No. 28

May 15. 1914.

Indexed June 18, 1915

May. 19. 1914.

Out from Ft. Lauderdale at 9.30 AM. Tom Buss boatman. The New River. a deep stream with an average width of 250 to 300 ft. Banks low. vegetation dense. Water hyacinths in the stream. coming into blossom at this time. their yellow flowers pushing up from among the leaves. Equipment for the trip simple as there is required only a geologist collecting hammer, collecting boxes, wrapping paper, twine, smoked glasses. ~~and~~ In the way of provisions only one days meals necessary as the boat is expected to reach Ritta by night. On the banks is seen the air plants in blossom, rock ferns.

First Exposure of rock seen is 4 mi from Ft. Lauderdale by river & about ½ mi above entrance of the north fork of Little River. The rock at the waters edge here is the typical miami oolite as is also that dredged up from the canal.

This rock consists of a mass of round grains with occasional shells or pieces of shells, indicating shallow water formations.

Second stop near the 5 mi post. Rock examined on the north fork. The rock in place in the fork here rising about two ft. above the water level is rather soft and is a little sandy, but is oolitic. The rock dredged from the canal or seen on the fork is decidedly oolitic. The rock between 4 & 5 mi rises 2 to 3 ft above water stage of date

Third stop at the lock 6 mi from Ft Lauderdale. The rock here from the canal is oolitic and also contains many shells. collections made here. The rock in place was examined just above the lock. It stands 1 ft 1½ ft above water and is oolitic, also has

streaks throughout that are compact. Some cavities filled with calcite crystals.

Fourth stop at 7 mi. No rock is seen here either in the fork of the canal or on the dump. The canal fork here is about 4 ft here and the water in the canal probably about 4 ft. so that the oolitic rock is more than 8 ft deep. A short distance above the 7 mi post on the south side a projection of oolitic rock is seen seemingly in place.

8th mile post. No rock either in the canal bank or on the dump. Bank of canal exposing dump about 4 ft high. (did not reach the foot.) In this part of the canal where there is no rock seen the water washes the sand beneath & the muck 3 or 4 ft thick comes in thus widening & filling the canal.

9th mile. Bank of coral low
nothing seen over the mud matrix
about 3 ft. On the bank, a dump
some fragments showed the
continued presence of the oolitic
rock occasionally reached in the
canal. The dump not high
here being nearly 3 ft above
the glade level. The glades very
entirely dry & more springy
under foot. Small tubes seen
about over the glades.

10th mile. oolitic limestone
on the dump. The bank about shows
only muck. (stop)

11th mile. oolitic limestone on
the dumps. only muck in the coral
bank. The limestone quite general
on the dumps between 10 + 11.

12th mile (stop) Rock muck the
same on the bank. not seen in
the coral bank where only the
muck shows.

13th mile (stop. dinner)
The rock is oolite all the coarser
& heavier than before. Are hardy,
contains some shells. A good
deal of rock lies on both sides of the
canal. Samples taken for analysis.
Test as to road material & for
lithologic samples. Glades are some-
what wet. Some small trees seen

14th mile (stop) Rock harder, less
distinctly oolitic, yellower. Calcite
repairs the shells. At about 14 1/2 the
a shell marl was found with
many good shells. See Samples &
collection. With this mile glades
is found also the usual hard rock
& some hard concretions, finely oolitic.
13 — mi. Some rock, finely oolitic.
as at 14 mi. At about 13 1/2 mi
or 15th a hard rock thrown out as
boulders is found. See Samples.
This rock is non oolitic & no fossils
have seen.

16th This seems to have been a
local variation for at 16 mi the
rock was about at 14 & 15 mi

17 mi
at 17 mi no stop on account of rain. Banks low here and only a small amount of rock seen which appears to be as usual for 14. 15 & 16,

18 mi – The bank low not much rock & that soft & granular with fossils.

19 mi 19 mi post not seen. but at about 19¼ a rock was seen on the north bank holding the flat based gasteropod. [Small sample] further examination which was desirable not possible on account of rain storm.

20. 21 & 22 mi passed on ac of rain storm.

23 mi. mostly non oolitic altho some oolitic appearance at 23¾ mi a large amount of rock which is hard & non oolitic, and very fossiliferous,

24 mi No Stop.

25 mi, – Heavy massive rock. very many fossils altho mostly as casts., as seen on storm tip near cliff. a few flat based gasteropods more samples needed.

No stops were made beyond 25 mi. as it was then 3 o'clock and a heavy wind and storm made it necessary to go direct to Rita island in order to reach that place by 11 P.M.

However while stopping to oil and light up at 6 P.M. the rock was examined. This stop was between the 38 & 39 mi markers. The rock, of which only a small amount is thrown out, is light colored at the surface, bluish beneath. It is compact and very hard. The coiled plane gasteropod. Planorbis

is present, altho not 10
abundant. Samples
were taken for analysis, and
test and as lithologic
specimens.

Rock of this character had
been observed along the
coast for some miles. It
is conspicuous on account
of being snow white and lying
upon the black muck
For a further account of
the rock & coast see
paper — of return trip

Harpswell came on soon after
passing the 38 mile, and at about
9 A.M. — the lake was reached. It was
cloudy, windy and raining slowly, but
the wind being from the N.E. & hence favorable
the boat made Rita island reply at 10.55 P.M.

May 20. 1914.

