
GEOLOGICAL SURVEY OF KENTUCKY.

N. S. SHALER, DIRECTOR.

REPORT

ON THE

TIMBERS OF BOYLE AND MERCER COUNTIES.

BY W. M. LINNEY.

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INTRODUCTORY LETTER.

Prof. N. S. SHALER, *Director of the Kentucky Geological Survey.*

DEAR SIR: In pursuance of instructions from the Office of the Survey, I have for some time past been making a study of the timbers of Boyle and Mercer counties. I herewith submit the results of my investigations, which, though not as complete and elaborate as could be desired, will, I hope, be found as full and correct as could be expected for the limited time given for the work.

My thanks are due to a number of persons for information given, and I take this opportunity to return them.

Respectfully,

W. M. LINNEY.

HARRODSBURG, KY., July, 1879.

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REPORT ON THE TIMBERS OF BOYLE AND MERCER COUNTIES.

GENERAL REMARKS.

The district comprising the counties of Boyle and Mercer is very interesting from the point of view of its botany and its geology.

As these sciences are so intimately connected in some particulars, I have thought it best, in the following report, to refer briefly to its geological features, and endeavor, at the same time, to show some of those well-marked peculiarities in the distribution of certain vegetable species, largely due to the variations and conditions of the soils.

Though this question may not be viewed in itself as an economic element in the present supply of timbers in this region, yet the distribution and adaptation of certain species to soils will become of great economic importance for the future, when the propagation and cultivation of valuable trees shall be forced upon posterity, either from necessity or for profit.

This district was one of the first portions of the State to become settled; and as, for more than a hundred years, there has been a continual increase in the population, it necessarily follows that there has been a continual and increasing demand made upon its forests.

Resulting from this drain, about sixty per cent. of the surface has been entirely denuded of its native trees, and over the remainder a large proportion of its valuable timbers have been removed.

The destruction of late years has been very great; and, if continued in the same ratio, it will not be long before the last tree shall have passed away.

A recently published item in one of the local newspapers asserted, that of the woods remaining in Boyle county, seventy-five per cent. had been destroyed in ten years.

From my own knowledge of the county during that period, and careful observations made during the year, I am satisfied that, in some sections, the statement is no exaggeration; but the proportion is evidently too large for the whole county.

In Mercer, the destruction has not been so great, yet it has been large enough to seriously alarm those whose attention has been called to the subject.

In the first settlement of the country, a great deal of valuable timber was undoubtedly destroyed in clearing the lands for cultivation; but years have passed since any of the forests were thus removed.

Some logs have been cut near the Kentucky river, and floated to market, and some lumber has been shipped out of Boyle county by railroad; but the quantity has been comparatively small.

It follows then, as a general rule, that the forests have been felled, and their material used in the district: the cherry and walnut for furniture, the poplar (*liriodendron*), oak, ash, and chestnut for buildings; these, and other varieties, for fences and fire-wood, and the bark from the chestnut oak for tanning.

At the present time nearly all of the lumber used in house-building and furniture is either imported from the North, or from the mountain counties of the State.

A number of small saw-mills are still at work in various parts of those counties, cutting up the remnant of available and marketable trees.

Perhaps the greater part of the denudation may be viewed as legitimate; but much of it should have been avoided, and no excuse can be offered for the destruction, wanton sometimes, carried on, save ignorance and cupidity.

From all the evidences, I am satisfied that, originally, no part of Kentucky had a fairer property in the size, variety, and quality of its forest trees, or in the beauty and richness of its general flora.

While over a greater portion of its surface the native plants are gone, yet crowded back into the slopes and hollows of the knobs, and the steep cliffs of the rivers, with here and there a thicket, are many plants whose occurrence is rare; and in comparing the incomplete list, appended to this report, with the flora of other districts, and with the knowledge that this is on the geologic summit of the State, I have reached the conclusion that this section has been one of the centers from which the plant life of surrounding portions of the country has been distributed.

GEOLOGY AND TIMBER DISTRIBUTION.

From the deep gorges of the Kentucky and Dick's rivers to the top of the knobs in the southern part of Boyle county, there is exposed about fifteen hundred feet of rock sections, extending from the Kentucky river series, the probable equivalent of the Trenton period, up to, and including, the waste of the Millstone Grit.

These various series of rock masses, from which the soils are immediately derived, have given quite a number of soils that differ very materially from one another.

This dissimilarity is due usually to the chemical character of the various layers, which, added to the qualities derived from their depth, drainage, elevation, and exposure, seem to be the controlling causes that have produced the diversity observed in the distribution of a number of the species of plants.

To those who have not investigated the causes, the location of various belts of different trees growing in this district is remarkable. Some of them I will briefly notice:

THE TRENTON AREA.

Nearly all of the region from a line southwest of Danville, and extending between Salt river on the west to Dick's and Kentucky rivers on the east, and north nearly through Mercer county, as well as a strip extending from Salt river west nearly through Boyle county, is based on the Trenton Limestones.

Through the first mentioned portion, there evidently once flowed a stream, which in time became a swamp of some depth, and considerable dimensions, but which had, at the time of the first settlement of the county, been divided by underground drainage into several portions which were still marshy in their character.

The timber was largely made up of those species that love a wet location.

Blue ash (*Fraxinus quadrangulata*) grew everywhere in this belt, and in greater numbers than any other species.

The chinquapin oak (*Quercus castanea*) almost rivaled it in numbers and distribution.

The sycamore (*Platanus occidentalis*) grew at some points in plenty, and of magnificent size.

The buckeye, especially the Ohio buckeye (*Aesculus glabra*), was very common.

Wild cherry (*Cerasus serotina*) was here in considerable quantities; while the hickory, black walnut (*Juglans nigra*), black oak (*Quercus nigra*), and hackberry (*Celtis occidentalis*) were common. Among these grew many other species, with an undergrowth of grape-vines, spice-wood, and cane. White oak, birch, and poplar (liriodendron) were notably absent. Surrounding this swampy tract, but based on the same limestones, is a higher region, with better drainage and drier soils. On these soils there was a considerable change in species. Sycamore ceased; blue ash, chinquapin oak, overcup oak, and wild cherry decreased, while white oak, black walnut, sugar maple, and others, increased in numbers.

A few beeches were scattered here and there, and where the geodes and pebbles of the higher rocks were preserved in beds, a few poplars grew.

The red cedar everywhere covered the rocky walls of the river cliffs, and dogwood, along with cane, gave variety to the undergrowth.

LOWER BEDS OF CINCINNATI GROUP.

The lower beds of the Cincinnati Group, extending from their base to the silicious mudstone, occupy the area between

Chaplin and Salt rivers, in Mercer county, and also a belt, extending east and west, through Boyle county, south of the Trenton exposure.

The beds here consist of brown and blue shales, with intercalated beds of thin limestones.

These limestones have been much shattered, so that everywhere the roots of trees could penetrate to a great depth.

