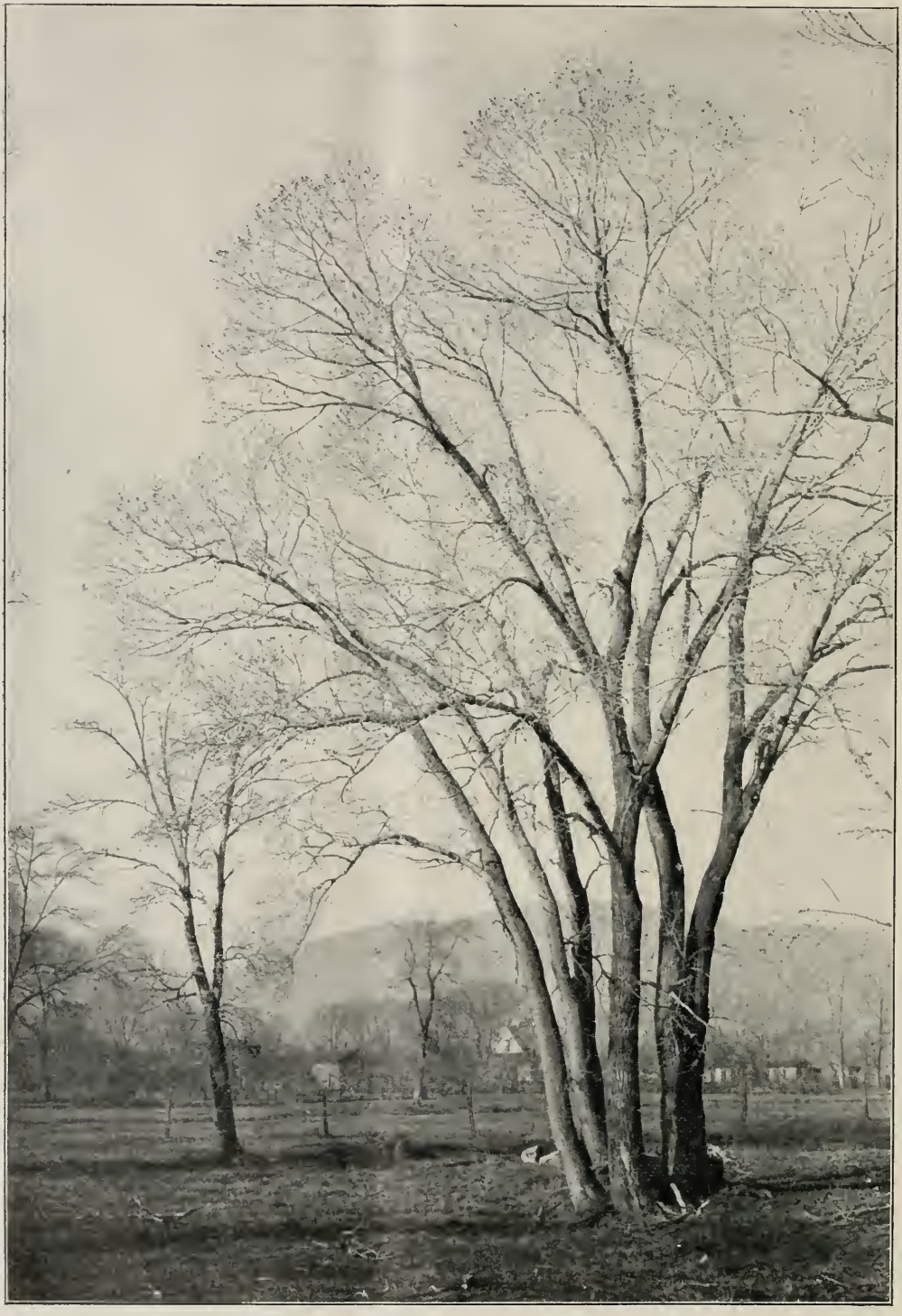
White pine is easily the leading packing-box material of New England, and three hundred and forty-four box factories were reputed in the six New England States in 1905. Of a total consumption of 600,493,000 board feet, white pine furnished 81.8 per cent., or more than four times as much as all other kinds combined. For the boxmakers it is an ideal wood, and the manufacturers would be hard pressed to find a suitable substitute. Practically all of the wood used in the manufacture of such boxes is obtained locally, and of late years a shortage of lumber suitable for the purpose has confronted the New England box manufacturers, as they depend for their supply of lumber mainly upon farmers' wood lots. Forestry authorities assert that the land now producing pine can be made to produce more, and that land which now bears a growth of inferior trees can be made to produce pine.

One of the unfortunate conditions which exists is, the unwise and really wasteful, wicked practice of small sawmills, which are cutting pine trees which will only make a single stick of 2 by 4 or, possibly, 4 by 4 lumber, which should be left several years until the tree could be cut into profitable lumber.

This is on a par with the turpentine operators of the South, who murder the yellow-pine forests by girdling the little trees for their sap, while the land is not required for other use, thus soon to exterminate the timber, and with it the living of turpentine operators.

OPINION OF A TECHNICAL JOURNAL.

John P. Brown in the latest issue of ARBORICULTURE continues his energetic arguments for the cultivation of *Catalpa speciosa,* a tree that has suffered by the similarity of its name to other and much less worthy members of the catalpa family. For a vigorous showing of catalpa possibilities, get a copy of ARBORICULTURE, which is edited by Mr. Brown at Connersville, Ind. His conclusions are sometimes disputed by other foresters, but his sturdy independence tends to clearer thinking for all concerned. Assuredly the case for catalpa loses nothing in his hands.—*Woodcraft, Cleveland, Ohio.*



THE NARROW-LEAF COTTONWOOD. (*Populus Angustifolia.*)

The Family of Poplars.

The *Populus* group comprises a goodly number of softwooded trees of rapid growth, which are largely distributed throughout the world. From Siberia to Italy in the Old World and from the Atlantic to the Pacific in the New, some forms of poplar are everywhere present.

In the eastern portion of the United States the cottonwood, *Populus monilifera,* is the prominent representative of the species. In Canada and on the northern border of the United States the balsam poplar, *P balsamifera,* abounds, while in the higher altitudes of the Rocky Mountains the aspen, *P. tremuloides,* holds sole sway as a deciduous tree among the more abundant conifers.

In Utah the Lombardy poplar, with its tall form waving in the breeze, is a prominent picture on the otherwise treeless plains. This tree is a native of Lombardy, Italy, but has become a resident of Utah by adoption.

In almost every city of this land the abele, with its silvery leaves, is known as one of the few trees which stand the dust, root mutilation, and abuse generally, to which street trees in cities are obliged to withstand.

This tree, usually called silver poplar, is of European origin, and has often been described in ARBORICULTURE. Its persistent suckering habit is the greatest objection to its use in cities. In Europe much cheap lumber is made from this tree, but so far no such use has been made of it in the United States, owing to the greater abundance of other timber. However, there is no doubt but it would be profitable to plant large areas of abele for fuel, lumber and wood pulp. It makes good paper, grows quickly, and is easily propagated, the innumerable suckers being obtained in large quantities from about old trees in neglected localities. The suckering habit would not be objectionable in forest plantations.

After the wars with Napoleon I. a large land owner in Silesia was almost bankrupt. The estate, according to the laws, could not be mortgaged nor sold; the land was poor, and there was no money to buy cattle to build up the large estate for farming purposes.

A forester advised the owner to plant the white poplar, which he did, and in twenty-five to thirty years enough timber was sold from the estate to engage in proper farming and make the owner wealthy.

The broad-leaved cottonwood has large distribution. The seed is small and enveloped in a cottony covering, which is wafted by the winds in all directions for great distances. Untold millions of the very abundant seeds perish by alighting in dry locations, or upon grass or weeds, and not being able to reach the soil or moisture, yet the seeds which alight upon the sandbars of rivers and muddy banks of streams grow up into dense thickets.

If all the seed produced in a single season were permitted to grow into trees, they would reforest the entire earth.

As a lumber-producing tree the cottonwood requires deep, rich, moist soil, and this it finds in the Delta lands, so called, along the Mississippi River and lower tributaries, Yazoo, Sunflower, and other streams. Here the growth is rapid, mak-

ing straight, tall trees and producing the best of softwood lumber.

On the contrary, the ancient trees along the valleys in the semi-arid regions are very short-bodied, knotty, twisting, and totally worthless except for fuel.

As the elevation increases to 6,000 feet along the base of the Rocky Mountains, the broad-leaved cottonwood disappears and the narrow-leaved tree makes its appearance. This is *Populus angustifolia.* The narrow-leaved cottonwood has a much handsomer foliage than the broad-leaved, being willowy and graceful in form, often growing in clusters. The tree is of rather small growth.

Another form of the cottonwood in the same locality, and greatly resembling the former, is *Populus angulata,* the leaves of which are broader at the base, and the under side of the leaves and younger branches are tinged with yellow.

There are many other varieties of the poplars.

Again ascending one or two thousand feet, and these are replaced by the aspen, which covers the mountain sides at from 8,000 to 10,000 feet altitude.

Latitude, as well as altitude, governs the poplars—aspens thriving in the far North, cottonwood to the southward.

The cottonwood is dioecious; that is, the male and female flowers are on separate trees, the seed being produced only on the female trees; hence the so-called Carolina poplar, which produces no seed, is merely the masculine form of common cottonwood, and, being produced from cuttings, do not change their sex.

The male in trees as well as animal nature are more vigorous, stronger growers, and in their youth are rapid in growth, but with age all forms of the cottonwood become ragged, ugly, unsymmetrical and most undesirable for home adornment or as street and shade trees.

Our illustration of the narrow-leaved cottonwood is from the camera of Mr. D. M. Andrews, the noted collector of Rocky Mountain plants and seeds, of Boulder, Colorado.

Glen Eyrie, the home of General Wm. J. Palmer, near Colorado Springs, contains many handsome trees of this rather rare poplar.

A DETERMINED RAID UPON THE NATION'S TIMBER LANDS.

This journal commends President Roosevelt in his insistence that large areas of the forest lands which remain as the heirloom of the American people shall be kept sacred for the future nation, and can only condemn the speculating crowd who met at Denver a few days ago for a determined onslaught upon the forests.

Greater opposition to the plans of the schemers than was expected made it a very tame affair in the wind-up.

Success by these raiders would mean an end to the forests.

Greater expense to the Government in river and harbor expenditures to maintain a navigable depth to the great rivers.

Increased cost to Texas, Louisiana, Arkansas and Mississippi, far removed from these forests, in building greater levees to prevent overflows.

The manufacturing industries of the nation are in jeopardy when the forests cease to supply the materials necessary to their very existence.

These are a few of the evils which must result from the continued spoliation by lumber concerns, cattle magnates and real estate speculators, who are so determined to gain possession of the nation's forests.

CALIFORNIA AND IRRIGATION.

The success of California as an agricultural and fruit-growing region to a very great extent depends upon the ability of her citizens to greatly extend their means of irrigation.

The rainfall is periodical, and during the long months of summer few crops succeed perfectly without artificial irrigation.

Upon the high Sierras there is usually a goodly snowfall, and along the coast the moist atmosphere from the Pacific Ocean enables some crops to be grown advantageously, but for the most part the parched and brown surface shows the want of water.

The State is so large and the water supply being limited, it behooves the people to use every effort to increase the rain and snowfall and to husband every particle of moisture which nature furnishes.

THE FIFTEENTH NATIONAL IRRIGATION CONGRESS is to be held in Sacramento early in September, and the citizens are making extensive and systematic preparations to welcome all guests who attend this meeting. The people of California, and especially of Sacramento, are already active in arranging details of the entertainment to be accorded visiting delegates. The Board of Control, consisting of prominent citizens of the State, including the Governor of the State, Mayor of the city of Sacramento, and representatives of leading business houses, banks and other institutions of the Capital City of California, holds weekly meetings. At a meeting held last week committees were appointed to take charge of the various lines of work.

California is going to make a special effort to entertain royally on this occasion, and in order that plans may be ample and organization perfected insuring precision and execution, the greatest comfort and enjoyment of guests, the details are being worked out now.

The people of Sacramento and suburban towns are going to open their homes to delegates. The Board of Control announces that assurance has already been received that practically every home of the better class will be available.

THE OPPORTUNITY TO SEE CALIFORNIA is one of the best ever offered, as the railways will make specially low rates as well as low-rate excursion trips to every part of the coast.

It is unfortunate, however, for this great State that, while the agricultural classes, fruit growers, and by far the greater majority of her citizens are earnestly laboring to extend the water supply, the wealthy lumbermen are as zealously cutting away the forests, and thus reducing the precipitation and making the State still more arid than ever before.

The legislature apparently is controlled by the Lumber Trust and makes no effort to curb their operations, which directly counteracts the great work of the irrigation forces and practically destroys their efforts.

Each year the climate becomes more arid from the extensive removal of the forests, and when these have gone it will require a thousand years to replace them.

Large areas which were formerly wooded have been cleared of the timber, and now the soil is eroded from mountain and hillsides, so that they have become barren.

It is within the province of the legislative branch of the State to protect the citizens by forbidding the total destruction of forests.

The Catalpa as a Lumber Tree.

For more than a hundred years the Catalpa tree of Indiana has been known as a tree of very great value to the pioneer settlers in the lower valley of the Wabash.

It was found useful in making canoes by the pioneers, following the practice of the American Indians, who traveled hundreds of miles to obtain Catalpa logs, which they could fashion with their own tools, was very light for carrying from stream to stream in portage, did not check with alternate wet and dry conditions, and possessed the enduring qualities so necessary for the aborigines, who did not possess the tools of the white man with which to make others rapidly.

The wood was chiefly used for posts and rails; many fences of early days in Indiana being made of morticed posts, into which the rails were inserted; also the old worm fences eight or ten rails high, staked and ridered.

Where Catalpa could be obtained it was always the first choice; walnut, oak and ash being used as second choice.

If a plow beam was broken, or an evener disabled, the Catalpa sapling supplied a stronger wood for such repairs.

Handles of various kinds were made of Catalpa, which was strong, elastic, light and easily worked.

In the absence of sawmills the frame stuff was hewn out of Catalpa, with which to build the house.

Hay frames for wagons, ladders, and articles in common use upon the farm were preferably made from the Catalpa tree, while no timber equaled the Catalpa for shingles.

With such a demand for this special wood in a region where it was never abundant—growing only here and there among the forest trees—it is not strange that the supply had practically become exhausted before the first half of the nineteenth century was passed.

With the advent of the railways of Southwestern Indiana and Southern Illinois, the engineers were not ignorant of the many qualities of the Catalpa, and hence it was diligently sought for ties and telegraph poles.

The Illinois Central, Louisville & Nashville, Big Four, and the Albion & Oakland City Railway, now part of the Southern System, all used large numbers of Catalpa ties, many thousands; while in Southeastern Missouri the Iron Mountain Road was largely constructed upon Catalpa ties within the limit of the region of its growth.

This constant drain upon the native forest has almost exterminated the Catalpa—only a few trees here and there can now be found.

So far the uses of this wood were confined to the articles which we have enumerated, except in a very small way.

When it was determined to make an exhibit of the *Catalpa speciosa* at the St. Louis World's Fair, I began an exhaustive search for timber, purchasing a few trees along the Wabash Valley, had them shipped to Connersville, sawed into lumber, put into the dry kiln, and prepared for manufacture.

There was an extensive correspondence with manufacturers in an effort to have a number of articles made for the exhibit. A majority refused to render any assistance, but enough manufactur-

ers responded, so that a magnificent collection was prepared.

PRACTICAL ARBORICULTURE, on page 362, gives a list of articles in this exhibit, together with several illustrations from photographs.

From ARBORICULTURE, September, 1904, now out of print, we reprint the following:

WHAT HAS BEEN PROVEN AT THE WORLD'S FAIR.

1. That the *Catalpa speciosa* will grow in twenty years to be twenty inches in thickness and forty feet high.

2. That in fifty years it reaches a height of 100 feet and a diameter of thirty inches, in forest.

3. That as a fence post it has lasted eighty-five years.

4. As a fence rail it has withstood eighty years of sunshine and storm.

5. That as railway cross-ties the wood has resisted wear and decay for thirty-two years.

6. That it makes magnificent furniture.

7. Interior house finish equal to any American wood.

8. That every portion of a freight or passenger railway car may be made of Catalpa.

9. It may be carved into handsome chairs.

10. It is suitable for picture frames, receiving any stains and taking a high polish.

11. That firm, straight telegraph poles may be secured in a dozen years.

12. That it may be bent, and retain its form.

13. That for cabinet work it does not shrink or warp.

14. That fine book paper may be made from the wood.

15. That it is straight and upright in habit of growth.

16. While an oak tree requires twelve times as long to grow as its term of durability in the ground, Catalpa has lasted for ties twice as long as the period of growth. And for rails and fence posts, four times its period of growth.

17. For mine timbers it has no superior for strength or durability, and may be quickly grown in mining regions.

There is no article of furniture which is now made of oak, walnut, maple and other woods but can be made as well of Catalpa, which is handsomer than any of the common woods.

It can be but a brief period when something must be substituted for the quartered oak, which is now the fashionable furniture material, for the supply is fast being exhausted. It will require two centuries to produce other white oak trees suitable for quarter sawing, while in two decades an abundant supply of Catalpa can be secured if only the trees shall be planted.

Building lumber is still advancing, and innumerable contracts for house construction have been annulled because of the excessive cost of timber.

There is not a sill, joist, stud, floor, shingle, casing, door, window, or other portion of a house, be it a common shack or a palatial residence, but can be constructed from the Catalpa tree.

Not only that, but the building will be more durable and more easily constructed. The carpenters will find the Catalpa as easily worked as is white pine, while it is far stronger; and it may be polished as finely as cherry, walnut, or mahogany.

Mr. Wm. R. Smith, Director of the U. S. Botanical Gardens, says that in Japan blocks of Catalpa are used in the

place of boxwood for wood-engraving blocks.

For wood carving the quickly-grown timber of the Catalpa is equal to oak, walnut, or butternut.

In short, there is no article made of wood but what can be made of rapid-growth (generally termed second-growth) *Catalpa speciosa.*

Steamed and bent, it is not the inferior of hickory, ash, elm and other woods generally used for bending. The letter "B" which was shown at the World's Fair was made by Messrs. Barney Smith & Co., car builders, Dayton, Ohio, and proves the capacity of this wood for bending purposes.

Ten times as much valuable timber can be grown in twenty years upon an acre of land planted in *Catalpa speciosa* as can be produced from any other species of valuable timber in America.

Are not these declarations of sufficient interest and importance to attract the users and manufacturers of lumber?

BADLY IN NEED OF A SPANKING.

The labor unions of San Francisco, probably the worst in the world, aided by unprincipled politicians who manipulate these fellows as they choose, in order to get and hold office and secure the spoils, have several times come near to throwing the entire nation into a war with a peaceable foreign power. They should be severely sat down upon by the National Administration.

From the time of Dennis Kearney, of sand lot fame, and Kalloch, the preacher-mayor, all the way down to Ruef and Schmitz, the unions have been in power and carried things with a high hand.

This nation should settle at once and for all the right of a handful of politicians and their followers to commit the country to a disastrous warfare. They should be spanked.

A PROPER FOREST POLICY.

Several centuries of experience in Europe have developed a system of forest perpetuation best suited to conditions in the Old World, and this has become a science to which a large number of persons have been educated and trained in the management of continental woodlands.

It is well known how carefully these forests are guarded, what restrictions are placed upon the cutting, pruning, disposition of even the branches which are cut off, and the very important requirement by several governments that, when a tree is ready for market and is removed, another must be planted in its stead, in order that the forest area and density shall be preserved.

It is also well known that the climatic influence of forests and trees is a hereditary heirloom of all the people, and must not be destroyed by the individuals who happen to be possessed of the land titles.

And, furthermore, the supply of wood for the various uses of the manufacturer and for all other purposes does not concern solely the capitalist who, at the immediate present time, is making vehicles or furniture, or is building houses, but is a matter of solicitude to every individual of the realm, and is therefore guarded by the government authorities from waste and destruction.

So far our interests, in America, are identical with those of Europe, but our practice is radically different, while the government—that is, Congress—pays little attention to the real needs of the na-

tion except for the present generation, having no competent adviser.

After a century of destruction and most wasteful onslaught upon the natural forests of this continent, largely from necessity, to clear for farms and homes, and to supply the requirements of manufacturers, commerce and the building trades, we have come to see some of the disasters resulting from the too great clearing of hill and mountain tracts which are not needed and can not be profitably employed for agricultural operations.

Unprecedented floods, serious changes in climatic conditions, such erosion of hill and mountain slopes as to destroy them for agricultural uses, while filling the channels of many streams with soil from the hillsides—these are but a few of the many evils resulting from the loss of American woodlands.

The problem of timber supply in the future is one of the most important questions which statesmen and business men have to consider.

Two systems of timber supply are advocated by students of the forest conditions.

THE FIRST METHOD may be considered as the one practiced, in a way, by the United States Government and considered by a majority of forestry students. This contemplates the entire production of all wood and timbers from the natural forests, supposing the increment of growth to equal the demand for lumber.

THE OTHER SYSTEM assumes that, as the natural woodlands are rapidly being denuded, the future supply must of necessity be met by advance planting of vast quantities of trees.

Of the first method, which includes the various forest reserves of the Government, and timber lands owned by lumber syndicates, the actual quantity of timber standing on these tracts is very much less than Congress and the public are led to believe.

Estimates have been published by officials of the Government evidently employed by, or greatly interested in, the manipulation of trusts who were anxious to obtain possession of Government forest property, which have officially shown such vastness of our forest wealth that Congress and the people have been soothed into the belief that no legislation was necessary to guard the people from the fraudulent acts of powerful combinations of speculators.

One of these estimates a few years ago represented Indiana to be possessed of a wilderness of timber, no less than one-fifth of the State being forest, while other States were estimated by this individual as having from ten to a hundred times as much timber as really existed.

Recently the Forestry Bureau issued a circular showing the rapid decrease of the forests, and immense quantity of lumber consumed and exported. Still Congress does not act. The stand-patters in Congress refuse to remove the duty on imported timber, thus encouraging the hastly destruction of the remaining forests.

UNDER THE LEADERSHIP OF A WESTERN SENATOR, WHO REPRESENTS THE SAWMILL INTERESTS AND THOSE WHO WOULD SEIZE UPON ALL TIMBER LANDS REMAINING, CONGRESS ASSERTED THERE SHALL BE NO MORE GOVERNMENT RESERVATION OF FORESTS.

We take it that this is but a beginning, and that in due time the various tracts of timber land which have been reserved from sale and destruction will be opened up for entry, presumably as *farm lands*, but the timber will be sold to speculators.

IT IS EVIDENT THAT CONGRESS HAS NO FOREST POLICY, NO DESIRE TO PERPETUATE AMERICAN FORESTS, HAS NO INTEREST IN THE VAST NEEDS OF FUTURE GENERATIONS IN LUMBER OR THE INFLUENCE OF THE FOREST UPON THE COUNTRY.

In a few years the manufacturers will be seeking in vain for lumber with which to keep their workmen and machinery employed. The vehicle makers will be obliged to use metal where the cheaper and better woods are now employed, and the builders will rely upon concrete and metals to a far greater extent than at present.

WILL THE EUROPEAN FORESTRY METHODS PREVAIL?

The demand for lumber is so much greater than the annual increase of growth that under the most favorable conditions the forest area must be greatly reduced each year, hence some other policy must be adopted to supplement the native forests.

In a natural forest, except in a few instances, various species of timber are present, some of value, a majority of inferior worth. The trees invariably are so irregularly placed that economy of space is not considered. Nature never plants an orchard. In a majority of woodlands the more valuable trees require from 150 to 600 or more years to grow. Hence, when the present supply has become exhausted, from eight to ten generations of men will be without timber before the trees now started into growth will become useful.

The true forest policy for the United States, and possibly other nations, in addition to the protection of native forests, is, to *plant trees by the millions,* selecting such species and varieties as will mature during the present generation.

A forest properly planted, with a system most economical of space, will produce from two to five times as much timber as where planted by birds, animals and the wind, as is provided by nature.

If, in addition to this, selection is made of tree species of great value, then the question of future timber supply will be solved.

The following declaration of the Colorado Forestry Association is fully approved by ARBORICULTURE:

PLATFORM OF THE COLORADO STATE FORESTRY ASSOCIATION RELATIVE TO THE GOVERNMENT FOREST POLICY.

