ELEMENTARY SCIENCE. **BULLETINS NOS. 7 AND 8.**

March 24, 1899.

MICHIGAN

STATE AGRICULTURAL COLLEGE

EXPERIMENT STATION

CLINTON D. SMITH, DIRECTOR

BOTANICAL DEPARTMENT

TWO PROGRAMS FOR ARBOR DAY

I. Convention of Trees in 1888

II. Convention of Trees in 1899

BY W. J. BEAL

AGRICULTURAL COLLEGE, MICHIGAN
1899

These are the seventh and eighth of a series of bulletins on elementary science, published at the Agricultural College. While they are prepared especially with the view of helping teachers in the common schools, they should interest every enterprising farmer and horticulturist, or any other wide-awake citizen. Inquiries for bulletins or information regarding this work should be addressed to

THE SECRETARY,
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The following bulletins of this series have been published:

1. *Observing and Comparing Beans and Peas Before and After Sprouting.*

2. *Study of Wheat and Buckwheat Before and After Sprouting.*

3. *A Study of the Seeds of Timothy and Red Clover Before and After Sprouting.*

4. *Observations on the Leaves of Clovers at Different Times of Day.*

5. *Branches of Sugar Maple and Beech as Seen in Winter.*

6. *Potatoes, Rutabagas and Onions.*

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ELEMENTARY SCIENCE.

A CONVENTION OF MICHIGAN TREES.

(The text of this Bulletin was published in 1888, as a portion of Bulletin number 33, and reprinted in Michigan Board of Agriculture for 1888 beginning on page 366.)

Norway Pine (Louie): Fellow trees of Michigan, to organize this meeting I move the election of White Oak as chairman. (Seconded.) All who favor this motion please say aye. (Unanimous vote.) Those who are opposed will say no. The ayes have it, and White Oak will take the chair.

White Oak (Julius): Fellow trees, the object of our meeting is to consider whatever may be to our best interests in the forests of Michigan. It is a subject of great importance to the State and to all of us, and we hope to gain much valuable information from each other and to hear from every one present.

We have gathered from all parts of the State for this conference. As we should keep a permanent record of our proceedings, and as the newspapers will probably wish to publish our papers and discussions, I think a secretary will be needed to take the minutes of this meeting.

Beech (Harry): I nominate Chestnut (Lillie) to act as secretary. (Seconded.)

White Oak All who favor the nomination last made will say aye. Those who are opposed will say no. The ayes have it, and Chestnut is elected secretary. (She takes her place.)

White Oak: Our musician, Pine (Bessie), has kindly arranged the music for us. She sings only when the spirits move her. We may know when that is by the peculiar swaying of her head. At the swaying let us suspend business and listen. She moves—we will hear "The Echoes from the Forest."

White Oak: We are now ready for discussion. (Several trees rising at once.)

White Oak: Tulip tree has the floor.

Tulip Tree (Herman): Fellow trees, I am glad to have this opportunity to plead my qualifications as an ornamental tree. I grow to a great size and height and have shining, queer shaped leaves and large, tulip-shaped blossoms which remind you of the sunny South, where my sisters, the Magnolias, live.

Burr Oak (Joseph): I should like to ask Tulip tree of what use he is? Michigan people have a right to demand of us both usefulness and beauty.

Tulip Tree: I am not only valuable as an ornamental shade tree, but I also furnish excellent timber for carriage bodies, furniture, and finishing houses. Years ago my forefathers were numerous south of the Grand River Valley, and supplied wood for laths, shingles, and lumber in the place of the white pine. Our family is a small one, represented in Michigan by a single species.

White Oak: We shall be glad to hear from any members of the Oak family who live in Michigan. (Sixteen members rise.)

White Oak: This is certainly a large family. I recognize Chestnut as entitled to the floor. What claims have you to rank in the Oak family?

Chestnut: All botanists of the present day agree that the Beech, the Ironwood, the Blue Beech, and the Hazels and Chestnuts are first cousins to the Oaks. I live in four counties in the southeast part of the State and am well known for valuable timber and a good crop of edible nuts.

Beech: Upon my smooth, gray bark many a heart history has been carved. The poet Campbell tells it so beautifully:

> "Thrice twenty summers have I stood,
> Since youthful lovers in my shade
> Their vows of truth and rapture paid,
> And, on my trunk's surviving frame,
> Carved many a long forgotten name."

And here is another beautiful thing from Whittier:

"I have always admired the taste of the Indians around Sebago Lake, who, when their chief died, dug round the beech tree, swaying it down, and placed his body in the rent, and then let the noble tree fall back into its original place, a green and beautiful monument for a son of the forest."

I am one of the commonest and best known trees of Michigan.

Burr Oak: Ten of us Oaks, out of about 300, live in this State. Brother White Oak is by far the most common and well known. He is the senior member of our family and has attained a very great age. He never thrives in perfection except in a good soil and in a temperate climate. The Michigan people are proud that so many of our family live with them.

Tulip Tree: White Oak is certainly loyal to his family, but I should like to hear the uses of this tree.

Burr Oak: Every particle of him is useful, even to his ashes. His bark is used for tanning leather; his wood is hard, compact, heavy, tough and durable, good for heavy wagons, plows, railroad ties, fence posts, ship timber, furniture, and finishing the interior of houses.

Swamp White Oak (Leona): As much of my timber is so nearly like that of White Oak, and often passes for it, I will say as a tree, "I am beautiful in every stage of my growth; at first, light, slender, delicate and waving; at last, broad, massive, and grand, but always graceful."

Chestnut Oak (James): Emerson says of White Oak: "As an ornament to the landscape, or as a single object, no other tree is to be compared with it, in every period of its growth, for picturesqueness, majesty, and inexhaustible variety of beauty. When standing alone it throws out its mighty arms with an air of force and grandeur which have made it everywhere to be considered the fittest emblem of strength and power of resistance. Commonly the oak braves the storm to the last, without yielding, better than any other tree. The limbs go out at a great angle and stretch horizontally to a vast distance."

Laurel Oak (John): The famous A. J. Downing said: "There are no grander or more superb trees than our American oak. We are fully

disposed to concede it the first rank among the denizens of the forest. As an ornamental object we consider the oak the most varied in expression, the most beautiful, grand, majestic and picturesque of all deciduous trees."

Black Jack Oak (Herbert): Poetry, history, mythology and romance abound in references to the oak. I should like to hear from our fellow trees some common quotations in reference to the oak.