That this is necessary for the white oak (*Quercus alba*), I am not prepared to say; yet this is the most remarkable white oak region that I have ever seen. The forest might be said to be almost entirely of that species. Very often it is ten to one of all other trees. Some red oak is found, and where there are good east and west exposures, and a deep coating of leaf mold, some clumps of sugar maple occur; few other trees are seen, and many of those found on the Trenton are noticeably absent.

The size and quality of this white oak was very fine, and although the destruction has been great, the timber of this kind, in the region between the rivers named, is by far the most valuable within the two counties. The prices of white oak I found to be from one to eight dollars per tree, according to size and location.

Its principal use is for fencing purposes, though many valuable trees are cut every year for fire-wood alone.

The farms over this area, where the land has been cleared a few seasons, are usually covered with stones. These stones, if removed and put into permanent fences, would add value to the land, and save in the cutting of timber; but the rule is to leave them on the fields as they lie, or to pile them up over the ground. Farmers lose the use of the soil thus covered, while the same labor would almost suffice to put them in a fence; and this is done by persons who have to purchase timber for their rails, or buy the rails made to hand.

I am disposed to think that the average amount of the white oak over this belt was equal to, if not greater than, seventy-five per cent.

From a number of counts I made over widely-separated localities, where the woods had been little disturbed, I computed the following table:

SPECIES.	Per cent.
White oak	78
Red oak	5
White ash	3
Sugar maple	4
Hickory	4
Other species	6
	100

Undergrowth, dogwood and some others.

On the lowest beds that contained no shale were notably a few post oaks and laurel oaks. I noticed one peculiar characteristic of the post oak (*Quercus obtusiloba*), which I have not seen mentioned: that is, its tops are never erect. I have examined a great many trees, and every one was leaning in some direction from a perpendicular.

I have not seen a single point where any protection has been given to secure a reproduction of oak timber. The supply is not much greater than would be required to replace the inclosures were they destroyed; so it seems that not a generation must pass ere the white oak must be "numbered with the things that were."

SILICIOUS MUDSTONE.

The middle division of the Cincinnati Group here consists of one hundred or more feet of exposed shales, that extend east and west nearly through Boyle county, and form the surface soil on Deep creek, in the western part of Mercer.

With the exception of a few harder layers, it disintegrates very rapidly, and, to a considerable depth, leaving a very loose half sandy soil. This soil, after clearing, needs great care to maintain its fertility.

The surface lies in short, steep, rounded hills, and where the soil or sod is broken, it is rapidly worn into gullies, often many feet in depth.

These soils produced beech as its most abundant growth; but the walnut and poplar trees occurring on it could not well be surpassed, the latter sometimes eight or nine feet in diameter. Some sugar maple, white oak, and white ash were also found, yet the species were few compared to some other soils.

THE UPPER BEDS OF THE CINCINNATI GROUP.

The outcrop of these, from their steep dip beneath the knobs, in an east and west line through Boyle county, gives but a narrow exposure, and their surface on each side of the little anticlinal, through which the North Rolling Fork flows, is also small. The timber, as a general rule, has all been cut off, and I found it impossible to make out a table that would exhibit the distribution over its surface.

Sugar maple, walnut, poplar, and white oak seem to have been the leading species, with quite a mixture of other kinds. The same remarks will apply equally as well to the exposure of the Corniferous, except that the waste of its cherty member is scattered over much of the lower series, and thus produced more variety in the forests that once covered it.

THE OHIO SHALE (BLACK SLATE).*

This formation, where unmixed with the decomposed rocks of the upper series, is inferior for agricultural purposes, yet it has given a fine forest of beech. Its outcrop is everywhere marked by this timber, which, in many places, is the only growth.

Where it is disposed to be marshy, there is sweet gum, swamp white oak, and some other trees, and where the Waverly shale has covered the slopes, chestnut is often found.

THE WAVERLY.

The greater mass of the knobs in Boyle county is composed of the Waverly shale, and holds the larger part of the remaining timbers of the county.

From the various conditions of soil here found, there is a

*This is the Huron shale of many geologists; but it has been termed Ohio shale in these Reports to avoid the risk of confounding it with the "Huronian."—N. S. S.

great variety of species; but in their distribution there is a certain order.

The tops of the knobs, where the shale covers the surface, is well marked by the New Jersey scrub pine (*Pinus inops*), rock chestnut oak (*Quercus prinus var monticola*), and chestnut, with such shrubs as sumac, huckleberry, service berry, and others. Along the streams sycamore, sugar maple, white maple, and walnut, together with other kinds, grow.

Where the leaf mold is deep, and the waste of Sub-carboniferous limestone has added its richness, and the direction of the exposures give variety, almost every species peculiar to the district may be found; but everywhere the best trees are rapidly decreasing, and in many spots all the kinds are being destroyed.

THE SUB-CARBONIFEROUS LIMESTONES.

This series of rocks is found only on a small portion of the knobs. Where it extends up to the decomposed rocks of the St. Louis Group, it gives a soil of fair character, which, as it lies in a small synclinal, is better protected than is usual in this section. Its principal growth seemed to have been white oak, red oak, and black oak:

A few patches of the wasted sands and pebbles from the Millstone Grit have retained the characteristic cucumber tree (*Magnolia acuminata*).

DESTRUCTION OF SOILS.

Trenton.—The exposures of the Trenton soils are comparatively level, save on the steeps near the rivers; and as their drainage is commonly underground through fractures, caves, and sink-holes, the soil is not so liable to be washed away during heavy rains; consequently, the destruction of the soils has not been great, except in limited areas.

In some places the massive layers of the bird's-eye limestone have been uncovered, and the area become worthless. This stone is so little acted upon by atmospheric and other causes, that it must require ages to reproduce a soil over it.

Along the bluffs of the Kentucky and Dick's rivers are many places that can never be cultivated, but which have been covered with timber. These, with care, would still produce trees. Yet these have been and are being cleared in such a manner that the little soil, exposed to the beating rains and the more rapid freezing and thawing, is being washed off to the bare rock.

Lower Cincinnati.—Were it not for the great preponderance of shales or marlites that this series contains, among the solid limestone layers, the soils derived from them would hardly, from the usage to which they are subjected, last five years over the greater part of its area.

Over thousands of acres of land that have been cleared for some time, it seems, from an examination of the few trees left in fields, that often, for a depth of several feet, the soil has been entirely washed away; but such is its power and fitness for a speedy conversion into soils, that every turning by the plow leaves it as rich in plant-food as before. The lower layers, notably those full of heavy beds of branching corals, have, however, a different character, and over those beds a large per cent. of the soils have been ruined.

Silicious Mudstone.—The soils on this group, from their soft character and the steepness of their slopes, wear away very fast when cleared and under cultivation. A slight break in the soil or sod starts a wash that, unless stopped in its incipency, will soon gully down many feet. So rapid is this destruction, that only a few years is necessary to render whole fields worthless. Wanting usually in lime and cohesive properties, it is hard to restore these slopes to fertility; so the ruin has been great.

