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THE PLANT LIFE

OF

Hartsville, S. C.



BY

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It is I find in zoology as it is in botany; all nature is so full that that district produces the greatest variety which is the most examined.—*Gilbert White.*



THE PLANT LIFE OF HARTSVILLE, S C.

INTRODUCTION.

South Carolina has been the home of several of the most prominent botanists of America. Thomas Walter, an Englishman by birth, who lived on the Santee River in the upper part of St. John's Parish; Stephen Elliott of Charleston, H. W. Ravenel of Pinopolis and later of Aiken—these are honored names in the history of our science; nor are they by any means all who have made valuable contributions to the botany of the State. Dr. Francis Peyre Porcher, Dr. James McBryde, Dr. J. H. Mellichamp, and Prof. Lewis R. Gibbes were all native South Carolinians and careful students of its flora. All of these men lived and worked in the lower half of the State, in fact, all but two entirely below the Santee River. With the exceptions mentioned below, the flora of the northern and northeastern parts of South Carolina was left without any particular study, and knowledge of its composition has been largely a deduction from what was reported from similar or adjoining areas. There is much work yet to be done before the composition and distribution of even the higher plants of the State can be said to be at all well known. Mr. Ravenel and Dr. M. A. Curtis did considerable work in the fungi, but with these exceptions the lower plants have been studied scarcely at all.*

No catalog of the plants of South Carolina has ever been compiled. Elliott's book was called "A Sketch of the Botany of South Carolina and Georgia," but none realized more than the author the necessary incompleteness of the work, especially for the upper part of the State. The local lists that have been published are those of Thomas Walter for the upper part of Berkeley County, of Prof. Gibbes for Columbia and environs, of Mr. Ravenel for the vicinity of the Santee Canal (being a part of Walter's territory), and of Dr. John Bachman for the neighbor-

*Observations on the vegetation of South Carolina by the pioneering botanists of the early days,—travellers like Catesby, Bartram and the two Michauxs,—are of much interest and value, but they can be mentioned here only in passing. See also my articles in *THE JOURNAL OF THE ELISHA MITCHELL SCIENTIFIC SOCIETY*, as follows: "A Visit to the Grave of Thomas Walter," Vol. 26, April, 1910. "The Garden of André Michaux," Vol. 27, July, 1911. "Dr. Joseph Hinson Mellichamp," Vol. 27, May, 1911.

hood of Charleston.* At the end of his list of the more noticeable native and naturalized plants of South Carolina, in the volume on South Carolina published by the State Board of Agriculture in 1883, Mr. Ravenel gives the number of flowering plants known at that time in South Carolina as 1,810. A considerable number have been added since, and with a complete survey the total would probably reach over 2,100.

A history of the botanical work done in Darlington County can be written in a few words. As it lies somewhat off the direct line between Charleston and the North, or between Charleston and Columbia, few itinerant botanists have stopped in the district. Dr. Lester F. Ward passed through the county in 1895 and collected a few plants near the town of Darlington; and it is possible that Prof. Louis R. Gibbes of Columbia or Mr. H. W. Ravenel may have picked up something here. However, I have not seen or heard of any specimens in their collections from this section. The botanical exploration of the county has been confined almost entirely to one man. Rev. M. A. Curtis, a gifted botanist of wide reputation, was for nine years (1847-1856) rector of the Episcopal church at Society Hill in the eastern part of Darlington County, about seventeen miles from Hartsville. He gave his attention largely to fungi, and together with the Rev. M. J. Berkeley of England published a large number of new species in that group. However, he did not by any means neglect the flowering plants. He published no list of Society Hill plants or any papers dealing exclusively with the flora of this region, but several new species of Angiosperms were described by him from Society Hill, among them being *Ilex Amelanchier* and *Baptisia Serenae*. Appreciation must also be expressed for the work of Mr. W. D. Woods, of Darlington, who through newspaper articles, correspondence and personal effort, has encouraged through a long life the study and preservation of our native trees.

CLIMATE OF HARTSVILLE.

The altitude of Hartsville is 214 feet, its latitude about 34° 4^m and 2^{sec.}, its distance from the sea about eighty miles. The

*In addition to these Dr. F. P. Porcher has published as a thesis for the degree of M. D., an extensive and valuable Medico-Botanical Catalogue of the "Plants and Ferns of St. John's, Berkeley, South Carolina"; and a paper by me on the Flora of the Isle of Palms, appeared in *Torreya* for August, 1905.



Young and old growth of Long-leaf Pine in the Sand Hills.



town has no station of the weather bureau and no records of consequence are at hand. The climatological data may, however, be approximately guessed at from the records of nearby stations. For this purpose I give below a table containing the more important records for several of our nearest neighbors:

	Altitude in Feet	Mean Annual Temperature.	Highest Temp.	Lowest Temp.	Mean Annual Pre- cipitation.
Society Hill...	192	For 18 years 61.8	In 18 years 100	In 18 years 0	For 17 years 49.31
Darlington ...	155*	?	In 6 years 101	In 6 years 8	For 13 years 47.26
Cheraw	144	For 20 years 61.6	In 20 years 104	In 20 years 9	For 21 years 47.66
Columbia	351	For 22 years 63.2	In 22 years 106	In 22 years 2	For 26 years 46.62
Camden	222	?	In 4 years 100	In 4 years 12	For 42 years 44.18
Alken	565	For 25 years 63.9	In 25 years 107	In 25 years 3	For 26 years 46.43
Hartsville	214*				

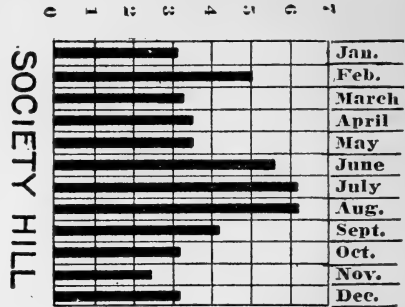
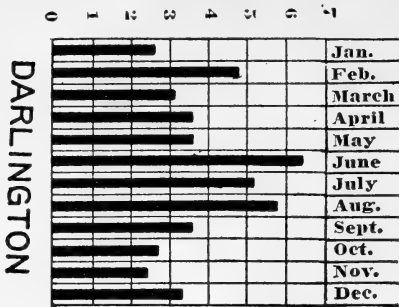
From the data in this table the conditions at Hartsville may be very closely approximated. Darlington is about fourteen miles from Hartsville, Society Hill about seventeen miles, Camden about forty miles, but the temperature of the two last places is much nearer that of Hartsville than is that of Darlington. I would guess that Hartsville is a little colder than Society Hill and the least bit colder than Camden. It is considerably colder than Darlington. As expressed by the vegetation there is a difference of nearly ten days in the coming of spring in Darlington and Hartsville, and there are some remarkable differences in the native vegetation. For example, the following coast plants are found wild or naturalized at Darlington but not at Hartsville: Carolina laurel cherry, or mock orange (*Prunus caroliniana*), † Darlington oak or laurel oak (*Quercus laurifolia*), *Decumaria*

*Elevation at the Atlantic Coast Line Railroad station as given by their survey. The Weather Bureau gives the altitude of Darlington as 175 feet. All other altitudes in the table are taken from the Weather Bureau reports.

†I know of about six trees of this species that have appeared spontaneously in or near the swamps and bays at Hartsville. In Darlington it has escaped abundantly.

(*Decumaria barbara*) and gray moss (*Tillandsia usneoides*).† One small spray of the gray moss has been found hanging over Black Creek at Hartsville.

As the nearest available information in regard to the rainfall of Hartsville there are given below diagrams of the data for Society Hill and Darlington:



Diagrams showing the mean annual rainfall for each month at Society Hill (for the seventeen years preceding 1909) and for Darlington (for the thirteen years preceding 1909). From the U. S. Weather Bureau reports.

There is no doubt that one of the principal factors influencing the distribution of species is the length of the growing season; and this may be determined by the mean occurrence of the last killing frost in spring and the first killing frost in fall. The nearest stations to Hartsville for which this data is available are Cheraw and Florence. For Cheraw the average date of the first killing frost in fall is November 1st, and for the last killing frost in spring is April 5th. For Florence the dates are November 7th and March 31st. This would give a growing season of 209 days for Cheraw and 220 days for Florence. Hartsville's growing season would be nearer that of Cheraw's, say about 212 days.

There are no humidity records for this section of South Carolina, but I think there is no doubt that the humidity is less in the vicinity of the sand hills than in any other part of the State. It is almost certainly a difference in atmospheric humidity rather than of temperature that accounts for the presence of the gray moss (*Tillandsia*) at Darlington and its absence at Hartsville.

†The non-occurrence of these plants at Hartsville is supposed to be due to a difference in climate. There are a number of others whose absence is due to soil characters, e. g., certain shrubs and trees of the Pee Dee swamp.

The very rare occurrence, say once in twenty years, of cold waves that drop the temperature for a night or so to the neighborhood of zero seems to have little effect in determining the constitution of the flora. Length of growing season, atmospheric humidity, and mean lowest temperature are much more important.

The climatic position of Hartsville may be understood best, perhaps, when we consider the success or failure there of certain well known cultivated plants. A number of half hardy subtropical species such as camellia (*Camellia japonica*), tea (*Camellia Thea*) camphor tree (*Cinnamomum camphora*), oleander (*Nerium oleander*), Cape jessamine (*Gardenia jasminoides*) may be successfully grown in the open, but our rarely occurring zero weather will injure them if unprotected. Oranges and other citrus fruits cannot withstand the average winters, but the new citrus hybrids, called Citranges, such as Morton, Willits, and Rusk, thrive and bear well.

TOPOGRAPHY AND GEOLOGY.

Hartsville is situated on the exact inner edge of the upper drier part of the coastal plain, marking, therefore, the northern boundary of this great geographical division of the State. Just to the north of the town proper is the rapid descent of about 50 feet into the valley of Black Creek. This valley, with certain irregularities, extends for approximately one-half mile and is terminated on its northern edge by the outposts of the sand hills, which, gradually rising in gentle undulations, extend their barren prospect for miles to the northward. These sand hills are on the line that separates the piedmont plateau from the coastal plain, and are a transition from one to the other. In their vegetation and geological origin they approach more closely to the character of the coastal plain. They were once much higher than they are at present, as is evidenced by the occurrence among them of a considerable hill, called Sugar-loaf Mountain, which rises to an elevation of 150 feet above the surrounding country and is capped by a layer of sandstone of sufficient strength to resist the extensive erosion that has elsewhere taken place. These hills mark the coast line of a Pleistocene sea that, shortly before the glacial epoch, halted here for thousands of years. An elevation then took place and the sea receded southward, exposing its level floor as our fertile and extensive coastal plain.

A cross section of the coastal plain in the neighborhood of Hartsville would show the following geological formations:

1st. **RECENT.** A surface layer of a few inches to a foot or more in thickness composed of a rather coarse gray, sandy loam, known as the Columbia sands.

2nd. **PLIOCENE? LAFAYETTE FORMATION.** About 20 or 25 feet of variegated clays and sands, often highly and attractively colored. These may be seen at the big water cut across Home Avenue above Mr. McNair's place.

3rd. **MIDDLE FRESH WATER CRETACEOUS: MAGOTHY FORMATION:** Drab or black clays only a few feet in thickness, containing much lignite and vegetable matter. Many pieces of wood occur in this stratum, perfect in shape but very soft.

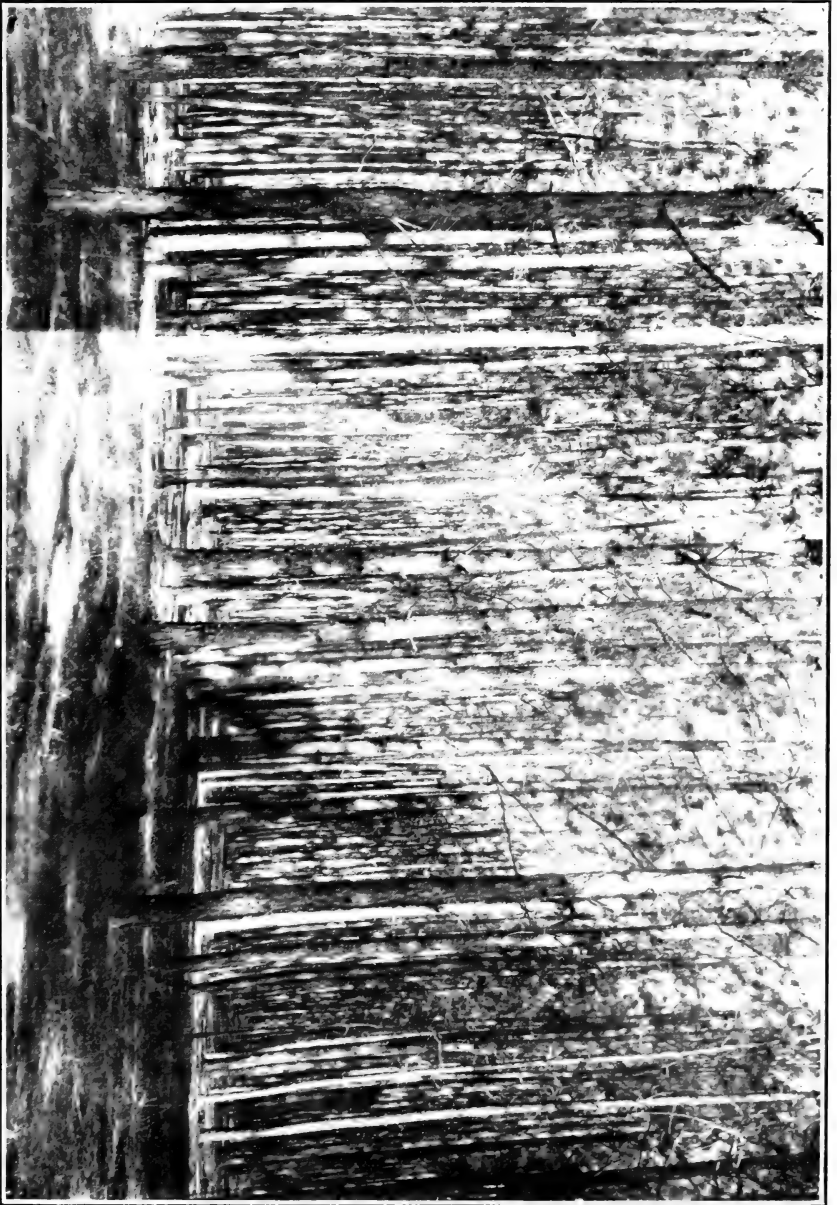
4th. **LOWER FRESH WATER CRETACEOUS: POTOMAC FORMATION.** This is the oldest of the coastal plain deposits, resting unconformably on the crystalline, igneous rocks below. It is characterized by absence of fossils, distinct banding, and the thickness of its component layers of sands, clays, arkoses, gravels, etc. It is often stained with iron or other pigments, and mica is plentiful. It is from the sands of this formation that the artesian water that supplies the town is obtained. This water is as nearly pure as ground water can be, and its remarkable clearness and sparkle make it unsurpassed as a table water.

In the lower part of the county there is interpolated between the Lafayette and the Magothy a deposit of Miocene marls of marine origin, and at places there are outcrops of this formation that have been worked for agricultural lime.

The general surface configuration of the country south of Black Creek valley is that of a remarkably level plain, with gentle elevations and depressions, and occasional erosion cuts by the streams. As a result of this topography the surface drainage is often not good and open ditches are much used to empty pockets and lower the water surface in cultivated land. Except on a very few sandy knolls on the southern rim of the creek valley, that are really outposts of the sand hills, the nature of the vegetation on the level plain is determined very largely by the position of the water surface in the soil, and it is easily seen that the main ecological plant formations are dependent chiefly on this factor.

According to the United States Soil Survey of Darlington County there are in the immediate neighborhood of Hartsville five types of soils. The town itself is shown in their map as situated on the Orangeburg sandy loam, but there is evidently some mistake here* as this type is described in the text as con-

*The town really stands, I think, on the Norfolk sandy soil and the Goldsboro compact sandy loam.



Second growth of Long-leaf Pine in the Sand Hills.

taining "from 10 to 40 per cent. of water-worn pebbles, which rarely exceed the size of a man's thumb." As every one who lives in Hartsville knows, the soil does not contain such pebbles. Even the boy with the slingshot never found them out. This type is shown as extending to the foot of the hill towards the lake, and there being replaced by the Norfolk sand, which composes the flat valley, and with some interruptions extends up into the sand hills a mile or more, where it merges into the "Sandhill" type.

The plantation immediately south of the town is of the Goldsboro compact loam type (according to the above-mentioned report), which may be said to correspond roughly to the flatwoods.

The plant formation that I describe as well-drained upland forest, which should include, I think, most of the area covered by the town and the hill slope to the north, seems to be typically characterized by the type of soil called Norfolk sandy soil by the Survey.

In describing the vegetation of the region it will be best to distinguish the principal plant formations and then to take up each in turn. Including the sand hills, streams and swamps, as well as the various distinctive areas of the level uplands, we may distinguish in the vicinity of Hartsville as many as six ecological divisions or areas, as follows:

1st—THE SAND HILLS, OR PINE BARRENS.

The soils are extremely porous and composed very largely of sand, the surface specimen analyzed by the U. S. Soil Survey showed 94.78 per cent. coarse and fine sands and only 0.77 per cent. of organic matter. The subsoil is a yellow sand of the same texture, and of slightly higher clay content. In lower spots the proportion of humus is much greater and the soil is denser and damper.

2nd—THE WELL-DRAINED UPLAND FOREST.

The soil is that of the Norfolk sandy loam which is described as follows by the Survey:

It "consists of from 12 to 24 inches of a gray sandy loam, not unlike the soil of the Goldsboro compact sandy loam. A superficial examination might not suffice to distinguish the two types, but the subsoil gives rise to a variation in crop production which is quite evident. This subsoil is a sticky yellow loam or clay, which contains enough medium and fine sand, however, to render

it much more friable than the subsoil of the Goldsboro compact sandy loam.

“There are a few areas of this type bordering large sand tracts, but its normal occurrence is as a narrow border, varying in width from one-half mile to two miles along the smaller streams. As the stream is approached the sandy soil becomes deeper and the subsoil lighter in texture.

“On account of the position of this soil the drainage is generally good. The uncleared areas support a heavy growth of pine and the various hard woods common to the uplands of this section.”

When cleared it makes an excellent type of farm land, but on account of the rather coarse texture it is somewhat inferior to certain of the more compact soils.

3rd—THE POORLY-DRAINED FLATWOODS.

These areas are somewhat lower than the preceding ones and are so extremely flat that the drainage is poor. The soil is Goldsboro compact sandy loam, and is thus designated by the Survey:

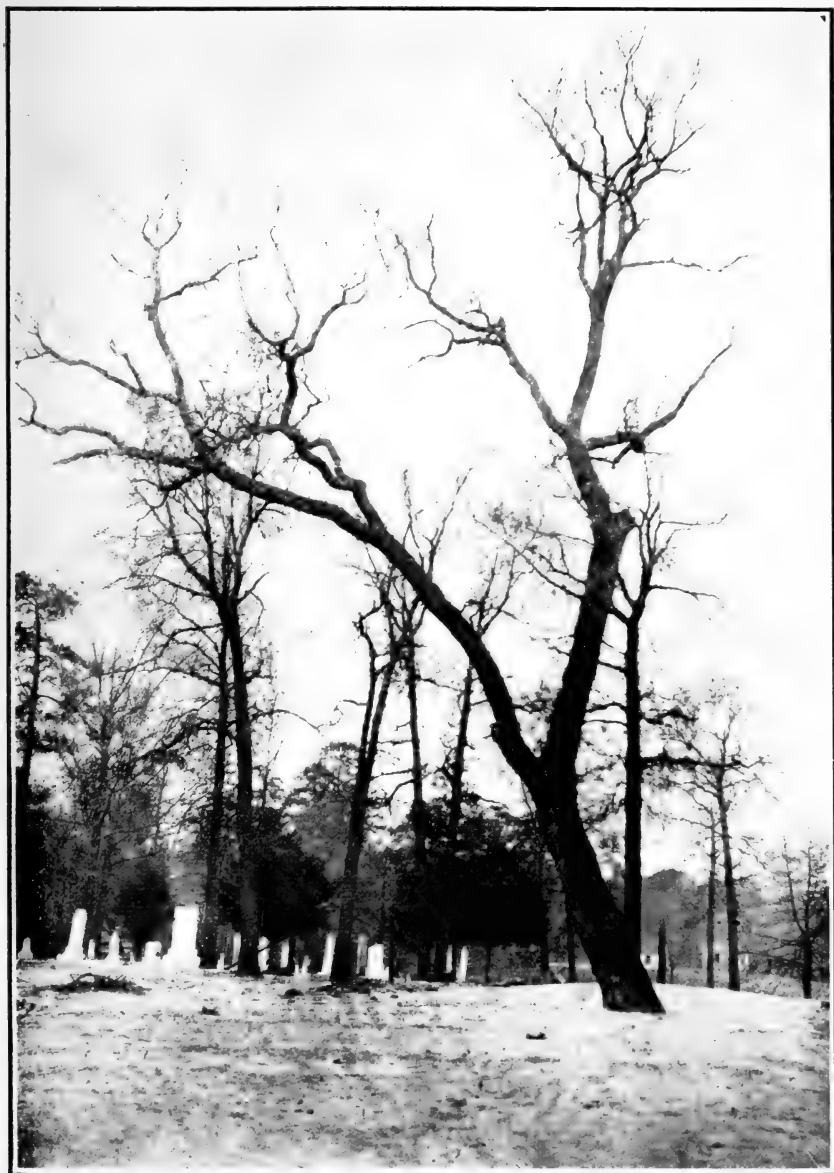
“The surface soil is an ashy-gray sandy loam, 10 to 20 inches in depth. There is usually a slight stickiness and coherency in this sand which distinguishes it from the [s]oil of the Norfolk sand. The subsoil is a tenacious and rather impervious clay loam, varying in color from yellow to dark gray. At lower depths the subsoil becomes lighter in texture. The line of contact between soil and subsoil is well defined.”

4th—THE SAVANNAS.

These conspicuous and interesting formations are undrained depressions in the flatwoods where the water stands at or above the surface for a considerable period of the year. The surface soil is a heavy, peaty, sandy loam and the subsoil is generally a dark gray sticky pipe clay that is almost impervious to water. In colder climates the savanna would probably be a Sphagnum bog.

5th—SWAMPS.

These may be divided into two sorts, the shallow swamps or bays (often called “galls” or “gall bays”), and the deeper swamps, and the bays may be further divided into the alluvial or typical bays and the non-alluvial or flatwoods bays. The typical bay is a low, wet, alluvial area of deep, fertile, more or



A large specimen of Turkey Oak (*Quercus Catesbaei*).

less muddy soil, rich in humus, with a pervious subsoil and some surface drainage. In the lower areas slowly moving surface water is generally present in pockets and runs between the tussocks. The non-alluvial or flatwoods bay is a formation that occupies an intermediate position between the flatwoods and the savanna. There is no drainage and the distinction is one of water content of the soil. The surface of the ground is almost saturated in rainy seasons, and damp in dry seasons, and the vegetation is quite different from either the savanna or the flatwoods. This is the formation that is called a "pocosin" in eastern North Carolina, although the term is used sometimes, it appears, to include the alluvial bay (see Harper, Bull. Torrey Bot. Club, Vol. 34, page 361). The deeper swamp is like the alluvial bay except that the surface is under water for a good part of the year. The bays are not subject to inundation and scouring from stream freshets as the deeper swamps are, and in the effect on vegetation this is perhaps the most significant difference between them.

6th—STREAMS AND PONDS.

Here the vegetation is aquatic and is either free floating or attached to the muddy or sandy bottom.

It will be best to take up the plant covering of each of these types in turn.

VEGETATION.

THE SAND HILLS.

The covering of these hills is a thin open forest of two stories—the upper one of long-leaf pine (*Pinus palustris*) towering high above the scrubby growth below. In the original condition the pines were moderately close, but not enough so as to cast a dense shade. These magnificent trees extend their spreading crowns at an altitude of 75 to 100 feet and seem more sure of themselves and more in character here than in any other place. And in reality it is only in these barren hills that the long-leaf pine is holding its own against the constant encroachment of the old-field pine that now seriously threatens its supremacy in all other parts of the coastal plain. For many years all the destructive powers of man have been waged against this most admirable natural product of the Southern States, until now there is scarcely anywhere to be found an undisturbed fragment of the original sand hill forest. The pines have been boxed and burned and cut for sawing until they are now only thinly scattered over the hills. But fortun-

ately they are reseeding themselves quite well in many places, and with the observance of the most elementary principles of forestry they could be renewed and increased indefinitely.

The frequent woods fires are still more or less destructive to the young plants, but after close observation for a number of years I am now convinced that the idea expressed by W. W. Ashe in several of his bulletins* that this species is more susceptible to injury by fire than the old-field pine is entirely erroneous. It is true that its growth is so slow that when five years old the bud is usually but a few inches above the ground, but the very dense and abundant protective scales of the bud are wonderfully efficient in keeping out the heat from the delicate growing point. Moreover, the widely spreading mat of long, succulent, mature leaves that rest on the ground prevents the accumulation of inflammable material near the bud and thus greatly reduces the intensity of the heat. Early in the spring of this year, when all buds were dormant, a severe fire ran over the woods between Burnt Bay and Prestwood's Lake. During the first week in June the ground was looked over carefully for evidence on this point. The woods are rather open and a large number of young long-leaf pine had made a start. The mature leaves were killed back almost or entirely to the bud, and were largely burned off, but I could not find a single plant even though only an inch high that was not putting out its fresh young leaves from the unhurt growing point. On the other hand, nearly all of the young plants of the old-field pine were killed, and many of them were four to six feet high. It is, of course, true that year old seedlings of long leaf pine cannot resist hot fires, and the destruction of very young plants in the way is doubtless a great deterrent at present to the reforestation of the sand hills.

Gifford Pinchot was the first to call attention to the superior adaptations of the long-leaf pine to fire resistance. In the National Geographic Magazine for October, 1899, page 298, he says: "Almost all trees yield readily to slight surface fires during the first ten or fifteen years of their life. To this statement the long-leaf pine is a conspicuous and rare exception. Not only do the young trees protect themselves in early youth by bark which is

*See Bulletins N. C. Geol. Survey, No. 5, page 58; No. 6, pages 157-165, and No. 7, page 16. In these bulletins Mr. Ashe gives an excellent discussion of the long-leaf pine problem and of the methods necessary to secure the continued propagation of the forests.



Upland Willow Oak (*Quercus cinerea*) in the Sand Hills.

not uncommonly as thick as the wood (the whole diameter being thus two-thirds bark and one-third wood), but they add to this unusual armor a device specially adapted for their safety when growing amid long grass, usually a most fatal neighbor to young trees in case of fire. It is to be noted that the vast majority of long-leaf pines are associated with grass from the beginning to the end of their lives. During the first four or five years the long-leaf seedling reaches a height of but four or five inches above the ground. It has generally been erroneously assumed that this slow growth makes it specially susceptible to injury from fire; but while the stem during these early years makes little progress, the long needles shoot up and bend over in a green cascade which falls to the ground in a circle about the seedling. Not only does the barrier of green needles itself burn only with difficulty, but it shades out the grass around the young stem, and so prepares a durable fire-resisting shield about the vitals of the young tree."

In his little book on "The Long-Leaf Pine in Virgin Forest," published in 1907, G. Frederick Schwarz discusses this point and calls attention to the exceptional fire-resistance of the long-leaf pine after the first two or three years of growth. On page 71 he says: "Without attempting to minimize the immediate and serious harm done to young growth, it may be asserted that the destruction of long-leaf pine seedlings by surface fires has been somewhat exaggerated and misunderstood; at any rate, so far as concerns seedlings over two or three years of age." And while admitting that one or two year old seedlings are destroyed as a rule by fires he says (page 72): that "After the seedlings have attained several years' growth they begin to offer wonderful resistance to surface fires." In the *Bulletin of the Torrey Bot. Club*, Vol. 38, p. 523, 1911, R. M. Harper says: "It is pretty well known that long-leaf pine, after it is four or five years old, is less affected by fire than almost any other tree we have, and in Southern forests periodically swept by fire little else can grow but this pine and a great variety of more or less xerophytic, mostly perennial, herbs, among which various grasses are usually most abundant."

In the original condition of our forests the old-field pine was largely confined to the boundaries of swamps, bays, and water courses. Over the remainder of the country the long-leaf pine was supreme. I think it probable that this condition was due principally to the fact that the long-leaf pine was able to endure

the fires of the uplands, while the old-field pine was not. The latter was pushed aside to protected places. The present preponderance of second growth old-field pine in most thrown-out land, outside of the sand hills, is probably due to two factors—1st, the infrequency of fires in cleared old fields, and 2nd, the insufficient seed production and limited seed distribution of the long-leaf pine. Given an equal chance and protection from fire and the old-field pine seems able to supplant the long-leaf pine from most of the good lands that it once occupied. It is different in the sand hills. There the soil is too poor to support the old-field pine and the long-leaf pine is given a free hand. The slow propagation of the latter there at present seems to be due as much to the scarcity and infrequent seed production of old trees as to fires, though these certainly do great damage, as mentioned above, in the destruction of young seedlings. The fact that the long-leaf pine can reproduce itself in the sand hills and is doing so abundantly in places is evidenced by the growth shown in Plates I and II.

