

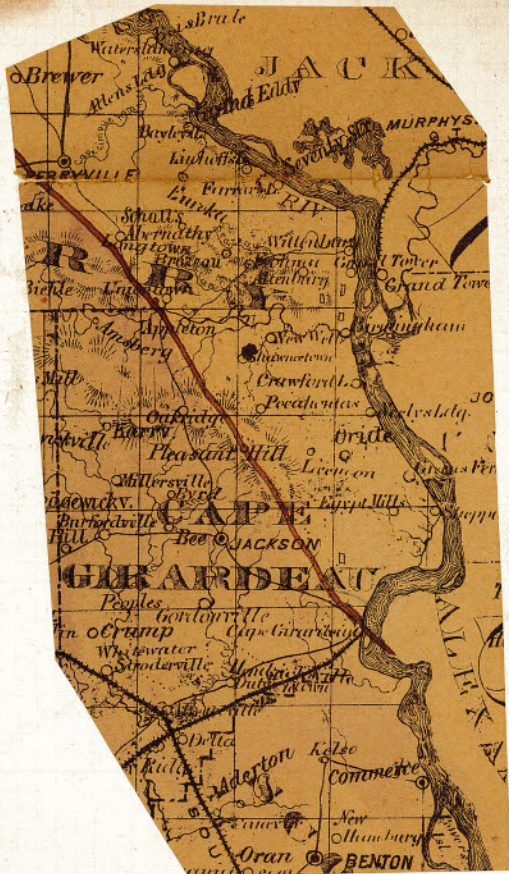
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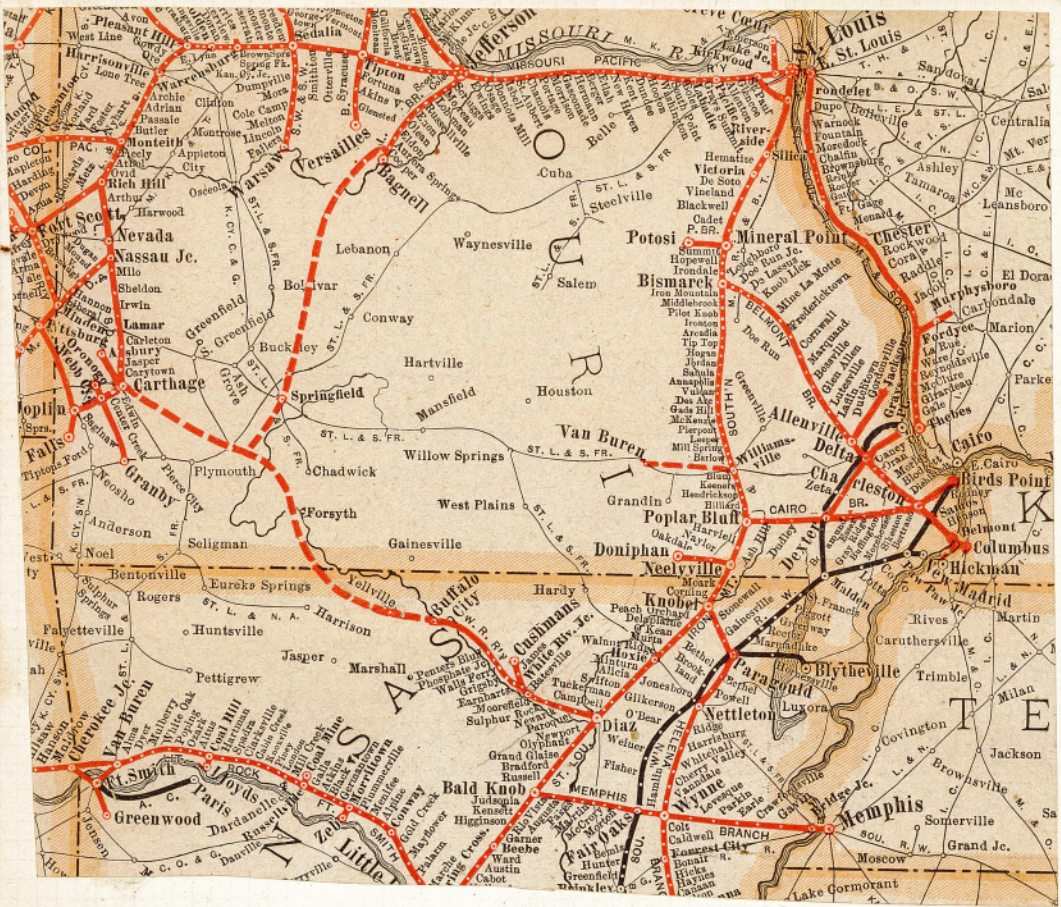
GROSS SECTION BOOK

A - 207.

QUEEN & CO., PHILADE

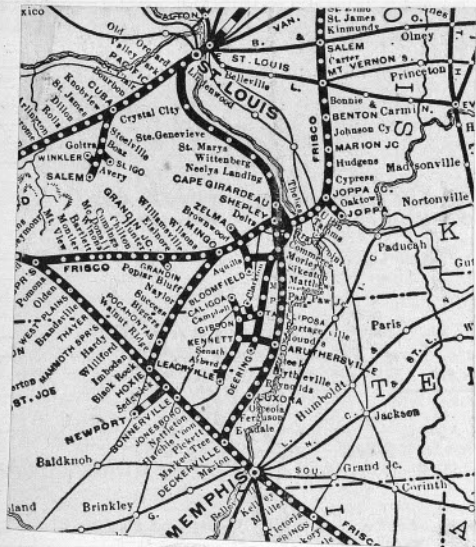
GILBERT van INGEN
Batesville, Independence County
ARKANSAS
Jan. 1-19, 1904





WHITE RIVER BRANCH.