Ohio Shale.—The soils derived exclusively from the Ohio shales are, as a general rule, poor for agricultural purposes.*

Being thin, their destruction is rapid after clearing. The surface exposure is not large, yet much of this has been injured by the removal of the forests.

* This inferiority is principally due to their impervious nature; when well under-drained, they are nearly as fertile as the blue limestone soils.—N. S. S.

Waverly Shales.—This group of shales is left only as slopes, often of considerable steepness, with here and there belts on the top that are comparatively level over small areas. Those level points have been cleared to some extent, and where put in fruit trees, promise something for the future; but where under cultivation, as soon as the leaf mold is exhausted, their value is lost.

This soil will not produce blue-grass; and when it has been uncovered down to the shale, it seems to be impossible to form soil over it again. Its character is well illustrated at Knob Lick, near Danville Junction. This point, perhaps, contains a hundred acres, and about one hundred feet of those shales are here exposed. Bare of all vegetation, save a few lichens and mosses, the soil all gone, and the shales gullied down through the whole thickness, it is a miniature desert, and a striking illustration of what the Kentucky knobs are to become when they have been entirely denuded of vegetable coverings.

Hundreds of these licks now exist, and every year adds to their number. It required ages to clothe them with plants, and this only with the aid of the fertilizers from the other series of rocks. A few years, under the influences now going on, will leave them bare.

The complete destruction of the timber over this area will be fraught with ill effects other than the destruction of the soils. (See below.)

The cause of the rapid destruction of these shales seems to be two-fold. Containing little except clay, water entering their crevices dissolves them, or freezing separates the particles, thus allowing them to be wasted rapidly.

The other reason is due to the quantities of iron pyrites which they contain. This substance is speedily decomposed when exposed to the air or water. The iron, sulphur, and alum in their combinations being injurious to plants, the shales are left in a finely divided state on the surface, and are swiftly washed away.

These knobs should never be cleared, and as the old trees

are removed, the young ones should be encouraged and protected. They should be left intact, for all time to come, as nurseries from whence the local timber wants must be supplied, otherwise the whole extension of the Waverly will be but one vast Knob Lick.

Bottom Lands.—In Mercer county there are no bottom lands of much extent, and in Boyle county the only ones of note are situated on the North Rolling Fork. By clearing away the fringe of timbers on the margin of this stream, and from the more sudden rising of the floods than formerly, a great deal of valuable land has been swept away, and each year sees an additional amount crumbling into the stream to be carried away. Proper care would have prevented this in the past, and might save yet much for the future.

REPRODUCTION OF TIMBERS.

Perhaps more than half of the surface of these two counties, remaining in woodlands, is totally devoid of young trees of any description. Should they come up, and the cattle not kill them, they are carefully grubbed out of the way.

The knobs contain much young timber. Some of the white oak woods abound in small trees, and over the other sections are left an occasional thicket where the young growth is thick.

A few walnuts have been left in some places. These walnut trees promise little—growing isolated, and oftenest in the sunlight, they become stunted, with forking heads and many branches.

The honey-locust (*Gleditschia triacanthos*) gives the most forcible illustration of this law of any species that have come under my observation. The original trees of this species are fine, tall trees, without thorns, and the young trees in the undisturbed woods are unarmed; but wherever growing over the county, in isolated conditions, they are low, bushy, and covered from root to branch with horrid thorns.

Trees, to grow tall and straight, and fit for lumber, must be close enough to have their lower limbs shaded. These limbs

drop off in time, and, as the individuals run up, they acquire long trunks. This seems to be the only condition necessary to give valuable timber.

As a rule, the poorer species are everywhere coming to the front, and succeeding the valuable kinds. As far as I have been enabled to investigate this fact, it is not due, unless exceptionally, to any change in the soil or climate, but depends upon the preservation and distribution of the seed.

Perhaps the more common species to take possession of the soil are honey-locust, black locust, coffee-bean, and red-bud. The seed from these trees are protected by such hard coverings that they are preserved for many years in the ground. Year by year they make their appearance as young trees. It is probable that they may lie in the ground for many years, and only germinate when favorable conditions arise.

The seeds of the wild cherry, hackberry, cedar, and the haws are widely scattered by birds, and germinate wherever they may fall. While elm, box-elder, and other kinds, have their fruit widely disseminated by the winds, and are among the first to propagate themselves. Of the more valuable kinds, their seed often do not last longer than one season, and then may be entirely destroyed.

The white oak has few chances for reproduction. The woods are everywhere a range for hogs, and with the birds and squirrels to help them, the acorns are all eaten, and I found it impossible in the spring to find a single specimen during a careful search.* Yet where hogs have been kept from inclosed woodlands, it is no unusual thing to see hundreds of young white oaks under a single parent tree. Black oak, laurel oak, and post oak having more bitter fruit, the acorns are not so much sought after; consequently, they have more chances in the race for life, and young trees are oftener found. I can see no reason to prevent the valuable species from taking and keeping the lead, if only a little care be exer-

*See on this point the successive Reports of Mr. L. H. DeFriese, in the 2d, 4th, and 5th volumes of this series of Reports.—N. S. S.

cised in the preservation of their seed, and in the destruction of the poorer kinds of plants.

For some purposes the red cedar (*Juniperis Virginiana*) is a truly valuable species. Over all the limestone soils, where the rocks are near the surface, it is increasing in great numbers, and does well on rocks so bare that few other kinds can find a footing with it. Reason would suggest its preservation. For fences and posts no wood is more enduring. Last winter I saw some stock successfully wintered in a cedar thicket. If the wide-spread destruction of timber over the United States is continued a few years longer, the erection of great stables and sheds will be too costly for small farmers, and I know of no better substitute that can be devised than groves of cedar.

The worn-out farm lands, if put in trees, in time would be good again. Started as nurseries of valuable species, each year's growth would add value, both to soil and plants, and, in a near future, they might be of more pecuniary value than all the rest of the farm.

Every farm in this district, however small, should have a grove, where young trees, of the best species suited to the soil, should have the same careful attention given them that any other growing crop receives.

The cutting away of woods over this district should cease, and no greater proportion of cleared lands to forests should ever exist. All the valuable trees of this region could be raised nearly everywhere, and the sooner their cultivation is begun, the more will posterity have to thank us for our wisdom. The care and expense given in the past to such introduced species as catalpa, balm of gilead, white poplar, lombardy poplar, ailanthus, and others, would have produced thousands of the most valuable trees, with no loss to the beauty of home or country.

OTHER DESTRUCTIVE EFFECTS.

In a region of unbroken forests the streams are usually clear, and their flow is comparatively regular. The piles of leaves, the beds of moss, and the deep leaf mold are as

myriads of sponges that absorb the falling rain, the roots of plants are so many pipes penetrating the earth, leading the water into reservoirs, from which the whole year they find their exit through springs, and thus keep up the normal currents of larger streams.