Below the pines the rather low growth of the hills is composed most largely of several species of scrub oak. Among these the turkey oak, or fork-leaved black jack as we call it, (*Quercus Catesbaei*) is by far the most abundant, especially in the purest sand, where it is often the only oak over considerable areas. It is generally associated with broad-leaved black jack (*Q. marilandica*), upland willow oak (*Q. cinerea*) and post oak (*Q. stellata*). The turkey oak and upland willow oak are typical sand hill species, but the other two occur also in more genial soils, where the latter reaches a much greater size. Though characteristically very small and scrubby the turkey oak may in favorable situations become a tree of considerable proportions—say 40 feet high and 2 feet in diameter. One of the largest I know of is that shown in Plate III near the Baptist Church building.

The upland willow oak is the smallest of all our species. The largest specimen I ever saw is shown in Plate IV (a winter view). It is about 25 feet high and 14 inches in diameter. The associations of this oak as shown in the picture will give a good idea of what is characteristic of sand hill conditions. Tall long-leaf pines are scattered in the back ground, and in middle ground are small trees of turkey oak, black jack oak, post oak, a few stunted persimmons, choke cherries (*Prunus serotina*), and sassafras bushes. Poison oak (*Rhus quercifolia*) and summer grape (*Vitis aestivalis*) were the only other woody plants. In August,



Pine and Oak woods below Captain Cannon's Residence.

1910, the flowers in bloom around this tree were *Vernonia graminifolia*, *Liatris pauciflora*, *Chrysopsis graminifolia*, *Dasystoma pedicularia* (fly poison) and *Ascyrum hypericoides*.

In the most barren knolls of the hills, where the sand is purest, about the only trees that can stand the conditions are the long-leaf pine and the turkey oak. And there is no shrub that can be said to be tolerant of such places. But where the slightest advantage in moisture is to be had the trees already mentioned can establish themselves, and a number of shrubs become characteristic components of the cover. Horse sugar (*Symplocos tinctoria*), stagger-bush (*Lyonia mariana*), sumach (*Rhus copallina*), and the summer grape (*Vitis aestivalis*) are frequent. The Carolina holly (*Ilex caroliniana*), a small shrub with large deep red, shiny berries, is also a member of this community, but it is rare, in fact one of the rarest Hartsville shrubs. It will grow in much damper soil, as for example in front of the Upper Farm Place on Home Avenue.

Bear grass (*Yucca filamentosa*) and rattlesnake master (*Eryngium aquaticum*) require slightly damper soil than the preceding group. They are usually to be found near the foot of slopes that descend to water courses and bays. But I have found the rattlesnake master in very dry places at times, and also in almost saturated soil. Another little shrub that can endure almost the extremes of both drought and moisture is the dwarf black huckleberry (*Gaylussacia dumosa*). This plant can flourish under a remarkable range of conditions. It is as much at home on the damp edges of savannas, associated with *Lycopodium adpressum* and *L. carolinianum* as it is in the sand hills in company with the scrub oaks. This is also true of that pretty little pink flower *Sabatia brachiata*. Next to the pines and oaks there is nothing so at home in the sand hills as the wire grass (*Aristida stricta*). Its grayish-green, terete, wiry, recurved leaves form large tussocks thinly scattered in the sand. Frequently there is so little other growth that the pure white sand may be seen from a long distance shining under the trees.

The sand hills are not without their share of attractive flowers; in fact, with the exception of the savannas they are the most colorful of the floristic regions of our section. In early spring all except the most barren places support a good display of violets and bluets (*Houstonia caerulea*), shoe-strings (*Cracca virginiana*), and the dainty little dwarf flag (*Iris verna*). *Arbutus* (*Epigaea repens*) is also very frequent here, and lovely

in early spring. Wild phlox (*Phlox Hentzii*) and the blue flowered lupine (*Lupinus diffusus*) are very conspicuous, but occur only rather sparingly in scattered patches. At several spots in the hills there have been discovered in recent years a number of colonies of that most charming little carpet plant *Pyxidantha barbulata*, called flowering moss. It has been known before only from the pine barrens of New Jersey and North Carolina.* In summer there is a continuous series of bloom that reaches its height in August, with a number of conspicuous composites, such as *Chrysopsis graminifolia*, *Chrysopsis aspera*, *Chrysopsis pilosa*, *Vernonia augustifolia*, *Aster concolor*, *Silphium compositum*, *Coreopsis delphinifolia* and species of goldenrod.

Other characteristic herbs of the hills are *Stillingia sylvatica* (queen's delight), *Cracca ambigua*, *Cracca spicata*, *Amorpha herbacea* (lead plant), *Indigofera caroliniana* (wild indigo), *Astragalus apilosus*, *Hieracium Gronovii*, *Carduus repandus* (thistle), *Breweria trichosanthes*, *Baptisia tinctoria*, *Asclepias tuberosa* (butterfly-weed), *Tragia urens*, *Euphorbia Ipecacuanhae*, *Euphorbia Curtisii*, *Euphorbia maculata*, *Penstemon laevigatus*, *Onosmodium virginianum*, *Paspalum setaceum* and *Stenophyllus capillaris*. There is a small sedge (*Cyperus Martindalei*) that is also abundant here, but it had not before been reported from the State.

THE UPLAND FORESTS.

The vegetation of the well drained upland forest of this section has been largely cleared away, but certain areas still remain that exhibit to some extent the primitive conditions. Originally it was as in the sand hills, a two storied forest with long-leaf pine as the dominant, but not the most abundant tree. Most of the pines have now been felled, but the vigorous and luxuriant growth of broad leaved trees that reached almost to the lower limbs of the pine crowns has been scarcely changed. The oaks are the dominant factor now, as they are in the sand hills, but are of different species. The Spanish oak (*Quercus falcata*) and black oak (*Q. velutina*) are the largest and by far the most numerous trees. Both of these oaks are of fine proportions, often reaching a height of seventy feet and a diameter of 3 or 3½ feet. Next in abundance come the post oak (*Q. stellata*) and white hickory (*Carya alba*). The former, which in the

*See my article in *Torrey*, Vol. II, page 9, Jan., 1911.



Sparkleberry (*Vaccinium arboreum*) under Old Field Pine (*Pinus taeda*)

sand hills is scrubby or even bushy, is here a large tree, second only to the black, scarlet, and Spanish oaks. The scarlet oak (*Q. coccinea*) is a less common, but characteristic member of this community. There is a very large old tree of this species on the lawn of the old Law Place (now the residence of Mr. A. M. McNair).

Among the smaller trees dogwood is abundant, and pignut hickory (*Carya glabra hersuta*), persimmon (*Diospyros virginiana*), sassafras, and choke cherry (*Prunus serotina*) are frequent. There are few shrubs except in open places where sumach (*Rhus copalina*), red haw (*Crataegus uniflora*), cowitch (*Tecoma radicans*), and Jersey tea (*Ceanothus americanus*) are common. The slope of the hill towards the creek supports a fine forest which exhibits well the transition from the dryer to the damper well-drained soil. Its crown is covered with the growth just described, but on the slope there appear a few scattered trees of short-leaf pine and old-field pine, and there is more dogwood (*Cornus florida*), choke cherry (*Prunus serotina*), sumach (*Rhus copalina*), and Jersey tea (*Ceanothus americana*). There were once a number of chinquapin bushes (*Castanea pumila*) on this hillside opposite Burnt Bay, but they are now nearly all gone.

At the foot of the hill behind the residence of Capt. E. W. Cannon there are several acres of well-drained fertile land that slopes gently toward the lake, and supports an untouched forest that exhibits well a slight modification of the conditions just described. In Plate V is shown a photograph of this spot. The old-field pines are very tall and fine and rise far above the hardwood growth of oak, hickory, etc., with gums and holly near the lake. In the center of the photograph is shown a fine post oak with wide-spreading branches. The lower woody growth is most conspicuous for its very fine dogwood (*Cornus florida*) and sparkleberry (*Vaccinium arboreum*). The latter is as luxuriant and abundant as I have ever seen it and in places almost forms thickets as shown in Plate VI. It here composes about all the undergrowth and is twelve to fifteen feet high.

Where the two paper mill roads go down the hill there are scattered specimens of the pretty little dwarf flowering locust (*Robinia nana*), one of our rarest shrubs. On newly deposited soil near gully washes, etc., one may occasionally find catalpa trees (*Catalpa bignonioides*) and red mulberry (*Morus rubra*), both probably introduced and not native. The bullace grape (*Vitis rotundifolia*) and the summer grape (*Vitis aesti-*

valis) are quite plentiful in these woods, as they are in most places that are not too wet. Wild "honeysuckle" (*Azalea nudiflora*) is also found here but is more at home in the flatwoods. As the foot of the hill is reached and the soil becomes more moist the appearance of holly (*Ilex opaca*), yellow jessamine (*Gelsemium sempervirens*) horse sugar (*Symplocos tinctoria*), etc., indicates the transition zone to bay-margin conditions.

Beginning a little way above Captain Cannon's Place the swamp margin is bordered on the south side by more or less abrupt bluffs which may reach the entire height of the valley, as at the old Bacot Place. The vegetation of these bluffs represents the most northern element of our flora. Here is Mountain laurel (*Kalmia latifolia*) in profusion, and the rare combination may be seen of kalmia trees adorned with luxuriant vines of yellow jessamine. Perhaps the most interesting plant of these bluffs is coltsfoot (*Galax aphylla*) which occurs in plenty in several places, and reaches here its seaward limit so far as I can ascertain. Spotted wintergreen (*Chimaphila maculata*), heartleaf (*Asarum arifolium*), partridge berry (*Mitchella repens*), arbutus (*Epigaea repens*), snake root (*Aristolochia serpentaria*), calamint (*Clinopodium carolinianum*), witch hazel (*Hamamelis virginiana*), and sourwood (*Oxydendrum arboreum*) are attractive plants that occur here at their best. At two or three places along these bluffs, as at Laurel Land and below the paper mill, the remarkable little trailing huckleberry (*Vaccinium crassifolium*), with firm, oval, evergreen leaves is found.

In Plate VII is shown the vegetation of these bluffs as it appears at Laurel Land. Mountain Laurel (*Kalmia latifolia*) is in the foreground, holly (*Ilex opaca*) and white oak (*Quercus alba*) in the background.

At the top of the high bluff behind the Bacot Place there are a few escaped trees of mock orange (*Prunus caroliniana*) and China tree (*Melia Azedarach*). As in the case of the peach, such occasional escapes as this do not entitle these trees to a place among the naturalized flora of the section.

To one accustomed to more northern conditions the most striking peculiarity of our rich woods is the almost entire absence of the conspicuous early spring flowers that show their attractive colors before the sun is cut off from them by the leafing of the trees. We have no anemones, hepaticas, bloodroot, giant chickweed, spring beauty, or dogtooth violets (which are not violets at



Kalmia, Holly and White Oak at Laurel Land.

all). The hills and savannas have considerable color from herbaceous plants, but the deeper woods get most of their spring charm from the woody plants, as kalmia, yellow jessamine, dogwood, and azalea.

THE FLATWOODS.

A transition from the well-drained forest to the more pronounced flatwoods may be noticed in the pine grove to the north of Home Avenue, in front of the Upper Farm Place. Here for the first time we find a considerable amount of the short-leaf pine (*Pinus echinata*), and with it are associated long-leaf pine and old-field pine. Among these I was surprised to find a large tree of pond pine which is here in as dry a situation as I know of for the species (see Pond Pine under Hartsville trees). This is the only bit of level ground I have seen where these four coastal plain pines are to be found within a few yards of each other. Below the pines is a rather complete covering of shrubs and small trees. In addition to black oak and Spanish oak there is water oak (*Quercus nigra*), willow oak (*Q. Phellos*) and some black jack (*Q. marylandica*). One of the most conspicuous things about the grove is the large number of young holly (*Ilex opaca*) trees which are more abundant here than in any place I know of near Hartsville. The other trees are dogwood, white hickory, sassafras, choke cherry and persimmon. The shrubs are sparkleberry (*Vaccinium arboreum*), which is in great abundance, Carolina holly (*Ilex caroliniana*), red haw (*Crataegus uniflora*), and another species of *Crataegus* not yet determined. The perennial and almost shrubby little calamint (*Clinopodium carolinianum*) is abundant. Yellow jessamine, bullace grape and summer grape are the only vines.

The re-seeding of the three species of pine in this grove is a point of considerable interest. There is abundant reproduction of the short-leaf pine, less of the old-field pine and a little of the long-leaf pine. Most of the young growth is in the more open places, but even in quite shady spots among the shrubs there are a large number of slender, delicate and struggling little short-leaf pine plants that grow about three inches a year and when ten years old are often not thicker than a lead pencil. Among the young long-leaf pines that were scattered here and there were some that were withstanding a shade so dense as to seem quite prohibitive to such sun-loving plants. One of these young

trees is shown in Plate VIII. It is growing in a dense clump of sparkleberry bushes and short-leaf pine saplings, over which is a canopy of bullace grape vines. The extent of the shade is indicated by the occurrence around the foot of the pine of clumps of moss and of a number of plants of pipsissewa (*Chimaphila maculata*). This little pine is at least twelve years old and is only three feet three inches high, but it is far more stocky and vigorous than a number of young short-leaf pines near it, several of which had been killed by the shade. Another surprise was the finding in the same grove of a young long-leaf pine closely surrounded by holly (*Ilex opaca*). In fact all one's previous experience in regard to the associations and requirements of the long-leaf pine seems controverted here.

Among the herbaceous plants in the grove are *Aster concola*, *Vernonia angustifolia*, *Lespedeza repens*, *Dolicholus erecta*, *Crotalaria Purshii*, *Lespedeza virginica*, *Lespedeza Nuttallii*, *Galactia volubilis*, *Stylosanthes riparia*, *Zornia bracteata*, *Baptisia tinctoria*, *Schrankia angustata*, *Polygala grandiflora*, *Euphorbia Curtisii*, *Dasystoma pedicularia* (fly poison), *Helianthemum majus*, *Lechea villosa*, *Lechea racemulosa*, *Lechea Torreyi*, *Chimaphila maculata*, *Hypoxis hirsuta*, *Erigeron ramosus*, *Hieracium venosum*, *Solidago odora*, *Vernonia angustifolia*, *Chrysopsis graminifolia*, and *Sericocarpus bifoliatius*. On a ditch bank through an open field near here are a good lot of honey locust trees (*Gleditsia triacanthus*), a few hackberries (*Celtis Smallii*), and a single small ash tree (*Fraxinus Darlingtonii*), the only one I have found in the neighborhood of Hartsville.

For the typical low flatwoods I shall select for description that area lying directly south of Mr. J. E. Miller's residence. Here the long-leaf pine is still present in considerable quantity in mixture with the old-field pine, which is the dominant tree of the flatwoods. The relative abundance of these two pines fluctuates very rapidly according to the slight dips and elevations of the surface, the long-leaf pine preferring the higher ground.

Originally the pines stood pretty close in the flatwoods, but in most places they have been so culled as to be now considerably scattered. The general effect is rather open. The willow oak is abundant, and is perhaps the most characteristic tree. The other arborescent growth consists of water oak, Spanish oak, black jack oak, post oak (a little), black gum, sweet gum, and persimmon.



Young Long-leaf Pine in dense shade.

Beneath the trees the shrubbery is more or less clumped, with open spaces between. The small gallberry (*Ilex glabra*) and the wax myrtle (*Myrica cerifera*) are the most abundant shrubs. The former is evergreen and in such open positions is rarely over three feet in height. On May 24th, 1909, it was in full bloom and its black berries of the preceding season were still hanging on in abundance. The wax myrtle is of two forms, a large shrub three or four feet high, that often stands close against the boles of the pines, and a small dwarf variety, one foot high or less, that runs extensively in open places. To this latter form Dr. J. K. Small has given the name of *Myrica pumila*. As there has been some doubt as to whether *M. pumila* is a species or merely a growth form of *M. cerifera* dependent on environmental influences, I undertook to settle the point by planting the two forms side by side both at Hartsville and at Chapel Hill, N. C. After several years each retains its character completely, thus proving at least a varietal distinction.

There is a good deal of the little stagger-bush (*Lyonia mariana*) around the edges of the other shrubbery. It is very pretty when covered with its large, white, bell-shaped flowers. The only other shrubs noticed in this area were high blackberries (*Rubus Andrewsianus*) and sumach (*Rhus copalina*). Plate IX is a photograph of these woods.

About two hundred yards farther down the road where it turns towards the old Lucas Place the soil is not quite so damp and is covered with a dense growth of remarkably varied composition. The trees are long-leaf pine (*Pinus palustris*), black gum (*Nyssa biflora*), sweet gum (*Liquidambar styraciflua*), black jack oak (*Quercus marilandica*), post oak (*Q. stellata*), willow oak (*Q. Phellos*), water oak (*Q. nigra*), Spanish oak (*Q. falcata*), white hickory (*Carya alba*), persimmon (*Diospyros virginiana*), choke, cherry (*Prunus serotina*) and dogwood (*Cornus florida*). This is an unusual combination, but no more so than is exhibited by the shrubs. Gallberry (*Ilex glabra*), sumach (*Rhus copalina*), cat brier (*Smilax rotundifolia*), low-bush Huckleberry (*Gaylussacia frondosa*), low black huckleberry (*Vaccinium tenellum*), a species of haw (*Crataegus*), shad bush (*Amelanchier Botryapium*), stagger-bush (*Lyonia mariana*), poison oak (*Rhus quercifolia*), dewberry (*Rubus procumbens*), and late blackberry (*Rubus cuneifolius*), all occur within a few feet of each other. Here also are sensitive plant (*Schrankia angustata*), wild yam

(*Dioscorea villosa*), and bracken fern (*Pteris aquilina*) growing together.

As we pass through these flat woods in a southerly direction the surface gradually becomes more depressed and the soil damper until we enter a typical flatwoods bay, called a "pocosin" in North Carolina.* In general aspect the flatwoods bay is much like the alluvial bay, but the tiers of vegetation are generally more sharply marked, there being fewer broad leaved trees of medium height to fill in between the pines and the shrubs.

At the northern end of this bay, near Mr. Miller's house, the distinctive peculiarities of the pocosin are more clearly marked than is usual in this section. The characteristic two story effect of evergreen shrubs is strikingly produced by the open forest of old-field pine with the gall-berry bushes below. The wax myrtle does not enter here, and the gall-berry is the only shrub over most of this end of the bay. On the gentle slope that marks the boundary of the bay is a scattered growth of *Lyonia mariana* and *Vaccinium tenellum*.

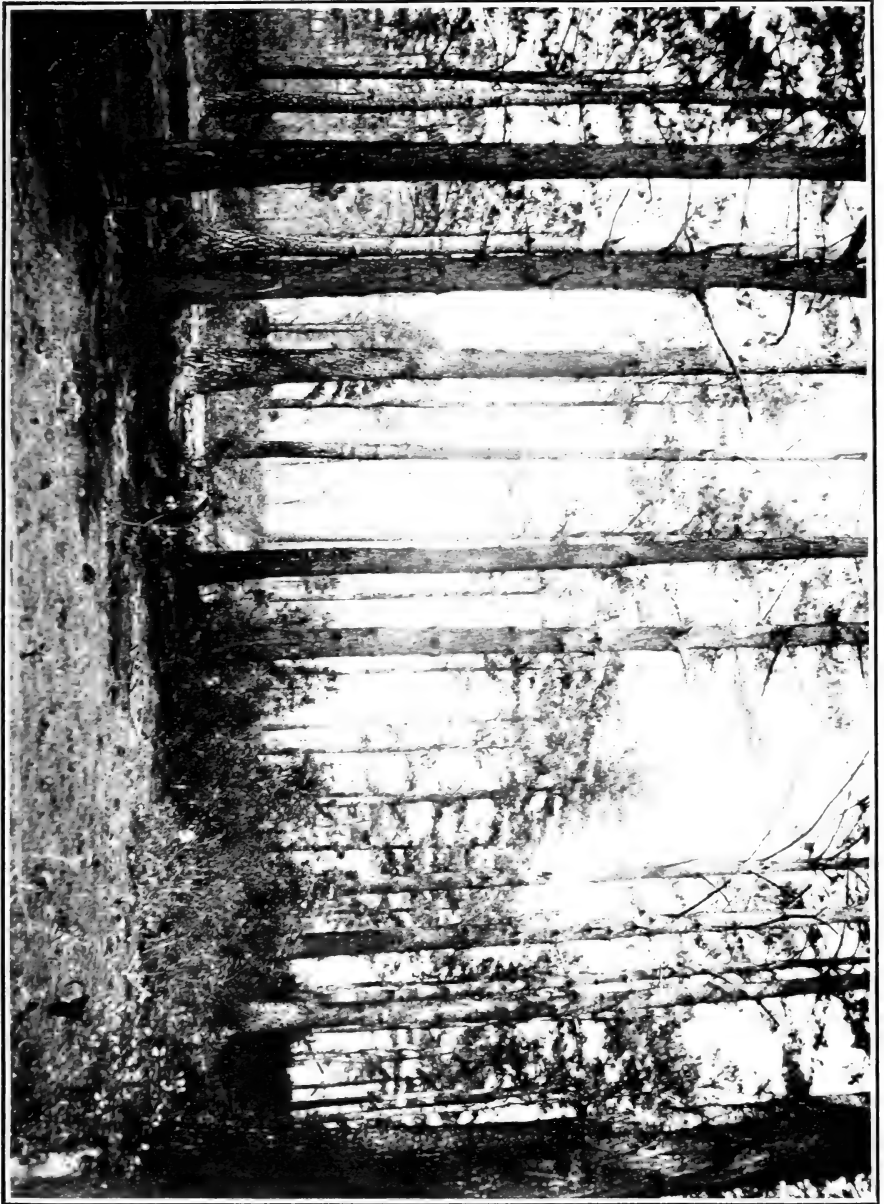
Through the main body of the bay there is mixed with the pine a good deal of scattered cypress, and there is a little black gum (*Nyssa biflora*) and holly (*Ilex opaca*). In the lowest places the gallberry disappears, but the pine and cypress are scarcely interrupted by the wetter soil.

On the west side, at this end there is a slightly dryer area over a hundred yards in width where the old-field pine is suddenly replaced by long-leaf pine, but the gall-berry continues on with even greater density and luxuriance. The slight difference in moisture is also indicated by the appearance of *Lyonia mariana* in considerable amount

In open places between the bushes in the bay the ground is covered with grasses, sedges, and a few other herbaceous plants. On April 28, 1912, the only flowers in bloom were white violets (*Viola primulifolia*, pubescent form), cinquefoil (*Potentilla caroliniana*), a species of blue-eyed grass (*Sisyrinchium*), and a very little of the pretty composite, *Thyrsanthema semiflosculare*. In dryer parts and in the adjoining flat-woods small bluets (*Houstonia patens*) were in bloom on April 7th.

As this bay extends toward the southeast it becomes denser; other species of trees and shrubs appear, and the vegetation takes

*There is some difference of opinion as to exactly what a pocosin is. See Harper in Bull. Torrey Botanical Club, Vol. 34, page 361. 1907.



Hartwoods showing Old-field Pines and a few Long-leaf Pines; undergrowth of Sand-berry (*Myrica cerifera*) and Gall-berry (*Ilex glabra*).

on more of the aspect of the alluvial bay. Whether this increase in number of species and density of growth is due to better drainage is not certain, but that this is so seems likely, as there are several ditches in this part that considerably reduce the amount of standing water in wet seasons. The old-field pine is still dominant, and much young growth of this species is coming on. The cypress, on the other hand, is confined to the lower places where competition is not so strong. The other trees that appear here, mentioned in order of their abundance, are black gum, sweet gum, red maple, long-leaf pine, water oak, holly and sweet bay (*Magnolia glauca*). The three last are scattered and scarce. In addition to these a very few red bays (*Persea pubescens*), one dogwood (*Cornus florida*), and one choke cherry (*Prunus serotina*) were seen.

Among the shrubs the gallberry is still most abundant, but there is a quantity of both of our high bush huckleberries (*Vaccinium corymbosum* and *V. fuscatum*), each reaching a height of ten to twelve feet. Of these two *V. fuscatum* is considerably more plentiful than the other and reaches a slightly greater height. Chokeberry (*Aronia arbutifolia*), cat brier (*Smilax rotundifolia*) and low black huckleberry (*Vaccinium tenellum*) are not rare, and there is some sweet pepper bush (*Clethra alnifolia*), bullace grape (*Vitis rotundifolia*) and bamboo briar (*Smilax laurifolia*). The two last are far more abundant and characteristic in the alluvial bays.

On the ditch bank by the road passing through this part of the bay to the Lucas Place were high blackberry (*Rubus Andrew-sianus*), dewberry (*Rubus procumbens*), *Smilax glauca* (a little), woodbine (*Lonicera sempervirens*) and a good deal of the exotic Japanese honeysuckle (*Lonicera japonica*).

Near the back of Major Coker's Hartsville Plantation on the west side, is another flat-wood's bay of somewhat different character from the one just described. It is lower and wetter and in its central part the pond pine (*Pinus serotina*) replaces the old-field pine (*P. taeda*). Many square yards of the wet ground are covered with thick compact mats of hair-cap moss (*Polytrichum commune*). Cypress is present, with sweet gum, black gum, sweet bay and red maple in good amount. There is a little willow oak, red bay, black willow, and Carolina poplar. The shrubs here that are not found in the other bay are horse sugar (*Symplocos tinctoria*), male berry (*Lyonia ligustrina* var. *foliosiflora*), *Cyrilla racemiflora*, *Zenobia pulverulenta*, *Zenobia*

cassinifolia, *Itea virginica*, and *Leucothoe racemosa*. From this list it would seem that this bay approaches somewhat to the alluvial bay, but it may still be distinguished from such a growth as Burnt Bay by the much more open vegetation and small development of evergreen trees (except pine). The sweet bay present is small and inconspicuous, and red bay is rare and also small.

Ascyrum stans and *Ascyrum hypericoides* are present, and there is a little *Smilax laurifolia*.

Shrubs occurring here that were also found in the bay by Mr. Miller's place are *Aronia arbutifolia*, *Vaccinium corymbosum*, *V. fuscatum* and *Clethra alnifolia*. On the edge is an abundance of *Clethra alnifolia*, *Gaylussacia frondosa*, *Vaccinium tenellum*, *Andromeda mariana* and *Ilex glabra*. The pretty little partridge berry (*Mitchella repens*) was also found growing in damp mossy spots near the borders. Under the old-field pines beyond the edges of the bay were low, extensive beds of *Azalea nudiflora*, *Vaccinium tenellum*, *Gaylussacia dumosa*, *Myrica pumila* and *Ilex glabra*.

Zenobia pulverulenta and *Zenobia cassinifolia* are two beautiful shrubs of the heath family that are partial to the flat-woods bays, but they are very erratic in their occurrence. They prefer the wet, undrained soil of these bays and are rather rare in alluvial bays, but all flat woods bays do not contain them. They multiply by underground shoots and frequently form rather extensive patches, to the exclusion of other growth. In Plate X is shown a large clump of each of these species. *Zenobia pulverulenta* is at the right and *Zenobia cassinifolia* is at the left. Both are in flower, and a charming display they make. The point where this photograph was taken is not in the area just described, but in a somewhat similar flat across Black Creek about half mile below the paper mill. In the photograph there is shown some *Lyonia nitida* under the front edge of the large bushes, a slender plant of *Ilex lucida* projecting through the center of the right hand clump and *Ilex glabra* standing behind and to the left. In the immediate neighborhood were *Cyrilla racemiflora*, *Viburnum nudum*, *Aronia arbutifolia*, and small trees of pond pine, red bay, black gum, red maple, and sweet bay.

A comparison of the flatwoods bay or "Pocosin" and the alluvial or well drained bay will show the presence in the latter and absence in the former of juniper (*Chamaecyparis thyoides*),

loblolly bay (*Gordonia lasianthus*), large gallberry (*Ilex lucida*), swamp azalea (*Azalea viscosa*), swamp wax myrtle (*Myrica carolinensis*), and the two 'possum haws (*Viburnum nudum* and *Viburnum cassinoides*). On the other hand the two *Zenobias* and cat briar (*Smilax rotundifolia*) are found in the flatwoods, but are generally absent from the alluvial bay. There is the further difference in the Hartsville area of the dominance of the pond pine in the drained bay and of the loblolly pine in the flatwoods bay.

In the bay north-east of the old Lucas Place through which the road passes there may be seen a beautiful example of transition from bay to savanna conditions. On the south side of the road near the center of this area the vegetation of the bay circles about and encloses a pretty little savanna of about a quarter acre in extent, where four or five cypress trees are standing on a grassy floor. This sudden change from the bay vegetation is due to a depression in the surface and an increase in the dampness of the soil in consequence.

