

PEAT

11

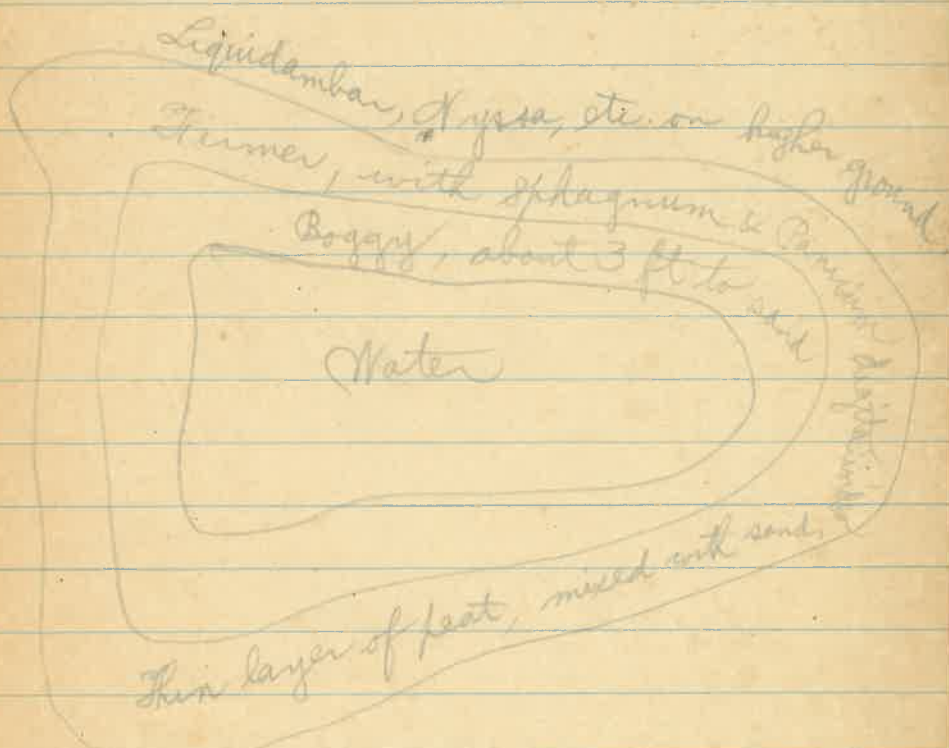
FIELD NOTES  
ON THE  
PEAT DEPOSITS  
OF  
FLORIDA

by  
Harper

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Dec. 4, 1908.

1. Pond on Lake Ball road about  
3 m. NE of Tallahassee, Leon Co.



Plants in water

*Castalia odorata* ∞

*Brasenia* (not common)

*Sagittaria* ? " "

*Limnanthemum* " "

*Sphenanthus* around edge  
Boggy zone (and sample 1.11)  
*Eleocharis interstincta*  
*Ludwigia sphacelata* as  
*Jussiaea leptocarpa* (not com)  
*Scirpus riparius*  
*Juncus effusus*  
*Sagittaria* *Itea*  
*Boehmeria* *Sphagnum* sp.

Former ground (dry sample 1.2)  
*Mesophyllum*  
*Panicum digitarioides* as  
*Sphagnum cuspidatum* (and others)  
*Panicum agrostoides*  
*Eriophorum* sp. as  
*Helianthus angustifolius*  
*Lythrum hirsutum*  
*Salix nigra*

*Salix humilis*? at edge of dry ground

Dec. 7, 1908.

2. Non-alluvial swamp about 5 miles  
WNW of Galahasssee, within a mile of  
GFA and SAL Rys. S 29,  
T 1 N, R 1 W, Leon Co.  
Area about 200 acres.

Swamp is fed by ground-water  
from slightly more elevated land  
around it, and drains off southward  
toward Lake Bradford in wet weather.  
Surrounding soil is sandy, and  
bottom of swamp doubtless likewise.

Swamp seems to be in perfectly  
natural condition at present. Boat  
is full of roots and logs, and  
therefore difficult to sound, but is  
at least 6 feet deep in middle.  
Seems to be entirely free from sand.

Sample 2.11 (wet) from near middle of  
swamp, among cypresses, depth 4-5 feet.  
2.12 from about 1 foot, same place.  
2.21 " " " " near west  
side of swamp, among black gums.

Vegetation of swamp, in approximate order of abundance.

TREES

*Nyssa biflora*  
*Magnolia glauca*  
*Taxodium distichum*?  
*Nyssa uniflora*  
*Persea pubescens* (small)

SHRUBS

*Pieris nitida*  
*Itea Virginica*  
*Leucothoe racemosa*  
*Smilax laurifolia*  
*Cynilla racemiflora*  
*Photodendron flavescens*  
 (parasitic)

HERBS

*Tillandsia usneoides*  
 (epiphytic)  
*Utricularia* sp.  
 (common in pools)

*Cholima ligustrina*  
*Eleocharis acutifolia*  
*Vaccinium corymbosum*?  
*Pieris phillyreifolia*  
*Aronia arbutifolia*

Also a number of mosses and liverworts on bases and roots of trees, and fallen logs.

No grasses, sedges or *Sphagnum* in this swamp.

Revisited and photographed Feb. 27, 1909.

Similarity of the flora to that of Diemel Swamp very striking.

Dec. 12, 1908.

3. Hick's Prairie, Lake Co., about 3 miles north of Eustis & 2 miles northeast of Fort Mason. T18S, R26E. Area said to be about 2000 acres. A drainage ditch cut a good many years ago leads off to the southward, and is about 10 feet deep at the deepest point, but it does not seem to have had much effect on the vegetation.

Approached the prairie by way of the ditch, waded into it about 100 feet, and found there about one foot of water and two of muck, on sandy bottom. Muck and water are doubtless both deeper toward center. Took samples with Davis sampler at several points within a few feet of each other & put them all together. (no. 3.11, wet and dry)

Vegetation of prairie (as far as  
could be seen)

A few clumps of *Magnolia glauca*,  
*Cladium effusum* (saw-grass)

*Pontederia cordata*

*Eleocharis interstincta*

*Nymphaea macrophylla* (in ditch, and  
presumably in open water toward center,  
if there is any)

*Psilocarya*

*Homalocenchrus hexandrus*

*Sagittaria lancifolia*

*Gynertheca tinctoria*? (a little too far off)

Dec. 14, 1908

4. Mature, filled, grass-covered bog on  
north side of Lake Gora (between the  
lake and A.C.L. RR., and not far from  
either), about 3 miles east of Favores,  
Lake Co. S T19S, R 26 E.

Area of bog perhaps 100 acres. It is  
approximately circular in shape, bordered  
by scrub on north side, and apparently  
by hammocks on most other sides.

A few trees are scattered through it, and  
there is one clump of small evergreen trees  
about 50 feet across, about 100 yards  
from north edge. Vegetation mostly  
grasses, so that the whole looks like  
a dry prairie, or old field full of  
broomsedge. In the vicinity of the  
clump of trees just mentioned a  
sounding rod could be run down  
18 ft without difficulty, and without  
striking bottom. Peat seems to be  
a little more compact and homogeneous  
at that depth than a few feet higher up.

Took samples from about 15 feet (no. 4. 11) and 1 foot (no. 4. 12). Surface of bog gives quite a firm footing, but can be shaken a little.

This particular locality is of interest as a source of silica, or infusorial earth. A plant for its preparation, with drying, grinding and burning appliances, and incline track leading down into the bog, was erected on the north edge of it some years ago, and connected with the railroad by a narrow-gauge track about 1000 feet long through the scrub.

An acre or two of the bog was excavated to a depth of a foot or so, and the material (sod) passed through the various processes, and presumably most of it shipped, for

But the whole seems to have been abandoned for several years. Found a good deal of the raw and finished product lying around the building, and bought some away.

### Vegetation of this bog.

#### Grassy portion

*Andropogon* (2 or 3 species)  
*Rhynchospora fascicularis*? (small)  
*Eupatorium capillifolium* (introduced?)  
*Solidago fistulosa*  
*Lycopodium Chapmani*  
*Grosera capillaris*?  
*Phexia* sp.  
*Pontederia cordata*  
*Bartonia verna*  
*Sphagnum*

Blump of trees above mentioned

TREES

*Olex bassine* (6 in X 20 ft.)  
*Magnolia glauca*  
*Persea pubescens*  
*Pinus Elliottii* ?

HERBS

*Asmunda cinnamomea*  
*Anchistea Virginica*  
*Dryopteris Thelypteris* ?  
*Louisaena areolata*  
*Asmunda regalis*

SHRUBS

*Cephalanthus occidentalis* ?  
*Olex glabra*  
*Smilax laurifolia*  
 " sp.  
*Vitis rotundifolia*  
*Rubus* sp. (introduced ?)

(all ferns)

This place was revisited and photographed Feb. 21, 1909.