In the first settlement of this district every hollow between the hills afforded a rill; springs burst forth everywhere along them, and every mile or so little branches flowed where the fish could hide. Stock found water on every farm. With the destruction of the forests thousands of these springs have been destroyed, and the rills have disappeared. The ruins of the "old mill" are seen by the side of a stony gulch, and passers-by wonder "where they got their water."

The atmosphere has increased in dryness, and the ill effects from protracted dry spells are far worse than formerly. Every old person, with whom I talked, asserted that the summers are more oppressive, and the crops more uncertain than formerly, and that these evils had increased from year to year.

Local rains during the summer are far more variable of late years, and it is no unusual thing to see clouds divide, and follow the greater belts of forests with refreshing showers, while the intervening region, almost treeless, is left without its supply. The greatest amount of rain over this district undoubtedly falls over the knob region, as there is the greatest and richest body of forests; and the fact is so patent that it has been noticed and discussed by many persons.

The heads of all the streams are located there, and, in a large measure, they are the reservoirs from which the springs and wells are supplied. The utter destruction of these forests would be a great calamity, and one from which the district could never recover. The streams of Knob Lick, Clark's Run, Salt river, and Chaplin would cease to flow, save after heavy rains, while the freshets would become much more destructive.

The elevation and geological structure of the district make these evils greater than in other sections of the State, and every effort should be made to prevent their increase in the future.

Added to the destruction of our timbers, as noted by human agency, is another element that is alarming in itself. *The remaining trees in our forests are dying*, not singly or in clumps, but over the whole country there seems to be universal decay. Over the more rolling parts of Boyle and Mercer one may travel mile after mile, and scarcely find a perfect tree.

The elms (*Ulmus Americana*) are dying outright, and the mortality among them seems to increase year after year. For some years past the dying trees have amounted to ten per cent. of their numbers, and during this summer several of our most observing owners of woodlands have estimated their loss as high as twenty per cent. I have examined a number of trees of this species, and find that the leaves are all punctured and galled by some insect, until it seems that they have lost the power to perform their necessary functions.

The oaks, particularly the white, red, laurel, and post oaks, are dying at the top. Everywhere, above the green foliage, the dead limbs protrude, and each season adds to their number and length. Growing trees require in a season an immense quantity of water, and if a sufficient amount is not furnished, the parts farthest from the roots suffer first. The blue-grass sod absorbs a large amount of moisture, so that in seasons of great drought little of the water falling on the surface penetrates beneath the rootlets of the sod. The top limbs die from thirst, and succeeding rains enter the rotten limbs, and work downward until the whole tree becomes involved.

Other species are differently affected; but all, in some form, and to a greater or less extent, have incipient decay written on them. One great cause seems to be, that in the large destruction of timbers, the proportion of insects to trees has increased, and their destructive effects largely developed.

From some observations made this year, together with the recollections of some years since, there seems to have been a decided increase in the quantity of the false mistletoe (*Phoradendron flavescens*) which infests our trees. May it not be that this plant is injurious to the trees upon which it grows? As this species has its habitat upon many of our most valuable

species of timber trees, it is hoped that other and closer investigations will be made in regard to its influence.

SUMMARY.

The result of my observations and investigations may be summed up as follows:

First. That comparatively little really valuable timber remains in the district; the remainder seems doomed to speedy destruction, while no effort is being made to reproduce or protect young forests for the future.

Second. That a great deal of land has been ruined, or badly injured, by the destruction of the timber over it, and an unwise system of cultivation.

Third. That from the large destruction of forests, and its geological elevation, the atmosphere has become drier, crops more uncertain, and the water supply less.

Fourth. That the present proportion of cleared lands to forests should never be increased; but that, when suitable land should hereafter be cleared, an equal amount of injured soils should be given to the growth of forests.

Fifth. That no part of the knobs in Boyle county should ever be cleared entirely of trees; but every encouragement should be given to increase the forests upon them.

CONCLUSION.

Several interesting questions suggested themselves to my mind while preparing my notes. One I shall briefly notice, as it is a question the solution of which would be of considerable interest. Up to eight or ten years ago malarial diseases were little known over Boyle and Mercer counties; but they have, since that time, been gradually increasing.

In view of the reputed properties of the eucalyptus, may not a similar office have been performed by our native plants in the past, the destruction of which have left the way clear for this introduction of disease?

The subjoined list will be found nearly complete for the trees and shrubs; but for the smaller plants, owing to the

period of the year when the list was made, it does not show, perhaps, more than one fourth of the forms.

In the old deeds recorded in Mercer county, the Kentucky coffee-tree is named mahogany.

The common names for the aromatic sumac (*Rhus aromatica*) are stink-wood, polecat-wood, and skunk-wood, while the alder buckthorn (*Frangula caroliniana*) is called the Indian cherry. *Ptelea trifoliata* is known as the wafer-ash, and *Cladrastis tinctoria* is called shittim-wood.

The lead plant (*Amorpha canescens*) has its range in the West and Northwest, and is believed by miners to indicate the presence of lead ore. It seemed singular to find it growing here, out of its known district, and especially where some little lead is found in the veins of the deeper rocks that line the Kentucky river.

Perhaps we have no forest tree in this country of a more limited distribution than yellow-wood (*Cladrastis tinctoria*). It was quite common for some miles along the Kentucky and Dick's rivers, but has been nearly exterminated. Some measures should be taken to insure its preservation, not only on account of its beauty as an ornamental species, but its wood is really beautiful, and susceptible of a very fine polish, and for fancy work, where a yellow wood of great toughness is desirable, its value should be great. Some years since the Shakers gathered its seeds in large quantities, and sold them to nurserymen in the North; but I have been unable to learn the success that attended their efforts to propagate them.

The white pine (*Pinus Strobus*, L.) seems well adapted to some of our soils, growing rapidly and straight, shedding its lower limbs well, and would prove valuable for wind-breaks, and, in time, for timber.

Ranunculaceæ—

Leather flower, Clematis Viorna (L.)

Common virgin's bower, C. Virginiana (L.)

Carolina anemone, Anemone Caroliniana (Walt.)

Wind-flower, A. nemorosa (L.)

Round-lobed hepatica, *Hepatica triloba* (Chaix.)
 Sharp-lobed hepatica, *H. acutiloba* (DC.)
 Rue anemone, *Thalictrum anemonoides* (Mx.)
 Tall meadow-rue, *T. Cornuti* (L.)
 Early meadow-rue, *T. dioicum* (L.)
 White water-crowfoot, *Ranunculus aquatilis* (L.)
 Small-flowered crowfoot, *R. abortivus* (L.)
 Hooked crowfoot, *R. recurvatus* (Poir.)
 Bristly crowfoot, *R. Pennsylvanicus* (L.)
 Early crowfoot, *R. fascicularis* (Muhl.)
 Tall crowfoot, *R. acris* (L.)
 Columbine, *Aquilegia Canadensis* (L.)
 Tall larkspur, *Delphinium exaltatum* (Ait.)
 Dwarf larkspur, *D. tricornis* (Mx.)
 Azure larkspur, *D. azureum* (Mx.)
 Field larkspur, *D. consolida* (L.)
 Yellow-root, *Hydrastis Canadensis* (L.)
 Red baneberry, *Actæa spicata* (L.), var. *rubra* (Mx.)
 American bugbane, *Cimifuga Americana* (Mx.)

