

NO

No. 26.



PROPERTY OF
CALIFORNIA STATE GEOLOGICAL SURVEY



No. 2.

Indexed June 18, 1915

Given temperature T reduce to C . $X(F-32) \times \frac{9}{5}$ 1
 " " " " T mult. $C \times \frac{9}{5}$ + add 32.

1. Sec. ft. = 7.48 gal. water per second.
 1 in rainfall on 1 sq. mi = 2,323,200 cu ft water.
 1 horse power = 550 foot pounds per sec.
 " " = 1 sec. ft. falling 8.80 ft.
 1 gal. distilled water at $60^{\circ}F$ = 8.3328 lb.
 1728 Cu in. in one cu ft.
 231 " " " " " Gallon
 1 cu ft water = 7.4805 + Gals. = $7\frac{11}{231}$
 1 sq mi = 27,878,400 sq ft.
 1 gr. = 17.14395 + parts per million.

1 CM = .3937 in. 1 M = 39.37 in.

To estimate the flow of a stream,
 multiply the effective width in ft.
 by the average depth in feet by the
 rate of flow in feet per second gives
 the flow in cu. ft. per second. multiply
 this by 60 to get the flow in cu ft
 per min. and again by 7.48 to get
 the flow in Gallons per minute.

Given phosphoric acid to obtain
 calcium phosphate multiply by 2.184
 Given calcium phosphate to obtain phosphoric
 acid multiply by .458.

Stimberly - Feb. 11-13.

At Mutual #8 Mr. H. L. Dennis, foreman
 of the picher belt has promised to save samples.
 Mr. Silas, superintendent of the mine also promised
 to have specimens saved.

At Cummer #6 Mr. J. W. Thompson, Supt. promised
 to have all specimens saved. Will send them to
 us if we wish.

At Cummer #9, Mr. H. F. Robertson, ^{Supt.} and W. W. Lee, promised
 to save fossils.

At Franklin #4, Mr. J. C. Freeman, Supt. promised
 to have men save fossils. Saw men in pit but
 none saved. Saw Norfleet, Jr. but he had no
 more fossils. Promised to save them.

At Franklin #2 Mr. J. J. Martin promised to save
 fossils. none now obtained.

At Cummer #11, Mr. H. L. Hodges, Supt.
 Saw Mr. Hodges but no fossils.

Butter #3 did not see Mr. A. C. Fowler but saw

O. B. Vangant, ^{man in shop.} who promised to save fossils. Some
 shows teeth obtained from Vangant.

Given temperature F to reduce to C . $X(F-32) \times \frac{5}{9}$ 1
 " " " C " " F mult. $C \times \frac{9}{5}$ & add 32.

1. Sec. ft. = 7.48 gal. water per second.

Mistral J. Mr. Tower not in. Mr. D. P. Nodds,
bookkeeper promised to still save fossils.

Cummer #8, Mr. T. C. Bailey, sups. promised
to save specimen. Some teeth obtained today. ²/₁₁/₃

Bunnellon 2/12/13

At Buttigbachs Bone run mine some teeth etc obtained from negro on picker belt. did not see the supt.

at Buttebacks Run mine some few bones were
obtained through Mr. F. H. Johns. Johns has charge of
engine room I think.

At Culler's river mine made arrangements with men
on Baker belt for fossils. J. L. Cornell, supt. did not
see him.

At Buttgenbachs "grig" mine saw man on piece
belt who promised to save fossils.

At Camp's 2 log mine Mr. Shiotto says no fossils
have come up yet.

at camp mutual mine Mr. Jack Boyd, supt. See Prices belt
at camp Sugar Hill, few fossils, from J. W. Pratt, supt. Panning
to save them as they came up. Inverness, 2/13/13

At Holder Pk. Co. plant #2, 4 mi. S/E
of Imuris, nr. N. L. Bassett, super.
promised to save fossils. none turning
up now.

at Southern Phos. Sewer. a - 1 m. S/W of
Immaculata, Ind. Oliver, supt. promised
to save fossils. Not mining deep now
and no fossils coming up.

Saw Mr. King, supt. Durrellon 11 & 12. He advised our letter and promised to save all fossils that turned up. He said nothing so far had shown up. There two mines close to Hernando.

Durrellon #2 H. G. Terry, supt. did not see him, was in business. man on pick belt promised to save some fossils.

Durrellon #4 J. H. Hane, supt. Obtained a lot of fossils from Mr. Hane. He promised to save more.

Durrellon #8, L. A. Boswell, supt. Had not yet saved any but promised to do so. This mine near Hernando.

Brittgenbach's syndicate #3, H. H. River, supt. Holder, Fla. Will save fossils. This mine just began operations again today, 7/13/13. This mine about 4 1/2 mi. N 1/2 of Hernando, near Durrellon #9.

Floral City.

Dutton #24 & 25, J. B. Townsend supt. did not see him but man pick belt promised to save fossils.

Bradley plant B. J. Thines, supt. Has a collection now and will give to us if Mr. Bradley permits. This mine now shut down but prospecting for another location now.

Estachetta, Bill Gerard, supt. Promised fossils. These people just beginning operations again after closing down for 5 months. Plans unclear.

Mutual (new and ^{#3} old) H. H. Dunn, supt. The old plant not operating and the new one not quite complete. The human remains reported found by Mr. Dunn were found in Suwannee Co., and Dunn says new finger bones.

Croon,

Supt. at F. Godwin.

Pebble phosphate district.

7

Dominion Phosphate Co. Mr. Waldo.

Christina.

H. M. Clark, Supt.

Phosphate Mining Co.

Hans, Working boss.

Medulla,

Standard Phosphate Co.

H. A. Evans, Supt.

men in
office

A. D. Castel.
C. G. C. Wright.

Christina, P.O.
~~Medulla~~

Mr. Smith, in charge of pits.

Jager Bay, P.O.

B. H. Griffin, Supt. Min. Dept.

J. Maxey, pit foreman, #1.

R. W. Herertz, pit foreman #1.

} night & day.

{ J. L. Clark, floating gang foreman. }

A collection made by me and sent in, Bones, teeth etc. a lot of fossil wood in this pit (#1) A fine piece at least 3 1/2 ft long was picked out and stored at the water.

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At Dominion I saw Mr. Waldo and obtained a few teeth and one vertebra and one calcareous pebble.

At Swifts mine saw Mr. H. N. Nelson, Supt. Min. Dept. Not working at this end now but promised to come when they commence again. Mining at Alafia and he will ask them to pave. Mr. Nelson states that he found a large tumor in mining here but as soon as air struck it it fell to pieces. Large number of bones also found.

Mr. J. B. Burrows, Gen. Mgr. H. A. Phos. Co.
Barton, Ill.

At Armour's Mr. Nap. did not see him. Went down to pit but could do nothing. They mine with steam shovel.

At Phosphoria, Prairie Pebble, Mr. Hull, Supt. Saw a Mr. E. G. Hole, who has charge of pit. He has saved a good deal of stuff. Two large shark teeth and a number of small ones, and a number of vertebrae.

At Pierce did not see Mr. B. Lums who
is supt but saw S. N. Powell, pit foreman
who promised to save samples. Not mining just
now, stripping overburden and getting ready
to mine rock.

At Chicora H. Hatrick, see him about
specimens. Mr. Powell says he has a collection

At Royster mine Mr. A. A. McLeod, supt.
near, ~~out of the~~ office -
Sheppard, supt. of pits.

I saw Mr. Shepard and went through the
pit with him. He promised to save
any specimens that was found.

Florida Mining Co., Mr. Blood supt.
Mr. Blood says that not a great deal of
fossils are coming up now. He promised
to save all that might show up.

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Brown phosphates of Tennessee. ¹²

Examined Sept. 25, 1913.