It is partly drained by a ditch about 6 feet deep leading off through the low scrub to the eastward.

Dec. 17, 1908.

5. Black sticky muck (?) from edge of Mulberry Hammock, about 3 miles SE of Green Cove Springs, Clay Co. T 6 S, R 26 or 27 E.

Depth apparently about 2 feet. Sample (no. 5. 11) taken from about 1 ft. below surface. Extent of deposit difficult to estimate, but probably several acres at least.

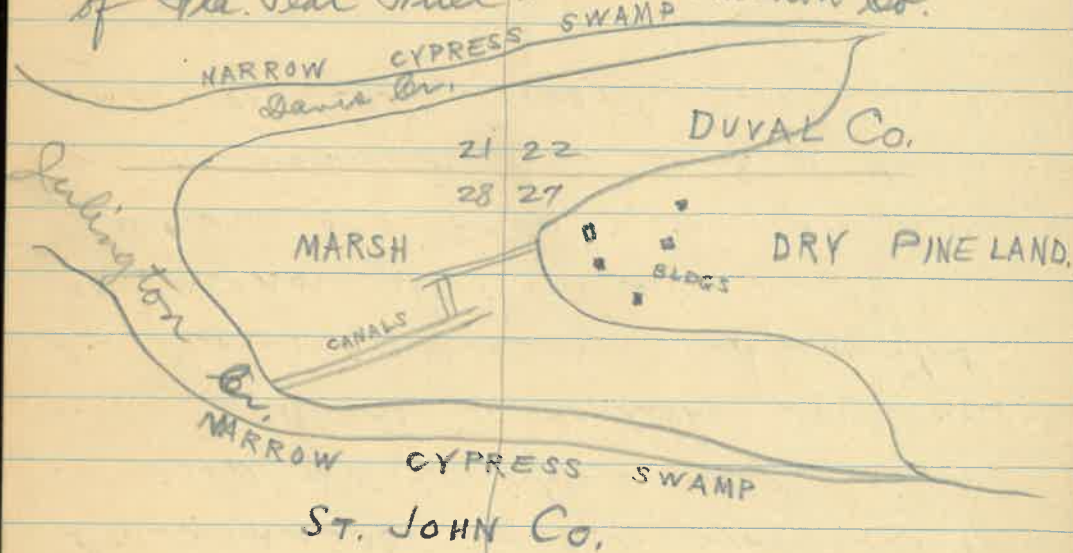
Vegetation where sample was taken chiefly *Pinus Elliottii* & *Quercus rubra*. Soil damp but not wet at this time. On one side it passes gradually into a swamp with *Xyssa biflora*, *Taxodium distichum*, etc. (*Limnium* around edge), and on the other into a hammock with *Ulmus*, *Crataegus*, *Liquidambar*, *Quercus Virginiana*, etc. Slope of ground is very slight here.

Not far away (certainly not over  $\frac{1}{2}$  mile) a bed of shells has been struck about 5 feet below the surface, in digging wells to supply engine used in pulling logs out of swamp. Surrounding country is mostly nearly flat rather dry pine-barrens with vegetation similar to that at same distance from the coast in S.E. Ga.

Land belongs to E. B. Wilcoxson, a trapezoidal man with headquarters at Walkill, about a mile away.

Dec. 18, 1908.

6. Fresh marshes at confluence of Davis and Julington Creeks, about 5 miles west of Bayard and the same distance east of the St. Johns River, Duval Co. T4S. R27E Area about 200 acres. Property of Fla. Peat Fuel & Construction Co.



This marsh has been carefully measured and sounded by the owners, and a maximum depth of about 30 feet found. During the early part of 1908

(and perhaps earlier) the canals shown in diagram were dug, the peat excavated by dredge and laid up on the banks to dry, then transported to the drying plant. Here it was dried (or roasted) by artificial heat (the same material compressed being used for fuel), pulverized, and shipped to Jacksonville to mix with fertilizers. (The fresh peat has a decided odor of  $H_2S$ , and is said to also contain ammonia.) Operations were suspended here when the main building was partly destroyed by fire, but may be resumed soon. A man is kept constantly on the ground to watch the property.

Samples were taken as follows. No. 6.11 (wet and dry) from a depth of 12 feet, close to canal, about half way between dry land and the creek. No 6.21, air-dried material exposed on bank of canal 4 or 5 months.

Specimens were also taken of the compressed material used for fuel, and of the finished product.

The present vegetation of the marsh consists of more *Spartina Bakeri* than all other plants combined. It happens to be just now in bloom, but flowering specimens are comparatively scarce. Other species associated with it are (over)

*Erianthus* sp.  
*Bladium effusum*  
*Osmunda regalis*  
*Sagittaria lancifolia*  
*Andropogon* sp.  
*Rhynchospora caduca*?  
*Eurygium proceratum*?

*Portulaca cordata* occurs along the outer edges, but is now almost choked out by its relative the water hyacinth, which is abundant also in the canals, together with *Ceratophyllum*.

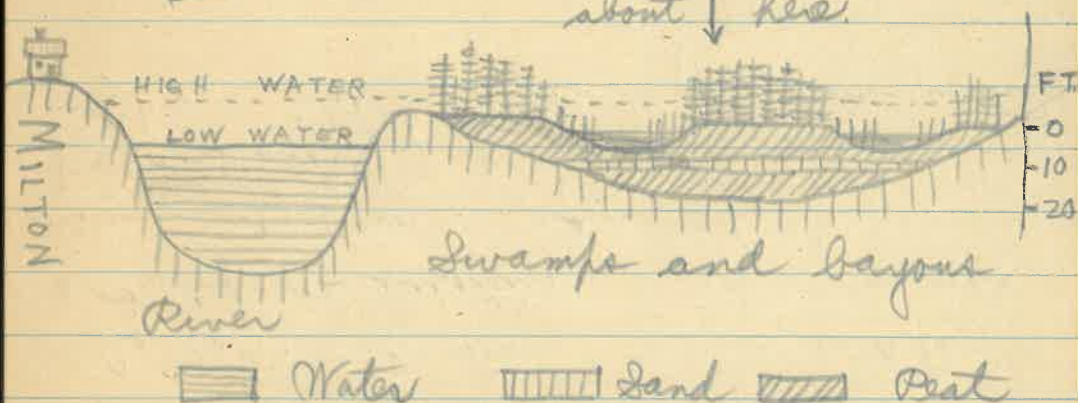
A few shrubs and small trees are scattered along the edges, such as *Myrica cerifera*, *Acer rubrum*, *Ulmus* sp. and *Baccharis halimifolia*.

This marsh has probably been a swamp once, as shown by pieces of rotten wood (cypress?) brought up from lower portions. It may have also been a salt marsh at some period in its history.

Dec. 28, 1908.

7. Swamp of Blackwater River at sea-level, opposite Milton, Santa Rosa Co. Water not perceptibly salt, but probably becomes so occasionally.  
 T 1 N, R 28 W.

Samples taken about ↓ here.



River in this vicinity is bordered on one or both sides by swamps, bayous and marshes, difficult to trace in the absence of a detailed map. At the place studied there seems to be a thin stratum of sand about 10 feet below the surface, but the swamp is said to be

about 20 feet deep there.  
 Samples nos. 7.11 and 7.12 were  
 taken at 8 and 4 feet respectively,  
 from a foot-bridge resting on small  
 piles which crosses the swamp here.  
 The character of the vegetation  
 probably bears no constant relation  
 to the depth of peat.

In the open bays are  
*Costaria odorata*  
*Mayaca fluviatilis*  
*Myriophyllum* sp.  
*Eleocharis* sp.?  
*Skara* sp. (about 4 ft. below surface)

Marsh vegetation consists mostly of  
*Cladium effusum*  
*Zypericum galoides*? } intermixed  
*Juncus Roemerianus* } with  
 " *polycephalus* }  
*Sagittaria lanifolia*  
*Eriocaulon compressum*  
 and fringed with *Portulaca*

Wooded swamps have a richer  
 flora, which is remarkably constant  
 everywhere in the vicinity. The  
 following species were noted at this  
 time and place.

