The last direct association that these chronicles had with the participants in the ever memorable three-day 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 uniformity from start to finish of the three days—weather of that kind with which no memory can recall any nearer parallel. 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. 29, a plantation near the bank of the river of black walnut obtained from nuts planted in the fall of 1897, in fumigated planted one- and three-half feet at an expense thus estimated:


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 and 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 Hiwassee road, some above and some below the road, all at one time. It is marvellous to see the relatively big fellows below the road, and above the road the walnut growing finer 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.

“About 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 well. This is a plantation on the Illinois-Iowa prairies.

“You ask why did I do this planting on this abandoned field? I do it on account of the influence of pines or in companionship with pines; we cannot raise them alone. This soil was occupied by beans for many years. You see the black walnut that was dug up showed a root system almost as long and stronger than the stem, and it was thought by Dr. Schenck that possibly in time the little windward walnuts would grow and thrive. Their 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 plantings. $4.00

Total. $54.85

Chapter XXXIX.—In a Walnut Plantation.

As an object lesson a student under the direction of Dr. Schenk 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 thirteen 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 who knows who knows who knows, or perhaps you yourselves know the answer. I am not the one. Certainly any effect of root excretions is the theory of one of my boys, and he may have the correct theory. Only from the time I do find that phenomenon after the tree has fruited. The green shales are everywhere and may have a poisoning influence on the soil. The boy may be correct and he may know more than the botanist. I am not the one. Certainly any effect of root excretions is the theory of one of my boys, and he may have the correct theory. Only from the time I do find that phenomenon after the tree has fruited. The green shales are everywhere and may have a poisoning influence on the soil. The boy may be correct and he may know more than the botanist.

The little black walnut that was dug up showed a root system of quite a different kind, as long and stronger than the stem, and it was thought by Dr. Schenck that possibly in time the little windward walnuts would grow and thrive. Their 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 plantings. $4.00

Total. $54.85

Chapter XXXV.—On a Primeval 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. I have called 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 off the moshappen, huge, mountain-shaped piles of the old field did not remain. I obtained a nice, even stand of pine poles. The trees have grown as a mature growth a second growth for the future use of man.

Three special poles of pine, echinata, rigidia and Virginia, were four feet in girth at this point.

According to a call of a number of pines killed by bark beetles in 1903.

Tip No. 29 was given casual attention. It consisted of a stand of oak, chestnuts and hickories, some of them over one hundred years old. Here is a stand of trees improved cutting remnant 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.

CHRONICLE OF THE SECOND MORNINGS JOUYOUS JOURENING—DISSENTATIONS ON PROFITABLE PLANTING—SOME MISTAKES AND THEIR LESSONS—VALUE OF FRENCH IDEAS AMERICANIZED—AN AL FRESCO LUNCHEON WITH EXTRAORDINARILY ATTRACTION FEATURES.

CHAPTER XXXVII.—A WHITE PINE IMPROVEMENT CUTTING.

At Tip No. 33 Dr. Schenk halted his class and said:

“I have 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 and nearly two feet tall. I cut 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. Prunimal 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 XXXVIII.—EXPERIMENTS WITH FAR-WESTERN WOODS.

At Tip No. 32 Dr. Schenk 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 growth.

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

“Here is a German sliver, I think, but I am not sure. The sapling in the shade with white pine it may average better. In the first seven years the silver fir does very little, but later 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. Schenk said:

“Don’t let us waste our time in arguing. It is very notable how much better the white pine does than the yellow pine under alkaline conditions. The black cherry 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 the size of a tall.

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 green young of 1898! I showed again an abandoned field the planting of nuts, as in this case, is practically out of the question—the planting of acorns, walnuts and hickory nuts, to be 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 led to transplant the saplings to this lot, it came back to productiveness. After cutting out the misshapen, huge, mountain-shaped piles of the old field did not remain. I obtained a nice, even stand of pine poles. The trees have grown as a mature growth a second growth for the future use of man.”

Tip No. 30 was given casual attention. It consisted of a stand of oak, chestnuts and hickories, some of them over one hundred years old. Here is a stand of trees improved cutting remnant 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 XXXVIII.—A WOODS-SCHOOL PLAN.

In the primeval woods, where all the trees are planted and you can imagine that many of the little pines, after being planted, stood just long enough for a heavy oak leaf and nearly two feet tall. I cut 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. Prunimal 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.”
I planted white pine, which was not a mesophyte in the prairie 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, at 500 or 600 years.

"This is a poor stand of white pine, and here is a heavy growth which we get when the trees are planted very well together. Then the boles for clean and quickly and then it 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 piled closely together trim them so fine that 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 prairie forest and were cut out about 1883, 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 older pines in the background. This seems to be the best way."

"This is white pine, and much of it has grown in the way I marked several trees, mostly misshapen or otherwise of no good, and here is a regeneration which is creditable. Here the students, under the direction of Dr. Schenck, marked several trees, mostly misshapen or otherwise of no good, growing under the instructions of Dr. Schenck. He seemed to pick out the victims with half a glance."

CHAPITRE XXVIII.—ACCRUING TO FRENCH METHODS.

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

"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 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 be done then I have changed my mind three times, and 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:

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

"The last lecture concluded a walk of five miles in the forest because the one was planted before the other."

"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 then let at many dollars out of it, unless the price is improved, and every thirty years at the same time we get for lumber purposes the older classes of the pine standards, of which we have 30-year-old ones, 60 and 90-year-old ones.

"So far not a single tree has been burned down or been attacked by insects. I have no promise from the insects for such an attack. They are blown down by a storm.

"This is a poor stand of white pine, and here is a heavy growth which we get when the trees are planted very well together. Then the boles for clean and quickly and then it get a better condition generally. This seems to be the best way."

FAIR NORTH CAROLINAINS WHO PRISSED AT A FEAST.

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, north Carolina pines with an undergrowth of oaks, hickories and the like. This soil on this French Broad base level was 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 acres. When the pine was cut, about 1880 or 1883, the hardwoods had the upper hand and were left intact. Some are groves 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 stump rather rapidly.

"This system of sylviculture, 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 sylviculture 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, sassafras and Hickory chestnut, forming the under story, and the upper story is formed of pine. Where that system is properly 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 then let at many dollars out of it, unless the price is improved, and every thirty years at the same time we get for lumber purposes the older classes of the pine standards, of which we have 30-year-old ones, 60 and 90-year-old ones.

"This is a poor stand of white pine, and here is a heavy growth which we get when the trees are planted very well together. Then the boles for clean and quickly and then it get a better condition generally. This seems to be the best way."

"When the pine was cut, about 1880 or 1883, the hardwoods had the upper hand and were left intact. Some are groves 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 stump rather rapidly."

With appetites borne of strenuous climbing and the fillip of prairie air, the participants here rested for luncheon. It was served out at 6 cents a tree and I would select only the best trees on each acre to insure the good trees of the future."

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 now see any dense stand here. The yellow seedlings in this cover are the progeny of two or three big trees down there. 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 be seen 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 all over as the group type of natural seed regeneration. I have found, to my great pleasure, that yellow poplar marked several trees, mostly yews, when 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 same growth of trees. It is all the nucleus for a group which is gradually enlarged just as the waves advance as it is dropped into the water."

Chapter XXXVIII.—Lunchen in the Opin.

With appetites borne of strenuous climbing and the fillip of prairie air, the 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, bea

ming 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 guests may safely be left for the time being.

(To Be Continued.)