WHEREAS, We believe that the forest-reserve law of 1891; and that under it the setting apart of forests at the headwaters of our mountain streams for conserving snow and moisture and to regulate the stream-flow of rivers and creeks, and that the organizing of a forest service capable of handling so stupendous an undertaking, that, taken all in all, these things mark an important era in the history of national forestry work and command our attention; and,

WHEREAS, We believe that in organizing the various and multitudinous national forests throughout the semi-arid West by appointing a supervisor for each, and under him forest rangers, numbering in Colorado about one hundred and fifty men, to guard the reserves against fires and illegal trespass, and at an expense of about $150,000 annually put the forests in better condition to supply timber and lumber for our varied wants; and that in adopting certain restrictions and making charges for business occupancy, timber and grazing, in order to make the forest service self-supporting, it is thereby adopting a wise policy; and,

WHEREAS, The forest service is manifesting an intelligent purpose, with a clear foresight of what should be done, and vigorously prosecuting the work it has undertaken to do; therefore,

Resolved, First—That we, the directors of the Colorado State Forestry Association, believe that any and all persons, companies or corporations enjoying the products of the reserves, or their use for grazing, the occupancy of the land for power plants and other similar

purposes, should pay a just and reasonable price, to be determined by sound judgment, circumstances and experience.

Second—That, in our opinion, the policy adopted of selling mature and fire-killed timber is both desirable and commendable, and that the method employed for doing so, on competitive bidding, is just, and that it closes the door against fraud and waste.

Third—That the Federal Government, in what it is doing, is virtually relieving this State of an enormous expense, which it could not afford in order to carry on this important work.

Fourth—That inasmuch as the forest reserves are principally at high altitudes, and contain little agricultural land suitable for homesteads, and as the service has expressed a reasonable desire to throw open such lands as are found to be appropriate for honest settlement and not for timber frauds, we see no force in the claim that the reserves are a hindrance to the growth of the State.

Fifth—That we indorse the policy being pursued by the forest service, and pledge it our support, and deplore any attempt to hamper it in its undertaking to protect the forests and improve them in their greatly dilapidated condition.

Adopted June 11, 1907.

A PUBLIC LANDS CONVENTION.

The Acting Governor of Colorado, E. R. Harper, issued a call for a convention of Western States representatives to consider the policy of the United States Government regarding forest reserves.

We give prominence to some points in this call which may emphasize the object of those most interested in this convention:

WHEREAS, The Government of the United States is the owner of large tracts of unoccupied lands within the Western States and Territories, over which Congress has absolute control and administration, and has made laws providing for the disposition of such lands to citizens of the United States under certain conditions; and,

WHEREAS, Under the compact made by the States when admitted to the Union, said lands can not be taxed as long as they remain the property of the United States, and consequently do not provide any revenue for the maintenance of the State Government until title to the same passes to the citizens; and,

WHEREAS, The changing conditions in the western part of the country, due to rapid settlement, has seemed to render necessary certain changes in the disposition of these public lands, acquirement of title to these lands by citizens, or the adoption of a policy contrary to that which has been in effect for so many years, which has recognized the right of the State to encourage settlement and development under the existing laws, might prove most disastrous to the prosperity of this section of the country; and,

WHEREAS, Owing to the fact that these public lands constitute a large part of the area of the States west of the Missouri River, in some instances exceeding half the total area of the States, the future welfare, prosperity and advancement of such States are largely dependent upon such policy and laws in relation to the administration and disposition of these lands *as will result in their early acquirement and development by citizens;* and,

WHEREAS, The enactment by Congress of new laws that will hinder the development and acquirement of title to these lands by citizens, or the adoption of a policy contrary to that which has been in effect for so many years, which has recognized the right of the State to encourage settlement and development under the existing laws, might prove most disastrous to the prosperity of this section of the country; and,

Now, therefore, I do hereby call a convention of representative citizens of all States and Territories west of the Missouri River, to meet in the city of Denver, June 18, 19 and 20, 1907. Said convention to be composed of delegates to be appointed as follows:

The Governor of each State and Territory to appoint ten delegates at large.

Each Chamber of Commerce, Board of Trade, Real Estate Exchange or commercial body may appoint *five* delegates.

Each association of stock growers or lumbermen and forestry, irrigation, horticultural or agricultural organization may appoint five delegates.

All delegates shall be provided with credentials from the authority whom they represent.

In order that said convention may have a definite plan of procedure, I do hereby appoint the following Senators and Representatives of the States to be represented as a committee on program, authorized to prepare a program and to outline in a general way the matters and questions upon which discussion may be had at said convention:

In the announcement signed by the Secretary, we find the following items:

A sentiment has been developed in the Eastern States that would deny the existence of any State interest, either legal or moral, in the disposition of these lands. The new policies being urged seek to establish the permanent ownership of these lands in the General Government, and would prevent their development and settlement by individuals, and encourage their occupation by the General Government for the purpose of producing revenue for the Government.

The Western States have been formed out of these public lands, and admitted into the Union, with all the rights and privileges of the older States. All of the older States were built through the settlement of public lands by citizens. Having thus grown in wealth and population, it is now proposed to deprive us of the rights they enjoyed, and to utilize the lands for procuring revenue for the benefit of the nation at large. Having eaten their pie, they would also share ours.

Homeseekers are pouring into the West, anxious to secure homes and become citizens of the newer States. While there are still vast areas to be settled, new governmental policies regarding these lands are so hindering the homesteader that it is becoming more and more difficult for the settler to find a location where he may be permitted to build him a home. It may be that the laws require amendment, but the amendment should be in the direction of a more liberal policy toward the homeseeker.

FALSE CLAIMS PRESENTED.

The comparatively small areas of forest lands still possessed by the Government are, for the most part, on mountain tracts which are the source of our greatest rivers, and are held principally to prevent the disasters attending the removal of timbers from such tracts.

The Rocky Mountain ranges, in which many of these reserves are situated, are not agricultural in character, although some are pastoral.

When the Government parts with these tracts of forest, and speculating corporations and cattle barons obtain possession, the timber will quickly be cleared, and the entire nation will be severely punished thereby.

CONVENTION PACKED BY COLORADO.

It will be noted in the list of delegates appointed by Acting Governor Harper that several of the most prominent and persistent opponents of forest reserves have been chosen.

It will also be seen that in providing for delegates to this convention, all real estate speculating bodies may send five delegates.

Stock growers and lumbermen organizations may also appoint five delegates, while forestry and irrigation organizations which are remarkably few in number may send five delegates.

Thus in the make-up there was a thousand to one of the members favorable to the extermination of the forests.

The entire nation is an interested party to the perpetuation of our remaining forests, while each locality in the immediate vicinity of a forest reserve demands the abolition of all restriction to the free chopping of timber on the public dominion.

The public-spirited citizens of the United States who believe that Congress should retain all remaining forest lands should make their demands so forcible as to overcome the evils of this proposed raid upon the reserves.

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ARBORICULTURE

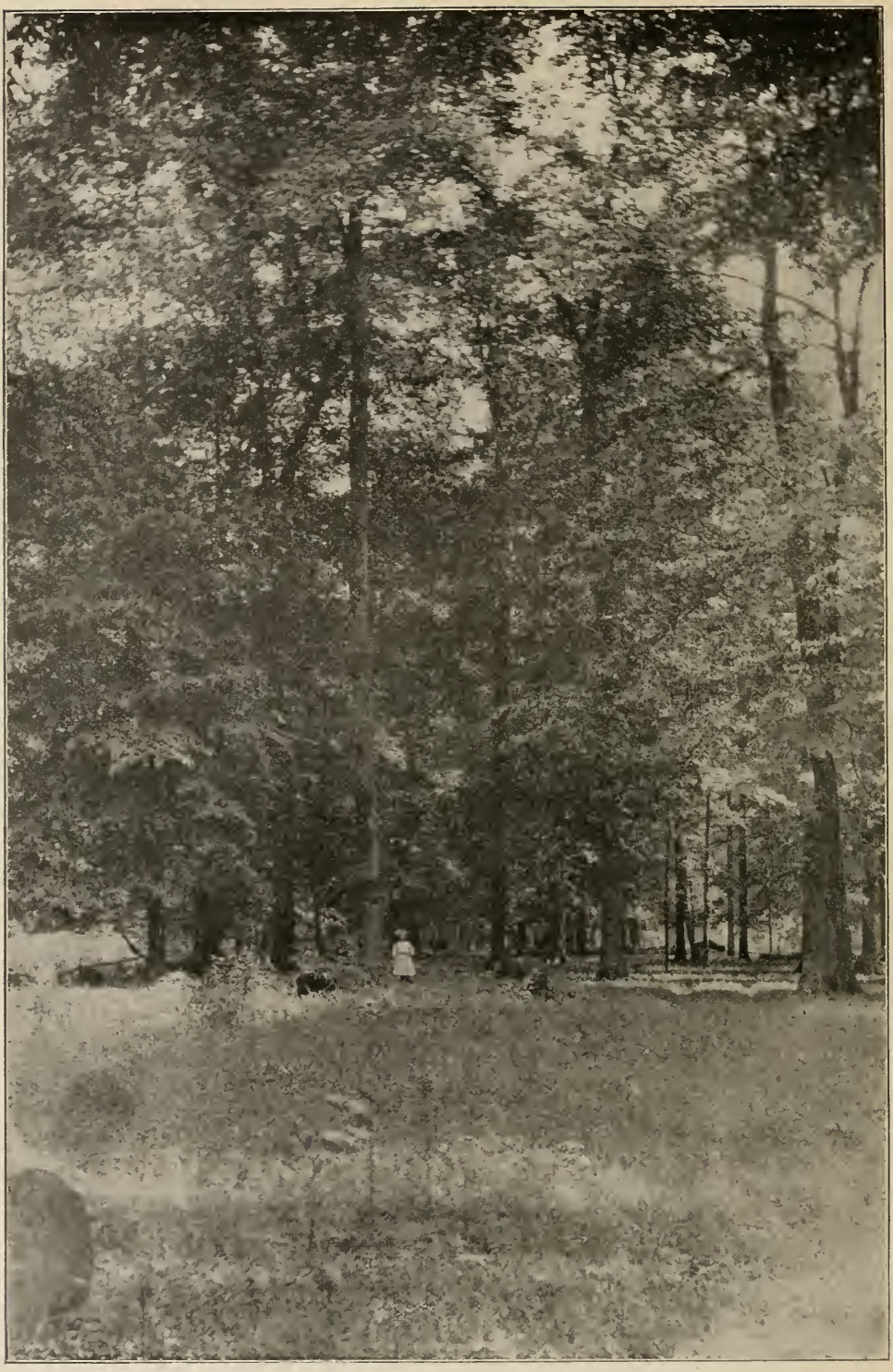
A Journal of the Forests

JOHN P. BROWN,
Editor and Publisher
CONNERSVILLE, IND.

TREES AND SEEDS
OF
CATALPA SPECIOSA

In order to provide genuine Catalpa Speciosa Trees for my railway planting and others, I have collected seeds and employed nurserymen to grow these trees and shall have a sufficient quantity of both trees and seeds for all my friends, which will be ready by November.

JOHN P. BROWN
CONNERSVILLE, IND.
U. S. A.



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In The Beech Woods.

THE AMERICAN BEECH, *Fagus ferruginea*, is one of the beautiful trees of our forests. Its shade is dense, cool and inviting. As a rule the beech grows among other trees rather than forming a forest entirely, although at times it is the predominating species present.

The character of the bole depends upon the soil in which it grows, and density of the forest. At times the trees are of great height, straight trunks free from branches and knots. Again the trees will be short bodies, low branched and extremely knotty. It is found from the Gulf of Mexico northward through the Middle States, but not west of the Mississippi River.

It has a comparatively small economic value, but as the more desirable woods have been removed from the Middle States farms, this is the principal timber remaining, and is now being sawed into common rough lumber.

For fuel it has been rejected, so long as hickory, ash, sugar tree or oak could be obtained, as being too difficult to split. The grain is interwoven and very knotty except in the dense forests.

The nuts, which are triangular, are very sweet and palatable.

Swine rapidly fatten when beech mast is in season.

Beech lumber warps and twists very badly in drying and is usually sawed into studding and large size timber. If secured with abundant nails it may be held in place.

When carefully kiln dried, it is used for some inside work, having a very handsome grain when quarter-sawed.

Beech decays quickly when in contact with soil, or moisture. Yet by thorough impregnation with creosote or zinc chloride its life is extended a dozen or more years.

The Pennsylvania and other railways have experimented quite largely with creosoted beech ties, but there has not yet been sufficient time to determine the results.

Small tool handles, not liable to injury from warping, and plane stocks always kept dry, are made of beech to advantage.

THE ROOT SYSTEM of beech is entirely along the surface—often on top of ground. Tramping by stock and erosion on the slopes of hills, soon kills the tree, causing at first dead tops, and then decay follows the trunk downward.

THE BEECH OF EUROPE, *Fagus sylvatica*, resembles the American tree in many particulars. From this there have resulted several ornamental varieties, the purple beech, copper beech, and the weeping form are all admired for park and ornamental planting.

Our illustration shows some of the few remaining beech woods in Indiana, where the editor's family spent the day.

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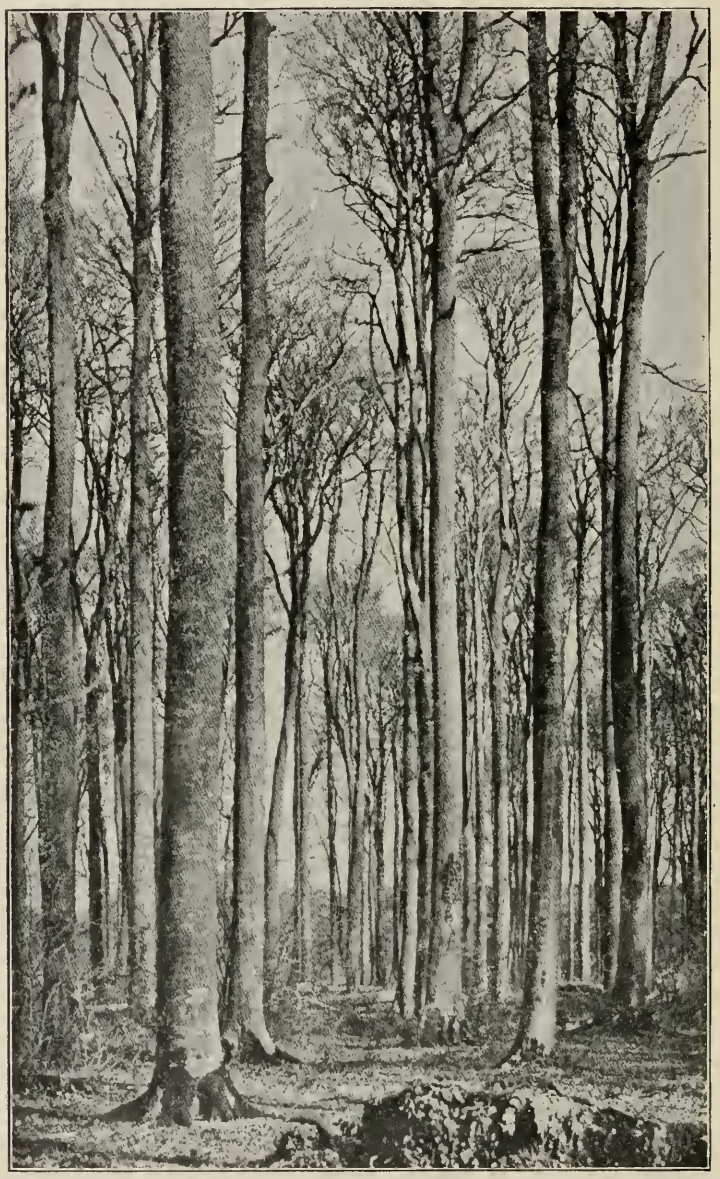

BEECH WOOD NEAR PETWORTH, SUSSEX. *Fagus Sylvatica.*

From the Trees of Great Britain and Ireland, by Mr. H. J. Elwes, F. R. S., Vice President of International Society of Arboriculture.

Kentucky Forest Exhibit at Jamestown Exhibition.

Arboriculture is in receipt of an elegant pamphlet, the report of the varieties of timber grown on the property of ST. BERNARD MINING COMPANY, at Earlington, Ky.

The following table of tree growths is of interest:

	Age when 12 Inches in Diameter	Age when Cut	Diameter when Cut
Kentucky White Oak..	75	142	27
" " " ..	90	153	21
" " " ..	100	156	20
" " " ..	93	150	21
" " " ..	99	149	24
" " " ..	94	153	28
" " " ..	96	225	34
" " " ..	90	220	33
" " " ..	105	203	28
" " " ..	101	216	30
" " " ..	135	223	26
" " " ..	90	223	26
" " " ..	100	222	30
" " " ..	100	235	27
" " " ..	98	165	24
" " " ..	130	312	36
" " " ..	115	265	27
" " " ..	95	226	27
" " " ..	127	290	35
" " " ..	68	178	29
" " " ..	96	228	27
" " " ..	90	275	35
" " " ..	113	297	31
" " " ..	149	295	31
" " " ..	120	310	36
" " " ..	130	301	32
" " " ..	95	325	41
" " " ..	95	293	36
" " " ..	141	280	38
" " " ..	85	299	37
" " " ..	166	286	35
Texas Red Oak.....		132	26
" " "		72	28
" " "		218	52
" " "		198	36
" " "		215	43
" " "		185	32
" " "		184	30
Black Oak.....		173	33
" "		148	28

	Age when Cut	Diameter when Cut
Hackberry.....	115 years	25 inches
Persimmon	45 "	20 "
Black Willow.....	50 "	18 "
Black Locust.....	31 "	15 "
Sassafras	112 "	19 "
White Elm.....	115 "	21 "
Red Elm.....	66 "	17 "
Sugar Maple.....	155 "	38 "
Swamp Maple.....	134 "	28 "
Blue Ash.....	173 "	34 "
Same	273 "	36 "
Laurel Oak.....	53 "	16 "
Yellow Chestnut Oak	186 "	21 "
Same	123 "	19 "
Post Oak	150 "	20 "
Chestnut Oak.....	125 "	17 "
Scarlet Oak.....	38 "	21 "
Willow Oak.....	81 "	16 "
Sycamore	260 "	57 "
Tulip	97 "	33 "
Same	225 "	57 "
Same	30 "	12 "
Beech	165 "	36 "
Hop Hornbeam.....	55 "	13 "
Sweet Gum.....	184 "	34 "
Same	141 "	25 "
Same	160 "	42 "
Wild Black Cherry..	46 "	16 "
Kentucky Coffee....	25 "	5 "
Black Walnut.....	45 "	13 "
Same	30 "	15 "
Same	189 "	29 "
Same	104 "	19 "
Same	145 "	22 "
Same	62 "	15 "
Shell Bark Hickory.	120 "	12 "
Bitternut Hickory...	58 "	14 "
Small Mockernut Hickory	63 "	13 "
Pignut Hickory.....	110 "	13 "
Kingnut Hickory....	163 "	19 "

Forestry Exhibits at Expositions.

By far the great majority of so-called forestry exhibits at the various world expositions are simply advertisements of various states and localities, of the timber which may once have existed in vast quantities and may yet have some timber in more or less reduced quantities, and are bids to the world, "Come and take it, come quickly."

Seldom indeed do these exhibits have any reference whatever to FORESTRY, which name implies the care, management and perpetuation of the forests, not their hasty destruction.

The art and principles of providing for a continuous supply of timber for the use of the citizens of the State or Nation are seldom considered in preparing such exhibits.

One hundred and twenty-two varieties of timber are shown in as many picture frames in the United States Building.

In these frames are pictures representing scenes from the farms, the mines and the forests of the Western Kentucky coal fields.

The planting of walnut, tulip tree, locust and catalpa speciosa is illustrated.

A TIMBER PLANTING COMPANY.

To Mr. John B. Atkinson, of Earlington, President of the St. Bernard Mining Company, the State of Kentucky owes a debt of gratitude for the efforts which his company is making to perpetuate the forests of the State.

It was the privilege of the editor of this journal to visit the forests of this company and inspect the timber and the plantations.

The mining companies of the United States are great consumers of wood, and mining timbers are becoming more scarce each year—they can not wait 300 years for oak to grow to replace the timbers now being used, and yet timber will be as necessary in future as it is at present.

But how many similar companies, mining coal, iron or other minerals, are making as good use of the land upon the surface in growing timbers for future use in the mines as the St. Bernard Company is doing?

It is indeed refreshing to observe a great corporation as the St. Bernard Mining Company of Earlington, Ky., take a different view of matters and teach the people to plant trees and maintain a perpetual forest.

Since 1888 this company has planted over one million black walnuts. During the past two years 75,000 catalpa speciosa and 75,000 locust were planted on 225 acres of farm land, 8x8 feet apart, and are being cultivated.

The company plants annually from 150 to 250 bushels of nuts of the black walnut in vacant places in its forests and on cleared lands, in Hopkins County, Kentucky.

In 1900 several thousand tulip trees were planted on farm land and at this time 20,000 young tulip trees are ready to be transplanted on farm lands or in vacant places in the forest.

In reveiwing these tables we find that 31 trees of white oak required from 75 to 166 years to become one foot in diameter.

One tree was 325 years old when cut and was then 41 inches in diameter, an average of eight years' time to grow one inch diameter.

The Tree.

Its Progression, Suppression and Retrogression.

Beginning with the seed there is stored up a considerable quantity of plant food which is absorbed by the embryotic plant which enables it to make some upward growth, even before it has formed sufficient root to gather nourishment for support.

But this is soon exhausted and the plant must rely entirely upon the food which the rootlets gather from earth and moisture.

The first few years of the tree's life are occupied in extending its system of roots, pushing them out in every direction where the elements in the soil may be absorbed by myriads of microscopic mouths and dissolved by water, carried upward to every portion of the growing tree.

In autumn, the sap with its load of food, is chemically changed by the atmosphere and descends to strengthen and extend the growing roots.

The tree, beneath the surface of the soil is much more extensive than is the trunk and branches which are seen above ground, and upon these unseen members the tree must depend for its life support.

Just so rapidly as the roots are enabled to push through the soil and gather moisture and nourishment will the trunk and branches progress. Advancing farther and farther from the stem of the plant, each step increases the area occupied by the numerous rootlets, in geometric proportion, and in the same proportion the trunk is forced upward and branches extended.

After a season the roots meet those from surrounding trees and a struggle takes place, unseen, beneath the soil, for the possession of territory, for the limited quantity of water which descends as rain, and for the plant food which can not be utilized except in solution with water.

Then comes suppression and the tree remains, possibly for many decades, sufficiently nourished to maintain life but insufficient for progression.

Retrogression follows as a few of the stronger overcome the more numerous weaker, crowding back the rootlets and feeding upon them as they decay, until all are destroyed except those which are fittest to survive.

During the first few years of life of any tree, this underground, unseen portion is the first to become established and the upward movement is always disappointing, unless thorough preparation and cultivation of the soil takes place.

As the roots gain in strength and in extent they are able to supply the ENERGY which pushes upward the visible portion of the tree, and this action continues until the roots are checked in some manner.

ERRORS IN TREE PLANTING.

Setting a tree in hard ground, without sufficiently pulverizing the soil.

Planting a tree in a hole of insufficient size, whereby the young roots not able to penetrate the hard earth, turn back and coil about the tree as in a flower pot.

Planting trees and failing to cultivate them so that the rain can not penetrate the soil but runs off.

Allowing grass and weeds to grow, these surface feeders absorbing all moisture.

Any of which practices will stunt the growth of trees by preventing proper extension of roots.

Too close planting, which causes suppression of growth, is the most prevalent cause of failure.

THE BUCKEYE.

THE BUCKEYE.

A RAPIDLY GROWING TREE FOR PAPER.

Mr. Wm. H. Gill, Vinland, Kansas, writes:

"I think you are in a much needed work in your ARBORICULTURE; but you are no longer working alone. A cry for the saving of the forests comes from all sides.

In several of your articles you have given the enormous quantity of wood consumed in making pulp.

The most worthless tree that I know of is the Buckeye. It is also the fastest grower, and easily ground into pulp. Could not waste land be utilized for growing the buckeye for paper?"

THE BUCKEYE, *Aesculus*, or Horse Chestnut, is broadly distributed and in a dozen varieties. The large forest tree, THE OHIO BUCKEYE, *Aesculus glabra*, was formerly very abundant from Pennsylvania west to the Mississippi River, growing to height of 100 feet.

While *Ae. Parriflora* is a shrub 3 to 6 feet high.

In the mountains of California *Ae. Californica* is common, usually 3 to 4 feet high, but at times 15 feet.

There are many varieties known but for the purpose of making wood pulp only the large growing trees, *Ae. Hippocastanum, Ae. Pavia*, Red Buckeye, *Ae. Glabra*, should be considered.

