UNITED STATES
DEPARTMENT OF THE INTERIOR

DI-6

APPROVED DECEMBER 1941

Flysh
Deposited @ 200 – 2,000 Meters

1. Sharp bottom of beds
2. Graded beds
3. Continuous beds
4. Internal structures
5. Abundant bottom markings
6. Coarse clastics

Wednesday, Sept 23, 1959
Ft. Smith, Arkansas

40 am Loading at Goldman Hotel, Ft. Smith

Party in 2 cars consists of
1. Pres Cloud
2. Tom Hendricks
3. Boyd Haley
4. Al Mercwether
5 Ernie Glick
6. Norman F. Williams
7. Marion Ksiazkiewicz

15 - 9 45
Stop A
Quarry above Arkansas R overlooking
Ft. Smith,
Source - NE ± Proff K

Stop C Cane Hill
Deeper than Prairie Grove deposition

Upper part of section - Atoka - Bloyd
break not obvious -
On road to east of highway
crest, 6" ± limonitic, dirty bed
with C-VC sand grains, fossils, etc.

Second as above (25' ± higher)
collected goniatite -- seems
to be rich fauna

Thursday – Harrison to Marshall to Clarksville

Friday – Paris Dam

1200' below Atoka top. No coal in section, but coal at top of bed 500' above. That bed grades upward from fine to coarse

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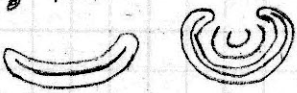
Pseudo nodules



Settling features – gravity settling resulting from a sudden shock of sediment that has much water in it.

These features may not be present in this locality.

These "lumps" seem to have been rolled a short distance -- break up of partially consolidated bed.

This is <u>not</u> flysh in this area.

Most beds are lenticular or wedge shaped. Hendricks says semiconsolidated beds that flowed or pulled apart.
Sample ① Small piece to show flowage

Saturday

S. of Gravelley, Ark

North-Aloka (?) to Johns Valley, South

This is first outcrop of true turbidite.

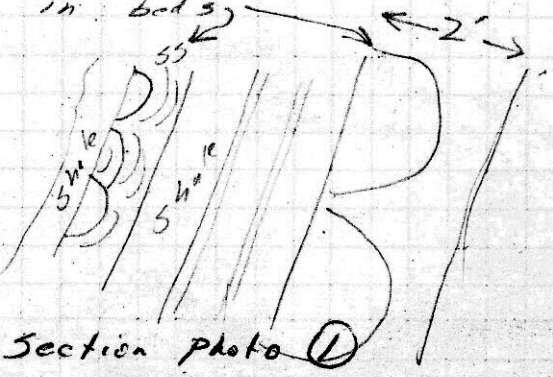
1. Graded bedding
2. Sharp contact
3. Fluting on contact (oriented in 30° arc but mostly from East)
4. Beds do not pinch out

Hendricks suggests ripple marks on top of some beds here is shallower water than are those of Stanley type

These flysh beds show good laminations, but no clear explanation for the laminations was given. This is one of the unsolved problems in this type of sediments

Sample - Chula section ①
To section across laminae to see grading within each laminae

Stop 2 On down the hill but still in Atoka.
Hendricks says spiral marks in beds



Chula Section photo ①

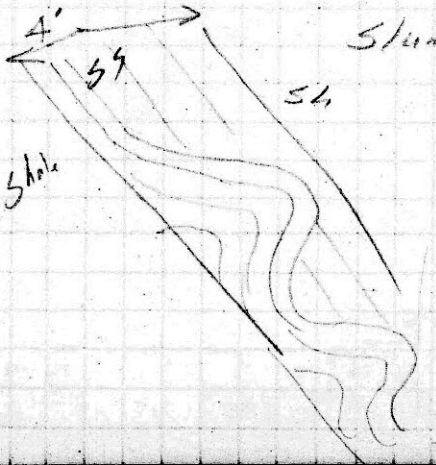
Known only in beds that are called Atoka - may show more slope & therefore, slump

Organic markings on beds destroy some of flysh characteristics. These "worm borings" are common in flysh -- generally more regular than these

Chula section photo (2)
Shows fluting on bottom of f-gr ss beds. Also worm tracks on bottom of thinner beds to right.