White Ash (Myrtie): "The unwedgeable and gnarled oak."

Black Ash (Ella): "The old oaken bucket."

Sugar Maple (Louise): "Jove's own tree that holds the woods in awful sovereignty."

Red Maple (Anna): "A goodly oak, whose boughs were mass'd with age."

Scarlet Oak (Ben): "King of the woods."

Blue Ash (Amy): "Thy guardian oaks, my country, are thy boast."

Silver Maple (Kate): "The monarch oak, the patriarch of trees."

Butternut (Burke): "The oak for grandeur, strength and noble size, excels all trees that in the forest grow."

Black Walnut (Frank): "Tall oaks from little acorns grow."

Buttonwood (Harrison),

" Woodman, forbear thy stroke!
Cut not its earth-bound ties;
Oh, spare that aged oak,
Now towering to the skies!"

Sassafras (Henry):

" Behold yon oak,
How stern he frowns."

Pepperidge (Walter): "The glory of the woods."

Buckeye (Samuel):

" Proud monarch of the forest!
That once, a sapling bough,
Didst quail far more at evening's breath
Than at the tempest now.
Strange scenes have passed, long ages roll'd
Since first upon thy stem,
Then weak as osier twig, spring set
Her leafy diadem."

Red Oak (Lulu): I begin to feel my pride rising, and hope White Oak will give me a chance to quote a poem written in honor of one of our family.

White Oak: (Bows.)

Red Oak:

" A glorious tree is the old gray oak;
He has stood for a thousand years—
Has stood and frowned
On the trees around
Like a king among his peers;
As round their king they stand, so now,
When the flowers their pale leaves fold,
The tall trees around him stand arrayed
In their robes of purple and gold.

" He has stood like a tower,
And dared the winds to battle,
He has heard the hail,
As from plates of mail
From his own limbs, shaken, rattle;
He has tossed them about, and shorn the tops,
When the storm has roused his might,
Of the forest trees as a strong man doth
The heads of his foes in fight."

Scarlet Oak (Otto): That poem which Red Oak quoted reminded me of an old saying of Dr. Holmes. He says: "I wonder if you ever thought of a single mark of supremacy which distinguishes this tree from those around it? The others shirk the work of resisting gravity; the oak defies it. It chooses the horizontal direction for its limbs so that their whole weight may tell, and then stretches them out 50 or 60 feet so that the strain may be mighty enough to be worth resisting. You will find that in passing from the extreme downward droop of the branches of the Weeping Willow to the extreme upward inclination of those of the Poplar, they sweep nearly half a circle. At 90 degrees the Oak stops short; to slant upward another degree would mark infirmity of purpose, to bend downward weakness of organization."

Black Oak (Ruby): What the Oak said sounds scientific. I want to tell you something that begins with "once upon a time." Once upon a time the devil agreed with a man that he should have the latter's soul at the time when the oak leaves fell; but when he came to look at the oak in the autumn he found it still in leaf, nor did it part with its old leaves till the new ones began to sprout. In his rage and disappointment he scratched the leaves so vehemently that they have been in consequence jagged ever since.

White Oak: These are certainly good words for the Oak family. We will next listen to some music from the little birds, our very dear friends.

White Oak: We shall next hear from the Maples, of which there are six in our State. They are cousins to the Buckeye, Bladdernut, and Boxelder, all of which belong to the Maple family.

Sugar Maple (Louise): I am a favorite ornamental tree. Poets of all ages have sung about the oak. I am no sweet singer of Michigan, but I am possessed of sweetness. I claim to have made more boys and girls happy than any other tree. I have many changes in dress—wearing in spring the softest shade of every color; in the summer the purest emerald, and in the autumn the most brilliant yellow. My wood is used for furniture, floors, and for furnishing the interior of houses, and after the houses are finished few can warm them better than I.

Red Maple (Mary): I am often called Soft Maple, a name also applied to one of my sisters. I beautify the country in spring with early red blossoms, and in autumn my leaves are streaked with scarlet.

Silver Maple (Jennie): My sister Red Maple and myself are both called Soft Maple. I make a very rapid growth and am found by the side of streams. I am often planted as a shade tree, and in the far west many are planted for shelter belts and for timber.

Bass Wood (Maud): I am a fine shade tree, my home a moist, rich soil. My fragrant flowers furnish a great amount of excellent honey for

the bees at a time when most other flowers have disappeared. My timber is soft, light and tough, and not apt to split, good for cabinet work, boxes, broom handles, etc.

Black Cherry (Ethel): With our beautiful blossoms we need not be envious of the orange groves of California. I am one large snowball of blossoms in the spring. My fruit is much liked by the birds, and my wood is fine, light, durable and looks much like mahogany. My cousins are the wild plum, crab-apple, mountain ash, hawthorn, Juneberry, spiræa, the apple, pear, quince, and the peach, and we all belong to the Rose family.

Black Walnut (Frank): I am not ornamental, nor am I a good neighbor, for I sometimes poison other trees that live near me. In spite of my bad qualities, I am liked because I can be converted into cash at any moment. Some of my brothers have sold as high as $2,000. Those who care for us care for a fortune. My relative, the Butternut, is much loved by boys and girls. It was round my brother at Haverstraw, on the Hudson, that Gen. Wayne mustered his forces at midnight, preparatory to his attack on Stony Point.

Hickory (Ray): There are four brothers of us in Michigan, but I am the least worthy of them all, and am the only one present at this convention. We are cousins of the Walnut and Butternut and all belong to the Walnut family. If you want a wood that is good for buggies, ax-handles, barrel-hoops, a wood like iron, call upon my brother, the Shag-bark. You will have all the nuts you want thrown into the bargain. Once upon a time there was a president of the country who had so many of my qualities that they called him Old Hickory.

White Oak: We will sing about the "Echo which in the forest dwells."

White Oak: We will next hear a few words from the Ashes. (Three rise and stand till all are through.)

White Ash (Myrtie): I am a tall tree and have often been complimented for my usefulness. I have been told that I have a graceful top and beautiful pinnate leaves. My wood is heavy, hard, strong, coarse-grained, compact, and of a brown color, and is much used for cabinet ware, farm implements, and house finishing. I thrive on rich, moist soil.

Blue Ash (Amy): I am not often found in Michigan. I grow slowly and attain a good size. My wood is valuable for lumber, posts and sills. I may be distinguished from all other Ashes by the square branches of a year's growth.