The Horse Chestnut of the nurseries is strictly an ornamental tree, from Europe, not of any economic value.

The Buckeye produces large roundish nuts, having a prominent scar upon one side. Usually two or three seeds are produced in one hull. The latter are smooth in some forms or have numerous spines in other varieties. The trees are all somewhat ornamental in appearance, although having a coarse foliage. The Buckeye is found in all kinds of soils, and can be cultivated on very rough ground, hence may be utilized for wood where other trees would have difficulty in securing a foothold. Still they do better in good soil.

In early days of Indiana the Buckeye was sought for the purpose of making wooden bowls for the kitchen, the wood being interlaced and not easily broken or cracked by alternate wet and dry conditions.

As a fuel it was never used, being soft and difficult to split into firewood.

The nuts or seed are poisonous and frequently cattle were killed, "buckeyed," from eating them. There is a reasonable doubt but this tree would become very profitable for planting systematically for the special purpose of making pulp. Probably the greatest difficulty would be in securing a sufficient quantity of seed, now that the Buckeye has almost disappeared with other American forest trees.

ARBORICULTURE has often advised the extensive planting of the dwarf buckeye in semi arid regions as nurse trees, beneath the shade and protection afforded by this rapid form of vegetation from wind and storms, for the growing of pine coniferous and other more valuable trees which can not readily obtain a foothold without such nurses.

The Buckeye has never been found of use for lumber, or so far as we are aware for any economic purpose other than what we have mentioned, but it certainly has a good paper fiber, and should be planted largely.

A CRIME OF THE WOODS.

A sturdy oak—its spreading branches filled
An acre round where ages it had stood—
The sinless monarch of this mighty wood
Till one there came who with a vandal's power
Sent crashing earthward in a single hour
What God required three centuries to build

—*Albert B. Paine.*

The Catalpa Speciosa For Telegraph Poles.

THE CATALPA SPECIOSA FOR TELEGRAPH POLES.

In our July issue we presented a view of a catalpa tree which would make a superb telegraph pole 70 feet in length, and having a diameter of a foot at the top.

We show in this number another tree growing in Gibson County, Indiana, which in twenty years has grown so straight and tall that it would surpass any telegraph pole now in existence.

A firm in Ohio, operating an extensive telephone system, is planting a large forest of catalpa speciosa for the special purpose of securing poles for this system.

Short poles of white cedar are still obtainable in the swamps of Michigan, but long poles are brought from Idaho and are of pine.

It will be but a few years when both the great telegraph systems and the various telephone lines will be obliged to use iron poles, unless some speedy planting is done to supply wood.

Companies desiring to provide a supply of poles may secure 170 poles per acre in twenty years at a cost of twenty cents per tree, including original cost of land and expense of planting and maintenance.

The present price of poles may average $3.00 each—some costing three times as much.

Railways are now creosoting most of their poles, but catalpa wood is already treated while growing and needs no chemicals to make them last three times as long as creosoted timber will last.

The Western Union and Postal Telegraph Companies would do well to carefully consider this matter and make such provisions as will insure poles in time when other timber will have disappeared.

THE PINE BARRENS OF NEW JERSEY.

HOW THEY MAY BECOME PRODUCTIVE

The New York Tribune recently gave a very vivid description of these barrens, from which we make some extracts:

"Those who have gained their knowledge of the New Jersey "pine barrens" from a few weeks' sojourn at Barnegat, Tom's River or other towns along the coast, supplemented by sundry glimpses from the car window as the train rushes along, may yet have but a faint idea of what the real pine barrens are like. To see them at their best—which in this case is also their worst—one must get further away from civilization than the railway will carry him. But before one leaves it, indications of what is to come are not wanting. The railroad dwindles from four tracks to two and finally one. This is the end of the road and the few houses which constitute the last village are clustered about in a spot whose fertility, although slightly above that of the surrounding country, is still sufficient to make it a veritable oasis in this all but desert land. In all directions from its borders the gray sand extends, tenanted by stunted specimens of pitch pine whose stems are little more than poles, with a brush of yellow-green foliage at top which scarcely shades the small oaks and huckleberry bushes forming the principal underwood.

As much rain falls upon this part of New Jersey as upon any other, but the thirsty sand rapidly sucks up the moisture and in a few short hours after a storm, the earth is dry again. These arid conditions have a very noticeable effect upon the few other species that here and there struggle with the pines and oaks for existence. For the most part they are heaths or heath-like plants with thick leathery leaves that are slow to let their scanty supply of moisture go. The wintergreen and trailing arbutus are common as is their near relative the bearberry. This latter is a prostrate shrub with small shining leaves and a profusion of red berries, very attractive to the sight, but containing a juiceless mealy pulp within.

The cactus is the only green thing in the region that seems absolutely happy even in the dryest weather. Its thick stems act as so many reservoirs storing up water during wet weather against a time of need and parting with its very grudgingly in dry times. This is probably the only plant that can produce fruit no matter how dry the season. In June and July the plants are fairly full of the dark red "prickly pears."

It is sometimes difficult to understand how certain species of sand plants are able to exist at all until the underground portions are examined. It is then seen that the top is but an insignificant part of the whole plant.

the thick roots often descending straight down for a distance of nearly six feet in their search for water.

Among the most attractive spots in the barrens are the low places where the water comes to the surface. Here the sand vegetation suddenly gives way to cranberry bogs set thick with sundews, bladderworts and pitcher-plants all busily engaged in trapping insects. Or a greater depression may contain a cedar swamp whose tangled depths are the source of one of the amber-colored streams which leisurely wander away to join one of the numerous small rivers of south Jersey. As one emerges from the plains in the direction of Wading river, these bogs become very numerous, notwithstanding which, it is claimed that there is no malaria there and the natives drink from any running water with impunity.

If one consults a map of this region, he will find many places marked upon it which fail to materialize when search is made for them. It usually turns out that they are the sites of iron furnaces which were once employed in extracting iron from the bog ores. With the diminution of the ore supply the furnaces were gradually abandoned until all that now remains of many are crumbling walls and decaying timbers about the hollows where dwellings once stood. A few small hamlets have managed to exist after the fires in their furnaces died out, but the greater number are deep in decay, tenanted only by the lizard who delights to bask in the sunlight upon their fallen walls.

ARBORICULTURE has made frequent reference to this region as well as to the very extensive tracts of sandy soil bordering the Atlantic Coast, from Cape Cod, Massachusetts, all over Long Island, the eastern shore of New Jersey, Maryland, Virginia, both of the Carolinas and the larger portion of Florida.

Here are thousands of square miles of almost barren sand deserts on which but few agricultural products can be profitably cultivated. Tracts of such low price as to be almost valueless. They bring no income to the State or locality in which they are situated, and, of course, none to their possessors—if they have any.

The great stretch of coast line which they border, dangerous to navigation, are a constant source of expense to the government in providing harbors and lighthouses. Yet these lands are pronounced to be valueless. Why should they be?

Four centuries ago the entire coast of the Atlantic was a wilderness of forest, which has been made barren by the unwise course pursued by Nation and States in discouraging the presence of forests. The timber has been cut and carried away, leaving neither seed nor young trees to reproduce the forests.

Lumber and timbers then had little importance, but now they are greatly enhanced in value with a prospect for a famine at no distant day.

All of these lands will become productive of timber if sufficient interest can be aroused to have it planted.

Corporations which are such great consumers of wood, and now find the supply almost exhausted, would do well to consider the extensive planting of these low-priced sandy lands in order to insure an ample supply when the natural forests have ceased to furnish what they require.

The objection raised heretofore to the planting of forests was the great length of time required for trees to become useful—from 150 to 600 or more years.

This is still true for nearly all wood that is now or has been in the market, as shown by numerous articles in ARBORICULTURE. But it is not true with the catalpa speciosa, which we have repeatedly shown succeeds in all these sandy lands and grows into merchantable lumber of highest quality in a score of years.

What an investment for a young man who in twenty years can have an income far greater than an investment of bonds with their great uncertainty eliminated.

The State of New Jersey may with a moderate expenditure make these lands the most productive of the State.

Of course, though, some extraordinary scientific fellow will say "the water table is too near the surface," "the clay hardpan is impervious," "the catalpa won't grow there," and by various arguments attempt

to prevent the planting of forests—but experiments have been made in a large number of places which prove that only the planting and care of the trees is necessary to insure success.

A FALSE PREMISE.

"When Baron Pinchot's menagerie gets here next week we would like to ask some of the animals a few questions. In Colorado less than twenty per cent. of the land is taxable because the government owns the remainder. Why should not the state have title to these lands? Putting all of this land into reservations and leased grazing districts would stop progress and shut off our source of taxation for all time to come. Twenty-five per cent. of the railroad land grants are patented and the roads are not paying taxes on their share. Just as soon as a man goes in and takes up a claim and puts a little house on it, he is compelled to pay taxes. After all why should the whole western country be put under the ban? Why not make forest reserves of the vast tracts of unoccupied land in Pennsylvania, Indiana and other states in the east and leave us alone to work out our own destiny?"—The Denver Field and Farm.

Colorado possesses some good land, some excellent soil, and some valuable mines, but Colorado also owns several million acres of absolutely worthless desert and a few millions more or less of mountain peaks which nobody owns or will pay taxes upon, and hence the burden of taxation comes upon the small proportionate area of land which people are willing to accept a title to and pay the taxes upon.

If Colorado could secure possession of the forests which remain it would not be five years until every stick of timber would be cleared off, and then no man would pay taxes on the rocks and desert which would remain.

Besides the ones who now pay taxes on irrigated lands would have to move away for want of water. Who, we ask the Senators from Colorado and others heading this movement, would pay the state indebtedness and taxes then?

DISASTER TO FOREST PLANTATION.

On the night of the 6th of July a hailstorm passed over the country adjacent to Pacific Junction, Iowa, which was about a mile wide, and destroyed everything in its path.

The fine plantation of catalpa speciosa established by the Chicago, Burlington and Quincy Railway was within the pathway of this storm, which took all the leaves off and cut the stems, taking the bark off from 90 per cent. of the trees.

The officials of the road report that there is very little left, and fear the trees are all dead.

We do not take quite so gloomy a view of the subject, believing that enough dormant buds remain, even beneath the immediate surface of the soil, to reproduce the trees yet this season.

With a great majority of trees this destruction treatment would be fatal, but the vast amount of vitality possessed by catalpa speciosa enables it to overcome the loss of foliage and push out new buds, which soon develops into healthy foliage in a short time.

BLACK WALNUT SEED.

For several years ARBORICULTURE has urged the planting of black walnuts, calling attention to their rapid growth and the high value of walnut lumber. Every year the editor has been requested by large numbers of people to procure seed for them, but invariably these requests have been received too late to secure seed for that year.

PLEASE REMEMBER that walnuts for seed must be secured while fresh and planted at once or stratified, that is, mixed with sand or soil to prevent drying.

IN ORDER to secure seed they must be engaged during the summer so that the nuts can be gathered in season.

APPEARANCE OF WORMS IN SOUTHERN PLANTATIONS.

A letter from an official of the Southern Railway details that in portions of the Wolf Trap, Va., plantation of catalpa speciosa, worms have appeared and are stripping the trees of their leaves. We are asked what remedy we can offer and what results may follow the defoliation of the trees.

The catalpa worm is the larvæ of the catalpa sphynx or moth—the life history of which will be described in another number of ARBORICULTURE.

The worms increase rapidly and are voracious feeders, attaining a size of 2½ inches in length, after which it spins a large brown, triangular cocoon, in which it remains until spring. Emerging from this cocoon as a very large butterfly or sphynx, it deposits numerous eggs upon the catalpa foliage.

Spraying with any poisonous sprays will quickly destroy the worms.

Gathering and burning the cocoons is a more thorough method.

This worm is the one natural enemy of the catalpa, feeding upon nothing else, and is common in the south on the catalpa bignonoides, and of course, goes to speciosa.

When it is considered, however, that not a tree, shrub, flower or plant in the entire world is exempt from insect attacks, some having as many as 200 distinct insect enemies, often so insidious, so minute as not to be readily found, while the catalpa has but the one insect which attacks it, and that one so large as to be easily seen and destroyed.

People come thirty miles to this forest to search for these worms, as they are considered the best fish bait obtainable.

AN INTEREST IN SWITZERLAND AND RUSSIA.

Some months since we received a letter from a gentleman of Zurich, Switzerland, showing great interest in experiments with catalpa speciosa in that country, and the gentleman specially requested us to send seeds and literature to a gentleman in Russia who has large landed interests, and who was greatly interested in forests. We acceded to this request and plainly expressed our opinions that he was too far north to hope for great success. We are in receipt of this reply:

Dear Mr. Brown:

Yesterday I received your kind letter from Connersville of June 18, 1907, for which and also for your valuable magazine, accept my most sincere thanks.

My friend, Mr. Chabot, Zurich, gave me seeds, and in 7 to 9 days I shall have some little plants in my hot house. Our latitude, I am sorry to say is 57-58° N lat. I will be pleased to make a report about this catalpa tree in a few years in lat. 57-58° North.

I will recommend the tree farther South among my friends when opportunity presents itself.

Again thanking you, I am yours very respectfully,

WOLDEMAR VON WULF.

Red Oak, Iowa, July 27, 1907.

Mr. John P. Brown:

I have enjoyed the perusal of your "Practical Arboriculture" very much. It is a master.

(Rev.) WM. MURCHIE.

FROM INDIA.

We are in receipt of Review of Forest Administration in British India, with a letter from the Inspector General of Forests, requesting ten pounds of seed of Catalpa speciosa for trees in this tropical region

FROM FORESTRY AND IRRIGATION.

A USE FOR OVERFLOW LANDS.

"Dr. T. J. Burrill, Vice President of the University of Illinois, gave a lecture before the students there in which he discussed the uses and supply of timber and the utility of different kinds of trees. Dr. Burrill predicted disappointment in the results of the Illinois Central catalpa grove which has been planted to supply railroad ties, because it is planted on impervious clay land, while the surprising quick growths for which this tree is noted are made on rich soils. The lecturer pointed out that there are many rich lands that are useless for agriculture because of being frequently overflowed and remarked that these would be suitable sites for catalpa groves."

Dr. Burrill, together with several other professors of forestry, in trying to explain the apparent failure of the Illinois Central Railway catalpa plantation, makes a woeful mistake as to its cause, which in due course of time we will explain in full and show to whom the blundering in this forest experiment belongs.

So far as Dr. Burrill's guess goes it is a mistake in toto. The land is remarkably rich. It has been productive of sugar cane for half a century. The formation is identical with that for miles along the Mississippi shore, beginning with the low delta land below Baton Rouge, and extending far below New Orleans.

The Mississippi River is higher than the surrounding lands, being kept in bounds by extensive levee embankments.

Formerly with each overflow the water poured over these adjacent lands and found their way into Lake Pontchartrain, and thence to the Gulf.

Each freshet brought the silt from the rich lands along the Mississippi Valley, depositing it in this delta.

One of the very common trees in this vicinity, growing in abundance in close proximity to Harahan, La., is the southern catalpa, bignonoides, the root system of which is similar to that of catalpa speciosa. The tree has no difficulty in penetrating the subsoil in this delta, any more than the pecan, and a host of other trees which form a tap root.

Within a mile of the Harahan tract are scores of these native catalpa trees, some of large size.

Within a few miles, right along the borders of the Mississippi River, may be seen very large trees, part of which are native catalpa, others of speciosa, that were planted some twenty years ago.

In New Orleans, only eight miles away, was one tree, six feet diameter, and many which are from two to three feet in thickness, and sixty to eighty feet high. Such trees have penetrated all the subsoil necessary to find a foothold and mature their trunks.

Rich land! Why there is no richer on the face of the earth.

There is no doubt, however, but that mismanagement has taken place and a grand experiment in forest planting bids fair to result in disaster.

THE INDIANA STATE FAIR.

The State Fair of the various States is a wonderful educator for the farmers. Year by year there are improvements in machinery, advancement made in stock, and methods of farming are changing, while the fruits, grains and productions of agriculture are of higher grade than formerly. It is well for the farmer to keep in touch with all advanced ideas. Then a few days' recreation is necessary, and here is the place to take it.

The Indiana State Fair, equal to the best, is to be held at Indianapolis September 9 to 13, inclusive.

A Rocky Mountain Forest Reservation

Western Politicians Want Farms Here.

THE CATALPA IN FLORIDA.

Mr. Herbert C. White, DeWitt, Ga., writes:

"I am mailing you leaves and pieces of wood of what seems to be catalpa speciosa. Parties in the neighborhood, in Florida, have posts 20 years old in perfect condition. All the catalpa trees in this neighborhood seem of the same kind, and the wood "lasts forever." Some dead trees standing in a pond are 70 years old, and when cut still make good fence posts. I think it must be speciosa, and, if true, I can obtain large quantities of seed."

The samples greatly resemble speciosa, yet it is impossible to determine from leaves and wood of young trees.

Examine bark of older trees. If thin and scaling off, reject such trees—but if thick, each year's addition of bark clinging, like ash, tulip trees, etc., it is a good indication of speciosa.

Compare seed with cuts found in ARBORICULTURE. Speciosa has a broad brush of filament at each end. In other sorts these filaments are drawn to a point.

The probabilities are that these trees are bignonoides, unless planted by man within fifty to sixty years, as speciosa was previous to the past century confined to Wabash Valley.

Send samples of seed before collecting any large quantity.

So far as we are aware all varieties of catalpa have the element of durability.

NUT NOTES.

The timber value of the hickory, walnut and chestnut should be a sufficient warrant for the planting of these trees by farmers.

The Santa Ana Walnut Growers' Association marketed last season over a million pounds of nuts, receiving $108,000 for the crop.

In this day of prepared foods increasing and deserved attention is being given to all edible nuts as ingredients for such preparations.

This is a great country with great diversity of soil and climate, but each section has one or more species of nut trees adapted to the local conditions.

Since the organization of the National Nut Growers' Association in 1901, a rapid development in the nut industry has taken place in Southern territory, where the pecan finds its most congenial surroundings.

There is a great difference between the ordinary Texas pecan, as seen in the market, and the large, thin-shelled, plump, finely-flavored nuts of the selected varieties now being propagated for commercial planting by budding and grafting.

The sixth annual convention of the National Nut Growers' Association will be held at the Jamestown Exposition, September 26-28. This meeting follows that of the American Promological Society, which closes on the morning of the 26.

VALUABLE BOOKS.

BIRDS OF BUZZARD'S ROOST.—ONE FOR EACH WEEK.

BY WILLIAM WATSON WOOLLEN.

Judge Woollen finds time, although a busy lawyer, to write a most useful as well as interesting book on the Birds of the Middle States, which he has seen visiting his "Bird Paradise," which he persists in naming Buzzard's Roost.

Fifty-two of our birds are described and colored plates are inserted of each—while thirty-three other plates are given.

Taking this book in hand, a child may determine each bird from its description. The illustrations as well as the descriptive matter are excellent. One can not fail to have a more exalted opinion of the birds of our land from reading Judge Woollen's new book.

The author was one of the twenty members who organized the International Society of Arboriculture, and has ever since taken a lively interest in the work of forest planting and management—and fully recognizes that neither the birds nor the forests could exist for a dozen years with the other destroyed.

This book should be in every library where nature is studied. We bespeak it a large circulation.

THE UNANSWERABLE QUERY.

(By Hon. W. G. M. Stone, President Colorado Forestry Association, in *Western World.*)

Early in April a letter from the Port Edwards Fibre Company, addressed to the State Forest Commissioner of Colorado, was received by the State Forestry Association saying that they understood considerable work in Forestry had been done in our state and that they would like a copy of the last report, and also copies of all future reports.

They were informed that Colorado had no forest commission; that the state was giving no time or attention to Forestry, and was spending no money on such matters.

In due time a reply came saying: "If there ever was a state which needed to take up the protection of its timber and the conserving of the sources of supply of its streams, it certainly is the State of Colorado."

Not satisfied with the report received, they wrote at once to the Governor's office for further information; this was referred to the Association for attention. In response they were reassured of the utter indifference of the state to the subject of Forestry, but were told in glowing terms what the government is doing within the state, and also what the State Agricultural College is doing.

In response we receive this information: "We are large users of timber products, and are exceedingly interested in all matters of this kind."

Mark their words: "Exceedingly interested in all matters of this kind." There is the milk—in this cocoa-nut shell! Timber is growing scarce and they are going over the country to see what interest the states are taking in Forestry. Being large users of timber products the question is: Where are their supplies to come from?

The lead pencil people, as we have seen, are wondering where their red cedar is to come from. Cooperage firms are craning their necks to see where they can get white oak staves for their shops; railroads are ransacking the forests of the South for ties; furniture factories are reaching farther and farther for something to meet the demand upon them.

The Pennsylvania railway, in view of the growing scarcity of timber said: "We'll try steel ties," and laid several miles, as an experiment. Their recent appalling disaster occurred on the very spot where these ties were laid, and it is charged that, in some mysterious way, they caused it. Whether or not the steel tie is responsible, the company replaced them with white oak.

For a railroad tie there is nothing so good or safe as wood. But the roads must have 100,000,000 cross ties annually for repairs alone, and so scarce is timber becoming that it is extremely difficult to secure enough for this purpose. From what source their supply is to come in even less than ten years no mortal can tell; and this query is the worry of all manufacturers and "large users of timber products."

Note.—Since the above was written the following important item, apropos thereto, comes over the wires to the public press:

Pittsburg, Pa., May 19.—The Pennsylvania railroad announces here that it has decided to plant 20,000 acres of ground at the foot of Alleghany mountains in tie lumber.

The steel tie will not do, it says. The wooden tie must be perpetuated, and with alarm the big railroad system has viewed the passing of available tie-making trees from the forests and it is announced that tie-growing on a scale never before thought of will be started at once.

It will be forty years before the trees now to be planted will be available for the first crop of ties, but the railroad has decided that it must look that far ahead, and with this object in view Assistant United States Forester E. A. Sterling has been lifted from Washington and employed by the Pennsylvania road to do nothing else but look after the tie-growing industry of the system.

807 ROTTEN TIES IN A MILE.

KANSAS RAILROAD COMMISSIONER INSPECTS MISSOURI PACIFIC TRACKS.

Hutchinson, Kas., June 29.—Railroad Commissioner Charles A. Ryker, of Atchison, and a representative of the press walked over the Missouri Pacific tracks between Hutchinson and Yaggy, the first station west of here. In one mile, between mile posts Nos. 48 and 49, 807 rotten, broken and weakened ties were found in the track. In one rail length there were nine bad ties out of seventeen, and hundreds of spikes could be pulled out on a mile of track.

Commissioner Ryker walked over some of the Missouri Pacific tracks near Anthony, on the Kiowa division, yesterday, and found conditions worse than on the Hutchinson division—two or three ties out of five being bad.

Ryker says the roadbeds of both this and the Kiowa divisions are very unsafe for heavy tonnage or for rapid movement of trains.

The straits to which many railways have come for timber and cross-ties may be seen by the above press dispatch recently sent to all daily papers.

Still the railways can not see the absolute necessity of preparing for a cross-tie famine which will catch all the railways before they realize it.

Obituary.

Mary E. Brown, eldest daughter of John P. Brown, died at Connersville, Indiana, July 1st, 1907.

She was born at La Cygne, Kansas, February 20, 1871. After the destructive visitation of locusts or grasshoppers the family was forced to leave Kansas in 1875, having lost all their property from this cause, and removed to the father's former home, Rising Sun, Indiana.

Miss Brown was educated in the Public Schools and at Oxford College, Oxford, Ohio.

In 1904 she began work as nurse, taking the course of training at the Cook County Hospital, and after graduating was engaged at nursing in several hospitals in Evanston, Illinois.

In 1902, being convinced that she had a call to become a missionary, she entered the Moody Bible Institute, Chicago, to prepare herself for the Foreign Mission field. She sailed from San Francisco, August 8, 1903, arriving at Seoul, Korea, October 14. After two and a half years' service in Korea, traveling extensively, nursing in the families of missionaries who were ill, and teaching the Korean women and children, who soon became greatly attached to her, she was stricken with that dread Oriental disease, sprue, from which few Europeans or Americans recover.

She was directed by the Board of Foreign Missions to return to America, in hopes that a change of climate might be beneficial.

After two years' suffering she expired at the home of her parents in Indiana.

European and American physicians have very slight experience with this disease, and give little hope for patients after the malady has become fixed.

Miss Brown was a frequent correspondent of ARBORICULTURE, and through her efforts many thousands of American forest trees have been planted in the Hermit Nation, and a very great interest has been awakened in forest and shade tree planting in that country, which is so barren of forests.

