

# THREE DAYS' FOREST FESTIVAL ON THE BILTMORE ESTATE.

**Chronicle of the Second Morning's Joyous Journeying—Dissertations on Profitable Planting—Some Mistakes and Their Lessons—Value of French Ideas Americanized—An Al Fresco Luncheon With Extraordinarily Attractive Features.**

**CHAPTER XXXIII.—IN A WALNUT PLANTATION.**

The last direct association that these chronicles had with the participants in the ever memorable three-days' forest festival of November last, on that great object lesson in conservative forestry the Biltmore estate, left the party on the farther bank of the French Broad river on the second morning of the forest fair, after a hazardous passage of the stream following a ten-mile ride from Biltmore village in the kind of weather that prevailed for uniformly from start to finish of the three days—weather of that kind than which no memory can recall any nearer perfection. The first objective point of the party after the passage of the French Broad, under the tutelage of Forester C. A. Schenck, was Tip No. 28, a plantation near the bank of the river of black walnut obtained from nuts planted in the fall of 1897, in furrows planted three and one-half feet apart at an expense thus estimated:

Sixty-two bushels of walnuts.....	\$33.00
Plowing furrows.....	3.00
Planting nuts.....	18.95
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Total.....	\$54.85

Here Dr. Schenck gathered his pupils about him—these pupils including all the “grown-ups” as well as the students of the Biltmore Forest School—and said:

“The idea in forestry, as in any other business, is to get rich quick, and as a consequence the idea is, when you enter the field of forestry, to plant the fastest growing species, and that is black walnut. [Laughter.] That was my idea, somewhat Americanized after I had been living here for a year or so, so I planted on this Hillside road, some above and some below the road, all at one time. It is marvelous to see the relatively big fellows below the road, and above the road the walnut growing smaller and smaller as the hill advances.

“These walnuts will grow rapidly only on a patch of land extremely fertile with heavily fertilized soil, and on such soil these walnuts have grown in ten years to some size. I do not call these walnuts very good; they do not have the bold development that seems to be desirable and are not very straight but they have grown fast, at least.

“Above the road the walnut plantation is practically a failure. The soil is too poor; below the road the walnut plantation, on agricultural land heavily fertilized, has done what I expected it to do; it has grown quickly to good size.

“You ask why did I do this planting on this abandoned field. Because a few black walnut trees growing naturally up here gave me a hint from nature and I took this to be black walnut ground, but I was wrong. In ten years some of it has grown ten inches, but they appear generally to be about as high as in 1898 above the road. It is remarkable that the slight difference in soil makes such a difference in growth—over there nearly twenty-five feet and here not twenty-five inches. It shows the dependence of the walnut on the quality of the soil. It is futile, it seems to me, to plant walnut on poor soil.

“When I found I had made a mistake I tried to mend it in the usual way by doctoring up with yellow pine with one-year-old seedlings imported from Germany, costing about 50 cents a thousand, and I believe that all this walnut plantation in time will be saved by the pine; the doctoring influence of the pine on the soil, I believe will be to make this a financial success. These measley little walnuts are now doing better, as the yellow pine has taken a foothold, than before and I am hopeful that finally the walnut will succeed through the influence of the pine. If you come back here after ten years I can tell you whether my theory is correct or not.”

As an object lesson a student under the direction of Dr. Schenck dug up a small walnut, apparently thriving, but suffering from frost.

Moving to another point in the plantation Dr. Schenck said:

“Here are the two walnut primeval trees which induced me to plant on these twelve acres. We planted under the trees walnut seedlings and planted yellow pine everywhere, but nothing is here but the remnants. Why is it that pine under the walnut, pine under its shade, will not thrive? These trees killed every competitor in the woods within their reach. Why is it? I must ask some expert who knows more about it than I do. The shade here or the proximity killed all the walnuts and all the pines. I do not know the reason. Toxic effects of root excrements is the theory of one of my boys, and he may have the correct theory. Only from the time do we find that phenomenon after the tree has fruited. The green shells are everywhere and may have a poisoning influence on the soil. The boy may be correct and he may know more than the botanists do. The plantation will fail in the immediate vicinity of the walnut trees. In the primeval woods, where all the trees started together, the other trees flourished with the walnut.”

The little black walnut that was dug up showed a root almost as long and stronger than the stem, and it was thought by Dr. Schenck that possibly in time the little backward walnuts would grow and thrive. The influence of frost was very evident on the specimen dug up.