Black Ash (Ella): I thrive in swamps and along streams, and become a large, useful tree. My wood is used for furniture, barrel-hoops, and baskets. When well cared for, I become one of the finest ornamental trees. For this purpose I have never been fully appreciated. The Ashes belong to the Olive family. We have been called musical, as in this quotation:

> " Ye Ashes wild resounding o'er the steep,
> Delicious is your music to the soul."

White Oak: Who will speak next? (A number rise.) Birch has the floor.

Birch (William): I am a useful factor in the cause of education, though not now so commonly found in the school room as in former years. There are five sisters of us Birches in Michigan. The Alders are our cousins. Probably you are best acquainted with the Canoe Birch, whose

white wood you see in spools and shoe pegs. It gives up its beautiful white dress without any injury to itself. Longfellow has made us a celebrated family in Hiawatha. He says of us:

"Give me of your bark, O Birch tree!
Of your yellow bark, O Birch tree!
Growing by the rushing river,
Tall and stately in the valley!
I a light canoe will build me,
That shall float upon the river,
Like a yellow leaf in autumn,
Like a yellow water lily!
Lay aside your cloak, O Birch tree!
Lay aside your white skin wrapper,
For the summer time is coming,
And the sun is warm in heaven,
And you need no white skin wrapper."

White Oak: Let us hear from the Elms.

American Elm (Lida): I have been called the Queen of the Forest, and stand without a rival at the head of the list of ornamental deciduous leaved trees. I claim this rank on account of hardiness, rapid growth, and the graceful and majestic beauty of my drooping branches. We are very proud of our Massachusetts relative, under whose venerable shade Washington first took command of the Continental army, July 3, 1775. How the affection of every lover of his county clings around that tree! What care has been taken of it, what marks of esteem have been shown it by the citizens of Cambridge, may be judged by those who have seen it standing, as it does, in the center of a great public thoroughfare, its trunks protected by an iron fence from injury by passing vehicles, which for more than a century have turned out in deference to this monarch of the Revolution.

Red Elm (Claude): I am well known for my durable red wood and mucilaginous bark and am often called "Slippery Elm." My sister, Rock Elm, is a fine tree with corky branches, and the wood is valuable for farm implements.

Hackberry (Otis): I am one of the poor cousins of the Elms, and am little known. I am sometimes called the Nettle tree, and I am afraid Michigan people are not on speaking terms with me. Allow me to tell you about my German relative, the Luther Elm, near Worms. It is said to have been planted as follows: A bigoted old Catholic lady, thrusting a stick in the ground, declared her resolution not to accept the new faith till that dry stick became green. The fact that it did so proved the interest taken by trees in the preservation of orthodoxy.

Red Mulberry (Robert): I am another obscure cousin of the Elms and not often seen in Michigan. The birds are fond of my berries and the wood is as valuable as cedar for posts. Let me praise the Elm.

"Hail to the Elm! the brave old Elm,
Our last lone forest tree,
Whose limbs outstand the lightning's brand,
For a brave old Elm is he!
For fifteen score of full-told years,
He has borne his leafy prime,
Yet he holds them well, and lives to tell
His tale of the olden time!"

White Oak: Let us all repeat the lines of N. S. Dodge in praise of the Elm.

"Then hail to the Elm! the green-topped elm!
And long may his branches wave,
For a relic is he, the gnarled old tree,
Of the times of the good and brave."

White Oak: We will have another song about the birds (or any other subject).

White Oak: We have heard nothing from the Willows.

Willow (Marion): I live near the water and my wood is made into the strangest things, artificial limbs, tooth-picks, ball clubs and gunpowder. Some of us are called "Pussy willows."

Elizabeth Allen has written this lovely poem to my sister the Weeping Willow of Europe, who has been for years mourning; something to us unknown.

"O Willow, why forever weep,
As one who mourns an endless wrong!
What hidden woe can lie so deep?
What utter grief can last so long?
Mourn on forever, unconsoled,
And keep your secret, faithful tree!
No heart in all the world can hold
A sweeter grace than constancy."

The Poplar (Cara): There are five sisters of us Poplars who live in Michigan. One is called Cotton Wood, and two are called Aspens. We are cousins of the Willows and all belong to the Willow family. I will read some lines of the poets:

"Why tremble so, broad Aspen-tree?
Why shake thy leaves ne'er ceasing?
At rest thou never seem'st to be,
For when the air is still and clear,
Or when the nipping gale increasing,
Shakes from thy boughs soft twilight's tear,
Thou tremblest still, broad Aspen-tree,
And never tranquil seem'st to be."

White Oak: We ought to hear from Red Bud and Sassafras and Pepperidge and Buttonwood or Sycamore, who live in our forests, but they do not appear to be present at this convention. Our exercises would not be complete without hearing from the members of the Pine family or cone-bearing trees.

White Pine (Sylvia): I am one of the tallest and largest, most common, well known and valuable trees of the State. In Europe, where some of my number have been introduced, they often call me Weymouth Pine. My leaves are long, light green and in clusters of five. As a long lived and beautiful tree for ornamenting rural grounds and parks, I take a high rank, while an immense amount of valuable lumber is cut from my wood.

White Oak: Let us hear from another pine of Michigan.

Red Pine (Naomi): I am often called Norway Pine, though I do not know why. I never lived in Norway, but am only found in North Amer-

ica. I am a tall, straight tree, with long evergreen leaves in clusters of two. I grow slowly, making valuable timber which is much harder than that of White Pine. For ornamental purposes I resemble Austrian Pine, though much superior to that tree, if we rely on the opinions of noted horticulturists.

White Oak: The White Pine and Red Pine have a sister Pine in Michigan. We shall now give her an opportunity to speak.

Grey Pine (Rose): I am a tree of small size, found on poor land in Northern Michigan. When young my growth is rapid; my leaves grow in pairs and are quite short. My wood abounds in pitch. I am known by a variety of names, as Scrub Pine, Jack Pine, Buckwheat Pine, Black Pine, Crocodile Pine, but the name I like best is Pinus divanicata.

I want to tell you what Ruskin says. "The tremendous unity of the pine absorbs and molds the life of a race. The pine shadows rest upon a nation. The Northern people, century after century, lived under one or the other of the two great powers of the pine and the sea, both infinite. They dwelt amidst the forests or they wandered on the waves, and saw no end or any other horizon. Still the dark green trees, or the dark green waters jagged the dawn with their fringe or their foam, and whatever elements of imagination or of warrior strength or of domestic justice were brought down by the Norwegian or the Goth against the dissoluteness or degradation of the south of Europe, were taught them under the green roofs and wild penetralia of the pine."