#### TREES

*Magnolia glauca*  
*Shamaecypariss thuyoides*  
*Taxodium imbricatum*  
*Pinus Elliottii*  
*Cliftonia monophylla*  
*Xyssa biflora*  
*Ilex basine*  
*Persea pubescens*

#### SHRUBS

*Myrica cerifera*  
*Pieris nitida*  
*Byrnia racemiflora*  
*Smilax laurifolia*  
*Zypericum*  
*Pieris phillyrifolia*

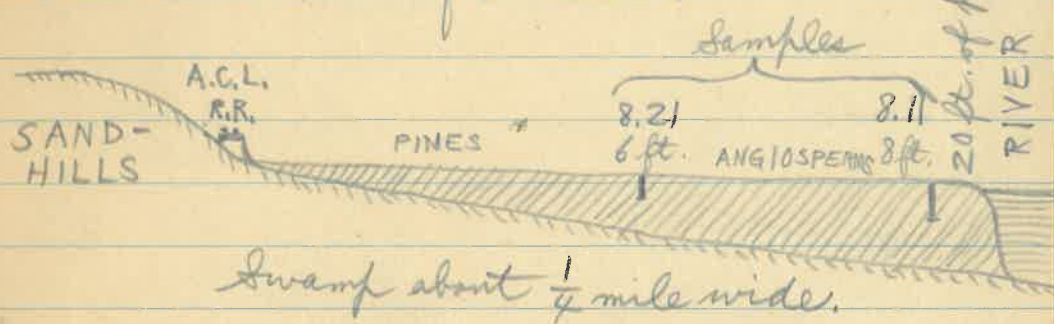
#### HERBS

*Cladium effusum*  
*Tillandsia usneoides*  
*Mesadenia sulcata*  
*Baldwinia*  
*Osmunda regalis*  
*Macranthera fuchsoides*  
*Coccoloba* sp.  
*Sarracenia Drummondii*  
*Eriocaulon decarvular*  
*Polypoda cymosa*  
*Labrenaria* sp.

These swamps and marshes around Milton are very accessible, being right on a harbor, and close to a railroad too. The peat could be easily taken out by dredges, as in Duval Co. The aggregate area of such swamps in Santa Rosa Co. must be a good many square miles.

Jan. 12, 1909.

8. Swamp of St. John's River about a mile above (south of) Palatka, on west or left side.



Swamp extends from foot of sand-hills about  $\frac{1}{4}$  mile out toward river, where it is about 20 feet deep.

At extreme inland edge there are a few hammock plants, such as *Avicennia* (abundant), *Rhus copallina* (common) and *Callicarpa americana*.

Vegetation of swamp proper is chiefly of non-alluvial type.

In the landward half the vegetation is about as follows (in approximate order of abundance)

## TREES

*Pinus serotina*  
*Magnolia glauca*  
*Gordonia Lasiacanthus*  
*Persea pubescens*

## SHRUBS

*Aralia spinosa*  
*Smilax laurifolia*

## HERBS

*Osmunda cinnamomea*

Toward the river this passes gradually into the following.

## TREES

*Magnolia glauca*  
*Persea pubescens*  
*Acer rubrum*  
*Gordonia Lasiacanthus*  
*Sabal Palmetto*  
*Fraxinus* sp.

## HERBS

*Anchaster Virginia*  
*Lonicera areolata*  
*Osmunda cinnamomea*  
*Centella*  
*Rhynchospora corniculata* (and a few other Cyperaceae)  
*Saururus cernuus*

## SHRUBS

*Pieris nitida*  
*Smilax laurifolia*  
*Myrica cerifera*  
*Sabal glabra*  
*Amorpha* sp.  
 (and some unidentified woody vines).

This swamp is now bordered by a dense fringe of water hyacinth, a few scattered plants of which even occur some distance back among the trees, probably brought there in times of high water.

The landward portion of the swamp, <sup>at this point</sup> has evidently been burned over within a year or two, which has lowered the surface about a foot, allowed many <sup>(blackberry)</sup> briars to come in, and doubtless changed the original vegetation somewhat. Other portions near by have been ditched and cultivated to some extent.

The locality is very accessible, having a navigable river on one side of it and an important railroad on the other, and being close to a city of several thousand inhabitants.

Jan. 13, 1909.

7. Small prairie or filled lake among the sandy hills of the lake region, about  $4\frac{1}{2}$  miles south of Grandin, on road to Palatka and Interlachen, Putnam Co.



About 100 or 150 yards in diameter. Slope of shores comparatively steep for this region, and probably continuous with slope of bottom. Peat about 12 feet deep 50 ft. from margin, and 20 ft. deep 50 yards from margin, near middle. Probably of excellent quality, though no samples were taken.

(OVER)

Vegetation at this place all herbaceous, except a few low scattered shrubs of *Zypericum fasciculatum*.

Herbs noted as follows, in approximate order of abundance.

*Panicum digitarioides*  
*Eriocaulon compressum*  
*Rhynchospora fascicularis* (?)  
*Gyneria tinctoria*  
*Centella repanda*  
*Andropogon* sp.  
*Eupatorium capillifolium*  
*Pluchea imbricata* ?

Jan. 13, 1909,

10. Small prairie about 1000 feet in diameter on nearly flat pine-barrens about a mile northwest of Rockledge, Alachua Co. Muck only about 4 feet deep in middle. No samples taken. Place more or less trampled over by cattle.

Vegetation all herbaceous, about as follows: -

*Rhynchospora fascicularis* ?  
*Eriocaulon compressum*  
*Triadenum Virginicum*  
*Centella repanda*  
*Andropogon* sp.  
*Proserpinaca pectinata*  
*Hydrocotyle* sp.  
*Sagittaria lancifolia* ?  
*Pluchea imbricata* ?

Jan. 16, 1909.

11. Ditched and drained prairie on south side of East Tohopekaliga Lake about a mile north of Ashton, Osceola Co. T26S, R31E.

Area probably two or three hundred acres, of which about 50 was a shaded pineapple field about 15 years ago, most of the posts still standing.

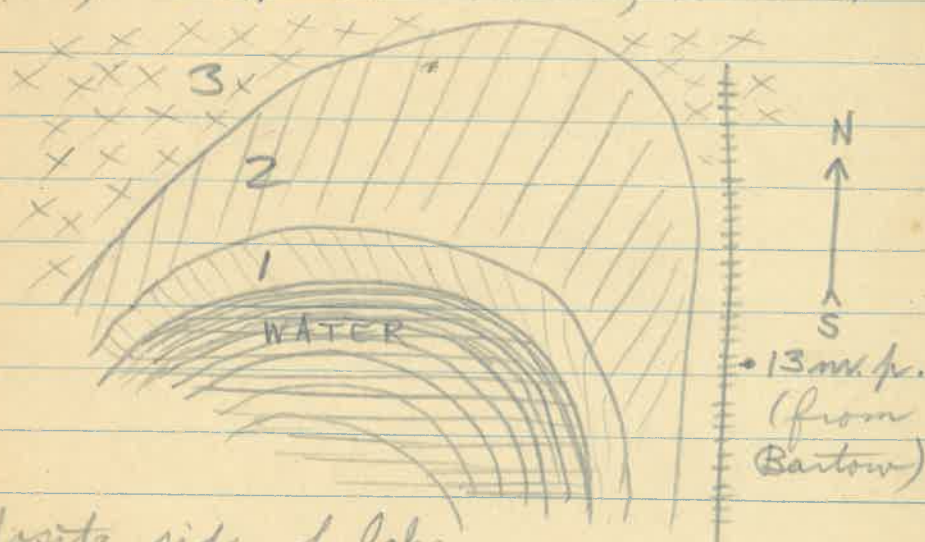
Greatest depth of peat found was about 10 feet. It was a little too sandy to use the Davis sampler to advantage, so dug out some from about a foot below the surface. (No. 11. 11.)

Original vegetation now nearly all gone except a few specimens of *Spartina Bakeri* along ditch. Place now covered with weeds, mostly *Eupatorium capillifolium*.

Peat here could be dug out by hand to a depth of two or three feet, and shipped on the railroad which runs right through the prairie.

Jan. 18, 1909

12. Peat at side of a small open lake about 1000 ft. in diameter, about  $\frac{1}{2}$  mile north of Florence Villa, Polk Co. T28S, R26E.



Opposite side of lake steeper, with hardly any bog.

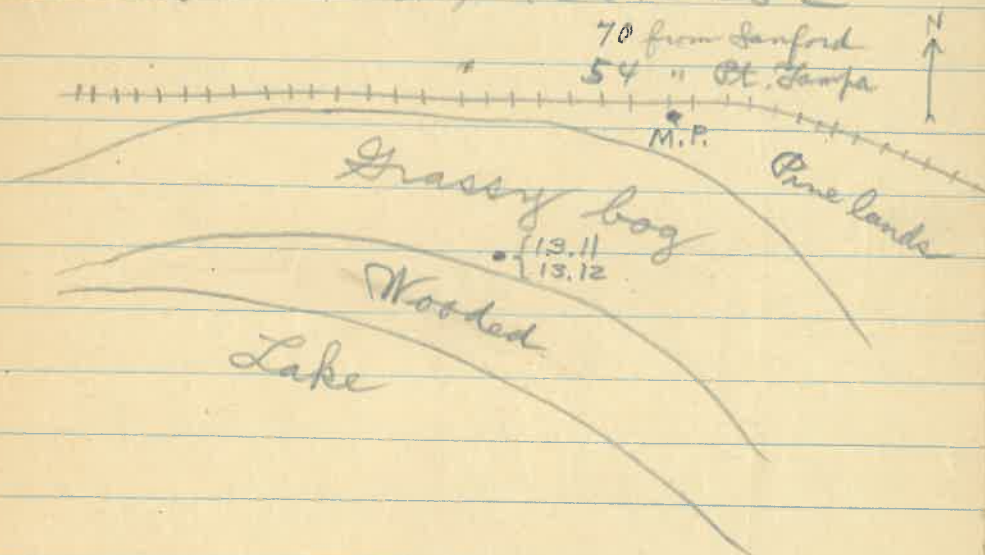
1. Zone of tall *Erianthus* sp., (8-10 ft. tall), with a few bushes of *Magnolia glauca*. Peat about 2 feet deep. Sample no. 12.11, from depth of 1 ft.