The bill for the “doctoring” of this plantation was given as follows:

Four thousand pine yearlings.....	\$ 4.00
Hauling and miscellaneous.....	.30
Planting pines.....	7.50
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	\$ 11.80

**CHAPTER XXXIV.—PINES ON AN ABANDONED FIELD.**

Journeying to the next point of interest, Tip No. 29, the party was addressed by Dr. Schenck as follows:

“I want to draw your attention to the manner in which the abandoned field is growing up in yellow pine and the attention of the engineers particularly to the manner in which the old deep gullies have grown up in pine after being saved by the pine humus accumulated through many years. You see that the heavy, deep layers of humus have stopped erosion entirely and brought the old field back to productiveness. After cutting out the misshapen, huge, matured trees after they had reseeded the ground, I obtained a nice, even stand of pine poles. The new trees have produced as a matured growth a second growth for the future use of men.”

Three special of pines, echinata, rigida and Virginiana, were found growing at this point.

Attention was called to a bunch of pines killed by bark-beetles in 1903.

Tip No. 30 was given casual attention. It consisted of a cut stand of oaks, chestnuts and hickories, some of them forty years old, from which an improvement cutting was removed in 1898, eight cords to the acre being obtained. It was calculated that in about ten years a thinning would be made in this tract yielding perhaps three cords to the acre. A prominent feature of this tip was a white oak 350 years old.

**CHAPTER XXXV.—A WHITE PINE IMPROVEMENT CUTTING.**

At Tip No. 31 Dr. Schenck halted his big class and said: “Here I made an improvement cutting which did not improve. I blame the contractor and the ranger. I was much disappointed with the result, though it does not look so bad today, after ten years have elapsed. After it was done I planted here a few thousand white pines one year old. At that age the white pine is a wee little thing and you can imagine that many of the little pines, after being planted, stood just long enough for a heavy oak leaf to smother them and but few are left. I cut out some of the white pines to give the others a rapid growth. I have it entirely in my power to help all these little pines. Primeval white pines are growing more slowly than others because they are always suppressed the first few years of their lives. These little fellows here will all make the trees just as good as any. The influence of light on the development of white pine seedlings is here very marked.”

**CHAPTER XXXVI.—EXPERIMENTS WITH FAR-WESTERN WOODS.**

At Tip No. 32 Dr. Schenck said:

“This shows the relative rapidity of growth of a number of species—Douglas fir, European spruce, Colorado spruce and white pine, all of the same age, all equally treated and planted about one foot apart. The Douglas fir has done poorly. Spruce has shown very slow progress.

“I made a little experiment here. To the right the white pine planted was obtained from abandoned fields and that to the left was taken from the nurseries, but it all made no material difference as time went on.

“Here is a German silver fir, and after associating in the shade with white pine it may average better. In the first seven years the silver fir does very little, but later on it may overtop the white pine. The upper growth of white pine is better in early youth. The silver fir makes better pulp than the spruce; less yield but better quality.”

At another point on the same tip Dr. Schenck said: “Here we have white pine and locusts alternating. It is very notable how much better the white pine does than the black locusts or cherries. The black cherries here, however, are now doing very well, but, volume for volume, give me white pine every time. Here is a row of black locusts which suffer very much from insects. The insects do not kill but simply injure them. They will easily grow to the size of a tie.

**An Interesting Experiment.**

“Here I want to show another mess which I made. This is a plantation of hickory, white pine and chestnut oak. Where are they? Here and here; these little growths. It shows again that on abandoned fields the planting of nuts, as in this case, is practically out of the question—the planting of acorns, walnuts and hickory nuts, to being with, is out of the question, in my opinion. We can raise the hardwoods only by the doctoring influence of pines or in companionship with pines; we cannot raise them alone. This soil was occupied by hickories and white oaks in primeval days, and so I was induced to plant the same subjects to reproduce what nature had here originally, and again I made a mess of it.



STUDENTS AND SOME OF THE FACULTY OF THE BILTMORE FOREST SCHOOL, MAINTAINED ON THE BILTMORE ESTATE OF GEORGE W.

I planted white pine, which was not a messmate in the primeval forest, but I found it did the best for the time being. How it will be three or four years from now I cannot say. Trees reproduce their kind until the year of their death, be it 500 or 600 years.

"This is a poor stand of white pine, and here is a heavy humus which we get when the trees are planted very well together. Then the boles for clean and quickly and then I get a better condition generally. This seems to be the best way. When they are fifteen years old you have a bole of about two long logs free of limbs, which makes fine timber. The trees planted closely together trim themselves. I could trim these at 6 cents a tree and I would select only the best trees on each acre to insure the good trees of the future."

#### Stories in Hardwoods.

At a further point the doctor said:

"In this tract I would say the hardwoods, and notably the yellow poplar and white oak, were prevailing in a primeval forest and were cut out about 1893, when lumbering was in vogue here after the advent of the railroad into Asheville. Here we find evidence of spontaneous regeneration of yellow poplar whenever it had a little light and the foot of the forester pressed the seed into the ground. We have only a few thousand acres of such forest. The majority we have in the vicinity of Biltmore was cut in 1899. What I have done here is simply a little improvement cutting, taking out the worst trees to make the average tree a little better and thus making incidentally a little money."