Pit of the Jackson Phosphate Co. now owned by the International Agricultural Chemical Corporation. Section in the pit:

1. About 8 to 10 ft of overburden, dark or redish in color, not much indurated. Comprising of clay, some phosphate & some sand.
2. Shelly phosphate rock breaking up into pieces of varying size. Some of the phosphate is in the form of small variegated pebbles which in mass have a dark brown color and known as much. This much common in the pits.
3. The phosphate gives place below to dense blue limestone. This limestone often projects into the phosphate stratum as peaks & knobs.

This section about the same for all pits. Greatest thickness of rock seen was about 18 ft.

method of mining Tenn. phosphate.

The overburden is removed by scraper, by hauling, by steam shovel or rarely by hydraulics. The rock is taken up by shovel or a mine at the one plant is using hydraulics (Blue Grass Phos. Co.).

methods of washing.

The phosphate rock is allowed to go through a log washer, then the small material goes into settling tanks. Usually two or three tanks are used.

Blue Grass Phos. Co.

The method used at this mine is as follows. The rock is pumped by hydraulics to a sump hole at the plant, is then picked up by an endless cup chain carrier and elevated to the washer. It is then passed through two two log washers. The logs are of steel. The water is let in at the low end of the logs. From the washer the rock passes over a 16

mesh screen. The larger rock drops to the shipping pile or rather the pile for drying. all material that passes the 16 mesh screen passes to settling tanks. The first tank is large and shallow, and the bottom is raked by chain drags. This removes the larger material to another settling tank from which it is let into a bin & then lifted by crane to the storage pile. The overflow from all these settling tanks is carried back to the sump hole or to a pond near the sump hole where all the fine material accumulates. The manager of the plant estimates that about 25% of the material fails to pass the 16 mesh screen. He also believes that about 60 to 68% of the material mined is saved. A picker belt or rather a chain picker belt is used. The Rhum Phosphate Co. is reworking old pond of Mt. Pleasant. Using suction pump & improved washer.

Fauxite deposits on
Mission Ridge. Tenn.

15

The fauxite is mined by shovel & lifted
by cable lift. The overburden is red
residual material. The fauxite is
dried by rotary driers.

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The phosphates of S. C. were
examined at the mine of the
Charleston S.C. Mining & Mfg. Co.
about 13 mi. N.W. of Charleston
on the Ashley River.

The overburden 6 to 18 or 20 ft
is removed by steam shovel
and is dumped into the old cut
at pit no 2. the overburden being
removed was about 10 ft thick
and consisted of blue clay,
yellow sands. all soft. In
places elsewhere the overburden
is said to be hard.

The phosphate stratum
has a thickness of 6 in to
14 in. at this pit it was
being removed by a dredge
the two parts ^{of the cut} being forced
together by steam pressure.

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The material under the plaster
while not entirely level
is sensibly so having no
great irregularity. In character
this material where seen is not
unlike that of the hard
pebble rock & the sample
obtained had fine fawn
pebble in it.

The plaster rock itself
includes light colored irreg-
ular pieces, dark flinty flint
irregular pieces, small flinty
pieces pebble & plaster-
type cast of shells.

The method of working
~~includes~~ is by cylinders having
rollers to keep the rock

moving. They are inclined the ¹⁸
rock entering the lower end.

The fine material escapes
through perforations in the
end of the rollers and
finally through a screen
at the upper end, the
moving screen, as the
drop the material that
was carried in the work is
seen to include plaster
rock pebble up to a $\frac{1}{4}$ in.
thick by a half inch or so
wide and silica or sand
pebble up to $\frac{1}{4}$ in thick. Also
much fine pebble & sand &
some fine loam.

The rock is shed by wood in
sheds as in the hard rock factory.
The sheds are lined ^{2 of workers}
were formerly used

Notes on clay testing machinery. 20

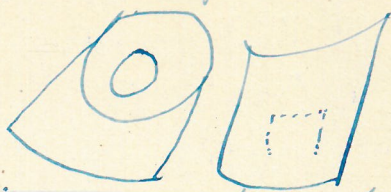
The W. S. Bunker & Stuedes has
a very complete clay testing
laboratory at Pittsburg (39 + Butte Sts).
It includes, two electric heated drying ovens,
one large steam heated drying oven,
one gas heated drying oven, shelves
for air drying. This in one small room.
Also, Fairbanks tensile strength
machine, a small mixing pan
operated by belt for dry or wet
mixing. One small machine
for making and cutting (end cut)
full sized bricks for testing.
One larger machine for making
sewer for making full size
paving brick. One large
mixing pan for wet or dry
mixing. Two brick kilns for
furning full size brick. All of this
in one large room. Belts & motor for the machinery.

Also a small oven for ²² layouts
 on days. Also a oven for
 refractory clays, also a
 large size standard brick
 rather testing machine, and
 a small not standardized
 testing machine for firebricks.

Professor Plummer in charge.
 Mr. Geo. Brown assistant.

This is only a partial list of the testing apparatus of mud & Chis. Especially of the former & high temperatures. This is made as follows: for the central cut shaped part take one fine brick and pound up to the consistency of coarse sand. Then take Fla. white clay or any good fire clay and mix and make a stiff mass. Then mould cup of desired size around a wooden block. Support this cup on four pins of fine brick. These resting on a foundation of fine brick. Build the sides of

fire brick blend as to make a circle around the cup leaving a space. Support these fire bricks by an iron band made of the proper size. size about 1 1/2 ft in diameter by 1 1/2 ft high. inside cap about 6 in. in diameter & 8 in high.



entire for testing clays & made by Prof. W. W. W. W.

Test clay as follows

Raw classification:

Appearance, color & homogeneity.
Hardness or rather resistance to pulverizing.
Optically apparent impurities.

Test for carbonates by HCl.

Find water of combination (this is known to be practically immune to the alkalis & to increase as the fusing point

uses. See Watts Ball Run²⁵
of mins No.

Kind fineness of grain, for this
purpose get sieves from
W. S. Tyler and Co. Cleveland O.
Get 20, 40, 60, 80, 100, 120
150, 200, 260, & 300 mesh
sieves. For still finer separation
See Watt. Ball. Bureau of Min. & Geol.
W. S. Tyler for Cat. no. 40.

Kind sloping properties for this
see Hatch.

For plasticity or moulding test
use standard sands obtained
from civil Eng. house such as
are used in cements. Determine
plasticity by the amount of
sand used by the clay.

Kind
Amount of water necessary to²⁶
mould. (see Hatch).

Drying behavior, including cracking
warping, efflorescence
shrinkage and tensile strength.

Burning behavior.

vitrifying temperature and the
deforming temperature.

color in oxidizing and in
reducing temperatures or conditions
shrinkage in oxidizing & reducing
temperatures or conditions.

Tensile and crushing strength.

Slake

Absorption test.

Examined various lab for making cones
and testing clays.

Notes on the country from 27th Washington to Columbus via Pittsburg.

Out from Washington on the B & O
crack on rock for some distance
probably 20 miles. Quercus, growth,
etc. Some sedimentary rocks
which weather red, following
which are igneous rock. From
16 mi or so east of Harpers Ferry to
that point are some cuts through
sedimentaries which on the Geol.
map of Delaware 1897 are shown
as Cambrian.

Beyond Harpers Ferry where the
B & O crosses into W. Va. the country
is more level and is underlain by
sedimentaries and mostly limestone.

A particularly fine outcrop on the
westward side of the Potomac river
is found at 12.30 P. (Lewis workshop of 10th).
This is about 75 mi east of Cumberland

about 40 mi east of Cumberland²⁸
is seen on the north side of the Potomac
some fine ridges, the sedimentary
rock standing on edge almost to
the soft and hard layers projecting
as ridges.

Again one or two miles out
going west from Cumberland fine
rocks on edge are seen. Also B & O
here passes through pronounced G&P
following a small stream.