2. In this zone *Amphicarpum*? is very abundant, and *Andropogon* sp. scattered. Peat averages about 1 ft. deep. *Spartina Bakeri* scattered along edges.

3. Sandy pine lands.

Jan. 18, 1909.

13. Bog at east end of Lake Marianna, half way between Bartow Jc. and Auburndale, Polk Co. T28S, R25 or 26 E



The trees here occupy a strip close to the water, with outlying groups of trees in the grassy part which borders the high pine land. The edge of the water was not examined here, for lack of time.

Samples nos. 13.11, from 8 ft., and 13.12, from 1 ft., were

taken in the grassy bog about 50 yards from the margin, and close to the trees. Total depth of peat at this point is 20 feet or more, but it becomes pretty sandy at 15 feet. Vegetation of this part of the bog is about as follows.

Andropogon sp. } very  
Lycopodium Chapmani } abundant  
Amphicarpum ?  
Drosera sp.

Guirena scirpoides

Wooded portion contains the following

| TREES               | SHRUBS                  | HERBS         |
|---------------------|-------------------------|---------------|
| Magnolia glauca     | Pieris nitida           | Osmunda cinn. |
| Gordonia Lasianthus | Liriodendron laurifolia |               |
| Pinus pubescens     | Vitis rotundifolia      |               |

This locality looks very much like no. 4. It is very accessible, covers a good many acres, and should be valuable.

Jan. 19, 1909.

14. Bog on both sides of railroad about 2 miles west of Suburndale, Polk Co. T 28 S. R 25 E



Width about  $\frac{1}{4}$  mile. Length from north to south considerably greater, but undetermined.

This bog is bordered on the east by the hilly sandy pine lands of the typical lake region, and on the west by low flat pine lands of different character, which are 4 miles wide in this latitude.

Next to the sand-hills on the east Magnolia glauca is the prevailing tree, associated with scattered specimens of Acer rubrum.

Undergrowth of ferns (*Osmunda* *regalis* and *cinnamomea*) and some *Cladium effusum* a little farther along.

In middle of bog the vegetation is about as follows.

TREES

*Pinus Elliottii* (very abundant, but slender)

*Magnolia glauca* (small and bushy)

SHRUBS

*Smilax laurifolia*

*Pieris nitida*

HERBS

*Anchistea Virginica*

*Gyrotheca tinctoria*

*Ludwigia lanceolata*

*Sphagnum* sp.

The herbs are relatively inconspicuous, and *Anchistea* is the only one at all abundant. The trees and shrubs (all evergreens) make an almost impenetrable thicket.

Toward the west the trees become more scattered and the herbs consequently more abundant.

The development of this bog was not studied in detail, but it has probably been built up slowly from the bottom by the same kind of vegetation that now covers it, and if so must be encroaching on the adjacent dry land.

Soundings made near the middle showed a depth of 10 feet, and a bottom of black sticky loam very similar to that of locality no. 5.

Soil sample here (no. 14.11) from depth of 6 feet. Peat appears to be of good quality, and will be easily accessible after the trees are converted into lumber.

This bog is different from anything else seen hitherto in Florida, but is pretty closely matched in southeastern Georgia, by the bogs surrounding some of the islands in Okefenokee Swamp, and the non-alluvial swamp of the St. Marys River along the railroad south of Kingsland, a mile or two from the Florida line.

In general appearance it resembles the pocosins of eastern North Carolina, but the pines are of a species which does not grow in N.C.

Jan. 19, 1909.

15. Peaty prairie bordering Lake Bony, about 2 miles east of Lakeland, Polk Co. T 28 S. R 24 E.

This covers several hundred acres, but varies in depth from over 20 feet to almost nothing without definite relation to vegetation or to distance from margin, so the amount of peat cannot be estimated without an extensive series of soundings.

At present this prairie seems to be drier than usual, and one can walk all over it without much difficulty. Cattle have trampled over it considerably and perhaps brought in a few plants which do not belong there.

The vegetation is of two kinds, herbs and clumps of trees, the latter small and infrequent. The herbaceous vegetation is about as follows, in order of abundance.

*Spartina Bakeri*  
*Slydrocotyle* sp.  
*Sagittaria lanifolia*  
*Portulaca cordata*  
*Triadenum Virginicum*  
*Limnanthemum lacunosum* ?  
*Eupatorium capillifolium* (introduced ?)

In the small clumps of trees, which may or may not be over the deepest peat, are the following.

#### TREES

*Magnolia glauca*  
*Ilex Cassine*  
*Persea Borbonia* ?

#### SHRUBS

*Smilax laurifolia*  
*Ehretia ligustrina*  
*Vaccinium virgatum* ?  
*Decodon verticillatus* ?

#### HERBS

*Syngoranthus flavidulus*  
*Drosera* sp.  
*Anchistea Virginica*  
*Tillandsia usneoides* } epiphytic  
" *recurvata* }

The peat, although now covered mostly with herbs, seems to contain a good many buried logs, which give some trouble in sampling.

Took sample no. 15. 11, from depth of 6 ft., near the deepest part.

Jan. 20, 1909.

16. Swamp of Withlacoochee River in  
NE corner of Hernando Co.,  
near Istachatta. T 21 S, R 20 E.

Vegetation about as follows.

TREES

*Taxodium distichum* (with knees 6 ft. tall)  
*Liquidambar styraciflua*  
*Acer rubrum*  
*Fraxinus* sp.  
*Salix* sp. (decumbent at base)

SHRUBS

*Cornus stricta* ?  
*Cephalanthus occidentalis*

HERBS

*Piaropus crassipes* (introduced)  
*Tillandsia usneoides* & *T. tenuifolia* (epiphytes)  
Peat 5 or 6 feet deep 100 feet from  
margin. Very coarse and not decomposed  
much. Sample no. 16. 11, from 15 inches.

OVER

Just above this place, at old boat landing back of R.R. station, the river is about 1000 feet wide and completely covered with *Piaropus* (water-hyacinth), associated with a few other floating herbs.

This seems to be forming peat rather rapidly, as there are several inches of it on top of logs which have been cut and fallen into the river.

Jan. 22, 1909.

17. Margin of shallow bay of Lake Isala Apopka about  $\frac{1}{2}$  mile southeast of Inverness, Citrus Co. T19S, R20E.

Water at present very low, exposing a peaty shore about 50 feet wide. Peat about 5 feet deep at edge of water, where sample (no. 17, 11) was taken from depth of about 1 foot.

Water at this point full of *Najas macrophylla*, in bloom. Principal vegetation on peaty shore is *Hydrocotyle umbellata*? (also in bloom), very abundant, and a few weeds (now dead), especially *Eupatorium capillifolium* and *Gloetidium vesicarium*.

Peat rests on sandy bottom.

This deposit, though very accessible, is probably too limited in extent to be of much importance.

Feb. 9, 1909

18. Sawgrass marsh near Lake Harris, one mile northeast of Eldorado, Lake Co. S 28<sup>0</sup>, T 19 B, R 25 E. Area about one square mile.

This marsh is bordered on the north or northeast by high pine land, and on most other sides by cypress swamps.

Vegetation identified as follows: -

*Cladium effusum* (everywhere)  
*Polygonum hirsutum* ?  
*Sagittaria lancifolia*  
*Acerida australis*

3 or 4 pictures of it taken.

Peat 8 to 10 feet deep at the point studied, very coarse, not much decomposed, odorless.

Sample no. 18.11, from 6 ft. Coarse.

" " 18.12 " 1 ft. Very coarse, full of roots.

If the quality of the peat should admit this marsh will be very important, on account of its great size and accessibility. It borders on the lake, and the railroad runs through the edge of it.

Feb. 9, 1909.

19. Sawgrass marsh at SW corner of Lake Griffin near Leesburg, Lake Co. S 23, T 19 S, R 24 E.

This is traversed by an old railroad embankment and a navigation canal, both about  $\frac{1}{2}$  mile long and parallel, connecting Leesburg with the lake. Vegetation as follows: -

*Cladium affuscum* (everywhere)  
*Sagittaria laniifolia* (abundant)  
*Acerida australis* (conspicuous)  
*Hydrocotyle* sp.  
*Peltandra Virginica*

On one side this passes into cypress swamp, and toward the lake it is bordered by aquatic vegetation, such as *Nymphaea macrophylla* and *Castalia odorata gigantea*.