The morning of May 20. was
cloudy, windy, squally and
rainy. The lake was very rough,
white caps showing, and no
opportunity for work in our
small open boat. Fossils packed
in forenoon.

shipment from H. Lovelace.
1st for F.L. contains from bottom
& top. 23½ F.L.; 38 mi F.L.;
23 mi. F.L. 19¼ mi F.L. & 6 mi F.L.
& 15 3/4 F.L.

Box #2. — 13 mi (6 specimens &
rough limestone) & 1 K ¼ mi
collection of shells in pail.
and one pkg from mouth of small Canoe
Rita Island is about
1 mi from the mainland and
is about due north of the
end Sand from Rita Island

entrance to the south coral. The island contains about 270 acres. The soil is much several feet deep resting on limestone. The small area cleared up around the hotel shows black rich soil with which is mixed many small snail shells. The cultivated plants growing include papayas which grow 8 to 12 ft high and bear one crop at the age of one to one and one half years. At this time may 20, the fruit ~~near the~~ low on the stem was ripening while that at the top blossoms were still forming. Some irish potatoes, tomatoes and cucumbers were growing

may 20 – afternoon 13

Rock exposed at the entrance to coral on the south side of the island is the same as that on the surface above the coral. See 38 T-L. It contains gastropods chiefly, some bivalves lying loose may come from the mainland at a lower level. The rock is usually very hard and light on the surface altho dark within. However a marly phase is found also, which is soft. The hard rock probably represents the surface material. The preponderance of gastropods especially of minute forms is conspicuous.

May 21. 1912.

Left Rita Blanco at 6 A.M. for the canal. morning clear and light airs and blowing and a little rough.

The fringe of cactus apple along the south side of the lake as seen along the canal is probably a mile wide. The abundant wild plants on the canal bank are cactus apple, moon flower, elder, ferns, and various weeds and grass and vines. The moon flower blossom opens only at night opening at about 6 P.M. closing between 6 & 7 A.M. Each flower is said to open once only.

5 mi out. 7 A.M. A chunk of rock from the canal bank showed the usual limestone formation.

Birds seen on the canal were Heron, black birds, and a parrot colored red headed bird larger than a blackbird. Sir Thomas Riley at the helm looking for a suitable place in which to train Heron for plumage.

alligators very abundant usually saw only their eyes above water. A hawk seen carrying a snake.

10 mi. on south canal the usual bird life was abundant on the surface judged from the canal. Many shells found here including the usual gasteropods some of which bore the color preserved. also corals rather numerous. small collection.

15 mi — Rock zone in appearance and with the bivalves and gasteropods. Big shells.

20 mi out on South canal.
Rock of the usual appearance, fossils not numerous and no collection made. Alligator skeleton taken here. The glades at 10 15. 20 miles out are level, dry + grassy no trees in sight at 20 mi out.
25 mi
The limestone lies somewhat near the surface at 25 mi on South canal and for along there miles the dredge threw out much rock. as usual the limestone is very hard rings under the hammer. This is the prevailing phase. locally it is softer including a mass of shells. The fossils are much the same as at the other localities. Bivalves and Gastropods abundant. Some coral present see collection.

Boxes 3 + 4. from South canal. 1 pkg. 6 mi South other material 24-27 mi S.
9 L.C.

May 22, 1914. Rita Island to Observation Island, clear day, slight freeze in the morning. Started 7 A.M. thousands of midges or blind mosquitoes in the wheat.

Reef of Rock in Okeechobee east or E. of S.E. of Sand point 2 mi about + about 6 mi almost due south of Observation island. The reef of rock is exposed intermittently for 3/4 or 1 mi in a north-south direction. at this stage of the lake the rock stood well above water.

as much or as more 18
rock being select one
locality. See photos 2, 3, 4, & 5.
The top surface of the rock is
exceedingly irregular. the maximum
projection above water being
about 2 ft. The rock itself is
prevailingly oolitic or is
made up of oolitic and non
oolitic fonds. with non
oolitic fonds enclosing the
oolitic areas. Few fossils
were found aside from
fragments of shells. (Samples)
an arrow point tip broken
was found on the island.

Photo 7 next filed is a
peculiar feature of the limestone
indicated vertical cores holed
1 & 3 in above the soft oolitic rock

Box #5. oolitic rock from

Reef in channel 1 mi S of 19
observation Island. also one
pkg. from South canal also
one pkg from ½ mi from
Lauderdale on North canal.
also the recent shells from
L. L. n mrs. Bell Brooks. mrs. Johnston
Parker at Island Hotel.

May 23. Rita to F.L.

Lauderdale - morning clear &
somewhat windy. Start at 5.15 A.M.
arrived at mouth of South Canal
North Canal one hours run.
6½ mi from Ft Lauderdale -
Rock thrown out on both
sides of the canal at the
entrance. This rock is prevail-
ingly of the hard white surface
rock like that seen at the mouth
of South canal. However a few
samples were seen that were
apparently oolitic. This is taken
to indicate that the oolitic
limestone lies beneath the
non oolitic rock. See Samples

Scooted down canal at 6.40 pm.
The custard apple
fringe on the north canal
is dense and as usual is
completely massed with the
moon flower vine. Many
air plants be seen where-
ever the moon vine permits the
trees to be seen.

60 mi. (no stops) The custard
apple on this canal gives
place gradually to the willow
and at one mile from the
lake there is little if any
custard apple to be seen. The
moon flow is still abundant
climbing on the willow &
on the weeds. Good grasses
The willow, occasional custard apple
and the moon flower vine about
2 mi. joining place & maiden
cane and an ordinary morning glory.
Flags, wild millet, sow grass.