THE ACME OF FOOLISHNESS.

The U. S. Forestry Bureau sends out a great deal of trashy misinformation. One such paper just sent out to the press, will be printed by thousands of newspapers throughout the country because it is AUTHORITATIVE, coming from the government. This is lengthy and we only give space for a small portion:

TREES CAN NOT BE ACCLIMATIZED.

United States Department of Agriculture,
FOREST SERVICE.

Washington, D. C., July 16, 1907.

"Trees are fixed, almost inflexible, in their habits. For centuries, indeed as long as we have record, each species has kept in its beaten ways; insisting on the same average of temperature and refusing to grow where this could not be found; seeking and occupying certain kinds of soil and demanding certain amounts of moisture and avoiding situations where these were wanting.

"The latest authorities go so far as to declare that trees can not be acclimatized; that is, that even the ingenuity and perseverance of man are unable to induce trees to change their habits far enough to adopt a country not closely like their native habitat. For a time the forester may use various devices to surround a tree with artificial conditions by which, so to speak, the tree is deluded into feeling at home. But as soon as the forester's care is withdrawn in such cases, the tree is seized with homesickness and dies of it."

What fools these gardeners of long experience who are in charge of the Kerr Botanical Gardens of England, the U. S. Botanical Gardens of Washington, the French, German, Japanese and many other great national and private collections of trees and plants, who having successfully cultivated a hundred thousand varieties and species of trees and plants during the past century must now admit their egregious error as the beardless youth of the Forestry Bureau proclaims this to be impossible.

A few instances among the tens of thousands may be alluded to.

Sequoia Gigantica habitat the highest mountains of the Sierra Nevada range; nowhere else in the world, and but two small groves in existence, limited to probably two thousand trees.

This Sequoia has been transferred to all kinds of soils and elevations, and is growing successfully in Europe, Asia and America in numerous localities.

Sequoia sempervirens, redwood, confined to a narrow margin along the coast of California, yet transplanted and growing in several localities many thousands of miles distant.

The Eucalyptus family, tropical in character, from Australian archipelago, Hawaii and other Pacific Islands. Now growing in Arizona, California and South Florida, only restricted by presence of frost.

Catalpa speciosa, confined to remarkably small area in Wabash Valley. Now growing successfully in every state of the Union, Germany, France, Italy, Great Britain, Japan, Korea, various South American countries, Mexico and South and West Africa.

Seed distribution is the only cause of tree and plant dissemination.

Birds, squirrels, wind and flowing water are the agencies used by nature to scatter seeds, and if these agencies fail from any cause to *plant the seed,* there can be no trees or plants.

The Forestry Bureau should be more careful in regard to sending out such misleading statements, which may prevent citizens from planting trees and making experimental forests.

CATALPA SPHYNX.

Mr. George Hampton, Bridgeton, N. J., reports his catalpa forest as doing very well. He destroys the sphynx with paris green. Other arsenicus preparations seemed to burn the leaves. He will double the size of his forest this coming season.

BOIS D'ARC, OSAGE ORANGE, MACLURA AURANTIACEAE.

A correspondent from Vincennes, Ind., wishes to know where to obtain seed of hedge for posts.

There are persons in Arkansas, Indian Territory and Texas who make a business of collecting the oranges from the osage trees, and by grinding them the seed is separated from the pulp. Washed and dried, they are sent to wholesale seed dealers in most western cities.

In planting the bag of seed is placed in a stream of water to soak or swell up the hard outer seed covering, and while moist are sown in drills, where they remain for one season's growth.

The wood is very durable, but is extremely hard, difficult to work with edge tools, and disagreeable to handle on account of the many poisonous thorns. In the forest the trees are crooked, low, spreading and very much branched. In former times some wagon work was made in the native locality with bois d'arc, but it would be too expensive and difficult to compete with oak and hickory.

Forty years ago vast numbers of osage trees were grown for making hedges. Many thousands of miles of such hedges are yet in existence, although few are now being made because of the abundance of wire for fencing. Some of these old hedge fences have been cut back, making fence posts of the wood.

The farmer who considers this economy of labor now must have time hanging heavily on his hands.

As a forest proposition the maclura has not proven a success. The young plants follow their instinct and bow to the ground. When a horse approaches in plowing then the thorns have a disagreeable habit of penetrating the horse's flesh.

The only forests of osage are in the small belt about the corner of Texas, Arkansas and Indian Territory.

THE OPEN COURT publishes an excellent work, Plant-Breeding, by Hugo De Vries, professor of botany, in the university of Amsterdam.

While all persons will not accede to the author's assumption of the correctness of Darwinian theory of evolution, but we do give credence to the practical work of Luther Burbank in hastening natural changes.

During long periods of time there are marked changes in both animal and vegetable organizations.

The oak, for example, is continuously undergoing variations; as we see in every oak forest, hybrids of the red oak family are often more numerous than are the true species. Yet in the beech variations are almost imperceptible.

The most rapid change, however, seems to be in plants and flowers of quicker maturity. Trees which require a century or more for reproduction by seed would naturally remain stable during the lifetime of many generations of men, while the annual plant has greater opportunities for natural hybridization.

Luther Burbank, by studying the habits and characteristics of plants, and bringing the pollen of certain relative plants into contact with the flowers in a single season produces thousands of hybrids while nature may require a century to produce one change.

This book is profusely illustrated while the arguments and discussions are extremely interesting.

The work is deserving an extensive circulation. Open Court Publishing Co., Chicago.

THE TALL JUNIPER OF AFRICA.

General William J. Palmer has received a letter from Mr. P. L. Sclater, of England, with some seeds of the tall Juniper, *Juniperus procera,* the finest timber of British East Africa, and which grows at an elevation of 10,000 feet above sea level on the escarpment between the coast and Lake Victoria.

Mr. Sclater, who was the head of the Zoological park in London for thirty or forty years, thinks this tree may succeed well in the higher Rocky Mountains.

FARMERS' INSTITUTES AND FORESTRY.

Editor Arboriculture:

The State Agricultural College of Colorado has put Forestry on the program for the Farmers' Institutes to be opened the last week in August in the eastern portion of the State.

Think of a series of Farmers' Institutes midway between the base of the Rocky Mountains and the State of Kansas, in the very heart of the "Great American Desert!" What would Daniel Webster think of it after his talk in the Senate of the United States, against establishing a Post Road from Independence, Mo., to the Pacific coast? In Ben Pearly Poor's Reminiscences may be found what he then said. What he would now say we shall never know, but were he to open his eyes and see what is to be seen and know what is to be known of this "worthless area," as he then termed it, he would stare and ask to be shown the lamp of Aladdin by which it is being transformed.

Yes, novel as it may appear, Forestry is on the program with potatoes, and Alfalfa, and field peas, and sugar beets, and a long list of cereals. By this program trees are to be treated as are other products of the soil. And why not? Arboriculture must soon be reckoned with, by the farmer, the same as agriculture. It should come before Farmers' Institutes all over the country; it will—it *must*. The time is near when it can not be left out.

When experts tell us that the forests of the United States contain less than one and a half trillion feet of standing timber (B. M.), and that we are consuming a matter of ninety billion feet per annum, we are amazed. It means that we shall be facing a timber famine in less than twenty years; it means that thousands of enterprises depending upon the forest for raw material must soon be closed and that tens of thousands of laborers must be thrown out of employment—all because the forests are failing.

No country can live without timber. The forest is the right arm of civilization. Cities and villages are built of lumber; the railroads must have ninety million ties a year and millions of feet of lumber for cars; the farmer must have houses and barns, fences and timber for endless other purposes; our homes, our offices and our houses of trade and commerce are lavishly furnished with the most costly woods; a large per cent of the luxuries, conveniences and necessities that enter into our daily lives are made of wood. The implements with which the farmer produces and harvests the food of the world are also largely made of wood. The uses of timber are endless; the draft upon the forest is simply enormous.

With such vivid pictures in view it is easy to *see why* Forestry should have a place at the Farmers' Institute. If in twenty years or less we are to be face to face with a timber famine, it becomes evident that farmers will have to go to planting trees, nor can they begin too soon to meet the impending crisis.

The Farmers' Institute must become his School of Forestry. He can attend no other. It is not scientific, technical nor theoretical forestry that he needs at these Institutes, but clear-cut, every-day, practical, horse-sense talks on how to grow trees for use and profit. I say *use* and *profit*. These are the two motives that will appeal.

The lecturer must be a practical man; he must know one tree from another; what trees are for utility and what are not; what species to plant, and how to plant them! He must know the relative lives of trees; at what age they can be marketed, and to what uses they can be put when grown. If he can point to examples of tree growing; if he can tell of successes and give instances of what can be done, who did it, where and when—the figures and the dollars—he will set farmers a-thinking, and then to planting.

The Agricultural Colleges of the various states, through the Farmers' Institute, can do for the farmer what the Forest Service can not. The Government can deal with the national forests; it can assist lumber companies and the owners of large estates in managing their forests, and it can help railroads to solve their timber problems, but it can not reach the farmer in any practical way. He is too far re-

moved, too individual, too numerous, and yet to him the future must look for a large per cent of its timber supply.

The Farmers' Institute can reach him, as no one else can, and in a manner to secure vast results. In a word, by him it can work miracles for forestry throughout the country, if it will. Give it a chance.

W. G. M. Stone.

Denver, Colo.

FIGHTING FLOODS WITH TREES.

"Chicago has reason to regard its drainage canal with its subsequent developments as a stupenduous undertaking for a single municipality, but in Pittsburg a project is under consideration which, it must be admitted, far surpasses our own little feat in making the Chicago River run up hill. The Pittsburg plan is nothing less than to reforest the mountain region around the city and thus greatly reduce the annual flood which last March caused a damage estimated at $150,000,000 in what is known as the "Pittsburg district" alone.

It has been known for years that the great spring freshets along the Ohio and other rivers were due in large measure to the destruction of the forests. When the mountains from which the Alleghany and Monongahela draw their waters were covered with trees the winter snows melted gradually and the streams though swollen, of course, seldom did serious damage, for they rarely overflowed their banks. Then came man who stripped the hills bare—and after man the floods. And now the people of Pittsburg realize at last that to stop the floods they must, at tremendous labor and appalling cost, undo the work of the earlier residents and reclothe the mountains with trees.

The project is almost stunning in its immensity. It is estimated that it will be necessary to plant 2,000,000 trees and that fifteen years must elapse before they will be thoroughly effective. The first step, of course, will be to secure the necessary legislation for a district equal in size to half the state of Kentucky. Great as is this undertaking, enormous as the cost is sure to be, it would appear a wise investment. With each year's addition to the population of the region, with each year's increase in railway traffic through Pittsburg the loss caused by the annual spring flood grows greater. The actual damage done is enormous, the loss of life considerable and the loss incurred by interruption of business immense. Thus man once more is paying a high tuition for a lesson learned in the school of experience."—*The Chicago Evening Post.*

A MAMMOTH SIGN.

The mammoth electric sign just erected by the Oliver Chilled Plow Works at South Bend, Indiana, is one of the modern wonders of the world, being the largest of its kind, and is attracting widespread attention. While it is impossible to do full justice to this triumph of the electric art, the illustration at the head of this article is a very good effort in that direction.

This sign is placed at the top of the plow company's new five-story warehouse and is visible far out into the surrounding country. It extends the entire length of the building, a distance of 250 feet. The trademark portion of the sign is a very prominent feature, the highest point of the letters in same being at the center, 42 feet above the base line and the plow shown, measuring 59 feet in length.

The letters in the words "Oliver" and "Works" are each 18 feet high by 14 feet wide.

A total of 3,200 lamps is required to properly illuminate this majestic sign and the light sent out casts its protective rays over the entire quarter of the city in the neighborhood of the Oliver plant.

Such a light would ordinarily be considered very expensive and a luxury, but in this case the cost is minimized by reason of the electricity used being generated at the power plant owned and operated by the Olivers, located something more than a mile distant on the banks of the St. Joseph River and designed primarily to furnish power for their great factory.

An illumination of this extensive character naturally consumes power, and 165 of the 320 horsepower generated by a single one of the 12 turbine wheels at their electric power station is required to keep this "Electric Marvel" brightly burning, making its light visible through the darkness for many miles, and so plain that the name "Oliver Works" and the immense trademark can be clearly distinguished and read for a distance of several miles.

Located as this sign is—very near to the main lines of the Lake Shore & Michigan Southern and Grand Trunk Railways—travelers will have a fine opportunity to see for themselves this "Pillar of fire by night," which is at once a triumph of invention and science and a tribute to the enterprise of its projectors and owners.

HOW TO MAKE USE OF DENUDED LANDS.

Talk With John P. Brown Inspires Long Editorial in Leading Southern Paper.

(*Mobile, Ala., Register.*)

Mr. John P. Brown, of Connersville, Ind., editor of the publication entitled "Arboriculture," has been visiting this part of the South for some weeks and spent a part of his time in Mobile. He left for his home yesterday. As editor of a magazine devoted to the spread of knowledge of tree culture, Mr. Brown shows much interest in the coast conditions as he finds them. There are large tracts of cleared and partially cleared land in this part of the country, and the question that suggests itself is, what are we going to do with this land?

The idea, a vague one, is that some time to come this land will be in demand for farming purposes; that there will be an influx of settlers from the West and from Europe, and all the land now cut over and of no value for its timber will be in use. This expectation may be realized, but no one knows when; and in the meantime a very considerable territory is not productive of profit to any one.

Mr. Brown contends that such land will not soon be required for agricultural purposes; and that if it should be used for such purposes there would be such increase in products that prices would be lowered. There is, however, he says, no prospect of an oversupply of timber, and all such land should be used at once for the cultivation of trees. Timber is becoming more scarce each year, and the fear is felt that a famine will occur—a famine that is inevitable in time unless efforts are made to restore the forests.

The catalpa is the tree that is recommended as best suited for growth in this locality. It is a quick growing tree, reaching a merchantable size in twenty years, whereas the pine tree requires 120 years and the cypress 600 years to attain maturity. The catalpa is described by Mr. Brown as resembling in its structure the butternut; it has a dark color, is a grained wood and possesses great strength. It can be used as building material, and also in furniture work. Veneers from this wood have a very attractive appearance. It would profit the State to encourage the cultivation of this tree, and all who engage in such cultivation will reap a great benefit.

The railroads are realizing that the supply of timber is short and likely to be shorter as time goes on, and some of them are providing for the future by cultivating trees. The Louisville & Nashville has an experiment tract of 1,040 acres near Carney Station with catalpa trees, one to four years old, all growing well, and these trees will be serviceable to the road when grown, principally for use as crossties. Mr. Brown has recently inspected this tree farm and is much pleased with it. He says that the land owners generally will do well to follow the railroad's example and plant at least a portion of their land with catalpa trees. They will find that land, not otherwise valuable, will produce for them a crop equal to that obtained from the best farming land in the country—a crop of trees, the product of which may bring a very much greater price in the market than is even dreamed of at the present time.

FARM FOR SALE.—35 acres, three miles from Indianapolis; good locality for fruit and truck garden. Apply to John P. Brown, Connersville, Ind.

The Cross Tie Problem.

The *Hardwood Record*, Chicago, is a live, progressive journal of lumbering. It does not stop with telling how to get rid of the timber but urges the planting of trees and proper management of the timber.

The description of individual species of American trees, with illustrations of their characteristics, is of immense value to the people. We reprint a part of the article on cross-ties from the July 25th number.

Swelling the general cry of distress over the failing timber supply of the United States comes the plaint of the railroads that they are uncertain where to turn for a future supply of cross-ties. The opinion is expressed by experts who have studied this question particularly, that were there no other great consumers of forest products, at the present rate of demand for material of this kind, it would be a question of only a few years before the timber of the country would disappear before its growing insistence.

In 1905 the steam railroads of the United States purchased a total of 77,981,227 ties, of which a very large percentage was oak. In 1906 the steam and street railroads purchased a total of 102,834,042 ties. Of this great number 45,363,426, or nearly fifty per cent, were of oak; the southern pines furnished the next largest quantity, or 18,834,514; of cedar ties there were purchased 8,085,302; of Douglas fir, 7,248,562; of chestnut, 6,588,966; of cypress, 4,103,296. The remainder consisted of western, lodgepole and white pine, hemlock, tamarack, redwood and a few other kinds, small in comparison with the above figures. Of the total purchased in 1906, 77,493,994 were hewn, while 25,340,048 were sawn. It is estimated that one-fourth the total quantity of oak timber cut last year went into railroad ties.

The seriousness of the situation has resulted in prolonged experimenting with various wood-preserving methods, as it is fully realized that the life of each individual tie must be prolonged as far as possible. The chemical treatment of wood has been found advantageous in other lines of consumption, so that it is becoming increasingly popular with railroads, and nearly ten per cent of the total number of ties purchased in 1905 were given some sort of preservative treatment.

On account of the increasing difficulty in obtaining a supply of cross ties and other timbers, and the rapidly advancing prices, the American Railway Association has assigned to its Tie Committee the work of studying existing conditions and presenting a report of their investigations and recommendations at its next meeting. The committee will hold a series of conferences and take up methods of preserving ties, the best materials for making a lasting product, and the value of metal and concrete for this purpose.

One of the large industries of Evansville, Ind., is its tie-preserving plant. From all parts of the Ohio and Mississippi valleys they are shipped and chemically treated at the rate of 3,000 a day. It is claimed that this number of ties will lay a mile of track and that they will last for fifteen years. With the preservative process in use there timber heretofore unavailable is made highly desirable. For example, there is considerable red oak sapling growth in Indiana which has not been used owing to the fact that the timber was not thought fit for any of the uses which would cause it to be exposed to any considerable degree. It is hard and strong, but soon decays in the ground. Treated with chemicals, however, red oak ties will remain solid for fifteen years or more. The process employed is to place them in a retort and then draw out all the sap and tannic acid by a vacuum pressure. At the end of five hours the ties are filled with the preservative inside and out, and so permeated that when laid open with an axe they show black through and through. This particular plant has been in operation only a few months, and already has more standing orders than it can turn out in a year, so that it will be necessary to increase its capacity several times over. It is estimated that 10,000 lumber jacks are at work along Green river and its Kentucky tributaries cutting up timber for railroad ties. In the forest they bring from 25 cents to 50 cents each, but when treated will sell for two or three times this amount.

The Southern Pacific Railroad has imported 1,500,000 oak ties from Japan of late, to be used mainly on its California lines.

California electric lines have purchased 50,000 oak ties from Japan up to this time, and intend to order many more.

The Union Pacific has a tie preserving plant at Laramie, Wyo., and its tie drive from the Platte river, which arrived at Ft. Steele this spring, will amount to more than 1,200,000 railroad ties and bridge timbers, all of which will be treated in the Laramie plant.

Among the railways which have begun tree planting on a large scale, the Louis-

ville & Nashville is foremost. Beginning in 1904 with ten medium-sized groves, it has increased its holdings until in 1905-6, 400,000 trees were planted. Along its right of way between Carmi, Ill., and St. Louis, Mo., the company is making a forestry test to determine the advisability of growing catalpa for ties. An extensive plantation has been made, and the development of the catalpa trees will be carefully watched. They are set about eight feet part and will be given careful attention all along the line. This company has great faith in the advantages of catalpa for ties, since the wood is extremely lasting, holds spikes well, and is not decayed by corrosion where metal comes in contact with it. A catalpa tie will last twenty years, and it requires only that length of time to mature a tree for commercial use. The L. & N. also has a plantation near Pensacola, Fla., one at Newport, Ky., and several in southern Illinois. The Illinois Central, Big Four and Southern Pacific roads also have several of the kind.

The Santa Fe is entering upon the culture of eucalyptus for its own use on a large scale. It has bought a ranch containing 8,650 acres, of which 300 have already been planted with eucalyptus. The Southern Pacific is said to be considering the matter of establishing a similar eucalyptus plantation.

The Canadian Pacific has commenced tree planting extensively along its western lines. Near the town of Wolseley, Assiniboia, it is the intention to conduct experiments in growing tamarack for ties, and at Medicine Hat, jack pine and tamarack will be planted.

The Pennsylvania system last year used 5,125,000 cross ties. This year it is planting 550,000 trees in its prospective forests, bringing the total up to 2,250,000 now being grown on 1,000 acres. It has selected catalpa, locust and oak as most desirable. The planting is done with great attention to scientific detail, under the direction of Forester A. E. Sterling.

The Pennsylvania road expends about $4,000,000 annually for cross-ties, and by its forestry and wood-preservative operations, expects to materially reduce this big item.

The Mexican Central uses about 1,500,000 ties every year, and always has standing orders for them in various parts of the country. The company purchased a shipment of 40,000 hardwood cross-ties brought to Vera Cruz from Tasmania recently, and will make a thorough test of them. It has just placed a requisition for 3,000,000 hardwood ties to be used in repair work throughout the republic.

Mahogany is often used by Cuban railroads, as well as in other tropical countries but Sir William Van Horne has forbidden it on his line. He considers it almost criminal to cut small mahogany trees, and there is an abundance of other timber in Cuban forests suitable for construction purposes.

Several experiments have been made with steel ties in this country, but as yet no definite decisions and results have been obtained. In Europe some roads employ them, but conditions are entirely different from those surrounding traffic in this country. However, it has not been decided there that metal ties are profitable, nor how durable they are in comparison with wood.

While it is scarcely probable that railroad companies will engage in forest planting upon a scale sufficiently large to meet all their requirements, it is important that they plant trees in as large quantities as possible upon their holdings, thus aiding greatly the conservation of the standing timber of the country, and affording a notable object lesson to other large property owners.

Mackinac Island, Mich., July 29, 1907.
Mr. John P. Brown:

I want to thank you for the good work you are doing. You are a public benefactor. Only ill-health, I suppose, has enabled me to read your ARBORICULTURE to-day, and I have been greatly interested in the July number. I have read with interest the articles, "Extinction of American Hickory," "The Catalpa As a Lumber Tree," "The Tribute to Parker," etc.

Yours truly,
H. H. HANNA.

PALO ALTO, CALIFORNIA.

Mr. John P. Brown:

I remember seeing you at the World's Fair, St. Louis, four years ago, and I thought you were quite an old man and quite frail, and had no idea you would live to this time. But you seem to be fighting the battles of the tree just as hard to-day as you were then, and I hope you may have success.

Are you familiar with the rapid growth made by some of Burbank's hybrid walnuts? Trees that are five feet five inches in circumference, in fourteen or fifteen years from seed.

The fight you have made for the reforestation of vacant lands in the United States has been something superb.

CHARLES MOORE.

The Interest of the Farmer in Forests.

Address of John P. Brown before Gathering of Farmers at Richmond, Ind., Aug. 10, 1907.

Whatever conduces to the happiness of the family; whatever relieves the farmer of a portion of his labors; whatever tends to increase his wealth, and especially anything which conduces to national prosperity and the well being of the human race, should be given due consideration by all thoughtful Americans.

I wish to present for your deliberations a matter which affects all these interests, and more, the very life of the nation. The world to-day faces a condition which threatens to cripple and perhaps exterminate many of the industrial and commercial interests on account of the scarcity of wood. European scholars have recently stated that the only remaining source of supply for timber was Canada and the United States, while the Department of Agriculture has depicted the condition as very grave from the excessive clearnings which have been and still are being carried on.

Seven years ago I published an estimate of the area of forest and quantity of timber then existing, which I showed to be less than one-third the quantity supposed to exist, and time has proven the correctness of those conclusions.

The great bodies of land on which there are yet forests, are owned by speculating lumbermen, and are being rapidly cleared. The forest reserves of the government, large in aggregate acreage, are infinitesimal when compared with the country's extent and requirements for wood.

There is but one way to avoid a timber famine within the next twenty years or even less, and that is for the farmers of America to begin the extensive planting of forests at once.

The United States, which was originally very densely covered with forests, except the rainless belt in the West, has disposed of nearly all this valuable and necessary production. A century of forest clearing, the hardest work farmers were ever called to perform, an unprofitable labor, as the logs must be rolled in heaps and burned, since there was no demand for the huge logs of walnut, hickory, oak, poplar, ash and similar timbers. Yet all this was necessary before your comfortable homes and profitable farms could be provided.

When the frosts cut the leaves and they began to flitten toward the earth, and as the snow began to fall in great flakes, your fathers ground their axes, prepared wedges and mauls, and commenced their arduous task of chopping down trees, trimming up the branches and with yokes of oxen these were dragged and rolled into great heaps, where they were burned, in order that a few more acres of land could be brought under cultivation.

This was no child's play, but harder work than you have ever been obliged to perform. A few sheep were kept and the wool must be carried sixty miles to factory, awaiting their turn for the yarn to be spun and again the sixty miles through wilderness of forest and over roads of mud the return home. An equal distance must be traversed to the little water mill to have the corn ground into meal.