Chula section photo (3)
Some area, flutes

Chula section photo (4)



(gravity)

In photograph 4, slump feature of almost convolute bedding style - Axes of slump features are aligned with flutes. Hendricks suggests this is movement down slope of early anticlines aligned with current direction.

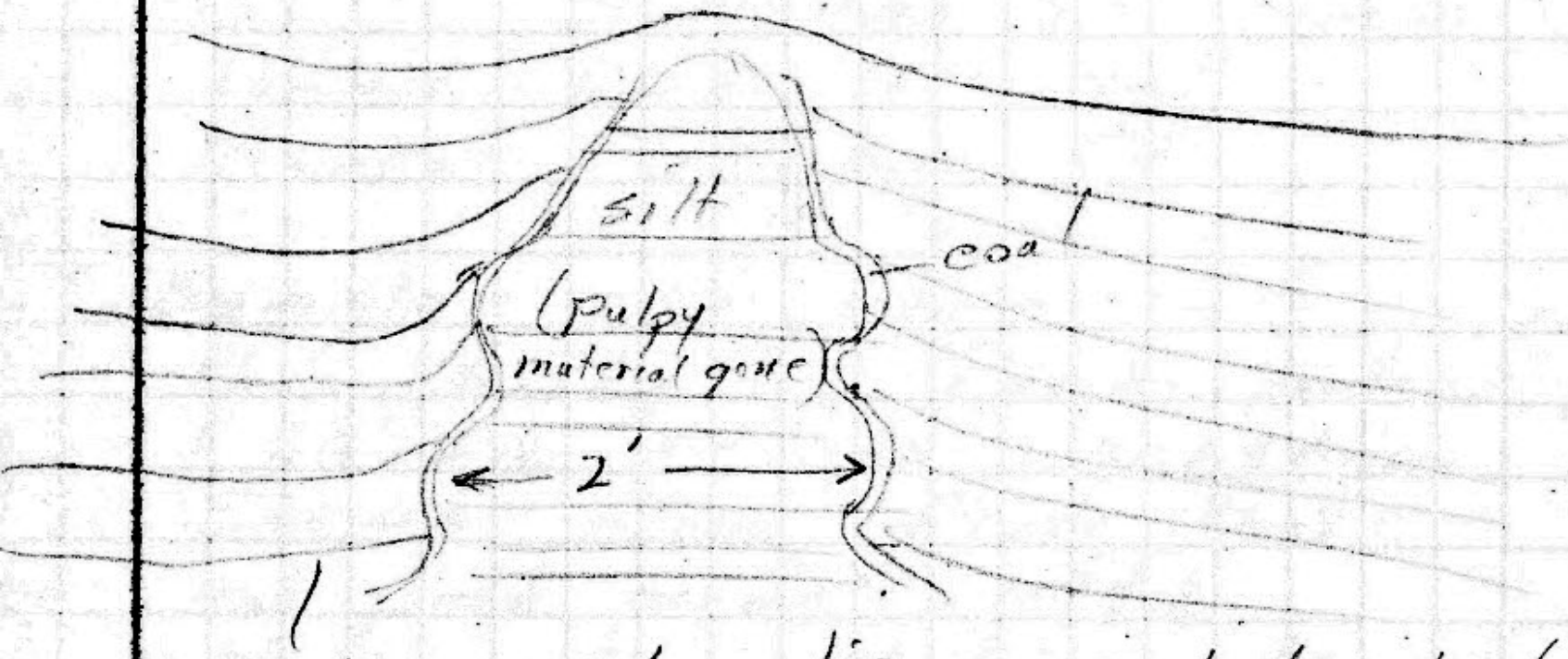
Chula section photo (5)
Unexplained laminations on thick (6') sandstone bed in lower Atoka
Hendricks says this should be close to "gunk" bed

Chula section photo (6)
Hendricks @ sequence 50' stratigraphically higher than Chula (2)

Oklahoma

Pine Mountain strip pit - Lower Hartshorne Coal

Cordites - large but all trees in upright position



Quaquaversal dip -- post depositional compaction

Also calamites - 6" ± diameter

Both types are turned over to the north more than in any other direction

Saturday - 32, 6N, 16E

Stop (3)

Savanna sandstone showing dip of foreset beds into whirl pool —

Sample Savanna SS from foreset beds collected Marked Oklahoma (3)

Sample — one piece of thin silty SS from below (60' ±) X-bdd sandstone. Shows micro flute casts and prod mark with plant piece that made it (Send this to Pres)

Stop (4)

Arch school locality

Sample collected of middle part of upper Wapanucka limestone and upper part of siliceous spiculer siltstone. Upper siliceous bed always present. Underlies Atoka (?).

