E. C. Ulrich

Appalachian Valley (1)

Notebook 6

1905, 1906, 1907, 1908

Spring Fing p. 9 to
Evans Fing — p. 71

U. S. GEOLOGICAL SURVEY

TRAVERSE BOOK

9–904

8

[illegible]

From Chambersburg 12th Monday A.M. To F
" P.M. " E, C & D.
13th Tuesday via Greencastle pike To H, G. & G'
14th Wednesday to localities in vicinity of Waynesboro'.
15 Thursday A.M. To I at Ft. London
" P.M. To K, " Cowans Gap, pike
16 Friday from Ft. London To L & L' near McConnellsburg, thence S. To M and N. and through Folty to Mercersburg.
17 Saturday A.M. To J.
" P.M. To Chambersburg.
17. Saturday P.M. to Martinsburg, W. Va.
18 Sunday at " " "
19 Monday " Cacapon " "
20 Tuesday " " "
21 Wednesday } Strasburg Va.
22 Thursday }
23 Friday } Harrisonburg, Va.
24 Saturday }
25 Sunday } Staunton, Va.
26 Monday }
27 Tues. Clifton Forge, Va.
28 Wed. } Lexington, Va.

INDEX

Page.

N.B. no. 8

Stose's section in 1904. at Loc H.

147 — 60' Soft thin ls, weathers white
30' Harder ls

143 — 20' Same (Oolitic Crystal bed)
142 — 15' Same
141 — ~~80~~' M. th. B. black ls w. tabulate } bed 9 of Wheeler sect.
140 — 120' Th. Shly l.s. & knotty ls. Schizophoria bed

Stose's section in 1904. at Lor H.

144 — 60' Soft thin ls, weathered white
30' Harder ls

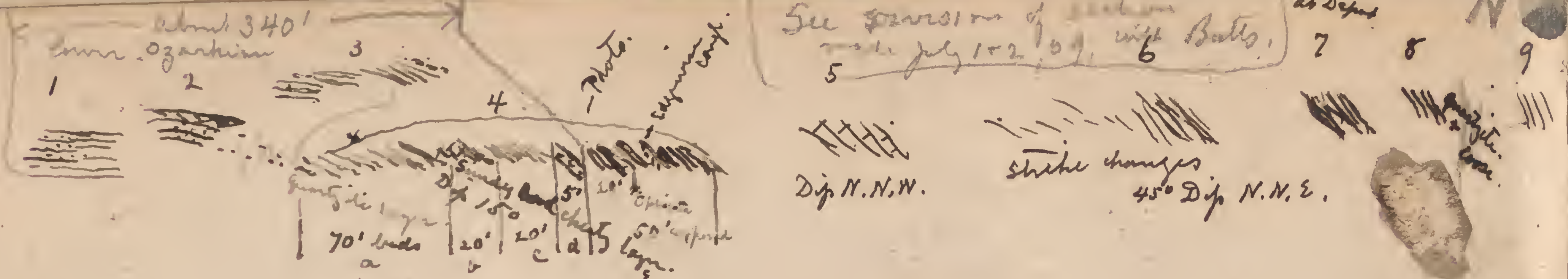
143 — 20' Same (Uhlipora crystal bed)
142 — 15' Same
141 — 80' M. th bl. black ls w. trilobites } bed 9 of Ulrich's section
140 — 120' Th Shly ls & knotty ls. Echinosphaerites bed.

9a ~~10~~ 3

June 8, 1905.

2C + 2D

Section at Bellefonte Pa.



1. Tollgate + R.R. crossing, 1 mile S. of Bellefonte. Rocks practically flat – Crypt. dolo. with coarse Cryptozoon structure. Some of the beds full of rounded grains of quartz, which in many instances form nuclei of oolite. The latter often silicified. In a blue layer 38 ~~[illegible]~~ dolo. the ova are also granular though some of them contain grains of quartz. Specimens (4) taken to show lithology. (Compare Sulp's Bed A.)

2. 100 yds north of R.R. crossing of pike. Not over 20 ft. of rocks above 1. Here some of the layers consist of crossbedded s.s.; others are granular dolo. with abundant quartz gr. parts of the latter may be quartzite. Those containing quartzite commonly also contain rounded or flat pebbles of fine-grained argill. ls. Up to this point rocks are practically horizontal. Now they begin dipping – first gently – to north.

3. ~~Between~~ 2 + 3 (opposite stack of Nittany Furnace, and about 200 yds n. of 2) on Nittany Valley R.R. rocks continue to dip n. less than average of 5°. Top of bluff reaches layers perhaps 75-90 ft. above loc. 1. Much of this is like beds at 2, one or two of the quartzitic ls. congl. layers however attaining thickness of 2'-3'. Some of the dolomitic layers also contain similar ls.-pebbles. Occasionally a little, finely brecciated chert, though chert is on the whole, very scarce. At 3 dip attains about 12°. Upper 25 ft at 3 fine grained and thin-bedded.

4. In wagon road along Nittany Furnace grounds – 155' rocks clearly exposed – all dipping 12-15° northward – section begins with quartzite layer like one of those in 2. Above this 30 ft. of moderately coarse-grained dolo. in thick & thin layers – [illegible] cherty layer – no chert otherwise.

b. 20 ft. fine gr. submarine dolo.

c. 20 ft. thin bedded fine-gr. " (earthy)

d 5 ft. massive laminated bed (like c otherwise) – upper part of bed with lenticular pebbles

e Variable grained, thick & thin bedded in lower half, prevailingly thin & earthy in upper half. ~~[illegible]~~ Several layers distinctly conglomeratic – pebbles lenticular – one layer markedly edgewise 25 ft. above base. – 8 ft beneath this thin layer – only slightly ~~magnesian and~~ dark sub crypt – is full of small ~~Ophileta~~ Raphistomina & ? Straparolloid form.

5 Limestone shown in old quarry, 150-200 ft. higher in series – Small gastropods like at 4 seen in heavy ~~black~~ dark gray dolo.

∠ Nittany dol.

6. City Laundry – just above – good exposure mostly fine limestone about 100 ft. with numerous but imperfect fossils. Asaphus canalis marginalis etc horizon. A small Raphistomina? ⊘ ● ⊘ Corresponds to Collier Hor. ?

Dip of rocks 45° N.N.E. about 180 ft above 5

6a Ostracoda zone 70 to 100 feet above gastropod layers. (5 [illegible])

7. From City Laundry (no 6) to Centr. R.R. of Pa. depot where is good Expos. & rocks dip 45-50° N. 10-15° W. Thickness of beds between two points about 1575 ft.

8 Loose quartzite fragments in road possibly not far from bed. Locality 300 feet south of first limekiln n. of depot. About 800 ft. of rocks between sta. 7 & 8. Dip 50-60° bet. 7 & 8.

Dip 60-70° bet. 8 & 9.

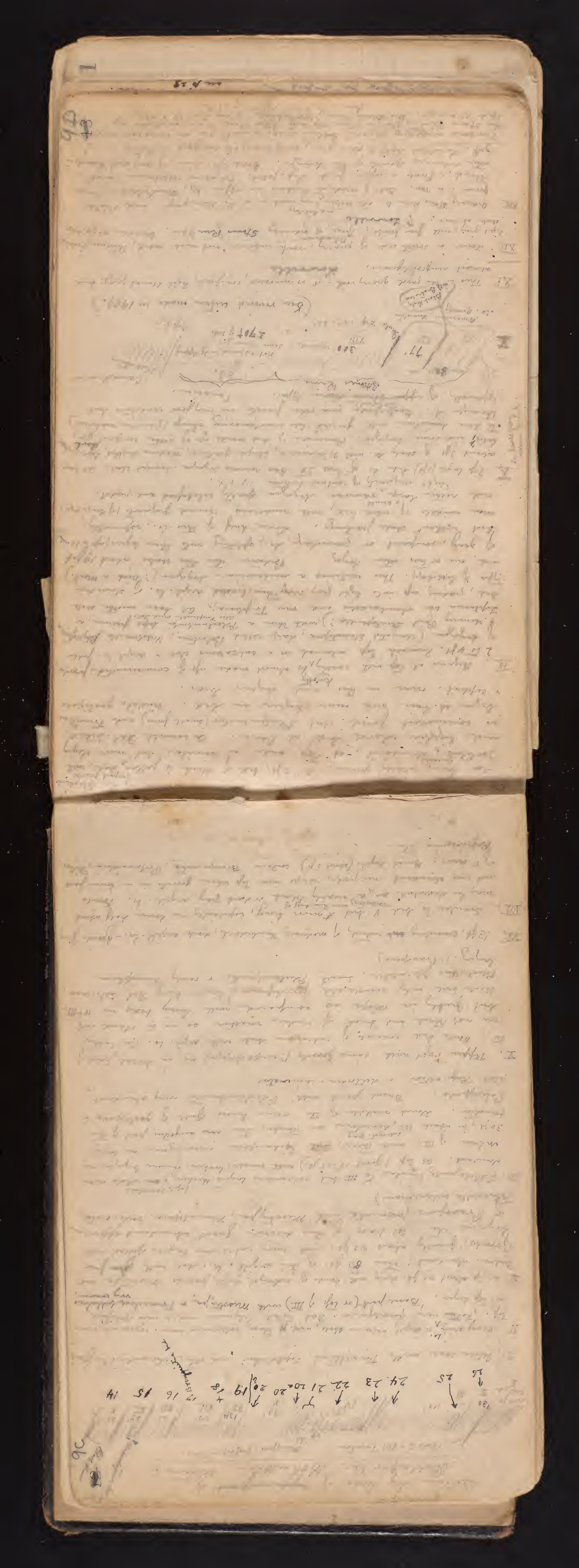
9 Quarry at limekiln – first 100 ft. of beds above loose quartzite not exposed. First seen thereafter is of Stones River age having the same lithologic features characterizing formation in Ky. River gorge and in Mo. (worm-holed) & fossils apparently throughout but fossils more common in upper half. Thickness of Stones River exposed to first layers examined about 350 ft.

Base of exposed Stones River about 1500 ft. above the Proto-orthis? bed (no 6) providing no duplication of beds occurs.

see p 29

9b

1



Upper Cambrian. C.

At Scotland, 4 miles northeast of Chambersburg. Fine exposure in quarry. Fragments of trilobites in the limestone beds at western side. Some weathered slabs exhibited large variety of species of ~~shells~~ & trilobites.

This is about the base of the upper (third) member of the limestone series. The base carries the "edgewise" layers, red stain and shale, wavy and knotted "organic" layers, sandstone and breccia beds, chert, and other indications of shore conditions. These may be seen at D, northeast of Scotland and at E, 1½ miles southwest of Scotland.

On road NW from Scotland, Buckmantown fossils observed on both sides of Greenvillage.

June 12 - 1905. P. M.

Visited loc. C & E - cut out D, going northwest through Greenvillage and thence through Beautiful and south over shale hills back to Chambersburg instead.

Examined E first. Here found Edgewise beds and other features mentioned above. Also some thin layers of oolite and in these a few fragments of trilobites. The horizon may very well correspond essentially with Elvins formation of Mo.

Next looked into rocks at Quarry at C. Here found some fossils and a 3 ft. gray grain oolite. The horizon is slightly shaly and is nearly equivalent to that at E. Less than 100 ft. beneath found Edgewise bed standing vertical along road.

In driving to and beyond Greenvillage (or Buckmantown?) noted eight to ten outcrops. In every case the rocks dipped ESE. This phenomenon can be explained only (assuming Cambrian shenandoah underlies Buckmantown) by supposing a number of strike faults. An overturned fold however, probably occurs at Scotland, the fossil loc. being near axis. The fossil horizon seems to outcrop again at point about ⅓ - ½ m. N.W. of quarry.

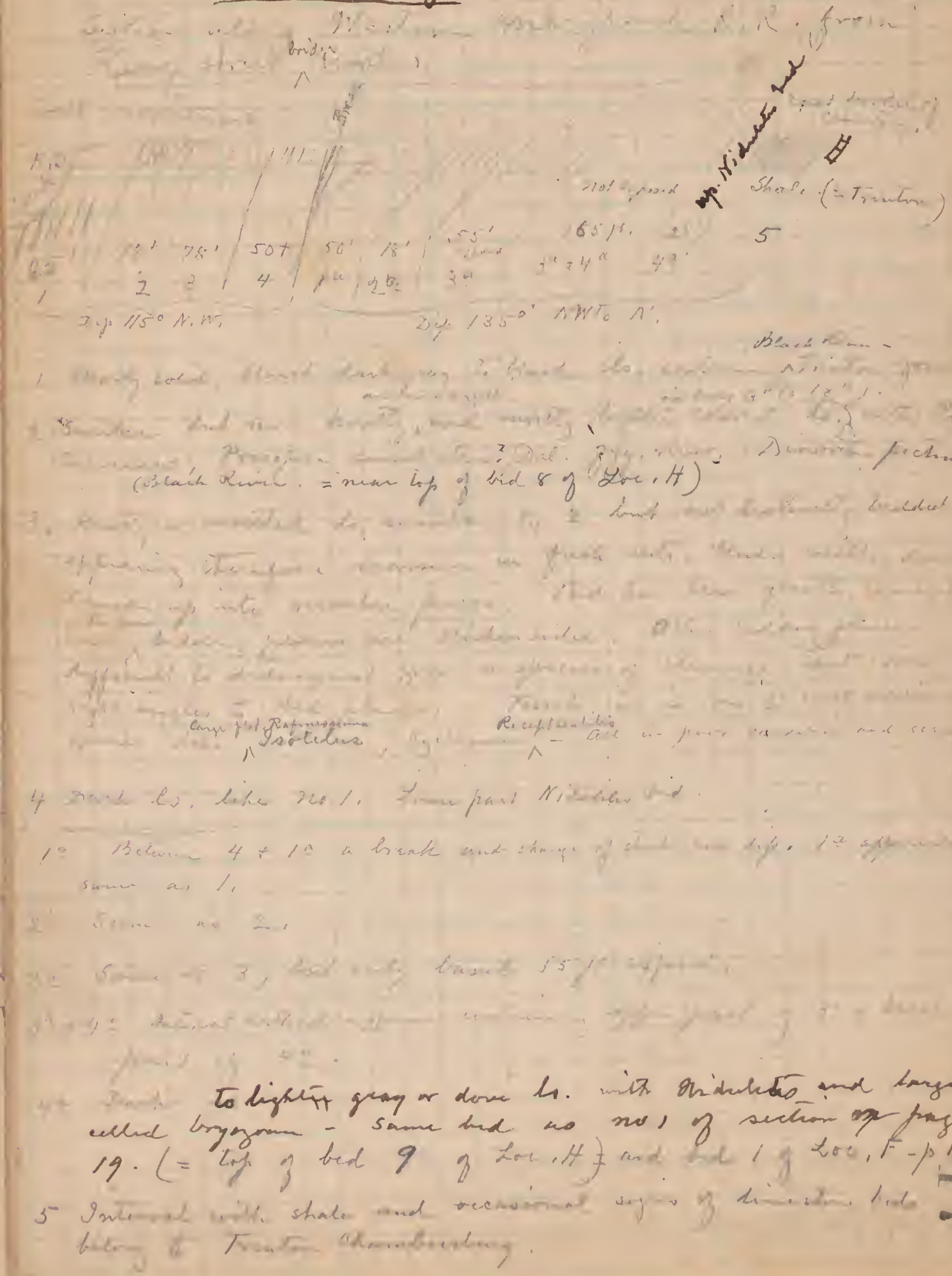
St. London.
on p 19

Drive from Chambersburg to Greencastle on pike & visit contact at several points to west

Trenton (& ~~Stone~~ River.)

Good detailed section at Utica contact.
Friarthus bed.

Chambersburg Pa. (p. 12-19)



4 Dark ls. like No 1. Same part Nidulites bed.

1a Below 4 & 1a a break and change of shale [illegible] 1a appearance same as 1.

2 Same as 2.

3a Same as 3, but only [illegible] 55 ft apart.

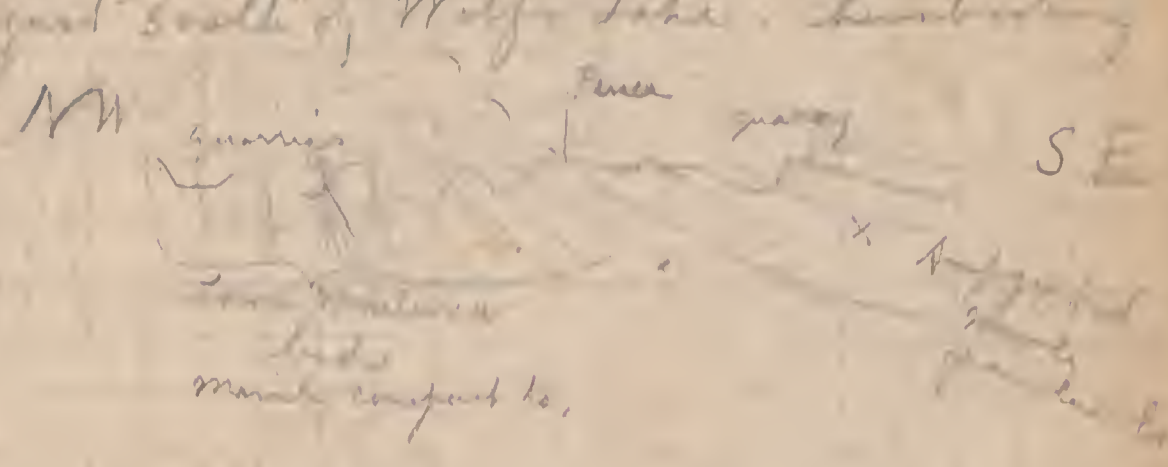
4a Dark to lightish gray or dove ls. with Nidulites and large called bryozoan - Same bed as No 1 of section on page 19. (= top of bed 9 of Lot. H) and bed 1 of Lot. F - p 19)

5 Interval with shale and occasional layers of limestone like belong to Trenton Chambersburg.

See N.W. end as Ft. London.
see p 29

May 3, 1906.

Quarries just south of Wolf Lake. Chambersburg



Several ledges in quarry nearing lower Marlboro beds are filled with gastropoda and cephalopoda. Maclurea rudis common but difficult to procure in good condition. A Buccania, that could not be distinguished from B. subcatenata and other gastropoda occurred here. Rocks vertical or much sheared.

In the fields to the south of these quarries several smaller openings out cut opposite ledges. These ledges are more nearly horizontal and the rock darker and in considerable part granular. Off the latter a couple of blocks were found that contained Ampyx thalli, Dystichopora and two orthoids, one of apparently Hebetoceras bonalei and the other like Blasinoceras stoplerianum.

Stratigraphic relations of two fossiliferous ledges not definitely determinable here, but the Ampyx bed is believed to be the higher. Also that the more siltstone quarries are near the base of a fold that flattens out rapidly to the south.

Trenton G. 213

Good fossil locality in small quarry No. 127. Bryozoa, etc.

G.1, ~~Good~~ upper Trenton? fossils, small black gasteropods, lingulids, etc. No. 136

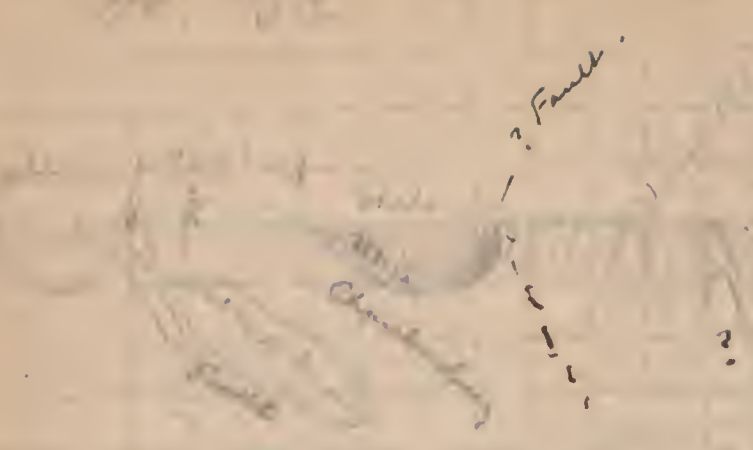
June 13th 1905.

Loc. G.

At bridge over Conococheague Creek (south side) Stones River rocks standing vertically are shown in good exposures. The top of the Stones River occurs about 440 ft. East of road. Going westward something like 150 ft. of lower Chambersburg are exposed. The upper 50' contains Pleurotomaria and other Chambersburg fossils, while the of the latter 25 ft. afforded Leptaena, Plectambonites, Tetradium, Rafinesquina, small orthoid or Strophomenid (comp. at high ledge of Stones River) all indicating lower Chambersburg. Frequent exposures (almost continuous) along steep grade east side of road. Best exposure seen at edge of wheat field, which lies about 407 feet below top of Stones River. Every exposure afforded fossils of Stones River types, hence the whole thickness beneath Chambersburg (i.e. 407 ft.) is referred to the St. Rivers. The lowest exposure contains some trochiforms that should be looked into. The rock containing them was not found in a ledge but several small boulders were found. On a lime concretion [illegible] 100 ft. higher one ledge was filled with small Cystidella [illegible] The [illegible] Pelagiocrinus seem to [illegible] small nodules of chert in [illegible] Apparently the [illegible] The [illegible]

150'	275+	132'
Chambersburg	Up. Stones R.	Mid. Stones R.

On RR. cut at Ft. London. on p 29



= upper

H. = very prime upper St. R. b.

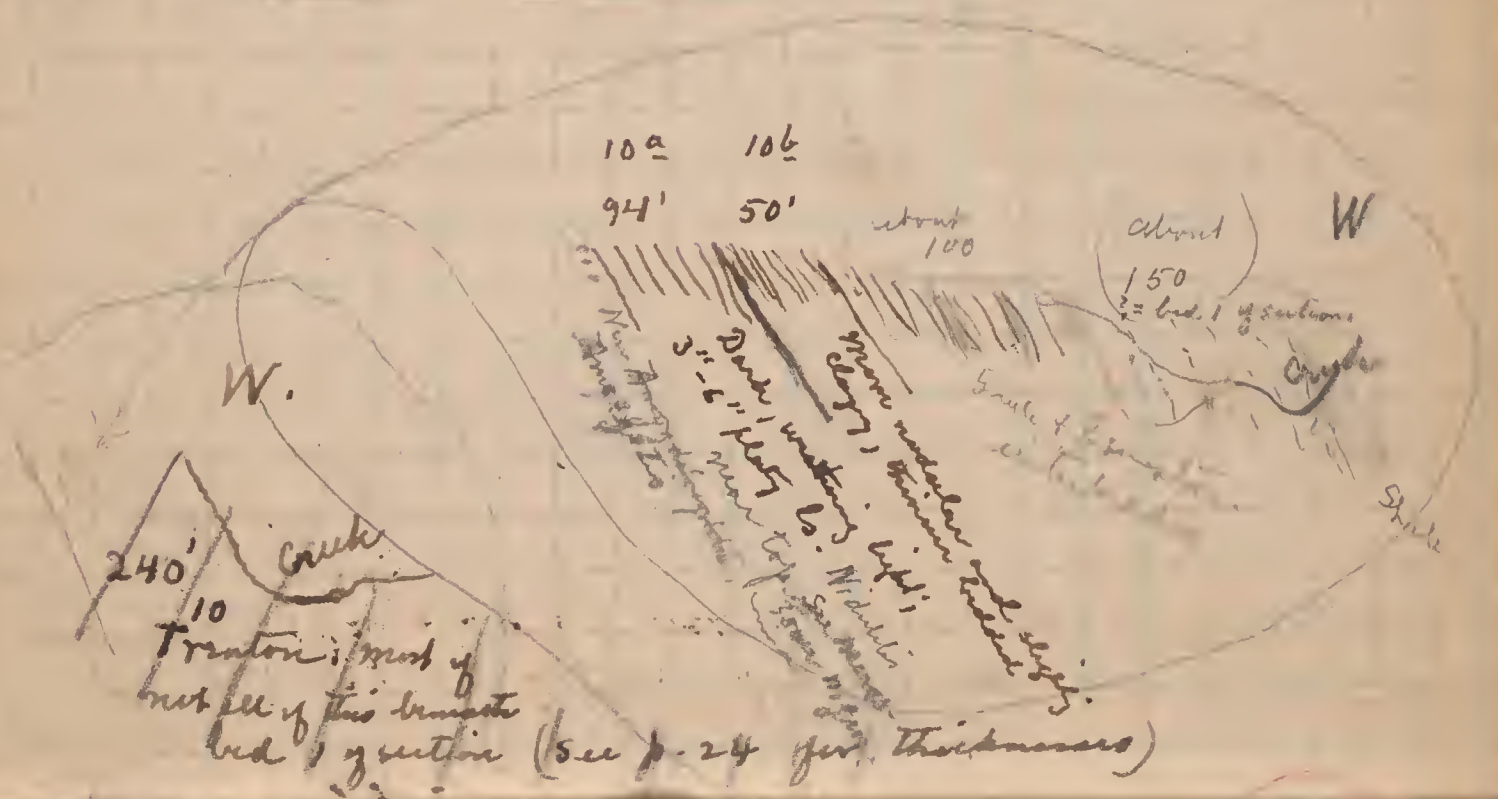
(200-300)

Thus

*

was observed.