No. 127 Mixed Daily	No. 125. Daily.	Miles from St. L.	STATIONS. Nov. 1, 1903		Miles from Cotter.	No. 126. Daily.	No. 128. Mixed Daily	
11.45AM	7.00AM	261	Lv	NEWPORT	Ar.	125	8.30PM	10.15AM
12.01PM	7.12	259	"	Diaz	"	122	8.18	9.50
12.30	7.27	265	"	Paroquet	"	116	8.02	9.25
12.50	7.40	270	"	Newark	"	111	7.49	9.00
1.15	7.55	276	"	Sulphur Rock	"	105	7.35	8.25
1.40	8.05	280	"	Moorfield	"	101	7.25	8.05
2.10	8.20	286	Ar.	Batesville	Lv.	95	7.08	7.40
3.00	8.27	286	Lv.	Batesville	Ar.	95	7.03	7.15
3.15PM	8.37AM	288	Ar.	WHITERIVERJCT.	Lv.	93	6.56PM	7.05AM
3.40PM		293	Ar.	JAMES	Lv.	4		6.40AM
4.00PM		297	Lv.	CUSHMAN	Ar.	0		6.30AM
	8.37AM	288	Lv.	WHITERIVERJCT.	Ar.	93	6.56PM	
	8.49	293	"	Earnharts	"	87	6.42	
	9.03	299	"	O'Neal	"	81	6.29	
	9.13	303	"	Wall's Ferry	"	77	6.18	
	9.20	306	"	Penter's Bluff	"	75	6.12	
	9.40	313	"	Yancy	"	68	5.52	
	9.54	318	"	Handford	"	62	5.36	
	10.09	325	"	Sylamore.	"	56	5.20	
	10.20	330	"	Mount Olive	"	51	5.10	
	11.04AM	342	"	Calico.	"	39	4.23	
	12.03PM	358	"	Norfolk	"	23	3.27	
	12.45	370	"	Buffalo	"	11	2.45	
	1.30PM	381	Ar.	COTTER	Lv.	0	2.00PM	



Harriet was
G. Van Ingen's
wife

Dec. 23. 1903. With Harriet from Princeton to Rochester
via N.Y. Central \$9.75. 1 dinner on train \$1.13.

Dec. 26. Rochester 11:38 AM to Buffalo. trolley City Line car north on
Main St., 30 min, to Buffalo Cement Co quarry at ~~Amherst~~ Street,
Amherst.

Quarries cover several acres but are shallow: - 15 to 30 feet.

431A- Bennett Quarry.

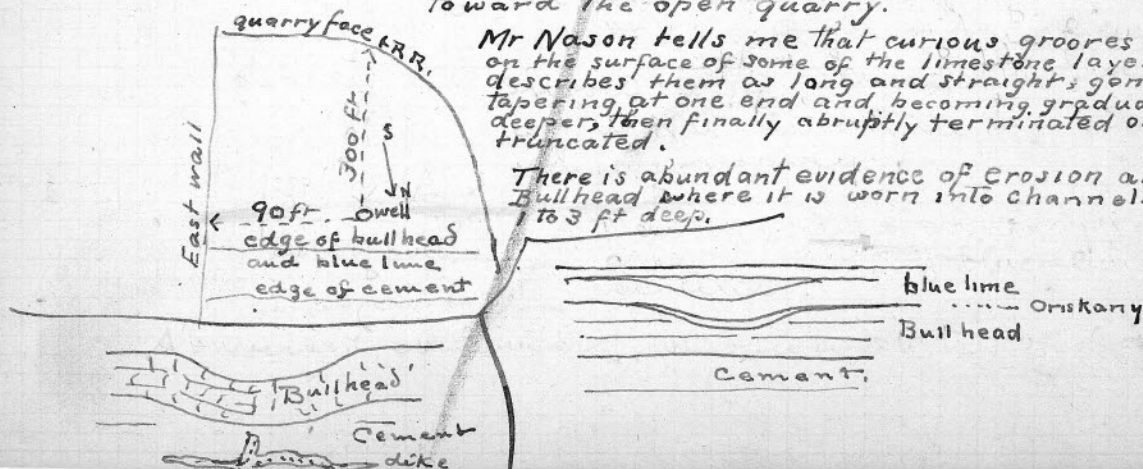
- 1- South wall just east of crusher - a small very irregular sandstone
dike in cement rock. Does not show in overlying Bullhead. Has many
ranifications into cement rock. Occurs just beneath a slump in the
Bullhead - which may be a channel filling
- 2- Material at contact surface of top of Bullhead: i.e. Oriskany
horizon, where only 1" thick: shale, sand, green + black pebbles.
- 3- On east side of quarry the Oriskany shows somewhat thicker: -
appear at one point as a 4" bed of conglomerate: pebbles are
mostly Bullhead fragments with some of green + black shale: matrix
is round quartz sand with calcareous cement.
- 4- Oriskany shale + conglomerate in trough 28" deep: by 7 ft wide. Oriskany
is 8" thick at bottom of trough, and thins out at edges. Blue limestone
fills trough, and is there thicker than elsewhere.
- 5- Bullhead, "brecciated" from 12" below bottom of trough. It has
been shattered by some agency and the small fissures filled
with quartz sand.
- 6- Dike on South wall just west of mill, white sand. Very thin arms.
- 7- Large dike on south wall about 150 ft west of mill. Mostly covered
up by debris. Could get photo in summer when ice + debris had gone.

Mr S.R. Nason, supt of works has noticed many features of interest.

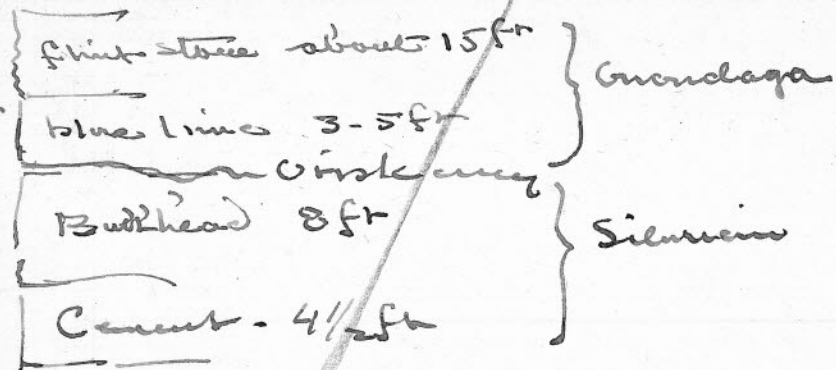
Expansion of Limestone finely shown by a 10" upper layer of the
blue lime - from above which had been removed a load of 15 ft of the
flint stone (Onondaga). Before flint rock was removed a 6" drilled
well hole had been bored. The upper layer of blue lime moved $5\frac{1}{4}$ "
across the well hole mouth in a WNW direction
toward the open quarry.