Monday — Stop 6

Pine Top chert — radiolaria - Spumellaria
Lower Stanley — " Prunoidea
Sample of Pine top taken
Sample of nodules from glauconite zone
Sample of siliceous black shale taken 200' above glauconite zone

Elias measured this section and put top of caney base of Goddard lower than Hendricks did

Stop 7 — Beds of questionable age may be

Atoka ?
Morrow ?
Springer ?

Beds below are known to be at least the lower part of the Springer.

3 samples, L. M, U, collected for spores.

A

Little or no current bedding

Very few Flutings
Nearly no drag marks
Grading, terminating in lamination.

B

Flutings - pleautful
Fairly frequent drag marks
Grading terminating in lamination
Current bedding more frequent

C

Fluting scarce
Pleantiful drag & scratch marks
Grading not too conspicuous
Abundant lamination and current bedding, X-bdin

Perhaps end of sequence is current bedding

Stop 8	Chickasaw Creek siliceous shale
	Sandstone 50'± below this siliceous shale is basal Jackfork sandstone. Shale contains lenses of breccia to 19" thick, mostly 2" thick. Beds of exotic boulders, some with solution weathering present in the siliceous shale zone
Stop 9	Wesley siliceous shale Sample collected 200' below Johns Valley Shale Contains silicified solution shaped exotic boulders
	Moyer Siliceous Shale (U. Stanley) About 800' below Stanley top.
	Prairie Hollow Sandstone member of Jackfork - U. Stanley type lithology. Red color 1000' above Jackfork base

Springer – Hwy 43 + 69

Sample collected from lower part of Springer

Fossil zone 45' above basal glauconite zone that may be base of Springer. Several cephalopods collected & 2 bags of shale.

Thursday

3 miles W. of Whitesboro
Stop on Stanley to show
Cone in Cone –
Collected –

1. Slump ball – looks like pscudo nodule that has gone even further

2. whirl ball – development unknown
Proff K says rounding in whirl pool
Hendricks – angular & cracks rounded in gritty mud flow

3. Cone in cone & Cycle structure

1.1 mi S. of Big cedar 2,600'?

Stanley, upper part, but well below top

Photos of beds showing regularity of beds, but not as much grading as some, Prof. K says material may have been of about the same grain size and therefore not quite so graded.

Bag of sandstone and shale collected to show relationship to photo. More dense SS from thicker beds

Photo

Stanley ② - 2.3 mi S. Big Cedar up hill about 1.2 mile Still well below Stanley top Photo of large road cut with Haley on outcrop near abrupt change in bed from SS to 3' thick shale bed