* Important in indicating that Fort London cut beds are low in Chambersburg and that they are there separated by a fault from the Trenton limestone to west of cut.

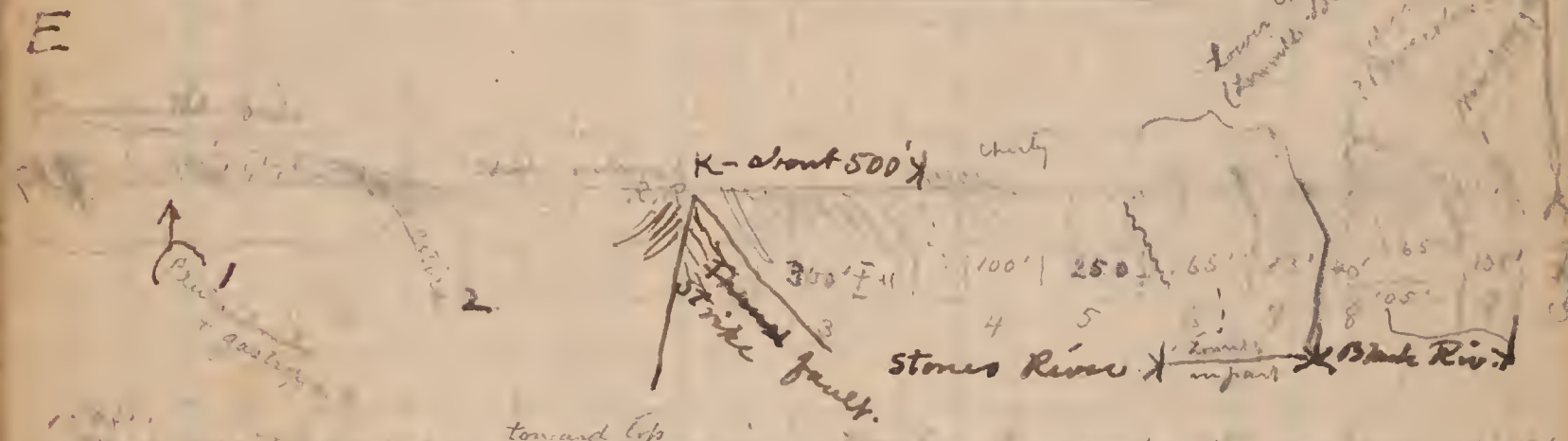


Trenton, H.

Good section of upper beds along RR. Very fossiliferous (Nos. 140 – 144) Contact with shale not exposed in cut.

June 14, 1900

Section beginning at Chambersburg limestone and going east to Conococheague Cr. at K.



Fault between 2 & 3, lower Stones River ~~[illegible]~~ Utica shale.

upper Stones River.

Dark, but dark, Lowville & Black River b. with

up. part 8 & low. pt 19: Middle bed.

Remainder not searched.

(102 over this.)

On RR. cut at Ft. London. see p 29

The section on preceding page brings out following facts:

1. There is a well-marked ~~thrust~~ strike fault between beds 2 (= Utica - Edenshale) and 3 (= Lower Stones River). The throw of this fault amounts to no less than ~~1960~~ 1700 ft. and probably is very almost as 2000 ft.

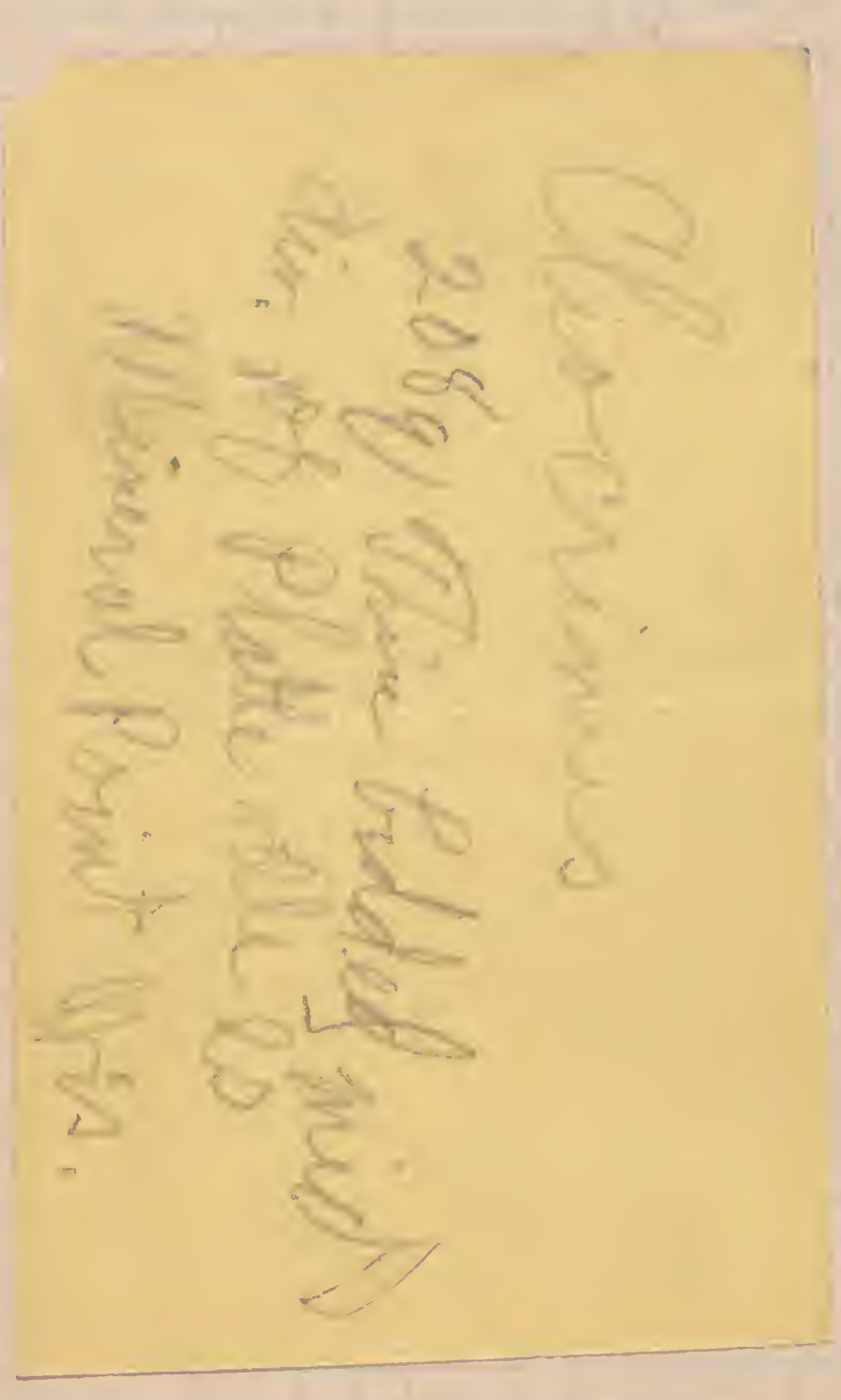
2. Assuming that most if not all of bed 1 overlies bed 10, the Total thickness of the Trenton ~~cannot~~ be less than 350-390 feet.

3. The rocks referred to ~~Black River~~ Chambersburg aggregate a total thickness of ~~* 210-213~~ about 600 ft. This is the greatest development seen. ~~An interesting feature in this connection is the total absence of the Black River and a lesser thickness of the Trenton in the Chambersburg section. It would appear that the Black River basin did not reach as far east as the Chambersburg band.~~ (But 9 probably includes Riddlesburg bed of Chambersburg section. Only perhaps 20 ft. of this bed was reached at Loc. H. July 20 ±)

4. The rocks referred to the Stones River aggregate ~~800~~ 1100 = 1150 ft. which is 600 ft. more than was reported in the section at Loc. G. It is to be noted however that the lower part of the latter section was recognized in the Loc. H. section ~~500~~ ft. above its base. ~~It is possible that a part of these lower 800 ft. may belong to the Kite but at present cannot say. Now that~~ Faulting has cut out base of Stones River at G. by 500 ft. more than it has at Loc. H. Probably not less than 1200 ft. Stones Riv. in Chambersburg belt.

Strong [illegible] N. is [illegible] found Trenton on pike and then Stones River. The latter ~~[illegible]~~ gradually grew flat, lying the dip (N.W.) 1-2 m. w. of Greencastle, being between horiz. & at 20°. That a large part, if not all of the rocks passed over between Huffman and Greencastle are Stones River is indicated by large number of cedars.

← See R.R. cut at Ft. London. on p 29



Eden. K

2 B'

Trenton I

2 B'

South of Ft. London. (Good)

Broad area of flat lying Trenton rocks. Good fossils & exposures in quarry and R R cut. Crinoid plates, etc. No. 332. Shale contact exposed to south. Columnaria shales cover hills to west & well exposed in road cu

village found
at the S.W. end
Blanch in fault (Trm plane in
Penn. This
upper Cactus
filitexta, Raf.
Rhin. nicholsoni
Licrophyllum
ds above it.
not clearly exposed,
lipsum
ish dark gray
first 8-10 ft. Next
shaline, crinoidal
plates of one or two
tapied with these
lin or Trochelina
s. Other fossils
Columnaria halli
ica? and a small
with Parkydiliza
hen bryozoa.
beds beneath
and Ulr Gomphoceras. Fragments of Illaenus
and Asaphus noted.

Strophomena
Columnaria
Calliopsis

Stratigraphy. Blanch. Penn.

Fort

10'

8'

May 5, 1886

29

← In RR. cut at
Ft. London.
see p 29

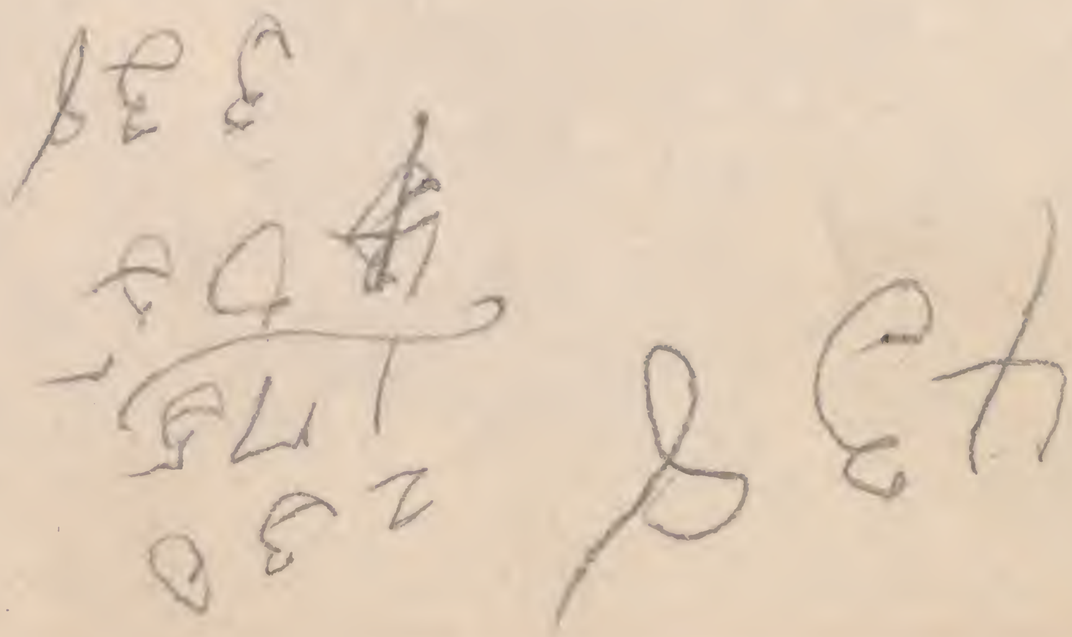
Clio crimus

2089 Thos Eddes mid

dir. of Platteville

Mineral Point Wis.

Steady supposed "Ottawa" at Lone Mt. for comparisons with upper shale member of the Thompson Valley formation.



牛乳及び2½マイル 5分 London

第5巻

Where is material for Marlborough.

2月7日 (火)

Text & from Transcribing

Eden. K

2 B'

Trenton I

2 B'

South of Ft. Loudon. (Good)

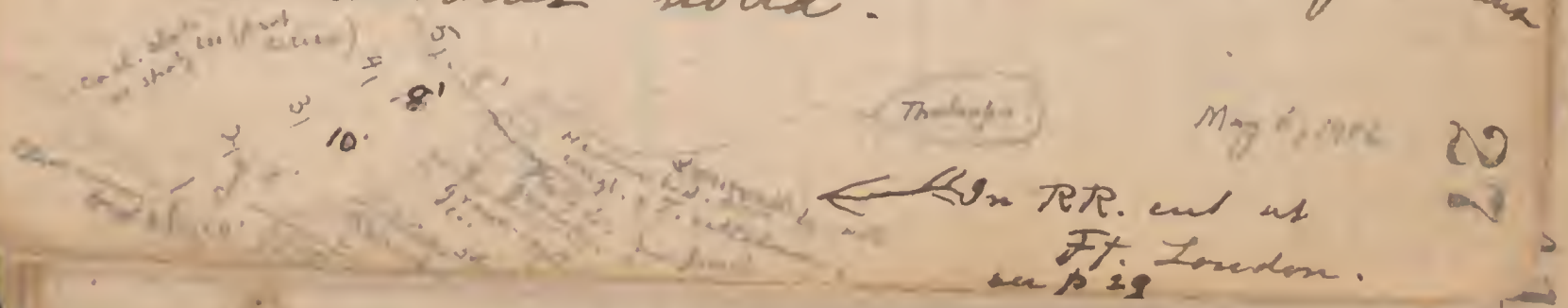
Broad area of flat lying Trenton rocks. Good fossils & exposures in quarry and R R cut. Crinoid plates, etc. No. 332. Shale contact exposed to south. Columns shales cover hills to east & well exposed in road crossing hill westward.

Fort Loudon loc. I. See also p. 29

In railroad cut, small quarry just south of village found basal 30 ft of Black River and at the S.W. end of cut about 8-10 10 ft of upper Lowville-Black River displaced in fault (Trim plane on SW side) ~~Stones River~~. This ~~bottom~~ downthrown plane bed is thin-bedded and of the usual upper Cactus mottled type. Contained Strop. filitexta, Raf. minutostriata, Esch. varicosa? Rhin. nicholsoni very good specimen of Cliocrinus, Lichophycus & other fucoids. Same general fauna as beds above it.

The true Black River, though contact not clearly exposed, begins with finely granular sparsely fossiliferous bluish dark gray ls. The type prevails through first 8-10 ft. on next 10 ft. ~~return~~ & more or less crystalline, crinoidal ls. predominates. These contain plates of one or two new cystids. Dark layers interstratified with these contain trilobites, a large Lepreditia or Isochilina and Val. pervata & other brachiopods. Other fossils in this bed drawing number are Columnaria halli & Tetradium columnare. Beatricea? and a small Isochilina occur in lower 10 ft, with Parkyndia foliata, Stictopora cribrosa and other bryozoa.

Upper 10 ft. more earthy than beds beneath and less fossiliferous. Fragments of Illaenus and Isotelus noted.



Thalassia May 6, 1902

20

In RR. cut at Ft. Loudon. on p 29

In reply please refer to E.W.P. and date of this letter.

Address all communicat
"Director, U. S. Geologic
Washington, D. C.

SUBJECT: Coal tests at the St. Louis Exposition.

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WASHINGTON, D. C., April 15, 190

To the Coal Operators of the United States:

An act of Congress approved February 18, 1904, authorize the United States Geological Survey to make use of certain exhibits at the Louisiana Purchase Exposition for analyzing testing the coals of the United States, in order to ascerta as far as possible the most economical method for their uti ization. The law especially provides, however, that all co to be tested must be delivered at the testing plant in the Exposition grounds

Close-section at Fort Loudon above Utica and 5 in RR.
(not section)

Fissile shale = Utica.

40'

Calcareous slaty shale, dark, weathering light gray, with some hard lime beds. Trinucleus etc.

Bed 9

Top bed subgranular black with crinoid stems, gastropods, rapidopoda (288 b) = B6 of St. Thomas

30 ±

Bed 8

Partly exposed similar dark cobbly ls

288 a) 23' (?15 ft) Dark shaly ls with fossils (Bed 7 + 8 = bed 5 of St. Thomas (294) section.)

Bed 7

Bed 6 12' Dark subgranular massive limest (= bed 6 of Dickey section and top bed 4 of St. Thomas (294))

3'

Bed 5 Pure dove ls with Tetrad. gasteropods, lepeditera etc. (Same beds as at C 4 2)

288

= top of bed 11 in Blue Spring section and top of bed 5 of section Ft. London Chambersburg Ls. section

May 6, 1906.

Ft. Loudon section along R.R. from ¼ to 1 mile south of station.

Later on Snowy Stone found exposure of beds above bed 5 to the base of overlying shale, giving total thickness of Chambersburg ls. as 160-165 ft. S.

1. Basal Chambersburg = upper Carters = ? upper chazy. Large Cliocrinus and other things mentioned on p. 27. Also Gonioceras. Rocks mainly thin bedded + thinly banded. At base some granular beds with gastropoda & Gonioceras. Thickness not seen but probably more than 20 ft.

2. As described p. 27.

3. More or less cryst. crinoidal, grayish ls., full of fossils. A layer near base full of Solenopora. (Cliocrinus bases at top with Beatricea.) Cystid plates, Rhy. plena O. costalis, Tetradium columnare, Columnaria alveolata etc

4. Bluish subgranular with Lepeditia and dark gray rather compact and irregularly bedded ls. with Isotelus and Illaenus. (Much less except at base) fossiliferous than no. 3.

5. Conglomeratic dove ls., pebbles very small (resembles oolite) and of same general character as matrix. Contains Tetradium cellulosum fasciculata, Lepeditia, Ft. London

Utica rather limy — probably near base of formation. Same indicated by slabs (out of place) containing Trinucleus.

To be worked (Probably faulted)

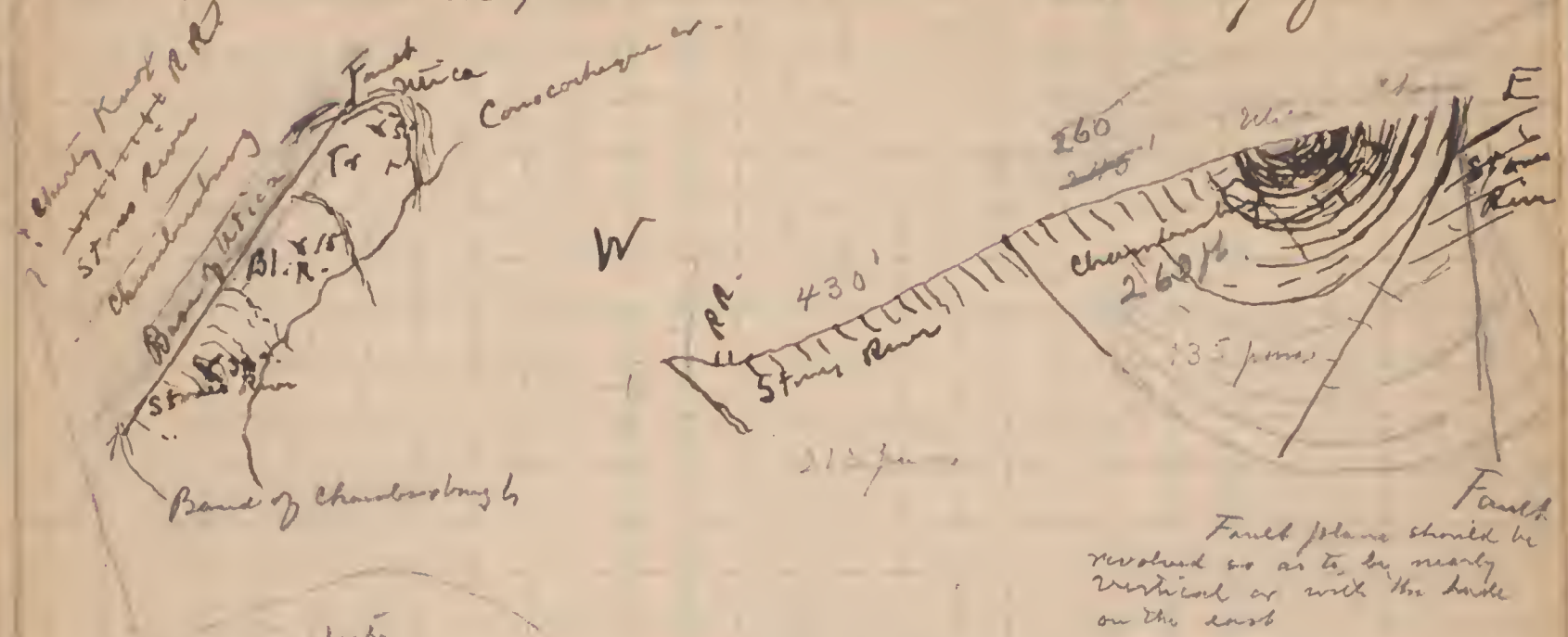
Carry vegetation and in plexus

in body of bed

69

Stone loc. K9.

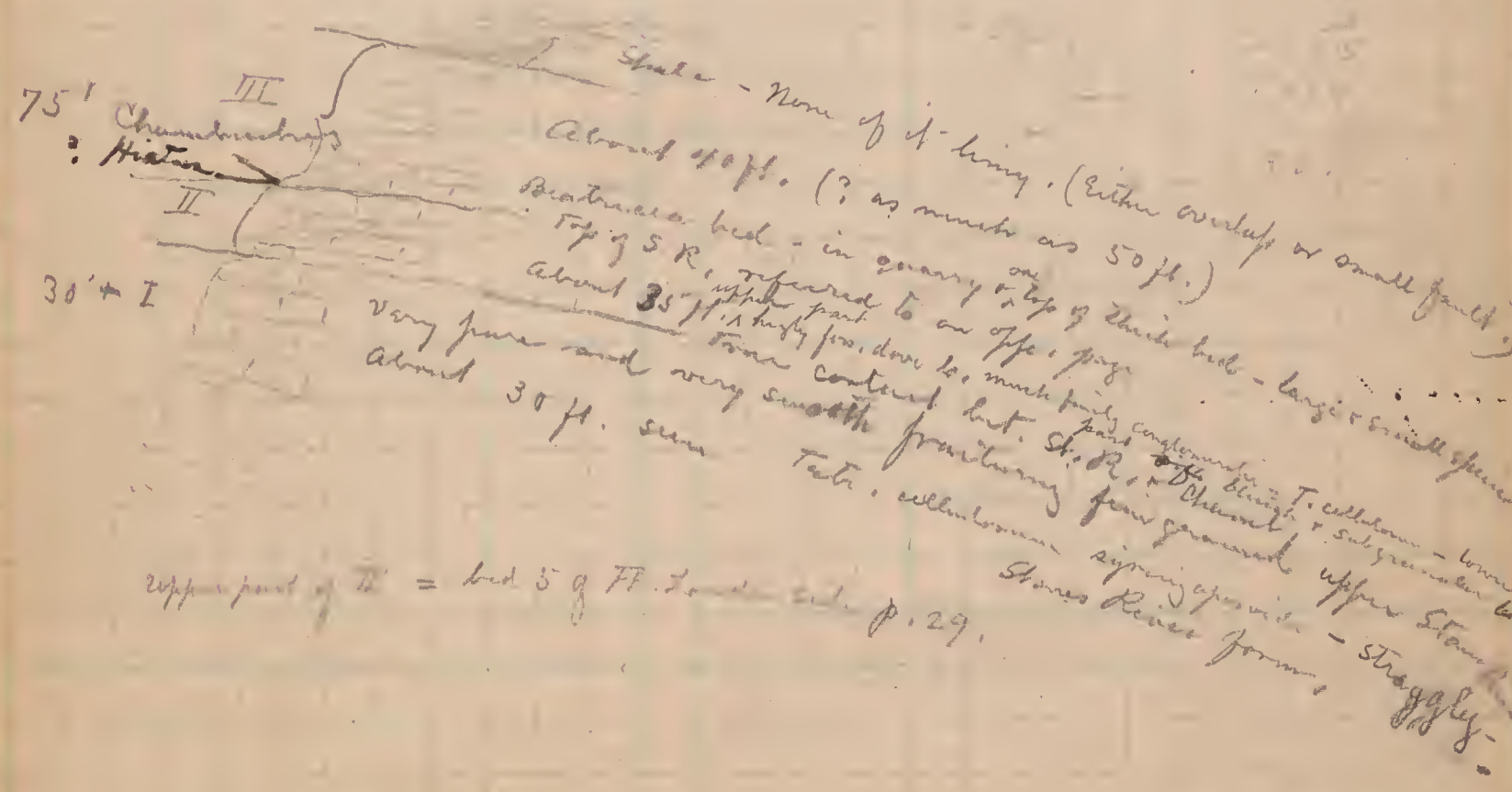
1½ m. N.E of Mercersburg, at plunging N. end of anticline, outlined on west side by fault



This may be clearly seen in the Stones River, middle of Stones River, East on account of the known of upper stone R. in that case (it 430') this is doubtful. May 1, 1907.