White Oak: We have another cone-bearing tree in attendance. I call on

Hemlock Spruce (Agnes): I have been called by students in art and botany and horticulture "the most beautiful coniferous hardy tree yet known." I grow to a good height and acquire a large size. My evergreen leaves have delicate tints, my young branches droop gracefully. As a timber tree I do not claim the highest honor. My bark is valuable for tanning leather.

White Oak: There are two other sister evergreens called "Spruces" I see in the audience.

Black Spruce (Rhoda): I abound in swamps in Northern Michigan. I am often used for Christmas trees on festive occasions, and boys and girls search me over for a supply of first-class gum. I am not responsible, though, for all the gum that goes by my name. Within a few years my wood has been largely used to make white paper.

White Oak: I recognize another evergreen. I call on

Red Cedar (Clara): In summer my leaves are beautiful, but in winter they become brown. I am found only sparingly in any part of the world, though I am the most widely distributed of any tree in the United States. I grow slowly and produce a beautiful red, fragrant wood, which is soft and very durable. My wood is now mainly limited to the making of lead pencils.

White Oak: Let us hear from

Balsam Fir (Alice): I am a rather small, slender evergreen found in swamps, though often cultivated as an ornament about dwellings. I arrive at my prime when about fourteen years old.

White Oak: I shall now call on

Arbor Vitæ (Maud): I thrive in the swamps of the North and afford shelter to wild animals. I am often called white cedar and I furnish

most of the telegraph poles, some fence posts, railway ties and blocks for paving streets. I take a high place as an ornamental tree.

White Oak: We have now heard from all of the cone-bearing evergreen trees who are present. There is another tree of the State, not here present, which is cone-bearing, and belongs to the Pine family. I refer to the tamarack.

There are some other matters appropriate to Arbor Day which should command out attention at this time. How do the trees of Michigan compare in beauty and variety with those of Great Britain of which we read so much?

Susie: The farther north we go the fewer kinds of trees we find; the farther south, the greater the variety. Great Britain and Ireland contain more than twice the area of Michigan. They have one basswood, not so good as ours; one very small maple, one cherry, one small ash, two elms, two poplars, one beech, one small birch, one pine, one oak much like our white oak. Great Britain has about ten species of trees native to her soil, while Michigan, with half the territory, has about sixty species, or six times as great a variety.

White Oak: For some interesting points in reference to nuts and seeds I call on

Red Maple: Last autumn the hazels, beeches, chestnuts, oaks, hickories, walnuts, and buckeyes matured their fruit, and with this maturing the burs, or cups, or husks, opened or the stems snapped in two at a joint which began to form months before. If a bur or nut held fast too tenaciously, the frost made it willing to drop, and down it went with hundreds of others, among the leaves.

The leaves, with the help of the shifting winds, gently covered the fruit—or some portions of it. The leaves make the best kind of protection from dry air and severe cold, and they come just at the right time. All the seeds are not covered, but Dame Nature is generous. She produces an abundance; enough for seed and enough to feed the birds, squirrels, and other animals.

White Oak: We want to hear a word about Nature's tree-planters, the squirrels, birds, and other animals.

Basswood: The squirrels eat many nuts, but carry a portion to some distance in every direction, where they plant one or two in a place. It may be the thought of the squirrel to return at some future time of need, but his bump of locality is not well developed or he has laid up more than he needed. At all events, some of the nuts are allowed to remain where he planted them. In this way he is a benefit to the trees, and pays for the nuts which he eats. He has not lived in vain, for he is a tree-planter and believes in arboriculture. His arbor days come in autumn, and he needs no gubernatorial message to stimulate him to work.

White Oak: This subject will be continued by

White Spruce (Adeline): Many of our trees and shrubs produce a fleshy fruit or berry. Among them are the mountain ash, service berry, wild crab apple, hawthorn, cherry, holly, viburnum, pepperidge, hackberry, mulberry, sassafras, wild plum, persimmon, paw paw, cedars and junipers. Many of these when ripe are rendered conspicuous by brilliant colors. The fruits are eagerly sought by grouse, turkeys, deer, bear, or other animals. In most cases the seeds of such fruits are protected by a very firm covering and are not digestible. They are sown broadcast

by wild animals under circumstances most favorable for germination. The birds, too, belong to the society of tree planters.

White Oak: We will next listen to some accounts of the wind as a sower of seeds.

Sassafras (Iona): Some trees produce dry seeds or seed-pods, and usually drop only a portion in autumn. They hold on to some seeds with considerable tenacity. Among these are the buttonwood, basswood, ironwood, blue beech, box-elder, hop tree, tulip tree, the ashes, catalpa, locust, Judas tree, birches, alders, larches, pines, spruces. The fruits or the seeds are thin, or provided with wings, which distribute them as they fall, or after they have fallen. In winter it needs but a slight packing of the snow to bear up the seeds. At such times, some of the seeds are torn from the trees by the wind, and may be seen sliding along like miniature ice boats, often half a mile or more from the nearest tree. The wind also aids in transporting the seeds of our elms, maples, willows and poplars.

White Oak: Next listen to something more about seeds.

Red Bud (Cynthia): A seed is a young plant and is packed ready for transportation. It has a tiny stem, some seed leaves and a terminal bud. The mother tree, before casting off her progeny into the world, did not fail to give it a little outfit in the form of starch for food stored up in or surrounding the thick seed leaves. As the young chick while in the shell is nourished by the yolk of the egg, so the young oak or maple subsists on the starch stored up before ripening.

White Oak: When do our trees make their growth and how do they get ready for the next year?

Box Elder (Nina): Most of our trees put forth their new growth during a few weeks in spring or early summer. Do you wonder what they are doing during the rest of the warm weather? They are by no means idle. They may be perfecting flowers and seeds, but all of them are getting ready for the next winter and spring. Through the influence of light and heat, the green leaves are forming starch which is transported and stored in the pith, young wood, and bark. The young leaves and stems are started and arranged, packed in cotton, covered by scales and in some cases the scales are protected by pitch or varnish.

White Oak: Next in order will be a few words in regard to the tree as a community.