THE SAVANNAS.

There are all gradations between the level flatwoods and the savanna formations, and there are savannas of every size from an acre or less to a number of square miles.

The savanna is a wet, undrained prairie or meadow with a scattered open cover of cypress and pond pine trees. There is practically no shrubby growth. In late spring and summer these savannas show the most conspicuous display of attractive flowers of any of our plant societies. In May and June the two species of swamp iris or blue flag (*Iris versicolor* and *Iris prismatica*) are conspicuous and beautiful with flowers showing all shades of color from deep blue and lilac to light blue.

The most extensive savanna in Darlington County is the Big Savanna east of Auburn about six miles from Hartsville. The Atlantic Coast Line road runs directly across it. I have not had an opportunity to study this particular savanna, but from the train it seems to have the same sort of vegetation as the others I am more familiar with. However, on account of its large size, it is quite probable that it will show some peculiarities on closer acquaintance and I hope some day to make it a more extended visit. The savanna most studied was the one on the back part of Maj. J. L. Coker's plantation, called "Plantation Savanna" in

the herbarium labels. It is a small one, only about three acres in extent, and recent drainage has begun to change it a little. There is here, in addition to the cypress and pond pine, some black gum and sweet gum. The herbaceous cover is made up largely of grasses and sedges. *Juncus aristulatus* and *Rynchospora glomerata* when in fruit give a decided reddish color to considerable areas.

Among the most noticeable flowers of the savanna are *Pluchea bifrons*, *Ludwigia capitata*, *Stachys hyssopifolia*, *Polygala mariana*, *Polygala ramosa*, *Ludwigia hirtella*, *Eupatorium Mohrii*, *Diodia virginiana*, *Gerardia linifolia*, *Rhexia lanceolata*, *Rhexia mariana*, *Linum medium*, *Sabatia lanceolata*, *Oxypolis filiformis*, *Linaria canadensis*, *Dasystoma flava*, *Gratiola pilosa*, *Eupatorium semiserratum*, *Hypericum virgatum*, and *Boltonia asteroides*. In the flatwoods not far from here was found a little *Baccharis halimifolia*. It also occurs sparingly near Prestwood's Lake and the paper mill and seems to be getting more plentiful.

Just to the north of the dam at the paper mill are some low flats, that show almost the same herbaceous growth as a typical savanna. In the wettest spots grow *Typha latifolia*, a few trees of *Salix nigra*, the decorative *Scirpus Eriophorum*, *Juncus scirpoides*, *Juncus trigonocarpus* and *Mikania scandens*. Mingling with these and running out into slightly dryer places were *Rynchospora glomerata*, *Juncus aristulatus* (these two giving a red effect to the meadow with their fruits), *Fuirena squarrosa* (very abundant), *Bohemeria scabra*, *Hypericum virginicum*, *Eriocaulon decangulare*, *Lachnocaulon anceps*, *Limodorum tuberosum*, *Rhexia mariana*, *Linum medium*, *Linum striatum* and *Eupatorium rotundifolium*. The somewhat less wet portions of the flats was covered with the following: *Cynoctonum sessilifolium*, *Gratiola pilosa*, *Buchnera elongata*, *Aletris farinosa*, *Spiranthes praecox*, *Hypericum setosum*, *Lobelia Nuttallii*, *Ludwigia hirtella*, *Burmannia capitata*, and *Rhexia lanceolata*. With these flourished large quantities of *Lycopodium adpressum*, and *Lycopodium alopecuroides*, and in the firmer more sandy spots *Lycopodium carolinianum*. In the dryer parts were *Chrysopsis graminifolia*, *Crotalaria rotundifolia*, *Gnaphalium purpureum*, *Rumex hastulatus*, *Psoralea pedunculata*, *Asclepias amplexicaulis* and *Hypericum gentianoides*. On a ditch bank through this flat grew a good quantity of *Amelanchier Botryapium*, here not over two feet in height.



Zenobia pulverulenta and *Zenobia cassiniifolia* in flower.

THE BAYS AND SWAMPS.

As the typical "Bay" of this section we may select the one called Burnt Bay which runs along the southern side of Black Creek valley west of the novelty mill. It is covered with a dense growth of trees and shrubs of which so many are evergreen as to give a general effect of verdure at all seasons. On the edges there is old-field pine and a little long-leaf pine, but the typical pine of the bay, and the only one that extends through most of the deeper parts, is the pond pine. This grows much larger here than in the savannas, reaching a height of over seventy-five feet and a diameter of two and a half feet.

On the edges of the bay there is an attractive fringe of low shrubs that leads up gradually to the taller growth behind. Among these the two gallberries (*Ilex glabra* and *Ilex lucida*) and the fetter bush (*Lyonia nitida*) are evergreen, and so numerous are they proportionally as to give their hopeful winter color to the whole border. Abundant among these are the following deciduous shrubs: swamp azalea (*Azalea viscosa*), *Lyonia ligustrina* var. *foliosiflora*, sweet pepper bush (*Clethra alnifolia*), he-huckleberry or myrtle (*Cyrilla racemiflora*), Virginia willow (*Itea virginica*), swamp sumach (*Rhus Vernix*), swamp candleberry (*Myrica carolinensis*), the two possum haws (*Viburnum nudum* and *Viburnum cassinoides*), chokeberry (*Aronia arbutifolia*), the two high-bush huckleberries (*Vaccinium fuscatum*, tall, berries black, and *Vaccinium corymbosum*, tall, berries blue), high blackberry (*Rubus Andrewsianus*), and a little of the shad bush (*Amelanchier Botryapium*), called "wild currant" here. Yellow jessamine (*Gelsemium sempervirens*) climbs over this border in abundance, and just behind it are great masses of the bamboo briar (*Smilax laurifolia*) one of the most beautiful evergreen vines in the world. Poison ivy (*Rhus Toxicodendron*), Virginia creeper (*Psedera quinquefolia*), and cross-vine (*Bignonia capreolata*) extend throughout the bay, but the bullace (*Vitis rotundifolia*) is confined to the borders.

Next to the pine the largest trees of the bay are black gum (*Nyssa biflora*), juniper (*Chamaecyparis thyoides*) and red maple (*Acer carolinianum*). Water oak (*Quercus nigra*) is plentiful in the borders and shallower parts, and willow oak (*Quercus Phellos*), while not a typical bay tree, is found in Burnt Bay where it edges off into the low sandy woods on the south side.

The most common evergreen trees of the bay are sweet bay (*Magnolia glauca*) and red bay (*Persea pubescens*). They are both extremely abundant and characteristic. The sweet bay is not entirely evergreen with us. There are specimens in Burnt Bay that reach the unusual height of 35 feet. The loblolly bay (*Gordonia lasianthus*) is not nearly so common as the two preceding, but is found scattered near the edges of nearly all bays. It is quite evergreen, and when covered with its fine white flowers it is one of our handsomest trees. Around the edges of Burnt Bay cinnamon fern or poor man's soap (*Osmunda cinnamomea*) is plentiful, and there is a little bracken fern (*Pteris aquilina*) and royal fern (*Osmunda regalis*). In the deeper and more shady inner parts are scattered beds of chain fern (*Woodwardia areolata*), and in shallow standing water or mud is the large, coarse, swamp fern, *Woodwardia virginica*.

In the low damp woods along the north side of the bay grow old-field pine (*Pinus Taeda*), long-leaf pine (*Pinus palustris*), white hickory (*Carya alba*), dogwood (*Cornus florida*), sassafras (*Sassafras variifolium*), Spanish oak (*Quercus falcata*), willow oak (*Quercus Phellos*), water oak (*Quercus nigra*), and the following shrubs: sparkleberry (*Vaccinium arboreum*), *Vaccinium teneilum*, *Gaylussacia frondosa*, *Myrica cerifera*, *Lyonia mariana*, *Ascyrum stans*, and *Ascyrum hypericoides*. The pretty herbaceous vine called carrion-flower (*Smilax herbacea*) and the wild yam (*Disoscorea villosa*) are also to be found in these woods. In an open damp meadow here (savanna conditions) was found *Juncus abortivus* for the first time in South Carolina. With it were *Rhexia virginica*, *Gratiola pilosa*, *Gratiola virginiana*, *Bacopa acuminata*, *Ludwigia linearis*, *Xyris caroliniana*, and *Lobelia Nuttallii*.

The edges of Burnt Bay are in most places either too abrupt or too shady to admit of the best development of many of the attractive flowers that are often associated with bay conditions, although most of them may be found sparingly at places around its margin. For the study of such flowers it is best to cross over Prestwood's Lake to the edges of the bays surrounding the savanna-like open area in Captain Cannon's sheep pasture (referred to in the list as "Sheep Pasture Savanna"). The meadow-like area of a couple of acres is low, moist, and sandy, but too well drained to show typical savanna vegetation. It is bounded on both sides by low bays and the transition between



Upper part of Prestwood's Lake showing large dead
Cypress trees.

the bays and meadow show some interesting plants. Through the open area are scattered a few large trees of the pond pine (*Pinus serotina*) and long-leaf pine (*Pinus palustris*), which is the only arborescent growth except a few small plants of black jack oak (*Quercus marilandica*), upland willow oak (*Quercus cinerea*), Spanish oak (*Quercus falcata*), and post oak (*Quercus stellata*). The open space was also dotted with scattered clumps of *Myrica pumila*, *Ilex glabra*, *Alnus rugosa*, *Gaylussacia frondosa*, *Lyonia mariana*, *Lyonia ligustrina* var. *foliosiflora*, and *Clethra alnifolia*. Along the wetter edges of the bays the following shrubs made a dense and attractive border: *Zenobia pulverulenta*, *Zenobia cas-sinifolia* (a little), *Kalmia cuneata*,* *Vaccinium corymbosum*, *Leucothoe racemosa*, *Leucothoe axillaris* (a rare and interesting evergreen), *Azalea viscosa*, *Ilex glabra*, *Ilex lucida*, *Aronia arbutifolia*, *Myrica cerifera*, *Myrica carolinensis*, *Lyonia ligustrina* var. *foliosiflora*, *Fothergilla Gardeni*, and *Lyonia nitida*. Just back of these the taller bay vegetation began with *Viburnum nudum*, *Viburnum cassinoides* and *Magnolia glauca* conspicuous on the border. The trees of the bays were red bay (*Persca pubes-cens*), black gum (*Nyssa biflora*), Carolina red maple (*Acer carolinianum*), pond pine (*Pinus serotina*), and a little juniper (*Chamaecyparis thyoides*). Bamboo briar (*Smilax laurifolia*) and red-berried bamboo (*S. Walteri*) were plentiful. Partially submerged in an open piece of water in the bay were found *Juncus repens* and *Eleocharis Torreyana*.

In certain places on the east side the shrubby borders were replaced by a wet Sphagnum bog in which were masses of cin-namon fern (*Osmunda cinnamomea*) and fine conspicuous clumps of pitcher plants (*Sarracenia flava*). *Sarracenia pur-purea* is also plentiful here in the Sphagnum, and *S. rubra* grows abundantly where the Sphagnum is less deep. Along this border five species of Orchids were found,—*Pogonia ophioglossoides* and *P. divaricata* (blooming on May 24th), *Limodorum gramin-*

*This interesting little *Kalmia* seems to be represented in American her-baria only from southeastern North Carolina, and it is generally considered as confined to that State; but Mr. R. M. Harper has called my attention to the fact that F. A. Michaux (in his Journal for July 18, 1794), and Thomas Nuttall (in his "Genera of North America Plants," Vol. I, page 268, 1818) both mention its occurrence at Camden, S. C. See my "Additions to the Flora of the Carolinas," II Torreya, Vol. II, page 9, Jan., 1911.

folium (July 8),† *Habenaria blephariglottis* and *Habenaria ciliaris* (August 20th). In July *Rhexia mariana*, *R. lanceolata*, *R. ciliosa*, and *R. glabella* make a very bright effect with their handsome flowers, while in May the white flowered *Zygadenus angustifolius* and *Chamaelirium luteum* were conspicuous in the same place.

In the main body of the savanna where the soil was moist but not boggy grew *Rynchospora glomerata*, *Juncus aristulatus*, *J. trigonocarpus*, *Lachnocaulon anceps* (small hat pin), *Buchnera elongata*, *Marshallia obovata*, *Bartonia lanceolata*, *Tofieldia glabra* (blooming about Sept. 1st), *Xyris arenicola*, *Aletris farinosa* [a yellow *Aletris*, supposed to be *Aletris aurea*, was collected but lost], *Spiranthes praecox*, *Polygala lutea*, *Linum medium*, *Eupatorium rotundifolium*, *Eupatorium verbenaefolium*, *Ascyrum stans*, and *Aster squarrosus* (not seen in bloom). Towards the outer edge of the savanna where the soil was dryer grew *Seriocarpus asteroides* (said by Small to grow in rocky woods), *Lespedeza repens*, *Indigofera caroliniana*, *Vaccinium tenellum*, *Gaylussacia dumosa*, and *Lyonia mariana*. Farther up still, in the flat sandy pasture, *Stipulicida setacea* was collected.

THE DEEPER SWAMPS.

We have at Hartsville no swamps of the type found by the larger muddy rivers that are subject to frequent floods, as the Pee Dee and Santee, and many plants that affect such swamps are absent at Hartsville. Such, for example, are overcup oak (*Quercus lyrata*), elm (*Ulmus alata* and *Ulmus americana*), water hickory (*Carya aquatica*), tupelo gum (*Nyssa aquatica*), swamp chestnut oak (*Quercus Michauxii*), planer tree (*Planera aquatica*), and deciduous holly (*Ilex decidua*).

Our swamps and bays grade insensibly into each other, and the edges of all our swamps are bays. The typical bay would have a scattering cover of large trees with a dense tangle of undergrowth of shrubs and vines, largely evergreen. The typical swamp has a heavy cover of large trees (among which is always cypress) and a more or less open floor beneath. However, there

†*Limodorum tuberosum* also will be found here, no doubt, but I did not happen to see it. It is rather plentiful in such situations in our region. A white flowered form of the species was found on the edge of another bay not far from this spot and we have seen it since in several places.



Dead Cypress tree in Prestwood's Lake with a collar of shrubs.

are to be found on the tussocks and tree bases in the swamps nearly all the shrubs that have been described as making up the marginal growth of Burnt Bay.

As a good example of the typical creek swamp I shall choose that part of Black Creek swamp lying just behind the old Bacot Place. Here the tall, flat-crowned cypress trees reach high above all else, and give an impressive dignity to the place. Reaching nearly to their lower branches are fine specimens of black gum and tulip tree, and beneath these are smaller trees of red maple, juniper and sweet bay.

The undergrowth, which is rather dense, consists of fetter bush (*Lyonia nitida*), Virginia willow (*Itea virginica*), large gall-berry (*Ilex lucida*), a little of the small gall-berry (*Ilex glabra*), both 'possum haws (*Viburnum nudum* and *Viburnum cassinoides*), swamp azalea (*Azalea viscosa*), poison sumach (*Rhus vernix*), male berry (*Lyonia ligustrina* var. *foliosiflora*), high blackberry (*Rubus Andrewsianus*), and alder (*Alnus rugosa*). It was somewhat surprising to find here on the highest tussocks a little holly (*Ilex opaca*), myrtle (*Cyrilla racemiflora*) and French mulberry (*Callicarpa americana*). The two last are at their best in a sunny exposure, and are not noticeable constituents of swamps. *Mikania scandens* clambered about among the shrubs, and cross-vine (*Bignonia capreolata*) and poison ivy (*Rhus Toxicodendron*) ascended high into the trees.

In the shallow water or saturated soil there was a considerable herbaceous growth of marsh St. John's wort (*Hypericum virginicum*), lizard's tail (*Saururus cernuus*), joe-pye weed (*Eupatorium maculatum*), *Mayaca Aubleti*, some cinnamon fern (*Osmunda cinnamomea*), and chain fern (*Woodwardia areolata*) in abundance. Near the large spring on the edge of the swamp at this place were lady fern (*Asplenium Filix-femina*), and several plants of the grape fern (*Botrychium virginianum*), which were the only specimens of this interesting species that I have found in Hartsville.

Three of the most attractive and interesting of our swamp plants were not noted in the immediate spot just described, but all three of them are conspicuous in that bit of swamp lying between the dam and the creek crossing at the paper mill. They are wild wistaria (*Wistaria frutescens*), Walter's smilax or red-berried bamboo (*Smilax Walteri*) and storax (*Styrax americana*). The wistaria is very like the Chinese one that, in two

shades—purple and white—is grown for ornament. It blooms about three weeks later than the Chinese, and its flowers are borne in smaller clusters and are deeper colored than in that species. Our vine is offered for sale by nurserymen and there is an improved form (variety *magnifica*) that is more floriferous in cultivation than is the wild plant.

Walter's smilax climbs up as high as twelve feet or more into the trees, and in winter it makes a beautiful show with its bright scarlet berries. It was named for one of the best known early botanists of America, Thomas Walter of South Carolina.

The storax generally grows along the creek margins or other open spots where it can get some sunlight. It is a good sized bush that bears a profusion of pretty bell-shaped white flowers in middle April. It, too, is sold by dealers and is well worthy of cultivation.

The large cane (*Arundinaria macrosperma*) grows plentifully in the deep, rich soil of swamps, preferring the better lighted edges of the streams, and the dwarf cane (*Arundinaria tecta*) is abundant on the edges of bays and ponds. I have never known either species to fruit at Hartsville, though they probably do so at long intervals.

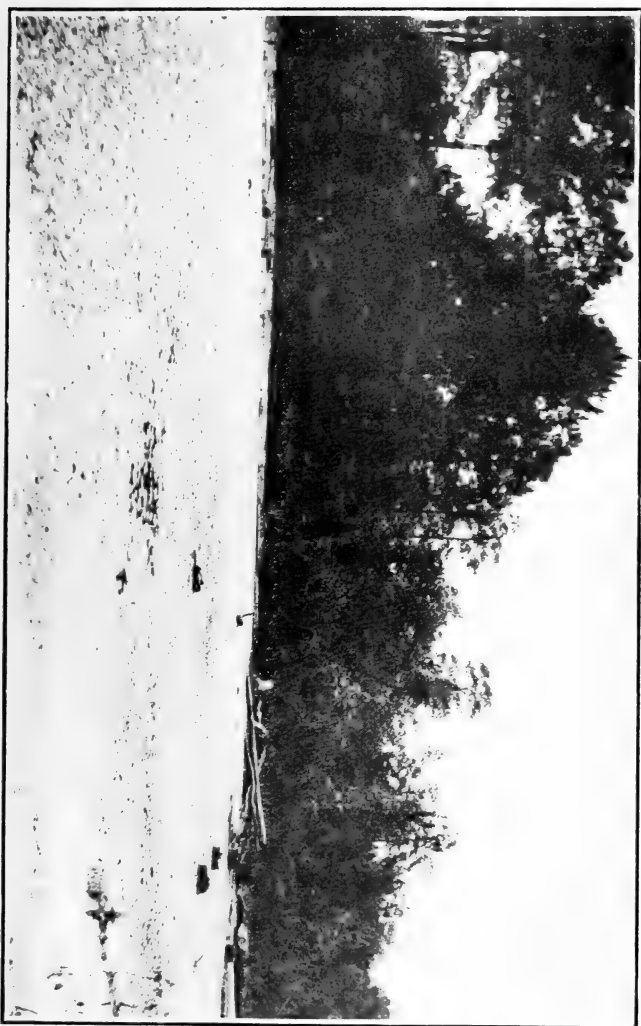
In the open swampy places below the dam there is in July a handsome display of the white flowers of *Sabatia lanceolata* and the greenish yellow flat-topped cymes of *Polygala cymosa*. Earlier in the season the small white flowers of the swamp fleabane (*Erigeron vernus*) are numerous enough to be quite conspicuous.

THE LAKES AND PONDS.

In many respects the margins of the more extensive bodies of water duplicate certain of the conditions already described, but it is not so at all points, and it is best to include the marginal growth in any discussion of their vegetation. I shall first consider the flora of

PRESTWOOD'S LAKE.

This artificial lake was formed by the damming of Black Creek by the Carolina Fiber Company about eighteen years ago. The lake itself may be said to extend for a little over a mile, but there is back water in the creek swamp for more than a mile farther. The width of the lake is about a quarter of a mile across at its broadest part.



A dense colony of Water Shield (*Brasenia Schreberi*) covering the water on the south side of Prestwood's Lake.

When the swamp was cleared in preparation for the lake it was decided as an experiment to leave several very large cypress trees in the deeper part near the dam and test the effect of the altered conditions. Standing in about twelve feet of water they continued to live for three or four years, but got weaker all the time and at last gave up the struggle. In the upper end of the lake a considerable section of the swamp was left uncut, and although the depth there is only about five or six feet, the results have been the same so far as the larger trees are concerned. The small cypress trees have for some reason shown greater adaptability, and many of them are left in apparently good health. They grow very slowly, but bear fruit abundantly. The only plants of the original growth that have remained alive with their roots under five feet or more of water are cypress, red maple (*Acer carolinianum*), myrtle (*Cyrilla racemiflora*), storax (*Styrax americana*), bamboo briar (*Smilax laurifolia*), and Walter's smilax (*Smilax Walteri*).

In Plate XI is shown this part of the lake. The large dead cypresses are seen in the background, and a number of small live ones are seen in the front. Most of the small cypresses are shoots from the cut stumps of old ones. In the middle foreground is a large bush of alder (*Alnus rugosa*), growing on a stump. The mossy-looking growth hanging from the tops of some of the dead trees in the lichen *Usnea barbata*.

The stumps, floating logs and standing dead trees support a large population of shrubs and herbs. The dead cypress shown in Plate XII has a dense collar of shrubs and young trees surrounding it at water level. Here are growing Carolina red maple (*Acer carolinianum*), juniper (*Chamaecyparis thyoides*), fetter bush (*Lyonia nitida*), myrtle (*Cyrilla racemiflora*), sweet pepper bush (*Clethra alnifolia*), *Zenobia pulverulenta* and *Lyonia ligustrina* var. *foliosiflora*. These plants were all rooted to the decaying bark of the cypress, five and a half feet above the lake bottom.

Some of the floating logs carry such a profusion of gay flowers as to look like miniature gardens. On one of these I have noted the following: juniper (*Chamaecyparis thyoides*), Carolina red maple (*Acer carolinianum*), alder (*Alnus rugosa*), fetter bush (*Lyonia nitida*), *Zenobia pulverulenta*, *Leucothoe racemosa*, myrtle (*Cyrilla racemiflora*), *Hypericum virginicum*, *Hypericum canadense*, sundew (*Drosera intermedia*), *Utricularia juncea*, *Xyris caroliniana*, and species of *Rynchospora*.

The aquatic plants of the lake are: *Brasenia Schreberi* (water shield), *Nymphoides aquaticum* (floating heart), *Nymphoides lacunosum* (small floating heart), *Potamogeton diversifolius*, *Potamogeton heterophyllus*, *Nymphaea advena* (yellow pond lily), *Utricularia fibrosa* (bladderwort), *Utricularia biflora* (bladderwort), and *Mayaca fluviatilis*.

The *Mayaca* is new to South Carolina, not having been reported before north of the Gulf States. It is a very delicate plant, growing in considerable masses, entirely submerged in rather shallow water.* The yellow pond lily has made an entrance in the last few years. About four years ago I noticed one plant at about the spot shown in Plate XI. Now there are a dozen or more colonies in that part of the lake.

Water shield is now the most conspicuous aquatic plant of the lake. Its small floating leaves coated on the underside with a beautiful clear jelly cover the water in large areas near the edges. A dense colony of it is shown in Plate XIII.

Nymphoides aquaticum (*Limnanthemum*), with large floating leaves that look much like those of the water lily, is not abundant; in fact, it appears to be much less so than it was several years ago. A careful examination of more than a half mile of the lake edge in June, 1912, revealed not more than a half dozen plants. On the other hand, *Nymphoides lacunosum*, which has appeared in the lake only in the last two or three years, is now increasing rapidly.

It is rather surprising that the water lily (*Castalia odorata*) has not yet made an entrance into the lake. It is plentiful in Kilgore's Mill Pond, only about a mile away.

Over a considerable area of the lake near the edge behind Captain Cannon's Place the water is only a few inches deep, forming a bog. The swamp had been cleared off here just before the water was raised, but it is now covered with a rather dense second-growth of the following plants: *Taxodium distichum* (cypress), *Salix nigra* (black willow), *Alnus rugosa* (alder), *Cephalanthus occidentalis* (buttonbush), *Callicarpa americana* (French mulberry), *Viburnum nudum* ('possum haw), *Nyssa biflora* (black gum), *Itea virginica* (Virginia willow), *Boehmeria scabra*, *Typha latifolia* (cat-tail), *Saururus cernuus* (lizard's tail), and *Peltandra virginica* (moccasin corn).

*There is much doubt as to distinctness of *Mayaca fluviatilis*. In fact, I am now convinced that it is nothing more than a submerged form of *M. Audleti*.



A large Holly tree (*Ilex opaca*) near the lake.

Climbing over the shrubs in great abundance was *Mikania scandens*.

On the muddy shore, not covered with water, there is a good colony of young *Pinus Taeda* (old-field pine). Near them, in addition to most of the above, were *Magnolia glauca*, *Clethra alnifolia*, *Cyrilla racemiflora*, *Liquidamber styraciflua*, *Lyriodendron tulipifera*, *Ilex glabra*, *Rubus Andrewsianus*, *Decodon verticillatus*, and the ferns *Osmunda cinnamomea* and *Woodwardia areolata*.

Where the border of the lake is a gentle sandy slope, as it is on the south side above Prestwood's Bridge, the first vegetation consists of large patches of the grass *Panicum hemitomum* in shallow water; behind this in shallow water and on the muddy edge is the larger grass *Panicum scabriusculum*; then handsome clumps of the tall yellow-flowered *Xyris fimbriata* and large pipewort, or hat pins as we call it (*Eriocaulon decangulare*), with flowers in compact white balls. Mixed with the last two or just behind them are *Iris versicolor*, *Iris prismatica*, *Hypericum virginicum* (Elodea), *Proserpinaca pectinata*, *Sclerolepis uniflora* (a pretty little pink-flowered composite), *Utricularia juncea*, *Xyris caroliniana*, *Drosera intermedia*, *Mayaca Aubleti*, *Lycopus pubens*, *Ludwigia linearis*, *Stachys hyssoipifolia*, *Rotala ramosior*, and *Polygala lutea*. Here also was discovered a fine colony of the orchid *Habenaria Nuttallii*, with greenish flowers, a species not before found in the State of South Carolina.

A little behind these as a rule were *Carphephorus bellidifolius*, *Diodia virginiana*, *Ascyrum hypericoides*, *Spiranthes praecoë*, *Limodorum tuberosum*, *Rhexia ciliosa*, *Bartonia lanceolata*. The large ferns *Osmunda cinnamomea* and *Woodwardia virginica* were conspicuous here, and the smaller *Woodwardia areolata* and *Lycopodium alopecuroides* were abundant. *Lycopodium adpressum* occupied slightly less wet situations.* Mingled with these herbs were scattered clumps of sweet pepperbush (*Clethra alnifolia*), swamp azalea (*Azalea viscosa*), low gallberry (*Ilex glabra*), fetter bush (*Lyonia nitida*), *Zenobia pulverulenta*, alder (*Alnus rugosa*), buttonbush (*Cephalanthus occidentalis*), myrtle (*Cyrilla racemiflora*), groundsell tree (*Baccharis halimifolia*) and yellow jessamine (*Gelsemium sempervirens*); also small young trees of cypress (*Taxodium distichum*), Carolina

*See notes by me on these two species of *Lycopodium* in the Fern Bulletin, Vol. 17, July, 1910.

red maple (*Acer carolinianum*), black willow (*Salix nigra*), and juniper (*Chamaecyparis thyoides*). Still farther up where the soil was damp but not soaked, were the white goldenrod (*Solidago* sp.), *Galactia regularis*, meadow beauty (*Rhexia lanceolata*, nearly white), *Rubus Andrewsianus*, *Vaccinium vacillans*, *Gaylussacia frondosa*, *Gaylussacia dumosa*, *Rhus copalina*, *Pteris aquilina*, *Vitis rotundifolia*, and *Diospyros virginiana*.