Mr Nason tells me that curious grooves occur
on the surface of some of the limestone layers. He
describes them as long and straight, gently
tapering at one end and becoming gradually
deeper, then finally abruptly terminated or rather
truncated.

There is abundant evidence of erosion at top of
Bullhead where it is worn into channels from
1 to 3 ft deep.



6 Section of Buffalo Cement Co quarries



Collected several large pieces from sandstone dike at W side of quarry. The sand has surely been washed into fissures. In thicker fissures the center of dike has largest grains and even pebbles. Some very thin horizontal seams only 1/5" to paper thickness extend for 18" from main dike. Bullhead seems to have been fissured perhaps by drying but there is no evidence whatever that the sand was forced into the fissure, nor are there any indications of earthquake origin of the dikes.

Pck 1 - Adams Express - Buffalo - Dec 26, 1903
 Samples from Buffalo Cement Co Quarries.

The Oriskany interval is very irregular and undulating lying at levels that vary within 4 feet, but over the whole the horizon is regular. The Oriskany deposits are very variable. on levels are thin (1") mixed shale and pebbles, some pebbles green others red + black, and some sand. In troughs or channels in Bullhead the Oriskany often shows conglomerate of Bullhead fragments in sandstone matrix overlaid by black shale. There is some iron pyrites which is in places oxidized.

To me it appears as if the cement beds had been broken or fissured, while still comparatively soft, and that the sand has been washed in from the Oriskany shore. The sand is all well rounded and that in the large dikes shows some sorting according to size, the larger grains and pebbles being in the middle of the vein, while the finer material is in the branch veins, and at the sides of the large veins. Not enough of any one dike could be seen to enable me to form any well founded explanation of the origin of the fissures. They may be due to shrinkage caused by weathering, but I rather think they are erosion or solution cavities or else due to chemical reactions within the Bullhead. Fragments of Bullhead + cement are common in the sand dikes - and some of the sand veins are mere cracks. The Bullhead is abundantly fossiliferous but I collected none. The fossils occur as casts.

In some of the sandveins the sand separates loosely from the matrix; in others the sand is compressed into the limestone and the two are firmly attached. This seems evidence that the limestone was soft either for some time after the sand had filled the fissure.

Mr Nason tells me that Mr Bennett, the owner, has a large collection of Eurypterus, which he gives to colleges and societies all over the world, and that he does not sell any. Nason showed me several beautiful specimens that had been found recently.

Cash account Dec 23-26.

23. baggage - Princeton	.50	fare Princeton-Rochester	9.73	cab	.25
carfare N.Y. City	.05	lunch (choo) + dinner	1.30	messenger	.10
24. baggage Rock	.35	photo plates	.94	carfare	.20
Rock - St. Louis	20.25	baggage Rock	.60	arctics	2.50
necktie	.25				
26. carfare Rochester	.05	bag stored Buffalo	.10	carfare	.20
richy	10	supper	.50	pepsin	.20
note paper	.10	cigars	.25	sleeper-St. L.	4.00
27. on train. Southwestern Limited leaving Buffalo at 12 AM					
left 2.45 AM. late.		Dinner	\$1.15	Supper	1.25
porter	.25	Carfare St. Louis	.05		

Went to Planters Hotel, the headquarters of the Geol. Soc. Amer.

28th. Took 2.21 P.M. with S. L. Moore to Riverside and walked back along track to Sulphur Springs on Iron Mt. road. Fine bluffs of Trenton limestone all the way, along shore of Mississippi. Rocks dip low to N.W. South of Sulphur Spr the beds are mostly cherty - brownish limestone. Returned to St. Louis 5 P.M. (train late) and had dinner at Faust's. Evening at Southern Hotel with A.A.S. members met Geo Bissell; Zeleny of Chicago; Curtis of Mo. Univ.; Griffin of Mo Valley College, Marshall Mo etc.

Dec. 29. St Louis to Sulfur Springs on Iron Mt RR. 8 Am.
Bkfst 50. paper + paper bags 35[¢] carfare 20.

433. sand from Loess in creek bank at Sulfur Springs
450 dug at Crystal City. fine white qtz round sand. found bird's track
wants book on *Crus* + *Crus*

434 Sulfur Springs - Glucose Lime Co quarry at Gen Park Sta
A. in Trenton limestone. Mr Peter McLeod Supt. Sulfur Springs

- 1- Heavy light xst limestone cherty below bottom of quarry - 10+
bottom not seen.
- 2- Heavy light pure xt limestone from floor up to first bench
seams of 15-12" thickness full of fossils - Fauna very interesting
Many genera of trilobites. *Sphaerocoryphe*, *Crinurus*, *Caecum*!
Illecebus, *Asaphus*. 28 ft thick
The trilobite bearing seams occur at 3 or 4 horizons.
Some species of this fauna resembles those of the St Louis Spot limestone.
Pterygometopus, *Eucrinurus*. Large *Illecebus*. *Proturus*.
Rennetoides. *Platymetopus*.

3- Heavy xt chert forming 2^d bench: - 22 ft high
mountain form abundant - quite the same fauna as below in 2^d
but did not collect so much of it. Abundant + beautiful Bryozoa.

- 4 top cross Trenton - 2 ft. *Guthrie partinella*. *R. capax*
- 5- clay - yellow - few fossils - 45" - yellow below. Devonian
- 5^a the upper 12" of clay is bluish and full of pebbles
many of the black grains are fish teeth.