Buckeye (Douglass): A tree is a composite being, a kind of community by itself. The leaves and limbs are all the time striving with each other to see which shall have the most room and the most sunshine. Each strives for all it can get. While some perish in the attempt, or meet with only very indifferent success, the strongest of the strong buds survive. Each leaf helps to sustain the limb which carries it, and each limb furnishes some nourishment to the common trunk for the common welfare. The tax is always adjusted according to the ability of each to contribute. As the limbs of a tree are striving for the mastery, so each bush and tree in grove or forest is striving with others for the mastery. The weakest succumb to the strongest; some perish early, some lead a feeble existence for many years, while even the strongest are more or less injured. With plenty of room, the trunk will be short, the branches many and wide-spread; where crowded, the lower limbs perish for want of light. Dead limbs fall to the ground to protect and enrich

it for nourishing the surviving limbs and trunk. The scars heal over, more limbs perish as new ones creep upward, and thus we find tall, clean trunks in a dense forest.

White Oak: To be successful it is very important to know how to gather and care for seeds and nuts.

Yellow Wood (Robert): Gather the seeds or nuts of trees when ripe and, if convenient, plant them where the trees are expected to remain. In this list we include especially the trees which have long tap roots, and do not easily transplant, such as the tulip tree, the hickories, the oaks, the walnuts, and chestnuts. The seeds of elms and maples are not easily kept over winter. Seeds of evergreens, the larch, and the locusts may be dried and kept as grain is kept. Many seeds and nuts may be mixed with an equal bulk of sand as it is dug from a knoll, and buried a few inches or a foot below the surface. In spring they may be carried to the garden and planted. Soak seeds of locust and honey locust in hot water till the outer covering softens, and then plant. Soak evergreens three or four days in water, changed daily, and then plant very shallow in rows a few inches apart in rich loam, well screened by lath, brush, or muslin. See that weeds do not rob the young plants of light, room and nourishment. Evergreens in small quantity, when small and two or three years old, can be purchased of experts more cheaply than they can be raised at home. These can be set in rows and cultivated for a few years like Indian corn. For further details you are advised to read copies of our State horticultural reports, take lessons of a nurseryman, or go to the Agricultural College.

White Oak: It is of little use to plant seeds or buy trees unless we know how to handle them while moving.

Kentucky Coffee Tree (Hiram): In taking up a tree, whether large or small, do not twist it about so as to break or bend the roots abruptly. Get all the roots you can afford to, remembering that a tree will not grow without roots.

When out of the ground keep the roots constantly covered with soil, moss, damp straw or something else. The roots are far more sensitive to dry air than are the parts above ground. No one need wonder that trees carted into town with short roots exposed to dry air, often fail to grow or lead a precarious life for years. Study the structure and the physiology of a tree and treat it as one who always makes everything thrive which he cares for.

White Oak: How shall we care for trees after planting?

Apple Tree (Hannah): To set a tree so as to insure its thrifty growth, place it but little deeper than it was while growing. Have the soil well pulverized and pack it closely about the tree.

After all this trouble do not court disappointment in the slow growth or in the death of a favorite tree, but dig or rake the ground every week of two, all summer from three to five years, for a distance of four feet or more each way from the tree. If this is impracticable, place a mulch of something covering the space above mentioned.

White Oak: After planting, trees sometimes become too thick. What shall we do?

Pear Tree (Andrew): A tree, like a child, is a living, organized being and keeps changing as long as life lasts. It is not best merely to set as many trees as we expect to remain for a lifetime, but plant them more

thickly with a view to removal. Here is where ninety-nine out of one hundred fail. They do not keep an eye on the growth, and trim or remove trees until they have crowded and damaged each other beyond recovery. In most instances, a few large, well developed trees should grow where many small ones were planted years before. It needs courage and judgment to remove some favorite trees that others may continue to spread and make a symmetrical growth.

White Oak: Next will follow something in reference to the flowers of trees:

Bitternut (Silas): With rare exceptions, our trees bear flowers which are inconspicuous. The elms and the maples produce flowers in spring before the leaves appear. Most have the staminate and pistillate flowers on different parts of the tree or on different trees. The wind or gravity carries the pollen to the pistil, so there is no need of sweet odors or a gay display of flowers to attract bees and butterflies and moths to carry the pollen. Compensation is well displayed in nature. If the tree has not gorgeous or fragrant flowers, it has a large size and often a beautiful form.

White Oak: We should learn to love trees and to associate them with the generous hand who planted and cared for them.

Wild Plum (Ezra): I will tell you something which was written by Washington Irving: "There is something noble, simple and pure in a taste for trees. It argues, I think, a sweet and generous nature to have this strong relish for the beauties of vegetation, and this friendship for the hardy and glorious sons of the forest. There is a grandeur of thought connected with this part of rural economy. It is worthy of liberal, and free-born, and aspiring men. He who plants an oak looks forward to future ages, and plants for posterity. Nothing can be less selfish than this. He cannot expect to sit in its shade nor enjoy its shelter; but he exults in the idea that the acorn which he has buried in the earth shall grow up into a lofty pile, and shall keep on flourishing and increasing and benefiting mankind long after he shall have ceased to tread his paternal fields."

White Oak: We will hear what O. W. Holmes says on this subject.

Tamarack (Elias): Dr. O. W. Holmes says: "I have written many verses, but the best poems I have produced are the trees I planted on the hillside which overlooks the broad meadows, scalloped and rounded at their edges by loops of the sinuous Housatonic. Nature finds rhymes for them in the recurring measures of the seasons. Winter strips them of their ornaments and gives them, as it were, a prose translation, and summer reclothes them in all the splendid phrases of their leafy language.

"What are these maples and beeches and birches but odes and idyls and madrigals? What are these pines and firs and spruces but holy rhymes, too solemn for the many-hued raiment of the gay deciduous neighbors?

"As you drop the seed, as you plant the sapling, your left hand hardly knows what your right hand is doing. But nature knows, and in due time the power that sees and works in secret will reward you openly."

White Oak: This concludes what we had on the program for this convention.

Hemlock: I move we have some more music and then adjourn.

White Oak: If there be no objection we will have the music.

White Oak. This convention stands adjourned until again convened by the proper authorities.

ELEMENTARY SCIENCE.

A SECOND CONVENTION OF MICHIGAN TREES.