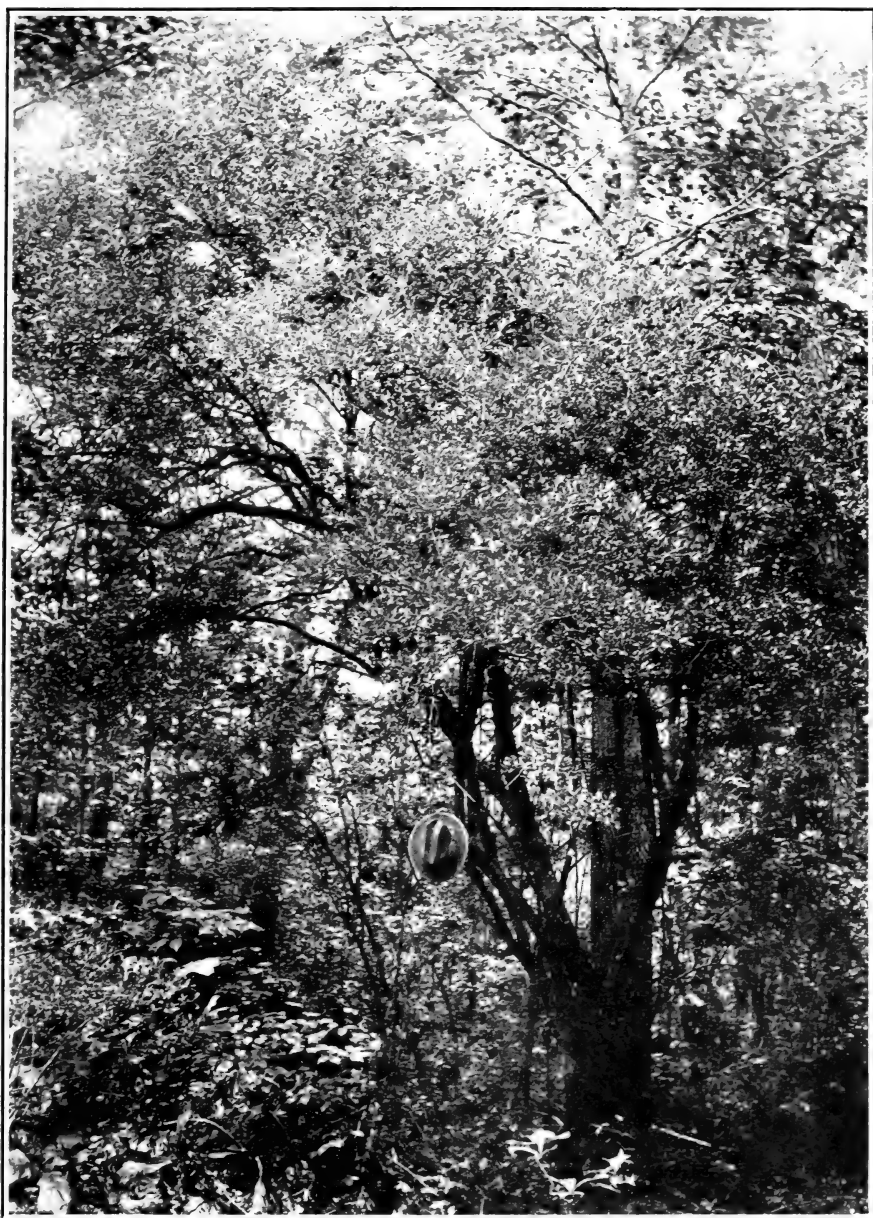
On the upper edge of this society was a large clump of male plants of *Ilex caroliniana*. A little farther back a low sandy ridge supported almost the typical growth of the sand hills, with long-leaf pine (*Pinus palustris*), turkey oak (*Quercus Catesbaei*), black jack oak (*Quercus marilandica*), upland willow oak (*Quercus cinerea*), post oak (*Quercus stellata*), sparkleberry (*Viburnum arboreum*), poison oak (*Rhus Quercifolia*), and wire grass (*Aristida stricta*) as the most conspicuous vegetation.

On the more or less wet edges of the lake at other points were collected the following: *Lysimachia terrestris*, *Rudbeckia hirta*, *Sabatia brachiata*, *Hypericum fasciculatum* (a good sized heath-like bush), *Bradburia virginica*, *Ludwigia alternifolia*, *Apios tuberosa* (known as "ground nut" on account of its numerous edible underground tubers), *Jussiaea decurrens*, *Myrica cerifera*, *Wistaria frutescens*, *Carex macrokolea* and *Scirpus Eriophorum*. The last is one of the handsomest herbaceous plants of the lake edge.

Just above the dam on the northern side there is in late summer a conspicuous show of the large white plumes of the very tall grass *Erianthus saccharoides*. I have not noticed golden club (*Orontium aquaticum*) in the lake, but in the run of Crowley's branch just above the old broken dam there is a fine lot of this interesting plant. It is a member of the same family as the calla lily, but has no spathe around its fleshy, yellow spike of flowers. It may be seen at many of the branch crossings in our section. The moccasin corn (*Peltandra virginica*), which is so plentiful in the shallow water of the lake edge, is a member of the same family.

On the low earth dam across the lake from the paper mill was collected *Solidago verna* (spring goldenrod) for the first time in South Carolina.* Other plants collected on this dam were

*See my "Additions to the Flora of the Carolinas," in Bulletin Torrey Bot. Club, Vol. 36, page 635, 1909. I have since found this species to be plentiful in the low woods near the lake. By June 1st of this year (1911) its blooming period was nearly over.



A large tree of Sparkleberry (*Vaccinium arboreum*) near Black Creek

Smilax glauca, *Rhynchosia simplicifolia*, *Penstemon laevigatus*, *Apocynum pubescens*, *Lactuca graminifolia*, and *Erigeron ramosus*.

KILGORE'S MILL POND.

This is a small body of water, much older than Prestwood's Lake, that lies in the low sand hills about one mile northeast from Hartsville. A study of the vegetation and its surroundings resulted in the collection of a considerable number of plants not seen around Prestwood's Lake. *Nymphoides lacunosum* and *Nymphoides aquaticum* are abundant, and submerged in the stream just below the mill race was *Scirpus subterminalis*, not before reported south of New Jersey (but I find a collection of it in the N. Y. Bot. Garden from Mississippi).†

On the west side of the pond is a flat marsh, inundated generally with several inches of water, which is covered almost all over with a pure growth of *Eleocharis melanocarpa*. In deeper spots this is replaced by *Eleocharis quadrangulata*. On the edges of this marsh grew abundantly *Rynchospora glomerata* and *Fuirena squarrosa*. *Juncus repens* grew in dense patches in the shallow water while *Rynchospora corniculata* and *Juncus scirpoides* were scattered on the margins. *Utricularia juncea* also grew sparingly here, but on the other side of the pond it was so plentiful in the shallow water as to give a marked yellow color to the margin. In the same situation on the east side was the little *Eleocharis Torreyana*, partly submerged and mixed with *Mayaca Aubleti* and some *Nymphoides lacunosum*. Behind these was a zone containing clumps of the large, handsome *Xyris fimbriata* mixed with the smaller *Xyris elata* and with *Ascyrum hypericoides*, *Proserpinaca pectinata*, *Schlerolepis uniflora* and some large "hat pins" (*Eriocaulon decangulare*). Back of this zone is a dense growth of the large grass *Panicum scabriusculum*, with some of the attractive tall sedge *Scirpus Eriophorum*. With these were a few small scattered individuals of *Alnus rugosa*, *Nyssa biflora* and *Acer carolinianum*. In about this situation were found a number of specimens of the greenish white orchid *Habenaria clavellata*, one of the rarest of our plants.

This zone passes beyond into a flat moist bay of poor soil cov-

†See my "Additions to the Flora of the Carolinas," in Bulletin Torrey Bot. Club, Vol. 36, page 635, 1909.

ered with an open growth of stunted trees and shrubs. *Nyssa biflora* and *Acer carolinianum* were the largest growth, and among them were *Alnus rugosa*, *Magnolia glauca*, *Rhus copalina*, *Rhus Vernix*, *Myrica pumila*, *Ilex glabra*, *Ilex lucida*, *Cyrilla racemiflora*, *Lyonia nitida*, *Prunus serotina*, *Viburnum nudum*, *Viburnum cassinoides*, *Rhus Toxicodendron*, *Rubus Andrew-sianus*. Scattered here and there were a few small trees of *Pinus palustris*, *Pinus serotina* and *Chamaecyparis thyoides*. It was rather surprising to find in such a place large quantities of broom sedge (*Andropogon virginicus*.) The smaller growth was *Pluchae foetida*, *Eupatorium maculatum*, *Eupatorium rotundifolium*, *Rhexia mariana*, *Centella repanda*, *Osmunda cinnamomea*, *Woodwardia areolata* and *Lycopodium alopecuroides*.

• In a small wet meadow to the east of the pond were collected *Polygonum hydropiperoides*, *Scutellaria integrifolia*, *Oldenlandia Boscii*, *Bacopa acuminata*, *Viola lanceolata*, *Gratiola pilos*, *Diodia virginiana*, *Aster cordifolius*, *Linum straitum*, and *Hypericum virgatum*.

Along the wet crossing below the mill *Verbena polystachya* was picked up; and in slightly damp soil near here were *Hieracium Gronovii*, *Kneiffia arenicola*, *Crotalaria rotundifolia* and *Helianthemum majus*.

On the dam grew *Wistaria frutescens*, and in the damp woods on the west side were a number of plants of *Berchemia scandens* (supple jack), a vigorous high-climbing vine, and one of the rarest woody plants of Hartsville. There is a good specimen of it at the Snake Branch crossing, just above the paper mill.

A KEY TO
THE TREES OF HARTSVILLE.

In order to encourage the study of our native trees the following key has been prepared for their easy determination by means of the leaves:

1. CONE-BEARING TREES: EVERGREEN (EXCEPT CYPRESS). GYMNOSPERMS.

A. Leaves needle-like, two or three together in a bundle. The Pines

a. Leaves three in a bundle.

Leaves ten to fifteen inches long; cones very large, six to eight inches long. . . . Long-leaf Pine (p. 43)

Leaves six to ten inches long; cones about four inches long. Old-field Pine (p. 43)

Leaves six to eight inches long; cones short and thick, $2\frac{1}{4}$ to $2\frac{3}{4}$ inches long. Pond Pine (p. 43)

b. Leaves two in a bundle.

Leaves $3\frac{1}{2}$ to 4 inches long; cones small, about two inches long. Short-leaf Pine (p. 44)

Leaves $1\frac{1}{2}$ to 2 inches long; cones small, $1\frac{1}{2}$ to 2 inches long. Scrub Pine (p. 44)

B. Leaves flattened, about $\frac{3}{4}$ inch long, scattered along slender little twigs that fall off in autumn; cones spherical, about $\frac{1}{2}$ inch in diameter. Cypress (p. 44)

C. Leaves very small, scale-like, cone about the size of a pea. Juniper (p. 44)

2. BROAD-LEAVED TREES: MOSTLY NOT EVERGREEN. ANGIOSPERMS.

A. Leaves compound; alternate on the twig.

a. Leaves twice compound; fruit a long pod; trunk and branches thorny. Honey Locust (p. 51)

b. Leaves once compound, leaflets less than ten in number; fruit a nut, with husk dividing into four parts when ripe.

Leaflets generally five (sometimes seven), brown-hairey beneath; nut with a thin husk.

Pignut Hickory (p. 45)

Leaflets generally seven (sometimes nine), soft hairy beneath; nut with a thick husk.....

White Hickory (p. 45)

c. Leaves once compound, leaflets more than ten in number; fruit a nut with a green husk that does not split away.. . . . Walnut (p. 45)

B. Leaves compound; opposite on the twig. . . . Ash (p. 55)

C. Leaves simple; alternate on the twig.

1. Fruit not an acorn:

a. Edges of leaves not toothed or lobed.

Leaves as broad or nearly as broad as long. . . .

Redbud (p. 51)

Leaves about twice as long as broad:

Leaves white beneath; partially evergreen. . . .

Sweet Bay (p. 49)

Leaves smooth and clear green beneath.

Black Gum (p. 53)

Leaves smooth and pale gray beneath.

Persimmon (p. 55)

Leaves more than twice as long as broad.

Leaves about two inches long, broadest above the middle, partly evergreen. . . . Myrtle (p. 52)

Leaves about two and one-half inches long, broadest at the middle, entirely evergreen. . .

Mountain Laurel (p. 53)

Leaves about four inches long, evergreen. . . .

Red Bay (p. 50)

b. Edges of leaves with teeth or lobes.

Blade of leaf as broad or nearly as broad as long.

Blade of leaf broad and notched at the end

Tulip Tree or White Poplar (p. 50)

Blade of leaf pointed at the end.

Leaves five lobed, smooth.

Sweet Gum (p. 50)

Leaves toothed, but not lobed, smooth. . .

Cottonwood (p. 45)

Leaves toothed, sometimes lobed, rough above, downy beneath.

Red Mulberry (p. 49)

Leaves with many irregular lobes and teeth, bark white. Sycamore (p. 50)

Blade of leaf much longer than broad.

Leaves evergreen.

Edges of leaves pricklyHolly (p. 52)

Edges of leaves not prickly

Loblolly Bay (p. 53)

Leaves not evergreen.

Leaves over five times as long as broad: narrowBlack Willow (p. 45)

Leaves averaging about three times as long as broad.

Leaves sour to the taste, with fine sharp teethSourwood (p. 54)

Leaves with two glands on the leaf stalk at the base of the blade, fruit a small black cherryChoke Cherry (p. 51)

Leaves as above, fruit a good-sized red or yellow plumOld Field Plums (p. 51)

Leaves averaging less than three times as long as broad.

Leaves with conspicuous parallel veins.

Leaves blunt, obovate, sharply and finely toothed, hairy beneathAlder (p. 46)

Leaves pointed, oblong, with long sharp teeth terminating the veins only; whitish downy beneathChinquapin (p. 46)

Leaves pointed, ovate-oblong with long pointed teeth terminating the veins, and with smaller ones between. Bark smooth and dark grayHornbeam (p. 46)

Leaves pointed, rhombic-ovate, regularly toothed and more or less velvety below; bark peeling off in papery layers on branches and younger parts of trunk.

River Birch (p. 46)

Leaves without conspicuous parallel veins.

Leaves ovate lanceolate, rough, with coarse teeth like a saw. Bark with thick corky wartsHackberry (p. 49)

Leaves without teeth, generally three lobed, but often simple or with only two lobesSassafras (p. 50)

Leaves about $3\frac{1}{2}$ inches long, smooth, leathery, with shallow inconspicuous teeth... ..Horse Sugar (p. 55)

Leaves about $1\frac{1}{2}$ inches long, smooth, thick, with very minute teeth on the turned under edges... ..Sparkleberry (p. 54)

2. Fruit an acorn.

Leaves broadest at the ends.

Two to three inches long... ..Water Oak (p. 48)

Four to six inches long... ..Black Jack Oak (p. 49)

Leaves broadest in the middle.

Leaves without lobes.

Leaves over three inches long and very narrow... ..Willow Oak (p. 49)

Leaves less than three inches long.....

Upland Willow Oak (p. 49)

Leaves with lobes.

Lobes bristle-tipped.

Leaves smooth on both sides. Cup covering about one-third of the medium-sized acorn. A large tree in fertile soil.....

Scarlet Oak (p. 47)

Leaves smooth on both sides. Cup covering about two-thirds of the rather large acorn. A small oak of dry, sandy soils.... ..Fork-leaved Black Jack or Turkey Oak (p. 48)

Leaves yellowish downy beneath when young, becoming smooth with age. Acorn large with cup covering half of it... ..Black Oak (p. 48)

Leaves yellowish-gray and downy beneath, with a long slender middle lobe, acorn small... ..Spanish Oak (p. 48)

Lobes not bristle tipped.

Leaves with seven to nine regular rounded lobes, whitish beneath... ..White Oak (p. 46)

Leaves with five to seven deep, irregular, rounded lobes, green beneath. Post Oak (p. 47)

D. Leaves simple; opposite on the twig.

Leaves three to five lobed, soft downy beneath as a rule... ..Carolina Red Maple (p. 52)

Leaves not lobed, about four inches long.....

Dogwood (p. 53)

Leaves not lobed, about two and one-half inches long

Black Haw (p. 55)

Leaves not lobed, very large, six to twelve inches long;
fruit a long rounded pod.Catalpa (p. 55)

THE TREES OF HARTSVILLE.

LONG-LEAF PINE (*Pinus palustris* Mill.).

A very fine, large tree with leaves ten to fifteen inches long, and three in a bundle. The cones are the largest of any Eastern American pine, and the seeds are of good size and edible. With the exception of the swamps and bays, it once covered this whole section in an unbroken forest, but it is now being fast encroached upon by the old-field pine, except in such excessively sandy areas as the Sand Hills.*

OLD-FIELD PINE (*Pinus Taeda* L.).

A large tree with leaves about six to ten inches long, and good sized cones. It is second in value only to the long-leaf pine as a timber tree, and it is extensively used by the Carolina Fiber Company, of Hartsville, in the manufacture of paper. This species is very abundant in our section in almost all soils except the sand hills and swamps, and penetrates much farther into the bays than the long-leaf pine. Most thrown out fields are immediately covered with a dense growth of old-field pine. If we are to lose the long-leaf pine over most of our territory, it is fortunate that so valuable a tree as the old-field pine is to take its place.

POND PINE, OR SLASH PINE (*Pinus serotina* Michx.).

A small or good sized tree that can hardly be distinguished from the old-field pine except by the cones: these are shorter and broader than those of the last, and usually remain unopened and attached to the tree for several years.† This pine is almost entirely confined to savannas, bays, and edges of swamps, and it is smallest in the savannas. In bays it may reach a height of seventy-five feet or even more. An occasional tree may be found in the

*For further remarks on the propagation of this pine see page 11 *et seq.*

†In my article on the Vitality of Pine Seeds and the Delayed Opening of Cones, in *The American Naturalist*, Vol. 43, page 677, Nov., 1909, it was shown that seeds taken from unopened cones at various ages up to fourteen years were still capable of germination. It has since been shown that in the case of the Western lodge pole pine seeds may remain alive in unopened cones for 75 or 80 years (See U. S. Forest Service Bulletin 79).

flat woods, as in the Upper Farm grove already mentioned. I have noticed it in the flat woods opposite the Southern Railway depot at Ten-Mile Station near Charleston, S. C., and even in the grove on the well drained sandy soil by the Seaboard depot at Camden, S. C.

ROSEMARY PINE. SHORT-LEAF PINE (*Pinus echinata* Mill.).

A large tree with short leaves that are generally two in a bundle, and with very small cones. It is not at all abundant with us, but when at its best it is our largest pine. It prefers to grow in slightly damp soil near water courses, especially on hill sides, but is also found in flat transition areas between well drained uplands and the wet flat woods. Next to the long-leaf pine this is our finest timber pine. In more northern markets it is generally known as North Carolina pine. There are a number of trees of this species in the grove in front of the Upper Farm Place, but the largest trees I know of at Hartsville are on or near the bluffs of Black Creek.

SCRUB PINE (*Pinus virginiana* Mill.).

A small tree of little value, with very short, twisted leaves and very small cones. This species is included in the flora of Hartsville on the strength of one specimen that I found in the sand hills about three miles north of town. It is plentiful in New Jersey, Maryland, and the hills of the Southeastern States, and is often called Jersey pine.

CYPRESS (*Taxodium distichum* (L.) Richard).

A very fine and large tree of swamps and savannas. The small leaves are borne on special short twigs that fall off in autumn, making the cypress one of the few coniferous trees that is not evergreen. The leaves are of two very distinct sorts, and there are botanists who think that this difference in leaves indicates a real specific distinction. The savanna cypress has small awl-shaped leaves that are pressed close to the twigs, while the swamp cypress has thin linear leaves that spread out in two rows. The cones are globular balls that are composed of a few large, flat scales. The wood is extremely durable and highly valued.

JUNIPER (*Chamaecyparis thyoides* (L.) BSP.).

The juniper or white cedar is plentiful in our swamps and bays, and on account of its durability is much in demand for line poles. The tiny leaves are closely pressed up in four rows against the twigs. The little cones are about the size of a small pea.

BLACK WILLOW (*Salix nigra* Marsh.).

A small tree with rough, dark bark, very long and narrow pointed leaves with fine teeth, and very small fruit pods with cottony seeds. The tree is scarce in Hartsville, but it is our only willow. It is a pioneer tree with us and occupies wet ground that has been newly cleared, having for company such plants as cat-tail, button bush and blackberries. There is a good lot of it on the southside of Prestwood's Lake near the paper mill, and it occurs at other places on the lake margin.

COTTONWOOD (*Populus deltoides* Marsh.).

A rapid-growing, short-lived tree with rather smooth, dark gray bark, large pointed leaves with broad bases, and small pods with cottony seeds. The cottonwood, called also Carolina poplar, has, like the willow, only a precarious foothold, and there are no full-grown trees in Hartsville. It appears here and there on new-made ground in damp places. The largest tree stands at the foot of the railroad embankment about one hundred yards south of the novelty mill, and there are several small trees among the willows near the lake.

WALNUT (*Juglans nigra* L.).

A large, fine tree that is too well known to need particular description. It is scarce in Hartsville and is found only along ditch banks, gullies, etc. It has no place in our matured forests.

WHITE HICKORY (*Carya alba* (L.) K. Koch).

In rich woods this is one of the most abundant of our trees. The nut is extremely variable both in size and shape, but it can be distinguished from that of the pignut hickory by its much thicker hull, that soon falls from the nut. The leaves are larger and more hairy than those of the pignut, and have seven to nine leaflets. The tall columnar form of this tree and its beautiful, rich yellow coloring in fall make it one of the most desirable for street and yard planting.

PIGNUT HICKORY (*Carya glabra hirsuta* Ashe).

A smaller tree, with smaller nuts and leaves than the preceding. The leaflets are generally five, sometimes seven, and in our variety are brown hairy beneath. The husk is thin and splits away imperfectly or not at all. This species occurs sparingly in our upland forests, and plentifully in the valley of Black Creek.

HORNBEAM (*Carpinus caroliniana* Walt.).

This interesting tree is represented in the vicinity of Hartsville by only a single specimen, so far as known. It stands about one hundred feet from the edge of the creek swamp directly behind the residence on the Upper Farm Place. The leaves look much like those of the beech, but are smaller, and the trunk and limbs are ridged with elevations like the horns of a deer. The bark is dark and even, and the wood is exceedingly hard. The tree is often called ironwood.

RIVER BIRCH (*Betula nigra* L.).

A good-sized tree with reddish brown bark that peels off in sheets on the branches and younger parts of the trunk. The leaves are about three inches long and parallel veined, and their edges are both coarsely notched and finely toothed. The fruit is a small, dry cylindrical catkin made up of numerous scales. This is another of our very rare trees. The only specimens found were near Black Creek directly behind Mr. Jordan's Place.

ALDER (*Alnus rugosa* (Du Roi) Spreng.).

A shrub or small tree with obovate roughish leaves that are hairy below. The veins are parallel and the margins are finely toothed. The leaves can be distinguished easily from those of the birch, hornbeam, etc., by their blunt ends. The fruit is a little cone-shaped, woody catkin made up of scales. The staminate catkins are long, slender and drooping, and the fall of their yellow pollen is the first indication of the approach of spring. The alder is common along water and often makes little thickets. It is rarely ever more than a shrub with us.

CHINQUAPIN (*Castanea pumila* (L.) Mill.).

A shrub or small tree. The leaves are whitish-downy beneath and have conspicuous parallel veins that are tipped with long, pointed teeth. The fruit is a small nut enclosed in a bur. The Chinquapin was always scarce in Hartsville, and now there are very few specimens left. Thirty years ago there were scattered here and there in the woods covering the slope to Black Creek north of town but now they are very scarce. There are a few plants at Laurel Land.

WHITE OAK (*Quercus alba* L.).

A large tree with light bark. The leaves are furnished with regular rounded and rather shallow lobes, and are whitish beneath. The acorns vary more in size than in any of our other

oaks, but are usually of medium size and set in shallow cups. They mature the first year. This is our rarest oak. It occurs sparingly in the rich woods on the southside of Black Creek.

POST OAK (*Quercus stellata* Wang.).

A good-sized tree, but smaller normally than the white oak, which, as its nearest relative, it resembles considerably. The leaves have deeper and broader lobes than those of the white oak, and are not white beneath, and the acorns are smaller. This is one of our commonest trees, and occurs both in rich woods and in the sand hills.

SCARLET OAK (*Quercus coccinea* Wang.).

A large tree with rather smooth bark. The leaves are smooth, deeply cut and bright green on both sides, and the acorn is large, with a shallow cup. This is not an abundant oak with us, but it is plentiful in our richer woods. In the valley of Black Creek and on the adjoining hillsides the scarlet oak is quite at home. The great old oak on Home Avenue in the corner of the old Law Place is of this species.

The Northern botanists do not yet properly understand the distribution of this tree in the South. In the seventh edition of Gray's Manual (1908), it is said to extend south to North Carolina. Sargent's Manual of Trees of North America extends it "along the Alleghany Mountains to North Carolina." In his "North American Trees" (1908), Britton gives its occurrence as "from Maine to Minnesota, North Carolina and Missouri." Hough's "Handbook of the Trees," etc., (1907) marks an improvement as its printed chart shows the species extending as low as piedmont South Carolina and Georgia. In the "Timber Trees and Forests of North Carolina," by Pinchot and Ashe, the extension is given as "South to North Carolina," although their distribution map shows the species extending abundantly down to the South Carolina line for a distance of over 200 miles. Only Small allows the possibility of the occurrence of the tree in our district.

These errors have persisted in spite of the fact that Michaux

recorded the scarlet oak as abundant in the Carolinas over a hundred years ago, an observation confirmed by Elliott (in 1824), Chapman, Curtis and others. As its Southern limits are approached the scarlet oak changes its habit considerably. As a low and contorted scrub oak it is found on the exposed and rocky summits of our Carolina mountains, and even in Chapel Hill, N. C., which is near the eastern boundary of the piedmont section, it is most abundant on the dryer, gravelly hills. In the coastal plain of North and South Carolina it descends into the damper valleys and prefers the richest woods.

BLACK OAK (*Quercus velutina* Lam.).

This is our largest but not our longest-lived oak. The bark is dark and the large leaves are covered beneath when young with a fine yellowish powder which is mostly worn away by mid-summer. The acorn is large and has a deep cup. This oak is generally called red oak (which it is not) with us, and is not distinguished from the scarlet oak or indeed from the Spanish oak. It is one of the commonest trees of the county.

SPANISH OAK (*Quercus falcata* Michx.).

This is one of our finest and commonest oaks. It is of rapid growth, but is very long-lived and we have no better tree for street or yard planting unless it be the willow oak. The leaves are not so wide as those of the black oak, and they may also be distinguished by their long, narrow central lobe and yellowish-gray, tomentose under surface. The acorns are small, and when fresh are bright red on the scar.

WATER OAK (*Quercus nigra* L.).

A rather small tree with small leaves that are deep green on both sides and widest at the end. It is common in flat woods and bays, and is often planted as a street tree. Many of the trees in the business part of town are of this species. It is related to the willow oak, but is inferior to that species both in size and longevity.

TURKEY OAK (*Quercus Catesbaei* Michx.).

This small scrub oak is very abundant in the sand hills and other dry, sandy soils. The thick leaves have long narrow lobes and are smooth and light green below. The acorn is large and is set in a deep cup with spreading scales. There are some very large specimens immediately around the Baptist Church, as shown in Plate III.

BLACK JACK OAK (*Quercus marilandica* Muench.).

A small scrub oak with large leaves that are very broad at the end and generally without lobes. The acorn is large and seated in a deep cup. This oak is very abundant in the sand hills and also more or less plentiful in good soil.

WILLOW OAK (*Quercus Phellos* L.).

A large and beautiful oak that is very common in the flat woods and on edges of bays. The leaves are very long and narrow and not lobed, resembling those of a willow. The acorn is small with a shallow cup. This species and the spanish oak are our most desirable trees for decorative planting.

UPLAND WILLOW OAK (*Quercus cinerea* Michx.).

A low scrub oak that seldom reaches a height of twenty-five feet. It is very common in the sand hills and in other poor, sandy soil. The leaves are oblong and generally not lobed or toothed. They are grayish wooly beneath and are not so long or narrow as those of the willow oak. The acorn is about the size of the willow oak's. See Plate IV for a very large specimen of this oak.

HACKBERRY (*Celtis Smallii* Beadle).

A good sized tree with rough and warty bark. The leaves are ovate-lanceolate, long pointed, toothed and rough. The fruit is a small, sweetish, nearly black "berry" (really a *drupe*). The hackberry is not native to Hartsville, but has become established in a few places. There is a good sized tree near the edge of Snake Branch about two hundred yards south of the High School building, and several may be seen along the ditch-bank separating Major Coker's Upper Farm and the Old Norwood Place. There are several large planted specimens in the yard of the Kilgore Place at Kilgore's Mill.

RED MULBERRY (*Morus rubra* L.).

A small tree with large rough leaves and edible fruits. It, also, is probably not native to the region immediately around Hartsville, but it is now established along ditches and gullies.

SWEET BAY (*Magnolia virginica* L.).

A small tree of swamps and bays. It has long, partially ever-green leaves that have smooth edges and are very white beneath. The fruit is a hard cone-shaped body from which the red seeds

hang out on strings at maturity. The large white flowers have a very strong but pleasing fragrance.

TULIP TREE: POPLAR (*Liriodendron tulipifera* L.).

A very large and fine tree of bays, swamp edges and water courses. The large leaves are of a peculiar shape. They have broad square ends with a notch in the center, and when put under water the lower side looks like silver. The tree is of the magnolia family and the resemblance may be noticed in the tulip shaped flowers and small cone-like fruits. Some fine specimens of this tree may be seen along Snake Branch.