Further on the doctor called attention to alternate rows of white oak and maple, of which he said:

"When the maples were about as high as my belt they were all attacked by fungus disease and I thought they would all die. First I came and planted here in alternate rows, where the oak had failed, yellow pine and white pine. What was necessary to beat me was that I changed my mind three times, each with entirely different results."

The tract showed a struggle for existence between white pine and sugar maples, and of this Dr. Schenck said characteristically:

"The slightest difference in soil brings about an entirely different result in silviculture. The differences are shown by a few steps different from place to place. There are three kinds of lies; first lies; second, statistics; third, theories, and I think I slipped up on the last."

Another plantation showed the effects of attacks of rabbits, which destroyed or discouraged the young growth year after year. The use of poison has been suggested to kill these, but the estate is preserving quail and small game birds and so fears to use poison against the rabbits. These pests do not attack the trees after they are three years of age, as was demonstrated by evidence found in an adjoining plantation of clack cherry and black locust.

Leading his party into a dense growth of white pine and oaks, Dr. Schenck said:

"This is white pine, and much of it has grown in the way I wanted it to. From now on it may be desirable to give it more space. Hard maple has been planted here for the benefit of the white pine. The dead limbs are relatively small, so they can be rubbed off without leaving heavy scars and laying themselves open to fungus growth. In other places we have instances of where white pine and sugar maple had outgrown the pine because the one was planted before the other."

The last lecture concluded a walk of four miles and the party adjourned to their carriages.

#### CHAPTER XXXVII.—REGENERATION OF YELLOW POPLAR.

At Tip No. 34 the forester addressed his students as follows:

"The yellow labels which you see here indicate poplar. I do not show all the seedlings here. The yellow seedlings in this cover are the progeny of two or three big trees down there. here is one having approximately 1,400 feet and one of 750 feet to the right. These few trees which I still find here and there in the hollows, all left of the original forest, give me a wonderful reproduction and dense stand of second growth of strong poplar. In this grove I find the first indication of

natural seedlings of yellow poplar in a small group. I have given it a little extra light, which, as done here, may not seem to best way to encourage the growth, which is about twenty feet, but here is a regeneration which is creditable. From time to time I go in with my little ax and mark a few of these hardwoods, removing them, making them into money. I do the same thing in the valley over there and as it goes on these groups will merge.

"This natural seed regeneration is known very well abroad now as the group type of natural seed regeneration. I have found, to my great pleasure, that yellow poplar lends itself admirably to this type, which, under conditions as found here, is very easy to handle. I will show you what I shall mark in order to give my yellow poplars more light. Above the road there are the trees of the same growth. It is all the nucleus for a group which is gradually enlarged just as the waves enlarge as a stone is dropped into the water.



FAIR NORTH CAROLINIANS WHO PRESIDED AT A FEAST.

It all comes from these two seed trees. The ground is strewn with yellow poplar seeds. Every year the seeds fall; about ten seeds to the foot. not more than one of them out of ten is good; most of them are hollow. The percentage of fecundity is German seeds is very poor—only about five in a hundred."

Here the students, under the direction of Dr. Schenck, marked several trees, mostly misshapen or otherwise of poor growth, following the instructions of Dr. Schenck. He seemed to pick out the victims with half a glance.

#### CHAPTER XXXVIII.—ACCORDING TO FRENCH METHODS.

At a farther point on this tip Dr. Schenck said:

"In the vicinity of Biltmore is an elevation known by geologists as the French Broad base level, where we would have found, in the first forests, bug North Carolina pines with an undergrowth of decrepit oaks, hickories and the like. The soil on this French Broad base level was not good enough to produce good hardwoods, but did produce splendid yellow pine. The primeval stand of yellow pine here had an average of 5,000 or 6,000 feet to the acre. When the pine was cut, about 1883 or 1880, the hardwoods had the upper hand and were left intact. These are scrub oaks found here, the best having been left, the poorest cut out. three or four years ago this was a stand which I would trim into the pole stage; which is to say there was a stand of trees of about thirty cords to the acre in which the pines were the minority and the hardwoods the large majority. I have cut the hardwoods out, coppiced them down and you see that in three years they have come up from the stumps rather rapidly.

"This system of silviculture, which I decided to introduce here and everywhere else in the larger part of the forests where pine alone will yield lumber, has a growth of coppiced understandards. It is the French system particularly of silviculture or forest utilization. In the coppiced understandards we have two series of forests, an upper consisting of lumber trees, and a lower consisting of fuel trees. The fuel trees are the oaks particularly and

black gum, sourwood and hickory and chestnut, forming the under story, and the upper story is formed of pines. Where that system is regularly used we have the following classes of pines: pines 3 years old, pines 33, 63 and 93 years old respectively. We see a few of the older pines in the background. The idea is this: every thirty years when coppiced down the hardwoods cut twenty cords to the acre and we will get as many dollars out of it, unless the price is improved, and every thirty years at the same time we get out for lumber purposes the older classes of the pine standards, of which we have 30-year-old ones, 60 and 90-year-old ones.