Magnoliaceæ—

Cucumber tree, *Magnolia acuminata* (L.)
 Tulip tree, Yellow poplar, *Liriodendron Tulipifera* (L.)

Anonaceæ—

Papaw, *Asimina triloba* (Dunal.)

Menispermaceæ—

Canadian moonseed, *Menispermum Canadense* (L.)

Berberidaceæ—

Twin leaf, *Jeffersonia diphylla* (Pers.)
 May-apple, Mandrake, *Podophyllum peltatum* (L.)

Papaveraceæ—

Celandine poppy, *Stylophorum dyphyllum* (Nutt.)
 Puccoon, Blood-root, *Sanguinaria Canadensis* (L.)

Fumariaceæ—

Dutchman's breeches, *Dicentra Cucullaria* (DC.)
 Squirrel corn, *D. Canadensis* (DC.)
 Pale corydalis, *Corydalis glauca* (Pursh.)
 Golden corydalis, *C. aurea* (Willd.)

Cruciferae—

- Water cress, *Nasturtium sessiliflorum* (Nutt.)
- Marsh cress, *N. palustre* (DC.)
- Toothwort, *Dentaria diphylla* (L.)
- Bitter cress, *Cardamine rhomboidea* (DC.)
- Rock cress, *Arabis lyrata* (L.)
- Rock cress, *A. patens* (Sulliv.)
- Rock cress, *A. hesperidoides*.
- Black mustard, *Sinapis nigra* (L.)
- Whitlow grass, *Draba cuneifolia* (Nutt.)
- Shepherd's purse, *Capsella Bursa-pastoris* (Moench.)
- Pepper-grass, *Lepidium Virginicum* (L.)

Violaceae—

- Green violet, *Solea concolor* (Ging.)
- Round-leaved violet, *Viola rotundifolia* (Mx.)
- Sweet white violet, *V. blanda* (Willd.)
- Common blue violet, *V. cucullata* (Ait.)
- Bird-foot violet, *V. pedata* (L.)
- Long-spurred violet, *V. rostrata* (Pursh.)
- Pale violet, *V. striata* (Ait.)
- Canada violet, *V. Canadensis* (L.)
- Downy yellow violet, *V. pubescens* (Ait.)
- Pansy, *V. tricolor* (L.)

Hypericaceae—

- St. John's wort, *Hypericum dolabriforme* (Vent.)
- St. John's wort, *H. corymbosum* (Muhl.)

Caryophyllaceae—

- Bouncing Bet, *Saponaria officinalis* (L.)
- Starry campion, *Silene stellata* (Ait.)
- Wild pink, *S. Pennsylvanica* (Mx.)
- Fire pink, *S. Virginica* (L.)
- Round-leaved catchfly, *S. rotundifolia* (Nutt.)
- Cockle, *Lychnis Githago* (Lam.)
- Sandwort, *Arenaria patula* (Mx.)
- Common chickweed, *Stellaria media* (Smith.)
- Great chickweed, *S. pubera* (Mx.)

Long-leaved chickweed, *S. longifolia* (Muhl.)
 Larger mouse-eared chickweed, *Cerastium vicosum*
 (L.)

Portulacaceæ—

Purslane, *Portulaca oleracea* (L.)
 Spring beauty, *Claytonia Virginica* (L.)

Malvaceæ—

Common mallow, *Malva rotundifolia* (L.)
 Sida, *Sida spinosa* (L.)
 Velvet leaf, *Abutilon Avicennæ* (Gærtn.)

Tiliaceæ—

Linden, basswood, *Tilia Americana* (L.)
 White basswood, *T. heterophylla* (Vent.)

Linaceæ—

Wild flax, *Linum Virginianum* (L.)

Geraniaceæ—

Herb Robert, *Geranium Robertianum* (L.)
 Pale touch-me-not, *Impatiens pallida* (Nutt.)
 Spotted touch-me-not, *I. fulva* (Nutt.)
 Common wood-sorrel, *Oxalis Acetosella* (L.)
 Violet wood-sorrel, *O. violacea* (L.)
 Yellow wood-sorrel, *O. stricta* (L.)

Rutaceæ—

Prickly ash, *Zanthoxylum Americanum* (Mill.)
 Hop-tree, *Ptelea trifoliata* (L.)
 Tree of Heaven, *Ailanthus glandulosus* (Desf.)

Anacardiaceæ—

Staghorn sumac, *Rhus typhina* (L.)
 Smooth sumac, *R. glabra* (L.)
 Dwarf sumac, *R. copallina* (L.)
 Poison oak, *R. Toxicodendron* (L.)
 Poison oak, var. *radicans* (L.)
 Fragrant sumac, *R. aromatica* (Ait.)

Vitaceæ—

Summer grape, *Vitis æstivalis* (Mx.)
 Winter grape, *V. cordifolia* (Mx.)

Fox grape, *V. Labrusca* (L.)
V. indivisa (Willd.)
 Virginian creeper, Woodbine, *Ampelopsis quinque-
 folia* (Mx.)

Rhamnaceæ—

Buckthorn, *Rhamnus lanceolatus* (Pursh.)
 Alder buckthorn, *Frangula Caroliniana* (Gray.)

Celastraceæ—

Climbing bitter-sweet, *Celastrus scandens* (L.)
 Waahoo, *Euonymus atropurpureus* (Jacq.)
 Strawberry bush, *E. Americanus* (L.)
 Strawberry bush, var. *obovatus* (Torr & Gray.)

Sapindaceæ—

Bladder-nut, *Staphylea trifolia* (L.)
 Ohio buckeye, *Æsculus glabra* (Willd.)
 Sweet buckeye, *A. flava* (Ait.)
 Red buckeye, *A. pavia* (L.)
 Sugar maple, *Acer saccharinum* (Wang.)
 Black sugar maple, *A. nigrum* (Mx.)
 White maple, *A. dasycarpum* (Ehrhart).
 Red maple, *A. rubrum* (L.)
 Box-elder, *Negundo aceroides* (Mœnch.)

Polygalaceæ—

Milkwort, *Polygala fastigiata* (Nutt.)
 Seneca Snakeroot, *P. Senega* (L.)

Leguminosæ—

Rabbit-foot clover, *Trifolium arvense* (L.)
 Red clover, *T. pratense* (L.)
 Zig-zag clover, *T. medium* (L.)
 Buffalo clover, *T. reflexum* (L.)
 White clover, *T. repens* (L.)
 Low hop clover, *T. procumbens* (L.)
 Sweet clover, *Melilotus officinalis* (Willd.)
 White sweet clover, *M. alba* (Lam.)
 Lead-plant, *Amorpha canescens* (Nutt.)
 Locust tree, *Robinia Pseudacacia* (L.)