In Penn. Oil wells are numerous
from near Washington to Taylorville
en route B & O & Wheeling. a 500
at Wheeling a number of oil wells
are seen. Also coal mines in Ohio
for some distance west of Wheeling.

30

30

Section $\frac{1}{2}$ mi above what spur
 of Rock Island & the spur
 No. 1. Rock extending nearly over the river &
 present stage (about 2 ft above the lowest
 muddy) Rock silicified in places & unstratified
 elsewhere. *Ceriodulus* abundant, also
Chelonic (rare) and a few other fossils. Varying
 regards this as the base of the Alton ~~Bluff~~ the top
 of the Chert (Tampa).

November 4, 1913 Section at Spring ^{230 ft. 32}
 above Rock island on ~~right~~ ^{left} bank of River. in
 Sumner Co. made by Vargen. with E. Sellsch.
 lower work bed, $2\frac{1}{2}$ ft of low water.

Pecten sayonur. *Ostrea maurensis*.
Anomia sp. *Siderostrea* ~~Gomoptera~~
 probably *californicus* Vargen inv.

This bed No. 2. No. 1. is rock island.

Bed No. 2 dip about $2\frac{1}{2}$ ft in 50 ft. or
 $5\frac{1}{2}$ ft, or ft. direction South 30° east. ^{western}

Black shiny phosphate pebbles small but
 visible with the naked eye in this bed

Clear grained quartz sand. *Monete* Rib line.

No. 3. $4\frac{1}{2}$ ft 6 in more with abundant?
 small shells, also *Ostrea*, *Pecten*,
 small phosphate pebble & clear sand as below.

No. 4. 14 in more calcareous & with few or
 no fossils.

No. 5. ^{$4\frac{1}{2}$ ft} ~~15 in~~ clear grained sand with thin
 calcareous or phosphatic cement, & with
 phosphate pebble. *Arbitolites compluvatis*
 abundant, also *Ostrea*, various *Pyrozya*
nullus & *Gastropods*. Shells both etc.

No. 6. 1 ft greenish clay.

" 7. Clay concretions.

Above No 7 covered & sloping to $4\frac{1}{2}$ ft
 above water level. Many *Ostrea maurensis*
 and *Cyatha* weathered out at level 4 or 5 ft
 above No. 7. Flat found to about 13 ft above
 No. 7. *Monete* Rib? in the flat.

Right fork from Spring 2 mi 33²
 after white spring 25 ft from here
 Left fork 22 ft above the water

30 ft down stream from Red
 Island the mud or 27 ft is of
 water level. & 100 ft further the
 nodular layer thickens & comes to a nearly
 to the water level. A distinct ceph
 layer here is 2 or 3 ft above the
 nodular layer.

Foss

N.W. 3. White Springs 34

Time 8.06 A.M. Hotel. Brown
 at 2.25

Station at 8.18 2.30

8.25. 2 mi from town, 1 mi from
 the River: Boat 2.40

1 mi from River 1.80
 E. 20 Bluff of river. 1.80

Flat over the River 1.75

on top of
 20 Bank of the river at the falls 1.60 - 2.20
 on top of Bank of River 1.75 - 11.00
 at Hotel 2.15 - 12.30

at Hotel or 1.38 2.25 -

On banks of river of Bridge 2.25 - 2.40

" " " " 2.00 - 3.45

at Hotel at 4.10 2.25 -

Nov. 6 " " 8 P.M. Nov. 6 2.50 -

" " " " 9.20 A.M. " 6 2.30

" " " " " " 2.15

across the river 2.35 -

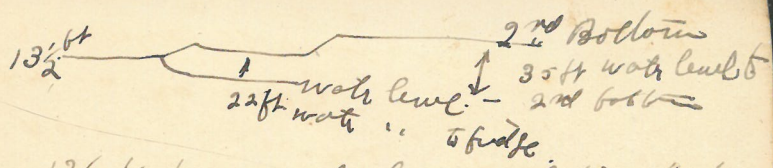
at Lake City 9.45 2.29

9.47 2.30

2.40

Section of the fall about 35
 4 in. above white spring. No. 5.
 Vosslegru, creek and
 Sellaas,

1. white silicified clay apar-
 antly calcareous, conchoidal exfoliation
 at water level below the falls. 2 ft.
 Specimen taken
 Few if any fossils.
2. Greenish yellow fulls earthy. 15 in
~~some sand~~
3. impure sandy clay 2 ft - 6 in
4. Greenish clay 6 in
5. Greenish argillaceous sand
 weathering gray, including
 hard masses. 6 ft
6. more laminated sandy clay
 fulls earthy texture, greenish
 weathering gray. Silicified silica clay. 2 ft - 6 in
7. coarse top of bank (for water) 15 1/2 ft.
 small clay concretions? found
 in No. 5. Sample Fulls clay
 more in the sandy clay.
 Siderite & sp found in place in No. 6
 and olivine 200 feet in place, no other fossils
 and form like as fossils.



13 1/2 ft from water level & the first bottom.
 under the bridge on the left bank is seen
 2 1/2 ft of grayish yellow platy shale
 alum fluff. Apparently some more
 on the right bank 2 or 3 ft.

Section on right bank of Suwannee River
 about 300 yards above railroad bridge. This section made
 by hand level.

1. from water level about 10' of mass exposed.
 This consists largely of gray, slightly phosphatic
 sands, having in places an abundance of silicified
 oyster, *Actinia equorea*, a few foraminifera
 and occasionally a bryozoan. In some parts
 of the section this stratum is almost devoid of
 fossils. Silicified clay chunks or lenses occur
 throughout this stratum and are particularly
 well developed near the top. This silicified clay
 near the top is often 2' or more in thickness
 and continuous for a distance of 25' to
 50' forming in this case the top stratum.
 These silicified nodules as already stated
 are not confined to the top layer but
 occur in masses throughout the whole
 exposure at this locality. Similar silicified clay
 well found as float at least 10' farther up bank.

2. - 6' to first bench above the river, just back of the natural level

3. 25' covered and sloping.

Total height of bank above river 41'.

In a draw between this section and the bridge is seen an exposure of about 6 ft of old peat bed, over which the stream makes a small water fall.

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Summary of sections at and near White Springs
Vaughan, carb. See also G. Hunt, v. 4 and 5 1913
numbers on horizontal line are of identical beds.

Sect. near Railroad bridge on Spring Right bank. Section at Arch Island & at the Spring 1/2 mi above or a bit springs

1. Chat. lime-stone. 2 ft. *Cassidulus* etc.

2. Alum Bluff marl, fossils 2 1/2 ft exposed

3. Alum Bluff marl many fossils 4 ft - 6 in

1. Alum Bluff marl, fossils 2 ft. exposed

2. Alum Bluff marl many fossils 5 to 6 ft.

1. Sand with calc. & plos. cement. few fossils & with thin masses of silicified clay. These not exposed. Exposed 2 ft. Total 10 ft.

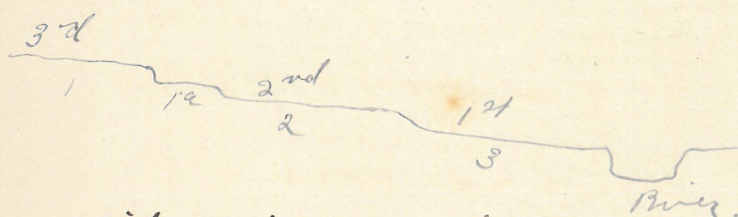
H. Clear ground sand, calc. & plos. etc. 5 ft 6 in

5. Concretion of silicified clay here merely a layer

3. The sand stratum here is not well developed & the clay nodule stratum is correspondingly thickened.

Terraces at white springs as 39
made out by Vaughan Nov 3-5. 1893
(From Vaughan note Book)

	Rapids Bridge	R. R. Bridge	Spring above R.R. Bldg.	Wagon Bridge
Third Bottom	85 ft.	55 ft.	62 ft 45' (interm.)	62 (41' interm.)
Second Bottom	38 ft.	30 ft.	22	32
First Bottom	13-15 ft.	20 ft.	—	20-25
Water level	0	0	0	



White Springs is on the 3rd plane
which extends on undetermined distance
to the north & west. Flatwoods with the usual
ponds etc on this plain. The above is
Vaughan's interpretation.