"That is the French idea of coppiced understandards, which is disputed by the Germans for reasons which I do not wish to dwell upon, but which seems to me particularly well adapted to our American conditions and to conditions now prevailing at Biltmore, and as I presume they will continue to prevail for a little while. This system of standards yields to me frequent revenue by frequent cuts of twenty cords to the acre and at the same time affords a certain amount of lumber. You see that when coppiced the pines get plenty of space to grow, but it should be done only when the pines are at least three years old. Then I give them plenty of food, light and air and merely an underscattering of hardwoods to shade the soil. I think that system is good and financially correct, as it yields to me lumber, fuel woods, chestnut tannic acid woods and business in other woods, and wagon timbers from white oaks.

"This is the system which I want to introduce more generally. I tried it here tentatively, where it would not be seen. I did not know what would develop; I do not know today. Suppose that after coppicing these pines they are blown down by a storm! I can not say today whether it is a good system, but my experience of three years tends to prove that I am on the right track and that this is financially and silviculturally the best system for us. I get my second growth free of charge—the regeneration of the pines free of charge absolutely. I get frequent and early hardwood timber and lumber trees, fuel trees and minor woods for wagon and acid making in addition. I stand on six different legs instead of standing on one. Thus it seems a safe investment. I am enlarging this system gradually, having obtained Mr. Vanderbilt's approval, but in a tentative way, because the Lord only knows what will become of it. The primeval forest looked like this system, only magnified many times. Pine is the superstructure, oak is in the upper structure, and I am rebuilding in a manner which seems to me economically correct.

"So far not a single tree has been burned down or been attacked by insects. I have no promise from the insects that they will not attack these individual pines, but so far they have not attacked them. I find that the insects rather like the dense woods, but not the pines where they are swaying in the wind and where other conditions appear not so advantageous to producing insects. It may be the very way to eradicate the insects.

"It is not necessary that the pines should be distributed singly over the scope of the wood lands; they may stand in a little group here or over yonder. We have a few white pines over here that are welcome, coming in free and promising good financial results. Should you come back in ten years, instead of the 200 acres on this tip I think you will see 2,000 acres treated in the same way, where the conditions are repeated, not taking here and there a spot, and having good chances for transportation.

#### CHAPTER XXXIX.—LUNCHEON IN THE OPEN.

With appetites borne of strenuous climbing and the filip of hours spent in the open, the forest fair participants here rested for luncheon. It was served out of doors, around an old log farm house, now and for



VANDERBILT, NEAR ASHEVILLE, N. C. THE ELEVENTH PHOTOGRAPH FROM THE LEFT, ON THE OPPOSITE PAGE, IS OF DR. C. A. SCHENCK.

some time utilized under the patronage of Mrs. William Vanderbilt as a cooking school for children from on and near the Biltmore estate, and some of those children were mighty proud of having been entrusted with the preparation and cooking of the hot biscuit which were passed around in quantities to a ravenous and appreciative crowd. They were a gastronomic success that would have done credit to a French chef or, higher praise, a southern "mammy." The biscuits were supplemented by sandwiches, meats, coffee, pies and a profusion of other things provided by Dr. Schenck's general and Mrs. Schenck's immediate and practical foresight, with an experienced understanding of the robustness of appetite of hungry scores who had spent the morning in hill climbing. And the way they were served!

In the language of an appreciative visitor from a far northern city, whose apparent disrespect was apparent only and was hidden by his admiring enthusiasm—

"S-a-y, did you expect to see anything like that in this wilderness? Talk about your belles! Did North Carolina produce these, really? Are they types of their kind of this section? Then I am going to move down here."

Those of whom he spoke, whose abounding vitality was reflected in superb forms, blooming complexions, beaming eyes, supplemented by the very latest, richest "creations" in the dressmaker's and milliner's line, were Mrs. C. A. Schenck, Mrs. Dr. Wheeler, Miss Rita Rees, the Misses Bessie and Bonnie Reeves, Miss Martha E. Race, whose hospitality and personal graces added that day to the

fame of North Carolina's fair daughters.

The cooking school was formerly used as a Sunday school by the junior residents on the estate, but for that purpose has been temporarily abandoned. Under the immediate charge of Mrs. Dr. Wheeler it has now a class of tenant's daughters who are being skilled in cookery, and its influence through them for good and for friendly feeling upon the farmers and others resident upon the Biltmore estate is marked.

And in the enjoyment of their hearty luncheon the good forester, his fair assistants and his gusts may safely be left for the time being.

**(To Be Continued.)**