There is no wonder that the impression was formed and handed down to several generations succeeding, that the forests were worse enemies than redskins or wild beasts.

In later years it has been the universal practice when a stick of timber was wanted, to go to the wood lot, select the best, ash, walnut, oak or catalpa trees which could most easily be split into rails or worked into the required articles, or possibly sold for highest price to the lumberman. The result has been that only the beech and more inferior trees remain; these have a very slight value and the wood lot is considered an unprofitable part of the farm.

Then the attitude of the state officials, most of whom oppose a reduction of taxation upon forest lands; the owner must pay as high, or even higher, taxes upon his trees as upon productive and profitable

farm fields. Thus the forests have been sacrificed and but little remains.

The twentieth century farmer sees a new era. While there is no increase of farm lands, but with populous manufacturing cities, thickly standing and rapidly growing with the wonderful increase in population, making a demand for lumber which the world is unable to supply. Manufactories of agricultural machinery, furniture and the building trades are all crying out for lumber, while the demands of commerce for cross ties and cars, of the telegraph and telephone companies for poles, for the farmer for posts and buildings, and the building trade for lumber of all kinds, will, in a brief period, be unanswered.

Why can not the American farmer grow a crop of boards, cross ties, telegraph poles and furniture lumber to a greater profit than he receives for wheat? Let us see. We take forty acres of wheat for a period of ten years, three years of which the land must be clovered to maintain its fertility. He expends for seed in the seven years, $378; labor, plowing and seeding, $700; harvesting and marketing, $700; an expenditure of $1,778. An average crop is eighteen bushels per acre, consequently in the ten years he receives $3,780, a net gain of $2,002, or average for each year, $200.

Presuming this forty acres to be planted in some good, quick-growing timber in a systematic manner. The cost of trees, planting, cultivation and pruning will not exceed $20 per acre or $800. In ten years he will harvest 35,000 fence posts or mine timbers, which, at twenty cents net, will bring him $7,000. Or if he thins the forest at eight or ten years, leaving 200 permanent trees per acre, these in twenty years or less will make telegraph poles worth $3 each, an income of $24,000. If these trees are grown for lumber, 100 trees per acre in twenty years, he can have 2,000,000 feet of lumber, which, even at present prices, would net him $40,000, which is considerably more than his wheat crop would bring.

Remember that every farmer is not going to plant a forest and the demand for lumber comes from every part of the world, with practically only Canada and the United States to supply it.

Of course, if oak and hickory are planted, it will be many years before the market will be reached, but there are a number of quick-growing, valuable forest trees which may be planted to profit. Black walnut, butternut, swamp ash, tamarack in places, Ailanthus, black locust on rough, poor ground, tulip trees or yellow poplar, Carolina poplars, which, however, is only a cottonwood, for paper stock, and catalpa speciosa for all purposes.

We understand that the farmer never counts his own time and that of his team in estimating cost of farm productions; it all goes in during the year as time necessarily spent, yet if he hires a laborer from the city he must pay twenty cents an hour, and if he has occasion to hire a team from livery barn it is four dollars a day, and so we estimate his time with team at $2.50 per day. Then, again, if he should devote one-fourth his farm to the growth of a forest, more time and attention could be given to the remainder, and I do not hesitate to tell you farmers that, as a rule, a heavier crop of corn, wheat or potatoes would be secured, and a greater profit upon three-fourths the land usually cultivated by the extra attention, better cultivation and more thorough fertilizing than is now grown upon the whole.

Thus the one-fourth given up to forest would not detract from the crops now gathered. Trees require no special fertilizing. It is a province of trees to enrich the land. Each year the annual deposit of leaves and fallen twigs adds fertility to the soil, while beneath the surface the subsoil is penetrated by strong roots, water, air and fertilizing materials are carried down by the sap, and as leaves die and fall away, so also roots and rootlets become useless and decay as fresh roots are pushed out further from the tree, thus adding carbon potash and other elements to enrich the soil for a succeeding crop when trees are removed.

The winds blow and carry falling leaves into adjoining fields, adding to their fertility.

It is well known how beneficial the wood lot is in breaking the force of the wind.

It is scarcely necessary to discuss the climatic influence of forest and the necessity of having a good proportion of timber

in every country. This is national necessity, as witnessed in China, a treeless nation, and Germany, which country protects her forests.

The income which may be secured will largely depend upon the character of trees which are planted; as, for instance, beech, a very slow-growing tree, is worth for milling $3.50 per 1,000 feet, walnut $20 to $40, and catalpa $50 and upward. The time of the investment is also a very important matter. White oak requires 200 years to mature; cypress in the South, 500 to 600 years; pines of various kinds, 70 to 150 years. Good walnut logs may be grown in 20 to 30 years, and catalpa, if the true species is obtained, makes good sawing timber in 20 years.

DISAPPEARING PULP WOODS.

EXTENSIVE FOREST TRACTS BOUGHT BY PAPER MAKERS IN CANADA.

A few years ago there was general confidence in the ability of our northern border states to furnish all the pulp wood that this country would ever need. That notion has been exploded, say the New York *Sun*. Our invasion of Canada for the needed supply is causing grave apprehension in that country. Wisconsin paper mills are buying pulp wood in Quebec, 1,200 miles away. The situation is a little better in northern New York and northern New England, but even in those regions the end of our supply is immediately befre us. Realizing this fact, a number of our large paper companies have bought extensive tracts in Canada and are busily cutting on them. One company owns about 3,200 square miles and another owns about 2,200 square miles. There are others with smaller holdings.

The point of special importance is not so much the possibility that Canada may impose an export duty on pulp wood as the certainty that unless proper steps are soon taken there must occur an exhaustion of spruce supply in Canada as well as in this country. So far as this country is concerned there is little if anything that the federal government can be asked to do. The spruce regions of Maine, New Hampshire, Vermont, New York, Michigan, Wisconsin and Minnesota are not a part of the national domain.

The danger, grave and impending, can be averted only by state or by undivided action, and only by the conservation of the existing forests and an extensive planting with a view to the remote future. Canada has much large powers of restriction and may exercise them. If she does, this country must dance to the tune she pipes.—*Daily News*, Chicago.

ARBORICULTURE is not alone in showing the alarming decrease of timber on the American continent and the probability of a timber famine at no distant date. Timbermen who clear extensive tracts should be compelled by law to plant trees and preserve the forest character of their holdings.

QUARTERLY JOURNAL OF FORESTRY.

Great Britain is fully alive to the importance of caring for her forests and trees, as is seen by this new journal, edited by W. R. Fisher, Clinton Road, Oxford. The work is full of practical papers by the most eminent arboriculturists of the British Isles.

STRIKE OF THE TELEGRAPHERS.

At this writing the business interests of the country are being seriously injured by the unwise and unreasonable strike of the telegraph operators throughout the entire country. This is absolutely without cause, and will greatly damage the men who have so abruptly left the keys, for undoubtedly the use of machines and the enlarged use of telephones must eventually replace many of their hasty operators.

We offer no excuse for the two great telegraph companies which have unjustly combined in restraint of trade, but this does not excuse a sympathetic strike, which is un-American and uncalled for. The men can gain nothing by such operations.

COPIES OF ARBORICULTURE WANTED.

Vol. 2, Nos. 1, 3, 10.
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Vol. 4, Nos. 1, 3, 4, 5.

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PLANTING STREET AND SHADE TREES.

Few people who plant shade trees prepare the ground properly. The hole should be fully three feet square and eighteen inches deep. If the earth removed is not rich garden soil, it should be carted off and fertile soil brought in which the tree may be planted. The tree will grow more rapidly and sooner make a shade by this method. No fresh manure should be placed in the hole, but good, well rotted manure or leaf mold will be of benefit.

Grass and weeds must not be allowed to grow within two feet of the tree, and the surface should be hoed occasionally. Trees require cultivation as well as a corn crop.

Be sure that sufficient water reaches the roots of the tree, not a superficial sprinkling.

If the tree must coil its roots around in a post hole, as in a flower pot, it will die or make but slight growth. Good food and plenty of it are as necessary for trees as for animals. Too many trees are planted, thirty to forty feet is the proper distance for street trees, not ten to sixteen feet. Three times as much labor and expense put upon one tree as usually given to three trees planted too closely will make a longer lived tree, a quicker shade and more satisfactory avenue.

A tree which is not worth protecting with a tree box, should not be planted. The efforts of years often are ruined by some horse, the careless owner of which, being a friend, one can not demand compensation.

Remember, that extremely rapid growth is not the only consideration. This may be had in the cottonwood, falsely represented as a Carolina poplar. Durability, long life, handsome appearance, freedom from insects and disease, unobjectionable root system, nor choking sewers, nor sending up innumerable suckers, are all valuable assets in the value of a tree.

The following humorous paragraph by George Fitch, in "Seeing Washington Through a Megaphone," is very near the truth. A vast quantity of trash is printed and the mails overloaded with public documents of all the departments of government, which are never read and of no benefit to anybody except the employes of the printing office. Second-class matter would cut little figure if this monstrous fraud of the Government was eliminated.

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NEW PRODUCTS OF THE TREES.

From the Fancher Creek Nurseries, Fresno, California, we have three handsome catalogues, The wonderful success of Luther Burbank in the production of new plants and trees is well known to the world. The Fancher Creek Nurseries is close to Mr. Burbank and supplies the various plants which Burbank has originated. The colored plates in these books show the appearance of the Plumcot, Santa Rosa Plum, Wonderful Pomegranate and flowers, while the Paradox Walnut tree is pictured and explained. The Royal Black Walnut is chosen as the lumber tree of the future.

Of course, all trees grow more rapidly in proper soils with sufficient moisture than in our Eastern States. Yet this walnut ought to be experimented with everywhere.

The Fancher Creek has Eucalyptas trees in large quantities, and a general nursery assortment.

Mr. H. J. Elwes, Vice President of the International Society of Arboriculture, has recently published a splendid work, "Trees of Great Britain and Ireland," from which we reproduce a cut on page 324—The Beechwoods. It is an expensive work—15£ 15s., about $75—but will be greatly appreciated by all students of the forests who can afford it.

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Shall we permit the extinction of the forests in order that a few greedy, soulless, speculators may gain greater wealth?

The International Society of Arboriculture is trying to perpetuate our forests.

Vol. VI November 1907 No. 6

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A Journal of the Forests

JOHN P. BROWN,
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CONNERSVILLE, IND.

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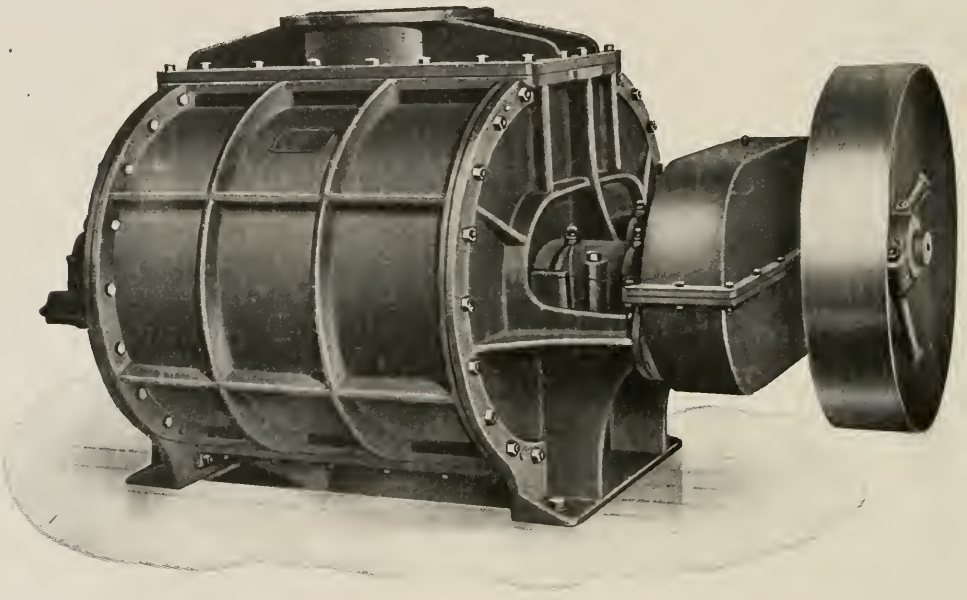

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LIBRARY
NEW YORK
BOTANICAL
GARDEN.

Shade Trees For Town and City Streets.

No matter how rich the designs, how elaborate the architectural display, how costly the structures or how perfect the workmanship, there is no city, no home, no public building but what can be improved in appearance, made more attractive, and become more beautiful by the addition of suitable foliage.

While the city of Washington has many fine avenues of trees, some of its public buildings seem constructed specially to display the skill of the architect, not a tree nor vine to offset the stiff, formal lines of the granite structures.

The Castles of Europe, centuries old, are far more handsome with the vines covering the walls than they ever were before nature hid the vanity of the architect with attractive foliage.

The city streets which are ornamented with fine trees; affording delightfully shaded avenues, attract the attention of all who see them, while the absence of shaded streets or the presence of undesirable trees cannot fail to receive the rebuke which they deserve from strangers who may visit such localities.

The carelessness of a large majority of citizens of almost every city is remarkable when it is considered that all of them admire beautiful homes and shaded avenues, while neglecting to plant and care for trees to make their own surroundings more attractive, or by planting such trees as are most undesirable from want of information as to the character of various street trees.

The tendency is to plant such trees as have but one solitary quality in their favor, and that, quick growth.

The object of this effort by Arboriculture is to present the claims of many trees suited for street planting, showing all their advantages in order that planters may select such as may be desirable for their locality.

With so large a territory as is covered by the United States, with its various climate, soils and conditions, it would be difficult to name one tree which will be satisfactory everywhere, and thus we endeavor to show as many good trees as possible which are adapted to the various conditions existing in all parts of the country.

There are varying conditions existing in town and cities which require careful consideration in selecting, planting and managing trees designed for shade in public streets, soil conditions, moisture, protection against injury from stock, from vehicles, and from playful boys, air spaces in paved streets, tramping of animals, injury to roots by pavement and street improvement, as well as guarding against obstructions of sewers by encroaching roots, must all

NOV 18 1907

be provided for by those who would have success.

It is unfortunate that because a few trees are so easily grown from seed or cuttings, and so quickly become saleable at good profit it is the tendency of many nurseries to grow these in vast numbers and place them first before the public, thus covering all our city streets with short lived, illy adapted trees to the exclusion of all the better and more permanent shade and ornamental trees.

The Elms on Boston Common are nearly two centuries old, as are also numerous grand street trees of New England.

The Live Oaks of the South are of more than a century's duration while all of our more desirable shade trees will be in existence a century after the death of the planter.

Not so with the trees which are being so largely planted in every American City, twenty years will be the life of most of them and less for many.

Troubles of Trees in Cities.

Taken from the woods where the soil is rich, mulched with decaying leaves accumulations of many years, shaded from scorching sun, by the foliage of its fellows its roots at all times finding abundant moisture; its foliage protected from insect pests by numerous birds; the storms of winter broken of their power by the surrounding forest; and thence removed and planted in the city where all its environments are the reverse of what they were in the forest, the City tree has a difficult task to maintain an existence.

Its roots mutilated in removal; carelessly planted in hard ground; insufficiently watered and nourished, exposed to the rays of torrid sun; and to the strongest winds of all seasons; its leaves smothered with smoke and dust; air and moisture denied by street and sidewalk pavements; its bark knocked off by vehicle hubs and gnawed by respectable citizens' horses; foliage eaten by insects, sap sucked up by aphides, trunk riddled by borers; branches mutilated by telegraph linemen; roots destroyed by pavement contractors and sewer excavations; the tree in the city indeed has a strenuous existence, and it is no wonder that by far the greater majority fail to grow. The ability of trees to overcome discouragement, and to grow under very adverse conditions is remarkable. Oaks, pines and other trees are frequently found growing upon ledges of rocks, where to all appearances there is neither soil nor moisture, yet they maintain an existence and flourish.

But these trees have not been transplanted, they have grown from the seed, and as the fine hairlike roots penetrate the fissures among the rocks for great distances in various directions, some of them find moisture and nourishment and these increase in size, forcing apart the rock strata for their own accommodation and convey the distant food to the tree and thus build up its system.

Such trees are never in a hurry, they take many years, often centuries, to perfect their growth, while we in the cities are not willing to wait nature's methods.

Give the trees a chance for their lives if you are deserving of their shade, otherwise it is folly to plant trees, but be content without them.

Silver Maple, Chicago, Ills.

How To Select and Plant a Tree.

Do not choose too large a tree; one of medium size will be preferable. There is nothing gained by planting an over sized tree, the working roots of which were sacrificed in digging. Usually two inches diameter is better than larger.

The tree should not be cut back when transplanted, as this causes a diseased top. Let the terminal bud continue in its upward growth, heading in such side branches as may be necessary to maintain the balance between top and roots.

See that the tree has all the roots which can be secured in digging. As the tree cannot make growth of top until roots are established in the soil.

The roots which feed and support the tree are the minute fiberous rootlets at the extremities and along the course of the large roots, and these must be formed anew before the tree can receive nourishment.

For this reason a small tree having all its roots preserved has a great advantage over a larger tree whose roots have been sacrificed in digging.

The feeding roots of a tree are far removed from the trunk, at times as far as the height of the tree, and in transplanting a very large tree it is impossible to save any of these, only a small portion of the larger roots being secured.

All feeding roots must be renewed from these stubs before any nourishment can be conveyed to the tree.

Meantime numerous buds expand, leaves are unrolled and evaporate moisture, all of which must be supplied from the body of the tree itself. How easy it is for borers and both insects and disease to prey upon a tree trunk so weakened, and how many such trees die or merely hold life for several years.

Elms, Willows, Cottonwoods, Soft Maple and a few other trees emit new roots so rapidly that they may live, while Oaks, Hard Maples. etc., cannot renew their roots quickly.

UNIFORMITY.

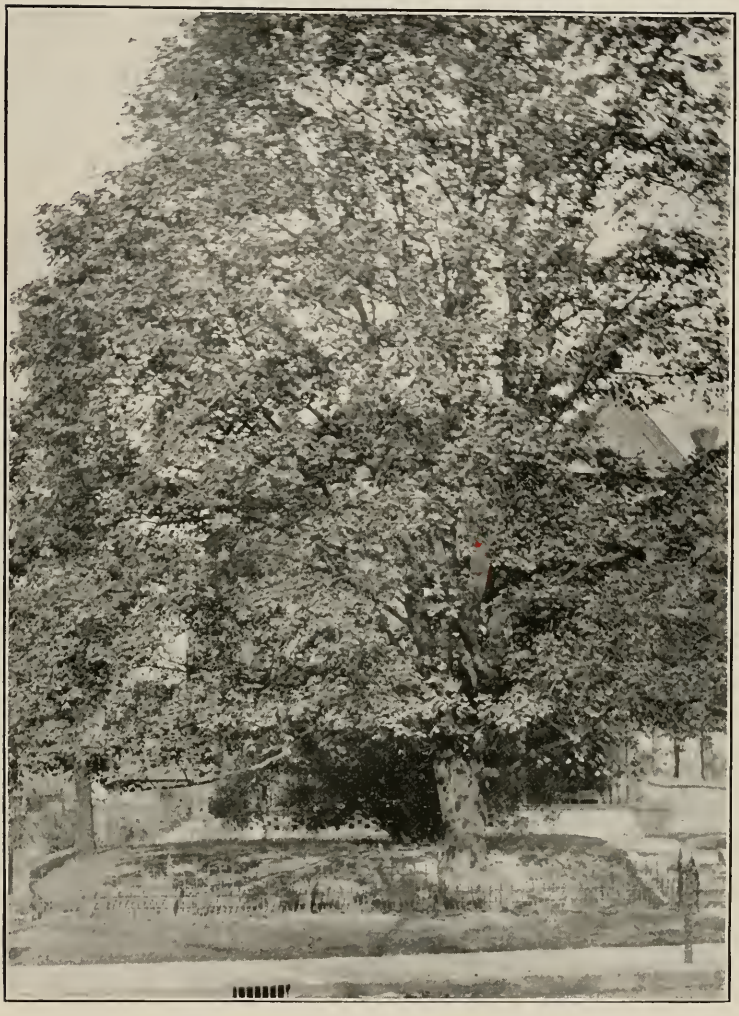
One expects in a park to see great variety, also on a private lawn, we enjoy the intricate variety in shapes of leaves, character of foliage, outline of trees or shrub, combination of harmonious colors in a forest, but an avenue of street trees should be uniform in species of trees, distance apart and method of pruning to have a harmonious appearance.

PREPARATION FOR RECEPTION OF TREE.

Digging the Hole—If the soil cannot be dug deeply and thoroughly as for a crop of grain, it should be excavated not less than four feet square and eighteen inches deep, and larger than this for a large tree.

Should this soil be compact, with rock or gravel, or of made earth which contains objectionable materials, then it will be far more profitable to cart this away and bring in good fertile soil to fill the hole.

Whether the tree is to barely live and for several years struggle with poverty of food, or whether it shall make a rapid healthy growth from the start will depend upon the care used in planting.



NORWAY MAPLE, HOME OF THOMAS TAGGART, INDIANAPOLIS, IND.

The Maples

SUGAR MAPLE. (Acer Saccharinium)

This is essentially a northern tree delighting in a cool atmosphere and the various soils found in hilly and even mountainous regions of Canada and the North eastern United States.

Of the two forms of Maples, one form grows in swamps, while the other is found on high lands. The sugar maple does not dwell in stagnant water or excessively wet places, preferring rolling clay lands where drainage is possible.

As an economic timber tree this holds a high place, but our present theme is special adaptability as park, ornament and shade tree.

To say that one tree is best for all localities, would probably be disputed by others who have favorites in trees. Yet it would be a difficult matter to find a tree which possesses so many excellent qualities for shade as has the sugar tree.

Its form is perfect, foliage beautiful,

more free from obnoxious insects than almost any other species of tree. The color is pleasant to the eye, and as autumn chilliness changes the foliage to the beautiful crimson and gold and their harmonious blending with the green, it presents that perfect appearance and harmony so agreeable to the eye.

The criticism of numerous careless persons is that it grows too slowly. This is not the case. Give the hard maples good treatment in taking them up from the woods or nursery, and in planting, together with subsequent cultivation or mulching, and they will not disappoint the planter by growing slowly.

Besides, some of the quick growing trees, as cottonwood and soft swamp maple, are short lived, while the hard maples are good for a century.

The branches are tough, strong and do not break easily with the storms if grown naturally with sufficient space for proper development.

The root system of the hard maples is entirely different from that of the Cottonwood and soft maple, being heavy and hard as the wood of the trunk, and they do not penetrate sewers as the other trees mentioned.

THE NORWAY MAPLE. (Acer Platanoides)

The Norway Maple from Europe is a faster growing tree, has a round head, with quite handsome foliage.

This belongs to the hard maple class, and succeeds almost everywhere in northern and middle states.

It is among the freest from insect and fungoid enemies and is a favorite of all the foremost designers of public and private grounds.

The Sycamore Maple, (Acer Pseudoplatanus) also from Europe, is a large spreading tree of excellent form, good habit, beautiful foliage and is suited for all park and street planting where the hard Maples succeed.

It is not so common in the west as the two former varieties, yet none the less worthy of extensive planting.

In the swamps of New England and marshy lands of the middle States extending to the Gulf of Mexico, there are found growing one or the other of the two swamp maples, the silver maple mentioned elsewhere and the better tree, Red Maple, (Acer rubrum.)

This is a rapid growing tree, not so easily damaged by wind as the silver maple, has a round head and makes good shade. The tree is not long lived, but is preferable to (A. dasycarpum) and may well be used for planting intermediate between other trees.

The seeds of the swamp maples, ripen in Spring and should be planted immediately as they fall.

The Hard Maples ripen their seed in Autumn.

There are several other varieties and variations, sold by nurserymen but it is not necessary to extend our list.

Our Illustrations.

The large number of views of trees and avenues in various cities, are from original photographs taken by the editor for the special purpose of arousing an increased interest in civic improvement and in beautifying the avenues and parks of our towns and cities.

American Linden, Owls' Nest Park, Cincinnati, Ohio.

Linden. Basswood.