Normal fault in west limb of plunging anticline later subjected to lateral pressure from east. The shale in syncline caused it to close more than the anticline to east of it.

Blue Spring section revised May 8th 1906



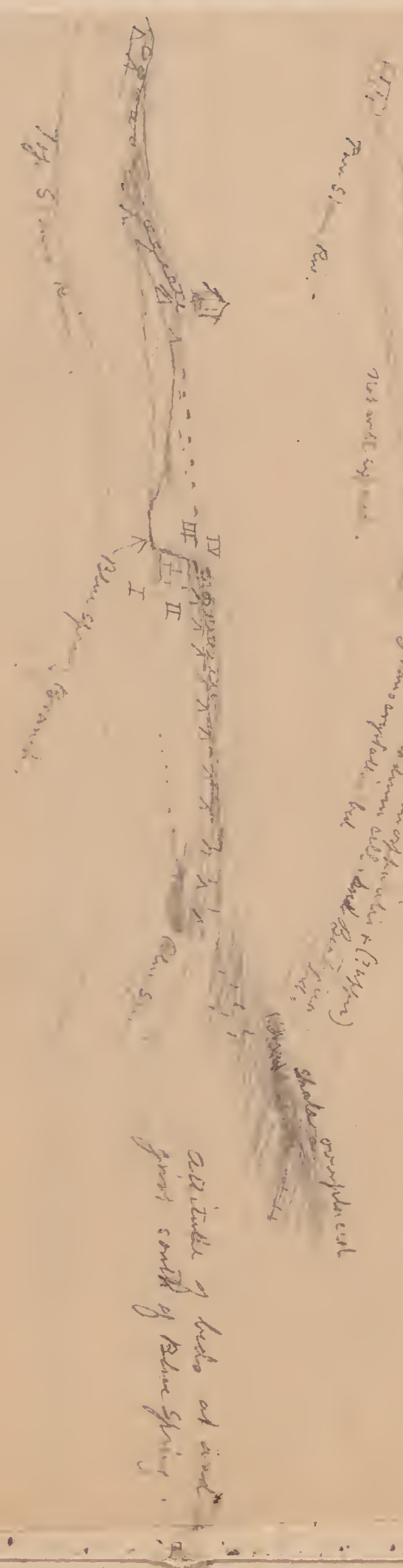
Trenton S.

At Blue Spring 3 miles southwest of Mercersburg.

Flat beds on east side of anticline. Sponge and associated fossils, Bed of shells, etc. No 210. Shale contact exposed (Good)

June 17. This locality proved very interesting and in a considerable degree perplexing. In the first place the exposure is of the top of the Stones River and basal Black River - about 30 ft. (top only exposed) of former and about 75 ft of the latter. (The Bl. R. part is divisible into ~~The contact in a way may be said to be sharply distinct with a blackish~~ subgranular ls. (no III) the base of which is 6-8' plastered on more massive, fine-grained dove ls. (bed II) preceded by nearly 30' (25-30) dark ls. Considering all beneath this dark ls. as Stones River, then the upper beds of the S. R. are to be described as consisting entirely largely of a very fine grained limestone, cerogle, with the matrix highly fossiliferous. With Lep. (mar.) fabulites the upper bed (2) contains a multitude of gastropoda, one of these a Helicotoma with sutures on upper side deeply impressed & whorls nearly separate. Unfortunately none of these shells could be secured in satisfactory condition. With them occurred either a Tetradium like cellulosum (in small equidistant tubes - another form in fascicles of 4 or 5) ~~or a sponge like Dyctatosponga~~. Also a Bratricea ½ to 1 inch in diameter. Another Bratricea found at quarry ⅛ m. S.W. of spring is less than ½ in. in diameter. Above these clearly Stones River beds (and just beneath bed 2 (Bratricea)) come the darker subcrypt. ls. filled with the same fossils found at Ft. London. ~~Dal. planata~~ Phacella borealis occurred abundantly - also Rap. (Lep.) charlottae, a Rhynchotrema plena, Zygos. recurvirostris and a number of Ostracoda. Among the latter a Leperditia near or identical with L. fabulites. Also a number of

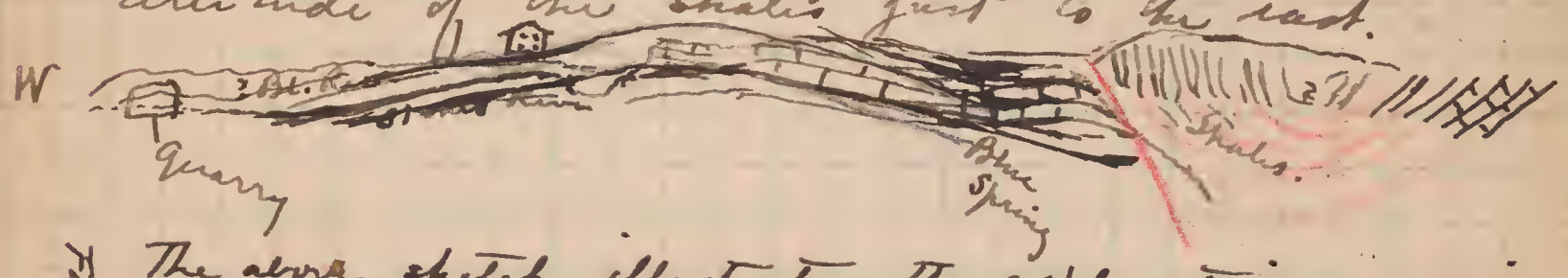
The upper part of bed II also is fine grained, but is distinguished by having a



Section on road ¼ m. North of Blue Spring.

Bryozoa, also the cystid plates found at Ft. London. (~~It is possible that the whole ls. section here is really Stones River – if so, the Ft. London section which agrees in lithol. & fauna is the Chazy St. Rio.~~).

The most peculiar feature of the structure of both areas is the fact that the ls. are nearly horizontal and the shales to the east or west are so near that, if there is no fault between them, there is not room for the upper Mohawkian beds. The big spring and fractures in the ls. indicate faulting, – likewise the vertical attitude of the shales just to the east.



The above sketch illustrates the explanation according to a ~~shale thrust~~ partly reversed normal fault, pushing shales over ls.

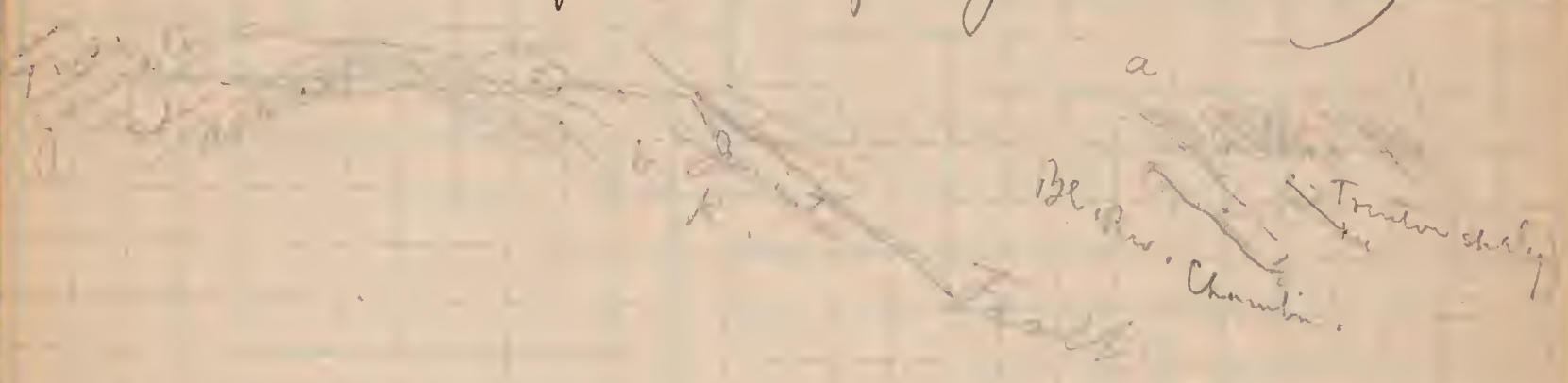
On the other hand, if there is no fault then we must assume that the upper Black River and the whole of the Trenton is missing in this band. The band of shale closing over ls. area just south of F and the narrowness of the Mohawkian band on the east side of the shale band are indicative of this second view. Still this condition could have been produced by erosion of the ls. area prior to the thrusting of the shale over the area. The absence of the Trenton may be due to non-deposition but the erosion theory strikes me as the more probable.

Fault theory is the easiest explanation.

Possibly this view applies also to the features observed in McConnellsburg area. This would obviate the necessity of a fault there which otherwise would have to be assumed. Still nondeposition would have to be entertained as partly explanatory of the conditions.

Cowan Gap, 6 miles north of Ft. London.

Eden shales exposed below ~~Clinton~~ Medina red sandstone. Fine fossil locality in weathered calcareous layers. No. 223. Questionable fossils from shales up road to west near Gap. (See if any Chiton here)

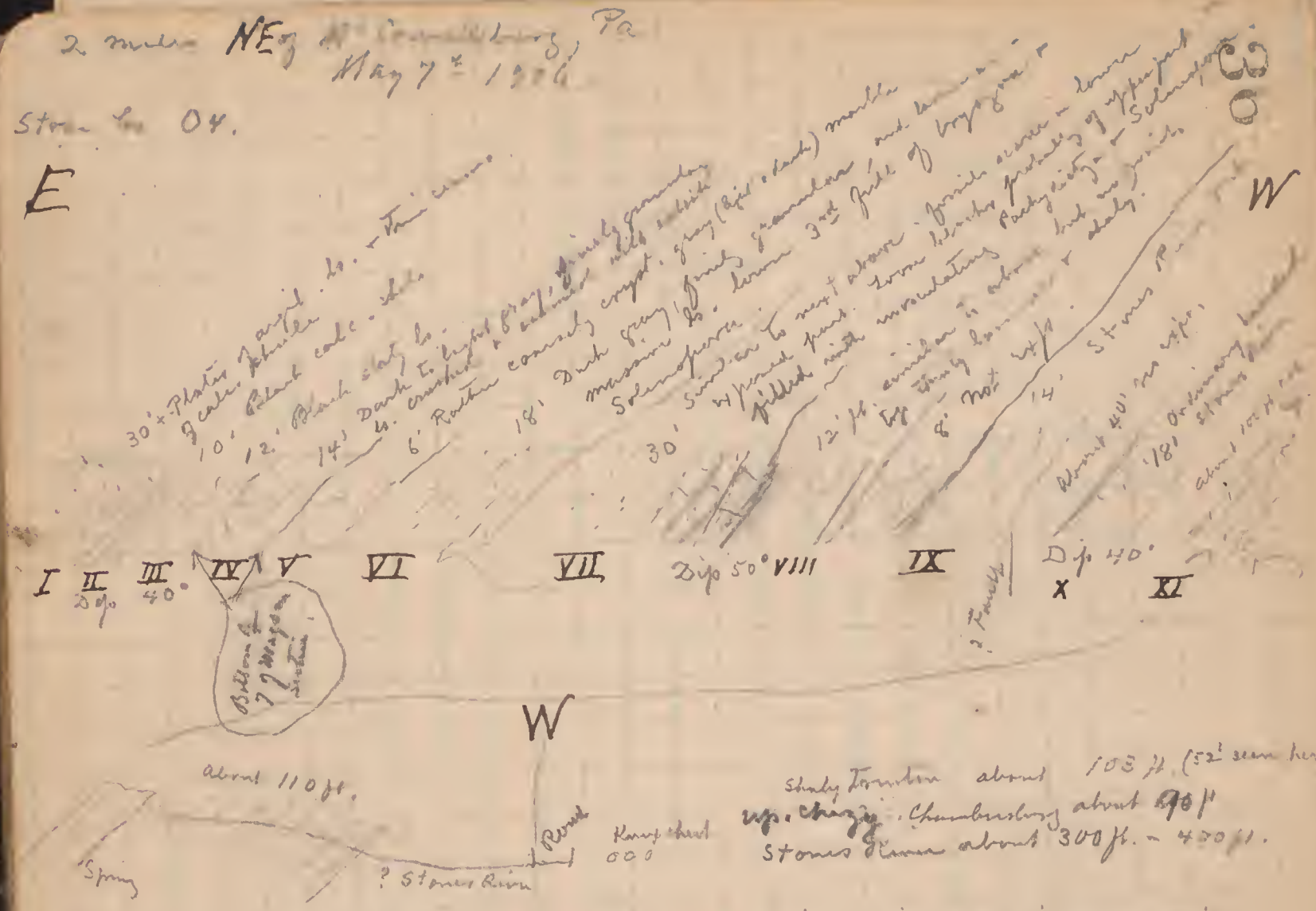


At a where walking road crosses from Medina shales to Eden shales a good section is shown. Top of Trenton is the usual dark bituminous limestone. The Utica sets in abruptly with black shale. The base contains a number of thin lying layers & usually more dense in texture than the more massive bedded Trenton ls. The shales underlying the thin lying layers contained Graptolites & many.

Up the mountain side in the gap (Cowan) at Stop No. 8, dark and calcareous layers full of fragmentary fossils found below shales. Among the fossils Orthoceras (long-ranged, familiar form) or slender Nautiloid, Strophomena, multistriate and other stem fossils. Big layers contained many small Polypiferous. A shell like Platyceras gemmulus was the commonest of all compressed. However, have no doubt of Utica Eden age of shales. The fossils found were of more Eden & Utica shale than Trenton. The Trenton shale was not found, but fossils, doubtless of Trenton age, should be found in the transition passage.

2 miles NE of McConnellsburg, Pa.
May 7th 1906

Stone Co. 04.



Bed above spring probably still Stones River, being fairly low in magnesia. It is however different from typical stones in having no branching. May correspond to bed in section west McConnellsburg quarry. The 110 ft next beneath (i.e. beneath spring) more or less magnesian and may be Knox, but more likely are to be considered as lower Stones River. No chert was observed in these 110 ft, but on other side of road (west) Knox chert was seen.

(Compare Murat ls. with beds IV - VIII. Also Boston Gap section.)

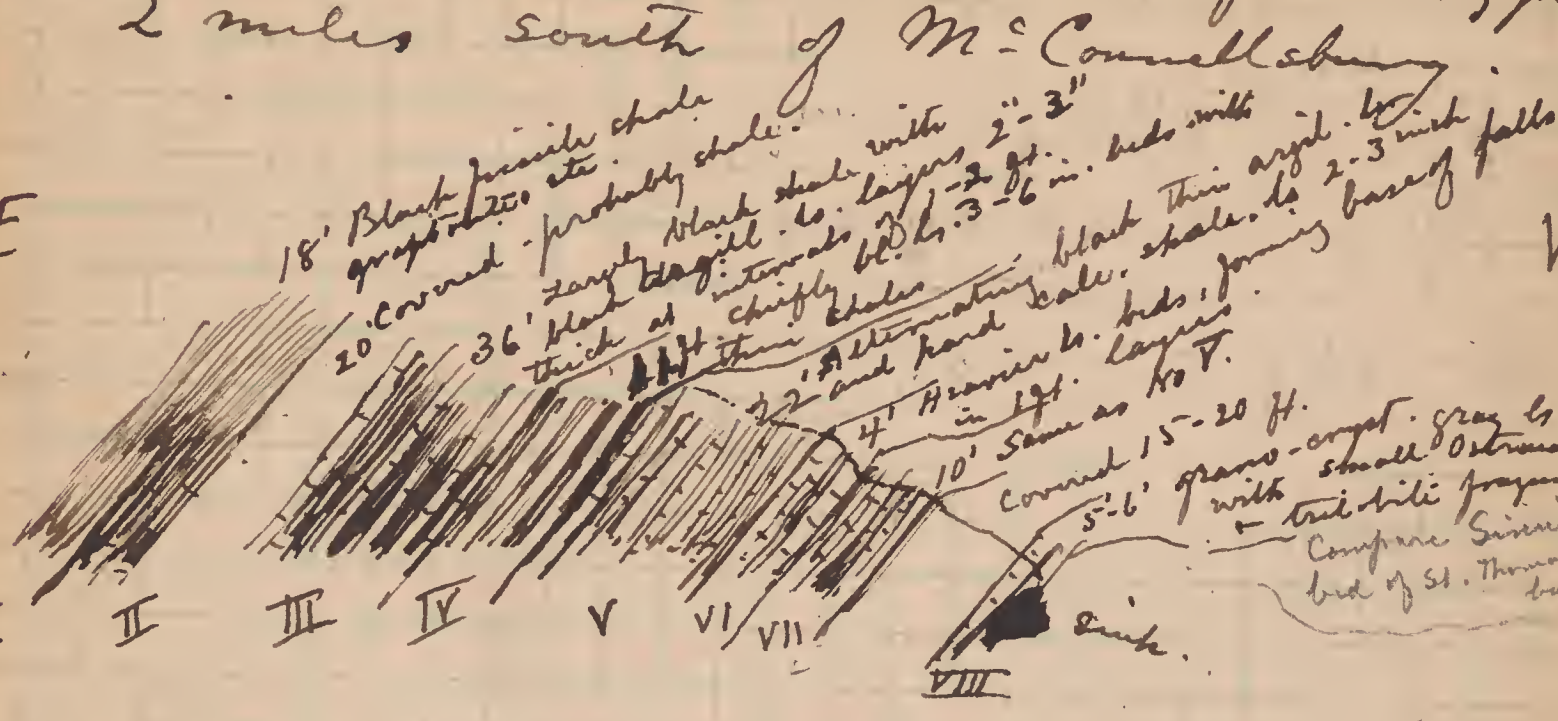
Beds IV - VIII (= 88 ft.) are referred to Black River and should be compared with Murat ls. of Virginia.

Beds I - III are regarded as of Trenton age. (See opposite page for overlying shale).

The lith. character of the beds is very diff. from corresponding beds in Chambersburg trough. The fauna however is diff. & the minerals thinner. Under circumstances cannot yet decide whether this thinner representative corresponds to the Top or to the bottom of the Chambersburg section at Loc. H. The fauna reminds of Clinton trough. Could not see these beds on west side of McConn. valley but did see Stones Riv. there, where lowest outcrop of them was decidedly a ls. congl. Some of the boulders were themselves finely conglomeratic.

Made 2 miles S. of McConnellsburg. Chazy crowded to east side of valley. Black River all below level of road. Trenton shale below. Knox not seen.

Suite on Magsam's land, near angle of Mercersburg pike 2 miles South of McConnellsburg.

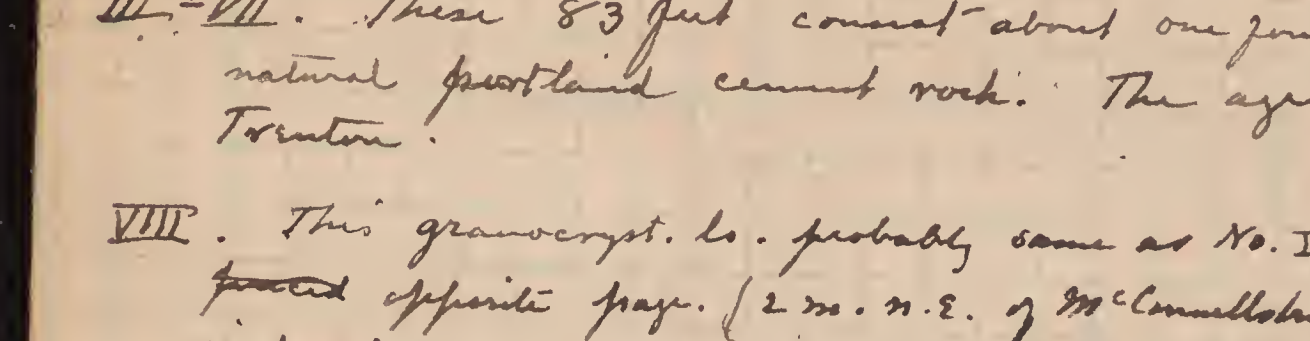


I. = Loc. L', (1 m. east of McConnellsburg.) graptolite zone. Corynoides (? two species) Diplograptus foliaceus, and Climacogr. very abundant. Also Leptobolus insignis, Schizo. filosa and small orthoceras.

III.-VII. These 83 feet consist about one fourth of promising natural portland cement rock. The age is regarded as Trenton.

VIII. This granocryst. ls. probably same as No. IV of section on ~~page~~ opposite page. (2 mi. N.E. of McConnellsburg.) The horizon is provisionally referred to top of Black River but in absence of a fauna cannot say positively that it is not Trenton.

½ m. S. of this suite, gully and adjacent slopes exposes underlying Stones River beds but none of Bl. Riv. Chambersburg ls.



Stop at stone house (Perry) at McConnellsburg.

Eden L.

2 miles east of Mc Connellsburg.

Soft sandstones with shells + crinoid stems

Limestone contact at L', 1 mile east of Mc Connellsburg. ~~Graptolites~~ in slide #182

June 16. Loc. L'.

Crossing the mountain west from Ft. London to McConnellsburg saw this locality first. The exposure of Utica is very good, especially in a small opening above the house where an attempt was made to procure roofing slates. In this opening which may be 15-20 ft. above base, graptolites occur very abundantly, 6-8 species apparently were secured, among them Corynoides ~~gracilis~~. Some graptolites occur also just above the contact. Leptobolus insignis is the only other fossil seen.

The actual contact is not satisfactorily exposed but the upper beds of the underlying Trenton are more or less earthy and interbedded with shale. Fossils are rare in these upper beds. The strata dip about 35-40° eastward.

~~Infinite~~ Less than 300 yards west from the Trenton-Utica contact dolomite outcrops at several points. These outcrops belonged in every instance to Kittatinny. One of the beds was very siliceous the whole layer weathering into a rotten chert, in which a Raphistomina-like Gastro. was observed. Some sandstone slabs (apparently not Tuscarora waste) were associated with the shaly beds.

If the dips of the shales and ups. Trenton is combined in strata of valley, the Trenton, Black River and Chazy River should recur further from the base of Utica than the outcrops of Kit. above mentioned. Either a thrust or a strike fault exists at base of the foot hills or the [illegible] formations are greatly reduced in thickness.

(Loc. L next page)

N.B.8 p 52, 53 1905-08

N.B 33 p 9 May 29-3, 1922

N.B 33 p 5 May 16-23
" " p 10,

Loc. L.

This point, like a number of others along the road in the next half mile, exposes fossiliferous Eden. With careful and long continued searching of these outcrops a considerable fauna might be procured. The crinoid column discs are the commonest of the fossils - next in abundance is Plectambonites then Dal. multisecta. Among the rarer fossils are the small Climacograptus of the Cin. Eden, a Strophomena like hallieanna, Calymene callicephala Protowarthia cancellata, Lophospira like one of the Cin. forms. Specimens of a Strophomena very like or identical with S. sinuata were an unlooked for occurrence. All the other fossils however from this horizon in ~~the~~ southern Pa. are clearly indicative of Eden.