65 mi From F.L. Hard white
rock some or 2 feet on South
canal. Few fossils. no samples.

The rock piles along the sides of
the canals are pretty well covered
with shells of the gasteropod (sp sample)
carried there to be eaten by birds.
Runs up by the tempiet. It is
said also that piles of shells of
this species are found around any
object that will serve as a
perch in the glades. "Indian"
mounds may have been found
in the same way.

56 mi - F.L. maiden cane
wild millet, sow grass. Hogs
morning glories, willow, poplar?
reeds, blackbirds. (No stop)
also the somewhat longer tailed with
parrot colored body, red bill & bare
underside of head and yellow
legs. A runner not a swimmer,
somewhat like a rail in action.

5¼ mi — Stop. Small area of rock which is the usual hard white limestone with a few gasteropods. Sod grass has possession of the glades here. No trees in sight. 7.40 A.

Canal turns from due S to abt S.E. at about ½ mi. 7.45 A.

Just beyond this turn very hard chunks of massive limestone white on the surface.

50 mi. Banks of canal about 2 ft. occasional pieces of the hard white rock. (no stop)

48 mi — 8.20 A. Stop.
Heavy chunks of white hard rock. Glades dry.

47 mi at 8.30. No Stop. white rock side.

45 mi — 8.46. Stop. Solid white rock zone as elsewhere

40 mi at 8.30 White rock occasional.

42 mi at 9.14 White rock.

38 mi at 9.45 — See note on this locality on preceding page (9), Trip to the Lake.

36 mi at 10 A.M. Stop. Some white rock.

35 mi at 10.12. No Stop. White rock.

Rock dredged from the canal at about 26½ mi from the lake. + 3 × ¾ from Loxahatchee. The last dug on rock bottom from near the 35 mi from L. (mi 10.18 c.)

30½. The dredge Photo 3. A. 5

+6. the 2nd up the canal. The 4th Copies next, 5 up canal. 6 Looking south. Lap. 5-Sec. 5-Sec. ½ Sec. 2½ Sec. Tub ½ 2 · ½ × ⅛ · ⅛. Rock Sons

29½ mi dinner stop. Rock Some

27 mi. Stop. oolitic rock predominates here, also some pieces of the hard gastropod limestone are found. a few samples

engine trouble at the 27 mi 24
stop from about 1.30 to 2.30

at about 26½ mi the canal
turns nearly south.

~~26~~ 25½ mi (about) 2.40 P.M. Stop
Gastropod rock predominates.

25 mi at 2.43. See note above
This rock seems to be the usual hard
limestone. shells being abundant.

24 mi as seen from the boat
many shells & rock of the
hard limestone mostly.

22¼ mi. Banks low, only a
small amount of rock
thrown out & this is
a friable shell bearing
rock. See collection. 3.15 P.

20 mi banks low & little rock
canal turns here from due S to
due east 3.30 No stop

25
15¾ mi heavy limestone conspicuous

13½ mi 4.20 P.M. very irregular
cavernous, irregular limestone
conspicuous. This rock is not
unlike the matting of sticks in
a hawk's nest. The kind of
rock continues

slopping of the banks seen
to be bad at 8 mi & there to
near the lock.

a large amount of sand
was moved in making the
canal for about 3 mi west
of the lock. The sand being
piled in places as much as
15 ft deep on the original muck.

At 5 mi the oolite
limestone lies immediately
under the muck. no sand or
little.

Boxes No. 6, 7, 8, and 9 (keg) from 2½ mi from F.L. Box No. 6 contains also 4 pkgs. from other localities on N. C. as labeled, including cutcrem & North canal, ledges on North canal etc.

Box #10. Alligator Skeleton.

May 24. Ft Lauderdale

In afternoon walked to the rock pit with about 1 mi S.E. of Ft Lauderdale. The common oolite as seen in this pit is a fossile limestone some shells etc but not many as a rule. The rock is very strongly oolitic. a few hard masses occur. Some of the oolitic [illegible] like concretions are seen. About 12 ft of rock is being worked. The rock on weathering usually shows parallel hard lines in

May 25.

Ft Lauderdale to Lantana and return. Sanford type locality of the Palm Beach limestone 12 mi west of Lantana is difficult to get to. Best reached by way of Boynton. On May 25 went by auto to Boynton, thence due west about 8 mi on bad road, thence N.W. to the dredge then working on the canal for the Palm Beach Farms Co; thence on foot N.W. & west of N.W. about 2½ or 3 mi to the range line canal of the Palm Beach Farm Co. There rock was found which is of a granular texture and rather brittle, much like that seen

The limestone is evidently thin on this canal only a few large lumps being thrown out. Beneath the limestone is found a shell marl which is evidently very general for that section as it is found also 2½ mi east of the range line in canal. Southward [illegible]

May 26
Ft. Lauderdale to Pits by the boat Wanderlust. Lv. F.L. 6.45 A.
6 mi on 7.45 A
Verified the observations on the Miami limestone & the rock. The top surface of the formation is irregular and measurements of the dip can best be plotted from well records.

The high coral forms above the coral we saw from the coral. The glades here are not more than 4 ft above the water level in the coral this is shown by the level of the old roads said as well as by the glades themselves as seen through openings in the Coral. As bearing on the evidence of a flotation of Coral

beneath the Miami oolite see notes of boat drilling at Pits coral rock.
also at Lantana well at about 45 ft end in coral.