(Tilia Americana)

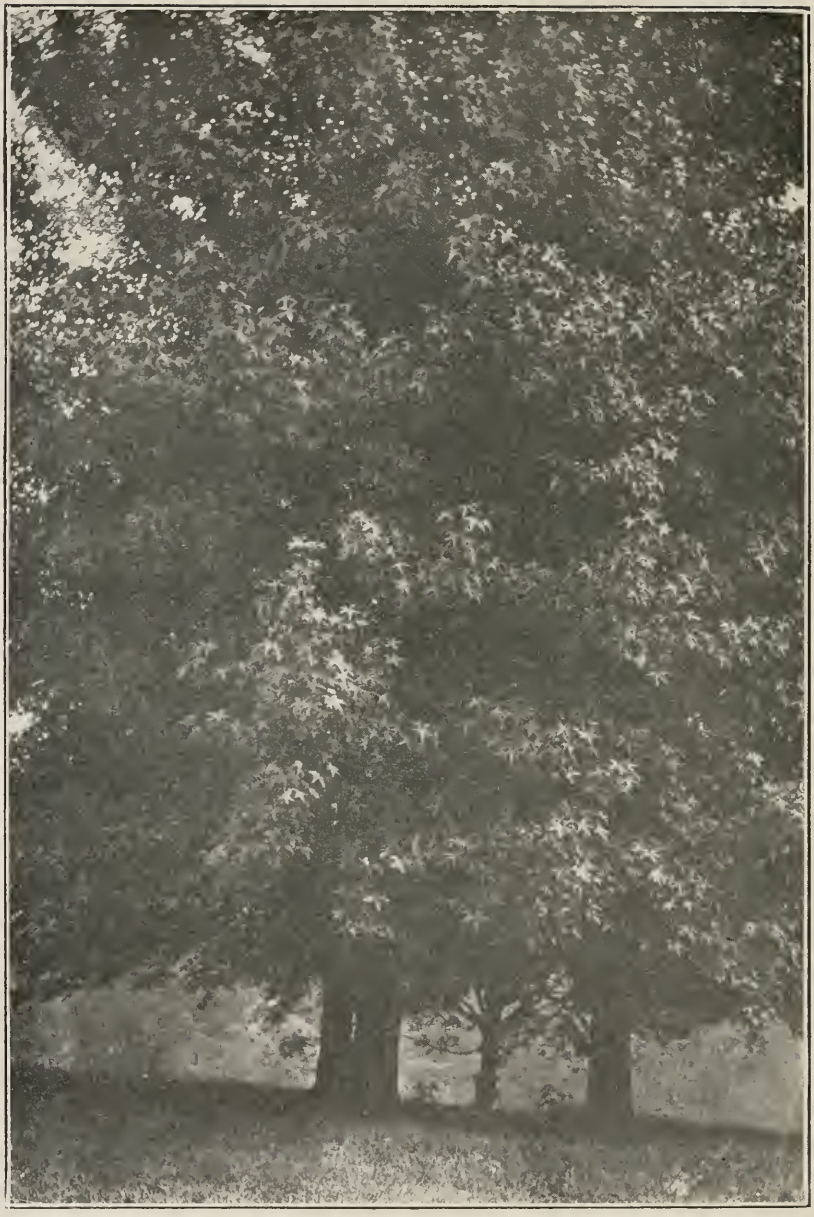
The Lindens of Europe are noted in history and song, and are held in much greater esteem than in America, yet this should not deter us from planting the linden in much greater abundance than at present.

The European Linden, (Tilia Europa) as well as the several varieties native to America, are obtainable at all prominent nurseries.

The trees are round headed, with clean, neat foliage, forming a good shade.

The name Basswood is the lumberman's and woodsman's appellation, it being a light, tough wood, is used in carriage body construction.

The tree grows rapidly and is quite clear of insects and has no seriously objectionable qualities.



SWEET GUM, EDEN PARK, CINCINNATI

Sweet Gum.

(Liquidambar Styraciflua.)

From the swamps of Louisiana and the rolling hills of Alabama northward, covering the Mountains of Tennessee, over the flat wet lands of Illinois and Indiana, the Sweet Gum has an extensive range of climate, soil and environments.

This is a very beautiful tree with clean foliage, seldom attacked by insects. Its star shaped leaves of bright

green, changes color with approach of Autumn, becoming yellow and crimson of many beautiful shades.

The Sweet Gum makes a very handsome street tree with good shade, and has no objectionable features.

The rapidity of growth will, to a great degree, depend upon the care used in transplanting and the subsequent treatment the tree receives.

The great range of latitude in which the sweet gum will thrive, and the variety of soils and conditions to which it accomodates itself, make this one of the very best general street trees.

Naturally, the shape of the tree is conical, and it is a blunder to cut out the terminal shoot for the purpose of making it more spreading.

As an ornamental shade tree, the Sweet Gum is grown extensively in the parks, cemeteries and on suburban streets, as well as on private estates of Cincinnati, Indianapolis, Louisville, and all the way to Pensacola and New Orleans.

Usually it requires two or three years for this tree, as well as with many others, to become established so that its roots may find nourishment with which to build up the tree's foliage and branches. This time may be materially lessened by proper care in planting in a large hole well filled with good earth.

The root system of the liquidambar is thick and not of a character to become objectionable or injurious to sewers. It does not sprout from roots as does the abele, black locust or ailanthus.

The tree eventually becomes a very large timber tree, yet may be pruned into such shapes as desired and easily kept in bounds.

This may be designated as a clean tree, the foliage being easily and quickly gathered up and removed when frost cuts the leaves.

The seed is quite small, winged and are contained in a peculiar, prickly ball about an inch and a half diameter, which is suspended by a stem four inches in length, from the branches.

The Tulip Tree.

(Lirodendron, tulipifera)

This immense forest tree of the Middle States extending southward to the Gulf of Mexico, is one of our handsome street shade trees. Primarily this is, or was a great lumber tree, known in the markets of the world as Yellow Poplar, yet it does not belong to the poplar family, but to the magnolias.

There are many tulip trees seen on the streets of our northern cities, yet it is well adapted to those of the South, as it is indigenous to the region near Mobile, Alabama, as well.

The tree is growing nicely at Denver, Colorado, and Salt Lake City, Utah, and in many eastern cities.

Few insects disturb it, and no diseases of which we are aware. It is clean, bright, and while in the forest its natural growth is tall and slender, yet in the streets, it spreads out into a fine shape for shade

The flowers, in Spring, resemble the single yellow tulips, from which fact comes the name.

It is readily obtainable from most nurseries, while in the vicinity where there are tulip trees in the forest, the small trees may be transplanted.

Spring planting is best for this and all trees of the magnolia family.

The Tulip grows quite rapidly after having obtained a good start of roots, which will depend upon the care used in planting.

The Carolina Poplar as a City Tree.

(Austin C. Apgar, Trenton New Jersey.)

This poplar has been sold in greater numbers by the nurseries in the last fifteen years than any other tree. There are features of good and evil in all trees and the balance between these should decide the question of any tree for any purpose.

I will first give what I consider the best that can be said in its favor. It is easily raised from slips and so nurseries can have a large supply with but little cost. By this plan there need be only the seedless form produced, thus eliminating the disagreeable cotton that is attached to the seeds and that litters up the lawns and catches on the window screens. This cotton gives the name of cottonwood to the tree. If offered under this name none would be purchased by those who know of this objectionable material. It is the most rapid growing of trees, adding three to five feet in height each year during the early years of its life. It has beautiful dark glossy green foliage, and the smoke from soft coal has but little effect in stopping its breathing and thus its health. The quivering of its leaves adds to its beauty and probably also to its freedom from the settlings of smoke and soot. It thus lives in health in conditions which kill almost every other kind of tree. Its roots lie mainly near the surface enabling it to be transplanted even when a large tree. It will grow well in almost any soil.

Thus in its favor are: 1. Rapid growth. 2. Bright, glossy, green foliage kept in motion by the slightest air movements. 3. Grows well in a great variety of soils. 4. Low price because of ready propagation from twigs. 5. The unpleasant cotton of the pistillate trees entirely eradicated. 6. Easily transplanted at almost any size.

On the other side of the question: Like practically all trees of rapid growth it has soft wood and if not cut back each year will be torn by every severe wind storm. This trimming is very expensive and for this reason the low, first cost does not make it a cheap tree. It is found in nature in low lands along water courses. So in cities with a sewerage system, the roots will find any opening in water pipes and will in a short time fill them wiih a mass of roots which will entirely close them. The repairs for this evil are very costly. The roots lying mainly so near the surface gives the whole tree but little anchorage, and after they are ten years old, a violent storm will readily overturn the whole tree. The abundant surface roots render any good lawn rough and unsightly. These same surface roots will lift any sidewalk. The granolithic pavements now so common, are broken and utterly ruined by this lifting. It is a short lived tree, reaching its best conditions in ten or twelve years from planting. A few years later, it becomes ragged and unsightly. Its large red catkins litter the ground around them in the early Spring. Most trees lose their leaves in eariy Autumn only, but this poplar has some of its leaves dropping throughout the whole Summer. The two worst insect pests we have to contend with in towns and cities are the white-marked tussock moth, and the oyster shell bark louse. Both of these readily propagate on this poplar but are not able to kill such a

vigorous growing tree. From this they speed to other bushes and trees which they kill.

To sum up the points against the tree: 1. Rapid growth and soft wood make necessary frequent trimmings. 2. Surface roots will lift any pavements and destroy all beautiful turf. 3. Drainage pipes are often filled with roots. 4. It is a short lived tree. 5. The dropping of flowers in the Spring and leaves throughout the season need much attention to render grounds attractive. 6. The worst city insects live on the tree and propagate in great numbers and the height of the tree makes it impossible to spray proper poisons effectively.

While this is probably the best of the poplars, what I have given would show it a short lived, and in the long run, our most expensive tree. With so many good trees to plant along our streets, we ought to check such an extensive planting of this tree.

Moss Draped Live Oak, Bay St. Louis, Miss.
On Louisville & Nashville Railway

Live Oak, City Park, New Orleans, La.

The Live Oak.

(Quercus Virens)

Probably the grandest shade tree of the south is this immense specimen of the Oak Family.

There are several varieties of the Oak which are termed Live Oak, for the reason that the leaves are retained, green, during the winter, and as the young leaves are formed in the spring the old leaves gradually fall away.

All along the Atlantic Coast from Virginia to Florida there are small growing trees of the Live Oak in its magnificence.

During the period of wooden ships, the timber of the live oak was sought by the Government and by ship builders for its very valuable timber strong, dense or close grained wood, possessing great durability, the choicest timber for men of war.

On account of its extreme value, even when the American forests were yet in their prime, the better lumber trees were almost exterminated.

At present, there is no special value placed upon the wood, beyond other oaks, and most of the trees have very short bodies, unfit for lumber.

We are now considering trees suitable for public streets and parks, and as such, there is quite likely no other tree possessing such grandeur, having so broad a spread of branches, or forming a be ter shade, than the old Live Oak trees of the South.

Along the Mississippi River, about the old time plantations, there were some avenues, double rows of Live Oak trees, leading from the residence to the river landing, which were quite ancient half a century ago, and some are yet standing.

These were of priceless value. We illustrate a Live Oak tree in City Park, New Orleans, and another near Bay St. Louis, Mississippi, on the Louisville and Nashville Railway.

There are comparatively few localities in the streets of cities, where the Live Oak can be used to advantage because of the great area covered by its branches, and these often bend to touch the earth, under the weight of the foliage.

For private grounds and large parks, it makes a superb shade tree, of course being confined to the south.

Where a street is of extra width so that a central park way can be formed, the oak may be set in the center of the street to advantage.

When not too large, the Quercus virens is easily and safely transplanted and is not a slow tree to make a showing, although its greatest beauty and magnificence is attained after a century's growth.

The tree is beautiful and attractive at any age, and should have prominent place in all southern cities.

Change in Form of Trees.

Several tree species which are pyramidal in shape while young, become very broad, with spreading tops, in age

The Bald Cypress is an instance. During the first fifty years of the life of this tree it retains its conical, or pyramidal, shape and is very handsome, but as the tree increases in age, and has reached its limit in height, the topmost branches reach out in various directions, and these great arms stretched out over the other trees of the forests, become very stout, while the lower branches gradually die and fall away.

In the same manner the Carolina Poplar has quite a handsome pyramidal shape until it is 10 or 15 years old, but by the time it has reached its twenty-fifth year it has entirely changed, the top having spread out, the main branches becoming stout and diseased, presenting a very ugly appearance.

We some time ago gave a photograph of the Grizzly Giant, one of the great Sequoias of Mariposa county, California. This tree is 3000 years old. It has no side branches, they having long ago disappeared, the immense trunk towering four hundred feet high is surmounted by a few stout arms with a small amount of foliage.

For the first hundred years of its life the Sequoia is of conical form, having dense foliage all the way along its trunk from ground to apex. Unless, however, it should be in a dense thicket, when the side branches would be eliminated,

With long lived trees we may not consider what they will be in three hundred or three thousand years, but in those having but thirty years to live we should look carefully to the character twenty years hence.

Repeal the Tariff on Wood.

There never was a cause for the tariff on lumber other than to aid the lumber trust to destroy American forests as rapidly as possible.

The sooner all duties are removed from paper stock and lumbet the better it will be for this nation.

But as the government and politicians are dominated by this trust, congress does not dare offend it.

Beautiful Trees at Peoria, Illinois

At Peoria, Illinois, the earlier settlers used much greater judgment in planting trees than their successors have done. There are very many fine old maple sugar trees on private grounds and upon the city streets; a majority of the trees of earlier planting are elms, hard maple, hackberry and similar trees of good character.

Upon the highlands in the newer addition the managers have set cottonwood almost exclusively. The result in a dozen more years will be treeless streets. As the sewers become clogged with Carolina poplar roots and the ugly decrepit condition which they will fall into, shall arouse the lot owners who are building fine residences here; these things will be chopped down and the residents must begin anew to plan trees for shade and ornament.

There are some very handsome parks. with excellent trees which will give still greater satisfaction as time goes by.

It is unfortunate here as in thousands of other localities, that so many of the Catalpa trees, and that is almost all of them, are of the worst scrub character. Yet all have been purchased and planted with the full belief that they were Catalpa speciosa.

Some of Peoria's trees on upland terrace are very wide, 100 feet, and have a central parking of grass. In some of these, trees have been planted with flowering shrubs intermediate between the trees.

Quite a number of fine Honey Locust trees, entirely free from thorns, are found about the Bradley Polytechnic School on West Heights, These are very desirable shade trees.

In the South, where streets are of sufficient width, the spreading Live Oak could be placed in this middle ground

Catalpa Speciosa, as a Park Tree, Riverside Park, Chicago, Ills.

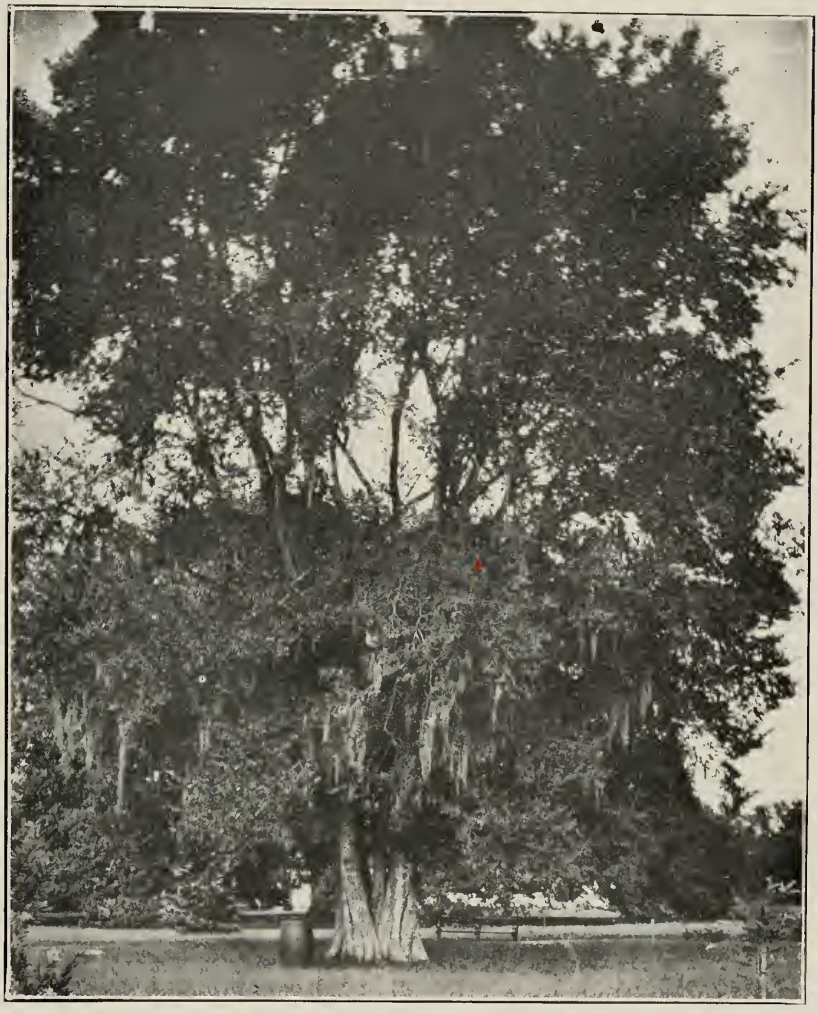
with a roadway on either side, still having room for a fine row of Water Oak or other shade trees alongside the foot path. These in Peoria are 25 feet wide from the land or lot line to the curb, the foot path or sidewalk proper being 5 feet wide.

Hackberry.

(Celtis Occidentalis.)

There are several reasons for planting the hackberry. Among the more important, being its production of food for birds which should be encouraged to assist in keeping various injurious insects in check.

However, the tree is a very beautiful one, with handsome foliage, hardy



HACKBERRY, AS A PARK TREE, NEW ORLEANS, LA.

everywhere, a good grower, easily transplanted, and makes a fine shade. It forms a round, spreading head, covering a large space when fully grown.

There are two varieties found in the south, which are better than our northern trees, one in Louisiana called locally, the Hackberry Elm, from the great resemblance of the young branches to those of the elm family.

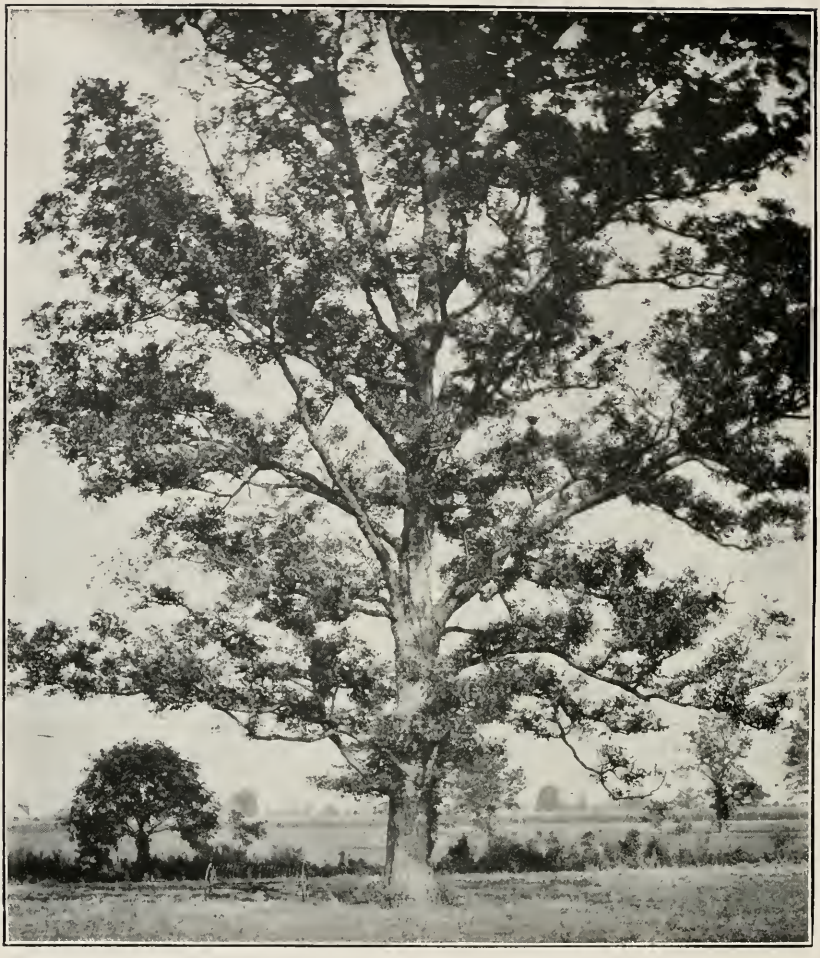
We have heretofore mentioned in Arboriculture, the beautiful avenue of Hackberry at Columbia, South Carolina, the street planting of that city being almost entirely confined to these trees.

Our illustration of the Hackberry in City Park, New Orleans shows what a magnificent tree it becomes in the South.

The Hackberry is an excellent tree for all western cities, even those in the Arid regions where all trees must be irrigated.

One variety found in the Pan Handle of Texas thrives in a sand soil with a very slight rainfall.

It makes good lumber, the wood being very white and hard. During the pioneer days in the west, hackberry was preferred for floors, on account of its clean white appearance when scoured and sanded as was the custom.



THE PECAN MAKES AN EXCELLENT SHADE TREE FOR OUR SOUTHERN CITIES.

The Hickory As A Shade Tree.

The Hickory is a broadly disseminated tree, varying from the North Temperate regions all the way to the Tropics. There are some eight well known varieties in the United States, and many more southward. In the North, the trees grow slowly and are never planted for shade, but in the warmer climates, the growth is more rapid.

We picture a fine Pecan tree, which is of the hickory family, Cary Olivaeformis. The Pecan grows to perfection in Texas and the Gulf States, and makes a fairly quick growth. It is used for shade in private grounds throughout the South.

In consideration of the very high value of choice pecan nuts and their demand in all the markets of the world, and in addition, the fact that the pecan makes an excellent shade tree, it would seem desirable and appropriate that the trees be planted upon the streets of more southern cities.

There are now many nurseries where pecan trees bearing the improved large paper shell nuts, may be purchased and even the ordinary seedlings will answer

the purpose of shade, and produce nuts as well.

In Europe, fruit trees are planted along the public roadways and some have advocated their use in American cities, but we consider this as a chimerical idea for the this country. The trees would quickly be mutilated by uncontrolled persons, while in Europe the very strict laws and numerous police officers; this can be prevented.

Still we have no objection to having nut trees under control of the lot or land owners.

Distance For Planting Street Trees.

Go to the forest, see the form assumed by trees under crowded conditions, then to the open field and observe the broad spreading and shady trees of the same species. It will be seen that ample space must be given if an ideal tree is to be produced.

Typical American Elm.

Then examine the monstrosities along the streets of numerous cities and towns where the unhealthy tree trunks have been crowded out of shape, have become diseased, broken of limbs and decaying at heart. All because people plant trees too closely and fail to thin out in time.

Twenty-five feet is not a great length for a prominent branch in a full grown tree, and few trees can form a perfect shape with less length of branches.

Thus forty to fifty feet should be the distance between spreading trees and thirty feet the nearest distance with upright growing trees.

Yet ten to twelve feet is the general rule, with resulting ill-shaped trees all injured by those adjoining.

Objection is made that it requires too long a period for young trees to grow into shade trees at such distances.

Then plant some less valuable tree which will grow more quickly, half way between the permanent trees, being sure to remove the temporary trees before they destroy the form and character of the more valuable, if slower growing neighbors.

Sycamore, St. Charles Street, New Orleans, La.

The Sycamore.

Sycamore, one of the finest shade trees of Evansville, is quite numerous.

Prefers a good soil and fair quantity or moisture, but will grow under almost every condition.

In Cincinnati, in paved streets, with slight chance for moisture and food, this tree maintains a living where few trees could survive.

About the capitol grounds at Washington, are large numbers of magnificent Oriental Plane trees which are the admiration of all visitors.

The Sycamore naturally grows in moist places, in rich soils along the margins of streams, growing often in dense thickets. In time, a few trees overcome the majority and become immense in size, the large leaves, bright, almost white bark, makes it a prominent mark in the landscape. In winter, the numerous balls of winged seeds become loosened, the seeds flying away on the wind, to establish other thickets where moisture and soil are favorable.

There are three prominent varieties of Platanus. Our Sycamore of the Eastern and Middle States being occidentalis, that from Europe, Orientalis, and one in California is racemosa.

Apparently, the sycamore and all its varieties, succeeds well and makes very satisfactory shade for streets in every locality.

Our view of an avenue in New Orleans, shows how it is admired in the South while it is a valued tree in every part of the country.

When the leaves fall, being very large, they are quickly and easily gathered up, although somewhat unsightly if allowed to remain upon a lawn or in the street.

MAGNOLIA, PENSACOLA, FLA.

The Magnolias.