- 6- 18" thin limestone ^{lenticles} and sandstone. Limestone is full of
Bellerophon - has some black pebbles. *Fork teeth* + *Samuelia* *Kentucky*
- 7- 10 ft yellow sandstone rippled, barren apparently,
sandstone seems brown + red on weathering
- 8- soil with chert fragments + clay on top of sand

The west base of quarry shows 50 ft of Trenton with the overlying
clay + sandstone showing in top of view plate V

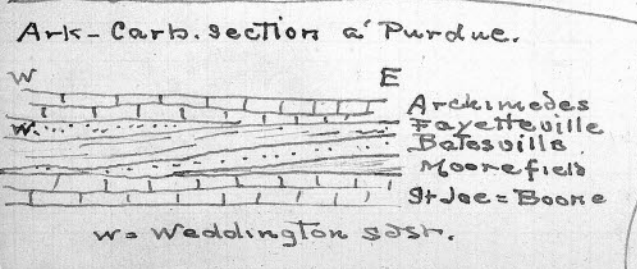
(2 barrels containing specimens from A 3, 4, 5 + 6 - packed and left at
lime quarry. Bill of lading made out at Sulfur Springs.
supper .25¢. tips 50¢.
Have had a very successful day,

432. A¹ - chert from Trenton between Riverside + Gen Park Sta
A² - Trenton lowest fossils below 434 A horizon + 7 in 20. of it
Dec. 30. bkfst 50. carfare 50. 20[¢]. 50

Dec. 30. 1903. St. Louis - Mo - at meeting of Geol. Soc. Amer. all day
 Evening dinner with Soc. (50) at Planters Hotel.
 E. R. Cummings - Bloomington, Ind. exchange. send Bryozoa Corals of Mo + Ark collection. Has Waldron fresh.
 A. R. Crook - Northwestern Univ. Evanston - Mineralogy
 Ransome U.S.G.S. Petrog. - write about Batesville-Louis petrog. micros.

A. H. Purdue, Fayetteville, Ark - gave me notes on Carb of Batesville vicinity. He is going to work up Batesville sheet for U.S.G.S. (see below)
 W. H. Hobbs. wants Roundout paper.
 E. A. Smith - University, Alabama will send me all his Paleozoic fossils for study sands; look up Tusculumbia sandstone - by Hayes. Get 1875 Rept Alabama in which Murchieson are noted.
 W. S. Grant @ Madison
 Weidman " Wisconsin Geol. Survey. wants Paleontology done.
 Robert Clark, publisher, Cin. Ohio can tell where to get Davis Kentucky Corals
 A. M. Miller - Lexington Ky - wants exchange.
 Gilbert, G. K. - Washington write to him for sands.
 Hovey E. O. wants Arkansas material.
 Miss A. J. Melford formerly Vassar. Teacher botany in Central High School, Second Ave. St. Louis. send Roundout paper -
 Parker, Toronto Can. prepare change of Guelph material,
 C. F. Marbut. says policy is to secure maps to work up museum, stratigraphy + paleontology and to engage in research in these branches. Little teaching - periods field work + museum work to be arranged to suit convenience of instructor.

Marbut read paper showing that there are 2 sandstones associated with magnesian limestones in the Ozark region. Sandstones are similar to each other while limestones associated with each sandstone are quite different lithologically. Write to Marbut for saccharoidal sandstones etc. He says that the upper sandstone has rounded grains while lower has angular grains. Upper sandstone appears along the Missouri river and across to Gelertown and MO river and lower is the Roubidoux sandstone of the interior counties.



Dec. 30 - Brkfst, fares, dinner, vicky 1.10 15
 Dec 31. Brkfst 40, dinner, fares, barber 1.10 20 75

Jan. 1. 1904. Left St. Louis 8:40 P.M. by Iron Mt + So R.R. for Batesville where arrived 10 A.M. Saturday. Found board and lodging at Mrs. Will Hinkle's @ \$1.00 per day. The Arrington Hotel has been burnt down & very cold + raw day.

Jan 2. Purchased some packing material and tools.
 435 Batesville, Independence Co., Arkansas. Saturday afternoon.
 A. bluff on left bank of White River at government dam #1 just below Ramsay's ferry, 1/2 mile East of Batesville.
 Bluff is 60-75 ft high of yellow Batesville sandstone.
 1 - Is solid sandstone. Sometimes containing fossils.
 2 - loose sand in pockets inside of solid sandstone. Rounded. The sandstone is massive, in heavy but irregular layers and yellow when fresh. On weathering it turns white.
 AX = pile of sand for use in mixing concrete, said by gov. engineer at dam to have been brought from Little Rock. Has many round grains.

Miller - photogr - Batesville is interested in geology
 Williams Phosphate Sta. " " "

Wrote letters to Weller, + short note to Hamlet

Miller showed me some fine examples of round sand bearing dolomite and of brecciated dolomite fragments without sand cemented by a sand bearing limestone cement; also of a pure white sand of 1/2 mm round quartz grains, and of another 1 mm round grained sandstone. These are Ordovician rocks from vicinity of Coon Creek and Sullivan Creek near Sandtown 10 miles north of Batesville.

Pfeiffer's quarry on Hickory Valley road 6 miles north of Batesville. Large sawing plant being installed. In Batesville limestone = Boone series. 4.50

Jan. 1. 1904. Transfer St. Louis 50, brkfst 50, lunch 50, fares, hotel 10.00, baggage, accid insurance 50+20
 Supper 80, mag 10

Jan. 2. 1904 - Baggage, mag, paper bags, meal bags, socks, sledge, 50 10 1.75 1.20 70 65

Jan. 3. 1904. Batesville - Ark. Cold day - +10-20°. no wind, dull.

In morning at Miller's gallery looking at rocks.

435 B. In afternoon out on R.R. west of Boone with Mr Miller to Spring Crk

- 1 - Collected some fossils from the Moorefield shale in R.R. cut east of road to Ruddle's mill.
- 2 - Boone chert on R.R. cut - a gray limestone 20 ft thick with chert in zones.
- 3 - pockets of chert descending into limestone. The one at right side is 6 ft long on its lower edge.
- 4 - piece from contact

Took photo. C. Inst. 750. 5 32. 15 sec. one day 4.20 PM
iodine¹⁵, glue¹⁰.