(*Personified by School Children.*)

White Oak: The delegates to this convention will come to order. Some of you will remember the assembling of Michigan trees in Grand Rapids, on January 26, 1888, more than 11 years ago. Since that time many changes have taken place, and it seemed to the authorities proper that we should again meet to discuss matters of great importance to the forests of Michigan.

Who shall serve you as chairman?

Beech: I nominate White Pine. (Seconded.)

White Oak: All favoring this motion, will say aye. (Unanimous vote.) All opposed will say, no. The ayes have it. White Pine will take the chair.

White Pine: Fellow trees, we have gathered here from all parts of the State to see if something cannot be done to improve our condition. All of us expect to die sooner or later, and when mature, none of us object to being put to good use. That is glorious, and nothing suits us better, but to be prematurely cut off while yet mere saplings of little worth to anyone, is ignoble and much to be dreaded. Rather than be sacrified while so young, it were preferable to mature, and fall, and go to decay, enriching the land which nourished us while growing, but worst of all, by far, is to be burned to death by flames carelessly kindled and allowed to lick up everything before them.

I am proud of the achievements of my kindred—the stately pines (and I know the great value of all other kinds of Michigan trees), but today I am lonely and sad, with few to protect me. With every passing breeze, I bow my head in grief and my wailings are borne to the trees in distant forests.

Whom will you select for secretary?

Tulip Tree: I nominate Canoe Birch, as I see she is well supplied with paper. (Seconded.)

White Pine: All who favor the election of Canoe Birch to serve as our secretary will make it manifest by saying aye. (Many ayes.) Those opposed will say no. The ayes have it, and Canoe Birch is now our secretar.

(She takes her place near the president.)

White Pine: We are now organized for business, and it will be in order for the delegates to engage in general discussion.

White Cedar: To give some idea of our condition, let me read a few verses from The Boston Journal:

"They've cut the wood away,
The cool green wood,
Wherein I used to play
In happy mood.

The woodman's axe has cleft
Each noble tree,
And now, alas, is left
No shade for me.

The brooks that flow in May
Are dry before
The first hot summer day,
And flow no more.

The fields are brown and bare,
And parched with heat;
No more doth hover there
The pine scents sweet.

No more his note is heard
To blithely ring
Where erst the woodland bird
Would sit and sing.

No more the wood-flowers bloom
Where once they bloomed
Amid the emerald gloom
Of ferns entombed.

Fled, now, the woodland sights,
The scented air!
Fled, all the sweet delights
That once were there!

And fled the gracious mood
That came to me,
When to that quiet wood
I used to flee!"

White Oak: I have not only been the main spoke in many a wheel, but also the hub of many. My uses are very numerous and important. So great has been the demand for fine timber, strong and durable, that very few of the oldest of my kind are left standing, and yet—would you believe it—so thoughtless are many men and boys, that they even act as though they hated the very sight of a tree, and hack into our sides, making painful wounds, requiring long years to heal over. Many of the trees thus maimed for life are left standing, but are never able to recover sufficiently to become sound and valuable.

Black Walnut: My tribe was once abundant in southern Michigan, represented by large, sound trees, the dark wood of which made fine furniture used by kings and queens in their palaces. The great value of the wood of large trees is the chief reason why very few now remain except scattered specimens of small size. These thrifty broad-topped trees are protected by children, because here they come to gather nuts in autumn to crack in winter.

White Ash: With all the good qualities of oak and pine and walnut, the wood of none of them can supply all of the demands, when ash timber can be secured. The trees of my kind have been hunted from Michigan to Georgia and Arkansas, till well grown specimens are becoming rare. Like White Pine, I feel lonely and sad and hope some one can devise a plan for protecting and encouraging the growth of fine trees.

Chestnut: It may cheer us a little to hear some verses written by our friend, W. H. Venable, under the heading:

FOREST SONG.

"A song for the beautiful trees!
A song for the forest grand,
The garden of God's own land,
The pride of His centuries.
Hurrah! for the kingly oak,
For the maple, the sylvan queen,
For the lords of the emerald cloak,
For the ladies in living green.

"For the beautiful trees a song,
The peers of a glorious realm,
The linden, the ash and the elm,
The poplar stately and strong!
Hurrah! for the beech-tree trim,
For the hickory stanch at core,
For the locust thorny and grim,
For the silvery sycamore!

"A song for the palm—the pine,
And for every tree that grows,
From the desolate zone of snows
To the zone of the burning line.
Hurrah! for the warders proud,
Of the mountain side and vale,
That challenge the thunder-cloud,
And buffet the stormy gale.

"A song for the forest, aisled
With its gothic roof sublime,
The solemn temple of time
Where man becometh a child,
As he lists to the anthem roll
Of the wind in the solitude,
The hymn which telleth his soul
That God is the voice of the wood.

"So long as the rivers flow,
So long as the mountains rise,
May the forest sing to the skies,
And shelter the earth below.
Hurrah! for the beautiful trees!
Hurrah! for the forest grand,
The pride of his centuries,
The garden of God's own hand!"

Sugar Maple: I am found in more townships of the State than any other tree. The name of maple, when applied to stove wood, is a sure sign of excellence.

My timber is very valuable, but so numerous are trees of my kind that there are still many good ones left; besides, we are doing our best, producing great crops of seeds to keep young trees thickly strewn over the ground. My trunk is injured every spring by a man who bores a hole in my wood from which to collect sweet sap for making sugar. This does some injury, but I am able to heal over the wounds just about as fast as they are made.

Some men, intending to be good to us, place a fence about a grove and turn in sheep and cattle, thinking to grow these animals and trees on the same ground. The cattle eat the young trees and this lets in the sun-

shine allowing grasses to grow over our roots. This robs us of moisture and other sources of life, and we pine for the well-shaded forests mulched by leaves and small trees to protect us.

Hickory: I am lonesome, and have few friends to care for me. Boys and girls plead for my protection, because of the fine crop of nuts they expect each year. These nuts we bear for the purpose of growing more trees, and not to feed greedy children. We, hickories, suffer in a different manner from pines and walnuts, as the timber of young hickories is often cut for hoop-poles and turned for handles of small tools and spokes for buggies. On my branches squirrels delight to stand as they gnaw the hard shell and eat the precious kernel within. Here is something from Longfellow:

"Round about the Indian village
Spread the meadows and the cornfields,
And beyond them stood the forest,
Stood the groves of singing pine trees,
Green in summer, white in winter,
Ever sighing, ever singing."