Clinton M, N, O.

In Cove Gap and on pike near tollgate. 4 miles northwest of Mercersburg.

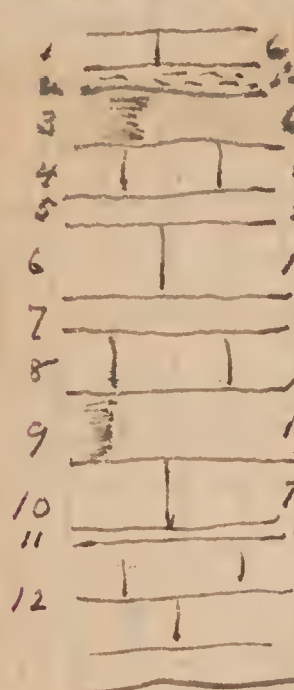
Localities 190, 191, and 195. Beyrichia and shells. Exposures on two sides of a faulted syncline. Loc. 190 best, 195 shells [illegible] and rocks inverted. Possible marking also [illegible] of 190.

Loc. M (= 190) After dinner at McConnellsburg and after passing loc. L, finally reached 2nd Clinton outcrop just beyond (below) tollgate. In addition to fossils brought in by Stose, procured several Pelecypoda. Several specimens of a large Cyrtodonta, 2 species of Cliidophorus and one or two of Rhynchonella. Also a new Treneta related to T. unibonata. The Ostracoda - principally Bollia lata - are extremely abundant in some of the layers. Brachs. are much less common.

As we were through with loc. M. the third rain of the day set in, and, continuing until we had passed the other Clinton localities, we did not examine them. Probably not much loss.

2A

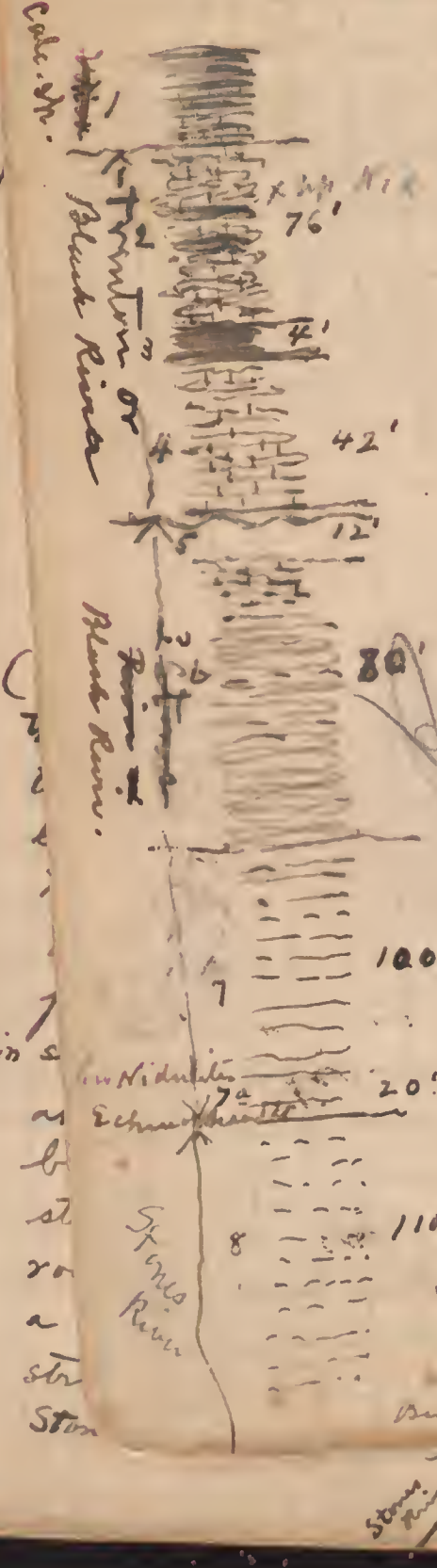
dept at Martinsburg, W. Va.



2, 3, 5, 7, 9 and 11 consists of finely laminar, yellowish dolomite.

1, 4, 6, 8, 10 and 12 consist of compact dense ls. several layers, especially 1 and 8, containing recognizable Stones River fossils. This horizon should be compared with Oregon dolomite of Ky. Rivers section (Jung Mountain section). Bed 12 is the first of a large series of dense Stones River ls. terminating in the low ridge west of the crusher quarries. (a large part of these ls. layers are composed of a fine ls. conglomerate, so fine as to simulate oolite).

Section along Burke st. Martinsburg, W. Va., between B. & O. R.R. track and cemetery at top of hill east.



Martinsburg

1. Graptolites shale, black, 10 ft. above base. lower 120 ft. more or less highly calcareous.

2. Dark gray to black, subgranular, knotty ls, with 2 or 3 thin layers of shale. Fossils fair. Nidulites abundant 20 ft. beneath top. weathering coldly

3. Yellow clay shale.

4. Similar to bed 2 but in lower half most of the layers are thicker and less knotty, and many are hard as dense in texture as the underlying Stones River. About 20 ft. above base pronounced gneiss. Pelecy. acutus and Cyrtodonta rectus. Fossils not common.

5. Not exposed here - probably shaly - contact between Martin and Stones River - No Black River.

6. Dark ls. similar to no. 2 and 4 but all of it dense in texture and without luster or crystalline grains. Some of it also considerably lighter in color. Texture normal for Stones River but color unusually dark. Nidulites & other fossils listed on p. 48, occur rather commonly, especially in lower half.

7. Still rather dark but otherwise typical Stones River rock. Base of bed as shown in quarries south of town contains Echinosphaerites. This bed is underlain by a few thin and sharply distinct, granular layers, quite unlike any other rock. In section shown in struct 2 blocks north it is seen to be a normal upper Stones River rock. Full of calcite specks and strings, some clearly of Pat. ellipsoides.

8. Not exposed here.

Bed 8 and less in bed 11 of section page 46-47.

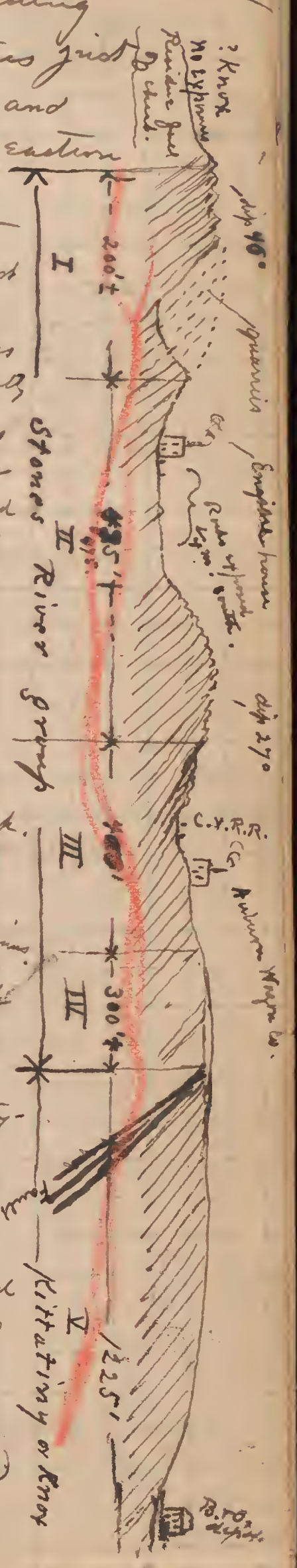
(over)

at west end Kitt. is very much shattered & crushed. Trenches on creek feed it. Cut by thick beds of travertine.

For extension of this section to North see back cover of book

Martinsburg, W. Va. June 18 & 19th 1905.

Section SEE. through town beginning with last good exposure of limestones just west of rock crusher quarries and ending in shale hills beyond eastern edge of town.



I. 200 ft. or more of ls., most of it dark gray to almost black and all moderately compact in texture. Except in color agrees very well with usual Stones River. Part of the beds however appear to be slightly magnesian, especially during basal 50 ft.

Fossils are not uncommon, in some of the layers very abundant, but good specimens are very rare except in a layer (about 125 ft above exposed base) shown in quarry. This is filled with a small but rather large-celled species of Solenopora and fairly good specimens of Stones River gastropoda. The latter however are satisfactory only in the chalky surfaces of the decomposing boulders.

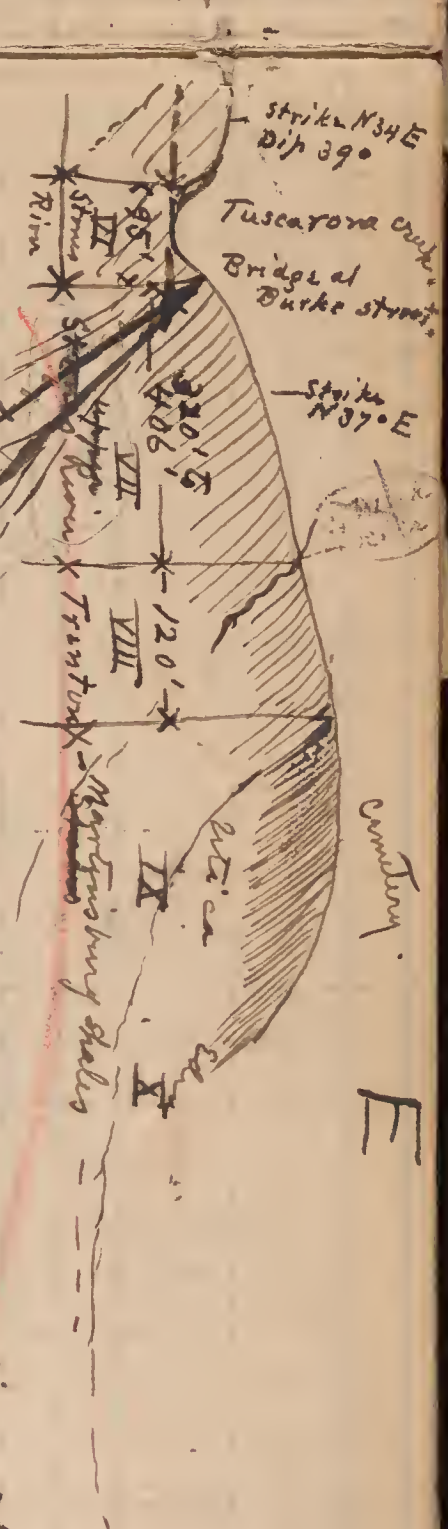
II. 475–500 ft. of lighter colored – usually a light to dark dove – compact textured ls., having all the characteristics of the usual Stones River rock. Hundreds of thin bands or seams are crowded with fossil remains, but unfortunately it is almost impossible to secure satisfactory specimens. They appear only on the weathered surface as more or less imperfect sections, but on fresh surfaces they are scarcely visible. The fossils consist mostly of gastropoda like Liospira and Eotomaria with some Bathyuroid trilobites, Lep. fab. Cyrtoceras, Orthoceras etc., the fauna reminding of Murfreesboro ls.

III about 400 ft. of mostly normal Stones River ls., the lower third of which is excellently exposed in a succession of cuts along Cumberland Valley R.R. north of depot. The interval comprised between 50 and 125 ft. above base consists of usual dove ls. (more or less highly fossiliferous) interbedded with thinner (6" – 6 ft) yellowish finely laminar dolomite. (?? This horizon probably corresponds to the Oregon ls. (Ky. marble)

(See detailed section p. 45) of the Kentucky Stones River section)

The fossils of this division agree in general aspect very well with those found in div. II. Additional forms are Helicotoma sp., Maclurea sp., Eccyliomphalus sp. and a syringoporid, simple tubed Tetradium.

IV. About 300 ft. intermittently exposed ls. A small outcrop above the middle is of the dark type of rock known to occur in the upper division (see VII) of the Stones River group in this section. It contained Lep. fab. and undet. gastropods and pelecypoda.



V. The next exposure of rock occurred in an excavation for water pipes on Martin st. west of this the excavation showed only red residual clay for 100 ft. or more. The rock is unquestionable Kit. or Knox. Occasional small outcrops indicate the same formation to the fine cuts just n.w. of the B.&O. R.R. depot, where a complete succession of the same formation (160 ft. in thickness) is shown. S.E. beyond this point to the first Stones River outcrops there is room for an additional 165 ft. of Kit. ls., the last intercropping within 30 ft. of the first Stones River. No sign of fossils was observed in any of the outcrops of this formation, the thickness of which, from its first appearance in the excavation on Martin st. to the base of the Stones River, is estimated at 1225 ft. There can be no doubt that this Kit. band is defined on the n.w. side margin by a strike-thrust fault. 800 ft. farther north, opposite the B.&O. round house, the east margin likewise is defined by a similar fault, but at Burke st. the creek crosses the strike of the fault so as to expose a 95 ft. belt of Stones River (no VI)

at east fault Kitt. is very much fractured & crushed. at bridge in creek fault is made by thick beds of travertine

(over)

Martinsburg. cont'd from p. 47.

VI. 95 ft. of basal Stones River shown along Burke st. to bottom of Tuscarora creek bed under B.&O. R.R. crossing. This band is narrows in going up the creek until it is completely covered opposite the B.&O. R.R. shops 800 ft. northward from Burke st. (There the overthrust upper Stones River has a thickness of about 406 ft. at Burke st. only about 320 ft.) Fossils of Stones River types, especially Lep. fat., were not uncommon in these lowest Stones River rocks.

VII. 320-406 ft. of upper Stones River rocks. The lower 3rd of this has the characteristic color and texture of the Stones River rock, but above this it grows darker (almost black, though generally only dark gray). The color is very much like that of the overlying Trenton but may be distinguished by its more compact texture and compactness dull surface when fractured. Fossils are not abundant except in a few layers - nor can good specimens be procured under the conditions of weathering & decomposition of the rock. Saw Monotrypa (? magna) Streptelasma profundum, Dalm. subaequata, Thaleops, etc. This is the bed that contains the Nidulites found here and at Chambersburg. The B.&O. bridge over creek & Burke st. is built of this rock, specimens of the Nidulites being clearly visible in some of the stones. Contact with Trenton, despite absence of all the Black River and much of lower Trenton, is not sharply marked. In better and larger outcrops no doubt it would be more noticeable.

VIII. The Trenton is thin here and very sparsely fossiliferous. Only 120 ft. of rock intervene bet. top of ~~Stones Riv.~~ & base of Utica. Near base procured Rhynchotrema acuta and Escharopora recta? The rock is dark, subgranular, and interbedded with several thin beds of shale. (See detailed section p. 45)

IX. Utica shale, lower 20 ft. calcareous. Graptolites present but rare. 500-600 ft. of it apparently before slightly arenaceous layers and yellowish color referred to Eden horizon sets in.

Pass pass quad.

Medina to Oriskany. P.

North of Great Cacapon and East of same.

Section north of river shows Clinton quartzite at east end with Niagara? limestone above, followed by Salina red sandstone and limestone & Helderberg limestone, and Oriskany sandstone all more or less fossiliferous. Rocks folded.

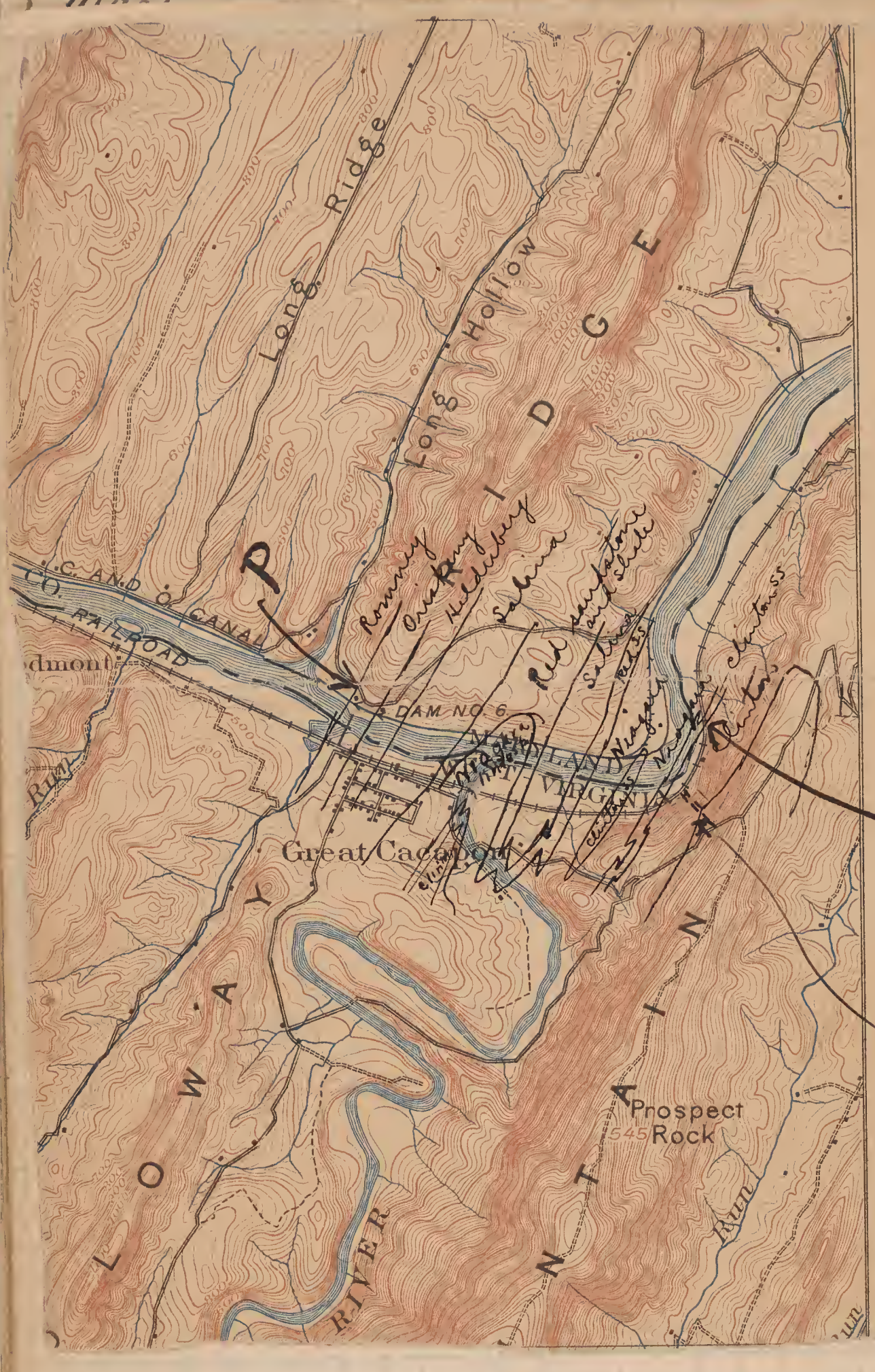
At Q the Clinton quartzite is exposed with Clinton shales below containing fossiliferous limestone at the top. Medina is quarried just above on the mountain.

(New R.R. probably afford good cuts; along canal, on north side of river)

Great Cacapon, ~~Md.~~ W. Va. June 20th 1905.

Spent morning at section of Helderberg to Clinton sandstone exposed in cuts of the new Wabash R.R. on north side of river. Collected only in the ls. bands in the shaly formation (?=Niagara) overlying the Clinton ss. Procured a great number of excellently preserved Ostracoda. Other classes of fossils rare.

In P.M. visited locality Q on W. Va. side of river. Here found the fossiliferous ls. layers at top of lower, shale, division of Clinton. The fossils in these layers consisted in all but one case of chiefly or solely of large crinoid stem buttons - an occurrence that is elsewhere very characteristic of the Clinton. One layer was full of altogether different fossils - namely Platyceras, several brachiopods, a Dalmanites and Beyrichia of large size. So far as I can see this is a nearly normal Clinton fauna, though not of the western type.



Virginia localities

Winchester, Va. June 21, 1905. 2A

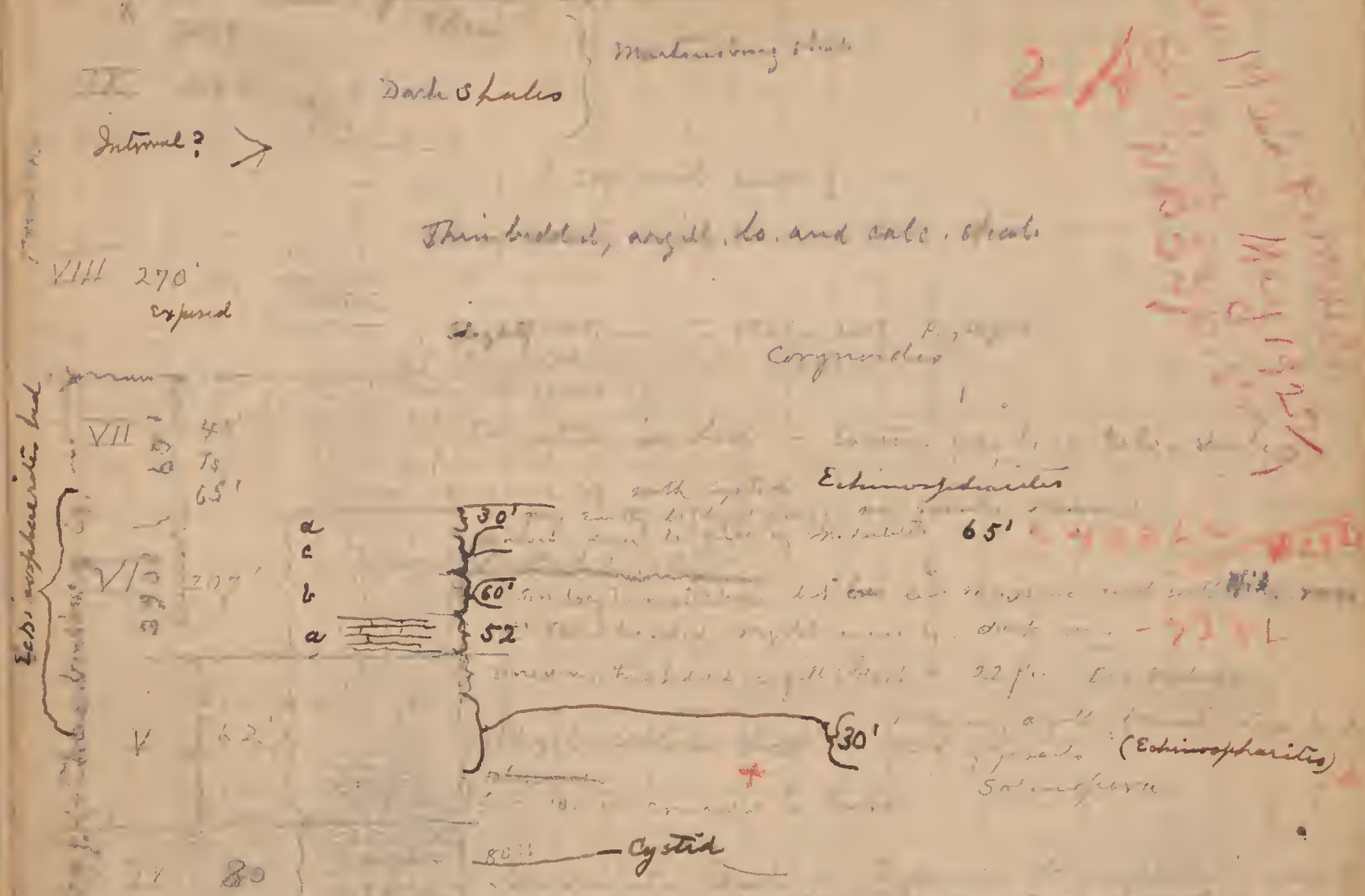
Having 2 hours between trains, en route from Martinsburg to Strasburg, at Winchester employed part of time in looking at section. Starting at B. & O. depot walked S. along track to Effingham ~~[illegible]~~ in cuts opposite cemetery. ~~[illegible]~~ These rocks certainly look like Knox dolo. but am not entirely certain they ~~do~~ not belong to dolomite (upper) Stones River horizon. Saw no fossils in them. Neither did I notice any in occasional outcrops along a street running west from the R.R. track. Farther west, however, there are quarries in Stones River rocks, but had not time to decide position of outcrops in formation. Coming back to depot, went eastward ~~[illegible]~~ along pike to Utica outcrop at trial track. All the outcrops seen till ~~[illegible]~~ undoubted Mohawkian ~~[illegible]~~ was recognized at corner in road at track, seemed to be quite ~~[illegible]~~ unfossiliferous and in all cases highly magnesian.