Jan. 4. 1904. Steel bar⁷⁰ smithy²⁵ shovel⁶⁰ In evening letter to Harriet - asked \$30.00

Drove out to Cason tract and broke out a lot of fossils + left them in pile

J.M. Gilbreath (at Moorefield store) 25¢ -

C.W. Lawrence - Batesville Ark. lives near Cave Creek Church and just south of the O'Feim mine.

Jan. 5. At Cason place - weather cool + clear.

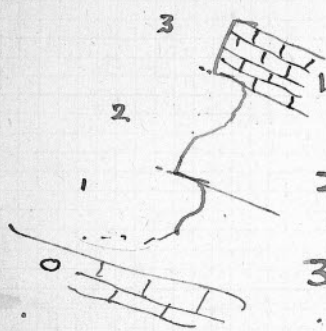
roll of paper 41 pgs @ 7¢ = \$2.85 express color screen .30
labor ————— 1.25 cord .50

This at West side of 2^d gully east of Park Benton road, and on east side of first hill east of the prominent wooded hill that shows above the woods at the edge of the Silurian hill country and about 1 mile east of the Park Benton road.

Bain H.F. + Van Hise, C.R. 1902 Preliminary Report on the Lead + Zinc Deposits of the Ozark Region { 22 Ann Rept USGS, Pt II Ore Deposits pp 23-227, pls VI-XXV.

436 St Clair ore at Cason place

Old pit of manganese mine on S.E. slope of hill bottom can not be seen.



1 - Layer 1 is 30" manganese chocolate shale with nodules soft in upper part.

2 - 50" harder band - nodules bearing shale.

2a - is 24" soft at top

3 - upper layer of ^{hard red} limestone with scattered nodules. 30" thick

4 - pure limestone 6 + ft fossils in upper part

Because of deep disintegration the thin layers between heavy beds can not be observed and it is possible that thin phosphatic beds may occur in this section just above the manganese horizon or just below it.

Manganese limestone ledges on loose ledges on hillside 5 north to top of hill - about 150 ft - all ledges fossiliferous. Ledge near top has a very interesting fauna, Spirifer radiatus, Spirifer crispus, Meristina

Returned to town 4.30 PM. Letter to C. Farr + Harriet.

5 - 10 ft hard limestone - fossils

6 - 5 ft - solid: 4 piles

7 - 8 ft

8 - 10 ft

9 - 5 ft - 4 piles

10 - 10 ft - 5 piles

11 - 5 ft - 3 piles

12 - 5 ft - 2 piles

13 - 15 ft

14 - highest ledges 10 ft thick + 20 ft above top of 13. Spirifer crispus

15 - 30 ft chert + clay to hill top

Hill is 150 feet high by contour of U.S.G.S. top sheet

Jan. 5. Worked 436 A 14 and got 150 pounds of fine material. In evening long letter to Harriet

Jan. 6. Collected from 436 A 7 about 200 pgs - fine clay, warm papoid. labor 1.25.

In evening Mr Miller developed my plates. All are good.

Letter to mother van J.

Peruse p 220 gives 105-110 ft of St Clair line above Cason

Jan 7. 1904 - Batesville Ark.

drove with Mr Miller to his tract between Cason and Ingleton Creeks
10 miles no of Batesville.

437

A

Recess are lower Ordovician limestone, dolomite, and sandstone.
A⁰ limestone, then a dolomite and then a saccharoidal sandstone.
Some of the dolomite has limestone congl with rounded sand cement in
this layer. Other beds of dolomite have rounded sand grains.
Some thinner dolomite beds show fine mud cracks (A³)

No fossils seen - The congl bed no 2 is 3 ft thick and continuous around hill.
These rocks are on gully ~~west~~ on old Montgomery place up north
side of Cason creek (west mouth of Cason Creek)
Go up past Cason Creek church.

The sandstone A¹ shows well in the pine covered hill to west of where
Miller dug his prospect holes and must have a considerable thickness.
Its position beneath the sandy dolomite can be easily well seen in
small stream ^{1/2} mi N of Thompson house. Rocks dip in general 10° SW

Write to Miller for coarse sandstone from point of pine covered hill

Jan. 8, 1904. Batesville, Arkansas.

Spent all day on the Cason hill, getting fossils out of layer 436 A 6.
They are numbered 6 only. Brought in about 250 lbs.

Wrote letter to Harriet asking her to send me \$5.00 needed to finish up
my work here (Cason, Cason Crk, one day Sylamore) and that I would be
back by end of next week Jan 16 or 18th.

Labor - 1.25. Another letter to Harriet in evening.

Jan. 9. 1904 Roll paper #1.40

Out with Henry Smith + Roy Hinkle to help me on Cason's hill. Had
a drummers hack and brought in 7 sacks full of material +

436

Took photos of magnesian rocks + of Silurian limestone and of
wooded camp. Labor (Smith) 1.25, loan Smith 1.00 labor
labor (Roy Hinkle) 1.00 Cotton, cord + tissue paper .50
Rain while we returned home. Day warm.

A⁰

The Ordovician limestone (Polk Bayou limestone) outcrops below
the manganese bearing Cason shale a short distance
up the gully. A⁰ is a heavy crystalline red manganese
stained limestone. All the beds in this section dip
about 10° or less to the south so that while the
Silurian often lies at the surface at the south base of
the hills, the underlying Ordovician appears
farther up the gullies and still farther north
makes the hill tops.

A¹⁻³ The Cason shale shows well on the southwest slope
of the hill where the different ledges show their character
of rather compact chocolate colored shales full of the flat
modules or "buttons" of manganese. The contact of this
shale with the underlying Polk Bayou limestone of Ordovician is
difficult to see although its position can be readily located.

A⁰

The upper surface of the Polk Bayou limestone is exposed
near the foot of the hill about 200 ft north of the old large
pit, and also farther up the gully to northeast.
The Devonian interval can not be seen on this hillside.
Its horizon is covered by clay holding Boone chert
fragments.

437A- Miller's farm, between
Coon creek and Sullivan Crk.