2 pictures taken of these.

Bank of canal is all peat (several hundred tons of it now dry and ready to burn), covered with tall weeds, such as

*Eupatorium capillifolium*

" *serotinum*

*Chaetochloa magna*

*Solidago sempervirens*?

Peat about 12 feet deep near lake end of canal, very coarse, and light-colored toward the top.

Sample no. 19.11, from 10 ft.

" " 19.12 " 4 ft.

" " 19.21 (dry) from bank of canal.

" " 19.31 " " " " "

The last is gray in color and doubtless contains much ash.

Feb. 11, 1909.

20. Big weedy prairie in Chickachatta Hammock about 2 miles SE of Brooksville, Hernando Co., T22S, R19E. (8)

This prairie drains into a sink at the western edge, and is just now dry except in a few depressions which contain water or peat.

Samples (no. 20.11) taken from depth of 1 foot in a depression about 100 feet in diameter, full of dead water-hyacinths. A few specimens of *Pontederia* constitute the principal native vegetation. Peat nearly black and rather pasty, probably not more than 2 or 3 feet deep.

Feb. 17, 1909.

21. Non-alluvial swamp in pine-  
barrens just west of Vocatee,  
DeSoto Co. T 38 S, R 24 E.

This is one of a large number  
of similar swamps which occur  
within a mile of Peace River, on  
land gently sloping toward it, in  
about the same latitude ( $27^{\circ}15'$ )

These swamps are mostly approximately  
circular in shape and a few  
hundred feet in diameter. Some  
are emptying into the river now  
and others do so only in wet weather  
and through vaguely defined channels.  
They seem to be caused by a layer  
of marl a few feet below the surface,  
which is comparatively impervious and  
makes the water in the sand come  
out to the surface as it travels down  
the gentle slope toward the river.

The vegetation of the drier land surrounding the swamps is mostly *Pinus palustris* and *Serenoa serrulata*. The following table of swamp vegetation is made up from observations in several of these swamps within a few miles of Arcadia and Nocatee.

#### TREES

*Nyssa biflora*  
*Magnolia glauca*  
*Acer rubrum*  
*Ilex cassine*  
*Gordonia Lasianthus*  
*Persea pubescens*  
*Pinus Elliottii*  
*Ulmus* sp.

#### SHRUB & VINES

*Vitis rotundifolia* (vine)  
*Myrica cerifera*  
*Viburnum nudum*  
*Smilax laurifolia* (vine)  
*Parthenocissus quinquefolia* (vine)  
*Phoradendron flavescens* (parasite on *Nyssa*)  
*Ilex Virginia*  
*Rhus radicans* (vine)

#### HERBS

*Blechnum serrulatum*  
*Tillandsia* (several species, epiphytes)  
*Saururus cernuus*  
*Peltandra Virginia* (and *P. sagittifolia* ?)  
*Arisaema triphyllum*  
*Oryopteris unita* ?  
*Asmunda cinnamomea*  
*Zosterocoryle* sp.  
*Mayaca dubletii*  
*Hephalopis exaltata*  
*Asmunda regalis*

## BRYOPHYTES

*Sphagnum cuspidatum* (and others)  
*Pallavicinia Lyellii*  
*Thuidium* sp.

The maximum depth of peat found was about 3 feet.  
Sample no 21.11, from 1 foot.  
Very coarse.

Too limited to be of commercial importance, but of considerable scientific interest.

Feb. 20, 1909.

22. Small grassy lake near 15 mile-post on Tavares & Gulf R.R., a little north of West Apopka, Lake Co. T21 S, R26 E

(Show in picture of L. Apopka taken from hill)

Vegetation mostly

*Andropogon* sp.

*Eriocaulon compressum*

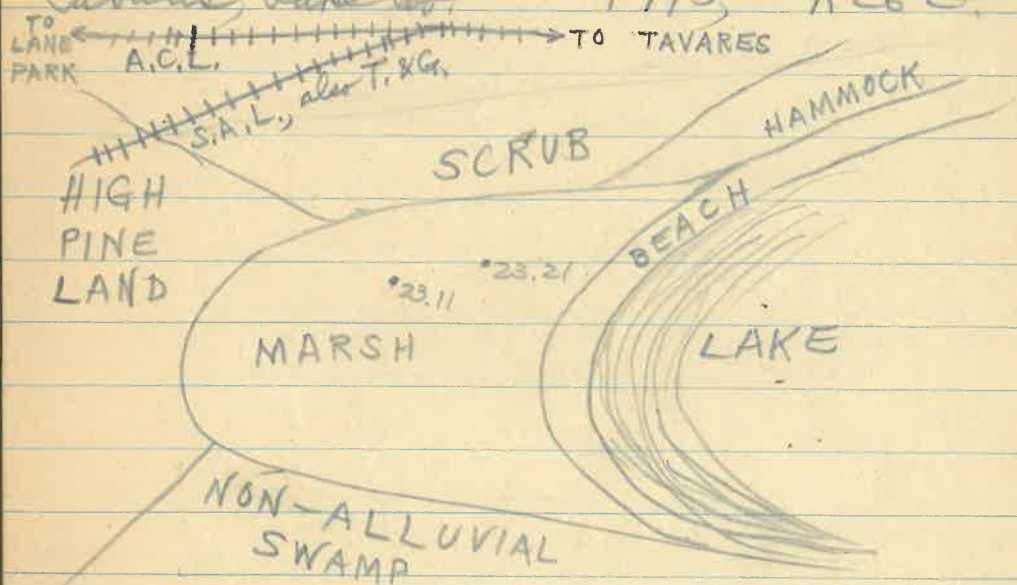
*Guirena scirpoides*.

Peat of good quality, but only about 2 feet deep as far out as one can conveniently go on foot.

Sample no. 22.11, from depth of one foot. Brown, moderately coarse.

Feb. 22, 1909.

23. Marshes at west end of Lake  
Gora, about  $1\frac{1}{2}$  miles from  
Tavares, Lake Co. T 19 S, R 26 E.



This marsh covers perhaps 50 acres,  
and is separated from the lake  
by a wave-built beach, as is  
often the case among the larger  
lakes in this county. It is  
bordered on the other sides by  
several different kinds of vegetation,  
as indicated above.

About 100 yards from dry land  
the vegetation of the marsh is mostly  
*Cladium effusum*  
*Eriocaulon* sp. } Peat about 4 ft.  
*Sagittaria lanifolia* } deep at edge of this

Nearer the land it is as follows.  
*Spartina Bakeri* (larger & abundant)  
*Eriocaulon compressum*  
*Andropogon* sp.  
*Sydnocotyle* sp.  
*Solidago fistulosa*  
*Phytolacca fascicularis* ?  
*Utricularia subulata*  
*Castalia* sp.  
*Bartonia verna* Peat 1-3 ft.

Samples no. 23.11, from edge of  
sawgrass portion, about 100 yards  
from shore, and 23.21, from *Spartina*  
portion, about 100 yards from former  
and same distance from shore.  
Both 2 ft. deep.

March 29, 1909,

24. Small slough or "gator hole"  
in south edge of Everglades just  
northwest of Paradise Key, Dade Co.

Vegetation about as follows.

SHRUBS or SMALL TREES

*Salix* sp.

*Anona glabra*

*Cephalanthus occidentalis*

HERBS

*Zizania latifolia*

*Cladium effusum*

*Nymphaea macrophylla*

*Pontederia cordata*.

Everglades are pretty dry now,  
and this hole probably has  
only a foot or two of water  
in it. In wet weather the  
whole place and its surround-

become flooded. Peat is probably only 2 or 3 feet deep, overlying marl or rock.

Sample no. 24.11, taken from depth of about a foot, near edge of water.

March 29, 1909.

25. Marly prairie soil at southern edge of Everglades, between Long and Paradise Keys, Dade Co.

Moist at this season, but not inundated. Upper layers cracked into pieces a few inches in diameter, light gray in color, appearing somewhat like moist wood-ashes. A few inches below the surface the material is more clayey. It is probably underlain by rock at no great depth.

This seems to be typical of the soil of a large part of the southern Everglades.

Vegetation mostly *Cladium effusum*, small and scattered.

Sample no. 25.11, from  
about a foot below the surface.

April 9, 1909

26. Everglades about a mile  
west of head of Miami River,  
Dade Co.

Peat about 5 feet deep, light  
brown on top, blackish below,  
rather firm, saturated with water  
at this time, but not inundated.  
One can walk over it without  
sinking in more than ankle-  
deep.

Vegetation at this point mostly  
Phragmites, growing rather  
sparsely. (See photograph.)  
A few dead prostrate specimens of  
Acorus here and there.