Pleistocene section at gully up stream
from R.R. bridge. G. Vaughan & C. B. (Chenoweth)

Surface sand	3 ft.
stiff sandy loam carbonaceous soil	1-4
crumbly grey mud	1-4
stiff grey loam or clayey loam	5-6
concoiled	2
carbonaceous loam more carbonaceous towards base	2
Peat humus in part towards top	5 ft.

Nov. 6. 1913.

41

Plots of Longston dike 4 mi N
or west of north of Lake City.

No. 1. Looking over the dike to the north
8 stops in Sec

No. 2. Looking over to the N.E. 10 stops 25 Sec.

Section Longston dike Nov. 6 1913
Saugher, Cook. Santa Sallado.

4. 5 ft. Grayish sandy soil

2 ft. Sandy soil

3. 3 " dark sand residual from the 2 ft
alum Bluff phosphate limestone.
upper in 8 ft in nodules with numerous
the decayed limestone.

2. 4 very numerous & probably phosphate
white limestone no fossils seen
in place. monotype in place 8 ft.
siderostrea lying on the surface on top of this
greenish & white clays not very

1. regular, in earth & shells reddish
yellow. Siderostrea oyster believed to
come from this clay set to found as
a float. also some bones as fossils 14
as seen in the gully carrying in front of
south west siderostrea nodules are
present in the lower part.

42

Road south from Lake City.
1 mi from Lake City. Hill

sloping north. greenish
scattered out red clay. sup-
posedly alum Bluff. (Really no
doubt but that there are alum Bluffs).
about 2 1/2 mi over a flat

apparently a terrace. This
elevation about 30 ft
below the hotel. Geo. Riblock's
house on this
level.

Sink of alligator Lake on

S.W. corner about 2 mi. south
of Lake City on Geo Riblock's place
shows gray sand matrix yellowed
or brown. Gray sands near the bottom
no fossils seen.

Total height of the fork about 15 ft.
This is probably alum Bluff material.

1/4 mi north of the sink found
siderostrea lying loose in the clay
about 15 ft above the lake. Some
clay on at the sink undoubtedly alum Bluff.

a second specimen of 43
Siderostrea found about one
half mi. along the lake north
of the sink lying loose on an
elevation of $27\frac{1}{2}$ ft. above the lake
C.H.S.

Piece of chert contains *Conidulus*
found ^{as float} near by about 12 ft above the
lake. Another piece of *Conidulus* rock
found a little further on.

Falling creek, 4 mi. northwest of
Lake City altho not revisited is with
little doubt of the same Bluff
formation, the stratum there
corresponding probably to the
calcareous phosphatic sandstone
seen in Longston sink.

Lake City to High Springs
Vaughan's Barometer. 335

At first stop about 3 or 4 mi
out of Lake City Vaughan's barometer
shows drop of 75 ft from Lake
City. The country here is rolling.
At Columbia 11 mi from Lake City
Vaughan's Barometer reads 240 a drop of 95 ft.

Piece of 15 ft from the depot to High
Springs P.O.

Vicksbury found in the streets of
High Springs. Some siliceous & containing
Conidulus. Also according to Vaughan
Orbitoids and apparently mammulites.

New sink 2 mi due north of High Springs
Residual masses of Vicksburg in sand
& clay. Oriskany from here
Identified by Vaughan. Barometer 335

Section at nigger sink in
 Section 18-7-18 Nov 7 1913
 Vonglow. Ash Sillcud and Gauber
 Sink is located about 1 mi N.E. of
 High Springs and about 9 N.W. of
 alumina + 300 yards or so west of the
 road. Sink is about ^{Baureto} 380
 feet ^{east} of 50 ft high bluff on side of
 Hill to the north ~~east~~ rises about
 55 ft.

1. Surface sandy with nodular chert
2. Residual soil with chert 24-6 in.
3. Sandy hard clay + greenish
 clay cracking on drying.
 the usual alum Bluff clay. 35 ft.
 Near the bottom more sandy layers
 and also concretionary clay.
 siderostrea is abundant in this
 section, also Ostrea maurisimilis (by Vonglow).
 found by 1913

Some material found along the
 west side of the sink lying on
 the greenish clay is probably
 phosphate. see test.

Coal streak. 13 inch from top
 Bed 13 Yellow news fossil. 13 fbb bed
 Bed 14 Yellow bed + 3 fbb bed
 Bleach nose. yellow and across bed.
 Thin black and
 coal streak. [?] Black [?] Bogus
 red.

Siderostrea in the road probably 20 ft
 above the top of nigger sink extremely abundant
 amounting to loads, forms a little ledge
 where it outcrops.

The corals continue to top 20
 as the school house about 85 ft above
 the top of nigger sink. coral by the
 road layers a wash tub.
 Brownish mound shows dip of 50 ft to
 first bottom on road to Alachua + rise
 again to 50 ft to top of hill at Mrs.
 Troxler house. (Brown 4 25)

47

Geology of the University grounds
Gainesville, Fla.

Sink no. 1. -

This sink is located $\frac{1}{4}$ mi south of the north line of the campus and about $\frac{1}{2}$ mi. west of the east line. It is in fact just across the university campus line and is therefore on the University farm.

It is located on or near the 160 ft. contour line. The sink is just at the break of the slope to the lower land.

The banks above water level are about 12 ft. The depth of water was not determined. Alum Bluff sand rock is seen apparently in place along the north border of the sink about 3 or 4 ft. from the top and directly under the ~~loamy~~ soil. Sand rock is also seen loose around the sides of the sink.

48

Sink no. 2. -

This sink is located west of south-west from Sink no. 1. It is also on the break to the lower land but probably a little lower down, probably near the 150 ft contour. This sink is just west of the garden house. The sink is

about 200 ft. in diameter. The bank is sloping. The water in the sink is 22 ft. according to measurements made by Mr.

Schnoblen. The bank above the water is about 15 ft. Alum Bluff sands are seen apparently in place up to 6 ft above water level. Residual fragments are found along the banks well up to the top of the bank.

Many smaller sink not specially examined are found around the border of the explored south & west of this sink. Some of these have been filled by the gardener.

11

This is a large sink located about S.W. from no. 2. It is the largest sink on the University grounds and is at a somewhat lower level than no. 2. probably near the 140 ft. contour. The south side of the sink is low & the water flows through a ditch into a small stream ultimately reaching the disappearing stream. The depth of water in this sink has not been measured. The back side sink on the upper side is probably 20 ft. higher than the lower side the bank is low. This sink was not specially named beyond the notation of alum bluff sands along the ditch on the lower side.

This is a small sink located a little west of south from no. 3. It is on the side of a slope and is near the 110 or 120 ft contour. The depth of water in this sink is not known not having been measured. No clay exposure is seen here altho alum Bluff sands ^{are} abundant on the surface and to some extent along the sloping sides of the sink.