Hence, although the time at command was too short for definite determination, it may be provisionally assumed that the structure at Winchester is practically the same as at Martinsburg — i.e. faulted so that a belt of Canadian (Beekmantown) rocks intervenes between two of Mohawkian age.

Stones River
Knox
Trenton
Shales

(The formation probably is Beekmantown)

Strasburg, Va., June 24th + 25, 1905



I. Usual Stones River – ~~and~~ as at Martinsburg, W. Va.

II Corresponds to similar bed in Martinsburg section, the lower part of which, however, only was seen there. Here the upper part.

III. Pure ls. of Stones River facies. Gastropods + Tetradium celloseum.

IV. Rocky bed full of Girvanella + Frondicularia. Fossils Lept. Dome, Crinoid stems among these the large Sowerbyella. Best occurs also in the transition of Murfreesboro shale. Also some Romingerina, usually associated, Trenton. – Probably intermediate facies of Phase IV.

V. This bed is full of fossils. The lower half contained Solenopora among others two species of Phylloporina, one like corticosa, the other a small meshed type like reticulata, Monotrypa ~~Crepipora~~ paucipora: Heliosroid (2) species, Batostoma fertile, B. nicholsi, Pinnatopora, Stictoporella, Rhinidictya, Isotelus very abundant but poor, Dalmanella (St. Pauli) + pirata, ? Diorthis, Pleurotomaria, Echinosphaerites, Leptaena and others. This assemblage is strongly suggestive of N.W. Black River shales. Bolbopsis suggests eastern facies.

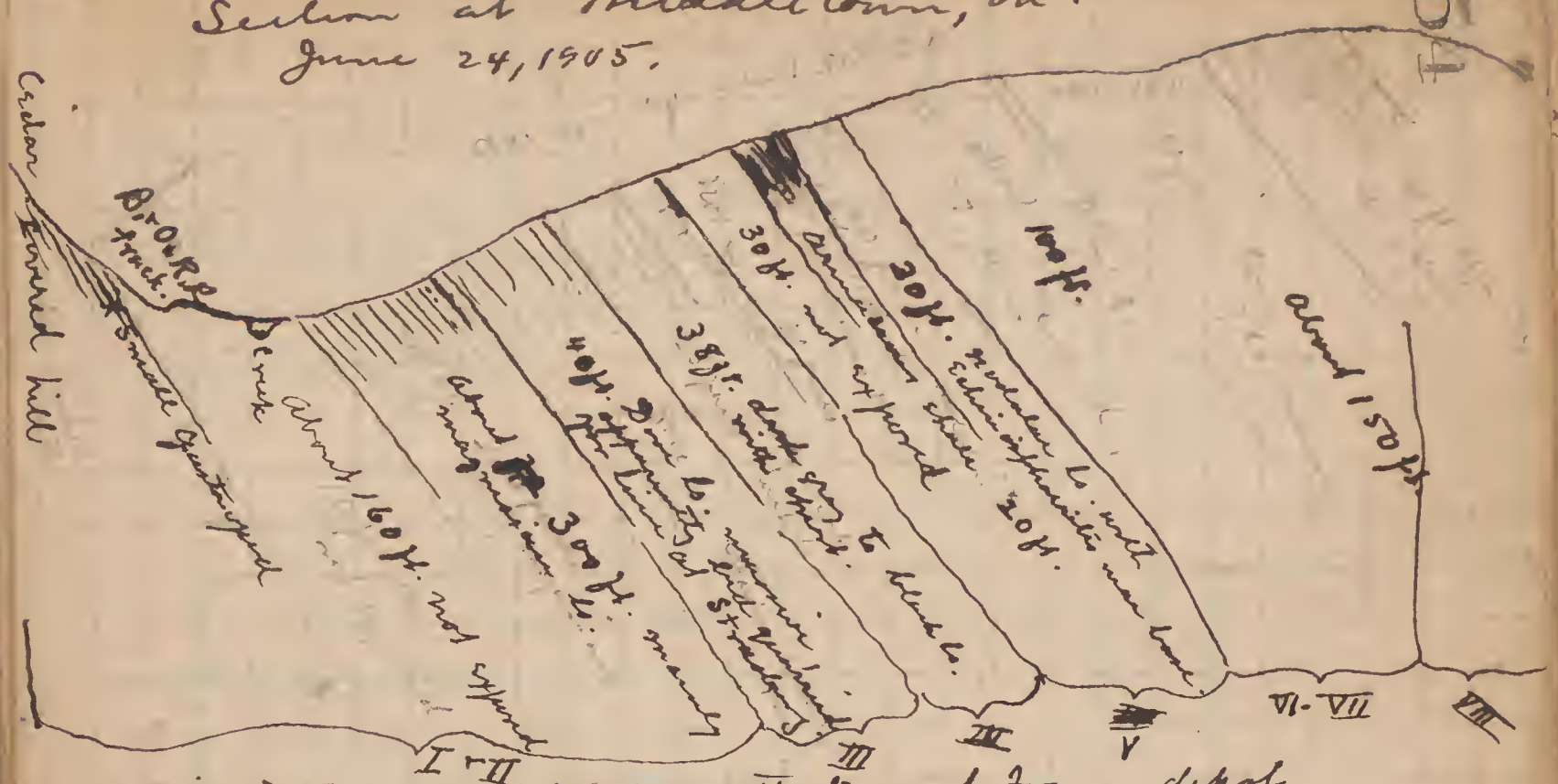
VI. The main fossils of this bed is Nidulites. It is especially abundant in bed VI c. Other fossils are Phylloporina ? dawsoni, Bolbopsis ? Monotrypa Isotelus and a hydrozoan like the Beatricia of the Martinsburg section.

VII. This bed also afforded many fossils. A small Chaetocrinus is the most characteristic fossil. With it Pleurotomaria piana nov. Plect. (= P. aspera Prouda. not Jones) several Orthoids, a triplesia, Bolbopsis, Echinosphaerites, numerous ostracoda, Tetracapsis and Isotelus. Bivalves + Lingula.

VIII Lower 50 ft. of this bed only some fossil fragments. A few graptolites, small Stenopora: Leptotaena and Corynoides calicularis ? ~~Nervamus bidd~~. Not Eutrea but may represent Trenton.

IX. No fossils seen. Lithologically, probably, grades into no VIII

Section at Middletown, Va.
June 24, 1905.

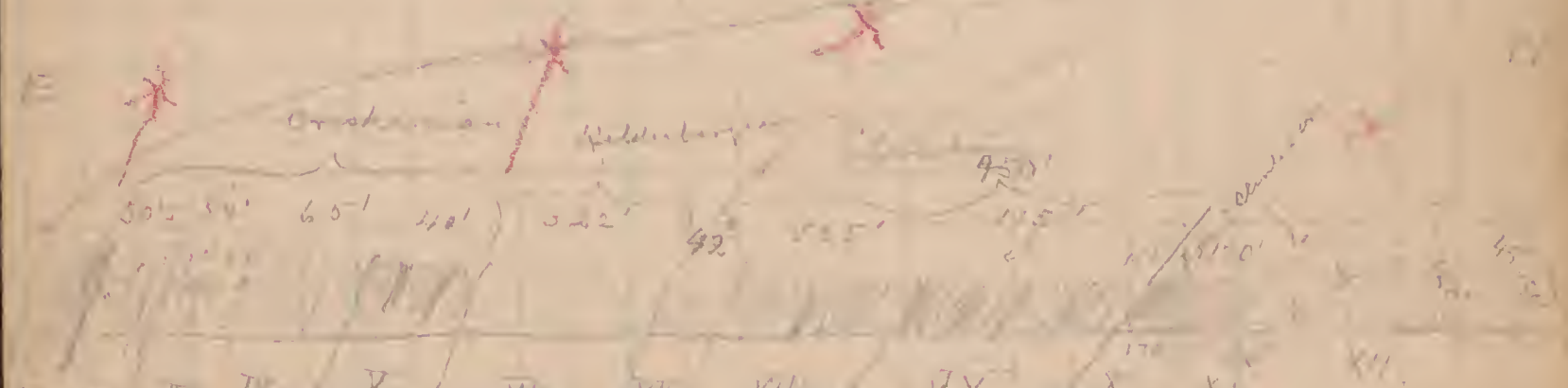


Section taken along street farthest west from depot.
Numbers (I - VIII) correspond to Strasburg section.

For Pennsburg, Md. section see p. 78.

Near Clifton Forge, Va.

June 25th 1905



I Shale of Chemung shade. Lower 1-2 ft, with lo. fossils [illegible] worm-burrows. One specimen [illegible] Pl. phosphatica.

II Lower layers [illegible] with Oriskany fossils.

III Moderately [illegible] shale bands, [illegible] shale bands [illegible] 1 to 3 ft. apart. Oriskany fossils like Edmondsonia. The Oriskany seems seen to be a replacement of the last [illegible] IV [illegible] granular lo. with abundance bands in [illegible] middle 3 ft a brown [illegible] full of structureless Stromatoporoids and [illegible] Lower part a sandy [illegible], grayish blue lo. apparently without fossils.

V Dark blue ss. with thin shaly beds, no fossils.

VI. No exposures – evidently shaly rocks – [illegible] shaly ss. found near middle with New Scotland fossils.

VII No exposures but evidently [illegible] of Clinton [illegible] (fall from layers above.)

VIII Sandstone and shale beds alternating.

IX Alternating s.s. & sh. at top a red oolitic [illegible] shale. Two of the ss. [illegible], the [illegible] are exposed. The bottom 5'-8' known as [illegible].

X Shale; at top with "Clinton [illegible]"

XI White Medina Tuscarora ss.

XII [illegible] Juniata.

Sketch illustrating probable occurrence of Oriskany [illegible]

June 1905

Regions very much faulted and folded.

Unusual rock structures underlies the grey outcrop, it seems to have strongly be supposed to be same as Mr. Dr. Langdon's Permian. The Permian rocks are fine grained, argillaceous, very nearly unfossiliferous. These should be the strongest horizon that exists. Very few organic fragments. In the first section at least 325 ft. of the cement rock are exposed but it is probable, not that thickness, both the top and bottom of the section being cut off by faults. It is evidently a fault cement rock and resembles rather closely of the Lehigh Valley rocks. Its unfossiliferous and lithologic character suggest that, like the Lehigh, deposited, this also was laid down in possibly a land-locked basin. Diffuse stratification gives the grey exposures the Fishburnville the cement rock a marking and the shales rest in the Permian.

The Permian is, as about except there here, thing it is impossible as get to say anything very definite concerning thickness of beds in this extreme disturbed area. It is filled of large Solenopora and Bryozoa, with there a large Lamellibranch Protonia, apparently the same as species found in Indiana Texas, & Wyoming. Also a very robust, fenestrate Stenopora like species found in Rawson valley between Clinton & Fleurville, Texas. Orthoceras, apparently like those found with Solenopora at Marble Bluff, Texas occurs also. Finally, the remarkable Lepidodendron found at Strasburg & Fleurville are unusually developed mesial septum.

Stones Ridge rocks, apparently, do not occur at Stanton. The Hyperstene rocks, though, are there. However, in disturbed condition of area cannot be certain of this point. If they do occur there they are faulted out.

Suggestions

S.W.

Stanton to

Shale

Cement rock

Solenopora

?

N.E.

Ft. Dix — Dist. Sydney.

N. Stanton to Fisherville

Shale

Cement rock

Solenopora

?

E.

Fleurville Cambrian basin

Stanton

Strasburg

Shenandoah

Cement rock

Shale

Strasburg Down

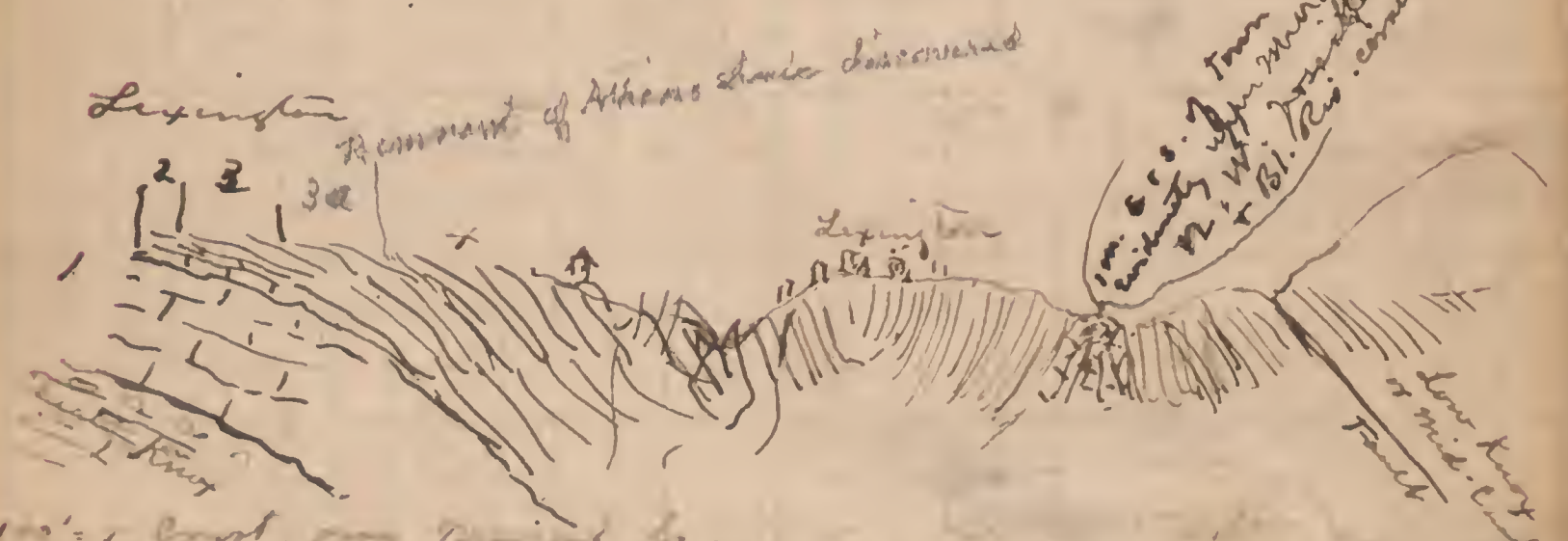
Mid. Ridge

Notes from Lexington to Buchanan Gap
in Little North Mt. June 25, 1905

1½ m. S. of Rockbridge Bat
Grad. have Lo. crops
outcrop Conococheague. Th
older than Stones R
newer than Knox
Thus Lowville Lim
and is below most
Knox, Knox should
form a per
overthrust fault
Just above Ro
on North River
Lo. The fossils si
some doubtfus are
are different and
recognizably distin
a distinct subbas
of the typical M
a subbasin equ
fault above me
that the Murat
(at edge of quad.)
This Knox Cauk
by the removal of
structure in this ar
the nearly horizonta
along the road for
Murat exposure.
The Trenton rocks
Little North Mt. is more fossi
the cement rock at Lexington.
also was deposited in a partially or entirely
separated basin defined by the same thrust
fault above referred to. Considerable shale
seems to be included in upper part of this
Trenton. In the upperment Lo. numerous Plectambonites
and Zygo. reticularis occur.

The shales above this in soon take on a
sandy character. They are to be correlated
with upper part of Martinsburg shale and contain Eden
fossils like those found in Chambersburg-
Mercersburg quad. More sandy beds referred
by geologists to Medina contain similar fossils
and also Orthoceras lamiger. A large part of
this "Medina" (at least all beneath Tuscarora ss.)
thus is referable to Cincinnatian. The Tuscarora
may be no younger than Lorraine or more
likely represents Richmond. Prof. Campbell
says he has found Triarthrus in basal part
of shales.
The Lexington cement rock and calcareous shales associated
with and above them in bands S.E. of overthrust
above referred to belong to the Lenoir or some other Atlantic basin
and the beds in this basin are to be correlated
about as follows: The Murat Lo. which is in
part a light gray marble with either the Holston marble
or with the marble beds near base of Sevier.
The cement rock or shales with higher beds
of Sevier. (The Sevier is not the same everywhere as mapped July 18 7)
A few feet above Murat the cement rock
contains the Aulopora and associated trilobite
fauna. Another species of Aulopora, possibly
Rowdenanus, was found by Prof. Campbell
south of Big House Mt.

At Buchanan, 25-30 miles SW of Lexington
the valley is very much contracted, being less
than 2 miles wide.



1 30' = 1. Crypt. gray marble Lo.
20' = 2. Brown bed of cement rock full of Cryptozoa sponge
40' 3. Aulopora bed - crystalline Murat Lo. full of trilobites
+ brachiopods Athens shale + marbles
50' 4. Cement rock, [illegible]

Left Green Lowville
on "Little Arch" Mbr. Green

1½ m. S.E. of Rockbridge Baths a fine gray fossil. lime ls. crops up suddenly from the middle Canadian. This rock is hardened not older than Clinton Rocks; the fossils are nearer those of Trenton age (among them Leptaena the paranyelitis small Rhynchonella and it looks much like (late Stones River) probably Lowville). It evidently must have been brought up from a depth by a series of faults. Doubtless an overthrust fault here.

Just above Rockbridge Baths bluff on east bank of North River exposes heavy beds of very fossil. ls. The fossils remind of those in Murat ls. and some doubtless are the same. Others (like a Constellaria) are different and with the lithology which is recognizably distinct probably indicate at least a distinct subbasin or trough to the north east of the typical Murat trough. That such a subbasin existed is indicated by the overthrust fault above mentioned. Also by the fact that the Murat ls. in the Kerr Creek area 5 miles S.W. (at edge of quad.) is typical Murat.

This Kerr Creek Murat area must be exposed by the removal of the overthrust Knox. Peculiar structure in this area is further indicated by the nearly horizontal position of the Trenton rocks along the road for nearly 2 miles north of the Murat exposure.

The Trenton rocks on the southeast flank of Little North Mt. is more fossiliferous than the cement rock at Lexington. It probably also was deposited in a partially or entirely separated basin defined by the same thrust fault above referred to. Considerable shale seems to be included in upper part of this Trenton. In the upper part ls. numerous Plectambonites and Zygo. recurvirostris occur.

The shales above this ls. soon take on a sandy character. They are to be correlated with upper part of Martinsburg shale and contain fossils like those found in Chambersburg-Mercersburg quad. More sandy beds referred by geologists to Medina contain similar fossils and also Orthoceras lumiei. A large part of this "Medina" (at least all beneath Tuscarora ss.) this is referable to Cincinnatian. The Tuscarora may be as younger than Lorraine or more likely represents Richmond. Prof. H. D. Campbell says he has found Triarthrus in basal part of shales.

The Lexington cement rock and calcareous shales associated with and above them in bands S.E. of overthrust above referred to belong to the Lenoir or some other atlantic basin and the beds in this basin are to be correlated about as follows: The Murat ls. which is in part a lithography marble with either the Holston marble or with the marble beds near base of Sevier. The cement rock or shales with higher beds of Sevier. (The Sevier is not the same everywhere as mapped July 18 7.)

A few feet above Murat the cement rock contains the Amplexus and associated Trilobites fauna. Another species of Amplexus, possibly Rudemanni, was found by Prof. Campbell south of Big House Mt.

At Buchanan, 25-30 miles SW of Lexington the valley is very much contracted, being less than 2 miles wide.

100' = 1. Crypt. gray Murat ls.
10' = 2. Murat ls. & cement rock full of Lophophyllum spinosum
40' 3. Amplexus beds – argillaceous ls. full of Trilobites, & brachiopods, Athens shales & rudemanni
50' 4. Cement rock,

Letter from Langston to Bonham Cap
[illegible] June 28, 1905

Back from Lexington to Pearisburg
[illegible] June 28, 1905

Section from Pearisburg Va. to half way up Pearis Mt. Beds I & II seen between town and railroad station one mile north.

July 3. '05

I do not date Pearisburg section as I do my Pearisburg notes as only in Pearisburg I was able to make out that between Pulaski & Pearisburg I did not see Knox. Beds I & II are Knox & Mechanicsburg. The Pearisburg section is in reality two to the only part of Stones River (Beds I & II) not [illegible] Pearisburg section.

[illegible] 1905

[illegible] probably shales.

2225 — } worst of sandy shales
2190 — 20 ft sandy shales & calcareous ss. (Large Ostracods)
IX — 95' to top of Lake Pearisburg, but with green efflorescence. Good hill.

2130 VIII — 48' Purple calc. shales & argil. ls. with dense ls. seams at top containing fossils. Rhynchotrema, Ostracoda, Rhynchotreta with smooth pedicle valve.

VII — 30' Fine gr. thin bedded, mostly ls. with interbedded shales. Good ls. at foot. Light gray, the weathered. No trace just a Dalmanella-like fossil. In upper part no recognizable fossils, though the seams may be made up of fragments of Trilobites & Ostracoda.

2055 — Ostracoda. Slight dip westward with Monticulipora.

VI — 60' — Grammysia & Stropheodonta — 60'
Mostly light gray, medium compact ls., with darker & some mottled beds. Ostracoda abundant in upper part. Also Stropheodonta. Poor geology.

2000 — ~~Fine gr. ls. mostly~~

V — 20' Dove, fine gr. ls. Probably ~~upper Stones River~~ Lowville

IV — 35' Mostly coarse bedded, slightly lamination impress. magnesian. Slight ls. Stropheodonta at base. (? Cortezena)
Dalmanella & Leptaena.

III — 65' Light (gray to black) moderately fine gr. ls. dense knotty & earthy, containing Bryozoa & large cellid bryozoan and towards top Dyscritocrinus. Dalmanella, very abundant in top layer.

II — 30' Dark bluish gray, subcrypt. & earthy ls. Especially in upper part containing Brachiopoda and Gastropoda - one like Maclurea? also very numerous Dalmanella. Beds thence to die.

I — 160' ~~20?~~ (or perhaps with chert) ~~of massive chert~~ ~~ls. Belongs to bed II.~~
200' — Mostly or less chert, especially lower 50 ft., dark gray, mottled, massive ls. Large cellid bryozoan & occasional branch. Fossil mostly numerous in lower 50 ft. D. pectinella? Rocky dendritic etc. and Cryptozoon. Small St. Mill [illegible]

Lower St. Mill — 50 ft. Medium — Nothing massive, dark blue, cherty ls. with Dyscritocrinus, Stromatocerium, large cellid bryozoan, numerous gastropoda (one like L. [illegible]) and ls. [illegible]

readily distinguished though that of the Knox is more abundant and deeper, the soil being very rocky with no bedded dolomite outcrops. The ls. chert is of a deeper red smoother on the surface, in larger pieces and usually associated with ls. outcrops. Besides it is more or less fossiliferous as at Pearisburg. No fossils observed in Knox chert and comparatively little soil covers the angular fragments of whitish chert. The chert of the ls. is black inside and usually laminar horizontally not concentrically.

In the quarry the ls., except along fissures, is practically free of chert, but it shows abundantly enough on long weathered surfaces.

Lower + middle St. River time is [illegible]

Apparently no true Stones River on Pearisburg section - Hermitage, [illegible] The dolomite beneath but I was not carefully searched for fossils, illegible rain prevented in time at our disposal. (See pp. 80-85 for section between Eggleston and Dry Branch, and below Narrows, Va., reporting south and north of Pearisburg.) - made in 1907).

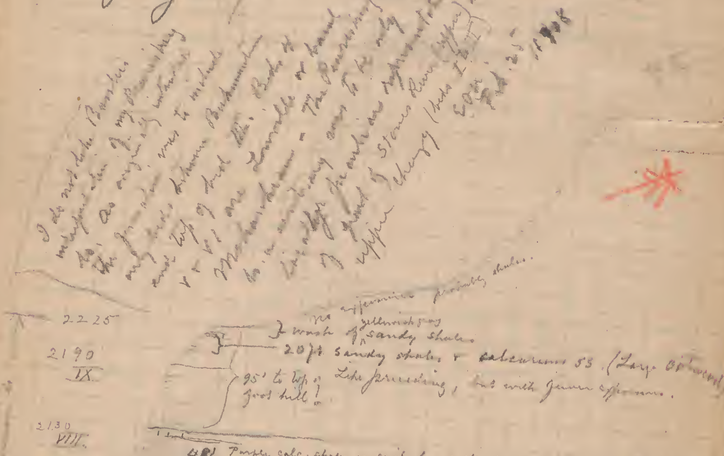
Mechanicsburg St. River [illegible]

The Rafinesquina [illegible] Mechanicsburg St. River [illegible] N. [illegible] Mechanicsburg. [illegible] Pearisburg? [illegible] Mechanicsburg [illegible]

June 25, 1905

Section from Pearisburg Va. to bay way up Pearis Mt. Beds I & II seen between town and railroad station one mile north.