- 437A1- Saccharoidal sandstone
A2- Heavy dolomite above A1.
A3- Thin dolomite layers with
mud cracks and sand veins.
A4- Iizard limestone, steelgray.
- 438- Moorefield shale at "Coal min
A' south side of river.
black shale with few fossils.
- 439- Block of Batesville sandstone,
~~439~~ with goniatites, loose, Miller.
- 440- Pfeiffer Stone Co quarry, in
A' (18) Batesville limestone (Carb) an
oolitic limestone.
- 441- Fayetteville ? shale from a
A# point northeast of Pfeiffer qu
quarry, given me by Mr Pfeiffe
- 442- (20) Polk Bayou fossils from
R. capax bed just east of Chinr
- 443- Section in bluff of Polk Bayou
A at 4th ford, east side.
- 1-22- Polk Bayou limestone
- 2-23- upper part mangan stained.
- 3-24- red limest with dark green pe
pebbles.
- 4-25- 10" gray lst
- 5-26- 2" greenish phosph rock
- 6-27- 6-8" ...
- 7-28- ...

Arkansas sections.

- 435- Batesville.
A1- Batesville sdt, Ramseys
A2- loose sand in Batesv sdt
Ax- Sand from Little Rock
- 435 B- Spring Creek
B1- Moorefield shale in RR cut
B2- Boone chert in RR cut
B3- decomp chert in pocket
B4- piece from contact
- 436 A- Cason hillside.
A0- Polk Bayou limestone up gully
A1- nodule shale, Cason shale, 30"
A2- 50" hard band, nodules
A3- 30" limest with nodules
A4- Limest, foss, 12 feet.
A5- Lst, 10 ft
A6- Lst, 15 ft.
A7- Lst, 8 ft.
A8- Lst, 10 ft
A9- Lst, 15 ft.
A10- Lst, 20 ft.
A11- Lst, 25 ft.
A12- Lst, 15 ft.
A 13- Lst, 25 ft.
A14a- 20 ft interval
A14- 10 ft, top ledge
A15- 30ft chert to hilltop.

444- Miller's cave, Sandtown.

A⁵²⁹

white saccharoidal sandstone

445- New mineral in cave.

30

446A, Phosphate City.

(33) 1- Section in east drift in
Pine Hollow.

33) 1- brown shale (phos rock) floor

34) 2- phos sandst, 18"

35) 3- yellow shale, 10-20"

36) 4- limest gray hard, St Clair 10
10 feet.

447A Along railroad spur southwest
of Phosphate City.

5 37- St Clair

2 37A 15" shaly stuff and mangan
chunks

3 38- Phosphate rock

4 38a- gritty shale

1- 38b- Polk Bayou limestone

448- (39) Sylamore sandstone on W

A'

Woodliff's land.

449- (40)- Carb limestone with

A'

fossils on Wilkerson's land

1

1- north of Batesville.

2

Jan 10. 1904. Batesville. Sunday-

AM. packing and numbering fossils from Cason tract.

A38
B
16.

Afternoon went with Mr Miller to edge of hills on south side of river where Mr Allen has been sinking a pit in search of coal into Moorefield shale. Of course no coal. Shale is very bituminous and in places contains quite a fauna in very poor condition of preservation. Collected away a few pieces with a large *Posidonomya* or *Estheria*. Other fossils that show indistinctly are *Lingula*, *Goniatites*, plant stems.

Have had sick headache all day. No letter written
Promoseltzer 25 + calumel 20.

Jan. 11. 1904 - Batesville - Cloudy + chill.

Arranged with Luther Barrwell for 5 boxes with covers of 1" wood size 36"x20"x20" - to be delivered Wed. P.M. @ 85¢ each.

Spent the day in packing and in picking out small fossils from Bed #14. The small *Meristina* appears in all layers. In the lower it has no fold + sinus. Fold appears higher up and in 14 it has small folds in sinus and fold.

17
439

Block of Batesville sandstone containing *Goniatites* from loose material near Polk Bayou 2 miles north of town. Given me by Mr Miller.

Branner + Newsom J.F. 1902. The Phosphate Rocks of Arkansas -

Bull. 74. Ark. Agric. Exp. Sta., Fayetteville, Ark. 123 pp.

free to all res of state who request them.

Letter to Harriet in Rev. Read one with POMO 30.

Jan 12. 1904 - Batesville, Ark. Rain in AM, so stayed in to pack small fossils. Afternoon with buggy to Pfeiffer quarry.

18 - Pfeiffer Stone Co - has been extensive plant in a hard solid oolitic limestone - runs even from top to bottom - no fossils other than *Meristina*. resembles somewhat the Boone limestone but is much harder. This is Jones lime taken in "Batesville limestone" of Hopkins report on Marble.

19 - Fayetteville shale fossils from 1 mi N.E. of Pfeiffer *
441 given me by Mr Pfeiffer. form of *Orbiculites* -

Evening at Miller's quarry. cigars: 50, wash: 40, apples: 40

Jan 13. 1904 - Batesville. Clear + cold. Out 8:30 - 6:00 with "Doc" + hawk.

Finished up the Cason hillside + brought in a large load of fossils, from layers 4, 5, 12 + 13.

12 is interesting in its large *Spirifer radiatus*. + *Halmanites arkan*

13 has for common species, *Strophomena* - ?

4 has an imperfect *Trochoceras*.

5 has *Stephanocrinus angulatus*.

Evening arranging my collections + writing letter to Harriet. Labor 125. Laundry .70. The Cason collection contains about 60 cft of specimens.
Mrs Hinkle 10 00

Livery account.

Mon - Jan 4 - all day	Mon - Jan 11 - rain - not
Tues - Jan 5 - all day	Tues - Jan 12 - afternoon
Wed - Jan 6 - all day	Wed - Jan 13 - all day
Thur - Jan 7 - Miller	Thur - Jan 14 - Miller's cave Polk Bayou - all day
Fri - Jan 8 - all day	Fri - Jan 15 - Miller's cave.
Sat - Jan 9 - all day	Sat - Jan 16 - all day
Sun - Jan 10 - not	Sun - Jan 17 - not -

8 1/2 d @ 3 00 = 25 50

Jan 14, 1904. Thurs. - Batesville, Ark.

up Polk Bayou

Photo of Trenton limestone bluffs E 3rd ford - bluffs east side
" " Sycamore trees
" " caves

442

20 - Polk Bayou fossils R. capax from just east of Chome spr

451 21 - sand from Polk Bayou at mouth of Cave Creek

A1=22 - Polk Bayou limestone in bluff left bank at 4th ford just below
4th ford. It shows at about 35 ft from river

2=23 - upper part manganese stained

3=24 - 10" hard limestone ^{Devonian}

8" red limestone ^{red shale} with dark green fossils - age?, Cason horizon

443 25 (4) 10" hard gray limestone Age? } Is this St Clair!