This sink is located along the side of the depression. a small stream enters the earth here through the Vicksburg Limestones. The 70 ft contour is shown as passing around the head of this stream where it enters. The Vicksburg is seen in place about 12 to 15 ft above the water level or about the 85 ft contour. The Vicksburg here seems to be the Ocala phase. large abiotoides, bygonia etc. at an elevation of about 17 ft above the water full impure fullers earth

clays and greenish clay sandy clays⁵¹
 are seen loose but evidently not
 far removed from the original
 locality, possibly having slid
 down hill somewhat. Above
 this level the fork is sloping
 and rise to a total height of
 about 40 ft. The contour map
 shows the 110 contour near the top
 of the hill & as much as 120 ft
 contour at the top feet somewhat from
 this side. The surface of the land
 is thickly strewed with sandstone
 (alum shuff) so much so as to
 interfere with the cultivation of
 the soil.

Measurements of the Hermit Mill⁵²
 Hopper using food as poll 8 ft long.
 hand level. Cooke, Seelands & Gunter.

chub 4 to Brownite	at top	400	
chub 11	at water level	295	
chub in return		400	
1st roots Boob site		8 1/2 ft.	
2nd "		8 "	
3	11 to top of board	9 "	
	Fore right to bottom of base	9 "	25 1/2
4	Hind right to top of feed	9 "	34 1/2
	Fore right to bottom 6 in	9 1/2	43
5	Hind right to top of feed	9 1/2	52
	Fore right to bottom of feed	9 1/2	52
6	Hind right to top of board	9 1/2	52
	Fore right to bottom of board 6 in	9	60 1/2
7	Hind right to top	9	68 1/2
	Fore right to bottom	9	68 1/2
8	Hind right to top	9	78 1/2
	Fore right to bottom	9	78 1/2
9	Hind right to top	9	87 1/2
	Fore right	0	87 1/2
10	Hind right to top	9	96 1/2
	Fore right	0	96 1/2
11	Hind right	9	105 1/2
	Fore right	0	105 1/2
12	Hind right	9	114 1/2
	Fore right	0	114 1/2
	Hind right	9	114 1/2

115-

Nats on the River Mill Hoppers. 54
Nov. 10. 1913. Cooke, Sclerod & Gault.

assuming that no. 2 of the published section is a dislodged fragment of no. 6. the section may be generalized as follows. No. 1 of the published section is now covered by sand and mud washed in from surface drainage and slump of the rocks.

1. at the top 25-ft covered and sloping.

This covered space has fragments of sandstone, probably blue plate, also by following up the drainage ditch entering

from the west side it is seen⁵⁵
that a similar sandstone material
is found residual in the channel
and along the sides up to the
full level of the plateau. This
material seems to be Alum Bluff
sandstone.

2. Yellow^{phosphatic} limestone in which is
found dark smooth phosphatic
pebbles as described in the published
section. This limestone forms a ledge 15 ft.

3. From the base of this limestone to
near the bottom of the sink is found a
succession of materials which are
variable including gray phosphatic
sand, fuller earth, mostly impure,
greenish clays, siliceous clays and
ledges. Altho steep in places this
succession of strata is sufficiently soft
to give a general slope seldom to
stop to climb. This is evidently the
Alum Bluff. 70 ft.

4. Sandstone with phosphate pebbles 5 ft.

The total number of the published⁵⁶
section, is as already stated now
correct.

An^{fairly} accurate measurement of the
depth of the sink made by Cooke
Selleach & Huntz, using a board as
a rod marked ft to foot lengths, showed
a depth of 115 ft. (The measurement
by Selleach gave 116 1/2. That by Cooke gave
115. The latter was accepted as being in
round numbers the depth of the sink). The
thickness of no. 3 of the section is based
on this measure of the total depth of the
sink.

Section of Alachua Sink 57

Nov. 10, 1913. Voughan, Sellards
 Cooke & Gentry. Measurements by Cooke.

Measurement of sink with water at
 medium level about filling the sink out
 nearly up to the general level of the prairie:

6. covered and sloping but with rounded
 Alum Bluff sandstone to the top of the
 fossils. In this material was found some grit.
5. Fuller earth stratum 8 in.
4. Sandstone more or less disintegrated.
 probably phosphatic & calcareous 1 ft. 8 in.
3. ~~Sand large disintegrated~~ 4 in.
2. Green clay resembling fuller earth 6 in.
1. sand - - - - -

1. Vicksburg limestone, Ocala phase.
 large oboloides, Pecten ovatifus, Ostrea
 Wicksburgensis, Coridulus? etc.

The actual contact of the Vicksburg and
 the Alum Bluff is not seen as the exposures
 are in different places separated by 25 ft or
 so. Doubtless the top surface of the
 Vicksburg is irregular.

Magnesia Spring, about 1 mi. ⁵⁸
 southeast of Park Grove, Alachua Fla.

The exposure of this spring is poor. but
 from a ditch dug to drain the spring
 was found green clay and a number of
 silicified oysters. From a pit dug
 near the spring was seen also a fragment
 of phosphatic sandstone like the Alum
 Bluff.

The old phosphate pits?

The old phosphate pits are located
 about 1/2 mi S.E. of the spring. They are
 on somewhat higher ground being
 back a little way from the stream,
 and presumably are stratigraphically
 above the green clays seen at the spring.
 The phosphate is not unlike the
 phosphatic sandstone seen elsewhere
 in the Alum Bluff altho possibly richer
 than the average.

The old limestone quarry near Park Grove
 is not mentioned in this trip.

Tallahassee north to Centerville. 59

The red mottled sand usual to the Tallahassee country is seen in all cuts north to Centerville. On the hill leading out from Tallahassee on Merrimack Road about $\frac{1}{4}$ mi from the present city limits (1913) was found an oyster as a float in the ditch on the side of the road. Also a fragment.

A fragment of an oyster was also found on the side of the hill about $\frac{1}{2}$ mi on the Centerville road.

Nov. 19, 1913. Lyles Lime Hills or
lime dol. about $1\frac{1}{2}$ mi N.W. of
lime dol.

In the pit at the lime hills there is exposed at this time about 15 ft of limestone. This is chiefly in the form of ~~con~~ limestone boulders. These are composed of close grained limestone with crystals apparently of calcite. There are inclusions of clay in practically all the rock. In this pit fossils as corals are abundant, including chiefly bivalves and gastropods, also a fossil possibly a tered. quite abundant. One echinoderm also corals was found and the Mr. H. G. H. thinks that he saw a chert sometime ago that was full of this same fossil. The elevation of this

exposure appears to the eye to be
nearly that of Linc. Cab. which
is 108 feet above na. This
limestone is near the base of
a hill. The hill is said by Lyle
to be a horizon by level from the
strat tower 65 ft above
Linc. Cab. & about 173 ft
above na.

Another exposure is found on
the north side of this same hill
and at about the same level
a possibly a little higher. About
526 ft of limestone is seen here
in an old pit. From this place
echinoderms like *Cassidulus* are
quite abundant, also the *trilobites*
like fossils. The rock is called
Chalobach limestone.

Newbury, no. 18. Cooke & Sellards.

Examined one pit of Cummins Plo.
Co. no. 6 about 1 1/2 mi south of
Newbury. Exposure is usual, a
good deal of *Alany Bluff*
sandstone near the bottom. No
Cassidulus seen in this pit.

no. 20. 1813. Cooke & Sellards.

Stone from Newbury to Clarke & visited mine
as follows:

Cummins No. 10. a new plant. begun
mining about one year ago. No. Each
pit given. In this pit *Cassidulus*
was found abundant in loose
rock about the pit. No other fossils
in this rock with *Cassidulus*. The
Vicksburg is seen in the pit in
place with an abundance of
Vicksburg fossils.

at Office of Trouthlin Plo. & Co.
received many fossils from Allen & Vicksburg.

at Cummer no. 11. a piece of the ⁶³
 Corridulus rock was found
 well imbedded in the gray sand
 rock near the top of the pit. This
 rock seemed in place in the road
 and yet seemed a residual.
 fragments carried into the road.
 Vicksburg fragments were often
 found at an equal level
 with the lying loose.

at Central no. 24 no
 Corridulus rock was seen. The
 other conditions were about as
 usual, fossiliferous Vicksburg at
 the bottom of the pit.

at Cummer no 8 no Corridulus
 was seen. Vicksburg at the bottom.

at Clarke silicified and crystallized
 limestone was abundant with the
 usual Vicksburg fossils, but no Corridulus.

at High Springs no. 20. 8/5
 Cooke, Hunt & Sellack.