July 3. /05



Pearisburg or Strouding formation

Spears Ferry formation

Tuscarora Valley

Knox

* at Ripplemead - 3 m. east of Pearisburg - in quarry works in Bed I. which here occurs in a neat syncline. Beds beneath the quarry rock (of which analyses were obtained from owner - Mr. Mason) afforded Tetradium ~~[illegible]~~ - single tubed form - and a few other things. Among the latter chert plates with widely separated pits that represent openings of a loose Tetradium or Syringopora-like form.

Contact between Knox and pure ls. not well shown. Between Pearisburg and Ripplemead road passes from lower cherts of limestone to chert hills of Knox and again to cherts of ls. The cherts of the two horizons are not readily distinguished though that of the Knox is more abundant and deeper, the soil being very rocky with no bedded dolomite outcrops. The ls. chert is of a deeper red smoother on the surface, in larger pieces and usually associated with ls. outcrops. Besides it is more or less fossiliferous as at Pearisburg. No fossils observed in Knox chert and comparatively little soil covers the angular fragments of whitish chert. The chert of the ls. is black inside and usually laminar horizontally not concentrically.

In the quarry the ls., except along fissures, is practically free of chert, but it shows abundantly enough on long weathered surfaces.

town + middle St. River trip is specified

Apparently no town Stones River on Pearisburg section - Narrows, not. The dolomite beneath bed I was not carefully searched for fossils, illness + rain prevented in time at our disposal. (See pp. 80-85 for sections between Eggleston and Dry Branch, and below Narrows, Va., reputing south and north of Pearisburg. J - made in 1907).

The Ripplemead quarry footed Mosheim & Bear valley on Pearisburg section. [illegible] apparently on a N. plunging anticline between Rich and Pearisburg, providing it has not overturned, unusually heavy Conococheague chert for middle River,

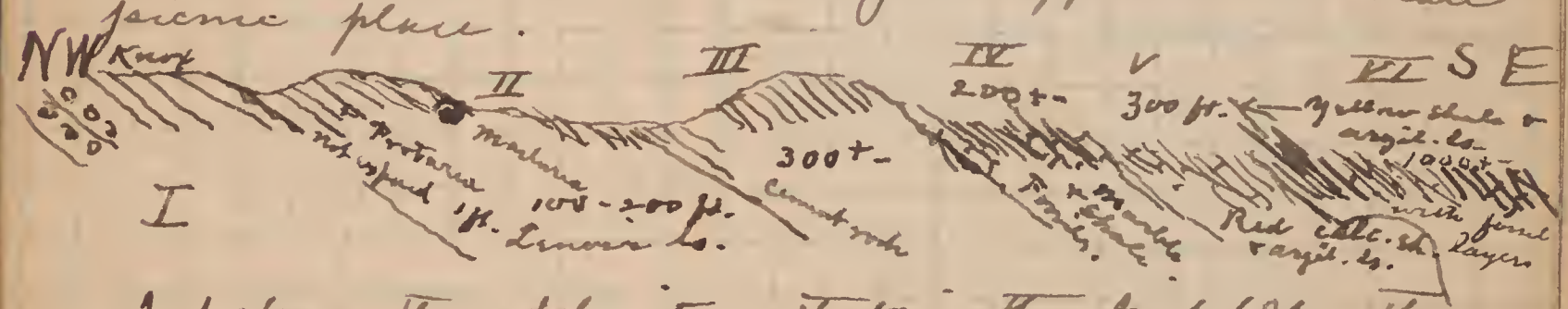
June 28, 1905

July 4th 1905.

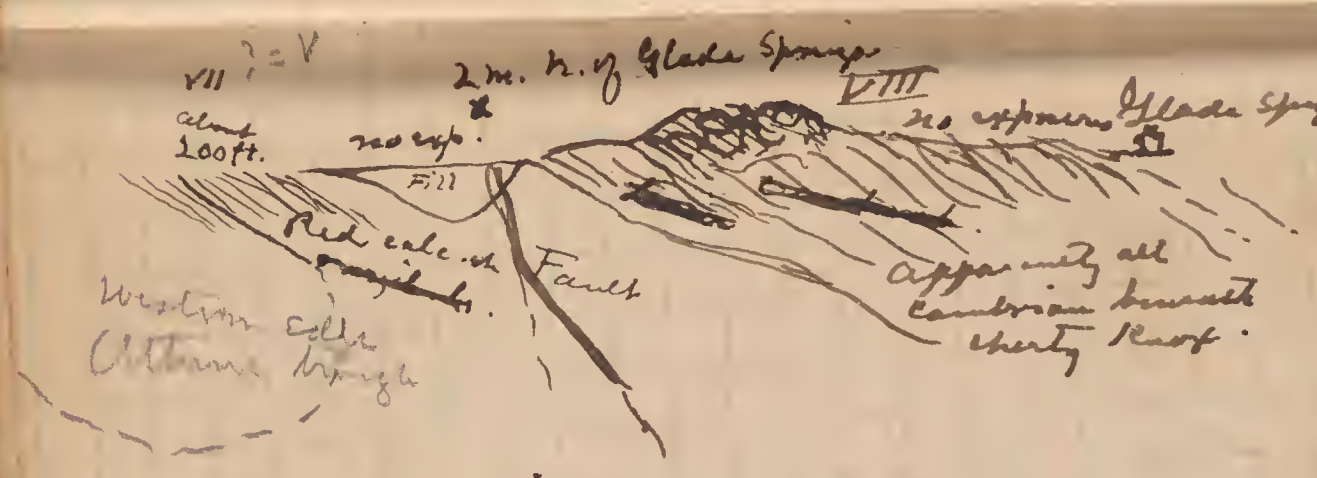
Ordovician section (between along railroad) Glade Springs and Saltville, Va.

Saltville lies on the north side of a great thrust with lower (edgewise) Knox thrust on Mississippian gypsiferous shales. At locality 1 (R.R. cut about 2 m. SW. of Saltville depot) found ~~some~~ layer with up. Cambrian trilobites. Associated beds were shaly and the ls. seams non dolomitic, the general aspect, with small ls. conf. seams, recalling supposed equivalent Elvins form. of Mo. 400 - 500 ft. approximately, of similar and thicker bedded non dolomitic rocks followed in ascending order. Above these for perhaps a thousand feet dolomites continue very sparingly cherty. Then the chert becomes abundant. The approx. 500 ft. or more of the Knox is again very sparingly cherty. (Can any of this be Stones River?)

At loc. 2, about 4 miles from Saltville first Lenoir ls. is met with. What appears to be contact between same and underlying non-cherty Knox is shown - though not very satisfactorily in a small R.R. cut just opposite a small picnic place.



Just above the dolomite - that is the first 6 ft. - the the rock contains some pebble-like plates and fragments of dolomite in a purer ls. matrix. About 3 - 6 ft. above contact a massive ls. bed is largely made up of such pebbles and fossils - the latter in poor condition. However, in face of rock recognized a cross-section of a large specimen of the laminar coral - presumably of the kind Stylonema paucum found in same bed near Knoxville. About 20 ft. higher in section saw good section of a Maclurea knoxvillensis.



I. Knox dolomite ? Beekmantown!

II. Over 100 ft. of largely magnesian Lenoir ls.

III Cement rock, representing higher divisions of Lenoir farther south and the Nitrous shale of the eastern trough; (also possibly corresponds to cement rock of Lexington; and perhaps) Red calc. sh. & argill. ls. of Pearisburg. The last possibly should be correlated with bed V, for which it greatly resembles (compare).

IV Cryst. ls. (marble) in thin beds, with more or less calc. shale. Contains numerous bryozoa and Ostracoda of types apparently like those found in basal Levin shales of Knoxville. A small Pleitambonites is characteristic.

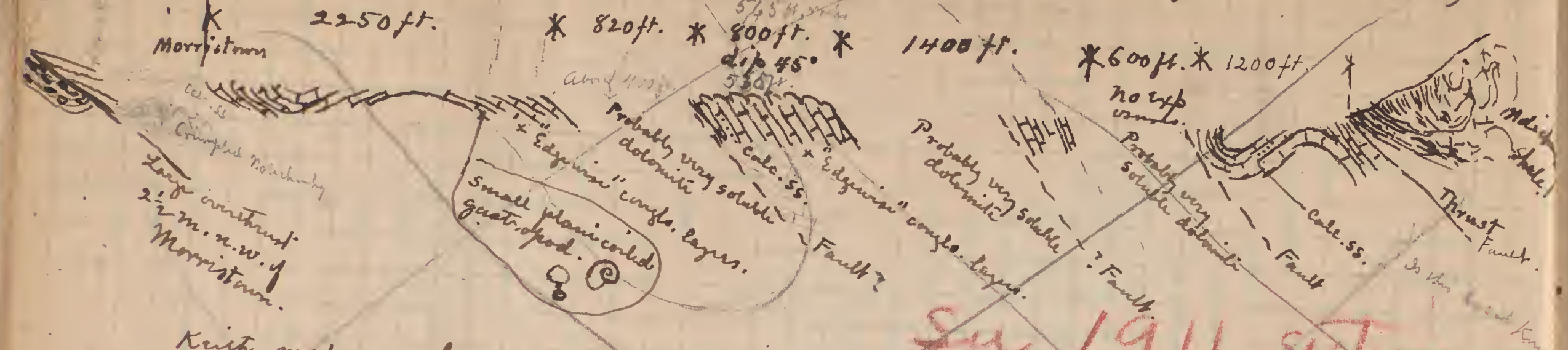
V. Red calca. sh. & argill. ls. (saw no fossils)

VI Ordinary Levin shale except that it contains more numerous plates of fossiliferous ls. than I have seen. The fossils consist chiefly of Pleitambonites (not sericeus, striae being coarser) and a Dalmanella near testudinaria. A small but relatively long Rafinesquina is characteristic.

VII Red calc. shale very much like parts of top bed V. Possibly it is that bed & not top of Levin or equivalent to Bays. If the fault just S.E. of it is an ~~normal~~ overturned thrust then it may be bed V, but as none of the other beds are repeated I think not. In the latter event the fault would appear to be, like those in the Scotland (Pa.) area, normal in origin and subsequently modified to thrust.

VIII Begins with shaly ~~shale~~ magnesian ls. like those seen near Saltville where fossils prove them to be basal Knox and middle Cambrian. No true Knox outcrops to Glade Springs, all the beds doubtless being older.

68 NW Section along R.R. & pike SSE. from depot at Morristown, Tenn. To Nolichucky shales hills 1¼ miles. (Thickness of rocks not estimated.) SE



See 1911 section

July 5, 1905

Keith maps a band of Chickamauga (Lenoir) ls. just about one mile s. of Morris-
town. Cannot understand which of the exposures in that vicinity he mistook
for that ls. but am confident there is no Lenoir there. All the rocks
between Morristown depot and the Nolichucky shale hills is older than
Lenoir and all the outcrops according to present knowledge are older than
the cherty Knox. Many of the outcrops contain nearly pure fine-grained ls.
layers reminding in their weathering & texture rather strongly of typical
Stones River rocks. It is certain however that they are much older, the per-
fossiliferous bands showing that the organic remains consist chiefly of trilobite
fragments, very much broken up. ~~The~~ Spar not a trace of the high spired gastropods
so common in nearly all parts of the Stones River. Still, the rocks contain
gastropoda, one layer being observed that was filled with a small, planispired
(perhaps involute) shell. The rocks in the various outcrops remind strongly of
those seen in the vicinity of Scotland, Pa. It is significant that here as there
some of the layers are ls. compo-mentes (edgmine beds) others are finely oolitic,
while a few, especially in the part regarded as basal, are arenaceous.

The structure of the Morristown area also recalls that pre
in the Greenvillage - Scotland (Pa.) region. If the structure is
aright it is marked in both areas by originally normal st
subsequently modified to thrusts. Comparing the 4 outcrops of
depot and Nolichucky shale it appears that they are all
of the same general horizon, distinguished from overlying lo
rocks ~~by~~ in being much less highly magnesian. Many of the lay
especially the fossiliferous ones, being apparently nearly pure l
contain streaks that must be quite low in magnesia. If
concerning the relative solubility of such fine-grained pure ls. a
is founded on fact then the intervening subequal spaces
are probably occupied by dolomitic ls. If the 4 outcrops of
grained ls. represent practically one and the same horizon an
spaces are occupied by repetitions of a more soluble overlying be
prevailing SE dip can be explained only by assuming a series of st

Another striking fact observed in this a
far-east bands of Knox and Shenandoah ls
rocks in these are not only fewer ls. - especially less magnesian - but al
cherty than in the typical Knox bands farther west. Either the s
is older and the younger cherty beds are not present (perhaps were not
or equivalent beds are strikingly different lithologically. That the fir
is probably the case is indicated by observations n.w. of Lexington, also
in Va. where the true cherty Knox is underlain by at least 2000 ft. o
in every respect with these. Everywhere they contain ls. compo. & pure streaks
trilobite fragments. (Notes on Knox cont'd on p. 75.)

June 28, 1905

Morristown (Tenn.) sheet.

Section from Clinch River near Evans Ferry (near corner of Claiborne, Hancock and Grainger cos.) S.E. to Beans station

Main barrier in Cowby Ridge

Fault in Cowby Ridge

Clinch River

Riverridge

I. Middle Knox (and equivalent of beds below) XXVII

II Shaly beds probably (not exposed) about 55

III Shales with thin highly fos. ls. slabs. 15-25

IV Dark gray, compact ls. very varying in thickness from 6" to 75 ft. Consists largely of massive beds weathering brown 25

Conrad. 10 ft. thin bedded and very cherty. Very fossiliferous — globular Maclurea, Lonsdale Monotrypa? Cherty limestone, a semi-shaled Trypanites, Dal. subangulata? O. fischerella? Cyclonema? Cherty top full of small sponges (Astylo + Hindia)

V Interbedded thin layers of shale, shale and plates of ls. Conrad. Receptaculites oweni etc., apparently same bed as Thorn Hill.

VI. Blue 100 (~120') marble, gray above, red below. thin bedded + heavy

VII. Like bed V. full of similar fossils. Receptac.

VIII. Top bedded stone River ls. is little shale, with plates Tetradium of cellulosum type — very large quadrangular Dal. Strophs. etc in addition to Receptaculites of normal form

Base of Lebanon

IX Thin bedded argillaceous ls. + shale, slightly metamorphosed. Same fossils as in 5 or 7 but marked by one O. trentonensis like branch, Lingula, marine bryozoa abundant with many Bicornella and various branch bryozoa.

X Clayey, thin bedded ls. fossils, few except in an occasional large, layer filled with gastropods

XI Chocolate and red clayey ls. of Maccrinia type but no fossils.

XII Fine grained dark ls. with no fossils, mostly thin bedded

XIII Medium thin bedded, dark ls. many layers filled with fossils. These consist chiefly of indeterminable gastropods + lamellibranchs — Lophospira, Helicotoma, Cyclonema. Also a Nucula that seems to conform with Stradomey species. Also the S. [illegible]

Lowville

XIV Sandy ls. bed 13 but fossils very scarce some red layers 135 13 ft. above base Conradella near base.

Fault.

XV Overthrust Rutledge ls.

XVI Sandy Rome shales.

XVII Manganiferous ls. less than 10 ft.

XVIII Hebertella sheale with nodular platy ls. heavier ls. + thin sandstone, thin shale, thin thin platy ls. 400 ft. or more (1500 ft.) Overturned + confused or separated by fault from bed XIX.

XIX Nodular ("Stones River" type) moderately fine gr. slightly magnesian ls. 80 ft. exposed Rutledge

XX Bluish black shale 130', ls. 20', shale 20'. (Raymond)

XXI Fine grained ls. more or less magnesian. Murfreesboro ls. 360 ft.

XXII Laminar, slightly shaly ls. with glauconitic layers at top 130 ft.

XXIII Shales and thin ls. interbedded, the ls. often sparingly with the oval black Trilobite fragments. 520 ft.

Nolichucky

XXIV More or less dolomitic ls., a few layers nearly pure — very little chert 345 ft.

XXV Principally dolo. with occasional layers nearly pure ls. a few thin shale or bed at layers with ls. 15 ft. at top. On top of ridge lower 150 very cherty but fresh exposures in creek show no signs of chert. Remainder of bed seems to be only slightly cherty.

Knox dol.

XXVI Dolomite with several thin layers, 25 in lower 200 ft. All very cherty on ridge but creek exposure shows no chert. (Typical Knox)

XXVII Sandy ls. 26 bed contains considerable chert.

XXVIII Dense, clear, apparently very slightly magn. ls., with chert nodules in creek + marble in lower 50 ft. 100 ft.

XXIX Platten [illegible] ls., mostly light colored, some [illegible] cotton [illegible]

XXX Dense, clear ls., with [illegible] and [illegible] [illegible] "[illegible]" [illegible] [illegible]

Upper and lower Knox dol. 2200 ft.

360' 130' 520' 560' 455' 335' 170' 180 ft. 470'

? Stones River
? Canadian
Mohawkian (Probably short chain)

Fault

June 28, 1905

= 1230 ft.

XXXIII. Gray marble but coarser grained than 31. 30 ft. med. heavy,
72' 22 ft thin bedded

XXXII Red marble 15 ft. 10 ft thin gray marble, 8 ft. medium shaly
190' with fossils, 30 ft good gray marble, 25 ft thin gray marble,
(fossils) 12 ft medium heavy gray, 10 ft shaly very fossiliferous (rum.
bryozoa very abundant) 80 ft gray marble = Beekmantown 190 ft

Relation (Perhaps by ...) ? Tellico, Ritter & Whitesburg missing.

Bur Oliver

XXXI 10 ft thin bedded shaly & argill ls. 10 ft thin bed crystl. 10 ft.
120 shaly = 120 ft (fossils ...)

XXXII 50' Dark gray marble 130 ft. pink marble, both in massive beds.
207 22 ft. very thin bedded marble, 5 ft. grading up into shaly (Lodi Stone)

XXXVII. 150 ft. shaly ls & yellow shale. some fossils in lower part.
150' 275 p 15

XXXVIII 80' pink marble good & massive; 40 ft. thin irregularly
120' bedded marble, passing above into next shaly bed. = 120 ft.

XXXIX 90 ft. beginning with 20 ft shaly bryozoa bearing beds & passing
90' into thin bedded crystl. ls.

? Top of Oneota.

? Stones River formerly Murfreesboro

Hampton Valley mining

XL 40 ft. very argill. or shaly ls. 60 ft more or less argill. thin
100 ft. ls, fossils abundant Receptaculites & bryozoa
also Selenocha

XLI 10 ft Chazyanus bed argil. ls. & sh.
Top of Blount Gr. Total thickness 1129 ft.

XLII 105 ft argill. ls. & sh. few fossils

XLIII. 100 ft Reddish argill. ls. 40 ft. light gray to drab, fine grained ls; 100 ft
like preceding but with numerous reddish clayey layers; 200 ft more clayey
laminated ls or calc. shale.
330 ft of same kind but more clayey red beds. Fossils very rare.

XLIV Hard layers thin preceding & with plates of argill. chert near base
a few forms there. 190 ft. Top of Blount group, Blount ls
small brach here - see Lee Valley section at Tazewell.

441C

XLV. 285 ft. Blount ls. with Dal. multicosta? 30 ft. more - mudstone, small
Rafinesquina, long hinged large Plectorhynchia aspera (James) Toward
top more argill. & nearly black. Upper 20 ft. with subregular layers filled
with Dr. basalis, Cyphaspis acuminata? (Lodi - Trenton)

XLVI. 800 ft - yellowish shales

XLVII 200 ft - calcareous shales & dark argill. ls.

XLVIII 200 ft yellowish shales to first observed Eden shales (Levis horizon)
... Mid. Eden layers

XLIX. About 50 ft. with numerous highly fossiliferous layers
alternating dip & strike again with shales as in 1046,
Following thin bed frequent reversals of dip and folding
to bottom of Rays. Possibly several hundred feet
more of Eden.

50

L Rays ss. consists of gray to red shales with very numerous
calc. ss. layers - many of these are filled with
lower Trenton fossils. Thickness not measured
but amounts to several hundred feet.

LI Clinton ss. = Tuscarora ss. Simply a
fill of same kind of Scolithus as occurs at
Cincinnati. Near top of heavy ss. found one
specimen of Arthrophycus harlani, above the massive
ss. in shaly ss.

Palark shale = Clinton

XLIII Drainage formation probably = Clinton.

XLIV - Overthrust Cambrian shales.

Clinch River Mohawkian band is in part distinct from Thorn Hill band - former compares better with Va. & Pa. localities visited this year. The two bands however were doubtless in communication most of the time. Exact correlation of beds in two bands very difficult and, except in general way, not possible before making a careful comparison of fossils. At present bed V seems to correspond best with bed XLI but believe it more nearly equivalent to some part of XXXIV.

Notes on Knox dol. giving observations on
from Morristown to Evans Ferry (Chuckey River) and
return.

As expected the Knox in going north from Morristown
continued of the non cherty type to overthrust along fault
Crockett Ridge. Considerable platy ss. & shale in thin beds
(corresponding to similar beds noted in northern slope
of the Nolichucky ridge south of Morristown - see section p. 68)
however was observed, especially in the 2nd mile north
of town. The beds lie nearly horizontal. Almost
immediately after passing the fork - the left road going
to Turley ferry, the right to Long ferry - chert in greater
or less abundance is felt and seen in the roadway; and
lime outcrops are practically absent between the fork
and the Nolichucky shale in River Ridge. This is in strong
contrast with the conditions south of the fault where limestone
outcrops are abundant and chert almost or quite absent.

The fact that Knox chert extends from the fault to,
or at least very near, the Nolichucky shale outcrop in River Ridge
is interesting & important, since it indicates one of two
conditions: either there is a fault near the Nolichucky
border, causing the lower Knox to be faulted out, or, as
seems much more probable, this band represents an old
barrier on which only the upper or cherty Knox was
deposited by overlap from the northwest. If this is
the proper explanation, I would still maintain that the
subsidence was not sufficiently general to submerge the
lower Knox areas lying to the SE of the Crockett Ridge
fault. These probably were not submerged again before the advent
of the Sevier shales sea, - but evidence on this point is lacking.

Observations on the Knox area between Long Ferry and
the Richland Knobs were not very careful and the results
are now hazy in my mind. As I recollect the facts this area
also contained only, or little clay, than the cherty upper Knox.

As shown in the section on p. 71 the Knox band immediately
north of Thorn Hill contains both the upper cherty division and
a comparatively non cherty series beneath it. — Observations
were not extended to the Chuckey River Knox band, only the top
of this ~~being~~ but touched.

The faults between Morristown and Poor Valley Ridge
seem to be successively developed and broken folds

Probably Oswalt - Exp. Jan. 1921

345 Lower Knox

560 ss layers 100 ft. chert below a few layers from top.
450 very chert
335 little chert.
1345
100 ft. Dark
470

Notes on Knox dol. giving observations made from Morristown to Evans Ferry (Chuckey River) and return.

As expected the Knox in going north from Morristown continued of the non cherty type to outcrop along fault Crockett Ridge. Considerable platy ss. & shale in their beds (corresponding to similar beds noted in northern slope of the Nolichucky ridge south of Morristown - see section p. 68) however was observed, especially in the 2nd mile north of town. The beds lie nearly horizontal. Almost immediately after passing the fork - the left road going to Turley ferry, the right to Long ferry - chert in greater or less abundance is felt and seen in the road way; and lime outcrops are practically absent between the fork and the Nolichucky shale in River Ridge. This is in strong contrast with the conditions south of the fault where limestone outcrops are abundant and chert almost or quite absent.