5=26 2" greenish phosph rock leptoceras

6=27 - 6-8 ft hard gray limestone with fossils } Devonian - ~~leptoceras~~

7=28 - Boone chert 50 ft forming banded bluffs.

These same manganese phosphate beds outcrop beside the new road cut in left bank of Bayou between 2nd & 3rd fords. South near the 4th ford the beds dip south so that Devonian interval reaches to within 10 ft of river bottom at point near small gully. South of this gully at 6th ford the Polk Bayou limestone rises to at least 50 ft above the river at the first ford? & evidently an E-W fault in gully at 3rd ford.

One valuable point of today's work is the determination that the Silurian (Nagaragan) true St Clair limestone is ^{very thin} ~~present~~ at this Polk Bayou section where the Devonian lies on the Ordovician P.B. limestone and is followed by the Boone chert.

In other words the Devonian and Carb overlap the Silurian. This same seems to be true on Cave Creek where examination of the bluffs and hills ~~at~~ between the twin caves and the St Peins tract and particularly of the hill on the east side of the gully 250 yds west of the Cave Creek schoolhouse showed the presence of Boone chert - just above top of manganese stained Polk Bayou limestone. This nondepos of St Clair along this line so near the Cason and St Clair exposures seems to indicate that the Silurian sea extended to the southward and perhaps eastward from these points, and that the Silurian land existed over the Ozark region to the north & west.

Look up Silurian localities in H.S.W. report Pal. Fauna N. Ark. Another interesting occurrence is that of the phosphate bed in such close association with the manganese bed and immediately above it the Devonian limestone fossils are *Athyris*, fish spine, *Pholidonella*. The manganese stained bed 23 has typical Ordovician fossils.

Labor 1.00. papoid .25.

F.S. Williams. Secy. Ark. Phosph. Co. 303 Security Bldg., 4th Locust St. St. Louis.
Mines at Cushman, Ark.

Jan 15, 1904. Batesville, Ark.

drove out to examine McMillers cave near Sandtown. With Miller, Perkins and Komard.

29 The mouth of cave is swale + steep in wall of sandstone - go in down
 — takes pile of large blocks of sandstone ~~and~~ to depth of perhaps
 30-40 feet below mouth at 200 feet from mouth. The floor is
 444 very uneven now deep V shaped holes with large sandstone
 — blocks on all sides, and deep cavities between blocks and again
 progress is impeded by immense piles of sandstone that
 rise nearly to the roof. The general course of the cave
 is remarkably straight in a direct east (mag) line for
 about 3/4 of a mile - then it changes to 10-15° north of
 east and keeps this direction for at least 1/4 mile.
 This latter portion is along the under side of a slickensided
 surface of sandstone that seems to indicate a fault of small
 throw. The rock on the footwall side appears to be somewhat
 crushed and is the same sandstone. That the foot wall is the
 upthrow side is shown by the bed of limestone that lies
 beneath the sandstone on that side (side) and which does
 not show in the north wall. In the further portion of the cave
 the walls show extensive decomposition for the sandstone
 has become a sandy mud full of water. At no points were we
 able to see the original bottom of the cave - for it is obscured
 by the considerable thickness of debris fallen from the roof
 and which is probably 30-50 feet thick. In some places
 the blocks have retained their tabular form and, now
 broken along the middle line of the cave and supported along
 the side walls, they form a V shaped trough. The general
 dip of the cave is with the dip of the sandstone strata,
 i.e. about 75-100 feet to the mile.

30 Water dripping from the roof forms stalagmitic masses and
 — consists of white, red + brown + black material that resembles
 445 gneiss, and that has been pronounced gneiss by an assayer
 in Smithville Ark and by another in Little Rock. In some
 places the stuff forms on sloping rock surfaces in small
 terraced pools like miniature hot spring terraces.
 This material has been sent by Miller 5. 2 or 3 assay offices: one of
 them at Smithville Ark pronounced it "Bas gneiss of great age"; the
 Ogden Assay Co Denver Col. - "decomposed porphyry", and a third stated
 it contains Uranium + Thallium - all 3 wrong etc.
 Some pieces brought to Perimeter have shrunk + checked in drying
 and given 5 pieces - though the red rosin retains its color and
 transparency.

Jan. 16. 1904. Batesville, Ark. drove out to Phosphate between
Cushman and Pines Bluffs

446 A.

33- section in easternmost drift in Pine Hollow.
Brown shale forming floor of drift

34- phosph 2525- 18"

35- yellow shale 10-20"

36- ~~limestone~~ limestone gray hard, crinoid stems and typical
St Clair fossils - 10ft

~~St Clair fossils~~

447

Getter drifts along spur of R.R. SW of Phosphate City.
Shows in every case the phos horizon underlain by Rock
Bayou + overlain by ~~Cushman~~ St Clair limestone and
then the Boone chert series.
In other words it is at horizon of Casson shale.

37 St Clair < 15" shaly stuff + irregular chunks

38 Phos 4' 7" underlain by gritty shale and then Rock Bayou.

Price H.S. Supt. Ark. Phos. Co. Phosphate City

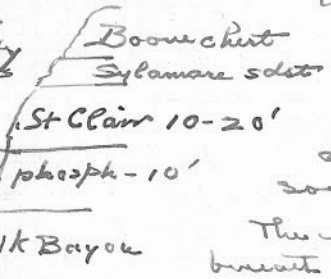
448

39- Sylamore sst in Sec 17 NW 1/4 of NW 1/4 on
J.W. Woodliffs land in shaly behind terrace house
on N.W. side road 1 1/4 mi SW of Cushman
6-8" dark sst. chert breccia at bottom
fish bone in breccia

448/a. "Sylamore sd. I guess". Loc. not given. sent by H.L. Miller Mar 7, 1904

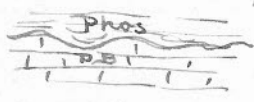
The above proves Parmer + Unsworth to be incorrect in their determination
of part of the phosphate horizons at least and shows that there are
2 important phosphate horizons of which the most valuable
lies between the Rock Bayou and St Clair marbles, i.e. —
the only operating phosphate plant secures its material from
the Casson shale horizon of Silurian age and not from the
Sylamore sandstone of Devonian age.