9 mi at 8.27 A. The discovery of coral thrown from the canal is gradually reduced. About noon at 9 mi. The muds probably thicken & the water stands against the muds. Shifting Tides not seen beyond about 9 mi.

First of the rock of the next limestone seen or abt 9 ½ mi. only small pieces indicating scraping of rocks or bottom of canal

10 mi at 8.40. Top of Limestone scraped from 9 ½ to 10 mi small amounts being thrown out.
Limestone increasingly abundant and at 10 ½ mi. 8.45 A is abundant pieces the typical hooks not apparent

11 mi at 8.52½
Limestone abundant & of the usual mottled appearance from 10 & 11.
shells not abundant

12 mi. 9.7½ This rock begins to be less abundant at 11½ or 12 mi also typical in appearance abundant again at 12½ mi

13 mi at 9.20. Limestone abundant and seemingly about the same, possibly a little harder.

14 mi at 9.35 (time lost with engines)
The limestone is abundant at first in general is much the same in appearance occasionally ... also not abundant.
Between 14 & 15 mi there are some shells ... not numerous, nor a shell marl.

15 mi at 9.46 – 11 min.
Only a little ... not very definite. Some ... in the glades ... coral. Scattered shrubs throughout.

15¾ mi above, 9.53 First of the heavy massive limestone & this only a reef, & mixed with the other limestone on the bank.

16 mi at 9.56½ – 10½ mi
Some bar ... seen along at intervals. from 15¾ mi.

16½ mi (? –) 10.05 ...
Shells rather abundant for distance.
17. mi at 9.6¾ – 10¼ mi

17⅘ mi – at 10–15 The rocks seem to be prevailingly of the hard limestone type, little if any of the mottled limestone being seen.

18 mi at 10–17 or 10¼ min
19½ mi at 10–33, hard light and evidently a quartered ... limestone first seen from the boat at about. light & soft marl beneath.
Time in coral at 10.30
20 mi at 10.37

Summary of the Canal section.

1. Miami limestone, oolitic and moderately altho not abundantly fossiliferous to + ½ mi above the lock on north New river canal

2. Sand formation from ⅛ mi above the lock to 9 mi or about 9 mi exposure.

3. Matted oolitic ? a granular limestone 9 mi to say 17½ mi, the change being gradual, or 8½ mi

4. Gasteropod limestone with later some shell marl, beginning especially at the turn of the canal at 20 mi + extending to 23½ mi followed by the road limestone shell marl etc to 34¾ mi & there in small amounts to the [illegible] - 61 mi or 48½ mi.

20 mi at 10.37 A.

a good deal of shell in the south beyond 20 mi. large pecten seen at 20½

21 mi at 10.47½

23½ mi abt. 11.13 A the marl which had continued from about 20 mi gives place to or is covered up with or mixed with the large amount of rock rock. See collections

24 mi at 11-17½ A. 111½

~~27½~~ 26½ mi abt. or 11-52½ A. Canal turns N.W, some loose rock.

27 mi. at 12 A.M.

May 27. - Rita &

Wanderlust. Capt Guy Moore

M B Hom. Smith

another mouth of 3 mi canal

Some rock with gasteropods but may have been carried there

3 mile canal shallow. 34
Boat pumped bottom. Lake
~~Hic~~pochee very shallow most
of the way across. Canal
beyond this lake so shallow
that boat pump. probably
about 2 ft.

Rock ledge in the canal
about 2 mi west of Lake
~~Hic~~pochee. Limestone much
like that seen in Lake Okee-
chobee. also a shell marl
lying probably beneath?
the limestone See Samples.

An abundance of shells
marl seen about 200
yards above Citrus
Center. Louis Isenhort
merchant Citrus Center says
some marl found in the wells
at about 15 to 20 ft.

Limestone seemingly as 35
seen from the boat granu-
lar & open, about 1 mi
below Citrus Center.

About 3 mi above
Coffee Hammock quantities of
shell and also masses of
large hard granular
appearing rock. no collections.

Coffee Mill Hammock 4.30

Heavy ledge of rock extends from
here up stream several miles.

At Edge - mi from Lake
hard limestone and scattered marl.

May 28 - Lobelle up river 36
in Louised U B Hom. Pete Emerson
The material at water level & 0 to
5 ft above is green blue marl with
shell stratum on top.
First bend north & south exposure
dip to the south. East & west exposure
about horizontal.
Second bend east west exposure 5
strata about horizontal north to
south exposure dip to the south,
west exposure dip to the S.W.
Dip to the south, dip to S.E.
East west exp about horizontal.
Shell stratum apparently
unconformable on the clay
marl. Shell stratum persists
& gradually dip nearer the
water, & does not conform to
the dip. Long east west exposure
strata horizontal.
Ledge of rough rock comes

in under shell stratum. 37
East west exposure level.
Oyster bar seemingly below to
rough layer. Gastropod layer
found in Lob. Flat. & above
the rough rock, & below the shell
rock.
Stop near old Ft. Thompson.
The blue marl has dissapeared below
water & the rough layer is at
water. The gastropod layer has
increased to 3 or 4 ft. & has two
ledges of limestone. Shell
stratum lying above
Photo 5x7. of Typ exp 1 Ft Thompson
limestone at Ft. Thompson 60 opening
5 sec. f.8 in weak sunlight. Second
exp. large stop 2 sec. The exp.
here is 5 ft of rock. at the bottom
is the rough limestone. oyster bar. on this
is the gastropod marl & limestone
and shell stratum. The top hard limestone
rests unevenly on a marl. All contains the
gastropod Collection

This limestone seems to show distinct small folds of Gadno's Land in R. J. Thompson. See ~~film~~ plate 3.