The fact that Knox chert extends from the fault to, or at least very near, the Nolichucky shale outcrop in River Ridge is interesting & important, since it indicates one of two conditions: either there is a fault near the Nolichucky border, causing the lower Knox to be faulted out, or, as seems much more probable, this band represents an old barrier on which only the upper or cherty Knox was deposited by overlap from the northwest. If this is the proper explanation, I would still maintain that the subsidence was not sufficiently general to submerge the lower Knox areas lying to the SE of the Crockett Ridge fault. These probably were not submerged again before the advent of the Senior shales era, - but evidence on this point - is lacking.

Observations on the Knox area between Long Ferry and the Richland Knobs were not very careful and the results are now hazy in my mind. As I recollect the facts this area also contained only, or little else, than the cherty upper Knox.

As shown in the section on p. 71 the Knox band immediately north of Thorn Hill contains both the upper cherty division and a comparatively non cherty series beneath it. — Observations were not extended to the Chuckey River Knox band, only the top of this being touched.

The faults between Morristown and Poor Valley Ridge seem to be successively developed and broken folds

Probably Knoxville - Jan. 1921

June 25, 1903

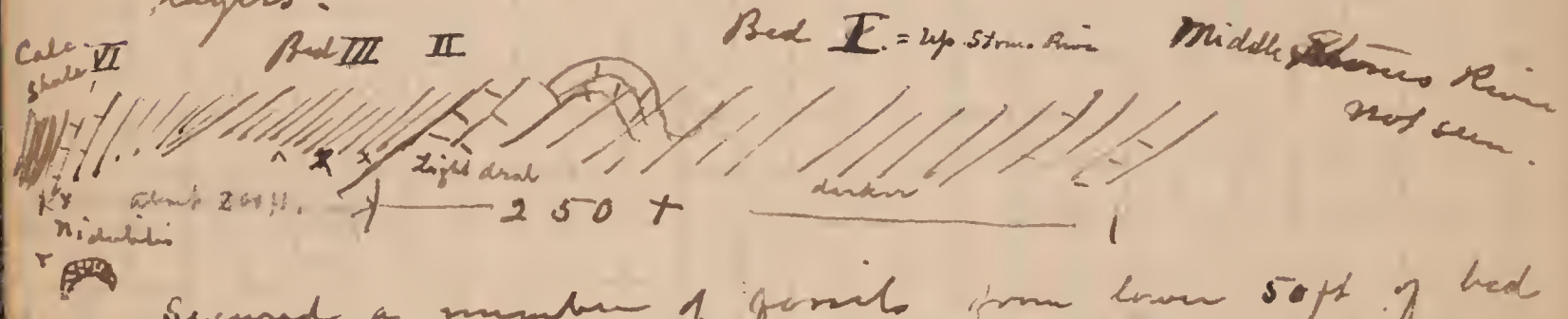
as the rocks were pushed over the original anticline located near the present Crockett Ridge fault or even nearer Morristown.

Respecting the Maryville Co.: in this district it has many of the lithologic characteristics of the Stones River rocks; also outcropping freely and simulating the Lebanon especially in supporting an abundant growth of cedars.

Pennsburg, Md. May 3rd 1906

Came to this burg at noon from Martinsburg - via. Cherry Run. Nothing here but several lime and dimension stone quarries.

Bed I of east Martinsburg section furnishes stone. Part immediately beneath Echinosphaerites bed (= II) of bed 7 not being worked but is present in same character and force as at Martinsburg. Beds chiefly worked are from 60 to 200 ft. beneath top of bed I, which is folded at this quarry. The lowest seen begin to include thin seams or strings of more or less magnesian ls. A new plant is being installed for crushing rock. This is to work the lower layers.



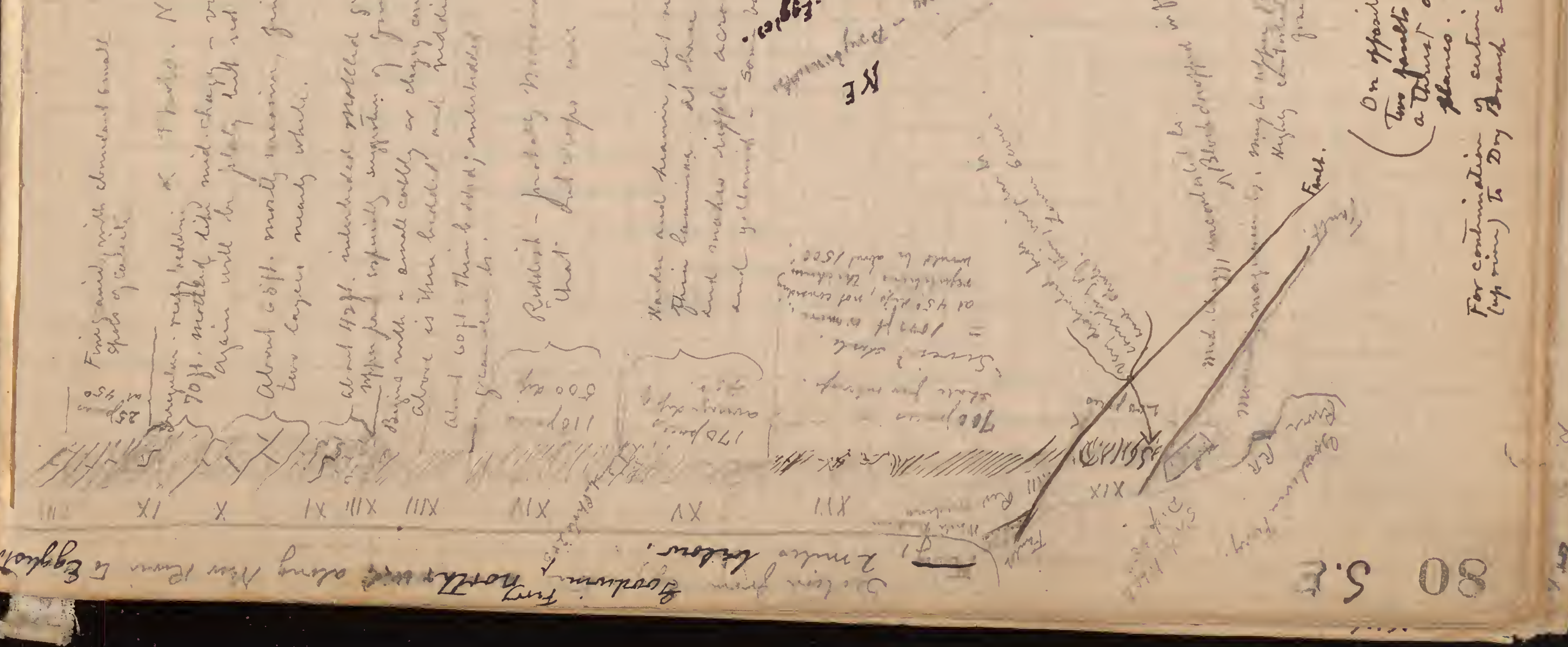
Secured a number of fossils from lower 50 ft. of bed II-III 7 among them Echinosphaerites, Nidulites, Receptaculites, Tropidoleptus and Brachiopods, & Bryozoa: Near top Nidulites & small hemispherical bryozoan nodules (?alt), some like as at Chambersburg, loc. F (p. 19). The dense ls. of bed I are not favorable for fossils. An occasional layer contains large Ostracoda (both Leps. & Isochilina) and one layer was noticed in which a part was filled with Girvanella. Another was filled with Lophospira and high spired Trochonema. Near middle of bed, associated with Girvanella, some of the layers have sun-cracked surfaces while one at least was observed to be a fine ls. conglomerate. On same quarry some of the seams or cracks contained a coaly very black mineral, which as it would not ignite is supposed to be graphite.

Season of 1907.

80 S.E

Section from Goodwin Ferry northward along New River to Eggleston

2 miles below.



25 paces at 45°

Fine sand, with abundant small spots of calcite.

Probably upper [illegible] Mtn.

Irregular, rusty bedding. × Photo. No 1

70 ft. mottled lilac and cherry – very irregular bedded in places. Again will be platy lilac and shaly.

About 65 ft. mostly massive, fine granular, mottled to one or two layers nearly white.

About 140 ft. interbedded mottled grayish blue and reddish to ~~gray~~ [illegible] upper part especially suggestive of [illegible].

Begins with a small cobbly or clayey conglomerate, but 6 ft thick. 10 ft or more above is thin bedded and reddish.

About 60 ft. Thin bedded; interbedded mottled, reddish & greenish, gray granular [illegible].

110 paces 500 ft.

Reddish – probably Moccasin [illegible]. Weathers so that it is inconspicuous.

Moccasin abt. 650 ft.

170 paces average dip 25°

Harder and heavier, but very sandy and weathering rolls thin laminae. At base about 40 ft that is thicker and makes ripple across river. Color reddish, greenish and yellowish – Some looks a little sandy.

700 paces shale few outcrops.

"Sevier" shale.

= 1800 ft or more. at 45° dip, not considering repetitions, the column would be about 1500'.

Very disturbed beds [illegible] considerably [illegible]

Mid. Camb.(?) unconformable to N Block dropped in fault subsequent to folding but prior to present erosion.

[illegible] may be upper Beekmantown. Highly contorted and faulted.

All must [illegible] ground and [illegible] remodeled,

SW Goodwin – [illegible] NE

Goodwin Ferry – Eggleston.

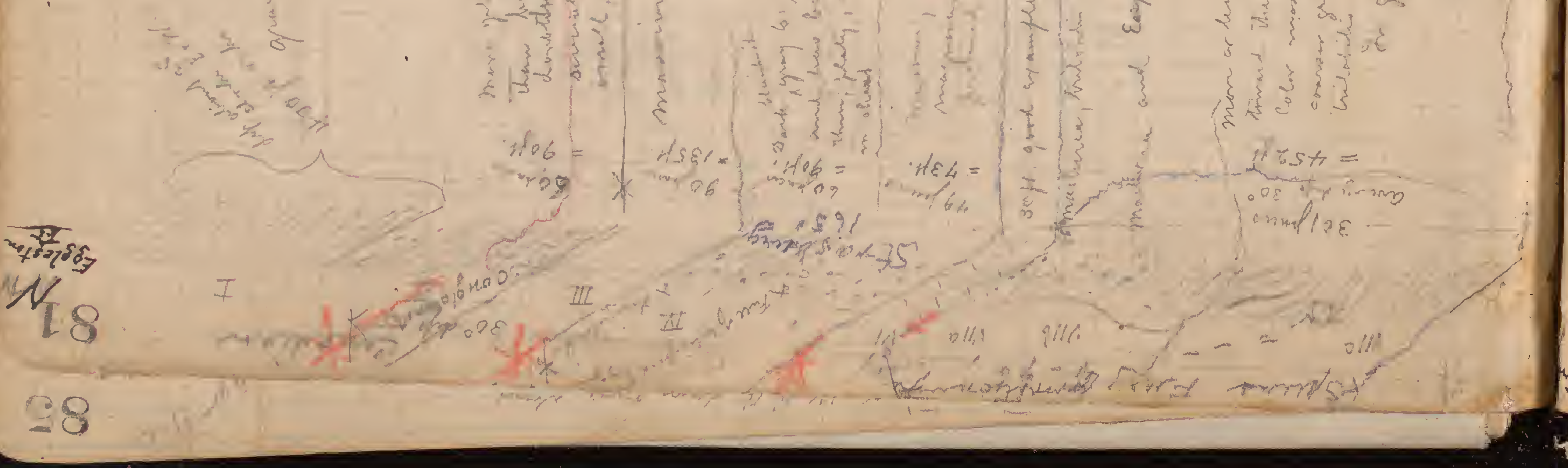
(On opposite side of river Topography indicates two faults as on South side. Apparently a "thrust" dividing river surface into two planes.)

For continuation of section from Goodwin Ferry southward (up river) to Dry Branch see pp. 83-82.

[illegible] 240'

81 N

Eggleston



Dip about 25° 1100 ft. gray to [illegible] dolo.

60 paces = 90 ft.

More granular in part, and less magnesian than below. Some bluish, fine gr. + dolostone low in mag. [illegible] Siliceous especially toward top, with numerous small, rounded chert pebbles. These last may be [illegible] deposits of Stones River.

90 paces = 135 ft.

Massive, fine gr., blue – lo. = Murfreesboro + Lower Stones Riv.

Strasburg 165'

60 paces = 90 ft.

Dark gray bl., with shale [illegible] in bands – [illegible] and has been [illegible] and makes [illegible]. [illegible] thin, platy, with [illegible] – [illegible] small bag of [illegible]

49 paces = 73 ft.

Massive, gray granular, in part [illegible]. Some [illegible]

30 ft. good example of "dove" lo.

In position of Holston, Ironside, [illegible]

Thompson Valley

[illegible], and Eggleston.

361 paces average dip 30° = 452 ft.

More or less finely granular, mainly in heavy beds, toward the top occasional seams with chert nodules. Color mostly gray to bluish; alternating seams & coarser grained. Fossils, Maclurea, the gastropod, Ecculiomphalus, bilobites, orthoids, etc. Ecculiomphalus [illegible] in general [illegible] and shaly.

Pearisburg 645 ft.

Pearisburg [illegible]

Aug. 8th Tues

Dorset Flood
Pendle & Sedgwick

Here or here earthy, mainly light gray, and lamina
magnesian lst. An occasional layer dark gray, typical
dole. A few bands of small chert - chert very inconspicuous
Edgewise corals in layer below middle. Cryptozoon reef
and again above the sequence. Here & there lacks fenestrata for fossils

Similar to below, beginning with a 2 ft chert in
irregular, perhaps occasional, layers. Top layer
made in transition by solution & [illegible]

Light gray & subcryst. ls, some layers supporting mostly
filled with Solenopora - Fewer bryozoan, bifoliate & a Monticulipora

Solid, fine grained, gray ls, the principal fossil is a rich Brachiopod
which fills some of the layers. A few broad chert in bands. Toward
top full of silicified remains bryozoan, also shells etc
Very cherty - otherwise similar to next below, less solid

Light gray, fine grained
Mostly & moderately ls, - massive fresh but weathers
the greater part breaks up with their cobbly joints and
rough shaly slabs. Fossils accordingly P. Sect
Bryozoa as in top of bed
Gray nodular ls, crowded with Solenopora.
Bryozoa - Phyllopora, large Monticulipora, Coelosa Graptolithus - Solenopora
Tetradium, alternans large & Beecrowella = Tonvillia

Red shaly ls or better living shales. Lower part only exposed

Light gray, subcryst. ls, 1-6 layers, interbedded with sandy and
shales. Fossils Plect. sericeus numerous - large. Dal. [illegible]
medium size. [illegible]

Shales - no ls. discovered
Apparently not red.

Ls. layer with small Plect. sericeus
" " " " " "

Plain shales - Trench to the
460 ft.

Dorset Formed - Sedgwick
Sedgwick

Quantity 10 ft.

Here label these beds
are lower Clinton. Bright
patches, yellow when
Crinoids.

500-700 ft. (Estimated)
Alternating SS & sandy shale

Clinton

Apparently slightly calc. blueish & greenish shale
with fossils - Small [illegible] etc. Cliff by Sedgwick.
Probably 200 ft.

Ferruginous SS. at base - [illegible] SS. & shale
above. ? Oriskany

5

Pendle & Sedgwick

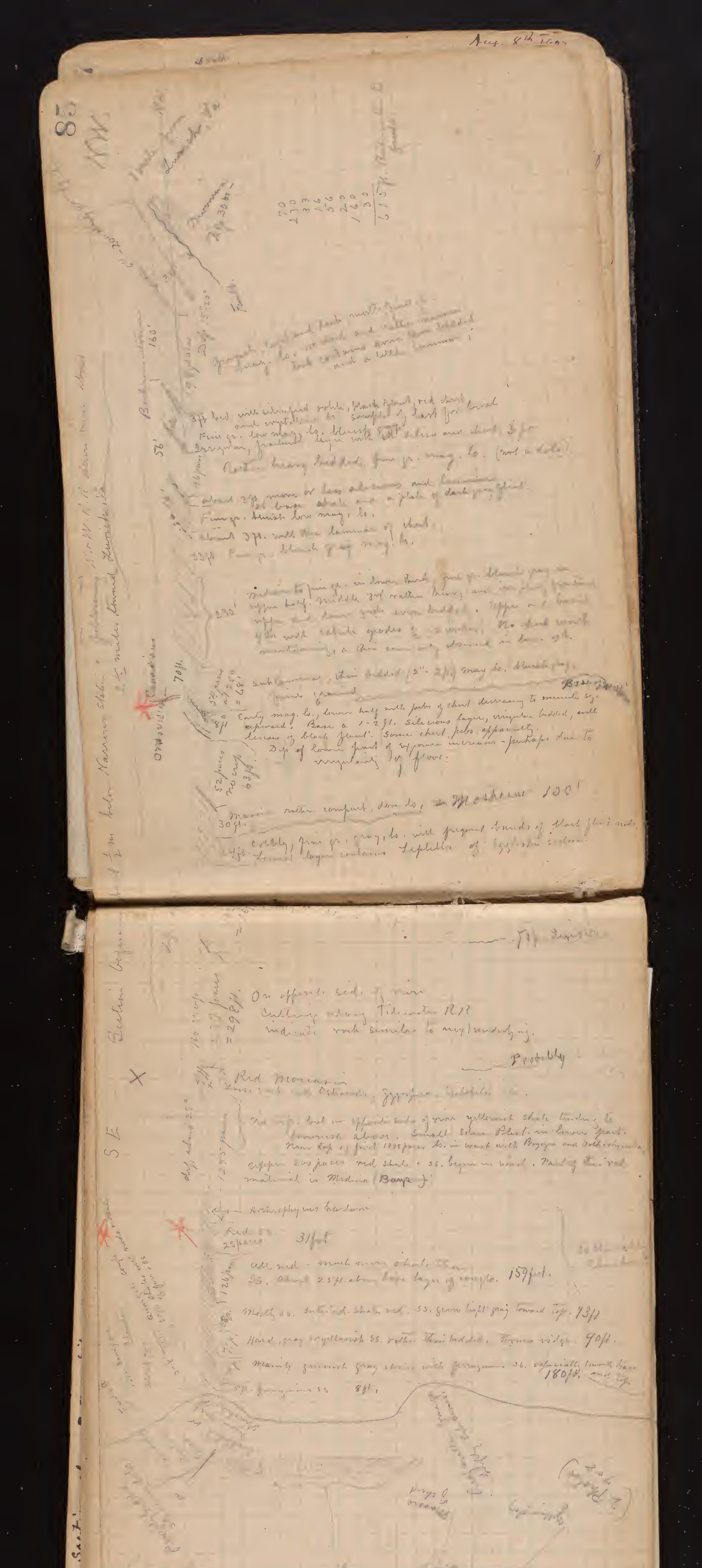
Pendle & Sedgwick

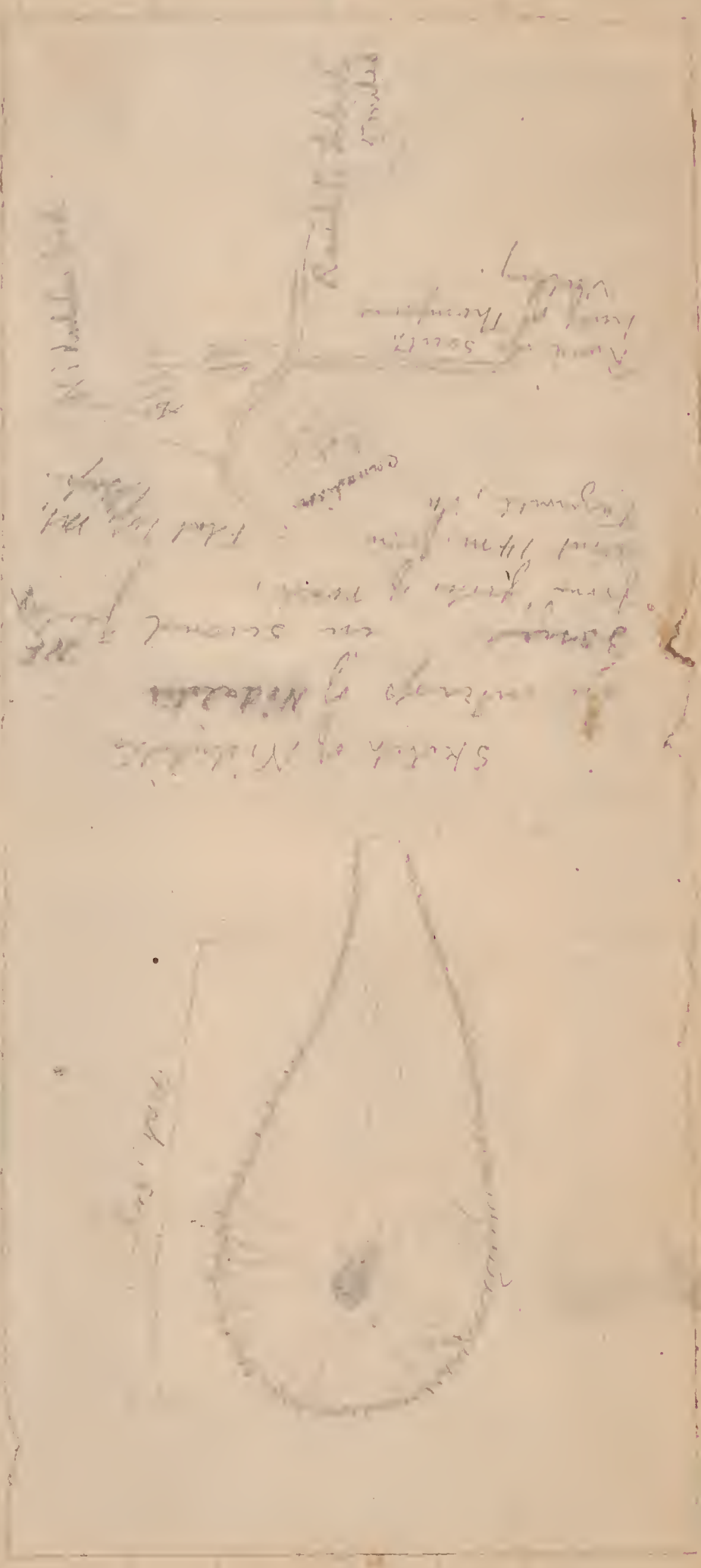
N.N.