Section at
Phos. City
Talus



The green phos rock is not so rich as the
dark brown. This underneath it,
The green contains black + gray pebbles
and fragments of Orthis in
abundance - which latter possibly the
source of phosphate.

The irregular surface of Rock Bayou limestone
beneath phosphate bed is well seen on R.R. spur
in cut about 1/2 mile SW of Phosphate City.
A true nonconformable contact.

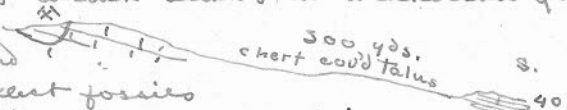


Labor. 50¢

Make micro slides of phos rock

Jan. 17, 1904 - Batesville, Ark

Limestone of Moorefield shales at marble quarry in NW 1/4 of SE 1/4 of Sec 7. 13R VI W. has good fossils of Spring Creek faunas. See Mr P. H. Wilkerson - editor of the Batesville Bee. This is 1 1/2 mi NW of Batesville.

449
40 - Black limestone of Moorefield shales 8 ft thick - bottom not seen - at west slope of hill apparently overlying the gray limestone of Boone series which shows in Wilkerson quarry on the hill E north. N.  The rock is solid and is a fine place to collect fossils. Spirifer (2 sp), Retinularia, Prod semist, Prod cora, Productella, Athyris, Orthisoides, Prod small. Collected about 50 pds. good fossils.

Cook & Crouch Hardware Batesville

Jan. 18, Batesville, Ark.

5 boxes @ 85¢ = 4.25, carting 50, livery 8 1/2 @ \$3.00 = 25.50
25¢ nails + wire, hay 50, Argosy .10,

Packing all day and evening.

Jan. 19, 1904. Batesville, Ark.

tacks .10, apples .10, cascara .25, trucking .50, baggage .50, board 7.00.

Packing all day.

Box 1 - fossils from 14 + 6

2 - " " 14 + phosphate rocks

3 - " " 6, 7, 8, 9 + tools

4 - " " 4, 5, 10, 11, 12, 13, 1

5 - " " 40, small specimens, tripod, bags, walnuts, collect bag, paper bags.

Sent 5 boxes off by freight. weight estimated by agent = 1000

Left Batesville 7.05 PM, arrived St Louis 7.15 AM. by me 2000

Jan. 20, 1904 - St Louis. car .10, baggage .30, headache pd .75, toilet .25.
ticket, St Louis - Rochester 19.63.

take Eagle Packet Co., or Chester Line Steamers, for Cape Girardeau, etc

Ticket St Louis - Rock. Big Four train 18. leaving St L 12 noon on Jan. 20/04. form N3-7 no E 9061. limited.

Baggage checks. Big 4. St L - Rock. via C&C + St L, LSMS + NYC + NY
Nos 322407 + 8 (bag)

raining all day + night.

Jan. 21, 1904 pulled into Buffalo in a blizzard at 8 AM (C.T.)
Waited 2 1/2 hours and reached Rochester 12:20. Harriet very well.
Stayed at Rochester till Jan 25 when went to Albany to see Dr Clarke and on to Princeton Jan 26th.

Feb. 29, 1904. Princeton New Jersey -
 5 boxes - Silurian Collections from Batesville 2150 pds. \$ 23.71
 P'd by Es.D. cartage 3.00
 26.71

Collection of 1896 in vicinity of Batesville, Ark.

426 - Batesville

A - Spring Creek - (Carb) B - Polk Bayou (Trenton)
 C - Cason Mine - (Silur).

427 - St Clair spring - silur. A - only

428 - Moorefield, Ark. A - Carb on Engel's land.

429 - Cave Creek.

A - Izard at spring west of Chinn Spring
 B - Trenton at cave just east of Chinn spring
 C - Trenton at Chinn spring
 D - Ord + Silur at Trent mine
 E - O'Flinn mine (Ordovic)
 F - Junction Sandtown and Cave Creek roads (Ord)

430 - Columbus, Ohio - 1897 - Onondaga limestone

431 - 451 Mo + Ark. + Buffalo, Ny, Dec 1903 + Jan 1904

5422 Mackie collection of Triassic ^{etc} sandstones, Elgin Scotland, 1904

- 1 - Trias. Sarnabrae quarry May 1903
- 2 - Spynie. Trias
- 3 - Newton. U.O.R
- 4 - Cuttleshillock - Trias
- 5 - Scaat Craig - Lowest Upper Red.
- 6 - up B. Red Bishop St
- 7 - Scaat Craig up Red
- 8 - Culbin Sand

28 Have broken fossils out of these layers: -

A36 A 4, A 5,

Exposure of Cramer plates

Plate	filter	f8	11	16	22	32	45	64
Crown	No	1/32	1/16	1/8	1/4	1/2	1	2
"	Yes	8	16	32	64	128	256	512
Inst Iso	No	1/16	1/8	1/4	1/2	1	2	4
"	Yes	3/16	3/8	3/4	1.5	3	6	12
Slow Iso	No	1/2	1	2	4	8	16	32
"	Yes	1.5	3	6	12	24	48	96

Bausch & Lomb 6 1/2 x 8 1/2 Lens
Ser. II A.

Rondout photos: - Slow Iso without filter; Nov 29-Dec. 20, 1902.
Deep cuts and mines, Day cloudy but bright: snow. f32: 12-20^s
at noon.

Face of cliff: shaded. 7-10^s. f32.

Rocks nearby: f32: 30-45. bright- 25^s; cloudy- 45^s.

Landscape, sun, snow on ground: f32: 2-4^s.