The family of Magnolias comprise quite a large number of varieties, many of which are purely ornamental. Asia has contributed several, all shrubs, which are valued for their flowers. Of the magnolias which rate as trees, two are much used for street planting.

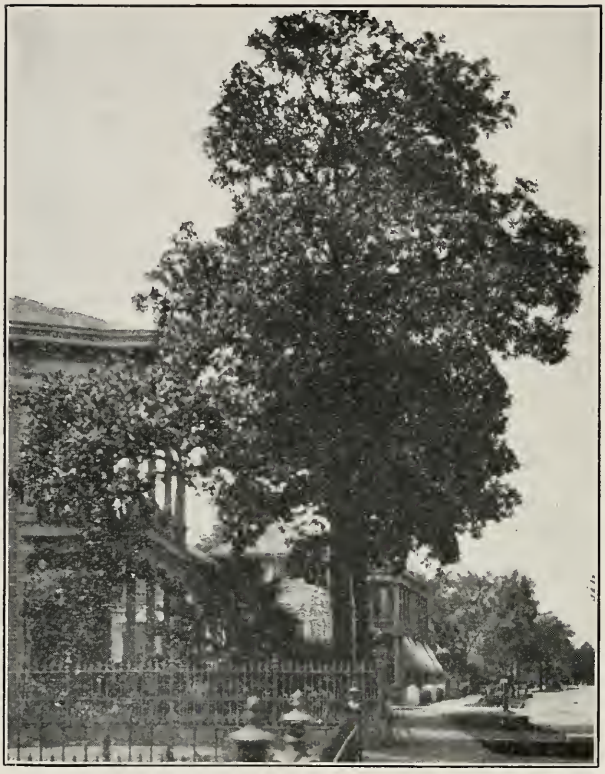
Magnolia Grandiflora is common in the forests of Southern Alabama and Louisiana, and are quite largely planted in southern cities.

The avenues of Magnolias in New Orleans and the groups of trees in Pensacola and elsewhere are very handsome at all times but doubly so when in flower. The large, thick, glossy leaves remain on the tree green all winter, falling away slowly as the new leaves appear in the spring.

Few forest trees have so beautiful flowers which are of purest white, and six to ten inches across when open.

The scarlet seeds are contained in a cone like husk, which becomes dry and brown when the seed are ripe.

The trees are easily transplanted from the forest or the nursery, and while not



MAGNOLIA GRANDIFLORA, NEW ORLEANS, LA.

extremely rapid in growth, make up for this want in long life and increasing beauty each year.

By greater care in removal and planting the Magnolia, like other trees, would grow more rapidly and well repay the extra care.

The trees do not spread their branches as do the oaks, but retain a somewhat rounded yet upright form,

Magnolia accuminata, or cucumber tree, is a more northern product now found in portions of Kentucky and Tennessee, but formerly was quite common in Ohio and Indiana.

Its name refers to the similarity of the green seed pods to a cucumber, which it much resembles.

The foliage is clean and is handsome, al hough not so glossy or brilliant as that of Grandiflora.

This tree is very desirable for street planting in the northern states where the grandiflora does not succeed, on account of frost.

Magnolia macrophylla is found in Tennessee and Kentucky and would be desirable for regions midway between the northern frost regions and the far southern cities.

The leaves are immense in size, often three feet in length. The flowers are also very large, a foot in diameter, white with slight purple tinge.

The Magnolias have thick, fleshy roots and in the north should be transplanted in Spring.

These are the principal varieties suitable for street planting, although all are desirable for ornament.

Pensacola Park Improvements.

On Wednesday, Sept. 12th, there was a very important meeting of representative citizens of Pensacola, Florida, at the Chamber of Commerce to consider the subject of park improvements for the city.

The Mayor, and part of the City Council, many professional men, bankers, merchants and those representing a great majority of the wealth of the city were present and were united in a determination to beautify the city.

The Editor of Arboriculture had come to Florida by invitation of the citizens and addressed the meeting, several leading citizens also expressed their approval and were emphatic in their demands for extensive, permanent improvement.

The city of Pensacola covers a large area of territory and is well planned, several blocks having been reserved for parks, some of which now have large fine oak trees as a nucleus for future planting of shade trees.

Bay View Park, 35 acres extent, lies on a beautiful sheet of water just east of the city. It is now covered with a dense growth of dwarf oak, Black Jack, with a few short leaved yellow pine. It can easily be converted into a handsome, shady wood, where families can picnic and fish in safe water as a diversion.

The Plaza in front of the new City Hall is the only park which has been improved and this with its stately palms, Live Oaks and well kept grass plot makes a good beginning for a grand system of Parks.

In company with Mayor Goodman, and two of the bankers, we were driven about the city and surrounding country, spending an hour in one of the most beautiful natural groves of Live Oak trees which we have ever seen. These trees 300 or 400 years old are grand, picturesque and wonderfully interesting.

J. P. BROWN'S ADDRESS.

The salient features of the address were:

The most useful Park is where the entire city with its shady trees, becomes one great parkway, and all citizens may enjoy it continually.

With a tropic sun and prolonged summer season, especially with sandy soils, the South needs shaded streets far more than northern cities, yet possesses less shade than her sister cities, elsewhere.

Well shaded streets are of greater importance than a few highly embellished beauty spots.

A home may be built in a season and the ornamentation of a park may be consummated in a year, but it requires a score of years to secure a perfect shade after planting the trees.

Invariably street trees are too closely planted, spreading trees cannot develope properly unless given ample room. A wilderness is not desired, but abundant shade with a bit of sunshine occasionally penetrating the foliage.

Forty to fifty feet apart is close enough for spreading shade trees and thirty feet for tall growing species.

While waiting for standard trees to form a shade, some quick growing temporary trees are permissable midway between, but these must be promptly removed before injuring the permanent trees.

Standard trees should be planted in all the parks and along all streets as

quickly as possible. Ornamentation may be deferred for a season, but will follow as demanded by the community.

No artificial or mechanical improvements should be undertaken until a thorough system of tree planting has been effected.

Economy should govern all park improvement. Politics and partisanship should be eliminated from park management. Employ men for their worth, not for their influence at the polls.

While a variety of trees with a diversity of foliage is desirable for a park, yet as nearly as practicable avenues along each street should be of one species of tree, different trees occupy the various streets; thus a city being one great park or boulevard, variety is accomplished.

The South has an endless variety of beautiful shrubs and plants suited for home adornment and park ornamentation, but the list of really good shade trees is comparatively small.

A nursery for the city Parks is absolutely indispensible.

Large trees ready for street planting are very expensive and transportation prohibitory, but small trees, seeds and plants are of slight cost and transportation on them inconsiderable.

Then when wanted from time to time they are on hands ready for use.

SUGGESTED LIST OF SHADE TREES SUITABLE FOR PENSACOLA.

Water Oak.
Hackberry.
Sweet Gum.
Sycamore, American and Oriental.
Tulip tree.
Red Oak.
Magnolia.
Deciduous Cypress.
Elm, Southern form.
Catalpa speciosa, for temporary shade.
Ash.

THE PALM IS FREELY USED IN THE SOUTH FOR STREET DECORATION

Regulation Of The Building Line.

In the earlier days of home building in American villages, it was customary to locate the dwelling directly upon the street, in order to allow greater privacy for the family in the larger rear area, and give a space for vegetable garden.

This practice is largely continued in the cities because of greater value of real estate. The more modern custom is to provide a large area for ornamental planting, between the street and building line, and the extent of this space must govern the character of the shade trees on the street.

Often, this broad space is agreed upon by the property owners, but usually it is determined by Civic enactment.

Handsome, well formed shade trees cannot be secured without ample space to spread their branches and where possible, the building line should be not less than twenty feet from the street.

Where houses are already built upon, or very near the street, such trees should be selected which are tall and slender, yet these do not supply very much shade. The Lombardy Poplar and Ball's Poplar are of this character. The latter, Populus Bolleana, is an excellent tree for ornament, although affording little shade. It has the leaf of the Abele or Silver Poplar, the silver lining of this foliage glistening as the least movement of the air sets the leaves dancing.

Unlike the Abele, this tree does not sucker. Is quite free from insects and grows rapidly.

What To Do With The Falling Leaves.

As Autumn leaves fall upon the lawn or in the street careless persons rake them into piles and burn them. This seems to be the easiest method of disposing of them.

But there are few localities where these leaves would not be of great benefit as mulching and to fertilize the soil.

The richest lands are the newly cleared forests where the accumulation of leaves has made it fertile, and the poorest lands are those from which the leaves and annual grasses are burned over each year to dispose of them.

Sandy soils especially are infertile, because there is no humus present. These leaves would soon enrich such sands and make them productive.

Grass lawns are frequently mown, the grass tops removed and nothing is replaced to restore the wasted fertility.

Leaves piled in some secluded corner soon decay and may then be used as a top dressing perhaps with the addition of some concentrated manures.

The kitchen garden will also be improved by the leaves, while by burning all the valuable chemicals are converted into gases and pass away into the atmosphere.

Farmers used to burn the corn stalk, after raking them into winrows, thus destroying thousands of tons of valuable fertilizers. Some foolish farmers still continue this practice, but they never get rich by it.

Red Oak, Spring Grove Cemetery, Cincinnati, Ohio.

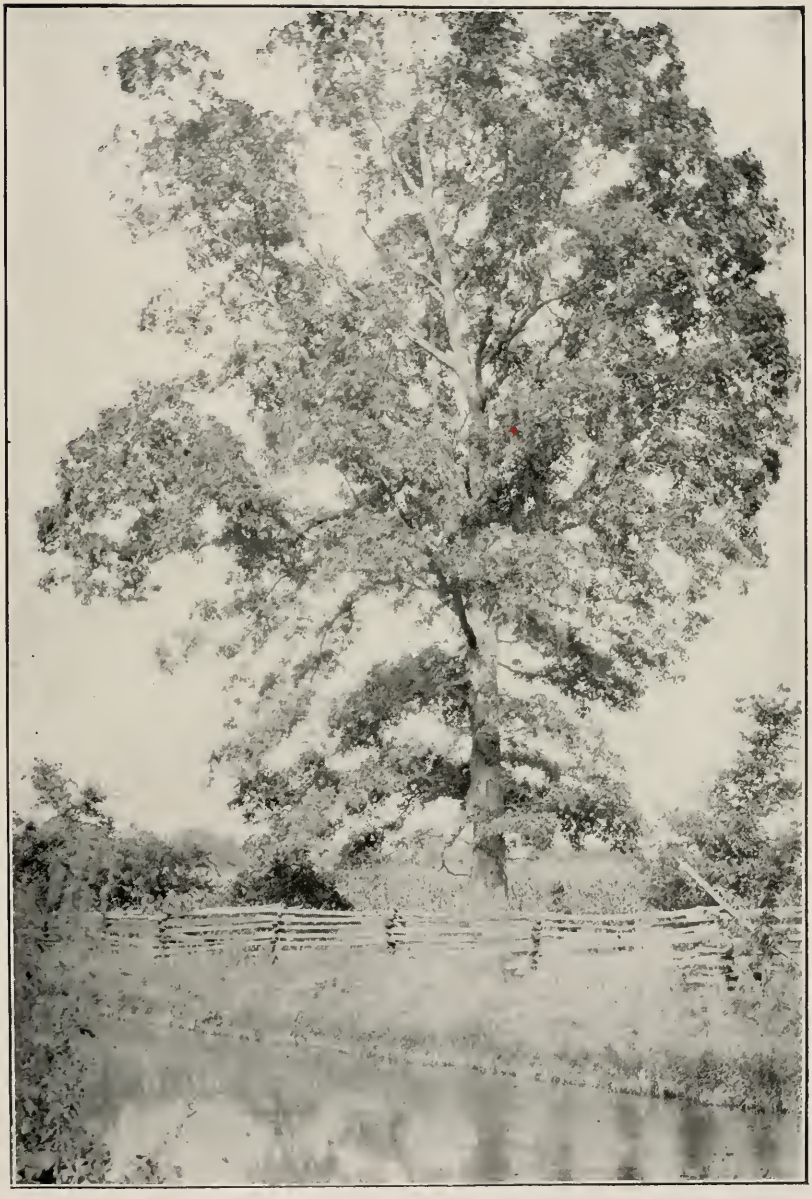
Colorado State Forestry Association.

Denver, October 7. 1907.

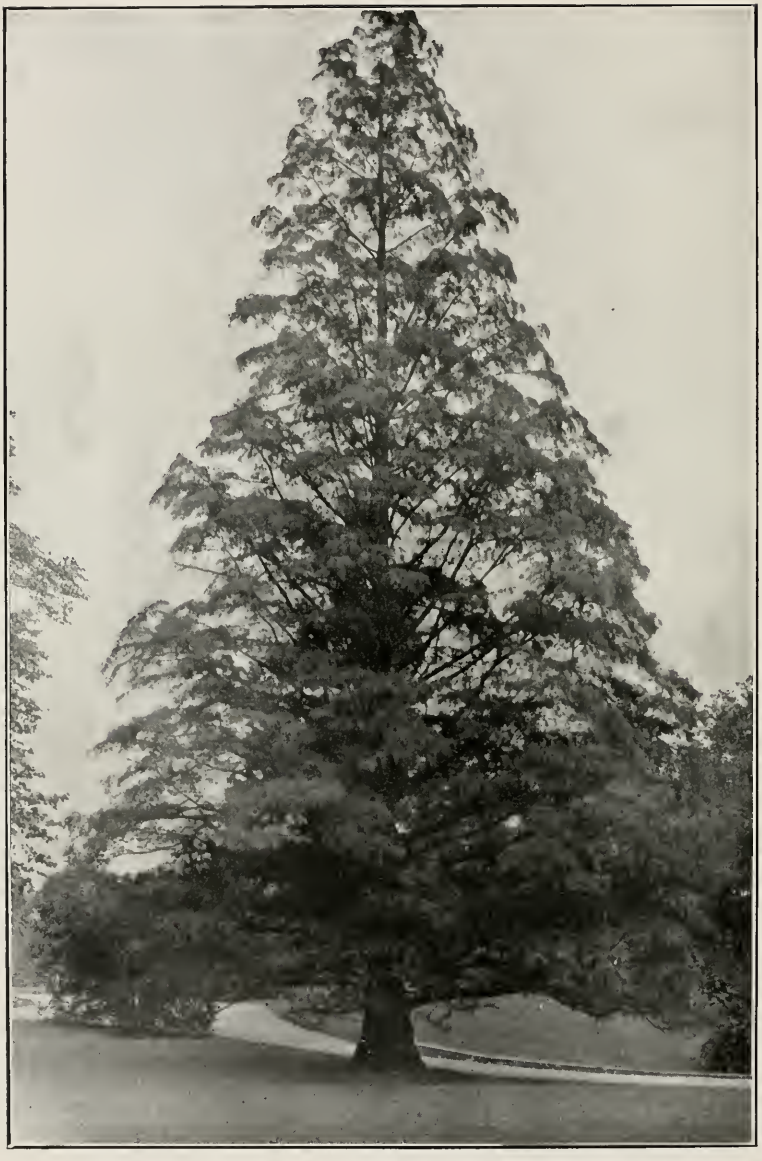
It seems to me our village ought to plant something better than Cottonwood, Box Elder or Carolina Poplar, and that the cities should rise above soft maples.

It is hard to find better shade trees than the Elms and hard maples. The New England type of white elm is a beautiful tree, and while the sugar or rock maple is a most charming shade tree, I am especially partial toward the Norway. One of the handsomest is a form of the sycamore maple, the large leaf so beautifully purple underneath.

Why so many people persist in planting cheap shoddy trees when there are such beautiful types to select from, is something I can't quite understand. W. G. M. Stone.



White, Oak, Near Connersville, Ind.



Deciduous Cypress, Owl's Nest Park, Cincinnati, Ohio.
This is 400 feet above the Ohio River, in high rolling ground, no swamp near.

The Buckeye---A Reminiscence.

In the last number of your Magazine you sent me I was much interested in reading your article on the Buckeye of the early days.

It brought to my mind very vividly the campaign of 1840, when William Henry Harrison was elected President. In fact, the Buckeye played a very conspicuous part in the election of Harrison, and especially in the state of Ohio. I was in my twelfth year and was the first I ever got interested in politics. The excitement was so great it was contagious. Some men in Connersville took a trip down the river for two or three miles, and they found a very large Buckeye tree. They cut it down and dug out a canoe that was forty feet long and three and one-half feet wide on the inside. Fifty girls dressed in white rode in it. It was hauled on a wagon drawn by six large horses driven by a man with a single line. The girls decorated the outside of the canoe by stringing buckeyes on strings and hanging them on the sides. There was a pole in the center of the canoe about twenty-five feet high and on top of that pole was a live coon. The next wagon in the procession had a log cabin built on it, out of buckeye logs. By the side of the door there was a coon-skin nailed upon it; on the other side of the door was a barrel of cider and a man sitting on the barrel drinking cider out of a gourd. By the side of the cabin was a buckeye tree, and in its branches were two live coons, and once in a while they would send a live rooster up to the coons and the way the feathers flew was a caution. The horse companies generally had strings of buckeyes about their horses' necks. So you see the buckeyes played a very conspicuous part in electing one president at least.

I was in Cincinnati in '47, the time of the flood your book speaks about. The merchants paid men two dollars an hour for getting goods out of their cellars.

Yours truly,
(Signed) C. C. MEEKER,
Muncie, Ind.

BALL'S POPLAR.

Spraying Silver Maples, Lincoln Park, Chicago.

Periodical Recurrence of Destructive Insect Depredation.

The year 1907 has been one in which many forms of insects have increased immoderately, some forms far beyond what has ever before been observed.

In the economy of nature, food is provided in abundance for every living creature. The higher forms of life are provided with vegetable food from millions of plants while the lower forms of life supply the higher forms with flesh.

Insects are made to increase enormously and after a brief life become the prey of other insects and birds.

Plants are provided with seeds for their reproduction far in excess of their necessities and the surplus or excess of seeds furnish food for numerous living beings.

All plant life is fitted as food for some animal or insect species and supplies their food. Thus, when not destroyed by some act of man, a balance is maintained between the animal, bird, plant and insect dominion, the excessive increase of one soon being overcome by the influence of the others.

The wholesale destruction of the Forests, and resulting decrease of bird life and also a reduction in numbers of small animals, could only result in the immoderate increase in insect species throughout the entire land.

Consequently the use of poisonous mixtures to kill superfluous insects has become a constant necessity with farmers, fruit growers, gardeners and those who have shade trees or ornamental plants.

There seems to be a periodical increase of various insects when great damage is done.

In 1876, the Rocky Mountain Locusts or, as usually termed grasshoppers, overran the states of Kansas, Nebraska, Iowa, part of Missouri, and Indian Territory, entirely destroying all garden crops, causing great distress among all classes of people throughout this territory. The Editor of Arboriculture suffered severely from this insect visitation, losing all his property, and was left worse than penniless.

The ravages of the periodical cicades are well known throughout America The Gypsy Moth and Brown tailed moth have cost Massachusetts millions of dollars while insidious microscopic insects threaten the destruction of the pine by sucking the juices from the leaves or needles.

The potato crop depends upon the quantity of paris green which is used to destroy the beetles.

During the present year the walnut trees have been infested with caterpillars which have defoliated many trees both north and south.

The sycamore, cottonwood, silver maple and other trees have suffered severely from various insect attacks.

The Ball worm is still at work upon the cotton.

If we abandon the cotton plant on account of the Ball worm, and quit planting shade trees because caterpillars have defoliated them at times and clear away the New England Forests to prevent gypsy moths from doing so, we will be just as wise as the learned entomologist of Indiana who advises against Catalpa trees since a worm has appeared which eats its foliage.

We shall simply have to use arsenical sprays and destroy the worms and be very thankful that this tree has but one insect enemy while every other tree has from a score to two hundred distinct insect enemies.

The Catalpa Sphinx.

(Ceratomia catalpae Bois.)

(By Lawrence Bruner, Lincoln, Neb.)

Owing to the growing popularity of the catalpa as shade, forest and ornamental trees, a brief account of their most important insect enemy in the United States will not be amiss at this time.

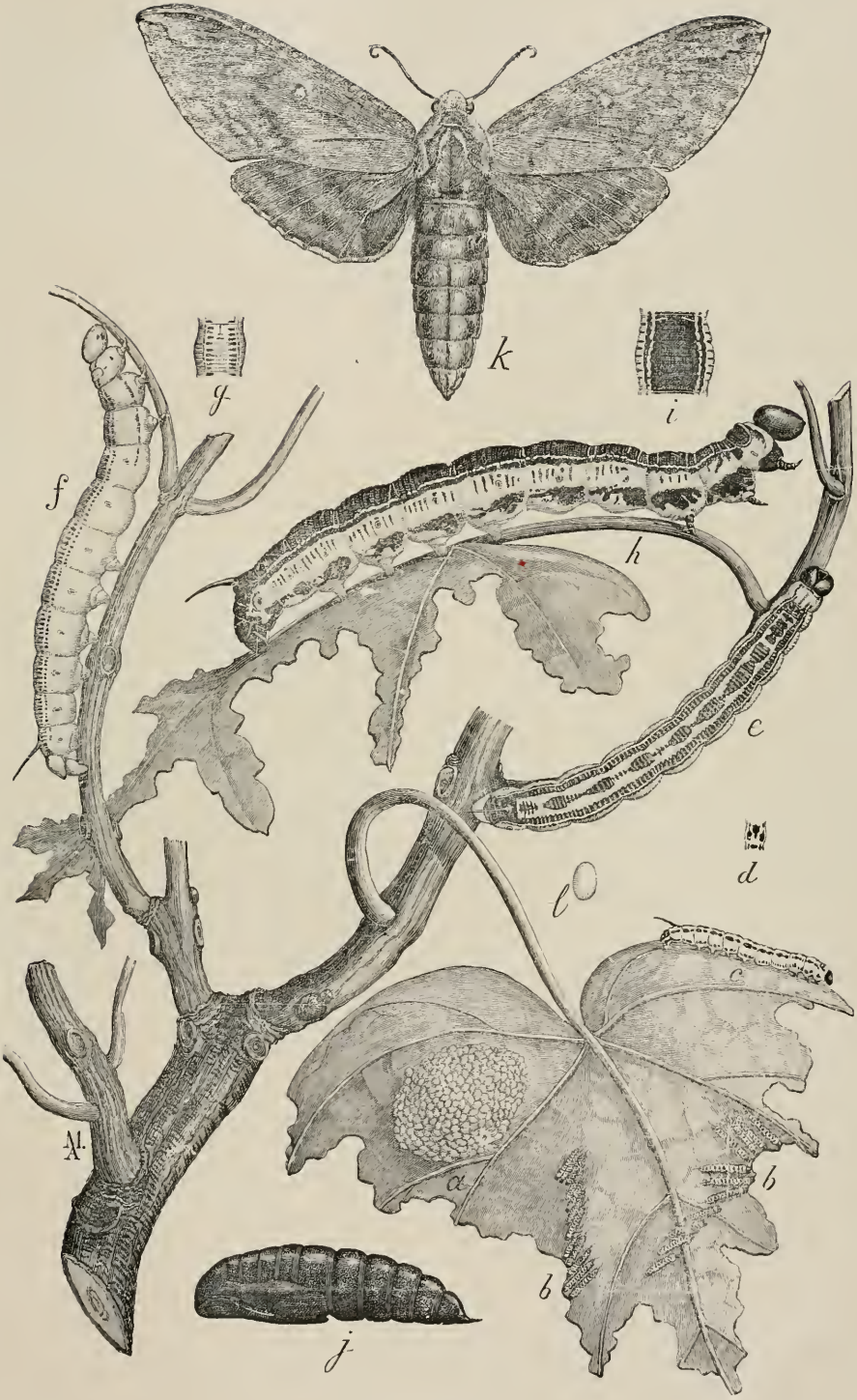
In the year 1836, or thereabouts, the French Lepidopterist, J. A. Boisdual, described a sphinx moth from Georgia, under the technical name of Sphinx catalpae. Judging from this name, its host plant was known even then. Be this as it may, the insect was scarcely known to American Entomologists until some years later, as will be gathered from the fact that it was not included in two of the most important lists of North American Lepidopters published in this country prior to 1881.

With the introduction of catalpas into towns, cities and parks for shade and ornamental purposes, occasional reports of the defoliation of such trees by a large, rather brightly colored caterpillar drifted into the offices of state and government entomologists and other persons who were known to be more or less familiar with insects. The life history and habits of the species have been studied and several rather complete accounts of the insect published during the past twenty-six years.