Black Cherry: The wood of fine, old cherry trees is so valuable that most of my kind have been cut down and sawed into lumber. I like this verse by Mrs. Addie V. McMullen:

"Though oak, and elm, and maple tree,
Call forth our love and care,
With tender buds and opening leaves,
They woo the soft May air,
Let not the birch tree be forgot,
For well I bear in mind
Its spicy buds and fragrant bark,
I search the woods to find."

Basswood: My flowers are sweet and furnish honey for bees and my wood is soft, white and suitable for many purposes. I have something good to tell you. I overheard some men talking the other day as they rested by the roadside, enjoying the cool shade of my numerous broad green leaves. They are friends of trees and spoke of several others who are about to meet in convention to make plans for preserving some fine groves of all kinds of trees.

White Pine: This is indeed encouraging, the only cheering news we have heard from anyone.

American Elm: I move the president appoint a committee of one from each kind of tree growing in Michigan to learn where these men meet and try to gain admittance to their counsels. (Seconded.)

Red Cedar: Such a committee as was proposed by neighbor Elm would be too large, as there are seventy kinds of us trees in Michigan. I move as a substitute that the chair select a committee of five, to serve as a committee, and hope that he will select some old veterans, dying at the top from exposure to winds, with scars on the trunk, and grass about the roots. (Motion seconded.)

White Pine: Are there any remarks? Those in favor of selecting five delegates will say aye. (Many ayes.) Those opposed will say no. The ayes are in the majority and I will name as such committee, Gnarled Oak, Crooked Hickory, Tough Beech, Weeping Elm and Knotty Spruce.

Allow the chair to suggest that after adjourning all of you return home and secure many signers to petitions to be used by the committee.

Sassafras: I hope this committee will try to induce our good friends of the convention of men to see that a large grove of many sorts of trees with some shrubs mixed in, be planted and protected in every school district of the State, thus giving a chance for the girls and boys to make our acquaintance, for there is nothing that shocks my green branches so much as extermination and oblivion.

Norway Pine: That is a good plan, but I think something should be done to prevent fire from running over the ground every year or two and killing the young trees and often injuring the larger ones.

Black Ash: If the fires could be prevented and cattle and sheep kept out of the woods, and men learn to see the importance of leaving some trees for the future, we should stand a good chance for renewing our numbers and benefitting the world by our presence.

Silver Maple: I am sure that if we could bring about the reforms suggested by Sassafras, Norway Pine, and Black Ash, the young, thrifty groves of mixed trees would prove so attractive, that the spirit of reform among Michigan men would soon become common and the State would soon regain some of her importance as a grower of fine trees.

Red Ash: To reform careless men and boys, we need all of the assistance we can secure. I have heard something about a society of persons, who are trying to save wild animals in considerable numbers, and for this purpose they need more trees, and especially thickets, where shrubs and young trees abound. Let us try to get their help.

Buckeye: There is another society of people who call themselves ornithologists, whatever that may be; they are very fond of birds. I have often seen them going through the forests and wading through the mire of swamps. These men like trees and bushes, because they shelter birds of all kinds. I believe they would be glad to help us, if we applied to them.

Mulberry: For many years past I have noticed a class of men, women and children who are studying nature in the woods and thickets; they seem to admire all kinds of wild flowers and plants, squirrels and birds. I know they are kind people and our sincere friends. They call themselves botanists and zoologists, and study things very carefully, but I fear there are not enough of them to render us much assistance.

Hemlock: I am not so certain about that, for four years ago they organized under the name of "The State Academy of Science," and have since held two meetings each year in different parts of the State, and they always speak about preserving the forests. They can be counted as our best friends.

Cottonwood: At a meeting of the State Academy held in Ann Arbor in 1898, the subject of a state survey was spoken of with much enthusiasm.

Witch Hazel: What does that mean, I should like to know? The word survey does not suit me very well, because I have noticed that when surveyors come along, they cut roads through the bushes, and soon the land is likely to be bought by some one for the timber growing there, or for farm crops.

Cottonwood: These naturalists, who love plants and animals, are not surveyors of that kind, but purpose having well educated men and

women visit all parts of the State to see what kinds of life can be found in each neighborhood, and these things they will study and write about, and try to induce more people to join their academy. They hope to influence the Legislature to grant a little money to pay some expenses and print reports of a survey.

Tamarack: I have just thought of another thing. The State Horticultural Society is a strong organization, doing much good for the State. It is more than twenty-five years old. The members of this society are all fond of trees and plants. They have often called attention to the need of protecting native trees even along the road sides, and they have sent flower seeds to be planted by school children to furnish something for beauty and study. We can rely on members of this society for help.

Honey Locust: The Agricultural College, many months ago, began to save her young forest trees and plant many more—one field has trees planted in straight rows, and many of these are now more than twenty years old. The experiment station of the college once sent out a bulletin, urging each farmer to plant a grove of native trees on his farm; and not long ago, several other bulletins were prepared on nature study or elementary science, telling pupils of the common school how to plant and grow and study seeds of many kinds. I am certain that all of the professors of the Agricultural College will assist us.

Butternut: At the convention of trees held at Grand Rapids, White Pine sung "The Echoes from the Forest." Several other songs of a cheerful nature were sung, and the remarks of the speakers were mainly on the bright side, but when we came to this convention it looked as though the days for most of us were numbered.

White Pine: We will now hear some verses spoken by some little bushes on the subject of the autumn leaves.

Hawthorn:

"I am a leaf from the tall elm tree
That stands high up on the hill top there;
Patiently my watch I keep
O'er all the hillsides and valleys fair."

Hazel:

"I came from the maple tree
By the church with its huge iron bell.
Many a time I've heard it say
'A tale of hope and peace I'll tell.'"

Huckleberry:

"I am a leaf from the old oak tree
Deep in the woods; I know
All the secrets of fairyland,
And how the flowers grow."

Red Bud:

"And I am a leaf from the aspen,
Do you know why I tremble so?
I heard a child tell a lie one day—
'Tis an awful thing to know."

Spiræa:

"Down where the dead lie sleeping,
In a calm and quiet spot,
I came from the willow weeping
O'er the blue forget-me-not."

Rose Bush:

" I grew on the big old apple tree,
Where the bluebirds and robins nest.
The children love me and the breeze—
O you can guess the rest."

Bittersweet:

" And now we will make a wreath,
Red, and yellow, and green;
When you see it you will all agree
'Tis the prettiest wreath that ever was seen."