RED BAY (*Persea pubescens* (Pursh) Sarg.).

A small evergreen tree that is plentiful in swamps. The aromatic leaves are oblong, grayish green beneath and with smooth edges. The small, black, pulpy fruits are much like those of the sassafras.

SASSAFRAS (*Sassafras variifolium* (Salisb.) Ktze.).

A small tree with smooth, generally three-lobed leaves that are not toothed. The abundant, greenish yellow flowers are very fragrant and attractive in early spring: they are of two sorts, staminate and pistillate, and they are borne on different trees. Only trees with pistillate flowers bear fruit. The sassafras is very common along hedge rows and in old fields, and, like the Chickasaw plum, gives the impression of having been introduced.

SWEET GUM (*Liquidamber styraciflua* L.).

A good sized tree that is very common in flat woods and along streams. The bark is rough and the branches are often furnished with narrow plates or wings of corky tissue. The aromatic leaves are nearly circular in outline and are deeply cut into five sharp lobes. The fruit is a globular, prickly mass of little pods and scales.

SYCAMORE (*Platanus occidentalis* L.).

A large tree with smooth bark that pulls off in strips, leaving a large part of the trunk and limbs a shining white. The leaves are very large and broad, with a number of sharp lobes and teeth; when young they are very wooly beneath, but get smooth as they grow older. The foot of the leaf stalk is swollen and completely encloses the bud. The fruit is a round, hard ball that hangs on all winter and sheds the seeds by breaking apart in

the spring. The sycamore is not common in Hartsville, but occurs sparingly along streams and on edges of swamps. A number may be seen where the road crosses the creek swamp near the paper mill. Harper, in the article mentioned below, says of this tree that in the pine-barrens of the Carolinas it seems to be confined to the banks of the muddy rivers, just as in Georgia. In Hartsville it is found along clear streams.

CHOKER CHERRY (*Prunus serotina Ehrh.*).

A small tree with smooth reddish bark that peels off easily. The leaves are oblong and closely toothed, and they may be distinguished from all others by the dense tuft of reddish hairs along the midrib below near the base of the blade. The fruit is a long bunch of nearly black and astringent little cherries. This tree is a frequent one with us, especially along ditches and fence rows.

OLD FIELD OF CHICKASAW PLUM (*Prunus angustifolia Marsh.*).

This plum is hardly deserving of being called a tree, as it rarely ever reaches twelve feet in height, but we will give it the benefit of the doubt. It forms thickets on edges of fields and clearings and is valued for its fruits. The good sized plums may be either red or yellow and are very good to eat. It was probably introduced from farther west.

HONEY LOCUST (*Gleditsia triacanthos L.*)

This well known tree may be said to be rare in our section, but there are a good many of them on the ditch bank west of the Upper Farm Place. The strong thorns on the trunk and branches, the large, twice compound leaves and the long, flat pods make the tree quite easy to recognize at sight.

REDBUD OR JUDAS TREE (*Cercis canadensis L.*).

We are almost out of the range of this tree, and so far we have found but one wild plant near Hartsville. It was growing in a low place in the sand hills about a half mile north of Crowley's Spring. At Darlington and at Society Hill it is not uncommon. The deep green shining leaves are broader than long and heart-shaped at base. The flowers are pinkish purple and are placed abundantly in clusters directly on the trunk and limbs. They are shaped like those of a pea, and this indicates the relationship of the tree. It belongs to the great *Leguminous* family, as does also the honey locust and the cultivated silk-flower tree (see page 61).

MYRTLE OR HE-HUCKLEBERRY (*Cyrilla racemiflora* L.).*

A shrub or small tree that is abundant on the edges of swamps and bays. The small, alternate, leathery leaves are obovate and entire on the margin. Some of the leaves remain green through the winter and even those that turn scarlet hang on for a long time. They make a very attractive decoration for Christmas. The small white flowers are borne in clustered racemes and are conspicuous in early June. The plant is well worthy of cultivation.

HOLLY (*Ilex opaca* Ait.).

One of the best known and loveliest of our trees, the holly has suffered for its popularity. There are still left a number of fine specimens in the environs of Hartsville, but they are being rapidly destroyed. The utter disregard of the average person to the conservation of natural beauty is distressing to any one who can see in nature something more than a storehouse for our material wants. Like the sassafras and the persimmon the holly is dioecious, bearing its staminate and pistillate flowers on different trees. The staminate trees never bear fruit, and as the berries are most prized for decoration, it is the sterile trees that are now most commonly found in their original perfection. Such a specimen, and one of the finest I have ever seen, stands near the lake edge exactly behind the residence at Captain Cannon's Place. In Plate XIV is shown a photograph of this tree taken in December, 1910.

CAROLINA RED MAPLE (*Acer carolinianum* Walt.).

This is our only maple and it may be readily distinguished by its opposite three and five-lobed leaves which are brownish or grayish below and soft velvety to the touch. The small but conspicuous red flowers appear in very early spring, and the bright red fruits (technically known as samaras) are nearly grown before the leaves unfold. Our tree differs from the typical red maple in having smaller, generally three-lobed leaves with velvety undersurface, but this character is not constant. Leaves from the same tree may be quite downy or entirely smooth below. I doubt if it is anything more than a variety of the red maple. It is one of our most desirable ornamental trees, being very attrac-

*That Harper did not see this plant from the train in his trip through South Carolina from Augusta via Charleston and Florence to Wilmington, is, as he says, surprising. I have seen it from the train between Charleston and Florence. See Harper in Bull. Torrey Bot. Club, Vol. 34, page 370.

cive, not only with its conspicuous flowers and fruits, but also in its magnificent autumn coloring. It is abundant in swamps and bays and along streams.*

LOBLOLLY BAY (*Gordonia Lasianthus L.*).

This is one of the most beautiful and unique trees of the Southern States. It is a member of the tea family to which belong also the well-known cultivated shrub *Camellia Japonica* and our very rare native shrub *Stewartia* (see page 90). The thick, oblong, shining leaves are evergreen, and the large, white flowers make the tree a very attractive object when they open in July. The deeply furrowed reddish bark also gives the tree a peculiar distinction. It is not a rare species with us, but occurs only in alluvial bays and on the edges of swamps. The finest example I know of stands on the north edge of Burnt Bay about a quarter mile from the novelty mill.

DOG WOOD (*Cornus florida L.*).

A low, spreading tree with opposite elliptical leaves without lobes and usually without teeth. The small greenish-yellow flowers are borne in small heads and the large white petal like bracts beneath each head are not parts of the flower but are modified leaves. This is one of the most beautiful of American trees and it should be more used for town and street planting. It is very common in rich woods.

BLACK GUM (*Nyssa biflora Walt.*).

A good-sized tree with rough brown bark and alternate oval leaves without lobes or teeth. The fruit is a small, dark blue "berry" that robins are very fond of. The black gum is a very common tree in swamps, bays, and flat woods.

MOUNTAIN LAUREL (*Kalmia latifolia L.*).

A small tree or shrub with reddish-brown bark and alternate evergreen elliptic-lanceolate leaves that are neither lobed or toothed. The beautiful flowers against the rich green leaves in

*This tree, as well as the silver maple, water oak, and Darlington oak, is badly attacked in Hartsville by the *gloomy scale*, one of the most destructive pests of Southern shade trees. It is an American species, closely related to the introduced *San Jose scale* of fruit trees. For methods of combating the *gloomy scale* see Journal of The Elisha Mitchell Scientific Society for August, 1912.

spring make this plant unsurpassed in ornamental value, and it is much used in the North for lawn planting. It should be so used with us. The leaves are poisonous to sheep and cattle when eaten. The *Kalmia* is plentiful along the southern embankments of Black Creek. The largest specimens in the neighborhood once stood at the mouth of Snake Branch, but these are now mostly gone. The finest are now along the creek below the paper mill and at Laurel Land and above.

SOURWOOD (*Oxydendrum arborcum* (L.) D C.).

A small tree with gray bark (reddish on the younger parts) and alternate oblong leaves with toothed edges. They are about four and one-half inches long and sour to the taste. The small, white bell-shaped flowers are borne in clustered racemes at the ends of the branches, and are very late to appear, opening in Hartsville about the last of June. They are much like lilies-of-the-valley, and if placed in a bowl with fern leaves, they make a most dainty and attractive centerpiece. The tree is not a common one with us, but it occurs rather plentifully along the embankments of Black Creek and in the adjacent woods. The leaves turn a magnificent scarlet in autumn, and for this and its flowers the Sourwood is very highly prized as a decorative tree at the North. I well remember with what pride a Northern friend once showed me a few specimens that he had succeeded in growing on his lawn. Why should we not give more of our affection to the beautiful things that are with us always, rather than be seeking for things new and strange from beyond the seas? Rarity and oddity can have no place in a true estimate of artistic value.

SPARKLEBERRY (*Vaccinium arboreum* Marsh.).

A shrub or small tree with gray bark and small alternate leaves that vary greatly in size. They may be less than one-half inch or more than two inches long, but average about one and one-half inch. They are oblong, gray beneath and with minute teeth on the margins. The fruit is a small, dry, sweetish berry that ripens late and hangs on for a large part of the winter. The plant is plentiful in sandy woods that are not too dry. One of the largest specimens I have seen is shown in Plate XV. It is fifteen feet high and eight inches in diameter. It stands near the creek swamp behind the Upper Farm Place. See also the thicket shown in Plate VI.

PERSIMMON (*Diospyros virginiana* L.).

A small tree that is too well known to need description. It is very plentiful in Hartsville, much more so than near the coast. The fruit varies greatly in size, quality and time of ripening. Some become quite sweet and ripe before frost; others never lose their astringency.

HORSE SUGAR (*Symplocos tinctoria* (L.) L'Her).

A shrub or small tree with reddish-gray bark. The leaves average about four and one-half inches in length, are alternate, thick, oblong, slightly toothed on the margin, and sweet to the taste. The small, light-yellow flowers are fragrant and rather conspicuous in mass, and are borne in little clusters on the twigs. The fruit is a small, oblong, greenish drupe about three-quarter inches long. The horse sugar is common on edges of bays and in flat woods. It is partially evergreen.

WHITE ASH (*Fraxinus Darlingtonii* Britton).

A fine tree with opposite, compound leaves and small, dry fruit about an inch long, that is winged at the end. The leaflets are obovate-lanceolate, with nearly entire margins and smooth beneath. So far we have found but a single wild tree, and that grows on the edge of the large ditch that separates the Upper Farm from the old Norwood Place. This tree has been determined solely from the leaves and it is possible it may prove to be *F. pennsylvanica*, if indeed the two are really distinct.

CATALPA (*Catalpa bignonioides* Walt.).

A small tree with very large leaves that are broad at base, pointed at the end and without lobes or teeth. The large, conspicuous flowers are white with yellow and purple spots in the corolla. The fruit is a long, slender, woody pod containing many winged seeds. The catalpa is a rare tree in our area and is confined to new-made soil at bases of hills and gullies, and along washed banks of branches. Specimens may be found at the Snake Branch crossing on Home avenue and at the foot of the hill east of the old Bacot house.

BLACK HAW (*Viburnum rufidulum* Raf.).

A small spreading tree with opposite, oblong leaves about two and one-half to three inches long, that are not lobed, but furnished with small, sharp teeth. The veins beneath and the leaf-stalk, which is winged, are covered with soft reddish-brown hairs.

The fruits are small, dark-blue drupes that are borne in open terminal clusters. They are considered edible by those who like them. The bark is much like that of the dogwood. I know of but two stations for this tree at Hartsville. There are a large number of rather small specimens on the sandy slope south of Crowley's spring, and there is a single good-sized tree that stands about thirty feet from the swamp edge and about 100 yards above the bathing place behind Captain Cannon's house.

CULTIVATED TREES: NOT NATIVE.

In addition to the native or naturalized trees mentioned above, there are, of course, a number of exotic species in cultivation in Hartsville, and a description of some of the more important sorts may be of interest.

MAIDENHAIR TREE (*Ginkgo biloba* L.).

This tree, perhaps the most remarkable in the world, is placed even below the pines and other coniferous evergreens in the evolutionary scale, but one would never suppose so from the large deciduous leaves and general habit of growth. The singular leaves are fan-shaped and with a texture very like that of the maidenhair fern leaflet. The fruit is a good-sized, plum-like drupe with bad smelling flesh enclosing a sweet, edible nut. The tree is a native of China and Japan, where it is an object of worshipful veneration. It is the sole survivor of an earlier vegetation that has long since passed away. The two sexes are separate, and the fruit is borne only on the female trees. There is a small specimen in Major Coker's lawn.

WEeping WILLOW (*Salix babylonica* L.).

A well known tree with drooping branches and long, narrow leaves that are whitish beneath. It is a native of the Caucasus and is much used for certain landscape effects. There are several in Mr. C. W. Coker's yard.

DEODARA CEDAR (*Cedrus Deodara* Land).

A very beautiful true Cedar from the Himalaya Mountains, with light, bluish-green drooping spray. It is closely related to the Cedar of Lebanon. The best specimen is in the yard of Mr. C. C. Twitty.

RED CEDAR (*Juniperus virginiana* L.).

This well known tree is native both to the north and south of us, but there is an intermediate region of varying width that it does not inhabit. This tree is not one of the true cedars as is the Deodara, and it may be distinguished from them by the blue fleshy "berry" that it bears. There is a very old and fine specimen to the north of Home avenue, about one hundred yards east of the old Law Place (now the residence of Mr. A. M. McNair), and there is a good row of them on the lawn of Maj. J. L. Coker.

CHINESE ARBOR VITAE (*Thuja orientalis* L.).

A small evergreen tree with flat sprays and small somewhat fleshy cones with recurved horn-like tips to the scales. It is a native of China. There are two good plants in the lawn of Maj. J. L. Coker.

CUNNINGHAMIA (*Cunninghamia sinensis* R. Br.).

A small evergreen tree with flat linear-lanceolate sharply pointed leaves arranged in two rows on the twigs. There is a good young specimen in the College grounds near Home Avenue. It is a native of China and is not hardy at a much higher latitude than ours.

PECAN (*Carya olivaeformis* Nutt.).

A large and fine tree that is too well known to need description. The fruit is very variable and the seedlings cannot be depended upon to reproduce the characters of the parent. Good fruit can be assured only by budding or grafting, and there is the further advantage of earlier bearing. Seedlings grow rapidly, but are usually very slow to flower: some planted by me about twenty years ago bore their first nuts when about seventeen years old. There are several good-sized trees in town, and Mr. Lawton has set out a commercial orchard. The pecan is native to the lowlands of the lower Middle and Gulf States.

BEECH (*Fagus grandifolia* Ehrh.).

A fine tree with very smooth, light green bark and firm oblong-ovate leaves that have conspicuous parallel veins and sharp teeth. The fruit is a small bur containing, usually, two dark shiny nuts that are angled. The beech is infrequent on the coastal plain, but is generally to be found along the larger streams. I have never

seen a wild specimen in the neighborhood of Hartsville, but it occurs at Society Hill and Darlington. There are several trees in the College campus and one on Home avenue in front of the Baptist Parsonage.

EUROPEAN CHESTNUT (*Castanea sativa* Mill.).

A small tree with a symmetrical rounded crown and long leaves with parallel veins that are tipped with sharp teeth. The leaf is much like that of the American chestnut, but somewhat smaller. The burs and nuts are larger than in the American chestnut, but the nut is not so sweet. It is much used as a food in Italy and Spain. There is a fine specimen of this tree in Mr. J. J. Lawton's garden: it bears full-sized burs, but the nuts never fill out.

DARLINGTON OAK (*Quercus laurifolia* Michx.).

A good-sized tree with small, oblong leaves that are usually without lobes or teeth. On vigorous shoots the leaves are often lobed or toothed at the end or even near the base, and in such cases they are apt to be broadest at the end, much as in the water oak. The leaves are evergreen in part, those towards the periphery of the tree falling first, and many nearer the center persisting through the entire winter. The tree is nearest the water oak, and is much like it in leaf, fruit, size, and habit. The Darlington oak or laurel oak (the name under which it is more widely known) is a native of the coastal region from Virginia to Louisiana. It is much planted as a street tree in Darlington and some other towns of the coastal plain, and it has become naturalized at Darlington. There are good specimens in the lawns of Major Coker and Mr. J. J. Lawton.

LIVE OAK (*Quercus virginiana* Mill.).

A magnificent broad-crowned tree with small evergreen oblong leaves that are pale beneath and usually without teeth or lobes. There are several good young trees on the College campus. The live oak is native along the coast from Virginia to Texas.

OVERCUP OAK (*Quercus lyrata* Walt.).

A large tree of river swamps and lowlands. The leaves are somewhat like those of the post oak, but are longer and more deeply and narrowly lobed. The acorns are almost entirely enclosed in the cup. The species is native to the swamps of the Southeastern United States. There are several specimens on

Fourth Street near Home Avenue. They were brought from the swamp of the Pee Dee River.

WHITE ELM (*Ulmus americana* L.).

A large tree with oval or obovate leaves that have conspicuous parallel veins and sharp teeth. In Hartsville the flowers generally appear in early March, but may open in February. The fruit is a small, flat two-winged samara which ripens and falls off before the leaves are full grown. The tree is native to most of Eastern North America, but with us it occurs only along the larger rivers. There are a number of fine specimens on Home Avenue that were brought from the Pee Dee swamp.

WINGED ELM (*Ulmus alata* Michx.).

A smaller tree than the above, and with smaller and more hairy leaves. The twigs and smaller branches are often winged with corky plates very much as in the sweet gum. The flowers appear a few days earlier than those of the white elm. It is a tree of more southern range than the white elm; not passing above Virginia in the Eastern States. There are good specimens on Home Avenue brought from the Pee Dee.

OSAGE ORANGE (*Machura pomifera* (Raf.) Schneider).

A small tree, once much cultivated for hedges and fences, but now less used. The large round fruit is closely related to the famous bread fruit of the tropics, but is unfortunately not edible. The Indians, however, are said to have eaten it roasted. The wood of the osage orange is of a fine orange color, is hard, heavy and durable, and takes a fine polish. It could be used with excellent effect for interior finish and for furniture. In north-eastern Texas there are fine groves of this species where the trees reach a height of 60 feet and a diameter of 2½ feet.

PAPER MULBERRY (*Broussonetia papyrifera* (L.) Vent.).

A dense and spreading small tree of Asiatic origin, with large, rough leaves and smooth bark. It suckers freely from the roots and is often a nuisance for that reason. The two sorts of flowers are borne on different trees and as nearly all the trees in the country are staminate the fruit is rarely seen. The only fruiting trees I know of in South Carolina are on the estate of Mr. W. G. Hinson, on James Island.

MAGNOLIA (*Magnolia grandiflora* L.).

A grand evergreen tree with large, oval, smooth-edged leaves that are rusty-hairy beneath. The large, white, heavily fragrant flowers are conspicuous against the deep green foliage, and when full grown in its native swamps there are few trees in the world that can surpass it in character and distinction. The magnolia or bull bay, as it is often called, is at home in the swamps of the lower coastal plain from Southeastern North Carolina to Texas. There are good specimens on several lawns on Home Avenue.

CRAPE MYRTLE (*Lagerstroemia indica* L.).

A small tree with smooth whitish bark and small, opposite entire leaves. The gorgeous flowers appear in summer and continue for a long time. Though widely cultivated in India, it is probably a native of China. There are a number of good specimens in town.

CAMPHOR TREE (*Cinnamomum camphora* T. Nees. & Eberm.).

An attractive, small, evergreen tree from the East Indies that yields the gum camphor of commerce. The alternate leaves are ovate-elliptic, entire and of a silvery blue color beneath. The gum is obtained by distilling the leaves and stems in water.

There are now a number of commercial camphor orchards in the Gulf States. The species is generally referred to as hardy only in Florida and the lower part of the Gulf States, but in Harts-ville it has stood fifteen degrees Fahrenheit twice, and twelve degrees once in the last six years, without the least damage. During the past winter (1911-12) the temperature fell to 8° and these trees were badly injured. Nearly all the branches were killed, but the main trunks survived and have put out vigorous shoots. There are two handsome young trees in front of the College dormitory on Home Avenue. They are entirely unprotected from cold.

MOCK ORANGE (*Prunus caroliniana* Ait.).

This is a species of cherry that is more widely and better known as the "Carolina laurel cherry." It has escaped in a few spots, as on the bluff-edge behind the old Bacot Place, but it hardly deserves to be called established, any more than the peach which is occasionally spontaneous along roads and open places where trash is thrown. The mock orange is a small, evergreen tree with

oblong, leathery leaves and small, black inedible fruits. It is native along our coast, and is well established as an escape at Darlington. It is much planted as an evergreen ornamental, and as a screen.

SILK FLOWER (*Albizzia Julibrissin* Durazz.).

A small widely spreading tree with large twice-compound leaves and attractive light-pink flowers in globular heads. The fruit is a flat bean. The tree is a native of tropical and subtropical Asia and Africa. It is often erroneously called Mimosa with us. There are good specimens in Major Coker's lawn. This tree was introduced into the South by André Michaux about 1788.*

CHINA TREE (*Melia Azedarach* L.).

A rather small tree with twice compound leaves, and small lilac, heavily fragrant flowers. The small yellow fruits are used as a vermifuge for cattle. The tree is a native of India and Persia. It is very commonly planted in Hartsville.

UMBRELLA TREE (*Melia Azedarach* var. *umbraculiformis*).

This is a variety of the China-berry Tree, with a dense, spreading, rounded top like an umbrella. All specimens are descended from a single tree found near the battle-field of San Jacinto, Texas; but no one knows what was the origin of the original plant. It was probably a seedling sport of the typical form. Its seeds are said to bring the true umbrella form in a certain proportion of the number sown.

FRINGE TREE (*Chionanthus virginica* L.).

A small tree or shrub with large, oblong leaves that are generally opposite, but sometimes alternate. The abundant, fragrant white flowers with long narrow petals make the plant a very conspicuous object when it is in bloom. The fruit is a dark purple drupe that is like a small olive, to which it is related. The plant is native to South Carolina, and is most at home in the Piedmont and upper parts, but it comes down the rivers into the coastal plain and may be found at Society Hill. There are a number of plants in Major Coker's lawn.

*See my article on Michaux's Garden in Journal of Elisha Mitchell Scientific Society, Vol. 27, No. 2, July, 1911.

SYSTEMATIC LIST OF HARTSVILLE PLANTS.*

PTERIDOPHYTA.

Polypodiaceae

- POLYPODIUM POLYPODIOIDES** (L.) Hitchc. Southern Polypody.
Near Black Creek on Captain Cannon's Place. Frequent on trees and old roofs.
- PTERIS AQUILINA** L. Bracken Fern.
Burnt Bay, etc. Rather common near bays and branches.
- WOODWARDIA VIRGINICA** (L.) J. E. Smith. Swamp Fern.
South side of the lake above Prestwood's Bridge. Common in swamps and bays.
- WOODWARDIA AREOLATA** (L.) Moore. Chain Fern.
Occasional in rich damp places, as in Burnt Bay.
- ASPLENIUM PLATYNEURON** (L.) Oakes. Ebony Spleenwort.
On beams under Kilgore's Mill house. Railroad embankment near the paper mill. Not rare.

*Exact locations as given in this list indicate the collection of specimens at that point. With the exception of about ten all were collected within a radius of two miles.

The plants noted in this list have been mostly collected by me at odd times for a number of years. Mr. Paul H. Rogers, my cousin, has been of great assistance in securing many plants at seasons not covered by my collections, and by picking up a number of rarer things. For his generous assistance and unfailing kindness I wish to express my thanks.

A large proportion of the collections were taken to the New York Botanical Garden and there worked up. The majority of the plants were looked over by Dr. J. K. Small of the Garden staff, whose assistance in determining the species I gratefully acknowledge.

To Dr. N. L. Britton, Director of the Garden, my thanks are due for the determination of certain plants and for his generous extension of all facilities. Prof. Ezra Brainerd, of Middleberg College, has been kind enough to determine the violets, and Mr. W. H. Blanchard, of Vermont, the blackberries.

This list does not pretend to be complete, especially among the grasses, sedges, and weeds.

In the matter of nomenclature I have followed generally the seventh edition of Gray's manual. So long as systematists are as far apart as at present it is just as well in a report of this sort to follow the most available and conservative book.

- ASPLENIUM FILIX-FOEMINA (L.) Bernh.** Lady Fern.
In Snake Branch swamp. Not infrequent on wet edges of swamps, as at Laurel Land and the Old Bacot Place.

Osmundaceae

- OSMUNDA REGALIS L.** Royal Fern.
Burnt Bay where the road crosses to Prestwood's Bridge. Not common.

- OSMUNDA CINNAMOMEA L.** Cinnamon Fern—Poor-man's Soap.
Burnt Bay, near the novelty mill. Frequent. When the leaves of this fern are rubbed up in water they make a lather like soap, hence the name "Poor Man's Soap," which it is known by at Hartsville.

Ophioglossaceae

- BOTRYCHIUM VIRGINIANUM (L.) Sw.** Grape Fern.
Near spring at foot of declivity to creek swamp on the old Bacot Place. Rare.

Lycopodiaceae

- LYCOPODIUM ALOPECUROIDES L.** Club Moss.
Plentiful along wet edges of swamps and bays.

- LYCOPODIUM ADPRESSUM LLOYD & UNDERW.** Club Moss.
In savannas, and in slightly dryer situations than the preceding. Plentiful.

- LYCOPODIUM CAROLINIANUM L.** Little Club Moss.
In damp, sandy flats. Frequent.

GYMNOSPERMAE

Pinaceae

- PINUS TAEDA L.** Loblolly Pine. Old-field Pine.
Very common in old fields and edges of swamps, flat woods, etc.

- PINUS SEROTINA MICHX.** Pond Pine. Slash Pine.
Common in bays, savannas, and edges of swamps.

- PINUS VIRGINIANA MILL.** Scrub Pine.
One tree of this species was noticed in the Sand Hills about three miles north of Hartsville.

- PINUS ECHINATA* MILL. Rosemary Pine. Short-leaf Pine.
Frequent near water courses.
- PINUS PALUSTRIS* MILL. Long-leaf Pine.
Common everywhere except in swamps, bays and savannas.
- TAXODIUM DICTICHUM* (L.) Richard. Cypress.
Swamps and savannas. Common.
- CHAMAECYPARIS THYOIDES* (L.) BSP. Juniper.
Swamps and bays. Common.

ANGIOSPERMAE

MONOCOTYLEDONS

Typhaceae

- TYPHA LATIFOLIA* L. Cat-tail.
A pioneer plant in open wet places. Infrequent.

Najadaceae

- POTAMOGETON HETEROPHYLLUS* SCHREB. Pondweed.
In the lake. Also in pools across the dam at the paper mill.
- POTAMOGETON DIVERSIFOLIUS* RAF. Pondweed.
Pool beyond the paper mill dam.

Alismaceae

- SAGITTARIA LONGIROSTRA* (M. Michili) J. G. Sm. Arrowhead.
Edges of ponds and streams. Frequent.

Gramineae

- ROTTBOELLIA RUGOSA* NUTT.
Plantation Savanna.
- ERIANTHUS SACCHAROIDES* MICHX.
North side of the lake, near the dam.
- ANDROPOGON SCOPARIUS* MICHX.
Sand hills opposite the paper mill.
- ANDROPOGON ARCTATUS* CHAPMAN.
Sandy soil opposite the paper mill. This species was known before only from Florida.

- ANDROPOGON VIRGINICUS* L. Broom Sedge.
Damp soil near the lake. Very abundant in old fields, sand hills, low flats, etc.
- SORGHASTRUM NUTANS* (L.) Nash. Indian Grass.
Flats across from the paper mill.
- SORGHUM HALEPENSE* (L.) Pers. Johnson Grass.
Has become established in a number of places in and near town.
- DIGITARIA SANGUINALIS* (L.) Scop. Crab Grass.
Very abundant in cultivated fields.
- LEPTOLOMA COGNATUM* (Schultes) Chase. Tumble Grass. Witch
Sand hills. Common also in old fields. [Grass.
- PASPALUM SETACEUM* MICHX.
Common in the sand hills.
- PASPALUM BOSCIANUM* FLÜGGE.
Roadside west of Snake Branch.
- PASPALUM PLENIPILUM* NASH.
Wet marsh on east side of Kilgore's Pond.
- PASPALUM FLORIDANUM* MICHX.
Near the paper mill.
- AXONOPUS FURCATUS* (Flügge) Hitchc.
Damp meadow east of Kilgore's Pond.
- ANTHAENANTIA RUFA* (ELL.) Schult.
Transition between meadow and sand hills east of Kilgore's Pond.
- PANICUM NEURANTHUM* GRISEB.
Sand hills across the lake. Very common.
- PANICUM HEMITOMUM* SCHULTES.
Shallow water on edges of the lake and of Kilgore's Pond.
This grass extends farthest into the water and is fringed on the land side by *P. scabriusculum*.
- PANICUM SCABRIUSCULUM* ELL.
Shallow water and wet soil along the margins of the lake, of Kilgore's Pond and of Black Creek. This is the first growth to occupy new made soil on the edges of water courses.