This limestone dips to the water level about ½ mi & the shell stratum opposite the Some followed from Label. 2 ft thick is in place on top of it. The shell layer not present at Gadno's landing & for ½ mi below, being removed probably by erosion. Collect from this ~~stratum~~ all specimens in place, any one as noted. Immediately on the limestone a thin soft gasteropod layer.

⅛ mi up canal limestone rises again to fully 3 ft above water. The rough rock thrown out from below.

The R. J. Thompson limestone falls below water as does also the shell stratum & for about ½ mi only the shell was reached by the dredge but at ¾ or 1 mi above Gadno landing both shell. ~~ft~~ Gastropod limestone & rough limestone brought out by the dredge. Both limestone & shell thrown out for perhaps one half mile. Then only the shell for possibly a mile. Near the east side of Lake Flirt is seen mixed with the shell a few chunks of the limestone.

On the canal through the eastern part of Lake Flirt gastropod marl is seen in the canal bank & here seemingly on top of the shell stratum. This marl seen continuously to Edge. For a mile or so below ... the ... marl is rarely seen in the bank

Beyond edge of a [illegible] or so
this marl rises as much as two
feet above water level & the
shell stratum is reached by
the dredge, the shells being
piled on the bank.

Just before reaching coffee
Hammock the shell rock comes
gradually to the surface &
is exposed in the banks, and the
gastropod rock is dredged from
the bottom of the canal in
large masses.

The rock at coffee mill hammock
+ contains the gastropods & also
marine shells. Samples.

Photo 4 of coffee mill Hammock.
1/2 sec. bright sun.

Noon lunch left at 12.36 P.

About 1/4 mi beyond coffee hammock
landing the limestone rises to
water level & may be seen in
place. The shell stratum
persists. Boatman Pete Timmons
says that the rock ridge runs in
general south & continues
he does not know how far.

Expense 1/8 mi west of
coffee mill hammock & [illegible] for
Pleistocene shells. None found.
~~Horse~~ forget leave.
also above the marl a limestone
like that of Okeechobee.

Petrosmias - Oyster bar about 1/2
mi below Gardner's landing seemed
from the fossils to be Caloosahatchee
marl. Shell marl on top of this, as also
the gastropod marls.

Clay lenses with the shell
marl & the gastropod marl
unconformable upon Caloosahatchee

just at the edge of Lobelle list on south side of the stream. Sionet Pectens seen in the caloosahatchee marl.

Lobelle 3.30 P.M.

The upper part of the caloosahatchee marl consists of blue sandy marl & oyster beds. At Lobelle the blue marl is some 5 or 6 ft above water level, the Pliocene shell marl on top of this. This shell stratum last seen about ½ mi below Lobelle.

The blue marl of the Pliocene gives place to rough concretionary rock almost a limestone. say 5 ft thick

Rock is seen at a point 4 or 5 miles by river below Lobelle. The pliocene marl on the top of the [illegible] here is apparently Pliocene.

May 29 - Lobelle to Ft Myers.

A phase of the Pliocene marl which probably lies beneath the limestone referred to above is a concretionary stratum, clodons etc lying nearly horizontal but with vertical facules.

6.25 A East & west exp. slight down stream dip.

6.27 A decided syncline in same strata. East to West Exp.

A distinct marl comes in under the rough limestone. Also an oyster bed seen at about 6.30 A. It seems to be this level that holds the elephant concretions as well as the oyster bed.

6.38 A Landing yellow marl at the water edge, rough limestone above.

6.45 A. Short outcrop, 45°, shell marl above. 6.48 + Limestone ledge or [illegible] that, 12 thick.

6.50 West Orm of outstalline
6.55. Ft. Lenore landing. Yellow marl at waters edge. Rough limestone above.
7.06 Landing the yellow marl for some feet above water, the limestone here evidently [illegible] from decay or [illegible].
([illegible] Lobelle say that Lord 45 mi South of Lobelle is a mass of rock.
7.18 [illegible] small outcrop. The limestone is absent [illegible] seems to be remnants. yellow marl probably 8 ft exposed in [illegible]
7.26 Landing. Only the yellow marl seen in the banks. The concretions from up stream are here being used, after breaking as material for concrete.
7.30 Limestone again seen

in the bank probably in a syncline.

River Heights 7.35 A.

7.45 A. Landing. Yellow marl at the water limestone above. Flowery Grove

Chuckdohee formation
Ft. Thompson limestone
Caloosa Hatchee marl
Lake Flirt marl.
Englewood limestone.

Alva. 8.20 A. Yellow marl shows at the watersedge at Alva.

8.40 A marl seen at landing [illegible] 1 ft. station Caloosa.
9.47 Normandie - decayed marl at the waters edge.
Some marl seen for a mile or so below Normandie & as far as the next small landing. Bakers Grove!
9.72 Olga. Some [illegible] marl apparently.

Flowing Orbicon well of Sulphur water at Hall city. Also well with strong flow reported in Edge at east end of Lake Kirt

Washing Plant of South carolina min & mfg Co. built 1914.