- Wistaria, *Wistaria frutescens* (DC.)
 Sensitive joint-vetch, *Æschynomene hispida* (Willd.)
 Tick trefoil, *Desmodium Canadense* (DC.)
 Tick trefoil, *D. nudiflorum* (DC.)
 Vetch, *Vicia Caroliniana* (Walt.)
 Spurred butterfly-pea, *Centrosema Virginianum*
 (Benth.)
 Blue false indigo, *Baptisia australis* (R. Br.)
 Yellow-wood, *Cladrastis tinctoria* (Raf.)
 Redbud, *Cercis Canadensis* (L.)
 Wild senna, *Cassia Marilandica* (L.)
 Partridge pea, *C. Chamæcrista* (L.)
 Wild sensitive plant, *C. nictitans* (L.)
 Kentucky coffee-tree, *Gymnocladus Canadensis*
 (Lam.)
 Honey-locust, *Gleditschia triacanthos* (L.)

Rosaceæ—

- Wild plum, *Prunus Americana* (Marshall.)
 Chickasaw plum, *P. Chicasa* (Mx.) (native.)
 Wild cherry, *Cerasus serotina* (Ehrhart.)
 Nine bark, *Spiræa opulifolia* (L.)
 Agrimony, *Agrimonia parviflora* (Ait.)
 Indian physic, *Gillenia stipulacea* (Nutt.)
 Avens, *Geum album* (Gmelin.)
 Five finger, *Potentilla Canadensis* (L.)
 Five finger, var. *simplex* (Torr & Gray.)
 Wild strawberry, *Fragaria Virginiana* (Ehrhart.)
 Wild strawberry, *F. vesca* (L.)
 Wild raspberry, *Rubus occidentalis* (L.)
 Blackberry, *R. villosus* (Ait.)
 Dewberry, *R. Canadensis* (L.)
 Dwarf wild rose, *Rosa lucida* (Ehrhart.)
 Sweet brier, *R. rubiginosa* (L.)
 Washington thorn, *Cratægus cordata* (Ait.)
 Red haw, thorn tree, *C. coccinea* (L.)
 Black thorn, *C. tomentosa* (L.)
 Cockspur thorn, *C. Crus-galli* (L.)

Crab-apple, *Pyrus coronaria* (L.)

Service-berry, *Amelanchier Canadensis* (Torr & Gray.)

Saxifragaceæ—

Wild gooseberry, *Ribes Cynosbati* (L.)

Wild hydrangea, *Hydrangea arborescens* (L.)

Early saxifrage, *Saxifraga Virginiensis* (Mx.)

Alum root, *Heuchera caulescens* (Pursh.)

Alum root, *H. pubescens* (Pursh.)

Bishop's cap, *Mitella diphylla* (L.)

Crassulaceæ—

Ditch stone-crop, *Penthorum sedoides* (L.)

Stone-crop, *Sedum pulchellum* (Mx.)

Stone-crop, *S. ternatum* (Mx.)

Hamamelaceæ—

Witch-hazel, *Hamamelis Virginica* (L.)

Sweet gum, *Liquidamber Styraciflua* (L.)

Onagraceæ—

Gaura filipes (Spach.)

G. biennis (L.)

Evening primrose, *Oenothera biennis* (L.)

Lythraceæ—

Clammy cuphea, *Cuphea viscosissima* (Jacq.)

Cactaceæ—

Prickly pear, *Opuntia Rafinesquii* (Engelm.)

Passifloraceæ—

Small passion flower, *Passiflora lutea* (L.)

Passion flower, *P. Incarnata* (L.)

Umbelliferæ—

Black snake-root, *Sanicula Canadensis* (L.)

Common carrot, *Daucus Carota* (L.)

Meadow parsnip, *Thaspium aureum* (Nutt.)

Smoother sweet cicely, *Osmorrhiza longistylis* (DC.)

Hairy sweet cicely, *O. brevistylis* (DC.)

Harbinger of spring, *Erigenia bulbosa* (Nutt.)

Araliaceæ—

Wild sarsaparilla, *Aralia nudicaulis* (L.)
Ginseng, *A. quinquefolia* (L.)

Cornaceæ—

Flowering dogwood, *Cornus florida* (L.)
Silky cornel, *C. sericea* (L.)
Rough-leaved dogwood, *C. asperifolia* (Mx.)
Alternate-leaved cornel, *C. alternifolia* (L.)
Black or sour gum, *Nyssa multiflora* (Wang.)

Caprifoliaceæ—

Buck-berry, Coral-berry, *Symphoricarpos vulgaris*
(Mx.)
Small honeysuckle, *Lonicera parviflora* (Lam.)
Horse-gentian, *Triosteum perfoliatum* (L.)
Common elder, *Sambucus Canadensis* (L.)
Red-berried elder, *S. pubens* (Mx.)
Black haw, *Viburnum prunifolium* (L.)

Rubiaceæ—

Madder, Cleavers, *Galium Aparine* (L.)

Dipsaceæ—

Wild teasel, *Dipsacus sylvestris* (Mill.)

Compositæ—

Iron-weed, *Vernonia Noveboracensis* (Willd.)
Joe-Pye weed, *Eupatorium purpureum* (L.)
Horse-weed, Great ragweed, *Ambrosia trifida* (L.)
Ragweed, Hogweed, *A. artemisiæfolia* (L.)
Cocklebur, *Xanthium strumarium* (L.)
Wild sunflower, *Helianthus occidentalis* (Riddell.)
Wild sunflower, *H. grosse serratus* (Martens.)
Wild sunflower, *H. divaricatus* (L.)
Common Beggar-ticks, *Bidens frondosa* (L.)
Swamp Beggar-ticks, *B. connata* (Muhl.)
Spanish needles, *B. pinnata* (L.)
May-weed, *Maruta Cotula* (DC.)
Common yarrow, *Achillea Millefolium* (L.)
Wormwood, *Artemisia absinthium* (L.)

Common everlasting, *Gnaphalium polycephalum* (Mx.)
 Plantain-leaved everlasting, *Antennaria plantaginifolia* (Hook.)

Common thistle, *Cirsium lanceolatum* (Scop.)

High thistle, *C. altissimum* (Spreng.)

Burdock, *Lappa officinalis* (Allioni.)

Dandelion, *Taraxacum Dens-leonis* (Desf.)

Wild lettuce, *Lactuca Canadensis* (L.)

Sow thistle, *Sonchus oleraceus* (L.)

Lobeliaceæ—

Cardinal flower, *Lobelia cardinalis* (L.)

Indian tobacco, *L. inflata* (L.)

Campanulaceæ—

Tall bell flower, *Campanula Americana* (L.)

Ericaceæ—

Deerberry, *Vaccinium stamineum* (L.)

Dwarf blueberry, *V. Pennsylvanicum* (Lam.)

Sour-wood, *Oxydendrum arboreum* (DC.)

Laurel, *Kalmia latifolia* (L.)

Aquifoliaceæ—

American holly, *Ilex opaca* (Ait.)