Panicum aciculare Desv.

Pine woods in front of the Upper Farm Place.

Panicum curtifolium Nash.

Damp woods near Burnt Bay. New to South Carolina.

Panicum condensum Nash.

Damp woods near Burnt Bay.

Panicum sphaerocarpon Ell.

Damp woods near Burnt Bay.

Panicum anceps Michx.

Damp woods near Burnt Bay.

Panicum dichotomiflorum Michx.

Near the paper mill.

Panicum barbuiatum Michx.

Damp woods near Burnt Bay.

Panicum virgatum L.

Plantation Savanna.

Panicum verrucosum Muhl.

Wet flats east of Kilgore's Pond.

Panicum capillare L.

In pastures and old fields.

Witch Grass. Tumble Grass.

Echinochloa colona (L.) Link.

Roadside west of Snake Branch.

Jungle Rice.

Echinochloa crus-galli (L.) Beauv.

Roadside west of Snake Branch.

Barnyard Grass.

Setaria imberbis R. & S.

Roadside west of Snake Branch.

Foxtail Grass.

Leersia oryzoides (L.) Sw.

Wet soil near the paper mill.

Rice Cut-grass.

Aristida purpurascens Poir.

Sand hills opposite the paper mill.

Aristida stricta Michx.

Sandy ridge south of the lake. Very common in the sand hills.

Wire Grass.

- PHLEUM PRATENSE L.** Timothy.
On the side of a street in town. Infrequent. Introduced from hay.
- SPOROBOLUS INDICUS (L.) R. Br.** Smut Grass.
Common along roads and in yards. A bad weed in lawns.
- SPOROBOLUS JUNCEUS (Michx.) Kunth.**
Sand hills.
- CALAMAGROSTIS CINNOIDES (Muhl.) Barton.**
Wet edge of Kilgore's Pond.
- CYNODON DACTYLON (L.) Pers.†** Bermuda Grass.
A common and valuable introduced grass.
- GYMNOPOGON AMBIGUUS (Michx.) BSP.**
Dampish ground near the lake. North end of the paper mill dam. Pine woods in front of the Upper Farm Place.
- GYMNOPOGON BREVIFOLIUS TRIN.**
Plantation Savanna.
- DACTYLOCTENIUM AEGYPTIUM (L.) Richter.** Crowfoot Grass.
Common in open places.
- ELEUSINE INDICA GAERTN.** Wire Grass. Yard Grass.
Roadside west of Snake Branch.
- ERAGROSTIS PILOSA (L.) Beauv.**
Roadside west of Snake Branch.
- ERAGROSTIS HIRSUTA (Michx.) Nash.**
Roadside west of Snake Branch.
- ARUNDINARIA MACROSPERMA MICHX.*** Large Cane.
Common in swamps.
- ARUNDINARIA TECTA (Walt.) Muhl.*** Dwarf Cane.
Common on edges of bays.

Cyperaceae

- ELEOCHARIS TORREYANA BOECKL.**
In shallow water at crossing in branch by Captain Cannon's sheep pasture.

†Bermuda grass is not supposed to produce seed in our States, but Miss Tillman has found that at Raleigh, N. C., a considerable amount of good seed is set. See Journal of the Elisha Mitchell Scientific Society, Aug., 1912.

*I have some doubt as to the determination of these two canes. There is no record of either having fruited in Hartsville. We may have only one of the species.

ELEOCHARIS MELANOCARPA TORR.

Covering a large area of shallow water on west side of Kilgore's Pond.

ELEOCHARIS QUADRANGULATA (MICHX.) R. & S.

Growing in standing water in open marshy places on both sides of Kilgore's Pond.

STENOPHYLLUS CAPILLARIS (L.) BRITTON.

Sand hills across the lake.

FIMBRISTYLIS AUTUMNALIS (L.) R. & S.

Damp woods near Burnt Bay.

SCIRPUS ERIOPHORUM MICHX.

Frequent in open wet places and edges of ponds. Wet pine woods near Burnt Bay.

SCIRPUS SUBTERMINALIS TORR.

Submerged in mill race of Kilgore's Mill. Flowering shoots emerged. New to South Carolina.

ERIOPHORUM VIRGINICUM L. Cotton Grass. Rabbit Tail Grass.

Wet soil at branch crossing near Cannon's sheep pasture.

FUIRENA SQUARROSA MICHX.

Flats across from the paper mill. Wet marsh east of Kilgore's Pond.

RYNCHOSPORA CORNICULATA (LAM.) GRAY.

Wet edge of Kilgore's Pond. Floating log in the lake.

RYNCHOSPORA GLOMERATA (L.) VAHL.

Wet edge of Kilgore's Pond. Flats across from the paper mill.

RYNCHOSPORA AXILLARIS (LAM.) BRITTON.

Flats across from the paper mill.

RYNCHOSPORA MICROCEPHALA BRITTON.

On floating logs in the lake.

SCLERIA RETICULARIS MICHX.

Damp flats across from the paper mill.

SCLERIA TRIGLOMERATA MICHX.

Marshy edge of the lake.

CAREX MACROKOLEA STEUD.

Wet meadow in Burnt Bay. Edge of the lake.

CYPERUS MARTINDALEI BRITTON.

A very common little sedge in the sand hills.

CYPERUS IRIA L.

Roadside west of Snake Branch.

CYPERUS HASPAN L.

Marshy edge of the lake.

Araceae**PETLANDRA VIRGINICA (L.) Kunth.**

Moccasin Corn.

Common in shallow water, edges of ponds, etc.

ORONTIUM AQUATICUM L.

Golden Club.

Crowley's Branch. Frequent in branches.

Eriocaulaceae**ERIOCAULON DECANGULARE L.**

Wet places across from the paper mill. Frequent.

ERIOCAULON COMPRESSUM LAM.

Edge of Black Creek, one mile west of Hartsville. Wet edges of ponds and streams. Frequent.

ERIOCAULON SEPTANGULARE WITH.

Edge of the lake. Edge of Black Creek, Laurel Land. Frequent.

LACHNOCAULON ANCEPS (Walt.). Morong.

Wet places across from the paper mill. Frequent.

Xyridaceae**XYRIS CAROLINIANA WALT.**

Yellow-eyed Grass.

Wet meadow in Burnt Bay. Wet edge of the lake by Prestwood's Bridge.

XYRIS ELATA CHAPM.

Yellow-eyed Grass.

Edge of Kilgore's Pond.

- XYRIS FIMBRIATA ELL.** Yellow-eyed Grass.
Wet edge of the lake, southside.
- XYRIS ARENICOLA SMALL.** Yellow-eyed Grass.
In savannah in Cannon's sheep pasture.

Mayacaceae

- MAYACA AUBLETI MICHX.**
Shallow water by crossing at the paper mill. Common on wet margins.
- MAYACA FLUVIATILIS.**
Submerged in the lake. I am now confident that this is nothing more than a submerged form of the preceding species.

Commelinaceae

- COMMELINA ANGUSTIFOLIA MICHX.**
Poor sandy soil in the paper mill yard. Damp woods east of causeway at the paper mill crossing.
- CUTHBERTIA GRAMINEA SMALL.**
Damp woods east of causeway at the paper mill crossing. Dry sandy soil in the paper mill yard. Locally plentiful. A beautiful plant.

Bromeliaceae

- TILLANDSIA UNEOIDES L.** Gray Moss.
One spray was found hanging over Black Creek behind Captain Cannon's Place. We are just at its inland limit.

Pontederiaceae

- PONTEDERIA CORDATA L.** Pickerel-weed.
In a wet place three miles down the A. C. L. Railroad from Hartsville near Sol. Hall's Place. Also seen on edge of a bay near the old Lucas Place. Rare.

Juncaceae

- JUNCUS REPENS MICHX.**
In shallow water at crossing of bay in Captain Cannon's sheep pasture. Wet marsh on east side of Kilgore's Pond.
- JUNCUS ARISTULATUS MICHX.**
Flats across from the paper mill.

JUNCUS ABORTIVUS CHAPM.

Open grassy meadow in Burnt Bay. New to South Carolina.

JUNCUS SCIRPOIDES LAM.

Wet edge of Kilgore's Pond. Damp flats across from the paper mill.

JUNCUS TRIGONOCARPUS STEUD.

Damp flats across from the paper mill.

Liliaceae

CHAMAELIRIUM LUTEUM (L.) Gray.

Edges of bays and swamps. Open edge of bay in Captain Cannon's sheep pasture.

TOFIELDIA GLABRA NUTT.

Sheep Pasture Savanna.

AMIANTHIUM MUSCAETOXICUM (Walt.) Gray. Fly Poison.

On sandy, shady hillside along road crossing at Crowley's Branch.

ZYGADENUS ANGUSTIFOLIUS (Michx.) S. Wats.

Edge of Sheep Pasture Savanna.

OAKESIA SESSILIFOLIA (L.) Wats. (Uvularia L.) Bellwort.

In low, damp, shady woods at Tory Cave, three miles west of Hartsville. Rare.

ALLIUM VINALE L. Field Garlic. Wild Onion.

Near middle of Upper Farm. Sparingly introduced in fertile places.

LILIUM SUPERBUM L. Turk's-cap Lily.

We have found this beautiful and conspicuous lily only a few times. Once in moist soil on the edge of Snake Branch near the A. C. L. Railroad Crossing, and in similar situations in the sand hills.

LILIUM CATESBAEI WALT. Red Lily.

Damp soil near Kilgore's Mill. Seen once on the margin of Burnt Bay.

YUCCA FILAMENTOSA L. Bear Grass.

Sandy woods across the lake. Plentiful on old earth dam on Crowley's Branch.

- ALETIS FARINOSA L.** Star Grass.
Damp flats across from the paper mill. Not rare.
- SMILAX WALTERI PURSH.** Red-berried Bamboo.
Swamps near the paper mill. Ditch bank on the old Lucas Place. Common in swamps.
- SMILAX ROTUNDIFOLIA L.** Green Brier. Cat Brier.
This is a very common vine in the flatwoods, forming tangles along the roads and ditches.
- SMILAX GLAUCA WALT.**
Side of earth dam across from the paper mill. Very common in low fields and along ditches.
- SMILAX LAURIFOLIA L.** Bamboo Briar.
Common in bays and on edges of swamps.
- NEMEXIA HERBACEA (L.) Small.**
Damp woods near Burnt Bay. Bluffs of Black Creek.
- NEMEXIA HUGERI SMALL.**
Clay hillside at Tory Cave, three miles west of Hartsville. Rich, sandy soil at Crowley's Spring. Rare.

Dioscoraceae

- DIOSCOREA VILLOSA L.**
Frequent in rich, low woods.

Amaryllidaceae

- HYPOXIS HIRSUTA (L.) Coville.** Yellow-eyed Grass.
Flat woods south of the lake.

Iridaceae

- IRIS VERSICOLA L.** Blue Flag.
Margin of the lake, and along edge of Black Creek. Common in wet soil.
- IRIS PRISMATICA PURSH.** Slender Blue Flag.
Common in Savannas and on wet margins. This species blooms in June, the preceding in May.
- IRIS VERNA L.** Dwarf Flag.
Flatwoods south of Hartsville plantation. Frequent in the sand hills.

- ***SISYRINCHIUM ATLANTICUM** Bicknell. Blue-eyed Grass.
In low flat woods, south of Mr. J. E. Miller's Place. This is our largest species, reaching a height of fourteen inches or more.
- SISYRINCHIUM FIBROSUM** Bicknell. Blue-eyed Grass.
(*S. carolinianum* Bicknell).
Sandy woods at the old Bacot Place.
- SISYRINCHIUM ARENICOLA** Bicknell. Blue-eyed Grass.
This is our commonest species. It is abundant in the flatwoods, and in rich woods along Black Creek. We also have it from the sand hills.

Burmanniaceae

- BURMANNIA CAPITATA** (Walt.) Mart.
Damp flats across from the paper mill. Plentiful.

Orchidaceae

- HABENARIA CRISTATA** (Michx.) R. Br. Fringed Orchis.
Crossing of branch entering Captain Cannon's sheep pasture.
Rare.
- HABENARIA CILIARIS** (L.) R. Br. Fringed Orchis.
Edge of Sheep Pasture Savanna. Frequent.
- HABENARIA BLEPHARIGLOTTIS** (Willd.) Torr. White Fringed Orchis.
In Sheep Pasture Savanna. Not infrequent on edges of bays and savannas.
- HABENARIA NUTTALLII** SMALL.
Damp edge south side of the lake, about 100 yards above Prestwood's Bridge. New to South Carolina.
- HABENARIA CLAVELLATA** (Michx.) Spreng.
Southeast edge of Kilgore's Pond. Rare.
- POGONIA OPHIOGLOSSOIDES** (L.) Ker.
Edge of the lake. Sheep Pasture Savanna. Not rare.

*In the present confused state of this genus it is almost impossible to refer specimens with certainty to their proper place among the scores of so-called species. The determinations here given represent the best we could do, with the help of Dr. Britton, by comparison with specimens at the New York Botanical Garden.

POGONIA DIVARICATA (L.) R. Br.

Edge of Sheep Pasture Savanna. Not rare.

LIMODORUM TUBEROSUM L.

Grass Pink.

Damp flats across from the paper mill. Black Creek swamp just above the paper mill. Frequent. We have twice found a pure white form of this orchid.

LIMODORUM GRAMINIFOLIUM (Ell.) Small.

Sheep Pasture Savanna. Rare.

SPIRANTHES PRAECOX (Walt.) Wats. and Coult.

Edge of the lake. Wet soil below the dam. Frequent.

MICROSTYLIS UNIFOLIA (Michx.) BSP.

Rich woods near Snake Branch northwest of the High School building. Rare.

DICOTYLEDONS

Piperaceae

SAURURUS CERNUUS L.

Lizard's Tail.

Creek edge at Laurel Land. Frequent in open, wet places.

Salicaceae

SALIX NIGRA MARSH.

Black Willow.

Open, wet places. Not common.

POPULUS DELTOIDES MARSH.

Carolina Poplar.

Damp soil near the lake. Rare.

Myricaceae

MYRICA CERIFERA L.

Candleberry. Wax Myrtle.

Common in the flat woods and along bays.

MYRICA PUMILA SMALL.

Dwarf Candleberry.

Flat woods near Burnt Bay; one hundred yards above Prestwood's Bridge. Common in the flat woods.

MYRICA CAROLINENSIS MILL.

Swamp Candleberry.

Edge of bay bounding Sheep Pasture Savanna. Frequent in bays and by water courses.

Juglandaceae

JUGLANS NIGRA L.

Walnut.

Occasional in rich ground and on edges of ditches.

- CARYA ALBA* (L.) K. Koch. White Hickory.
Very common in rich woods.
- CARYA GLABRA HIRSUTA* ASHE. Pignut Hickory.
Edge of the lake behind Captain Cannon's place; well-drained woods on road to the paper mill. Rather common.

Betulaceae

- ALNUS RUGOSA* (Du Roi) Spreng. Alder.
Edges of swamps and bays. Common.
- BETULA NIGRA* L. River Birch.
A few trees occur near Black Creek behind the Jordan Place.

Fagaceae

- QUERCUS ALBA* L. White Oak.
Occurs sparingly along the bluffs of Black Creek.
- QUERCUS STELLATA* WANG. Post Oak.
Very abundant in the sand hills and common in most woods.
- QUERCUS COCCINEA* L.—Muench. Scarlet Oak.
Near the paper mill. A large tree stands in the southeast corner of the old Law Place. Rather common in the valley of Black Creek and occasional in other rich woods.
- QUERCUS VELUTINA* LAM. Black Oak.
Common in rich woods.
- QUERCUS FALCATA* MICHX. Spanish Oak.
Abundant in rich woods.
- QUERCUS CATESBAEI* MICHX. Turkey Oak. Forked-leaved.
[Black Jack Oak.
Abundant in dry, sandy soil. One of the scrub oaks.
- QUERCUS NIGRA* L. Water Oak.
Common in damp places.
- QUERCUS MARYLANDICA* MUENCH. Black Jack Oak.
Common in the sand hills and in poor soil generally.
- QUERCUS PHELLOS* L. Willow Oak.
Common in flat woods and on edges of bays.
- QUERCUS CINEREA* MICHX. Upland Willow Oak.
Abundant in dry, sandy soil. One of the scrub oaks.

Urticaceae

- CELTIS SMALLII** BEADLE. Hackberry.
Ditch bank west of Upper Farm. Near Snake Branch south of the high school building. This tree is not native here, but is adventive from cultivated trees.
- MORUS RUBRA** L. Red Mulberry.
Found sparingly on new-made ground, along ditches, etc.
- BOEHMERIA CYLINDRICA** (L.) Sw. False Nettle.
Common in wet places. Southside of the lake and along Snake Branch.
- BOEHMERIA SCABRA** (Porter) Small.
Edge of the lake. Common.

Loranthaceae

- PHORADENDRON FLAVESCENS** (Pursh) Nutt. Mistletoe.
Common on oak, black gum, etc.

Aristolochiaceae

- ASARUM ARIFOLIUM** MICHX. Heartleaf.
Black Creek bluffs, one mile above Hartsville. Frequent in well-drained, rich woods.
- ARISTOLOCHIA SERPENTARIA** L. Snakeroot.
In well-drained woods. Not common.

Polygonaceae

- RUMEX OBTUSIFOLIUS** L. Bitter Dock.
Near the railroad station. A common rank weed in rather fertile waste places.
- RUMEX CRISPUS** L. Yellow Dock.
Along road to Prestwood's Bridge. Frequent in waste ground.
- RUMEX HASTATULUS** BALDW. Sorrell.
Low flats across from the paper mill. Abundant in waste places and old fields.
- RUMEX ACETOSELLA** L. Sheep Sorrel.
Frequent in lawns and old fields.
- POLYGONUM AVICULARE** L.
A very common weed in open frequented places.

- POLYGONUM PERSICARIA L.** Ladies' Thumb.
Waste places around yards, etc.
- POLYGONUM HYDROPIPEROIDES MICHX.** Water Pepper.
Wet marsh, east side of Kilgore's Pond.
- POLYGONUM CONVULVULUS L.** Bindweed.
A weed in gardens and open places.
- POLYGONELLA POLYGAMA (Vent) A. Gray.**
On Sugarloaf Mountain. A typical and very attractive pine barren plant. It is rare with us.

Chenopodiaceae

- CHENOPODIUM ALBUM L.** Lamb's Quarters.
Frequent in fertile open places. The leaves near the growing point are often purplish red. It is very variable in shape of leaf.
- CHENOPODIUM ANTHELMINTICUM L.** Wormseed.
A common weed in open waste ground.

Amaranthaceae

- AMARANTHUS HYBRIDUS L.** Pigweed.
A very common coarse weed.
- AMARANTHUS SPINOSUS L.** Thorny Pigweed.
Not so common as the above, but often found in gardens and barnyards.

Phytolaccaceae

- PHYTOLACCA DECANDRA L.** Poke Berry.
A common weed.

Nyctaginaceae

- BOERHAAVIA ERECTA L.**
A recently introduced weed in gardens. Frequent.

Aizoaceae

- MOLLUGO VERTICILLATA L.** Carpet Weed.
A rather common weed.

Caryophyllaceae

- SAGINA DECUMBENS** (ELL.) T. & G. Pearlwort.
Damp sandy soil on south side of Burnt Bay. Maj. J. L. Coker's lawn. A delicate little weed in open places.
- STIPULICIDA SETACEA** MICHX.
Poor sandy soil in Captain Cannon's sheep pasture.
- ARENARIA CAROLINIANA** WALT. Sandwort.
Dry sand hills seven miles from Hartsville. A beautiful little plant forming dense mats.
- STELLARIA MEDIA** (L.) Cyrill. Chickweed.
Very abundant in cultivated places.
- CERASTIUM VULGATUM** L. Mouse-ear Chickweed.
A weed in waste places.
- AGROSTEMMA GITHAGO** L. Corn Cockle.
An infrequent weed in waste places.
- SILENE ANTIRRHINA** L. Catchfly.
Along fence in front of Captain Cannon's Place. On side of a street in town. Fields and waste places.
- SILENE CAROLINIANA** WALT.
Roadside in front of Captain Cannon's Place. Sandy banks of the lake back of Mr. A. M. McNair's Place. Low woods near the paper mill.

Portulacaceae

- PORTULACA OLERACEA** L. Purslane.
A weed in gardens.

Nymphaeaceae

- NYMPHAEA ADVENA** AIT. Yellow Pond Lily.
Scattered in the upper part of the lake.
- CASTALIA ODORATA** (Ait.) Woodv. & Wood. Water Lily.
MacIntosh's Mill Pond, also in Kilgore's Mill Pond.
- BRASENIA SCHREBERI** GMEL. Water Shield.
In the lake and in Kilgore's Pond. Abundant.

Ranunculaceae

- CLEMATIS VIORNA** L. Leather flower.
Edge of a branch on road to Society Hill. Rare.
- ZANTHORIZA APIIFOLIA** L'HÉR. Yellow-root.
Along Snake Branch near the High School building. Rare.

Magnoliaceae

- MAGNOLIA VIRGINIANA** L. Sweet Bay.
Common in bays and swamps.
- LIRIODENDRON TULIPIFERA** L. Poplar. Tulip Tree.
Swamps and edges of water courses. Not abundant.

Anonaceae

- ASIMINA PARVIFLORA** (Michx.) Duval. Upland Papaw.
Sand hills on road to Kilgore's mill. Scattered in the sand hills, and occasional in the woods south of Burnt Bay and at Laurel Land.

Menispermaceae

- COCCULUS CAROLINUS** (L.) DC.
Seen only once; in a cotton field on Hartsville Plantation.

Lauraceae

- PERSEA PUBESCENS** (Pursh) Sarg. Red Bay.
Burnt Bay near the Novelty Mill. In flower June 11, 1911.
This species is distinguished from the smooth red bay by its tomentose twigs and leaves and long peduncles. Common in bays and swamps.
- SASSAFRAS VARIIFOLIUM** (Salisb.) Ktze. Sassafras.
Very common in ground that has been cultivated.

Cruciferae

- DRABA VERNA**. Whitlow Grass.
A common little early spring weed.
- LEPIDIDIUM VIRGINICUM** L. Peppergrass.
A common weed.

- CAPSELLA BURSA-PASTORIS* (L.) Medic. Shepherd's Purse.
A very common spring weed.
- SISYMBRIUM THALIANUM* (L.) J. Gay. Hedge Mustard.
Near Black Creek above Captain Cannon's Place. Waste places.
- ERYSIMUM CHEIRANTHOIDES* L. Worm-seed Mustard.
Street side near the depot. A rare introduction.
- CORONOPUS DIDYMUS* (L.) Sm. Wart Cress.
Near Mr. D. R. Coker's barn. A low spreading weed of rather recent introduction. Plentiful.
- BARBAREA VERNA* (Mill.) Asch. Early Winter Cress.
Roadside near the College. A winter and spring weed in cultivated places.
- ARABIS VIRGINICA* (L.) Trel. Roadside near the College. A winter and spring weed in open places.

Sarraceniaceae

- SARRACENIA PURPUREA* L. Pitcher Plant.
In sphagnum moss on edges of bays and bogs. Frequent.
- SARRACENIA FLAVA* L. Trumpets.
In a branch head at foot of Sugarloaf Mountain. Frequent in savannas and edges of bays.
- SARRACENIA RUBRA* WALT. Pitcher Plant.
Near edge of creek back of the Upper Farm Place. Near Black Creek two miles above the paper mill. Plentiful in open edges of bays. A plant of this species with double flowers was found in Captain Cannon's Sheep Pasture. It was sent to the New York Botanical Garden, and has since borne double flowers there.

Droseraceae

- DROSERA INTERMEDIA* HAYNE. Sundew.
Wet places on edge of the lake. Common on margins of open water and on floating logs.
- DROSERA CAPILLARIS* POIR. Sundew.
Wet places across from the paper mill dam.

Crassulaceae**PENTHORUM SEDOIDES L.**

On margin of Snake Branch. Rare.

Saxifragaceae**ITEA VIRGINICA L.**

Virginia Willow.

Edge of the lake. In a branch on the Darlington and Clyde road three miles southwest of Hartsville. Edges of bays and branches. Infrequent.

Hamamelidaceae**HAMAMELIS VIRGINIANA L.**

Witch-hazel.

Rich woods south of Black Creek.

FOTHERGILLA GARDENI MURR.

Edge of bay in Sheep Pasture Savanna. Occurs along the crossing at the paper mill. Occasional on edges of bays.

LIQUIDAMBAR STYRACIFLUA L.

Sweet Gum.

A very common tree in damp soil.

Platanaceae**PLATANUS OCCIDENTALIS L.**

Sycamore.

Along streams. Not common.

Rosaceae**ARONIA ARBUTIFOLIA (L. f.) Ell.**

Chokeberry.

Common on edges of bays.

AMELANCHIER BOTRYAPIUM (L. f.) DC.

Shadbush.

Edges of bays. Ditch bank by side of low flat across from the paper mill bridge. Common.

CRATAEGUS TOMENTOSA L.

Red Haw.

Dry pine woods in front of the Upper Farm Place. Also in the sand hills.

CRATAEGUS UNIFLORA MUNCH.

Red Haw.

Dry pine woods in front of the Upper Farm Place. This is frequent, and is our edible Red Haw.

- CRATAEGUS CRUS-GALLI* L. Cockspur Thorn.
Rather common in the flat woods. Pasture south of Mr. J. E. Miller's Place. This species often reaches the size of a small tree twelve to fifteen feet high.
- CRATAEGUS MICHAUXII* PERS. (*C. Ravenelii* Sarg., *C. Cuthberti* Ashe.). Label lost.
- FRAGARIA VIRGINICA* DUCHESNE. Wild Strawberry.
Southside of the lake. This is plentiful along the ditch west of the Upper Farm, but is rare in our area.
- POTENTILLA CAROLINIANA* POIR. Cinquefoil.
Woods and open places. (See North Am. Flora, Vol. XXII, Part 4, p. 303.) This is one of the most common and noticeable of our early spring flowers. It is plentiful in the flat woods, but is also found along ditches and roads. Its bright, yellow flowers were conspicuous on April 1, 1911.
- RUBUS ANDREWSIANUS* BLANCHARD. Blackberry.
Southside of the lake at Captain Cannon's Place; margin of Kilgore's Pond, etc. This is our common high bush blackberry.
- RUBUS PROCUMBENS* MUHL. Dewberry.
In stiff, black soil at Laurel Land; flat woods, etc. This is our common dewberry.
- RUBUS CUNEIFOLIUS* PURSH. Late Blackberry.
Damp, sandy soil near the lake, southside. Common in the sand hills and scattered almost everywhere.
- ROSA RUBIGINOSA* L. Sweetbriar. Eglantine.
Ditch bank west of the Upper Farm. A native of Europe that has sparingly escaped in open places.
- PRUNUS SEROTINA* EHRH. Choke Cherry.
Common by roads and ditches.
- PRUNUS ANGUSTIFOLIA* MARSH. Old-field Plum.
Edges of fields and clearings. Plentiful.
- PRUNUS* sp. ?
Edge of road in Burnt Bay at crossing west of novelty mill. Edge of the lake near bathing place. Neither of these trees has yet flowered, and determination is doubtful. They may be escaped domestic plums.

- PRUNUS PERSICA* (L.) Stokes. Peach.
Is an occasional escape.
- PRUNUS CAROLINIANA* AIT. Mock Orange. Carolina Laurel
Sparingly escaped from cultivation. [Cherry.]

Leguminosae

- SCHRANKIA ANGUSTATA* T. & G. Sensitive Plant.
Dry old field across from the paper mill. Rather frequent in
uncultivated open places.
- GLEDITSIA TRIACANTHOS* L. Honey Locust.
Scarce and very local in occurrence. A good many trees grow
along the ditch west of the Upper Farm Place.
- CASSIA TORA* L.
A rank, ill-smelling weed in cultivated places. Recently intro-
duced and getting more abundant.
- CASSIA CHAMAECRISTA* L. Large Partridge Pea.
Light soil near Tory Cave. A rather rare plant in our area, but
locally plentiful in the flatwoods.
- CASSIA NICTITANS* L. Partridge Pea.
Open places and edges of woods. Common.
- CERCIS CANADENSIS* L. Redbud. Judas Tree.
One tree in sand hills three miles north of Hartsville. It is
not uncommon at Society Hill and at Darlington, about fifteen
miles away.
- BAPTISIA TINCTORIA* (L.) R. Br. False Indigo.
Flat woods in front of the Upper Farm Place. Sandy woods
near Black Creek. Frequent.
- BAPTISIA VILLOSA* (Walt.) Ell.
Sand hills near Crowley's Branch. Dry pine woods near the
paper mill. Frequent.
- CROTALARIA PURSHII* DC. Rattle-box.
Across from the dam at the paper mill. Common.
- CROTALARIA ROTUNDIFOLIA* (Walt.) Poir. Rattle-box.
Sand hills east of Kilgore's Pond.
- ROBINIA NANA* (Ell.) Spach. Dwarf Locust.
Woods near Mr. A. M. McNair's residence. Woods south of
Burnt Bay, near the paper mill. Infrequent.