The ~~matrix~~ rock as pumped from the pit enters a receiving box 6 x 4 ft + 4 ft high, made of rough 2 in lumber. From this box it flows through an opening at the side into an inclined chute made of similar rough lumber, the sides of which are ~~with a~~ at which the bottom is ~~b~~ has a 3 x 5 ft 1/16 in. mesh screen. The fine mud sand etc. which passes the screen enters the waste flue. That which does not pass thru this screen falls into the low end of the first log washer. The escape for water from this washer is through an opening at the side near the middle. Thus

permitting the partial settling before the water escapes into the waste flue. The log washer is also constructed of rough 2 in lumber the box being about 20 ft long by 4 or 5 ft wide. The logs proper consist of teeth bolted to a ~~of~~ steel frame. Each tooth is about 3 in + 1 ft 3 in + sets with a broad inclination. The rock is pushed forward by these blades.

From this log the rock falls on a ~~second~~ double inclined screens. The first of these has 1/2 in or 3/8 in openings, the screen beneath is parallel and has 1/16 or 3/16 mesh. The rock from the top screen goes to a rock crusher; while that from the second falls directly into the second log. The material that passes the second screen goes to the escape flue.

The rock crusher ~~is~~ also serves to pass between plates about 1/2 in

The second log is like the first, the escape for water being also at the side. 48

From the second log the rock falls onto double jig screens, the first of these has a $\frac{3}{8}$ in mesh, while the second has $\frac{1}{16}$ or $\frac{3}{64}$ in mesh. The rock from both falls in the catch box from which it is elevated by endless cup chain to the loading bins. The water passing both jig screens escapes to the flume.

Coff. miner says that rock in this pit 12 to 15 ft. and that the boulder & torn matrix to 1 ton plat. also samples of mud in dump analyze 25% also not this the sand. beneath the ore is less than 25% in the dump

49

Sor ore 20% thin
from 8 tons matrix
Some $\frac{3}{4}$ ton col. phosphate
waste $1\frac{3}{7}$ " " "

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crushers have been in use by Smith for at least 2 years. The inclined screen instead of separator probably not more than one year.

at Sutcliffe see C C Rudd

and H. C. Adams, west of adams ore

Sutcliffe Rings

and Livingston Plantation or

Alvarado or Medary.

51

Jaw in possession of Amal. Phos. Co. is apparently Television fonigh, see sheeted. Nat. Size made from the specimen.

Small Mastodon tooth - probably M. Floridanus. also water worn coral weighing 1½ #. Piece had been broken off the specimen but bone. weighed 1¾ or 2 # originally.

Photo of jaw mentioned above & two fragments of another jaw. and end of crocodile upper mout.

Film 1 - 64 stop - 5 sec. 6 ft.
" 2 - 64 " - 3 sec "
" 3 - 64 " 10 " "
" 4 - 64 " 3 " "
" 5 - 64 " 4 " "
" 6 - 64 " abt 5 " "

N

This sketch was to illustrate local dip in pit 7 the Amalgamated Pho Co. A spot of the coarse sand only, the phosphate shown dipped towards the centre of circle from phosphate bearing sand. Area not a circle but rather a broad arc, to the S. the rock on north the level continued horizontal.

The rock of the Amalgamated Phos. Co. is high in specific gravity; the sand also is coarse.

at Arcadia Nov. 7

Examined old Pine mines near Arcadia Seems to be confined to the Pleistocene flood plain of the Peace Creek which in places is perhaps 2 mi wide. Phosphate stratum said to be 5 or 6 ft deep.

Nov. 8 – 10.

Re-examined the locality of the mouth of Mare Creek, 6 mi N. of Arcadia. No exposure is now found at the river, but exposures may be seen on the creek abt. 300 ft back from the river. The lowest rock exposed is clearly the "bed rock" of the land pebble phosphate country. See former notes.

On this is about 1 foot of phosphate pebble which is entirely like the Bone Valley formation. The phosphatic sand

rock lies on a stratum at the top of the pebble phosphate. This is the rock that Hall identified as old Pliocene.

Excavations made the following day. Nov. 10. show that while this stratum is chiefly at the top of the phosphate stratum yet similar rocks are seen throughout that stratum. Their accumulation at the top may be due to their remaining longer than the phosphate rock which is decaying.

No distinct bone bed is now seen at this locality. Broken ribs however are rather abundant on top of or with the sand rock.

A close examination of the phosphate shows that light colored pebble predominates. The matrix is clayey in both characters it is unlike the Pliocene bone beds of Arcadia.

No fossils were found in place. Also one large shark tooth & one fossil Ves hesperian tooth in the float.

Nov. 10. Also examined sections near the bridge at Brownsville. On east side of the river about 50 yds above the bridge is found the bed rock covered with fragments of the coarse phosphate & pebble sand rock. The sand rock is not in place. It is fossiliferous & on more rock. No determinable fossils found here. Also broken ribs fragments are present.

About 300 yds up stream in a sharp bend on the east side is found the following section:-

The usual incoherent yellow gray sand 4 ft.
The " coherent yellow sand & clay 6 "
Black fine pebble phosphate intermingled with sand. Contains also matrix and a few fossils. This stratum is clearly Pleistocene. The phosphate pebble is much finer than that on Myrtle Creek. It is also free of black pebble.

Fossils found:
Recent shark teeth in place.
Fine elephant teeth not in place.
Teeth fragments Rhinoceros?
Teeth 1 shark one ray.
Broken ribs. Arca fossil.

No bed rock seen in this exposure.

On the west side of the river abt 56
100 yds above the bridge is found
an exposure of the bed rock with the
usual coarse conglomerate material
lying over it.

Fossils found were bone of deer long
well up the trunk + neck of bacon? tooth
on the bed rock.

Nov. 11. Charlie Apopka Creek.