Ebeneaceæ—

Persimmon, *Diospyros Virginiana* (L.)

Styracaceæ—

Storax, *Styrax Americana* (Lam.)

Plantaginaceæ—

Common plantain, *Plantago major* (L.)

Ribgrass, *P. lanceolata* (L.)

Ribgrass, *P. pusilla* (Nutt.)

Primulaceæ—

American cowslip, *Dodecatheon Meadia* (L.)

Loosestrife, *Lysimachia ciliata* (L.)

Loosestrife, *L. lanceolata* (Walt.)

Bignoniaceæ—

Cross vine, *Bignonia capreolata* (L.)

Trumpet creeper, *Tecoma radicans* (Juss.)

Catalpa, *Catalpa bignonioides* (Walt.)
 Unicorn plant, *Martynia proboscidea* (Glox.)

Orobanchaceæ—

Beech-drops, *Epiphegus Virginiana* (Bart.)

Scrophulariaceæ—

Common mullein, *Verbascum Thapsus* (L.)
 Moth mullein, *V. Blattaria* (L.)
 Collinsia, *Collinsia verna* (Nutt.)
 Beard-tongue, *Pentstemon pubescens* (Solander.)
 Beard-tongue, *P. Digitalis* (Nutt.)
 Thyme-leaved speedwell, *Veronica serpyllifolia* (L.)
 Corn speedwell, *V. arvensis* (L.)
 Water speedwell, *V. Anagallis* (L.)
 Gerardia, *Gerardia integrifolia* (Gray.)

Acanthaceæ—

Ruellia ciliosa (Pursh.)

Verbenaceæ—

Narrow-leaved vervain, *Verbena angustifolia* (Mx.)
 White vervain, *V. urticifolia* (L.)
 Blue vervain, *V. hastata* (L.)
 Fog-fruit, *Lippia lanceolata* (Mx.)

Labiataæ—

Spearmint, *Mentha viridis* (L.)
 Peppermint, *M. piperita* (L.)
 Wild mint, *M. Canadensis* (L.)
 Common balm, *Melissa officinalis* (L.)
 American pennyroyal, *Hedeoma pulegioides* (Pers.)
 Lyre-leaved sage, *Salvia lyrata* (L.)
 Wild bergamot, *Monarda fistulosa* (L.)
 Horse-mint, *M. punctata* (L.)
Blephilia hirsuta (Benth.)
 Giant hyssop, *Lophanthus nepetoides* (Benth.)
 Catnip, *Nepeta Cataria* (L.)
 Ground ivy, *N. Glechoma* (Benth.)
 Synandra, *Synandra grandiflora* (Nutt.)
 Self-heal, *Brunella vulgaris* (L.)

Skullcap, *Scutellaria versicolor* (Nutt.)
 Skullcap, *S. nervosa* (Pursh.)
 Serrate skullcap, *S. serrata* (Andrews.)
 Mad-dog skullcap, *S. lateriflora* (L.)
 Horehound, *Marrubium vulgare* (L.)
 Motherwort, *Leonurus Cardiaca* (L.)
 Dead nettle, *Lamium amplexicaule* (L.)

Borraginaceæ—

False gromwell, *Onosmodium Carolinianum* (DC.)
 Gromwell, *Lithospermum canescens* (Lehm.)
 Lungwort, *Mertensia Virginica* (DC.)
 Stickseed, *Echinosperrum Lappula* (Lehm.)
 Hound's-tongue, *Cynoglossum officinale* (L.)
 Wild comfrey, *C. Virginicum* (L.)
 Beggar's lice, *C. Morisoni* (DC.)

Hydrophyllaceæ—

Waterleaf, *Hydrophyllum macrophyllum* (Nutt.)
 Waterleaf, *H. Virginicum* (L.)
 Waterleaf, *H. Canadense* (L.)
 Waterleaf, *H. appendiculatum* (Mx.)
 Phacelia, *Phacelia bipinnatifida* (Mx.)
 Phacelia, *P. Purshii* (Buckley.)

Polemoniaceæ—

Greek valerian, *Polemonium reptans* (L.)
 Phlox, *Phlox paniculata* (L.)
 Phlox, *P. Carolina* (L.)
 Phlox, *P. divaricata* (L.)
 Ground or moss pink, *P. subulata* (L.)

Convolvulaceæ—

Morning-glory, *Ipomœa purpurea* (Lam.)
 Morning-glory, *I. Nil* (Roth.)
 Morning-glory, *I. lacunosa* (L.)
 Wild potato vine, *I. pandurata* (Meyer.)
 Bracted bindweed, *Calystegia spithamæa* (Pursh.)
 Dodder, *Cuscuta glomerata* (Choisy.)

Solanaceæ—

- Bittersweet, *Solanum dulcamara* (L.)
- Common nightshade, *S. nigrum* (L.)
- Horse nettle, *S. Carolinense* (L.)
- Ground cherry, *Physalis angulata* (L.)
- Ground cherry, *P. pubescens* (L.)
- Ground cherry, *P. viscosa* (L.)
- White Jamestown weed, *Datura Stramonium* (L.)
- Purple Jamestown weed, *D. Tatula* (L.)

Gentianaceæ—

- Columbo, *Frasera Carolinensis* (Walt.)

Loganiaceæ—

- Polypremum procumbens (L.)

Apocynaceæ—

- Dogbane, *Apocynum androsæmifolium* (L.)
- Indian hemp, *A. cannabinum* (L.)

Asclepiadaceæ—

- Common milkweed, *Asclepias cornuti* (Decaisne.)
- Purple milkweed, *A. purpurascens* (L.)
- Variegated milkweed, *A. variegata* (L.)
- Four-leaved milkweed, *A. quadrifolia* (Jacq.)
- Obtuse-leaved milkweed, *A. obtusifolia* (Mx.)
- Swamp milkweed, *A. incarnata* (L.)
- Green milkweed, *Acerates paniculata* (Decaisne.)
- Green milkweed, *A. viridifloræ* (Ell.)
- Gonolobus, *Gonolobus obliquus* (R. Br.)
- Enslenia, *Enslenia albida* (Nutt.)

Oleaceæ—

- White ash, *Fraxinus Americana* (L.)
- Black ash, *F. sambucifolia* (Lam.)
- Blue ash, *F. quadrangulata* (Mx.)

Aristolochiaceæ—

- Wild ginger, *Asarum Canadense* (L.)

Phytolaccaceæ—

- Pokewood, *Phytolacca decandra* (L.)

Chenopodiaceæ—

- Lamb's quarters, *Chenopodium album* (L.)
- Goosefoot, *C. hybridum* (L.)
- Mexican tea, *C. ambrosioides* (L.)

Amarantaceæ—

- Pig-weed, *Amarantus retroflexus* (L.)
- Pig-weed, *A. spinosus* (L.)