All join hands and sing:

" Away to the woods, away!
Away to the woods, away!
All nature is smiling,
Our young hearts beguiling.
Oh, we will be happy today!

Chorus:—
Away, away, away, away!
Away to the woods, away;
Away, away, away, away!
Away to the woods, away!"

White Pine: Among people we have friends, chief of whom are some of the poets. Let us hear something from Bryant, entitled:

AMONG THE TREES.

Yellow Birch:

" Oh, ye who love to overhang the springs,
And stand by running waters, ye whose boughs
Make beautiful the rocks o'er which they play,
Who pile with foliage the great hills and rear
A paradise upon the lonely plain—
Trees of the forest, and the open field!
Have ye no sense of being? Does the air,
The pure air, which I breathe with gladness, pass
In gushes o'er your delicate lungs, your leaves,
All unenjoyed? When on your winter's sleep
The sun shines warm, have ye no dreams of spring?
And when the glorious spring-time comes at last,
Have ye no joy of all your bursting buds,
And fragrant blooms, and melody of birds
To which your young leaves shiver? Do ye strive
And wrestle with the wind, yet know it not?
Feel ye no glory in your strength, when he,
The exhausted blusterer, flies beyond the hills
And leaves you stronger yet? Or have ye not
A sense of loss when he has stripped your leaves
Yet tender, and has splintered your fair boughs?
Does the loud bolt that smites you from the cloud
And rends you, fall unfelt? Do there not run
Strange shudderings through your fibers when the ax
Is raised against you, and the shining blade
Deals blow on blow, until, with all their boughs,
Your summits waver and ye fall to earth?
Know ye no sadness when the hurricane
Has swept the wood and snapped its sturdy stems
Asunder, or has wrenched, from out the soil,
The mightiest with their circles of strong roots,
And piled the ruin all along his path?

Nay, doubt we not that under the rough rind,
In the green veins of these fair growths of earth,
There dwells a nature that receives delight
From all the gentle processes of life,
And shrinks from loss of being. Dim and faint
May be the sense of pleasure and of pain,
As in our dreams; but, haply. real still."

White Pine: The last quotation was encouraging and shows people that we can feel, as well as boys and girls.

Green Ash: I also read from Bryant:

" The groves were God's first temples.
Ere man learned
To hew the shaft and lay the architrave
And spread the roof above them—ere he framed
The lofty vault, to gather and roll back
The round of anthems, in the darkling wood,
Amidst the cool and silence, he knelt down
And offered to the Mightiest solemn thanks
And supplications."

Alder: I have something from Holmes:

"I shall speak of trees, as we see them, love them, adore them in the fields where they are alive, holding their green sunshades over our heads, talking to us with their hundred thousand whispering tongues, looking down on us with that sweet meekness which belongs to huge but limited organisms, which one sees most in the most patient posture, the outstretched arms, and the heavy drooping robes of these vast beings, endowed with life, but not with soul, which outgrow us and outlive us, but stand helpless, poor things—while nature dresses and undresses them."

Red Ash: I contribute verses from Whittier:

" Give fools their gold and knaves their power;
Let fortune's bubbles rise and fall;
Who sows a field, or trains a flower,
Or plants a tree, is more than all.

" For he who blesses most is ble-t;
And God and man shall own his worth,
Who toils to leave as his bequest
An added beauty to the earth."

Aspen: Here is a sensible paragraph from Irving:

"There is something noble, simple and pure in a taste for the cultivation of forest trees. It argues, I think, a sweet and generous nature to have this strong relish for the beauties of vegetation, and this friendship for the hardy and glorious sons of the forest. There is a grandeur of thought connected with this part of rural economy. He who plants an oak looks forward to future ages, and plants for posterity. Nothing can be less selfish than this."

Red Elm: I quote a sentence from Addison:

"There is something unspeakably cheerful in a spot of ground, which is covered with trees, that smiles amidst all the rigors of winter, and

gives us a view of the most gay season in the midst of that which is the most dead and melancholy."

Willow: Elizur Wright talks well:

"Keeping up a fit proportion of forests to arable land is the prime condition of human health. If the trees go, men must decay. Whosoever works for the forest works for the happiness and permanence of our civilization. A tree may be an obstruction, but it is never useless. Now is the time to work if we are to be blessed and not cursed by the people of the twentieth and twenty-first centuries. The nation that neglects its forests is surely destined to ruin."

Wild Plum: I like Wordsworth:

" One impulse from a vernal wood
May teach you more of man,
Of moral, evil and of good,
Than all the sages can."

Jack Pine: How do you like this from Byron?

" There is a pleasure in the pathless woods;
There is a rapture on the lonely shore;
There is society where none intrudes—
By the deep sea, and music in its roar."

Norway Pine: I give you a few lines from Aldrich:

" Faint murmurs from the pine-tops reach my ear,
As if a harp-string—touched in some far sphere –
Vibrating in the lucid atmosphere,
Let the soft south wind waft its music here."

Burr Oak: Hear Felix L. Oswald:

"The true basis of national wealth is not gold, but wood. Forest destruction is the sin that has caused us to lose our earthly paradise. War, pestilence, storms, fanaticism and intemperance, together with all other mistakes and misfortunes, have not caused half as much permanent damage as that fatal crime against the fertility of our Mother Earth."

Mountain Maple: Lucy Larcom writes well:

" He who plants a tree
Plants a joy;
Plants a comfort that will never cloy—
Every day a fresh reality.
Beautiful and strong,
To whose shelter throng
Creatures blithe with song.
If thou couldst but know, thou happy tree.
Of the bliss that shalt inhabit thee! "

Pepperidge: I am delighted with the work of this convention of trees, and I think we can all see the benefit of combining our efforts in securing needed improvements.

White Pine: We can congratulate ourselves on the brighter prospects for the forests of the future. The secretary will please see that the

reporters of the leading papers of the State are supplied with copies of the minutes of this meeting.

What is the further pleasure of the trees here assembled? Is there any other business that should come before us at this time? If not, a motion to adjourn will be in order.

Huckleberry: I hope this meeting has taught us a valuable lesson. We ought to have met many times since our first convention, held more than eleven years ago. I move to adjourn, subject to the call of the president and secretary, which will most likely come as soon as the committee of five has a report ready to present. (Seconded.)

White Pine: This second convention of forest trees of Michigan stands adpourned *sine die.*