This unit seems to fit environment A, page 10

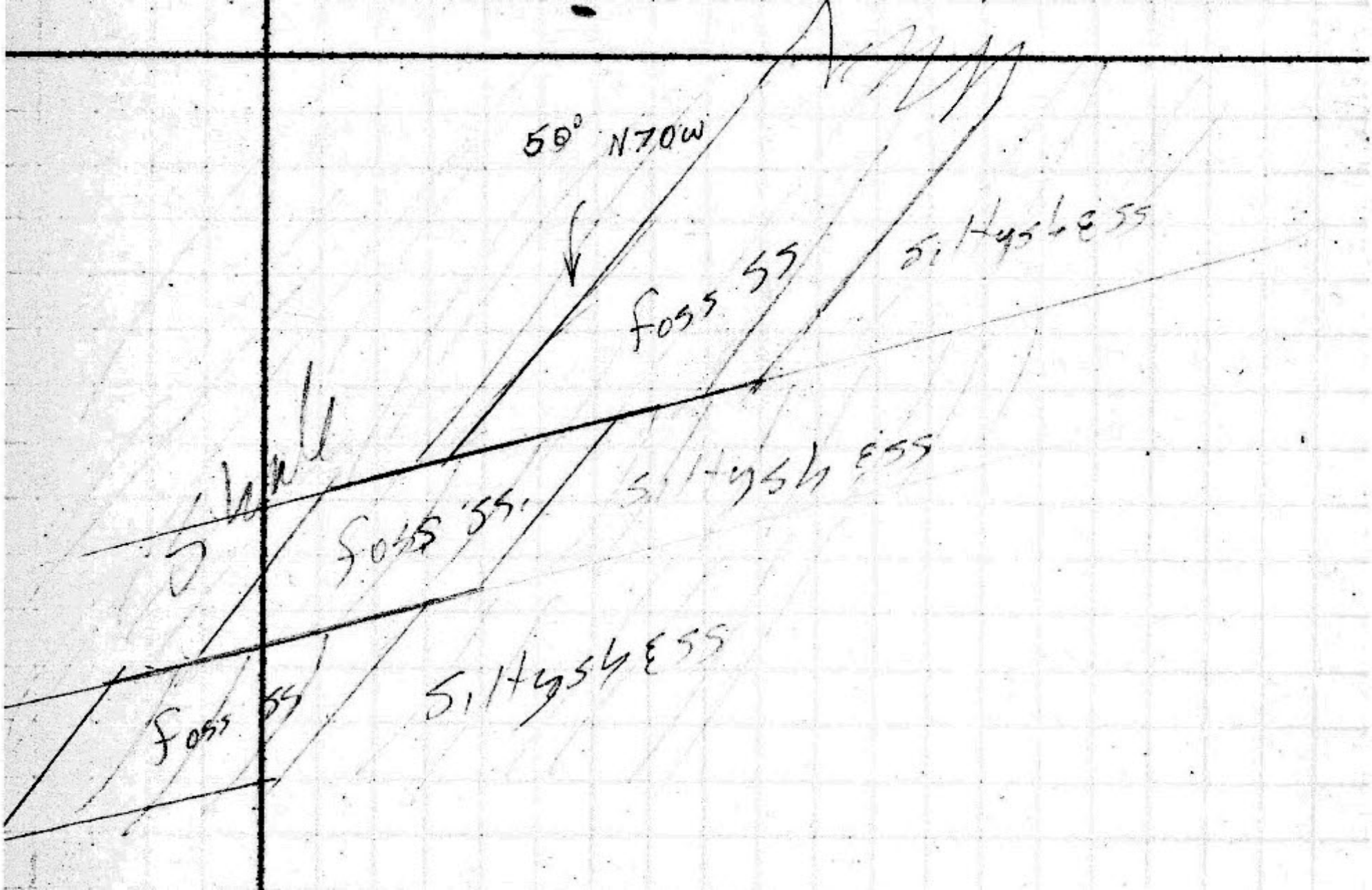
Photo	Top of Hill - 3.3 S. Big Cedar Clay slump ball in Jackfork
Sample	Typical Jackfork SS @ top of hill - 50' above Clay ball Jackfork (1)
Photo A & B	(5.1 mi S. Big Cedar) 0.2 mi below (N) top of hill Sandstone balls in Shale of lower Jackfork. This part of the Jackfork has a Stanley aspect. Sand slump balls
Sample	Cabbage leaf structures Some parallel fluting, some probably do not
Photos (2)	Load casts in Jackfork 4.7 mi S. Big Cedar. These features tend to be oriented and therefore may involve earlier directional features.
	Prairie Hollow maroon beds of Jackfork exposed half way down hill

Just north of Big Cedar

Major Fault Stanley against Atoka ?. Quartz and mylonite (hydrothermal clay mineral -- white on surfaces) show this is a major fault that goes to depth

Saturday - Summary of conference

Pennsylvanian micro fauna in Johns Valley, upper part, may unconformably overlie the Mississippian Caney (lower Jack Fork.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E.A. McIlhenny Est & Bamboo
Avery Is, La

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Geo. & Lucy Martin