Sample no. 26.11, from 2 feet.

April 9, 1909.

27. Estuarine marshes of Miami River on right side about 2 miles above its mouth and about opposite Olapattah Prairie.

~~RIVER~~  
~~MANGROVES~~

MARSH

~~ROCKY PINE LAND~~

River channel is bordered by a narrow strip of small mangroves. Marsh is about 100 feet wide at this point, and bordered by pine land which slopes down to it rather abruptly.

Vegetation of this marsh is about as follows, in approximate order of abundance.

*Cladium effusum*  
*Centella repanda*  
*Dichromena cibrata*  
*Sagittaria lanifolia*  
*Canoea pus erectus* { scattered, mostly toward land  
*Acrostichum aureum*  
*Thimbristylis spadicosa*  
*Rhizophora mangle* (edge of water.)

Peat about 4 feet deep, with streaks or patches of marl at various depths, which would probably spoil it for fuel.

Sample no. 27. 11, from 2 feet.

April 12, 1909.

28. Everglades at upper dam on north drainage canal, about 10 miles <sup>north</sup> west of Fort Lauderdale, Dade Co.

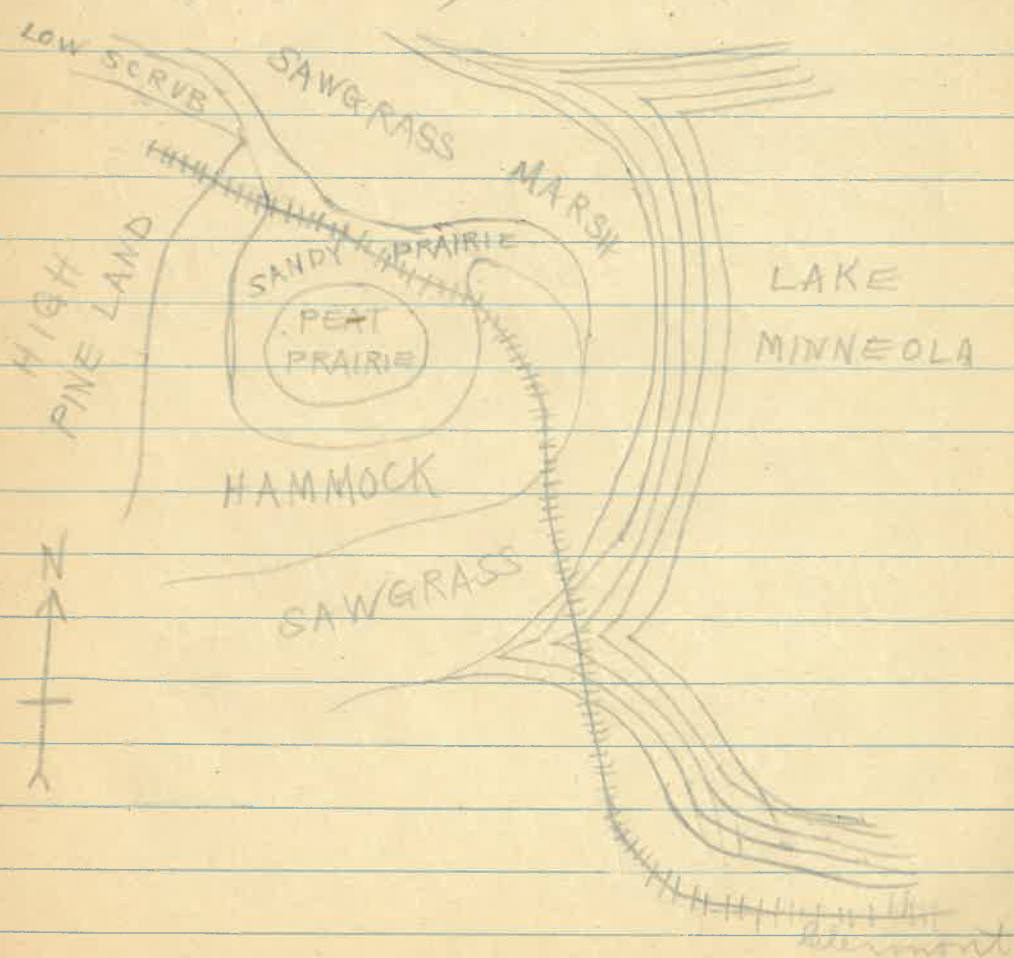
Peat along this canal is said to vary from almost nothing to over 15 ft. in depth. It always rests on sand and that on soft limestone rock (presumably the Miami white), which comes within a few feet of the surface in places.

Vegetation not examined carefully, but seems to be mostly *Myrica cerifera* & *Cladium effusum*.

Sample no. 28. 11, taken rather hurriedly with a shovel, from depth of about a foot, just off the canal.

April 16, 1909.

29. Peaty prairie of perhaps 20 acres, nearly circular, on a peninsula on west side of Lake Minneola, between its inlet & outlet, near Clermont, Lakeland, S 14, T 22 S, R 25 E.



Vegetation rather limited in species, the following being the only ones noted.

*Panicum digitarioides*  
*Eriocaulon compressum*  
*Castalia odorata* (stunted)  
*Pontederia cordata* (in patches)

Surface of prairie is now dry enough to walk on.

Peat about 10 feet deep in middle, with soft sandy bottom. Unusually coarse and light brown, for such a locality.

### Samples

29.11, from 6 feet

29.12, " 1 foot,

April 21, 1909

30. Peaty prairie about 2 miles south of Manatee, Manatee Co.  
T 35 S, R 17 or 18 E.

This has been partly destroyed by ditching, and by building a railroad through it, so the vegetation is not entirely natural. The commonest species seem to be as follows.

*Sagittaria lancifolia*  
*Cladium effusum*  
*Eupatorium capillifolium* (a weed)  
*Cephalanthus occidentalis* (shrub)  
*Pontederia cordata*  
*Anchistea virginica*  
*Erechtthites hieracifolia* } (weeds)  
*Chaetochloa magna*  
*Acer rubrum* (a tree)  
*Myrica cerifera* (a shrub)

The surroundings of the place are mostly flat pine-barrens. A calcareous formation seems to underlie this whole region within a few feet (sometimes a foot or less) of the surface, giving rise to many hummocks in the vicinity.

The area of this prairie is perhaps ten acres, and the maximum depth about 4 feet. Below 2 feet (in the middle) the peat is more or less mixed with sand.

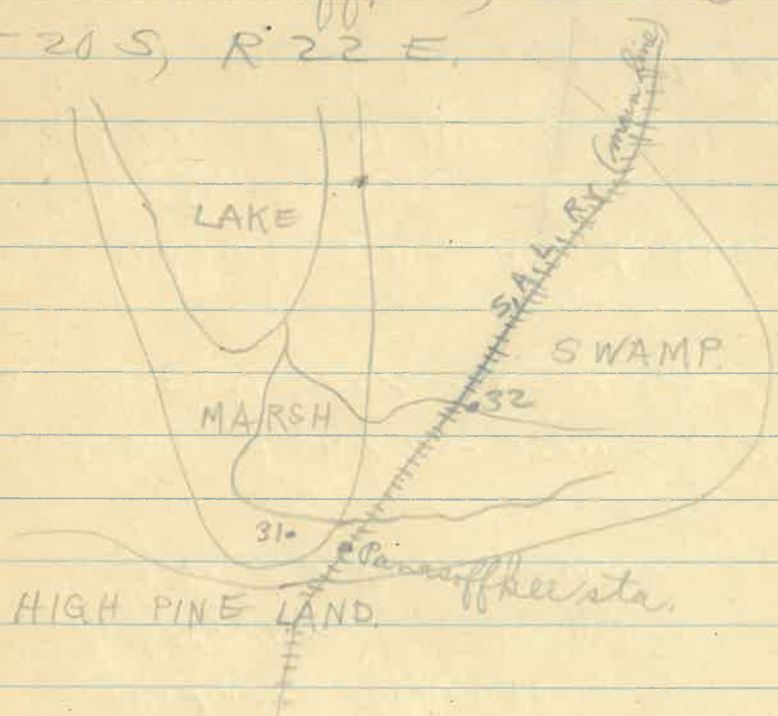
The edges of the prairie are cultivated a little.

Samples no. 30, 11, from depth of 2 feet.

But black, thoroughly decomposed, rather sticky, and very retentive of water.

April 22, 1909.

31, Marshes at south end of Lake Panasoffkee, Sumter Co. T 20 S, R 22 E.



These marshes are hundreds of acres in extent, and the adjacent swamp still larger. Both, as well as the lake, are exceptional features for this limestone region. According to the maps, the lake is on the same level with the

With Lacoochee River, a few miles to the westward, and connected with it, as Lake Tsala Apoka is in Citrus Co. (See Panasoffkee sheet, U. S. Geol. Surv. topographic maps)

The principal species in this marsh, near the edge, are

*Cladium effusum*  
*Eupatorium serotinum*  
*Sagittaria lancifolia*

*Taxodium distichum* occurs scattered and *Acerida australis* farther out.