Corridulus rock was found in place
 abundant from the depot to the
 river. At the river great pieces of this
 rock up to 3 tons or more are seen.
 In all cores except one this Corridulus
 rock is without fossils other than Corridulus.
 The one exception was a chunk of
 25 & 40 # which contained Corridulus.
 Phacoides matrix. Chonetes & Glycymeris.
 Vicksburg rocks are also found over
 this area some of which are in place.

Phosphate mine, no. 20. 19. 3

The mine within with 8 with one

1. Denton Dodge mine near Neal (no 6)
2. Cummer no. 8. (will wash out in a few days)
3. Central no. 24 (Mr. P. Bonnett has bored for gas)
4. Cummer " 11
5. Cummer " 10. 1 mi from Newberry, N.W.
6. Cummer " 6. 1 1/2 mi south of " E. Denton
7. method " 8 1 mi East of " no. 4 of N.
8. Cummer " 8 2 " " " 4 mi S. of N.

Terraces. On Santa Fe River
at the Santa Fe River By Bridge
1 1/2 mi from High Springs.

A first flat over flowed at
high water is 8 to 10 ft above present
water stage which is medium low.
This flat lies entirely on the west side of
the river at this crossing and is
perhaps 1/2 mi wide.

The second flat is about 25 ft.
above present water level (Bridge - 25 ft 6 in)
or about 15 ft above the first flat.
This flat on the south side of the
river is nearly a mile wide. On
the north side it is 1/2 mi wide.

The third flat was about 10 ft
above the second and on the south
side is not more than 1/2 mi wide.

Another rise of about 11 ft at the
A.C.T. depot brings up to the level of the city.

From High Springs to Ft. White
by public road. Nov. 21. 1913.

Silicified rock is abundant over
the surface all along the road
from High Springs to Ft. White.
All of these rocks are loose
pieces not in place. In a
sink about 4 mi east of High Springs
the Vicksburg was seen & it is doubtless
the country rock throughout this area.

at the cemetery and also 1 mi N.E. of
High Springs the *Conioidulus* rock is seen
in isolated fragments. One *Pecten* found
associated.

In the pit of the Ft. White Hard
Rock Phosphate Co. near Ft. White.
the *Conioidulus* rock is found in in-
numerable silicified boulders, but
these are not in place having
slid down among the pieces of
the Vicksburg limestone. The
foundations rock in this pit as
elsewhere in the Hard rock phosphate
area is the Acala phase of the Vicksburg.

From the examination of 67
the area from Newberry to
the white the conclusion is
evident that the condolus
rock belongs to a horizon higher
than the present top surface
of the Vicksburg. Another rock is
either a horizon of the Vicksburg
that has broken up by disintegration
and erosion or it belongs to a
formation later than the Vicksburg
which has disintegrated.

Cooke reports that he saw no
condolus or Pecten, Microphy + Acadia,
but regards the material along the
Vicksburg on all the hills & Alum
Bluffs. The Vicksburg in fact reaches
to about 110. 100 + 130 ft contours.

28

68

at Box about 7 mi South
of Lake City, Good locality 1/2 mi South
of old Box station + on the east side
of the Railroad is a sink about two
feet of limestone is exposed. This is
granular massive rock, cream colored
and rather soft. It contains an
abundance of Condolus and has
also many gastropods mostly small,
many pelecypods, mostly small, +
some other fossils not recognized.
No Orbitoids or other forms were
seen. Lithologically this rock, espe-
cially on the north side of the sink
looks much like the Vicksburg, but
as none of the common fossils of the
Acadia phase of the Vicksburg were
seen. On the south side the rock
is more closely crystallized & is less
like the Vicksburg but resembles more
nearly the Chattahoochee. Condolus,
in siliceous zones also found by Cooke 1/2 mi
further south & by all of the Box Station
prospects. not in place

Nov. 22, 1913 - Line Oak & Sumner 69
River. Cooke, Hunt & Sellards.

Cut in the S.A.L. at mile post 85 Jx
2 mi west of Line Oak. About 5 feet of
rock is exposed in this cut. It is a very
close grained compact limestone in
lithologic character resembling the Tampa
limestone or the Chattahoochee. Fossils
preserved as casts are very abundant
especially in some of the rocks. These
include Corioidulus (fairly abundant)
Chione, Glycymeris, and many Gastropods.

On the limestone is about 5 ft
of red sandy clay probably largely eroded.
The elevation at this locality is
probably about the same as at
Line Oak. The exposure in this cut is
evidently practically the same as at
Lyle & Edwards lime pit.

78

Numerous Spring at Tolmowick.

At this locality within about 2 to 4 ft
of the water at low water there is exposed
a soft yellowish granular limestone or
marl. In this marl is Corioidulus
rather abundant, also Gastropods very
abundant, Peliopods numerous. No
distinctly Vicksburg fossils recognized. No
Arborets or other forms seen.

The section at this spring was as follows.

1. Limestone below water	2 ft
2. Limestone in place above water	10 "
3. Limestone along the bank in large chunks evidently not much out of place	15 "
4. Sloping to the top of the bank about	10 "
This whole section believed to be Chattahoochee.	35 ft.

Photos were taken of this spring. Two
looking west to the sink where the stream
disappears & two to the east where it rises.
The distance from rise to sink was estimated
as about 500 ft.

Section of the S.A.L. & Public Road
crossing of the Suwannee 13 mi west
of Line Co. River at low water.

1. From the water edge very fossiliferous
limestone, yellowish and eroded rough
The fossils in this stratum 4 to 5 1/2 ft.
include a very great abundance of gastro-pods,
Pelyropods, many bryozoa, some small
corals preserved as casts. One specimen
apparently Astrea Vicksburgensis, a few apparently
Orbitoids. The fossils as a whole suggest
the Vicksburg.

2. This fossiliferous stratum grades into
a less fossiliferous soft white limestone
weathering yellow. At this level a
flat echinoderm resembling Mortonia
is fairly abundant, also the frequent
probably Astrea Vicksburgensis is from
this level.

at the top of no. 2 is an irregular line
which may be an unconformity.

3. A very hard silicified limestone which
weathers very rough. This stratum rests
with an irregular lower surface on
no. 2. The top surface is nearly horizontal
and level. no fossils were found in this
member. about 2 ft.

4. The next above is more thickly
bedded, Corridulus abundant in places. 2 ft.

5. Massive limestone containing
Corridulus and few other fossils 10 ft.

6. Reddish sands including clear silica
grains up to 1/4 in. 16.6 ft.

It seems very probable that
that part of this section below the
irregular line, 6 to 8 ft. is
Vicksburg. Above this line is
apparently the Chattahoochee limestone.

The surface elevation at Ellenville is
90 ft above sea. Figures from this the
water level in the river near the 55 ft level
(bridge a little higher than Ellenville & from bridge to
water 38.6 in). The Vicksburg river 68.8 ft
above the water, this places the top surface of the
Vicksburg here at about 60 ft above sea.

Terraces, on Savanne at Ellenville 73

The measurement from the top of the soil to the water is 38 ft. 6 in. The measure from the soil to the first or flood bottom is 17 ft 6 in.

The first bottom or flood flat is thus 24 ft. above the present water level.

The second bottom is about the level of the Railroad Bridge which is 38 ft 6 in.

another slight rise is seen one or two miles east of the bridge of possibly 10 ft.

as compared with the bottoms on South Tree River. First flat here 24 ft. on South Tr., the first flat is 10 ft. at White Springs the first bottom was 13 to 20 ft.

x

Re-Examination of the Seeps 74 near Loyola Nov. 24, 1913.