Exposure of Arcadia marl "bed rock",
at first bend of river up stream
from bridge on the public road. on
north side of stream.

up stream about 3/4 mi above
bridge on north side of river. The
section here is:-

1.	Bank soil etc & covered	8 ft.
2.	yellow coarse sand cross bedded. having thin phosphate layer at bottom	1 1/2 ft.
3.	dark sand stratum	1 "
4.	Sand giving place below to sticky blue clay	2 "

2)

Fossils observed in place in the 57
phosphate layer were
Fish vertebrae (discarded)
shark tooth "
Fossils found in the float were
Fragments of mastodon tooth
not determinable as to sp. (discarded)
Fragments of tooth of Elephas "
Tooth of horse. Equus (saved)
Shark tooth "
Turtle remains (discarded)

about 1 mi up stream from bridge
the river is cutting off oxbow + has
cleaned off to the bed rock. The principal
part of the stream however still
follows the old channell. In the
Arcadia marl here is found
many rock identical with those
containing the "Pliocene" fossils
at Moore Branch; also broken
ribs + phosphate. At the bar found
below the cut-off collecting is good for
small teeth of ray + sharks.
Fossils obtained
Ray + shark teeth, many.
one horse teeth Neo? Turtle remains.

About ½ mi above this cut off on the south side of the creek is an exposure in which 24 ft of phosphate stratified beds is seen lying unconformably on the Arcadia marl.
The section is about as follows

incoherent gray sand 4 ft.

yellow & gray & less coherent clayey sand about 8 ft.

phosphate stratum 1½ to 2 ft

Arcadia marl.

Fossils from below included elephas, fragments of tooth & tusks.
a little farther up stream may be seen 10 ft or more of the porous rock exposed on the north side of creek.

NOV. 12 –

From Gardner examined the Peace River from the Gardner Bridge to the entrance of Charlie Apopka. The Arcadia marl is exposed along the river at various localities. On the marl is the phosphate stratum two & three feet thick. Wherever benches occur the coarse material of the phosphate bed is strewn over the ground with the usual fossil.
On the east side above the bridge on one such bench was found large horse tooth in float.
The best exposure as well as the best collecting locality is that on the west side opposite the entrance of Charlie Apopka.
Here the section is as follows:–

Bone bed, loose sand & yellow clay, 6 ft.
Bed of phosphate & some fragments 4 ..
coarse dark phosphate
sand bedded & water 3 ..

15 ..

The fossils found in place were one rhs tooth in phosphate bed 8 ft from the water & within 6 in of top of the bed of that spot.

In the debris from the bed was found many horse teeth. Equus & neohipparion. Turtle. etc.

Nov. 13 - mines of Charleston Mn. & T. Co & Coronet #2.

At the Charleston mine. A. L. McMillon who is in charge of removing overburden has two mastodon teeth. one of which is small while the other is large. about 2½ by 5½ in.

At the office met Mrs. Rowell son of the Rowell of Charleston. also McLain Chemist.

At Pembroke mine had lunch with S.H. Goode chemist. also son Green, & met Mrs Andrews and Mr. Hobney.

In the pit of this mine along the east side is found some fossils of interest. From the overburden which is here a phosphatic grayish. perhaps also calcareous, was taken a Conus. a byozoon.? Turritella, casts (discorded) & undetermined fossils markings. while the shell casts and the byozoon? may have been washed into the deposits, the Conus and Turritella at least have the appearance of being indigenous. thus indicating a marine facies in the formation.

Of special interest is the presence within altho near the

top of the phosphate stratum 62
of an oyster bar. These oysters
which are silicified occur in masses
lying in clay & phosphate pebble
for several hundred feet. The
oysters are positive evidence of the
marine conditions prevailing
during the formation of the
land pebble phosphate.
From a lower level in the formation
was taken Conus. also a [illegible]semicardium?
a sharks teeth,

From the loose material coming
either from the overburden or the phosphate
or both was taken some oyster as
from the phosphate stratum,
shell casts, etc.

Habney + Gooch showed locality in
the valley of Peace creek where some
shell were supposed to have been found
in the phosphate. While none were
found in the two holes put down

it yet seems probable that 63
the shells referred to were the silicified
oysters as seen in the pit. The
phosphate in this swamp has only
about 8 & ft. of overburden.

The topographic map of the
property shows a change of level
from 78 feet in the river valley to
137 - (or 138 +) feet near Pembroke Station.
The station itself is about 135 feet.
a variation in level of approx 60 ft.

Messers Gooch + Habney +
Green think that the pebble at
Pembroke is harder + has the
appearance of being broken. thus
differing from that at Coronet #1.

Nov. 14 - Raining at Ft. Meade.
Visited Jane Jay. Plant not working
Cleveland Perry. mgr. was there + says that
the company will plant 12 acres of watermelons
on the sands of the phosphate dump + will use on
it the usual watermelon fertilizer.
also other stuff to the plants.

Tilghman phos. co or
Bowling Green operated no works.
Mr. Hawahan now in South Carolina.
Mr. Singleton in charge of the plant.

Nov. 15 - Sunday.
Travelled from Ft. Myers to Alva
with Henry Hendry. Had dinner
at north bank of River above 6 mi
down from Alva. Here a fresh
water marl with Planorbis + Physa
is exposed at the waters edge.