Polygonaceæ—

- Smart-weed, *Polygonum hydropiper* (L.)
- Smart-weed, *P. acre* (H. B. K.)
- Door-weed, *P. aviculare* (L.)
- Black bind-weed, *P. Convolvulus* (L.)
- Hedge bind-weed, *P. dumetorum* (L.)
- Pale dock, *Rumex Britannica* (L.)
- Curled dock, *R. crispus* (L.)
- Bloody-veined dock, *R. sanguineus* (L.)
- Sheep sorrel, *R. Acetosella* (L.)

Lauraceæ—

- Sassafras, *Sassafras officinale* (Nees.)
- Spicewood, *Lindera Benzoin* (Meisner.)
- Spicewood, *L. melissæfolia* (Blume.)

Thymeleaceæ—

- Leatherwood, *Dirca palustris* (L.)

Loranthaceæ—

- American mistletoe, *Phoradendron flavescens* (Nutt.)

Euphorbiaceæ—

- Spurge, *Euphorbia corollata* (L.)
- Spurge, *E. commutata* (Engelm.)
- Spurge, *E. hypericifolia* (L.)

Urticaceæ—

- Slippery or red elm, *Ulmus fulva* (Mich.)
- White elm, *U. Americana* (L.)
- Corky white elm, *U. racemosa* (Thomas.)
- Winged elm, *U. alata* (Mx.)
- Planer tree, *Planera aquatica* (Gmel.)
- Hackberry, *Celtis occidentalis* (L.)

- Mulberry, *Morus rubra* (L.)
- Wood nettle, *Laportea Canadensis* (Gaudichaud.)
- Richweed, *Pilea pumila* (Gray.)
- Wild hop, *Humulus Lupulus* (L.)

Plantanaceæ—

- Sycamore, *Platanus occidentalis* (L.)

Juglandaceæ—

- White walnut, *Juglans cinerea* (L.)
- Black walnut, *J. nigra* (L.)
- Pecan nut, *Carya olivæformis* (Nutt.)
- Shellbark hickory, *C. alba* (Nutt.)
- Small fruited hickory, *C. microcarpa* (Nutt.)
- Western shellbark hickory, *C. sulcata* (Nutt.)
- Mockernut hickory, *C. tomentosa* (Nutt.)
- Pignut hickory, *C. porcina* (Nutt.)
- Bitternut hickory, *C. amara* (Nutt.)

Cupilifera—

- White oak, *Quercus alba* (L.)
- Post oak, *Q. obtusiloba* (Mx.)
- Burr oak, *Q. macrocarpa* (Mx.)
- Chestnut oak, *Q. Prinus* (L.)
- Rock chestnut oak, var. *monticola* (Mx.)
- Yellow chestnut oak, var. *acuminata* (Mx.)
- Laurel oak, *Q. imbricaria* (Mx.)
- Black jack, *Q. nigra* (L.)
- Scarlet oak, *Q. coccinea* (Wang.)
- Red oak, *Q. rubra* (L.)
- Chestnut, *Castanea vesca* (L.)
- White beech, *Fagus sylvatica* (L.)
- Red beech, *F. ferruginea* (Ait.)
- Hazlenut, *Corylus Americana* (Walt.)
- Ironwood, *Ostrya Virginica* (Willd.)
- Water-beech, hornbeam, *Carpinus Americana* (Mx.)

Salicaceæ—

- Glaucous willow, *Salix discolor* (Muhl.)
- Petioled willow, *S. petiolaris* (Smith.)
- Black willow, *S. nigra* (Marsh.)

American aspen, *Populus tremuloides* (Mx.)
 Necklace poplar, *P. monilifera* (Ait.)
 Balsam poplar, *P. balsamifera*, var. *Candicans* (L.)
 White poplar, *P. alba* (L.), naturalized.

Coniferae—

Jersey or scrub pine, *Pinus inops* (Ait.)
 Red cedar, *Juniperus Virginiana* (L.)

Araceae—

Indian turnip, *Arisæma triphyllum* (Torr.)
 Dragon-root, *A. Dracontium* (Schott.)
 Calamus, *Acorus Calamus* (L.)

Typhaceae—

Cat-tail flag, *Typha latifolia* (L.)

Orchidaceae—

Coral-root, *Corallorhiza odontorhiza* (Nutt.)

Amaryllidaceae—

False aloe, *Agave Virginica* (L.)

Iridaceae—

Blue flag, *Iris versicolor* (L.)
 Dwarf iris, *I. verna* (L.)
 Crested dwarf iris, *I. cristata* (Ait.)
 Blackberry lily, *Pardanthus Chinensis* (Ker.)
 Blue-eyed grass, *Sisyrinchium Bermudiana* (L.)

Dioscoreaceae—

Wild-yam root, *Dioscorea villosa* (L.)

Smilacaceae—

Green briar, *Smilax rotundifolia* (L.)
 Green briar, *S. glauca* (Walt.)
 Green briar, *S. tamnoides* (L.)
 Carrion-flower, *S. herbacea* (L.)

Liliaceae—

Wake robin, *Trillium sessile* (L.)
 Wake robin, *T. recurvatum* (Beck.)
 Wake robin, *T. erectum* (L.)
 Bell-flower, *Uvularia perfoliata* (L.)
 Bell-flower, *U. sessilifolia* (L.)
 Lily of the valley, *Convallaria majalis* (L.)

False Solomon's seal, *Smilacina racemosa* (Desf.)
 Smaller Solomon's seal, *Polygonatum biflorum* (Ell.)
 Greater Solomon's seal, *P. giganteum* (Dietrich.)
 Dog's-tooth violet, *Eythronium Americanum* (Smith.)
 Squill, wild hyacinth, *Scilla Fraseri*.
 Wild onion, *Allium cernuum* (Roth.)

Filices—

Scaly polypody, *Polypodium incanum* (Swartz.)
 Maiden-hair fern, *Adiantum pedatum* (L.)
 Cliff-brake fern, *Pellæa atropurpurea* (Link.)
 Ebony spleenwort, *Asplenium ebeneum* (Ait.)
 Wall-rue spleenwort, *A. Ruta muraria* (L.)
 Narrow-leaved spleenwort, *A. angustifolium* (Mx.)
 Marsh spleenwort, *A. thelypteroides* (Mx.)
 Lady fern, *A. Filix-fœmina* (Bernh.)
 Walking-leaf fern, *Camptosorus rhizophyllus* (Link.)
 Beech fern, *Phegopteris hexagonoptera* (Fée.)
 New York shield fern, *Aspidium Noveboracense*
 (Swartz.)
 Marginal shield fern, *A. marginale* (Swartz.)
 Christmas fern, *A. acrostichoides* (Swartz.)
 Bulbous bladder fern, *Cystopteris bulbifera* (Bernh.)
 Common bladder fern, *C. fragilis* (Bernh.)
 Sensitive fern, *Onoclea sensibilis* (L.)
 Obtused-leaved woodsia, *Woodsia obtusa* (Torr.)
 Virginia moonwort, *Botrychium Virginicum* (Swartz.)
 Ternate moonwort, *B. ternatum* (Willd.)