The accompanying illustration will give the reader a very good idea of the appearance of the catalpa sphinx in its various stages of growth. At *a* is is shown the egg mass; at *b* the young caterpillars immediately or soon after hatching; at *c* the same after another molt; at *e*, *f* and *h* the mature larva. while I. represents the chrysalis or pupa and *k* the parent moth or imago. The freshly hatched larva, of which there may be from 500 to a thousand in a single community, is pale greenish yellow with black caudal horn and ocelli. As the insect becomes older and increases in size, its head becomes darker and the body is marked with velvety black as shown in the illustration, though there is a great variation in this respect, as will be seen by comparing *g* and *i* which show the dorsal portion of single segments from light and dark colored caterpillars. The eggs are laid in clusters on the under side of the leaf.

At first the larvae feed in companies, but later, spread indiscriminately over the tree. When mature, or fully fed, they crawl to the ground and enter it to a depth of about four inches. Here they transform to the pupa or chrysalis stage which is well represented at *j*. This latter is about one and two-fifths inches long, of a shiny reddish-brown color and of the form indicated by the illustration. The moth is grayish brown or ashy in general tint. with the shading as shown in the picture. This coloring gives it admirable protection when resting upon the trunk or larger branches of the tree.

In the northern portion of this insect's range, it is double brooded, the first brood of caterpillars appearing during June and July, while the second one is in evidence chiefly in the month of August. A little further south, the spring brood appears somewhat earlier, and a third generation of caterpillars hatches late in August or early in Sept-



CATALPA SPHINX

(After Riley, Rep. U. S. Commissioner Agriculture)

ember. In the extreme southern portion of its range there may be, and evidently are, four broods of larvae a year.

DISTRIBUTION.

The catalpa sphinx is distributed over the entire area occupied originally by both Catalpa bignonoides and Catalpa speciosa, as well as much of the additional territory now occupied by these trees under cultivation. In other words, it occurs from the Gulf States to Pennsylvania, and from Arkansas and Oklahoma to Illinois. It seems still to be absent from Nebraska and Iowa. It works on trees growing in the forest, in parks and along our village and city streets, as well as those scattered on farms and along roadsides. Even seedlings in the nursery are not exempt from its attacks.

NATURAL ENEMIES.

It is known that at least one species of Tymenopteraus parasite (Apanteles glomeratus or catalpae) attacks its caterpillars in large numbers over a wide territory. A Tachinid fly also is a very frequent enemy of the insect, as may be inferred from the frequency that caterpillars are found with eggs of these flies attached to the skin in the vicinity of the head. Were it not a fact that the Apanteles parisite is in turn, attacked almost as frequently by two other parisites, this proneness to parisitism on the part of the Catalpa sphinx, would, in itself take care of the problem.

The Yellow-billed and Black-billed cuckoos, the Catbird and the Baltimore oriole have frequently been detected in the act of devouring the larvae of this insect. No doubt there are still other parisitic and predaceous insects as well as additional species of insectivorous birds that do much towards reducing the otherwise large number of this insect that would be produced from year to year.

REMEDIES.

While the larvae of this insect, like those of most other species of the family, seem to be subject to the attacks of several kinds of parisites and is devoured with avidity by some of our birds as mentioned above, it certainly appears to be on the increase, and is enlargiug its range. This being true, it becomes necessary for us to do some personal work toward keeping it within reasonable bounds.

Spraying with Paris green, in the proportion of 5 ounces to 40 gallons of water, will kill the caterpillars and will be especially effectual while they are still small. Hand picking or the use of a torch will do good when the insect is working much or small and medium sized trees and while the caterpillars are still bunched. When attacking very tall street and park trees, the problem is more critical, while in the forest, reliance must, for the most part, be placed on natural checks, such as are mentioned above, and others.

Scrub Catalpa In Kansas.

While visiting at home this summer I cut several sections from a catalpa tree in the half-acre plantation of Hon. A. W. Hefley, five miles northwest of Downs, Osborne county, Kansas. One of these sections I mailed to you. The tree was a fair sample of the entire plantation, established 23 years ago. Of 128 trees measured, the average height was 30 feet, and the diameter breast high 7.3 inches. Until it was 15 years old the grove was most promising. Then sun scald and heart rot appeared, and Mr. Hefley says he now wishes every tree was out of the way. I did not see, in the Sixth Congressional District of Kansas, however, one catalpa plantation that has

Section of Diseased Catalpa Bignonides.

paid for its planting. The young trees look well but those large enough for use do not.

"Experienced and thoughtful persons are of the opinion that catalpa can not be planted with profit even on low ground west of the 98th meridian in Kansas. Mr. Hefley's site is ideal for that region – not unlike one a mile east where Russian mulberry is making money for the owner, who cut 120 posts from a single row last spring, taking as many as 22 from one tree."

"A section of the diseased catalpa was sent to Mr. E. E. Yaggy, Hutchinson, who was asked if the unhealthy condition of the plantation is due to the presence of alkali in the soil. Mr Yaggy replied 'The sun-scald has never bothered our trees, and we have not noticed that alkaline soil has any other effect on the trees than to dwarf or stunt them.'"

Mr. Hefley planted 8-¼ by 8-¼, cultivated carefully, and has not allowed stock to injure the trees. Black walnut planted 2 years later in vacant places is now 6 feet taller and much larger in diameter, I would very much appreciate information as to the best method of caring for catalpa in that region. Should it be pruned regularly and systematically, and must it be cut at 16 years of age to avoid scald and heart rot? If Mr. Hefley should cut his down now and burn it, would he probably secure posts in 10 years from the sprouts with the spacing 8-¼ by 8-¼?

REPLY OF ARBORICULTURE

I am in receipt of your favor of 8th, and some two weeks ago perhaps, I received the section of Catalpa bignonoides with heart rot.

It is extremely unfortunate that so many million of these scrub trees have been planted in Kansas, Nebraska and in lesser numbers through the east.

There is no question whatever regarding the variety of this sample.

In the autumn of 1906, at very great expense, I employed thirty men for an entire month, paying high wages, boarding part of the men at hotels, besides paying my own and their traveling expenses. The entire cost was a little over $2,500. For this outlay of money and labor I secured 1,000 pounds of genuine catalpa speciosa seed. The most of this was distributed, gratuitously, to all parts of the world.

First I sent a quantity to each Botanical Garden of the world; next to all societies of Forestry in Europe; then from five to ten pounds to each Experiment Station of the U. S., and lastly to nearly every prominent nurseryman in America, I sent a generous package for testing

with what they have been planting.

At the same time sundry parties in Kansas and Nebraska collected 25,000 pounds (five hundred million of seeds) which was sold to nurserymen, seed dealers and individuals, and this has produced fully 100,000,000 trees.

Responsible parties purchased several hundred samples of this Catalpa seed, of a score of dealers and collectors, almost the entire lot of which was bignonoides, kempferii and various hybrid seeds. Scarcely a sample showed speciosa characteristics.

Until the public and especially the seed dealers and nurserymen learn to distinguish these various sorts of catalpa, and cease collecting seed and growing trees of worthless varieties, it will be uphill work endeavoring to teach the world the value of genuine catalpa speciosa.

Now about the section of wood. It is a very common disease of the bignonoides catalpa, which I have seldom found in speciosa. There seems to be less of the antiseptic materials in the sap of bignonoides and its hybrids than in speciosa.

When an injury occurs to this variety during the growing season, the sap is so diluted that the antiseptic constituents are insufficient to repair the wound or prevent spores of fungus growths from entering the wound and following that downward through the heart of the tree.

In this case the trees had stood 8¼x8¼ feet for twenty-three years. It is apparent that 68 square feet surface is not sufficient to maintain a healthy tree growth for thirty years nor even fifteen years, and it is largely due to this overcrowding and consequent suppression of growth, which has caused the diseased condition of this grove.

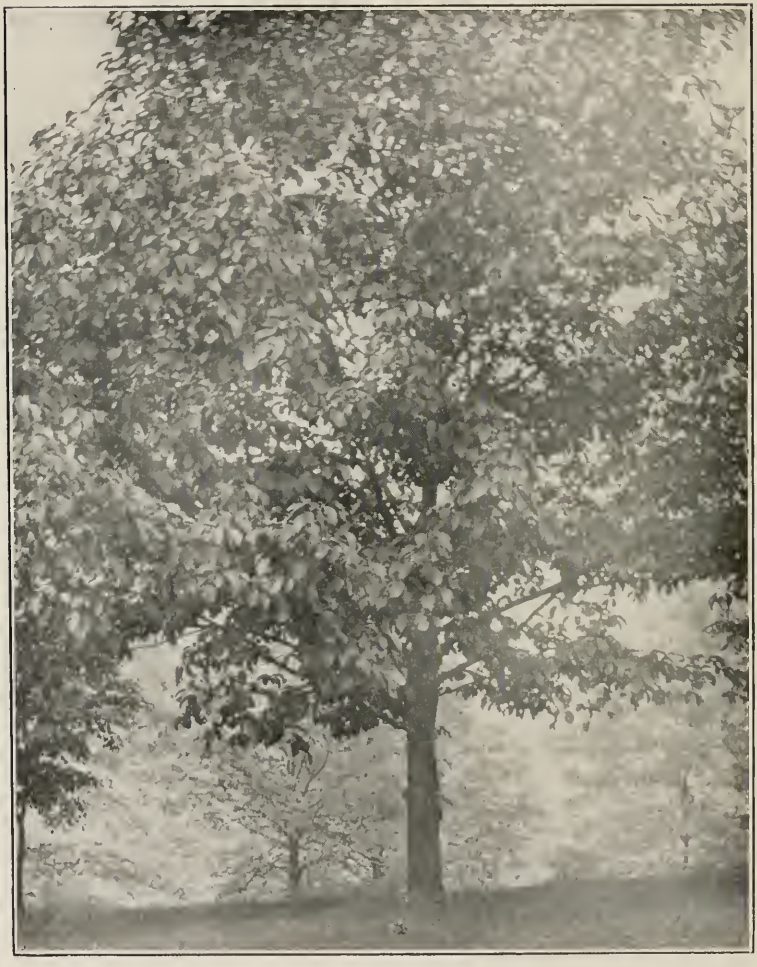
The Farlington, Kansas, grove was closer planted, 4x4 feet, and so remained for thirty years. Of course the trees never made saw logs at such distance, yet in the entire grove there was no disease. The Farlington grove was of catalpa speciosa.

Future Treatment: The stumps will reproduce the grove and in about seven years the owner can supply the neighborhood with fence posts. After cutting the second time there will still be sufficient vitality to produce another crop in the same time.

No pruning need be done with the grove, and if any of the groves in Kansas are speciosa there will be little pruning, simply removing superflous lower branches and to avoid double trunks.

There is no such thing as sun scald of Catalpa, especially in a grove planted so closely as to prevent the sun from reaching the trunks of the tree.

KENTUCKY COFFEE TREE, OWL'S NEST PARK, CINCINNATI.



Chestnut Oak, Eden Park, Cincinnati, Ohio.

Carlessness of Citizens.

As an instance of the gross carelessness of City authorities and citizens in regard to shade trees we cite the city of Connersville, Indiana, home of the editor of Arboriculture.

A manufacturing town of ten thousand people, and as well, a city in which almost every house is owned by its occupant.

There are approximately 36 miles of streets which are kept in excellent condition, and some 72 miles of first class cement side walks. There are approximating 23,000 shade trees along the streets, by far the greater majority of which, will be dead within ten years.

In fact we venture the assertion that two hundred live healthy trees of good sort, cannot be found in the city.

Many of these trees are so far decayed that they are already dead, or will be in a year or two, while all are in a very unhealthy condition.

Cottonwood and soft maple compose the majority of the trees, only a few of the better class having been planted.

The same situation exists all over the country, complaint of similiar conditions being made by the authorities at Indianapolis and elsewhere.

Ten feet apart is the rule of many planters, with the result as given above.

If citizens could only be brought to think of these matters a different condition would soon be found.

The following from the Farmers Review is opportune:

DISTANCE APART TO SET, SHADE TREES.

Shade trees of beautiful form are very scarce. It is surprising how few can be found in any one of our great city parks, where trees have been planted close together. Nature sometimes gives us magnificent specimens, but they are usually found growing alone in some field or pasture where the ax of the woodman spared them long ago when they were very small.

With nothing to shade them, they have grown up fully developed on all sides and have developed a large number of branches heavy with foliage. In a few of the great parks of this country, this has been looked out for and every tree has given been given room in which to do its best. This is seen on the grounds near the capitol at Washington. where are to be found some of the most magnificent trees in the country. They are a joy forever.

Planting trees close together will give shade but will not give beautifully formed shade trees. A solid wall of trees along a country road will give shade but they will not give the landscape effect that is to be obtained by having perfectly formed trees set at intervals of 100 feet. The landscape effect is probably worth more money than the solid wall of shade which at many times is of no benefit, such as on cool days in summer, on rainy days, on windy days and on days when the clouds obscure the sky. But the ornamental trees set at a hundred feet apart are ornamental at all times.

Moreover, the solid wall of the trees frequently kills out the grass under its solid shade and leaves a bare and uninviting aspect below. The ornamental tree lets in enough of the sun to keep the grass alive, and the green sward vies with the green of the trees to produce a beautiful effect. A single tree on a lawn is both useful and ornamental. Its great branches hold the ends of the swing rope, and under its generous boughs, the family meal is spread on a carpet of silken grass.

Unfortunately, the American idea of tree setting has been and is, to get just as many trees in a certain area as possible. Often the result obtained is the opposite of that desired. In twenty years, we find the owners cutting out the too abundant trees and leaving a mutilated arboreal wall that will never be healed of its raggedness. It is far better to so plant that in coming years no such amputation will be necessary.

Quercus Imbricaria, Eden Park, Cincinnati, Ohio.

Trees Requiring Much Moisture.

Elm, American White and others. Natural habit of swamps, margin of streams, lakes and undrained forests. Root system fine, fibrous, quickly injured by excessive drainage and want of abundant water. Insects, many; leaf eating and wood boring.

Splendid trees when supplied with water. One tree on author's grounds 29 inches diameter and forty feet high only 16 years old, plenty of water. Others planted same time, same soil, 8 inches diameter.

With proper care may be transplanted when of quite large size, up to six inches diameter, but not likely to do well if large.

Cottonwood, and poplars in variety have much the same habit as elm, growing along margin of all streams westward to Rocky Mountains, but not usually found away from moist locations.

Erroneous opinion that these are of value because of quick growth. There are other requirements.

Box Elder, a good tree in Arid regions when supplied with much water. Habitat, margin of stream throughout the west. Very poor tree for street or ornament, except as noted.

Willows, various kinds, all require water in abundance. Few willows suitable for street planting. Silver maple requires much water, surface roots, short lived, easily broken in storms, much diseased.

FARMERS INSTITUTES AND FORESTRY.

The new plan of having a series of lectures on forestry before the Farmers Institutes of Colorado, has proven wonderfully successful. W. G. M. Stone, of Denver, President of the Colorado. State Forestry Society, has this season, attended the Institutes of eight counties, all in the dry farming region except two, which were in a county where both irrigation and dry farming are practiced. 2160 farmers attended these assemblies, twelve institutes in all, to reach which, he traveled 2150 miles.

Mr. Stone reports that the Plains region has had less rain than for more than a decade.

But at any point, it was surprising to see the crops which they have produced and the yields.

He saw no failures and no despondency. Determination and expectation prevail.

A more cheerful lot of men and women, he has never met, nor a more eager people to listen to the talks. They all appeared ravenously hungry to hear everything.

Mr. Stone talked of forestry, and it was gratifying to see the interest the people everywhere are taking in the subject of trees,

THE NEW ST. CHARLES.

The Historical association. of New Orleans, would be very incomplete without recounting the events connected with the St. Charles Hotel, which, for more than half a century, has continued the leading hostelry of that City.

No other hotel of the Southland exceeds it in excellence of its appointments, magnificence of adornments or delicacy of its cuisine.

Fifty years ago. as a boy of sixteen, my first boating trip down the Mississippi River was made, and the recollections of the old St. Charles are still vivid. This was in the times of great plantations along the river, where a thousand slaves, working a thousand acres of cotton or sugar cane, all owned by one man, were frequent. The wealthy planters demanded the very best service and obtained it when they went to New Orleans at the St. Charles.

In the rotunda where were gathered large numbers of Southern gentlemen, together with visitors from all lands across the sea, we recall the oriental splendor of the scene, A great chandelier with innumerable lights illumined the room, while the reflection from a thousand crystals pending from the chandelier gave splendor to the surroundings.

It would be of interest to peruse the annual registers of this historic hostelry and recall the many notables who have been entertained here as they came and went from day to day.

While the New St. Charles is modern and does not partake of the ante-bellum days, yet it maintains the reputation of the past, and exceeds the former house in generous hospitality.

WHY PLANT THE CATALPA.

An Epitome of Forty Reasons.

1. By 1925 American forests will be exterminated.
2. The only valuable tree which will mature in time.
3. Is anti-septic, requires no chemical treatment.
4. It grows in almost all soils.
5. Is easily propagated; and managed.
6. Demands no professional manipulation.
7. Most durable wood known.
8. Valuable for cross-ties; Have endured half of a century.
9. Nothing better for telegraph poles.
10. Miles of living trees used for telegraph lines.
11. Makes magnificent veneers.
12. Superior to Oak for furniture.
13. Lighter than Pine.
14. Stronger than Oak.
15. Tougher than Hickory.
16. Free from warping.
17. Neither shrinks nor swells.
18. Makes best wood pulp and book Paper.
19. Immense yield per acre.
20. Excels for Building Materials.
21. Equals Walnut for carving.
22. Makes good fence posts.
23. For mine timbers not surpassed.
24. Ideal wood for shingles.
25. Every quality for interior House finishing.
26. Good plow beams and handles.
27. Used during centuries for boat building.
28. Suitable for all car construction.
29. Once planted becomes a perpetual forest.
30. Qualities of Basswood and ash for Agricultural Implements.
31. Blocks are used for Wood Engraving.
32. Strong and durable Piling timbers.
33. Will produce Cross-ties at 10 cents each.
34. Less insect enemies than other trees.
35. Fewer diseases than other timber trees.
36. Quick growth for wind brakes.
37. A desirable shade tree.
38. Beautiful flowers for ornament.
39. Roots never clog sewers.
40. Practically all uses for which wood is adapted.

CATALPA SPECIOSA IN BLOOM, AS A STREET TREE, FORT COLLINS, COL.

Why No Catalpa Cross-Ties

REASONS FOR NUMEROUS PAST FAILURES

1. Iron Mountain Railway purchased seed from Japan producing unsuited dwarf trees.
2. Farlington Plantation 4 x 4 feet could not grow.
3. Many western trees are Bignonoides, valueless.
4. No modern grove is old enough.
5. Original forest of Catalpa exterminated by settlers.
6. Vast amount worthless seed distributed; difficult to procure seed and trees of genuine.
7. Graft and mismanagement of some plantings.
8. Purchase of low priced trees caused ill results.
9. Want of care and cultivation of groves,
10. Abandonment of Groves after planting.

ONE YEAR'S GROWTH FROM THE STUMP

WATER OAK (QUERCUS AQUATICA)
RESIDENCE OF MRS. D. G. MILLIKEN, NEW ORLEANS, LA.

How Forests Increase.

SOME TREE SPECIES NEVER FORM DISTINCT FORESTS.

Nature has made provision for the abundant reproduction of the forests, and thus asserting their great importance, by enabling the trees to produce immense quantities of seeds, not only for reforesting the earth, but also to supply food for animal nature, and in some tree species, a rapid increase by suckers from the roots or from the stump. Besides, some are enabled to grow from parts of the branches which may have been detached by accident or otherwise.

Again, the seeds of certain trees are provided with wings of various kinds by which they are conveyed to greater or less distance by the wind.

In the frozen north, these winged seeds are skidded along over the ice and snow by force of the wind.

Some seeds float upon the water and are transported by its current. Others, too heavy to float or be moved by the winds, are given an edible character, so that birds and animals may transfer them to other localities.

The seeds of the Linden are appended to a leaf-like tract. These are blown very short distances from the parent tree, and thus, Linden does not form distinct forests, but occurs sparingly among other trees.

The Ficus, or rubber trees, are in places epiphytic, their seeds being lodged in the bark or scales of other

trees, such as palms, oaks, etc. Here, the seeds germinate, send out long thread-like roots, which in time reach the ground, when they rapidly enlarge and embrace the trees to which they have become attached, using it as a support, the rubber tree becoming the principal trunk above the point of attachment.

It is plain that the ficus in this manner cannot increase very rapidly or form a characteristic forest.

If all the seeds of a single Cottonwood tree should grow, scattered as they are so broadly by the wind, as the light cottony appendage to each seed insures it a distant flight, this one tree would forest the continent in a dozen years.

On the other hand, the walnut drops its seeds directly beneath the tree, where animals, including man, gather them for food. Occasionally, a nut is dropped which becomes a tree in some other locality.

The hickory also falls directly beneath the tree, bounding away and rolling down the hillsides, if on a slope. But as the hickory nuts are more palatable than the walnut, and the husk breaks open with the fall, releasing the clean shelled nuts, they are more attractive to the squirrels than are walnuts, and thus have greater distribution.

Yet, as a rule. hickories are not found in large forests, but are grouped among other trees.

The meaty, triangular nut of the Beech is a favorite food for both birds and squirrels. Very large quantities of them are stored away in cavities in the tree trunks, underneath decaying stumps, beneath rocks and in similiar hiding places. From its smaller size, thin shell and delicious meat, it receives much greater distribution and frequently occurs in distinct forests.

The Butternut is seldom found alone, usually the trees are quite scarce, never in solid forests. The bitter husk, very rough edges of the sculptured inner shell, cutting the animal's mouth, quite effectually protects the buttery meat, comprising the edible nut, hence its distribution is very limited.

The Cocoanut of the Tropics increases very slowly because of the great size of the nuts and comparatively small number produced. The light outer husk buoys it upon the water, whence it is washed upon the shores often quite distant.

Acorns are edible for birds and animals, hence they are scattered in all directions, and being produced by myriads, feed the wood folks amply and form large forests in which other tree species occur only as accidentals.

Willows, like the populus family, are provided with downy seed appendages and are carried by the wind everywhere, but only in moist locations and where the seeds are not unheld by rank vegetation, can the seed germinate, thus they are confined to water courses.

Catalpa speciosa produces sufficient seed, but it is not so readily distributed nor does it form a distinct forest. The seeds are winged but are seldom carried by the wind. Mice and birds are fond of the seed but destroy it in the process of eating, so they are not voided by these animals as are the seeds of cherries, juniper, blackberry etc.

The seed and pods falling upon the earth, are destroyed unless the soil is in condition for their speedy germination. While if they fall in the stream, soon become water soaked, sink and are covered deeply with mud. A few are cast upon the shore and become trees.

Other varieties of catalpa having much lighter seeds than speciosa, fare

better, being conveyed greater distances by the wind, produces more trees, yet do not form distinct forests.

The value and importance of tree species to man, cannot be measured by the ease with which it can be produced in nature, for man's art can produce ten thousand trees where nature grows but one tree.

Chestnuts are eaten by various animals and birds, yet a portion hidden beneath leaves becomes trees. Others stored by squirrels are left to grow.

The seed grows best in light, sandy soil and increases more rapidly.

Coniferous trees have seeds edible to some animal life, and are thus distributed The wind also carries their winged seeds and extensive forests of Pines, Spruce, Firs, Hemlock etc. abound.

Birch in Winter, Rutland, Vermont.
"Coming Events Cast Their Shadows Before."

Navigation of Western Rivers.

The President of the United States, in company with a large delegation, has recently inspected the Western Rivers, to determine the methods which may be employed to increase the depth of western navigable rivers, so as to secure a fourteen feet stage of water during the entire season.

Arboriculture has, upon various occasions, discussed the subject and has given numerous photographs illustrating the conditions which now exist.

We all want better facilities for transportation of freight by water, and desire as deep a channel and as regular flow as science can devise, and hope this may be secured.

But it is a great misfortune that the President and his advisors could not have made their inspection trip at period of the flood tide and see the distress prevailing along the entire course of the Ohio and Mississippi rivers and their tributaries and observe the cost to the people, of the annual overflows.

Every dam and obstruction placed in the bottom of the stream, must of necessity, increase the height of water during floods.

NAVIGATION ON THE OHIO RIVER.

WRONG COURSE PURSUED BY ENGINEERS : TEAR OUT THE DAMS : DREDGE OUT THE CHANNELS : DYNAMITE THE OBSTRUCTING LIMESTONE LEDGES : LOWER THE RIVER BOTTOM INSTEAD OF RAISING IT; AND AMPLE DEPTH WILL BE SECURED.

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