Pendle & Sedgwick

Pendle & Sedgwick

Aug. 8th 1903


Section between Nassau Station and Tidewater R.R.
Section between Tidewater R.R. and Lucinda Pt.
Section between Lucinda Pt. and Bay
Bedded
165'
56'
70 ft.
230'
8 ft
30 ft.
On opposite side of river
Cutting along Tidewater R.R.
indicate rock similar to my underlying.
Probably
Red Mountain
Archaeopyrus barbarum
31 feet
159 feet
73 ft
90 ft.
180 ft.
Bay



Aug. 3rd 1907

Section of North side of Thompsons Valley - along road 4-5 miles east of Tazewell, Va

Copied

335 ft

Tazewell gap = Lowville

See later (1921) section & notes in B. 32, p. 50

Sketch of Nidulites

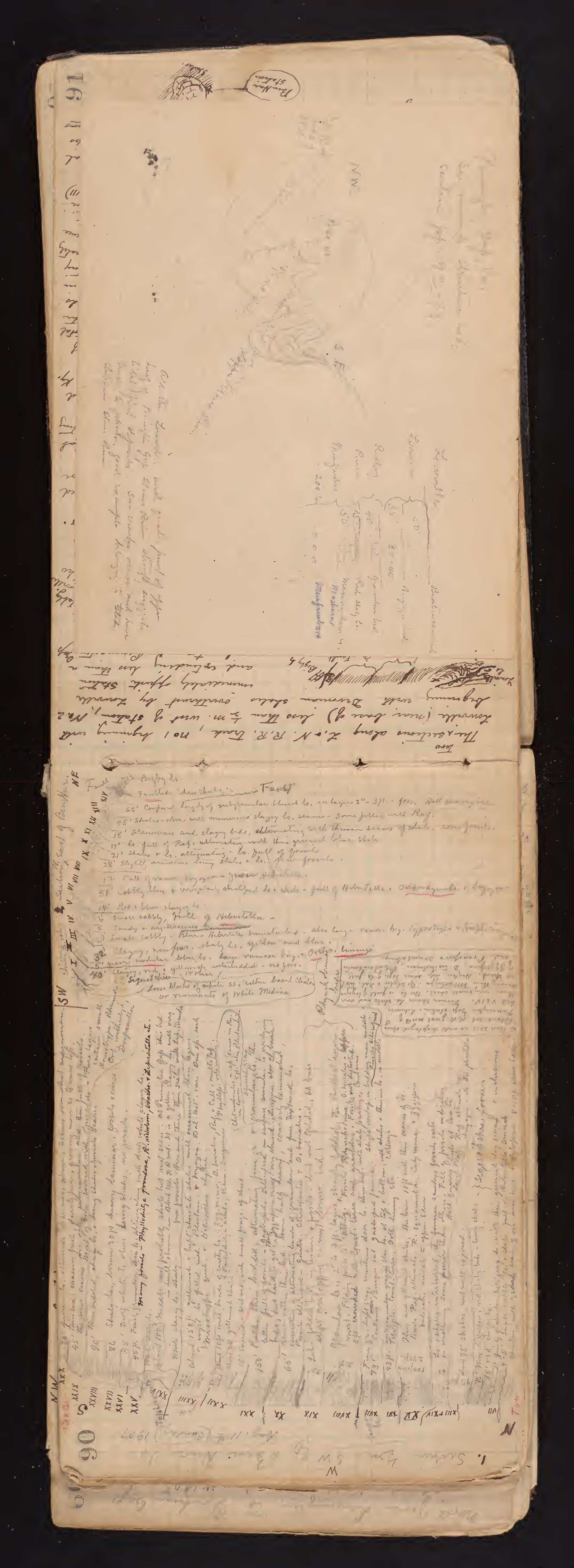
Nidulites bed

Same as second foss. from finder of road, about 14 m. from Tazewell, Va

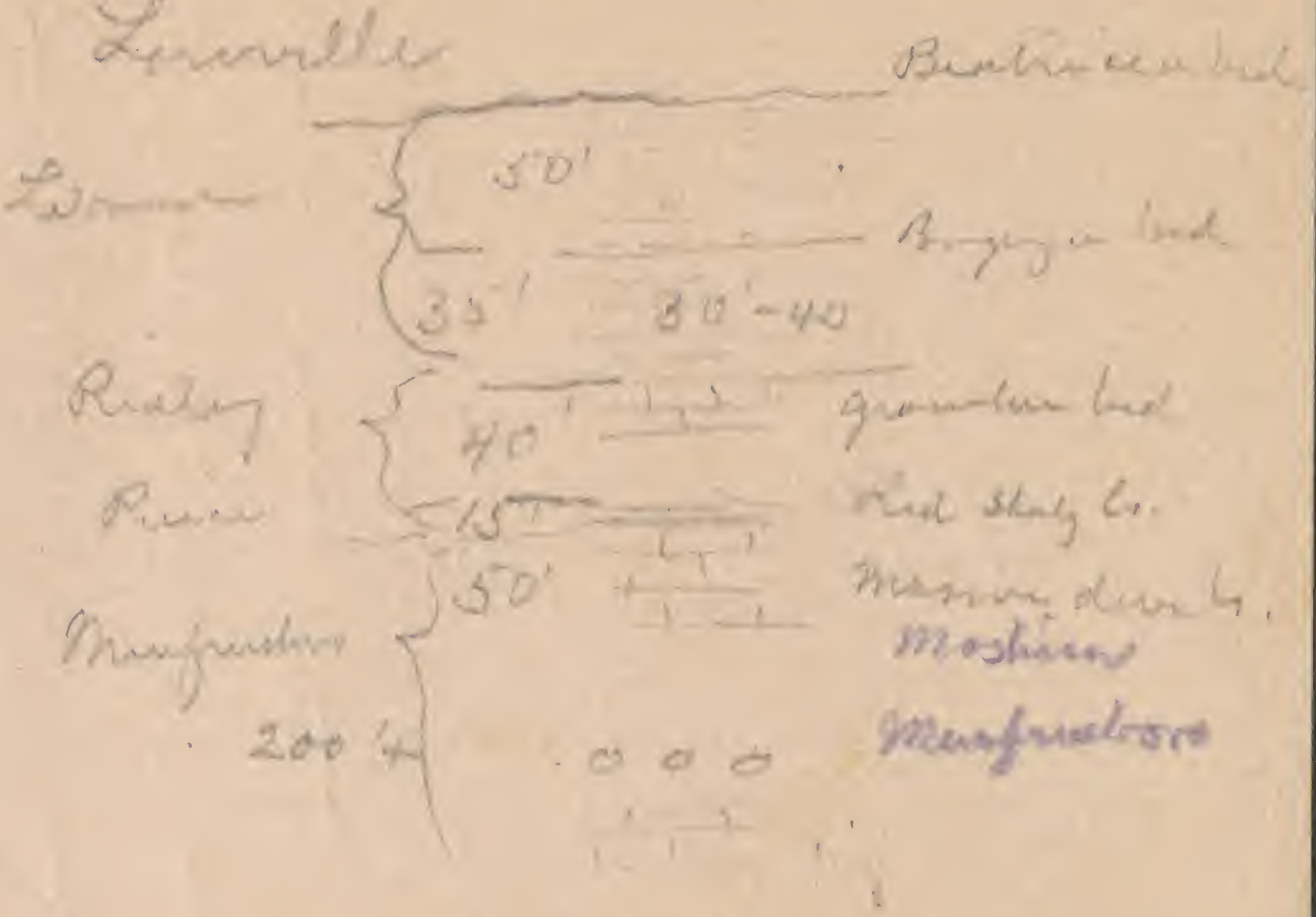
Total 1 ft. 7 in. high

Road on South side of Thompsons Valley

68



Pennington Gap, Va.
See revised structure and section pp. 92-93.



Lowville — Beatricea bed
Lebanon — 50' — Bryozoa bed
35' 30'-40
Ridley — 40' granular bed
Pierce — 15' Red shaly ls.
50' Massive dove ls.
Murfreesboro 200'+
Mosheim
Murfreesboro

All the Lowville and greater part of upper half of Pennington Gap Stones River strongly suggests 'tidal flat deposits'. Sun cracks occur and have tried to photo. good example belonging to Glade Lebanon Stones River

Subject to revision according to 1908 studies. EDH.

Notes on Knox & Beekmantown in Chickfont - Spears Ferry section

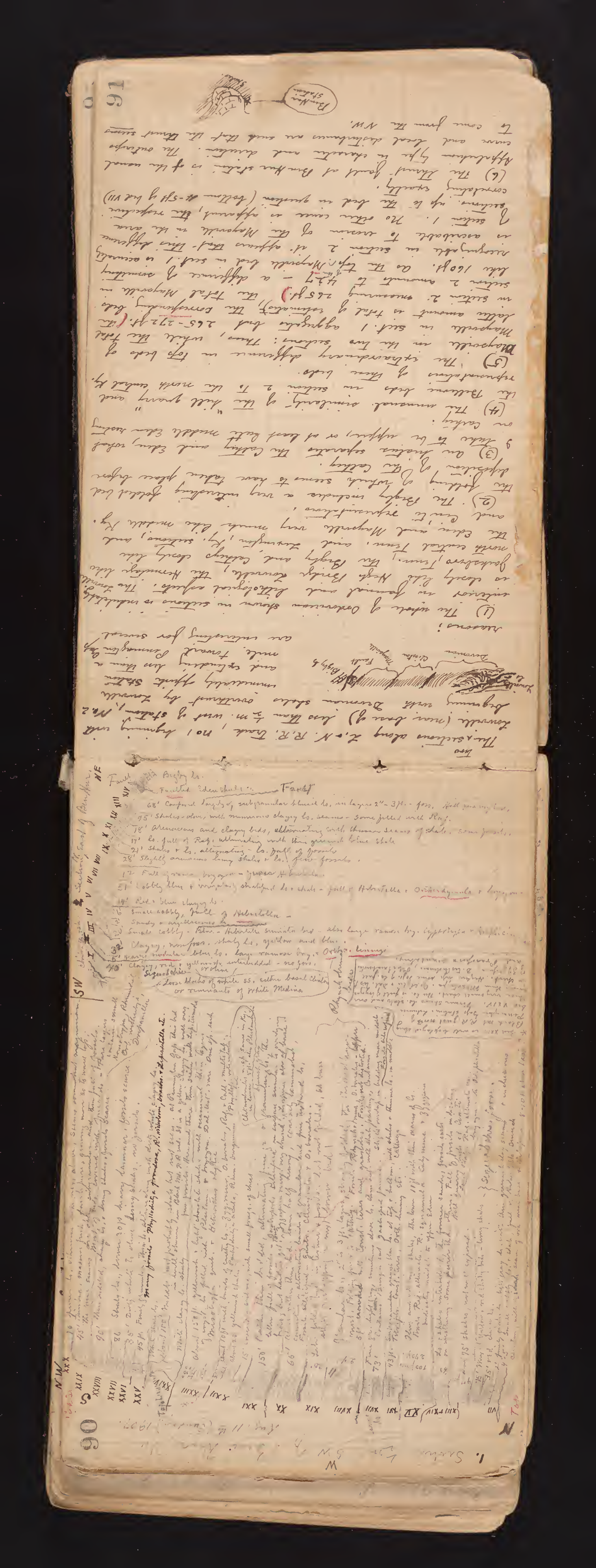
In these two sections the magnesian series (Knox - Beekmantown) offers the following features worthy of notice:

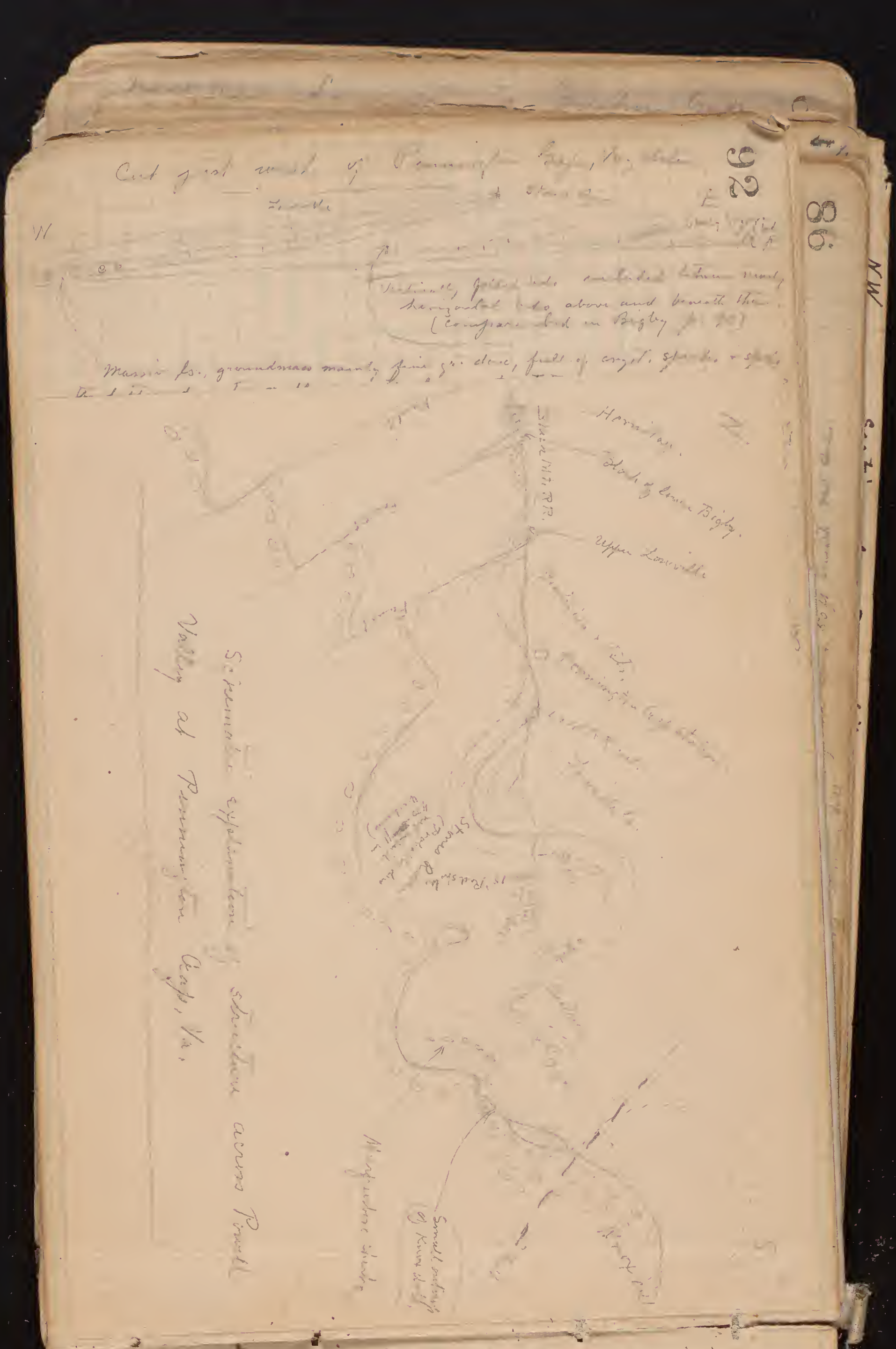
(1) Except the lower 500 ft, and aside from the magnesian character of rock there is no agreement between them. 500 ft above the Chickfont section has 1000 ft. of 55. Sdy chert & rocks not seen in Spears Ferry section. The upper 1200 ft look like the chert Knox but the chert study is rather sparingly developed (? due to rapid crossing of bluffs exposures). In the Spears Ferry section the whole 2300 ft or so is practically cherty in bluffs & R.R. cut but on hill lower half is cherty, probably prevailing type of the

(2) While the upper 1200 ft of the Chickfont section is a granular dolo. the corresponding upper part of the Spears Ferry section is almost typically cherty & much finer grained and more argil. magnesian lo; in fact while the former will pass very well for true cherty Knox, the latter agrees very closely with the Beekmantown of Pa. (where the Beek. is a lake formation than the cherty Knox, and (3) magnesian rocks of the

(3) Admitting that the upper 1200 to 1500 ft of the Spears Ferry section are Beekmantown and the remaining lower beds now called lower Knox it follows that the cherty or typical Knox is not represented in the Spears Ferry section.

(The ~~relations ages of the Knox and~~ chert-dolo position of the cherty Knox & Beekmantown ~~are~~ shown by the Chepultepec (Ala.) Chambersburg to McConnellsburg, Pa., and the New York sections in which the whole of either the one or the other occurs in the same section with the part of the other. Pennsylvania Va. seems also to have both. South of New York, at least, both occur only in the same range, Pennsylvania. To the east the Beek. rests on the lower non-cherty Knox. To the west and south of Pa. we have first a good developed cherty Knox and no Beek., then farther west, a cherty Beek over the cherty Knox (vide Chepultepec.) General remarks are known difficult to keep within the facts, the distribution of the seas, especially on a N. S. direction being very complicated.





The Stones River, though well exposed in vicinity of Pennington Gap, is here so much broken up that it is difficult to make out the succession. Fossils helps very little, the rocks having few and those, because of the commonly vertical attitude of rocks, very difficult to see, not to say procure.

So far as brief investigation permits of determining the matter the succession appears to be as follows:

Lowville — — T. cellul. + Beatricea bed — no bed corresponding to Carter ls. seen.

? Lebanon	85'	Mostly thin-bed. dove ls. weathering in part shaly. Lebanon bryozoa in middle part.
? Ridley	40'	Finely granular, bluish dove or gray in color.
? Pierce	15'	Red, shaly ls.
Murfreesboro	200'+	Compact dove ls. (50ft.) at top with less compact yet fine grained light-gray ls beneath to top of Knox chert. A cherty bed in lower half, 50ft or more above base. No fossils seen.
Total	340'+	Knox.

Cherty bed in lower part of section reminds in color of ls. and chert - the latter black - of cherty bed in Tazewell section. But it has none of the fossils characterizing that bed and the ls. besides is a trifle finer grained than average of that bed. At present it is regarded as representing cherts of the Murfreesboro ls. horizon.

Another cherty bed seems locally present over a bed that resembles the Beatricea - Tetr. cell. bed (regarded as basal Lowville) lithologically and in holding gastropoda and "worm-tubes". It was noted at two points along R.R. within 2 mi. west of Penn. Gap station, but as the two "best" fossils of the Beatricea bed (Beatricea & T. cell.) were not seen at these points (a number of Gastro. were collected) it is possible that the outcrops in question are of a lower bed. In that case the Stones River - Lowville section here would contain two gastropoda beds closely resembling each other in character of rock and fossil contents - especially gastro. and "worm tubes". The latter occur also in bed X Tazewell Va. section (p. 86) (= basal bed of Lowville). In all cases compact of decomposing masses of these beds are coated with a chalky layer.

All the Lowville and greater part of upper half of Stones River in this vicinity strongly suggest tidal flat deposits. Sun cracks occur & have tried to photo. good example belonging to Lebanon Stones River shown in quarry 1/2 mi. W. of Penn. Gap Station.

I & II & III is Strasburg Ls. = 50 ft. + Oriskany - about;
Clinton & Whitestone Lake Tonoloway 32 ft.
IV = Helderberg
V - VIII = Upper (= Heistand Shale member = 250 +) & Lower, Nat. Br.
Lemasone member (270') & the Thompson Hill ft.
320 ft
VIII a = Lebanon
IX = Lewisville - X = Mocanaqua

Subsequently made collections show that fossil contents
on the strata of Hillsdale or a Devonian that seems to the
genus to which Hillsdale applied

[illegible]

506 – 2 inch of drapper mud, clay [illegible] (= [illegible])

7 ft – Ref. in [illegible] half mile below Newport, P. R.

9 – Second cangle of Chicago along road ½ m. E. of fork with Liberty – near Red Top (Blank) P.O. Chert [illegible]

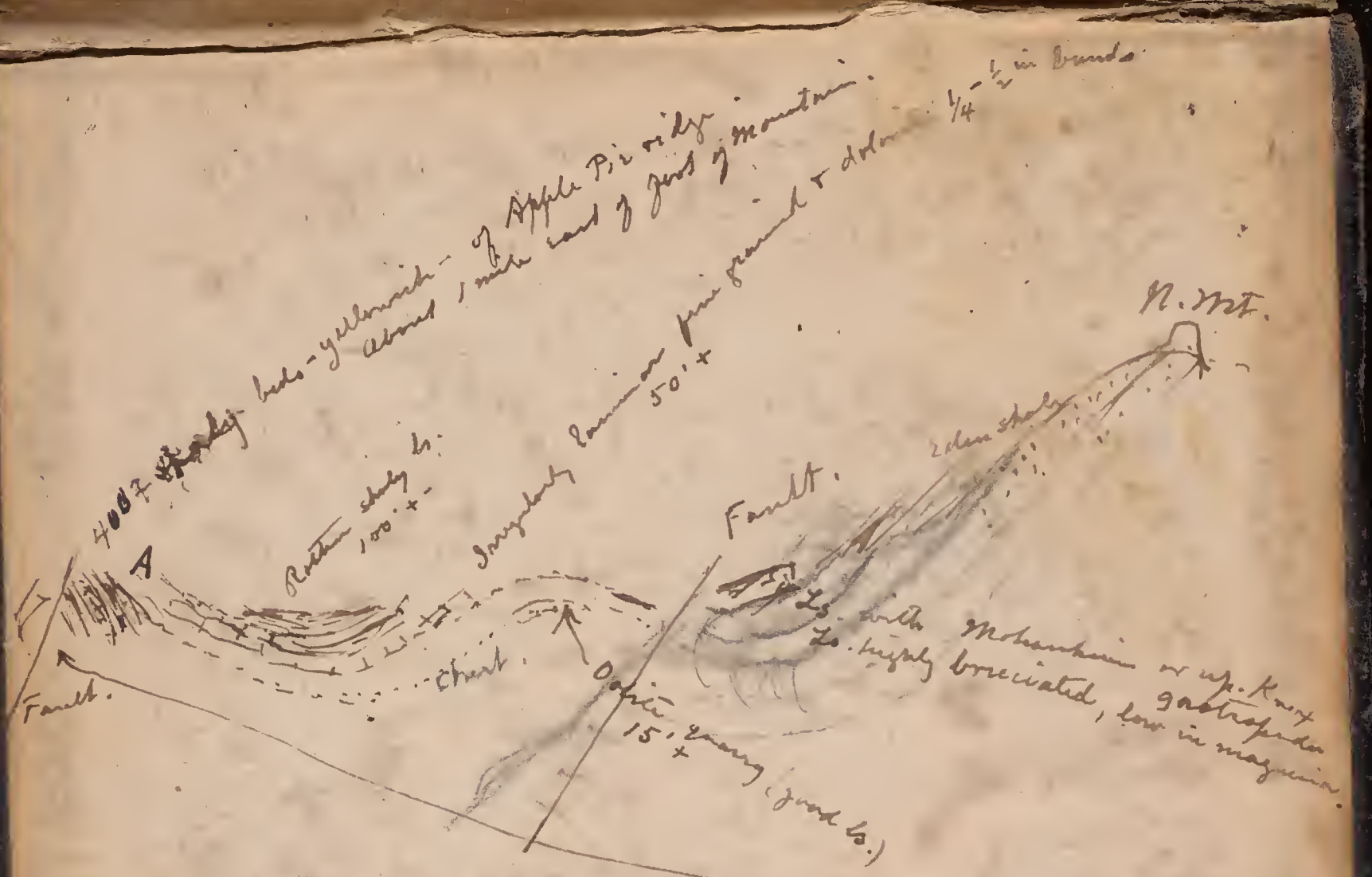
10. [illegible]

No. 3 (No. 1 = 10 [illegible]) | Carbonate – [illegible]

11 + 12 + No 2, 1 + 2 Distributed [illegible] Beds of Berkeley [illegible]

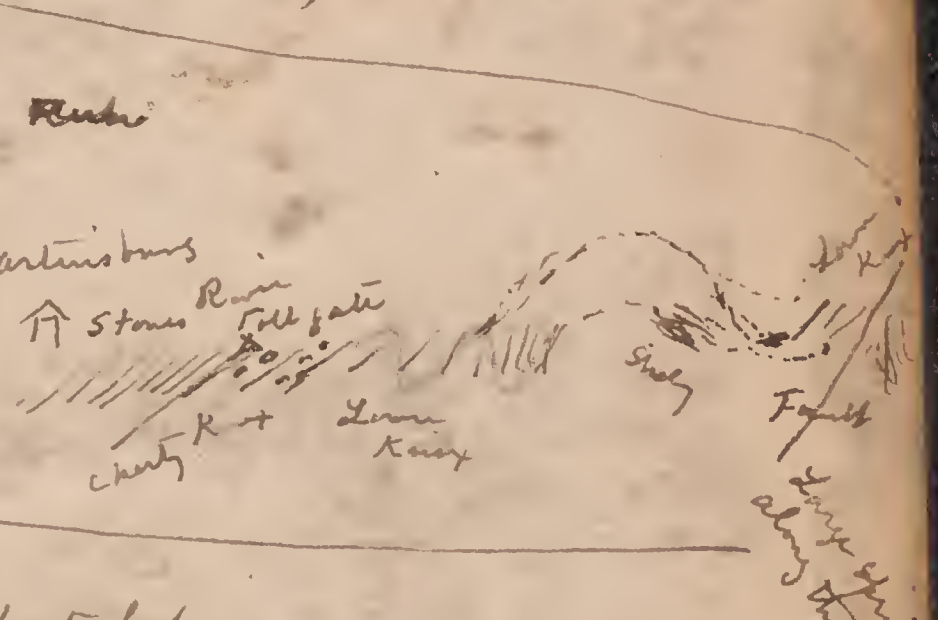
4. [illegible] Tyrone [illegible] Dev. [illegible]

5 – Sun cracks showing in bottom of layers in (basal 10 ft) of Lewisville – 1¼ m. S of Pennsylvania – in R.R. cut.



Section from Martinsburg to North Mountain along Dry Run

At A a road running SW with strike of rocks connects 1½ m. southward with Tuscarora creek pike, and on this distance passes almost continuous on decided chert beds. Surface thickly strewn with chert, much of it in ball-like masses of – 10 inches in diameter.



The stratigraphic position of this chert bed is doubtful. The ls. shown at A and on west limb of syncline certainly ~~[illegible]~~ not chert, and did not look like it could afford ~~[illegible]~~ chert under any conditions. However, and this seems a very plausible explanation, it might have come from the oolite and limy beds beneath it.

N.B. 8