Peat about 20 feet deep at the point examined.

Samples no. 31. 11, from 10 ft  
" " 31. 12 " 4 ft

Both brown, moderately coarse, with a little sulphurous odor. A few univalve shells are mixed with the peat. Water clear.

April 23, 1909.

32. Swamp near south end of Lake Panasoffkee, Santa Co. T 20 S., R 22 E  
(See diagram on preceding leaf.)

Vegetation of this swamp is about as follows.

TREES

*Taxodium distichum*  
*Fraxinus* sp.  
*Acer rubrum*

SHRUBS

*Cephalanthus*  
*Lambertia* (introduced?)  
*Cornus stricta*  
*Ilex Virginia*

HERBS

*Tillandsia usneoides*  
*Eragrostis* (introduced?)  
*Rhynchospora corniculata*  
*Sydnorotyle verticillata*  
*Gymnocallis* sp.  
*Saururus cernuus*  
*Oenandra regia*  
*Epidendrum compressum*

A bayou with clear (presumably calcareous) water running through this swamp is nearly filled with the following species.

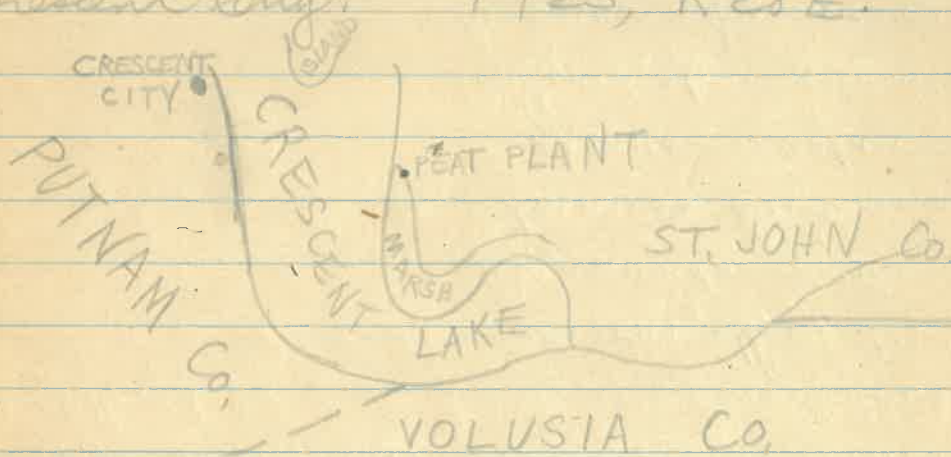
*Pistia spathulata*  
*Phrynospora corniculata*  
*Bienta Curtissii*  
*Hydrocotyle Bonariensis* ?  
*Portulaca cordata*  
*Echinochloa Cuscuta-Galli* ?  
*Carex comosa*

Peat is so full of logs that its depth is difficult to measure, but it seems to be at least 12 feet. It is full of small univalve shells, which shows that the water is calcareous.

Sample no 32. 11, from bed of bayou close to railroad bridge, from depth of 6 feet (including a few inches of water on top)

May 15, 1909.

33. Marsh on east side of Crescent Lake in St. John Co., about opposite Crescent City. T 12 S, R 28 E.



Property of Crescent Mfg. Co., which has just erected a plant on the edge of the marsh for the production of fertilizer filler.

Marsh is a few hundred feet wide and said to be 9 miles long.

Peat is said to be over 20 feet deep in places. It has a peculiar pungent odor, much like the gas made from it.

# Vegetation of marsh.

## TREES

*Taxodium imbricarium*

8

## SHRUBS

*Nyssa cerifera*

*Cephalanthus occidentalis*

(The above woody plants all rather scattered)

## HERBS

*Radium effusum*

*Spartina Bakeri*?

*Elophium Angelorum*?

*Centella repanda*

*Sagittaria lancifolia*

*Eriocaulon compressum*

*Zippia* sp.

*Scirpus namus*?

*Pluchea camphorata*

*Stimbatylis spodiaca*

*Sporaea sagittifolia*?

*Stibiscus Moscheutos*?

*Osmonda regalis*

*Moriera Caroliniana*

*Cyperus Laspar*

*Rhynchospora schenckii*?

*Brunum Americanum*

*Dichromena colorata*

*Pontederia cordata*

*Asclepias lanceolata*

This is a rather peculiar assemblage of plants. Some of them grow best in brackish marshes, and others prefer marly situations, and there is probably more or less lime or salt, or both, in the marsh water.

The surface of the marsh where dry enough is covered with a whitish efflorescence, and scattered over it are numbers of helicoid shells (*Ampullana*, the same species as in the Everglades and Lake Griffin), which do not grow in <sup>pure</sup> fresh water.

A flowing artesian well here, 60 or 70 feet deep, has water which seems a little briny, limy and sulphurous.

The country east of the peat plant, as far as one can see, is low flat pine woods, the trees all *Pinus serotina*, with a dense undergrowth of *Serenoa*. (Similar country occurs along the East Coast RR. in this county in just about this latitude.)

The surface of the sand must slope rather abruptly at the edge of the marsh, otherwise the peat would be pretty shallow.

Crescent Lake must have once been the main channel of the St. John's River (which it much resembles).

May 20, 1909.

34. Marshes on west side of Lake Apopka about a mile south of Montverde.

These marshes are now cultivated in corn and vegetables.

Opinions differ as to whether this has been made possible by the canal which was cut at the north end of the lake 15 or 20 years ago, or by the gradual lowering of the lakes in this region by natural causes which has been going on for about the same length of time.

Peat is over 10 feet deep at the point examined, black and fine on top (probably on account of cultivation), dark brown & coarser a little below the surface.

Samples were taken from the midst of a fine field of corn, no. 34.11 from 8 ft., and 34.12 from 1 ft.

Natural vegetation unknown.

May 21, 1909.

35. Swamp along Helena Run at west end of Lake Harris, about 4 miles south of Leesburg and 2 miles north of Okahumpka, Lake Co. T20S, R24E

This run is said to come from a big blue spring a few miles farther west, and its water is clear, instead of coffee-colored like the swamp water which prevails elsewhere in the lake region. The whole place looks almost exactly like the bayou or creek in swamp near Panasoffbee about 10 miles to the westward, visited on April 23 (locality no. 32). (Both places have been photographed.)

It is said that when Lake Harris is very high the water runs

westward instead of eastward  
in the run, and empties  
into Lake Panasoffkee and the  
Withlacoochee River (see in this  
connection Horton's Handbook of  
Florida, 1891, p. 85)

The vegetation of the swamp  
consists mostly of the following  
species:—

#### TREES

*Laxodium distichum*  
*Fraxinus* sp.  
*Acer rubrum*

#### SHRUBS

*Itea Virginica*  
*Cephalanthus occidentalis*

#### HERBS

*Rhynchospora corniculata*  
*Boehmeria cylindrica*  
*Hydrocotyle verticillata*  
*Erechtithis hieracifolia*  
*Carex striata*  
*Mikania scandens*  
*Hydrocotyle Bonariensis*  
*Samolus floribundus*  
*Tillandsia usneoides*

In and along the run are  
the following herbaceous plants

*Nymphaea macrophylla*  
*Hydrocotyle Bonariensis* ?  
*Ceratophyllum demersum*  
*Sagittaria lancifolia*  
*Potamogeton amplifolius*  
*Lemna* sp.  
*Pontederia cordata*  
*Pilea pumila*  
*Echinochloa crus-galli* ?  
*Carex comosa*  
*Sagittaria latifolia*

Peat seems to be only about  
3 feet deep in the swamp a  
few rods from the wagon  
bridge. It is of course full  
of woody roots and logs.

Sample no. 35. 11, from 1 ft.

June 9, 1909

36. Fifty bay (or swamp, or pond)  
about 50 ft. in diameter,  
near 7 m. p. on G. F. & A. Ry.,  
about 2 m. NE of Lanark Springs,  
Franklin Co., R. 3 or 4 W, T6 or 7 S

Woody plants all *Corylus paucifolia*  
Sparse undergrowth of  
*Aschistea Virginia* and  
*Dulichium arundinaceum*.  
*Castalia odorata* (small and rare).