Nov. 16 - at Alva. marls exposed
2 or 3 ft with oysters, Pecten
etc, one phosphatized shell taken
in place in the marl. Many
such shells in the river bed. +
have been dredged at John English
place 1 mi down river from Alva.
The phosphate pebble is small
dark + often exhibits casts of
bivalves or gastropods. Some
phosphate said to occur in the
river as far up as Ft. Denaud.
Fairly rich phosphate includes ray + shark teeth.
+ some bones.

02

Wells at Alva flow at
100 ft ±. Mr. English, sr. J.
says that bed wells 120 ft
as follows 5 ft marl like that
on the surface 30 to 40 ft
medium hard rock. 30 ft quick
sand. ~~total~~ 120 ft.

Ft. Myers to LaBelle by land
33 mi. Ft. Myers to Alva 19 mi.
by land. Alva to LaBelle 14 m
by land - Alva to Denaud
7 1/2 mi by land. Denaud to LaBelle
6 1/2 mi by land.

Rough concretionary limestone stratum
varying from 2 ft to 6 ft thick + at
LaBelle to 002 in. is seen from
about 1 mi above Alva to

This limestone where first seen
1 1/2 mi above Alva appears as
residual fragments not in
place. It is found about 2 mi
north of Alva where it is worked
for concrete material. Doubtless

the stratum originally extended farther west on the river having been removed by decay. Back from the river on the north side it is traced farther west.

This stratum is seen in place in the river bank scarcely more than ~~3/4~~ mile above Alva. From here it is continuously being observed from the section when first seen it lies at the top of the section, & here lies near the bottom of the section.

Beneath the rough stratum is a marl which as a yellow sandy marl with fossils. At Alva this marl contains large oysters and Pecten. At Hansford landing 20 ft 3 feet of this yellow marl is seen beneath the rough stratum & just beyond

it ft is seen. 5 ft of the marl is seen in an anticline about 1½ mi above Hansford. 6 or 7 ft on the north fork about 3 mi above Hansford. This is the maximum thickness exposed of this marl. At place of the marl at a point about 1 mi below Huggetts landing is seen 3 ft of this marl which is very fossiliferous. Angel wing abundant in places. also Pleurobis. Physa abundant. a second locality in which angel wing is abundant 1½ mi N of Alva Huggetts landing.

About midway between Rice Heights and Hansford on the north side of the river a thin outcrop of a phase of this material unlike that seen elsewhere. consisting of clay chiefly with calcareous seams occurs through the clay. Few or no fossils. This phase seen nowhere else.

This marl in the vicinity of Lebec becomes more sandy and less fossiliferous. The first appearance of this bed is about 2½ mi above Haspels Crossing on the north fork of the river. From this point it persists to Ft. Thompson where it does not appear above the bed of the stream.

At top of the rough stratum is shell marl. Hence but little moisture the shell marl is usually absent on the anticlines & remains as a remnant only in the synclines. However, it is well developed, reaching a maximum thickness of 6 or 7 feet. The shell stratum is first seen on top of the conglomerate lying on the north bank of the river about ½ mi up stream from ~~Bird Heights~~ Hansford lying in syncline. At this locality about 1½ mi below Ft. Hanley this marl is well developed in a small syncline. The section here includes Basal limestone & marl; marl shell marl, then hard limestone, then shell marl again.

Nov. 21. 1914. Fuller's earth mine of Florida Co at Jamieson. in company with McGowan and Shores of Geo.

The overburden being removed is 1 to 4 ft. and consists chiefly of the usual coarse sands, prevailingly red or yellow grey. grading below usually in two or three feet of "pipe clay". blue stiff clay & this on the top of the fullers earth bearing "shot head" which seems much like decayed fullers earth.

The fullers earth stratum here is 12 to 15 ft. averaging about 13 ft. a sand stratum lies below. thickness not known.

The overburden is removed with an orange peel dredge while the earth is taken up by steam shovel.

The earth is carried to the pits in small cars & is stored temporarily. is carried by belt carries & a pulverizer. This is made of two

port. The first is a ~~which~~ ~~which~~ cylinder which revolves at 600 per min. The second is a cylinder that has some knives set across its face & revolves at 900 per min. The shearing effect of the knives cut & crushes the earth for the driers.

The fuel used in drying is mexican oil. Two driers in use. In one the earth enters the hot end of the cylinder & drops out the cool end. In the other the earth enters the cool end and drops from the hot end. Said to be equally successful. No precautions to prevent over-heating. Earth put on market as 15–30 mesh. price about $11.00 up to about 100 mesh price about $8.00

June 10, 1917

Barometer at Hotel 8 a.m. time 9.40
meter [illegible] 1.0110 small t 49.2.

Wakulla depot 20.
meter large 1.01 24 small t 63

Wakulla River 15 time
meters 10127 t 66.3
direction from Wakulla S 45° W.
From Wakulla River S.E to crossing of Crawfordville – St Marks Road. 69.0
Traveled on St Marks – Crawfordville Road to crossing of Shell point road
Shell first crossing of Crawfordville Rd

Shell point 9 mi
meters 10139 72.2

Shell point
meters 10142 81.1
Tolla to Shell point. 32.

Medart
meters 10150 t 89.8
Donkey sop. [illegible] on Allens farm
4 mi [illegible] of Medart. ~~70~~
Sopchoppy. about 70
meters 10157 and 87

Fuller lett

metres 131624 01.2-.4

[illegible] 80 or 5.30

by [illegible] [illegible] [illegible] 70 or 5.46

Bank

Barrel

Boards for box 19 1/2 in long
by 12 1/2 wide (or 11 1/4 wide)

Peter Pierson. —
Lowes Smithtown —