GLOTTIDIUM VESICARIUM (JACQ.) DESV.

Sandy soil in an old cotton field on Camden road, five miles north of Hartsville. This is the only station we have for it so far. In flower September 10, 1911.

LUPINUS DIFFUSUS NUTT.

Lupine.

Poor sandy woods near the Bacot Place. Sandy hillside on the Kilgore Place. Scattered in the sand hills.

TRIFOLIUM ARVENSE L.

Rabbit-foot Clover.

Roadside on way to the paper mill. Not rare.

TRIFOLIUM PRATENSE L.

Red Clover.

On Major Coker's lawn. Rather frequent in good, rich soil.

TRIFOLIUM REPENS L.

White Clover.

Along roadside to Prestwood's Bridge. On side of a street. Common in waste places and yards.

TRIFOLIUM CAROLINIANUM MICHX.

Carolina Clover.

In poor sandy soil in Captain Cannon's sheep pasture.

TRIFOLIUM PROCUMBENS L.

Hop Clover.

Lawns and roadsides. Common.

TRIFOLIUM HYBRIDUM L.

Alsike Clover.

By road near Prestwood's Bridge.

PSORALEA PEDUNCULATA (Mill.) VIAL.

Along a ditch through low flats across from the paper mill. Common in flat open places.

AMORPHA HERBACEA WALT.

Lead Plant.

Flatwoods near south side of the lake. Sand hills across the lake.

INDIGOFERA CAROLINIANA WALT.

Dryish soil on edge of Captain Cannon's sheep pasture. Sandy soil beyond dam at the paper mill.

TEPHROSIA VIRGINIANA (L.) PERS.

Shoe-strings.

Dry pine woods across from the paper mill. Sandy soil near Laurel Land.

TEPHROSIA AMBIGUA M. A. CURTIS.

Sand hills beyond the paper mill dam.

- TEPHROSIA SPICATA* (Walt.) T. & G.
Sand hills beyond the paper mill dam.
- WISTARIA FRUTESCENS* (L.) Poir. Wild Wistaria.
Edge of the lake. Edge of Kilgore's dam. Frequent.
- ASTRAGALUS APILOSUS* SHELDON. Milk Vetch.
Sand hills across the lake.
- DESMODIUM NUDIFLORUM* (L.) DC. Beggar Ticks.
Woods behind Captain Cannon's Place.
- DESMODIUM DILLENII* DARL. ? Beggar Ticks.
In the paper mill yard.
- DESMODIUM PANICULATUM* (L.) DC. Beggar Ticks.
Roadside near the paper mill.
- DESMODIUM MARILANDICUM* (L.) DC. Beggar Ticks.
By railway track to the paper mill.
- DESMODIUM RHOMBIFOLIUM* (Ell.) DC. ? Beggar Ticks.
Roadside near the paper mill.
- LESPEDEZA REPENS* (L.) Bart.
Captain Cannon's sheep pasture. Dry pine woods west of Snake Branch. Common in open places, woods and pastures.
- LESPEDEZA VIRGINICA* (L.) Britton.
Pine woods in front of the Upper Farm Place.
- LESPEDEZA NUTTALLII* DARL.
Pine woods in front of the Upper Farm Place.
- LESPEDEZA HIRTA* (L.) Hornem.
Near the lake.
- LESPEDEZA STRIATA* (Thunb.) H. & A. Japanese Clover.
Lawns, roadsides and old fields. Very common. Introduced.
- STYLOSANTHES RIPARIA* KEARNEY.
Pine woods in front of the Upper Farm Place. Pine woods on Snake Branch.
- STYLOSANTHES BIFLORA* (L.) BSP.
Sand hills across the lake.
- ZORNIA BRACTEATA* (Walt.) Gmel.
Pine woods in front of the Upper Farm Place.

- VICIA SATIVA* L. Common Vetch.
 This pasture and forage plant from Europe has now become naturalized and is frequent around gardens and orchards. This is the plant that is now being sold by certain sensational seedmen as "Oregon Vetch," a made-up and misleading trade name of recent origin.
- APIOS TUBEROSA* MOENCH. Wild Bean.
 On Prestwood's Bridge causeway. Common in open wet places.
- STROPHOSTYLES UMBELLATA* (Muhl.) Britton.
 Woods behind Captain Cannon's Place.
- CLITORIA MARIANA* L. Butterfly Pea.
 Pine woods in front of the Upper Farm Place. Frequent in damp, sandy soil.
- CENTROSEMA VIRGINIANUM* (L.) Benth. Spurred Butterfly Pea.
 Along causeway at crossing by the paper mill. Dryish parts of flats across from dam at the paper mill. Frequent in damp, sandy soil.
- AMPHICARPA MONOICA* (L.) Ell.
 Fertile, sandy soil near Crowley's Spring.
- GALACTIA REGULARIS* (L.) BSP.
 Damp soil on side of the lake near Prestwood's Bridge.
- GALACTIA VOLUBILIS* (L.) Britton.
 Dry woods in front of the Upper Farm Place.
- RHYNCHOSIA SIMPLICIFOLIA* (Walt.) Wood.
 Sandy soil.
- RHYNCHOSIA ERECTA* (Walt.) DC.
 Pine woods in front of the Upper Farm Place.

Linaceae

- LINUM MEDIUM* (Planch) Britton.
 Flats across from the paper mill. Common in savannas.
- LINUM STRIATUM* WALT.
 Flats across from the paper mill. Common in savannas.
- LINUM USITATISSIMUM* L. Common Flax.
 About a dozen plants appeared spontaneously during the summer of 1912, by the railroad track at the novelty mill.

Oxalidaceae

- OXALIS STRICTA L.** Wood Sorrel.
Damp meadow, eastside of Kilgore's Pond. Southside of the lake. Common in open places.

Geraniaceae

- GERANIUM CAROLINIANUM L.** Cranesbill.
A common weed.

Polygalaceae

- POLYGALA POLYGAMA WALT.**
In damp woods across the lake. Near Burnt Bay. Frequent in damp sandy soil. The underground flowers of this plant are very interesting.

- POLYGALA CURTISSII GRAY.**
Pine woods in front of the Upper Farm Place.

- POLYGALA LUTEA L.** Bachelor's Button.
Damp woods east of causeway by the paper mill crossing. Edges of bay in Sheep Pasture Savanna. Common in open, wet places.

- POLYGALA RAMOSA ELL.**
Plantation Savanna.

- POLYGALA CYMOSA WALT.**
Black Creek swamp near the paper mill. Locally plentiful.

- POLYGALA MARIANA MILL.**
Plantation Savanna.

- POLYGALA GRANDIFLORA WALT.**
Flat woods in front of the Upper Farm Place.

Euphorbiaceae

- JATROPHA STIMULOSA MICHX.** "Nettle."
Sand hills. Frequent in dry, sandy woods.

- CROTON GLANDULOSUS L. VAR. SEPTENTRIONALIS MUELL.. ARG.**
A common weed.

- ACALYPHA GRACILENS GRAY.**
A common weed.

- ACALYPHA VIRGINICA L.**
A common weed.

- TRAGIA URENS L.**
Sand hills across the lake. A rather rare weed.

- TRAGIA NEPETÆFOLIA CAV.** "Nettle."
Rich woods behind Captain Cannon's Place. Rare.

- STILLINGIA SYLVATICA* L. Queen's-delight.
Sand hills across the lake. Rather infrequent.
- EUPHORBIA CORALLATA* L.
Meadow's near the paper mill. Moist woods along Black Creek.
Frequent.
- EUPHORBIA IPECACUANHAE* L.
Common in dry, sandy soil.
- EUPHORBIA GRACILIS* ELL.
Sandy flats. Burnt Bay near the lake.
- EUPHORBIA CURTISII* ENGELM.
At Tory Cave. Sand hills across the lake. Dry pine woods
across from the paper mill.
- EUPHORBIA EXSERTA* (*Tithymalopsis exserta* Small).
This species is new to South Carolina, not before having been
found out of Florida. It was collected in the sand hills at
Macbee, about sixteen miles from Hartsville, in June, 1911.
- EUPHORBIA MACULATA* L.
Very sandy soil in the Baptist Cemetery. Common.
- EUPHORBIA NUTANS* LAG.
Good soil near the paper mill.

Anacardiaceae

- RHUS COPALLINA* L. Sumach.
Common in open places that are not too dry. The largest
specimen I ever saw is in the swamp across the paper mill
bridge growing among juniper, cane, etc. It is about 20 feet
high.
- RHUS VERNIX* L. Poison Sumach.
In bays and swamps; not common.
- RHUS QUERCIFOLIA* (Michx.) Steud. Poison Oak.
Along railroad track near the paper mill. Common in sandy
soil.
- RHUS TOXICODENDRON* L. Poison Ivy.
Low woods and swamps. Bay on northside of the lake.

Cyrillaceae

- CYRILLA RACEMIFLORA* L. He-huckleberry. Myrtle.
Flats near Kilgore's Mill. Near the lake. Plentiful in drained
damp places.

Aquifoliaceae

- ILEX OPACA** AIT. Holly.
 In low, rich woods. Frequent.
- ILEX LAEVIGATA** (Pursh) Gray.
 Bay across creek below the paper mill. Rare.
- ILEX GLABRA** (L.) Gray. Gallberry. Inkberry.
 Abundant in swamps and bays.
- ILEX LUCIDA** (Ait.) T. & G. Large Gallberry
 Swamps and bays. Plentiful.
- ILEX CAROLINIANA** (Walt.) Trelease.
 Pine woods in front of the Upper Farm Place. Sandy, open woods near the lake, southside. Dry, sandy soil on road to Kilgore's Mill. Infrequent. This species is described as having glabrous leaves, but Hartsville specimens vary from strictly glabrous to densely pubescent. On the road to Kilgore's Mill the two extremes grow within a few feet of each other.

Aceraceae

- ACER CAROLINIANUM** WALT. Carolina Red Maple.
 Low woods and swamps. Abundant. Extremes of this seem distinct from *Acer rubrum*, but all intermediate forms may be found.

Rhamnaceae

- BERCHEMIA SCANDENS** (Hill) Trel. Supple-jack.
 Southwest edge of Kilgore's Pond. Snake Branch crossing near the paper mill.
- CEANOTHUS AMERICANUS** L. New Jersey Tea. Red Root.
 Sandy loam near Laurel Land. Common in woods.

Vitaceae

- PSEDERA QUINQUEFOLIA** (L.) Greene.
 (Parthenocissus. Ampelopsis.) Virginia Creeper.
 Common in bays and swamps.
- VITIS AESTIVALIS** MICHX. Summer Grape.
 Pine woods in front of the Upper Farm Place. Common.
- VITIS ROTUNDIFOLIA** MICHX. Bullace.
 A very common vine in woods and clearings.

Malvaceae**SIDA RHOMBIFOLIA L.**

Iron-weed.

A common weed in open ground.

Ternstroemiaceae**STEWARTIA MALACHODENDRON L.**

About two miles north of Segar's Mill, May, 1910. Collected and brought in by Mr. John E. Johnson. This is the only station known for this beautiful shrub in this section.

GORDONIA LASIANTHUS L.

Loblolly Bay.

A beautiful and fairly common tree of alluvial bays.

Hypericaceae**ASCYRUM STANS MICHX.**

St. Peter's-wort.

Wet meadow in Burnt Bay. Common. Sometimes reaches a height of 5 or 6 feet.

ASCYRUM HYPERICOIDES L.

St. John's-wort.

Burnt Bay. Wet woods southside of the lake. Flats east of Kilgore's Pond. Common.

HYPERICUM VIRGATUM LAM.

Plantation Savanna. Wet meadow east of Kilgore's Pond.

HYPERICUM MUTILUM L.

Wet meadow in Burnt Bay. Margin of Snake Branch.

HYPERICUM SETOSUM L.

Wet meadow in Burnt Bay. On floating log in the lake.

HYPERICUM FASCICULATUM LAM.

Wet places across from the paper mill. Damp woods east of causeway by the paper mill. Infrequent.

HYPERICUM GENTIANOIDES (L.) BSP.

Pineweed.

Sandy old fields across the lake. Frequent in poor, sandy throwout fields.

HYPERICUM VIRGINICUM L.

On margin of the lake. Plentiful in wet places.

HYPERICUM PETIOLATUM WALT.

Margin of Snake Branch. Frequent in swamps.

Cistaceae

HELIANTHEMUM MAJUS BSP.

Transition between marsh and sand hills on east side of Kilgore's Pond. Pine woods in front of the Upper Farm Place.

HELIANTHEMUM CANADENSE (L.?) Michx.

Near Kilgore's Branch in the sand hills. Sandy woods in front of Damascus church. Rare.

LECHEA VILLOSA ELL.

Pinweed.

Pine woods in front of the Upper Farm Place. Pine woods west of Snake Branch. Sand hills across the lake. Common.

LECHEA RACEMULOSA LAM.

Pine woods in front of the Upper Farm Place.

LECHEA TORREYI LEGGETT.

Flatwoods.

Violaceae

VIOLA PEDATA L.

Pansy Violet.

Sandy woods across Black Creek near Nettle's Bridge, April 27, 1912. This violet is exactly like the one following except that the two upper petals are a deep purple color in sharp contrast to the three others which are lilac or blue. It is rare with us and occurs scattered among the all-lilac variety, of which it is doubtless a recurring sport.

VIOLA PEDATA L. VAR. *LINEARILOBA* DC.

Bird-foot Violet.

Bluffs of Black Creek at Laurel Land. Sandy margin of the lake. Sandy woods near Nettle's Bridge. This is the common large violet of the sand hills with all the petals lilac-purple, or lighter colored.

VIOLA SEPTEMLOBA LeCONTE?

Flatwoods south of Hartsville Plantation.

VIOLA VILLOSA WALT.

Banks of Black Creek above Captain Cannon's Place.

VIOLA EMARGINATA LeCONTE.

Flat woods south of Hartsville Plantation. Burnt Bay. South side of Black Creek.

VIOLA EMARGINATA x *TRILOBA*?

South side of the lake near Burnt Bay.

VIOLA EMARGINATA LeConte (Near).
South side of the lake.

VIOLA PRIMULIFOLIA L. White Violet.
Flat woods south of Hartsville Plantation. Captain Cannon's sheep pasture.

VIOLA PRIMULIFOLIA—Pubescent form.
Bluffs of Black Creek. Laurel Land. Flat woods south of Hartsville Plantation. Low woods north of Nettle's Bridge. This form is more common than the smooth one with us, many are densely hairy all over.

VIOLA LANCEOLATA L. White Violet.
Low wet meadow east of Kilgore's Pond. Edge of Black Creek, Laurel Land. Swampy ground at Tory Cave. In ditch near Segar's Mill.

VIOLA PAPILIONACEA Pursh.
South side of the lake near Burnt Bay.

VIOLA TRILOBA Schwein.
South side of the lake.

VIOLA TRILOBA Schwein. (Near: *leaves cleft and hirsute*).
South side of the lake near Burnt Bay.

Passifloraceae

PASSIFLORA INCARNATA L. Maypop.
Sandy banks of Black Creek. A common vine in waste places.

PASSIFLORA LUTEA L.
A delicate little vine with very small purplish fruit. It was seen once by a roadside several miles east of Hartsville.

Cactaceae

OPUNTIA VULGARIS Mill. Prickly Pear.
Frequent in dry sandy soil.

Lythaceae

ROOTALA RAMOSIOR (L.) Koehne.
Edges of the lake.

DECODON VERTICILLATUS (L.) Ell. Swamp Loosestrife.
Edge of the lake behind Captain Cannon's Place. Rare.

Melastomaceae

- RHEXIA VIRGINICA L.** Meadow Beauty.
Wet meadow in Burnt Bay. Frequent.
- RHEXIA ARISTOSA BRITTON.** Meadow Beauty.
Plantation Savanna. Confined to Savannas.
- RHEXIA MARIANA L.** Meadow Beauty.
Wet meadow in Burnt Bay. Damp flats across from the paper mill. Sheep Pasture Savanna. Frequent.
- RHEXIA CILIOSA MICHX.**
Sheep Pasture Savanna. Damp flats across from the paper mill. Frequent in savannas.
- RHEXIA GLABELLA MICHX.**
Sheep Pasture Savanna. Infrequent.
- RHEXIA LANCEOLATA WALT.** White Meadow Beauty.
Along bay near Sheep Pasture Savanna. Damp soil near the lake. Meadow in Burnt Bay. Frequent.

Onagraceae

- JUSSIAEA DECURRENS (Walt.) DC.** Primrose Willow.
Along Prestwood's Bridge causeway.
- LUDWIGIA ALTERNIFOLIA L.**
Along causeway at crossing by the paper mill.
- LUDWIGIA HIRTELLA RAF.**
Damp flats north of the paper mill dam. Plantation Savanna.
- LUDWIGIA LINEARIS WALT.**
Wet soil south of the lake. Burnt Bay.
- LUDWIGIA PALUSTRIS (L.) Ell.**
In quiet, shallow water, as ditches and bays. Drain in Burnt Bay.
- LUDWIGIA SUFFRUTICOSA WALT.**
Plantation Savanna.
- OENOTRERA BIENNIS L.** Common Evening Primrose.
Roadside near the novelty mill. Rare.
- OENOTHERA LICINIATA HILL.**
A common weed in yards and old fields.

- OENOTHERA LONGIPEDICELLATA* (Small) Robinson.
Damp place in woods across the lake. Low flats near Burnt Bay. Frequent.
- OENOTHERA SPECIOSA* NUTT. White Evening Primrose.
Along road in front of Captain Cannon's Place.
- OENOTHERA ARENICOLA*.
Damp sandy soil near Kilgore's Mill.

Halaragidaceae

- MYRIOPHYLLUM HETEROPHYLLUM* MICHX. Water Milfoil.
Abundant in the lake.
- PROSERPINACA PECTINATA* LAM. Mermaid-weed.
Edge of the lake above Prestwood's Bridge. In ditch at Segar's Mill. Frequent.

Umbelliferae

- ERYNGIUM AQUATICUM* L. Rattlesnake Master.
Damp woods east of causeway at crossing by the paper mill.
Sand hills across the lake.
- SANICULA CANADENSIS* L. Black Snakeroot.
Southside of the lake. Flat woods near Burnt Bay.
- CENTELLA ASIATICA* (L.) Urban. Water Pennywort.
Wet marsh by Kilgore's Pond.
- CHAEROPHYLLUM TAINTURIERI* HOOK.
Burnt Bay. A weed in open places.
- PTILIMNIUM CAPILLACEUM* (Michx.) Raf.
Roadside near the lake. Burnt Bay. Ditch bank west of Upper Farm. Frequent.
- ZIZIA CORDATA* (Walt.) DC.
In low woods at Tory Cave, three miles west of Hartsville.
Southside of the lake.
- OXYPOLIS RIGIDIOR* (L.) Coult. & Rose. Cow Bane.
Snake Branch swamp. Edge of Kilgore's Pond.
- OXYPOLIS FILIFORMIS* (Walt.) Britton.
Plantation Savanna.

Cornaceae

- CORNUS FLORIDA L.** Dogwood.
Common in woods and preferring the lower places.
- NYSSA BIFLORA WALT.** Black Gum.
Common in swamps and bays.

Ericaceae*

- CLETHRA ALNIFOLIA L.** Sweet Pepperbush.
Burnt Bay. Edge of Black Creek swamp. Very common in the damper flatwoods and on edges of bays.
- CHIMAPHILA MACULATA (L.) Pursh.** Pipsissewa.
Along Black Creek, southside, above Captain Cannon's Place. Pine grove in front of the Upper Farm Place. In rich, shady woods.
- MONOTROPA UNIFLORA L.** Indian Pipe.
Black Creek bluffs one mile above Hartsville. Not rare.
- AZALEA VISCOSA L.** Swamp Azalea.
Edges of bay across the lake. Edge of Black Creek Swamp. Common.
- AZALEA NUDIFLORA L.** Wild "Honeysuckle." Pinxter Flower.
Common in flatwoods and on the edges of bays and branches.
- ZENOBIA PULVERULENTA (Willd.) Pollard.**
Edge of bay across the lake. Causeway of Prestwood's Bridge. Damp, sandy barrens and bays.
- ZENOBIA CASSINIFOLIA (Vent.) Pollard.**
Bay across the lake. Prestwood's Bridge causeway. Damp, sandy barrens and bays. Not so common as *Z. pulverulenta*.
- KALMIA CUNEATA MICHX.**
Edge of bay on west side of Sheep Pasture Savanna. One of our rarest and most interesting shrubs.
- KALMIA LATIFOLIA L.** Mountain Laurel.
Plentiful on the bluffs of Black Creek.

*The pretty little evergreen shrub with box-like leaves and white flowers called sand myrtle. (*Leiophyllum buxifolium* (Berg.) Ell.) does not quite reach our territory. The farthest inland that I know of it is on the sandy bluffs of Black Creek at Springville, about sixteen miles below Hartsville.

LEUCOTHOE RACEMOSA (L.) Gray.

Edge of bay in Sheep Pasture Savanna. Prestwood's Bridge causeway. Frequent on edges of bays.

LEUCOTHOE AXILLARIS (Lam.) D. Don.

Edge of bay in Sheep Pasture Savanna. On Prestwood's Bridge causeway. Edge of swamp at the north end of the paper mill dam. One of our rarest shrubs. Careful comparison leads me to think that *L. platyphylla* Small is not distinct from this species.

LYONIA LIGUSTRINA VAR. *FOLIOSIFLORA* (Michx.) Fernald.

Male Berry.

Burnt Bay. Causeway of Prestwood's Bridge. Common on edges of bays.

LYONIA NITIDA (Bartr.) Fernald.

Fetter-bush.

Burnt Bay. Common in swamps and bays. It not infrequently reaches a height of ten feet which is considerably more than is acknowledged by the manuals.

LYONIA MARIANA (L.) D. Don.

Stagger-bush.

Damp, sandy soil in Sheep Pasture Savanna. Edge of Burnt Bay. Common in moderately damp soil.

OXYDENDRUM ARBOREUM (L.) DC.

Sourwood.

In rich, well-drained woods, as bluffs of Black Creek.

EPIGAEA REPENS L.

Trailing Arbutus.

In shady, sandy woods. Frequent.

GAYLUSSACIA DUMOSA (Andr.) T. & G.

Dwarf Black Huckleberry. Woolly John.

Damp, sandy margin of the lake. Dryer parts of Sheep Pasture Savanna. Flat woods back of Hartsville Plantation. Common both in sandy flats and in dry, sandy woods.

GAYLUSSACIA FRONDOSA (L.) T. & G.

Low-bush Huckleberry.

Wet margin of the lake. Near south edge of Burnt Bay. Common about swamps, flats and bays.

VACCINIUM ARBOREUM MARSH.

Sparkleberry.

Black Creek bluffs, one mile above Hartsville. Kilgore's Mill. Common.

VACCINIUM TENELLUM AIT.

Low Black Huckleberry.

Burnt Bay. Edge of Sheep Pasture Savanna. Abundant.

- VACCINIUM VACILLANS** KALM. Low Blueberry.
Along southside of the lake, one hundred yards above Prest-wood's Bridge. Frequent.
- VACCINIUM FUSCATUM** AIT. Black High-bush Huckleberry.
Flat woods on Lydia Road. Margin of Burnt Bay. This species seems to have been overlooked by our South Carolina botanists. It may easily be distinguished from the following species by the pubescent twigs and leaves, the much smaller flowers and the shiny-black, smaller berries that ripen earlier.
- VACCINIUM CORYMBOSUM** L. Blue High-bush Huckleberry.
Common in flats and bays. The berries of this species are larger than that of *V. fuscatum* and ripen about ten days later.
- VACCINIUM CRASSIFOLIUM** ANDR. Trailing Huckleberry.
Southside of Black Creek below the paper mill. Sugarloaf Mountain. Back of the old Norwood Place. A rare and interesting shrub, with thick, box-like, evergreen leaves and procumbent branches that trail like vines.

Diapensiaceae

- GALAX APHYLLA** L. Coltsfoot.
Bluffs of Black Creek, one mile above Hartsville, and at Laurel Land. Rare.
- PYXIDANTHERA BARBULATA** MICHX. Flowering Moss.
Sand hills several miles above Hartsville, on Camden Road. New to South Carolina. Local.

Primulaceae

- LYSIMACHIA TERRESTRIS** (L.) BSP. Loosestrife.
Wet margin of the lake. Water's edge across from the paper mill.

Ebenaceae

- DIOSPYROS VIRGINIANA** L. Persimmon.
Common in woods and fields.

Styracaceae

- STYRAX AMERICANA** LAM. Storax.
Snake Branch swamp at railroad crossing. Margin of Kilgore's Branch. Outer edges of branch and creek swamps.

STYRAX GRANDIFOLIA AIT.

This beautiful shrub was found only once, in open, well-drained woods on the north side of the Society Hill road about one-half mile beyond Snake Branch. It was in full bloom on April 27, 1912.

SYMPLOCOS TINCTORIA (L.) L'Her. Horse Sugar.
Bluffs of Black Creek. Common in flat woods, near bay edges, etc.

Oleaceae

FRAXINUS DARLINGTONII BRITTON? Ash.
On ditch bank separating the Upper Farm and Norwood Places. Only one specimen found.

Loganiaceae

GELSEMIUM SEMPERVIRENS (L.) Ait. Yellow Jessamine.
Abundant in damp woods.

CYNOCTONUM SESSILIFOLIUM (Walt.) J. F. Gmel.
Flats across from the paper mill.

POLYPREMUM PROCUMBENS L.
Wet meadow in Burnt Bay. Dry field side near Burnt Bay.

Gentianaceae

SABATIA LANCEOLATA (Walt.) T. & G.
Plantation Savanna. Black Creek swamp at the paper mill. A tall, attractive plant of open swamps.

SABATIA BRACHIATA ELL. Marsh Pink.
Damp place southside of the lake. Dry sand hills near Crowley's Spring. This plant is remarkable as affecting both damp margins and the driest sand hills.

SABATIA GRACILIS (Michx.) Salisb.
Wet pine barrens near Plantation Savanna.

GENTIANA ELLIOTTII CHAPM. Elliott's Gentian.
Crowley's Branch Crossing. Flat woods south of town. Wet places by bays and streams. Frequent. A white variety was discovered by Mr. Rogers near Society Hill.

GENTIANA PORPHYRIO J. F. GMEL.
Flat woods south of Hartsville. Flat woods and branch crossings. Infrequent.

BARTONIA LANCEOLATA SMALL.

Damp places near the lake on southside of Sheep Pasture Savanna. Frequent in damp, open places.

NYMPHOIDES AQUATICUM (Walt.) Fernald.

Formerly abundant in the lake, but now scarce there.

NYMPHOIDES LACUNOSUM (Vent.) Fernald.

Abundant in Kilgore's Pond, and becoming common in the lake.

Apocynaceae**AMSONIA CILIATA WALT.**

Near the lake, southside. Sand hills beyond Kilgore's Mill. A white flowered form of this was also collected here. Not infrequent in the sand hills.

APOCYNUM PUBESCENS R. BR.

Indian Hemp.

Along railroad to the paper mill. Earth dam across from the paper mill. This has recently been recognized as the form occurring throughout the Southeastern States. It seems to be the only species at Hartsville.

Asclepiadaceae**ASCLEPIAS TUBEROSA L.**

Butterfly-weed.

Sandy pine woods along Black Creek.

ASCLEPIAS AMPLEXICAULIS SM.

Old field across from the paper mill.

ASCLEPIAS HUMISTRATA WALT.

Milkweed.

Dry sandy soil. Sand hills.

ASCLEPIAS ACERATOIDES M. A. CURTIS.

Sandy hills on northside of the lake.

ASCLEPIAS VARIEGATA L.

Low woods southside of the lake near Burnt Bay.

Convolvulaceae**BREWERIA AQUATICA (Walt.) Gray.**

Plantation Savanna.

BREWERIA TRICHOSANTHES (Michx.) Small.

Sand hills across the lake. Frequent in the sand hills.

IPOMOEA PURPUREA (L.) Roth. Morning Glory.
A common weed in gardens.

IPOMOEA PANDURATA (L.) G. F. W. Mey. Wild Potato.
Roadsides and open places. Flowers very much larger than the
the more northern form.

IPOMOEA LACUNOSA L.
Paper mill yard. Frequent in fertile waste places.

CUSCUTA COMPACTA JUSS. Love Vine. Dodder
Crowley's Branch crossing. Common on *Alnus*, *Cyrilla* and
other shrubs in damp places.

CUSCUTA ARVENSIS BEYRICH. Love Vine. Dodder.
On *Aster* in Sheep Pasture Savanna. Common on various
herbs in flats.

Polemoniaceae

PHLOX HENTZII NUTT. Wild Phlox.
Sand hills four miles north of Hartsville in rather stiff soil.
Occasional in sand hills.