St. Sellad Ed C.W. Cooke.

at the sink where the two small streams meet there is exposed about 20 ft of yellowish limestone in texture resembling the Chattanooga or Tampa limestone. It was really a lot to examine this rock carefully for fossils 4.35 pm. altho it was evident that the rock as exposed here is not very fossiliferous. A few hundred yards south of this sink and near the top of the stream fork, possibly a little higher than the exposure of the sink we found

limestone containing an abundance of a *frammina*. which Cooke identified as *Murchisonella*.

There were a number of other fossils at this place but we were unable to make a collection. In a small gully leading to the ~~rough~~ stream a short distance south of the water sink 15 ft of clay sand. Some *oysters* (also shells)

Lloyds & Wocina. Nov. 25, 1913. 75
C.W. Cooke & E.H. Sellards.

Barometer at Lloyds was 1485 ft. at the depot.
(90 ft. at the Hotel).

at the extreme top of the hill $2\frac{1}{2}$ mi. on the
public road S.E. of Lloyds Barometer 190.
The cut in the public road up this hill
shows the usual mottled sandy clays.
This road to Wocina continues on the upland
with minor elevation & depression until
within less than a mile of Thomas City.
It then goes down the abrupt es-
capment to Thomas City. The barometer on
this upland road goes up to 210. It
is doubtless true that the noonday rise
affected the barometer somewhat, but the
fact that it read 60 at the foot of
the escarpment shows that it was not
for wrong. This highland undoubtedly
exceeds 150 ft. & probably reaches the
200 ft. contour.

One of the best sections of the 76
red sands observed is on the public road
along the escarpment $\frac{1}{2}$ to 1 mi.
north of Thomas City.

The escarpment here is about 140 ft.
Red sands show throughout. In the new
cut near the top of the hill the following
partial section was observed.

1. Top sand and soil
2. Nicely bedded sands with white
clay parting, horizontal bedding. The
clay parting one from this seems up to
 $1\frac{1}{2}$ in thick. The sands interbedding one
a few inches to 6 or 8 inches thick. About
16 clay partings occur in the section of 7 ft.
a sag or a fold is seen a little higher
up the hill. (Plots). Somewhat further
down the hill is seen cross bedded
gritty sand. The full thickness of this
fresh exposure is about 35 ft. which is
however only a part of the whole section
shown by the escarpment of 140 ft.
2 Plots of the white bedded clay partings.

At Warren a pit dug for phosphate⁷⁷
was examined. Some phosphate rock
was found, but nothing characteristic.

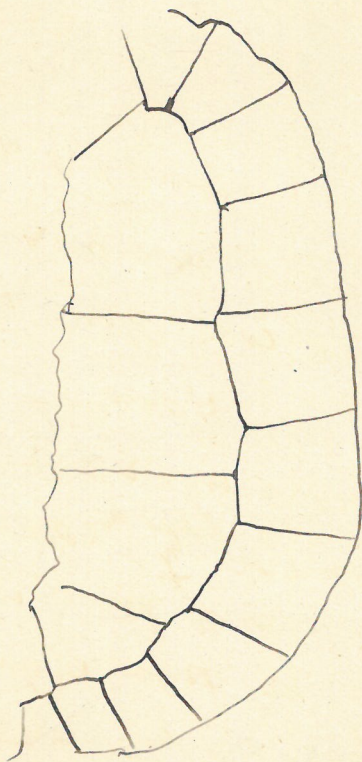
At the head of the river about 1 mi
south of Thomas city no rock was seen.

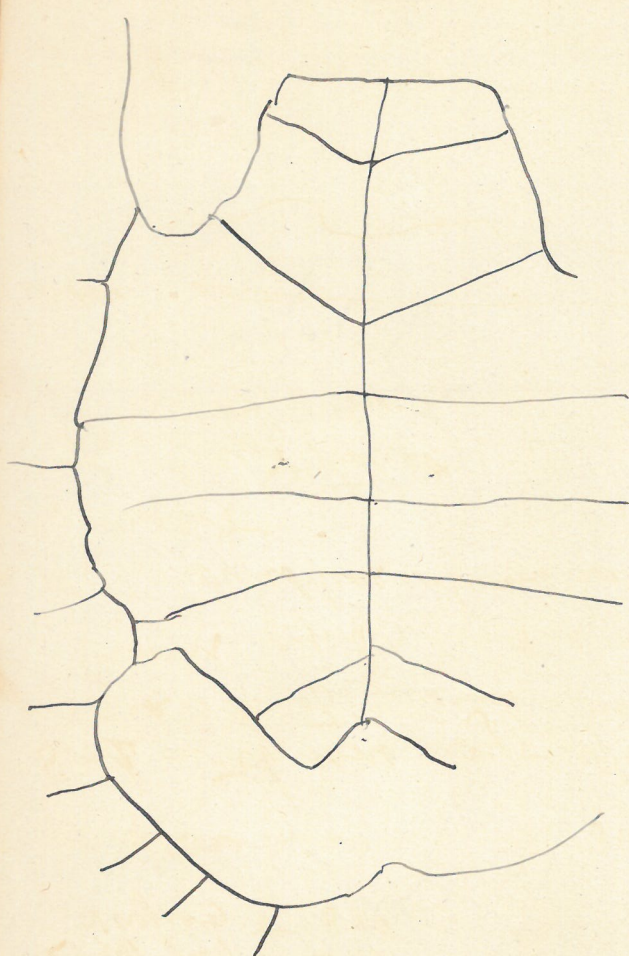
At Mr. Maloy's place on the east
side of this head and about 2 mi
south of Thomas city some hard
rock was found. This was not very
definite in character but fragments
from his well was similar to
the rock at Lin's lab, resembling the
Chalchukla or Tampa Limestone.

See clay made from T. rock
cub $\frac{1}{2}$ mi or so. About 3 mi
from Panama Spgs.

Soil Survey Party at Polk
mooney. Cobb. Gilbert & Hacker.

Soil Party of Hercules C
Jones & Morriston.





Truck in Byrnes collection
 about nat. size. Given for
 mechanical service by comit
 Will Thomas. for gluing on
 nose by H Byrnes, taken from
 section of sec. 29 north of
 about 1900.

Corner Plottholm Co.
 Loheland.
 In the office Mr. Corner & Mr. Gray.

Section in the pit of the Prairie Pottery Co.
 about 1/2 mi. N. of A.C.L. diff. on west side of
 A.C.L. Byrnes. Feb. 11, 1914.

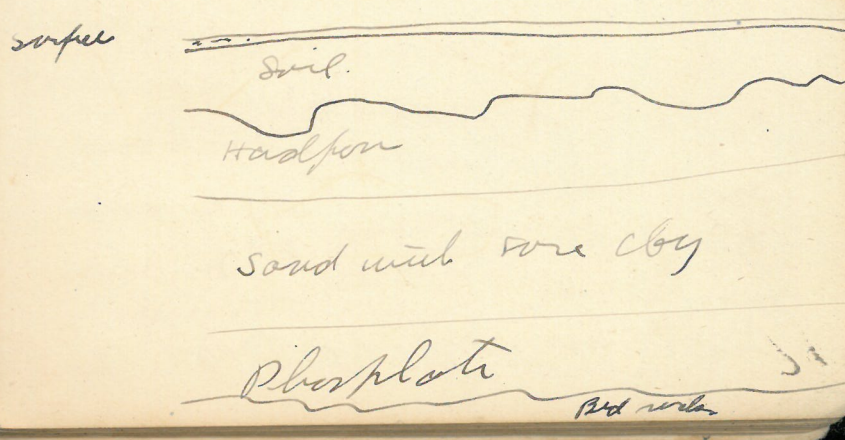
Light gray soil, again water table 1 1/2 ft.
 varying to 3 ft.