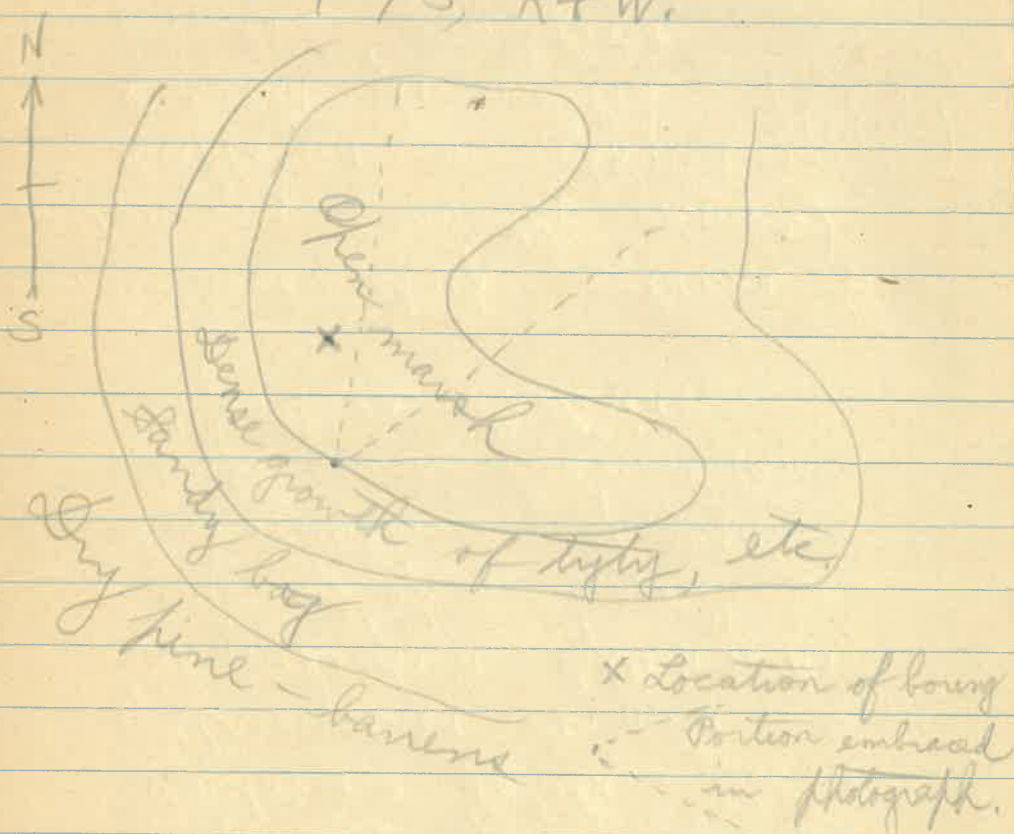
This occupies a basin-like  
depression in dry sandy  
pine-barrens, <sup>(old dunes)</sup> (see photograph)

Peat about 4 feet deep, with  
soft sandy bottom.

Sample 36.11, from 1 ft.  
Black, plastic, water not easily  
squeezed out.

June 10, 1909.

37. Deep tyty bay, treeless  
in middle, about a mile  
north of Canabell, Franklin Co.  
T 7 S, R 4 W.



This, like innumerable others in  
the vicinity, occupies a depression  
in dry sandy pine-barrens  
or ancient dunes.

Vegetation of open marsh (something  
like prairie of Okfinoke Swamp)  
(mostly herbs)

*Panicum digitaloides*  
*Elychalis* sp.  
*Castalia odorata*  
*Utricularia cornuta*  
*Rhynchospora leptorhyncha*  
*Xyris* sp.  
*Eriocaulon compressum*  
*Hypericum fasciculatum*  
*Gynerthea tinctoria*

Dense bushy strip contains the  
following (mostly shrubs)

*Cliftonia monophylla* } (mostly)  
*Synilla parvifolia* }  
*Smilax laurifolia*  
*Pieris phillyrifolia*  
*Lophiola aurea*

Sandy bog around edge  
contains the following, all herbs,  
arranged in approximate order  
of abundance.

*Rhynchospora Chapmani*?  
*Eriocaulon compressum*  
*Dracopis brevifolia*?  
*Panicum erectifolium*? -  
*Lycopodium alopecuroides*  
" *Carolinianum*  
*Rhexia flifanus*  
*Lophiola aurea*  
*Sarracenia psittacina*  
*Polygala lutea*  
*Sphagnum*

Peat sample no. 37.11, from depth of 4 feet, taken about 50 feet out in marsh (at end of fallen tree), where peat is about 10 feet deep, with sandy bottom. (It is doubtless deeper farther out.)

Peat is brown, moderately coarse, and considerable water can be squeezed out of it.

June 10, 1909.

38. Large rather open tyty bay about  $\frac{1}{2}$  mile north of Canabell, Franklin Co., T7S, R4W.

Vegetation about as follows:

SHRUBS

HERBS

|                             |                                  |
|-----------------------------|----------------------------------|
| <i>Elliottia monophylla</i> | <i>Arctostaphylos virginica</i>  |
| <i>Corylus parvifolia</i>   | <i>Rhynchospora fascicularis</i> |
| <i>Myrica cerifera</i>      | <i>Syntherisma flavidula</i>     |
| <i>Picea nitida</i>         | <i>Centella repens</i>           |
| <i>Smilax laurifolia</i>    | <i>Polygala lutea</i>            |
| <i>Leucothoe racemosa</i>   | <i>Triadenum virginicum</i>      |
| <i>Ilex glabra</i>          |                                  |
| <i>Myrica inodora</i>       | <i>Sphagnum</i>                  |

This bay seems to be drier than formerly, for some reason, and saplings of *Pinus Elliottii* are springing up in it in several places.

Peat is over 12 feet deep in places, dark brown and moderately coarse, like that from the preceding locality.

Sample no 38.11, from 4 feet.

June 24, 1909.

39. Sence tuffy swamp in NW edge of Delmariah Springs, Walton Co. S 26, T 3 N, R 19 W.

Vegetation of the interior almost entirely *Cliftonia monophylla*. Several other bog plants around edge, at foot of steep sandy hill (Listed 12-30-08)

About 100 feet from edge the peat is about 10 feet deep, dark reddish brown and somewhat plastic.

Sample no. 39.11, from 1 ft.

40. Jet black sticky peat, said to have been encountered 50 feet below surface in a driven well about a mile north of Lake Monroe, near Enterprise, Volusia Co. Owner claims to have gone through it for 50 feet.

Sent to State Chemist by James Armstrong, Enterprise, Fla. (See his letter of June 20, 1909)

Dry sample sent to USGS peat laboratory for analysis July 7.

May 18, 1910.

41. Peat prairie covering several hundred acres, on NE side of A.C.L. RR, about a mile NW of Blaines City, Polk Co. T 27S, R 27E.

Bulk of vegetation seems to consist of the following herbs.

*Eleocharis interstincta*  
*Rhynchospora gracyl*  
*Panicum hemitomon*  
*Eriocaulon compressum*  
*Castalia odorata*  
*Sparganium angustifolium*.

Some patches of *Cladium* can be seen in distance, apparently occupying better spots. Dense clumps of small trees (apparently mostly *Magnolia glauca*) are bordered by *Spartina Bakeri*.

Went out into this prairie about 100 yards & found peat there about 8 ft. deep, on sandy bottom.

Took samples (no. 41, 11) from 4 ft. Peat brown, fibrous, very watery & incoherent.

On drier margin of this prairie are small bushes of *Cephalanthus*, and the following herbs.

*Syntherisma flavidula*

*Centella repanda*

*Sisyrinchium capillare*

*Phytolopha fasciculata* (?)

*Xyris* sp.

May 24 1910.

42. Big marshy prairie between  
Champaign and Greenville, Madison Co.  
(118.3 miles from Jacksonville on S.A.L.)  
E. 1 A. R. 8 E.

Prairie is irregular in shape, and covers several hundred acres. It is bordered by a dense growth of *Taxodium imbricatum*, all draped with *Lillandsia aeneoides*. These trees decrease in size toward the water, those at the edge of the prairie being very much dwarfed. Small clumps of the same trees are scattered over the prairie, almost exactly like the "houses" in the prairie of Okefinokee Swamp (see photographs.)

Next to the timber is a dense fringe of *Archives* and *Decodon*.

Rest of the vegetation seems to consist mostly of the following herbs.

*Panicum digitarioides*

*Castalia odorata*

*Pontederia cordata*

*Sagittaria latifolia*

*Hydrocotyle* sp.

*Eleocharis interstincta*

*Sphagnum* sp.

Peat near where railroad crosses is about 5 feet deep, with sandy bottom. Probably deeper farther out.

Sample no. 42.11, from depth of  $1\frac{1}{2}$  feet, is coarse, brown, fibrous, not much decomposed, and containing many living roots.

43. Mangrove peat from Snake Creek, between Windyp Island and Plantation Key, Monroe Co. Near mile-post 43.7 on F.E.C. Ry., T 63 S, R 37 E.

Taken from 3 ft. below the surface, on north side of P.R., in red mangrove swamps.

Collected in Sept., 1910, under direction of W.J. Krome, Consulting Engineer, at our request.

Sample sent to W.S. Gil.  
Oct. 1, 1910.