PHLOX SUBULATA L.
Sand hills near Sheep Pasture Savanna. Frequent.

Boraginaceae

ONOSMODIUM VIRGINIANUM (L.) A. DC. False Gromwell.
Near edge of the lake, southside. Dry pine woods across the
lake from the paper mill. Sand hills across Prestwood's Bridge.
Dry, sandy soil near Kilgore's Pond. Frequent in sand hills.

Verbenaceae

VERBENA CAROLINENSIS (Walt.) J. F. Gmel.
Sand hills. Sandy soil at the old Bacot Place.

VERBENA POLYSTACHYA H. B. K.
Wet soil near Kilgore's Mill.

VERBENA OFFICINALIS L. European Verbena.
Sandy, open woods behind Mr. Lide Law's Place. Introduced.
Rare.

CALLICARPA AMERICANA L.
Along ditch banks, etc. Frequent.

Labiatae

- TRICHOSTEMA DICHOTOMUM L.** Blue Curls.
A weed in old fields and waste places.
- SCUTELLARIA INTEGRIFOLIA L.** Skullcap.
Open, wet meadow, Kilgore's Pond. Damp woods on Black Creek. Common.
- SCUTELLARIA PILOSA MICHX.**
Moist, shady woods along Black Creek. Along road near the novelty mill. A pure white form of this species was collected near the novelty mill on June 14, 1911.
- PRUNELLA VULGARIS L.** Heal-all.
Woods and open places. Common.
- LAMIUM AMPLEXICAULE L.** Dead Nettle.
A very common winter and early spring weed.
- STACHYS HYSSOPIFOLIA MICHX.**
Plantation Savanna.
- SALVIA AZUREA LAM.** Blue Sage.
Roadside leading from the paper mill to town. Damp soil near Crowley's Branch. Flat woods south of the lake. Frequent. Plants growing in the dryer woods have larger and lighter colored flowers than those in low places.
- SALVIA LYRATA L.** Lyre-leaved Sage.
A weed in open places.
- CLINOPODIUM CAROLINIANUM (Michx.) Heller.** Calamint.
Woods in front of the Upper Farm Place. Plentiful locally.
- PYCNANTHEMUM HYSSOPIFOLIUM (Benth.) Gray.** Mountain Mint.
Damp soil near edge of the lake, southside. Not infrequent in damp woods.
- LYCOPUS SESSILIFOLIUS A. Gray.**
Wet meadow in Burnt Bay. Frequent.
- LYCOPUS PUBENS BRITTON.**
Wet places on southside of the lake. Common. New to South Carolina.

Solanaceae

- SOLANUM NIGRUM L.** Nightshade.
Snake Branch swamp. An occasional weed in fertile waste places.
- SOLANUM CAROLINENSE L.** Horse Nettle.
A common weed.
- DATURA STRAMONIUM L.** Jimson Weed.
A common weed.
- DATURA TATULA L.** Purple Jimson Weed.
A common weed.
- PHYSALIS INTERMEDIA RYDB.** Ground Cherry.
Near the lake on Capt. Cannon's Place. Infrequent.
- PHYSALIS VIRGINIANA MILL.**
Near the lake on the south side. Damp soil on the Society Hill road, near the Goodson Place. Infrequent.
- PHYSALIS NICTAGINEA DUVAL.**
Edge of railroad track through Burnt Bay. Infrequent.

Scrophulariaceae

- VERBASCUM BLATTARIA L.** Moth Mullen.
Sandy soil near Prestwood's Bridge. Open woods near the Law Place. Occasional. The flowers are white on some plants, yellow on others.
- VERBASCUM THAPSUS L.** Mullen.
A weed in old fields, etc.
- LINARIA CANADENSIS (L.) Dumont.** Toadflax.
An abundant weed in uncultivated fields and waste places.
- PENTSEMON AUSTRALIS SMALL.**
Burnt Bay near the paper mill.
- PENTSEMON LAEVIGATUS AIT.**
Sand hills across Black Creek. Earth dam at the paper mill.
- BACOPA ACUMINATA (Walt.) Robinson.** (*Herpestis nigrescens* Benth.).
Wet woods near Burnt Bay. Damp meadow east of Kilgore's Pond.

GRATIOLA SPHAEROCARPA ELL.

Edge of the lake behind Captain Cannon's Place. In mud and shallow water in ditches, etc.

GRATIOLA VIRGINIANA L.

Wet places.

GRATIOLA PILOSA MICHX.

Wet meadow, Burnt Bay. Damp flats across from the paper mill.

VERONICA ARVENSIS L.

Corn Speedwell.

Major Coker's lawn and on the streets. Not rare. Flowers blue.

VERONICA PEREGRINA L.

Purslain Speedwell.

An insignificant little weed in damp or rather dry soil. Edge of Burnt Bay. Side of street. Flowers white.

SEYMERIA TERMIFOLIA PURSH.

Flat woods southwest of the old Lucas Place. In bloom Sept. 7, 1911. Rare.

GERARDIA SETACEA WALT.

Waste places and along roads. Presbyterian Churchyard.

GERARDIA LINIFOLIA NUTT.

Plantation Savanna.

GERARDIA PURPUREA L.

Purple Gerardia.

Flats across from the paper mill. Common in low woods and damp flats.

BUCHNERA ELONGATA SW.

Flats across from the paper mill. Damp woods by causeway at crossing by the paper mill.

DASYSTOMA FLAVA (L.) WOOD.

False Foxglove.

Banks of the lake. Plantation Savanna.

DASYSTOMA PEDICULARIA (L.) BENTH.?^{*}

Fly Poison.

Woods in front of the Upper Farm Place. This is one of the commonest plants of the sand hills.

^{*}Our plant has characters of both *D. pedicularia* and *D. pectinata* as described. The pedicels are at least twice as long as the calyx lobes and these are generally nearly twice as long as the calyx tube. The capsule is about 8 mm. long and the entire plant including the calyx lobes is densely hirsute pubescent.

Lentibulariaceae

- UTRICULARIA BIFLORA* LAM. Bladderwort.
In the lake. Pool beyond the paper mill dam.
- UTRICULARIA FIBROSA* WALT.
Pool across from the paper mill. In Segar's Mill Pond.
- UTRICULARIA JUNCEA* VAHL.
Wet edge of the lake, southside, above Prestwood's Bridge.
Edge of Kilgore's Pond.

Bignoniaceae

- TECOMA RADICANS* (L.) JUSS Cowitch. Trumpet-vine.
Common along ditches and fences and in waste places.
- CATALPA BIGNONIOIDES* WALT. Catalpa.
In open and well-drained low places. Infrequent.
- BIGNONIA CAPREOLATA* L. Cross-vine.
A common vine in swamps and bays.

Acanthaceae

- RUELLIA CILIOSA* VAR. *PARVIFLORA* (NESS.) BRITTON.
Sandy soil in open woods. Infrequent.

Plantaginaceae

- PLANTAGO MAJOR* L. Common Plantain.
West side of the paper mill yard. This weed has been introduced into Hartsville only very recently. It may be found now, infrequently, in rich, open places.
- PLANTAGO HETERAPHYLLA* NUTT.
In a rather low place on a sidewalk in town.
- PLANTAGO ARISTATA* MICHX.
Rather frequent in dry, waste places. Roadside on the way to the paper mill. A weed of recent introduction.
- PLANTAGO VIRGINICA* L.
Along roadside in front of Captain Cannon's Place. On southside of the lake. A weed in open, sandy soil.
- PLANTAGO LANCEOLATA* L. English Plantain.
A bad weed in lawns.

Rubiaceae

- GALIUM PILOSUM** AIT. Bedstraw.
Edge of Sheep Pasture Savanna. Rather frequent in dry or moist sandy woods. Our plants are not so hairy as the type or so smooth as *var. puniculosum*.
- GALIUM CLAYTONI** MICHX.
In mud and water at brook crossing east of Damascus Church.
- DIODIA VIRGINIANA** L.
Damp soil on southside of the lake. Frequent in savannas and open, wet places.
- DIODIA TERES** WALT. Buttonweed.
A common weed in dry, open ground.
- MITCHELLA REPENS** L. Partridge Berry.
On Black Creek bluffs, as at Laurel Land. Bay at back of Hartsville Plantation.
- CEPHALANTHUS OCCIDENTALIS** L. Buttonbush.
Common on edges of marshes.
- HOUSTONIA PATENS** ELL. Small Bluets.
Captain Cannon's sheep pasture. Frequent in flat woods and low waste grounds.
- HOUSTONIA CAERULEA** L. Bluets.
Near southside of the lake. In woods and yards.
- HOUSTONIA LONGIFOLIA** GAERTN.
Rich woods back of Captain Cannon's Place. Rare.
- OLDENLANDIA UNIFLORA** L.
Flats across the dam at the paper mill. Frequent in damp, open flats.
- OLDENLANDIA BOSCHII** (DC.) Chapm.
Wet marsh east of Kilgore's Pond. Common in savannas.

Caprifoliaceae

- LONICERA JAPONICA** THUNB. Japanese Honeysuckle.
Along road to Prestwood's Bridge. Escaped along roads and ditches.
- LONICERA SEMPERVIRENS** L. Trumpet Honeysuckle.
Ditch bank west of Upper Farm. Along ditches and open places. Infrequent.

SYMPHORICARPOS ORBICULATUS MOENCH. Indian Currant.
Sand hills along Camden Road, five miles north of Hartsville.
Rare.

VIBURNUM CASSINOIDES L. Narrow-leaved Possum Haw.
Edge of bay in Sheep Pasture Savanna. Edge of Kilgore's
Pond. Along Burnt Bay. Common.

VIBURNUM NUDUM L. Possum Haw.
Edge of bay in Sheep Pasture Savanna. Common.

VIBURNUM RUFIDULUM RAF. Black Haw.
Woods near Black Creek back of Captain Cannon's Place.
Sandy slope near Crowley's Spring. Rare.

SAMBUCUS CANADENSIS L. Elder.
Common in open, wet places.

Campanulaceae

SPECULARIA PERFOLIATA (L.) A. DC. Venus' Looking-glass.
A common weed in cultivated ground.

Lobeliaceae

LOBELIA NUTTALLII R. & S.
Flats across from the paper mill. Wet meadow in Burnt Bay.
Common in damp flats.

LOBELIA ELONGATA SMALL.
Damp soil near Crowley's Branch.

Compositae

VERNONIA ANGUSTIFOLIA MICHX. Ironweed.
Pine woods in front of the Upper Farm Place. A conspicuous
and common plant of the sand hills.

VERNONIA OLIGOPHYLLA MICHX. Ironweed.
Woods behind Captain Cannon's Place.

ELEPHANTOPUS TOMENTOSUS L. Elephant's-foot.
Woods behind Captain Cannon's Place. Dry woods near Snake
Branch. Frequent.

ELEPHANTOPUS NUDATUS Gray.

Flats east of Kilgore's Pond. Damp soil at end of the paper mill dam. Common. This plant agrees well with *E. nudatus* except that the scale-like base of the pappus is not abruptly narrowed into the bristle.

ELEPHANTOPUS CAROLINIANUS WILLD.

Edge of Kilgore's Pond. Not uncommon in damp, shady soil.

SCLEROLEPIS UNIFLORA (Walt.) BSP.

Edge of the lake.

EUPATORIUM CAPILLIFOLIUM (Lam.) Small Dog Fennell.

A common weed in open ground. Near the novelty mill.

EUPATORIUM COMPOSITIFOLIUM WALT.

Sand hills. Sandy soil across the lake. Near Crowley's Branch.

EUPATORIUM AROMATICUM L.

Near the lake.

EUPATORIUM HYSSOPIFOLIUM L.

Pine woods by Snake Branch, opposite the cotton mill.

EUPATORIUM SEMISERRATUM DC.

Wet pine barrens near Plantation Savanna.

EUPATORIUM MOHRII GREENE.

Plantation Savanna.

EUPATORIUM VERBENAEFOLIUM MICHX.

Southside of the lake. Sheep Pasture Savanna.

EUPATORIUM ROTUNDIFOLIUM L.

Damp, rich soil on southside of the lake. Edge of Kilgore's Pond. Damp flat across dam at the paper mill. Common.

EUPATORIUM MACULATUM L.

Joe-pye Weed.

Marshy place by Kilgore's Pond.

EUPATORIUM PURPUREUM L.

Joe-pye Weed.

Damp soil near the lake.

EUPATORIUM PERFOLIATUM L.

Boneset.

Near the railroad embankment in Burnt Bay. Infrequent.

MIKANIA SCANDENS (L.) Willd.

A very common vine in open, wet places.

TRILISA PANICULATA (Walt.) Cass.

Sheep Pasture Savanna. A wand-like plant with something of the appearance of *Liatris*. Blooming August 19, 1910.

LIATRIS CARINATA (*Laciniaria carinata* Small).

Sandy soil south of the lake.

LIATRIS PAUCIFLORA (Pursh.) Kuntze.

Button Snake-root.

Sand hills across the lake. Common.

LIATRIS SCARIOSA WILLD. Var. *squarrulosa* (Michx.) Gray.

Near the railroad track to the paper mill.

CARPHEPHORUS BELLIDIFOLIUS (Michx.) T. & G.

Damp soil on northside of the lake.

CHRYSOPSIS GRAMINIFOLIA (Michx.) Nutt.

Pine woods in front of the Upper Farm Place. Flats across dam at the paper mill.

CHRYSOPSIS ASPERA SHUTTL.

Sand hills across the lake.

CHRYSOPSIS MARIANA (L.) Nutt.

Near the lake. Sand hills.

CHRYSOPSIS PILOSA NUTT.

Golden Aster.

Common in the sand hills.

SOLIDAGO ERECTA PURSH.

Goldenrod.

Near Black Creek, one mile above Hartsville.

SOLIDAGO VERNA M. A. CURTIS.

Spring Goldenrod.

Paper mill dam. Captain Cannon's sheep pasture. Plentiful.

Reported heretofore only from Southeastern North Carolina.

SOLIDAGO PULVERULENTA NUTT.

Near the lake. Behind the novelty mill.

SOLIDAGO ODORA AIT.

Pine woods in front of the Upper Farm Place. Roadside near the paper mill.

SOLIDAGO RUGOSA MILL.

Behind the novelty mill. Southside of the lake.

SOLIDAGO ELLIOTTII T. & G.

Damp place behind the novelty mill.

SOLIDAGO CANADENSIS L.

Damp place behind the novelty mill.

SOLIDAGO TENUIFOLIA PURSH.

Near the lake.

BOLTONIA ASTEROIDES (L.) L'Her.

Plantation Savanna.

ASTER PRICEAE BRITTON.

Aster.

Near the lake.

ASTER PALUDOSUS AIT.

Damp soil near Crowley's Branch. Near edge of the lake.

ASTER CONCOLOR L.

Southside of the lake, damp soil. Pine woods in front of the Upper Farm Place. Sand Hills.

ASTER ELODES T. & G.

On earth dam at the paper mill. Burnt Bay at Novelty Mill crossing. Wet soil on north edge of the lake. A handsome late fall aster.

ASTER PATENS AIT.

Near the novelty mill.

ASTER CORDIFOLIUS L.

Damp meadow eastside of Kilgore's Pond. Flats across from dam at the paper mill.

ASTER UNDULATUS L.

Near the lake.

ASTER ERICOIDES PILOSUS PORTER.

South side of the lake.

ASTER DUMOSUS L.

Flats across from the paper mill.

ASTER LINARIIFOLIUS L.

Near the lake. Sand hills.

ERIGERON VERNUS (L.) T. & G.

Swamp Fleabane.

Low, open woods near the lake. Black Creek Swamp. Ditch bank on the old Lucas Place, etc., Common. The sand hill form of this plant collected at the head of a branch at foot of Sugar-loaf Mountain and in a low place north of Nettle's Bridge has pubescent leaves and stems and may deserve varietal rank.

- ERIGERON PULCHELLUS MICHX. Fleabane.
Flat woods.
- ERIGERON RAMOSUS (Walt.) BSP. Fleabane.
Along road near the paper mill. On dam across from the
paper mill.
- ERIGERON CANADENSIS L. Horseweed.
A very common, coarse weed.
- SERICOCARPUS BIFOLIATUS (Walt.) Porter.
Pine woods in front of the Upper Farm Place. Near the lake.
- SERICOCARPUS ASTEROIDES (L.) BSP.
Dampish place in Sheep Pasture Savanna.
- BACCHARIS HALIMIFOLIA L.
Damp flatwoods near Plantation Savanna. Occasional in
open, wet places.
- PLUCHEA PETIOLATA CASS.
Burnt Bay on road from Hartsville to Prestwood's Bridge.
- PLUCHEA FOETIDA (L.) DC. Marsh Fleabane.
Plantation Savanna. Damp flats near Kilgore's Mill.
- ANTENNARIA PLANTAGINIFOLIA (L.) Richards. Plantain-leaved
[Everlasting.
Flat woods south of Hartsville. Rare in the coastal plain.
- GNAPHALIUM POLYCEPHALUM MICHX. Rabbit Tobacco.
A very common weed in old fields, etc.
- GNAPHALIUM PURPUREUM L. Cudweed.
Low flats across from dam at the paper mill. Common in dry
old fields and roadsides.
- SILPHIUM COMPOSITUM MICHX. Rosin Weed.
Sand hills across the lake.
- BERLANDIERA PUMILA (Michx.) Nutt.
Sand hills across the lake.
- AMBROSIA ARTEMISIIFOLIA L. Ragweed.
A very common, rank weed.
- XANTHIUM CANADENSE MILL. Cocklebur.
A bad weed in low grounds.

- ECLIPTA ALBA* (L.) Hassk.
Roadside west of the paper mill.
- TETRAGONOTHECA HELIANTHOIDES* L.
Sandy soil near the Baptist Church.
- RUDBECKIA HIRTA* L. Black-eyed Susan.
Damp soil near the lake.
- HELIANTHUS ATRORUBENS* L.
Woods.
- HELIANTHUS ANGUSTIFOLIUS* L. Wild Sunflower.
Near the lake.
- COREOPSIS DELPHINIFOLIA* LAM. Tickseed.
Sand hills across the lake. Very common and conspicuous in
the sand hills.
- BIDENS BIPINNATA* L. Spanish Needles.
A common weed.
- BIDENS FRONDOSA* L. Tall Spanish Needles.
A weed in damp ground.
- MARSHALLIA OBOVATA* (Walt.) Beadle & Boynton.
Sheep Pasture Savanna. By road to Prestwood's Bridge.
- HELENIUM TENUIFOLIUM* NUTT. Sneezeweed.
A recently introduced weed along railways and roads.
- ACHILLEA MILLEFOLIUM* L. Yarrow.
At Segar's Mill. A weed in waste places.
- CHRYSANTHEMUM LEUCANTHEMUM* L. VAR. *PINNATIFIDUM* LECOQ
& LAMOTTE. Ox-eye Daisy.
A weed in wet places; not abundant.
- ARNICA ACAULIS* (Walt.) BSP.
Flat woods south of Hartsville. Very common.
- ERECTITES HIERACIFOLIA* (L.) Raf. Fireweed.
On excavated ground by road to the paper mill. Damp place
behind the novelty mill.
- SENECIO AUREUS* L. Golden Ragwort.
Roadside near the old Lucas Place. A well distributed but
not abundant weed.

SENECIO SMALLII BRITTON.

Captain Cannon's sheep pasture. Near the lake.

CARDUUS REPANDUS (Michx.) Pers.

Thistle.

Sand hills across the lake.

KRIGIA VIRGINICA (L.) Willd.

Dwarf Dandelion.

Sand hills across the lake. A weed in yards and along roads.

TARAXACUM OFFICINALE WEBER.

Dandelion.

Lawns and roadsides. Not common.

SONCHUS ASPER (L.) Hill.

Spiny-leaved Sow Thistle.

Woods near the lake.

LACTUCA VIROSA L.

A number of plants appear yearly in the open ground around the railroad stations. This is the form with almost entire leaves. The form with runcinate pinnatifid leaves, as I have observed, occurs abundantly at Charlotte, N. C., and at Bull's Gap, Tenn., mixed with the other. The pinnatifid leaved form is generally considered a distinct species under the name of *L. Scariola*, but in my opinion they are not distinct.

LACTUCA GRAMINIFOLIA MICHX.

Along a ditch bank across the lake from the paper mill. Flat woods near Burnt Bay.

LACTUCA SAGITTIFOLIA ELL.

Wild Lettuce.

Roadside to the paper mill. A rather common weed.

PYRRHOPAPPUS CAROLINIANUS (Walt.) DC.

False Dandelion.

A weed along roads and in open woods.

THYRSANTHEMA SEMIFLOSCULARE (Walt.) Kuntze.

Flat woods on the old Lucas Place, and back of Hartsville Plantation. Infrequent.

PRENANTHES ALBA L. (Nabalus).

Rattlesnake Root.

Moist soil, southside of the lake.

PRENANTHES VIRGATA MICHX. (Nabalus)

Slender Rattlesnake-

[root.

Near the novelty mill.

HIERACIUM GRONOVII L.

Dampish soil near Kilgore's Pond. Sand hills.

HIERACIUM VENOSUM L. Rattlesnake Plantain.
Pine grove in front of the Upper Farm Place.

CONOCLINUM COELESTINUM (L.) DC.
Southside of the lake.

The plants included in the preceding list may be summarized as follows:

Ferns and Lycopods..	12
Gymnosperms..	7
Monocotyledons..	127
Dicotyledons..	482
	<hr/>
Total..	628

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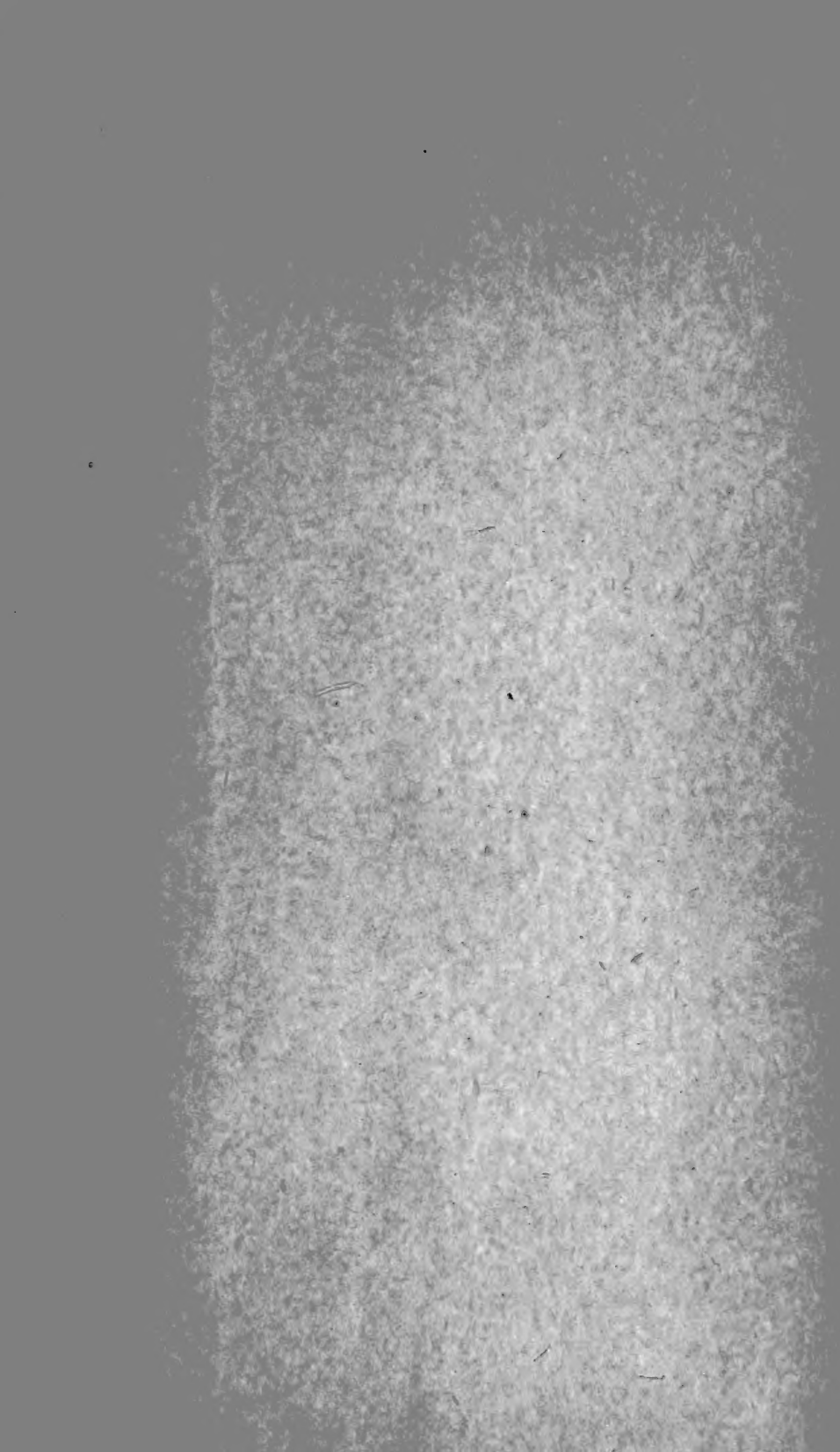
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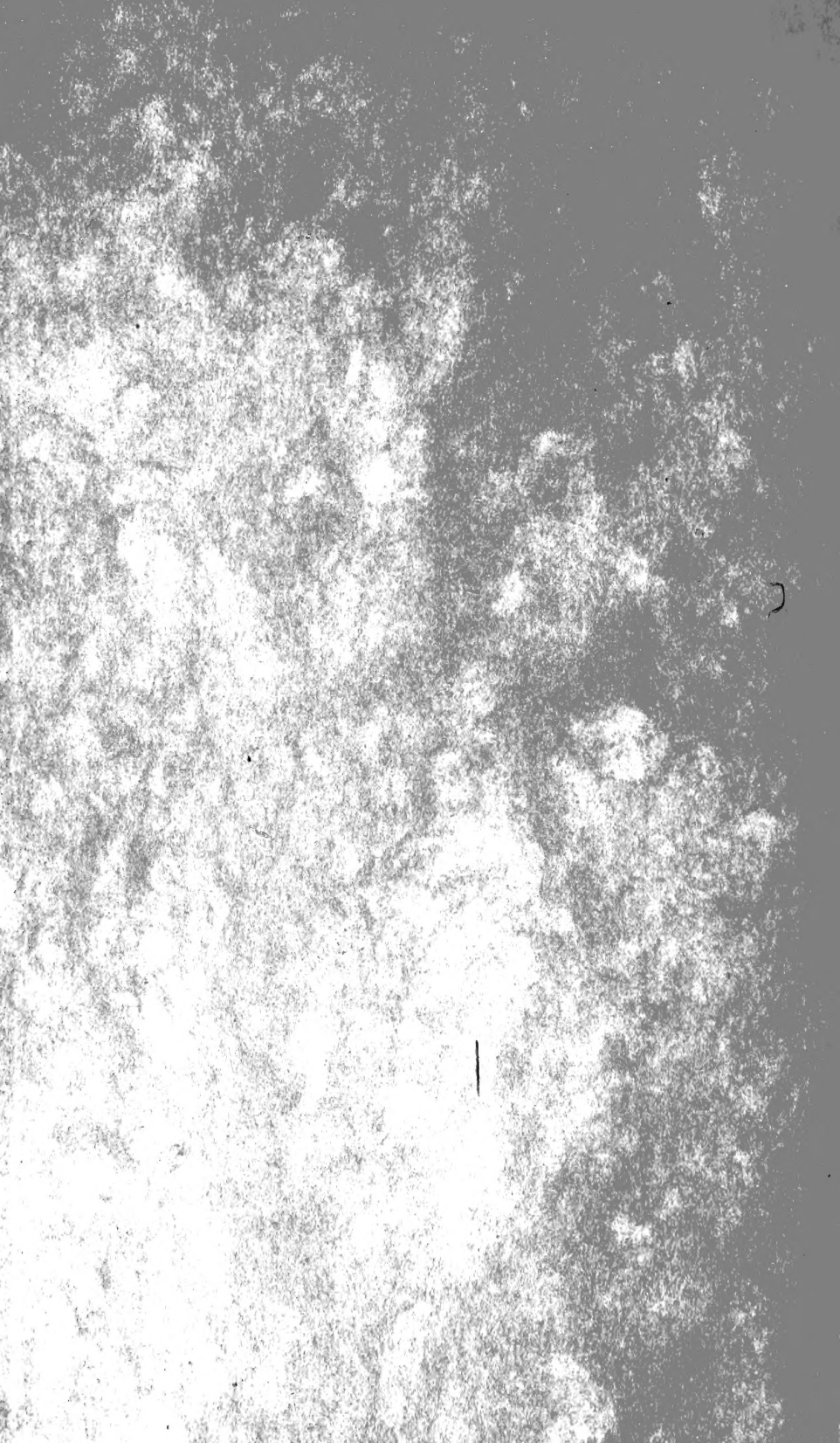
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