Hardpan normal depth, 3 ft + 1 1/2 ft

Sand with some clay & pebbles
 dark at the top, yellowish below, &
 becoming grayish & pinkish below, no
 well marked line between this &
 the phosphates

17 or 18 ft.
 8 ft.

The phosphate stratum
 probably above



The phosphate stratum is very⁸¹
uniform as the top is made
gradually into the materials above.
The first pebble found in the sand
being small & scattered, then follows
as seen & one blue on incision
amount of bubble much of which
is dark in color for about 1 1/2 ft.

Below this is a foot & 1/2 of material
in which the bubble are smaller &
the matrix has a shade of yellow.
Next is 1 ft & 1 1/2 ft in which dark
pebble predominate.

Below this is the greenish clayey
material that is usual near the base
of the formation.

a little farther along 100 ft
the coarse material of the top

4 or 5 ft is very marked. white.
below is two or three feet of yellowish
material with small pebbles.

100 ft farther along in this pt
the line between the coarse dark pebble

85

and the fine pebbles in a greenish or⁸²
yellowish matrix is so well marked
that it might be regarded as an
unconformity. this.

Coarse pebble gray & dark
greenish matrix

However inter lapping occurs
thus

coarse pebbles
greenish matrix

The standard mine as noted
in former notes is peculiar in that
there is practically no overburden.
The rock is very high 78 & 80. Some
samples run to 80.10. The bed rock
is well shown in the dump hole.
showing as an irregular line with
on iron crust at the top. There is also
a good deal of iron in the rock 4 to 4.5

86

The rock is lighter colored. 83
no distinct conglomerate layers
is seen. The bed rock here is
scarcely coherent phosphate sand.
plate

Priori Pebble pit no 1 is at the
1 mi N. of Priori Junction. Plot
2 richly stratified for coarse
& fine layers.

well of amol plot is given 5600 gal. per min.
Section in pit of amalgamated Phos. Co.

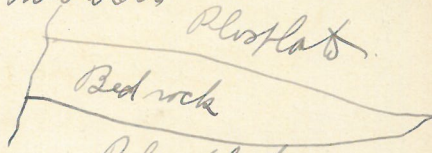
Sand & soil in which	3 ft
yellow gray mottled	2 1/2 ft
Sand	
weathered zone sand showing the usual sand concretions. section dark with some fine irregular thickness and	1 1/2 ft
Sand, clear grains, gray or yellow	3 1/2 ft
Sandy gray blue clay concretions.	4 ft
Phosphate stratum maximum	20 ft

Bed rock irregular.

The section in this pit is unusual in the presence of
the 4 to 6 ft of blue laminated clay. not seen in pit
near by. Also unusual in the abrupt rise of the
bed rock north west side of the pit

J. K. Smith. Pierce Co
Virginia 7 Head Rock

also there was seen here a
the typical bed rock imbedded in the
phosphate thus



There seemed no question but that the
lense of bed rock in this instance was being
altered to phosphate there being no
line between.

Large worn corals & silica pebbles from this pit.

Fossils from this pit included! -
Mastodon, fragments of teeth & tip of tusk.
Horse, Neohippion, three teeth.
Alligator, part of skull & isolated teeth.
Deer. Base of horn core. maybe from over-
burden.
Sharks teeth.
Boys teeth.
Fossil wood from both phosphate & overburden.
unidentifiable foot & leg bones.

The rock is lighter colored. 83
no distinct conglomerate layers
is seen. The bed rock here is
scarcely coherent phosphate sand.
phosphate

Priori Pebble pit no 15 at ft
1 mi W. of Priori Junction. Plot
richly stratified fork. coarse
& fine layers.
well of amalgamated phosphate is given 5600 gal. per min.

Section in pit of amalgamated phosphate Co.

Sand & soil in which 3 ft

yellow gray mottled 8 1/2 ft.

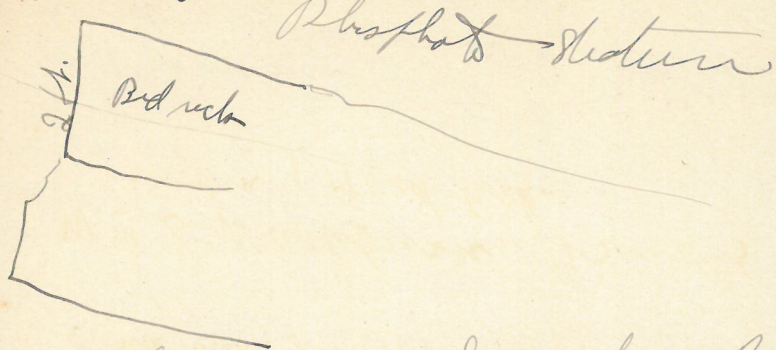
Sand
weathered zone sand showing the
usual sand concretions. Stratum
dark with some fine irregular
thickness and

Sand, clear grains. gray or yellow 1 1/2 ft. 85

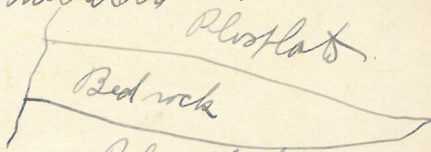
Wm S. Washburn. Brewster.
Origin of Hard Rock.

W W Walfolk. Brewster
John Atonaso ff. Brewster
Amalgamated phosphate Co

showing small cliffs this 86



also there was seen here a lens of
the typical bed rock imbedded in the
phosphate thus



There seemed no question but that the
lens of bed rock in this instance was being
altered to phosphate there being no
line between.

Large worn corals & silica pebbles from this pit.

Fossils from this pit included! -

Mastodon, fragments of teeth & tip of tusk.

Horse, Neohippion, three teeth.

Alligator, part of skull & isolated teeth.

Sheep. Base of horn core. maybe from over-
burden.

Sharks teeth

Ray teeth.

Fossil wood from both phosphate & overburden.

unabundant foot & leg bones.

Pierce Pis. ^{Mr. Lomus, mng.}
^{Mr. Turner, assistant.}
mostodon turb. narrow mng. of
mostodon tooth. work one size
Fossil wood. All of these in the
collection at the office.

From the pit two samples of indurated
sand from the overburden. Sect of pit:-

Sand & Soil	3 ft.	- 3 ft.
Indurated Sand, light colored & dark with organic matter (in two strata) each	8 ft.	8 ft.
more clayey and somewhat sandy off	4 ..	4 ..
phosphate stratum pinkish	12 ..	12 ..
said to make abt 500 tons per acre.		

Bed rock seen in sump hole abt as usual,
No coal seen in this pit. No large
pieces of silica.

Palmetto Phos. Co.

Mr. Cottman, mng.

Mr. Mansfield, asst. mng.

Mr. Scall. for fossils.

In well at plant - Gilbert drilled
40 ft in the 360 ft stratum in
12 hrs.

well at plant of Palmetto Phos. Co.
is pumped by a pump lowered in the 18 in
pipe about 60 ft or 12 ft blow water & 2 ft
or 3 ft blow water even when pump
pump runs 2 or 300 abt 500 ft per minute

This company has another well
which is lowered too low to pump by 500
gallons a minute.

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Pit of Charleston S.C. 10.

Ft. Muck
No corals and no large flint seen.

May 7 - Vertebra of whale, ^{ventral view} Size: about 1/2 natural.
Stop: 32; time exposed, 12 sec. Indoors on table
in front of south window. Slightly cloudy or
diffused sunlight. Negative # . In holder
#4. Negative # , 15 seconds. Dorsal view of
vertebra, same stop used and light the same.
Holder #2. Negative # , 20 seconds exposed, otherwise
conditions same as for above two. Holder #8.

