

MADISON

FENNER

CAZENOVIA

POMPEY

NELSON

DERBY

GEORGETOWN

CUYLER

Indian Hill

Watervale

Pompey Center

Carpenter Pond

Van Farms

Keeney

MADISON CO.  
OSKANA  
COUNTY

Delphi

Stockham Hill

MADISON CO.  
OSKANA  
COUNTY

Cobb Hill

Luion

Reservoir

Keeney

CAZENOVIA LAKE

Ripston

Delphi Station

Saw Woodstock

Keeney

Cemetery  
Cazenovia

W. Station

Saw Woodstock

Sheds

Hunt Hill

Chittenango Falls

Cemetery  
Cazenovia

Constable Bridge

Tinsler Hill

Sheds

Muller Hill

Fenner

Watervale

Pompey Center

Nelson

Tinsler Hill

Van Farms

Keeney

Muller Hill

4

2

3

1

5

6

8

7

9





M A N L I U S

F E N N E R

C A Z E N O V I A

P O M P E Y

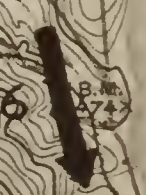
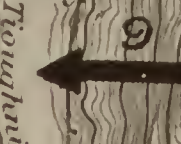
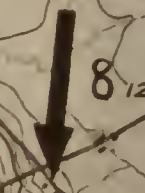
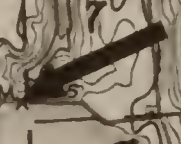
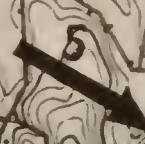
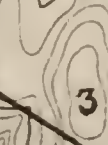
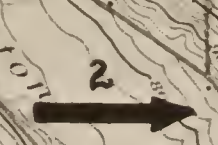
N E L S O N

F A B I U S

D E R U Y T E R

G E O R G E T O W N

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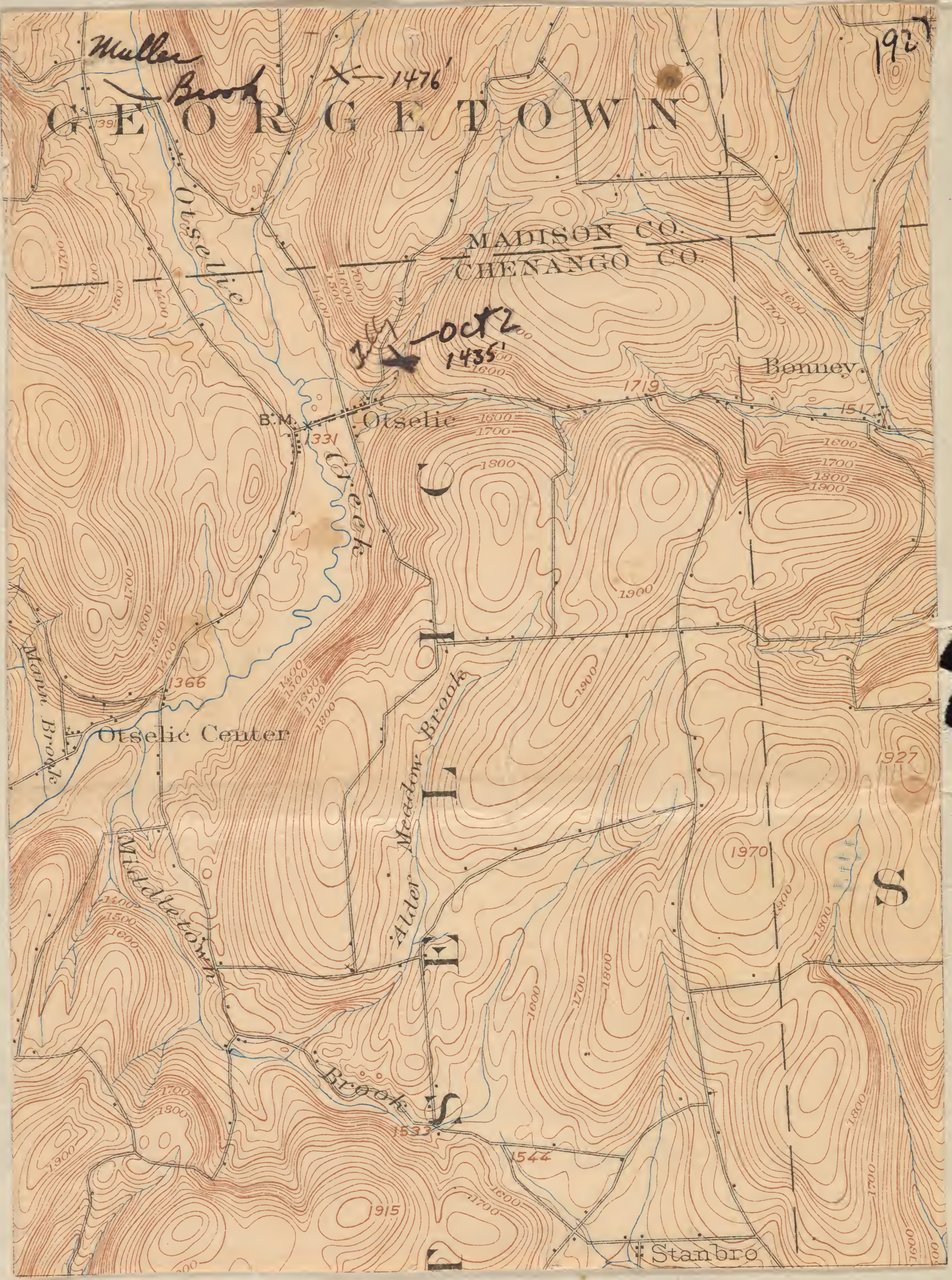




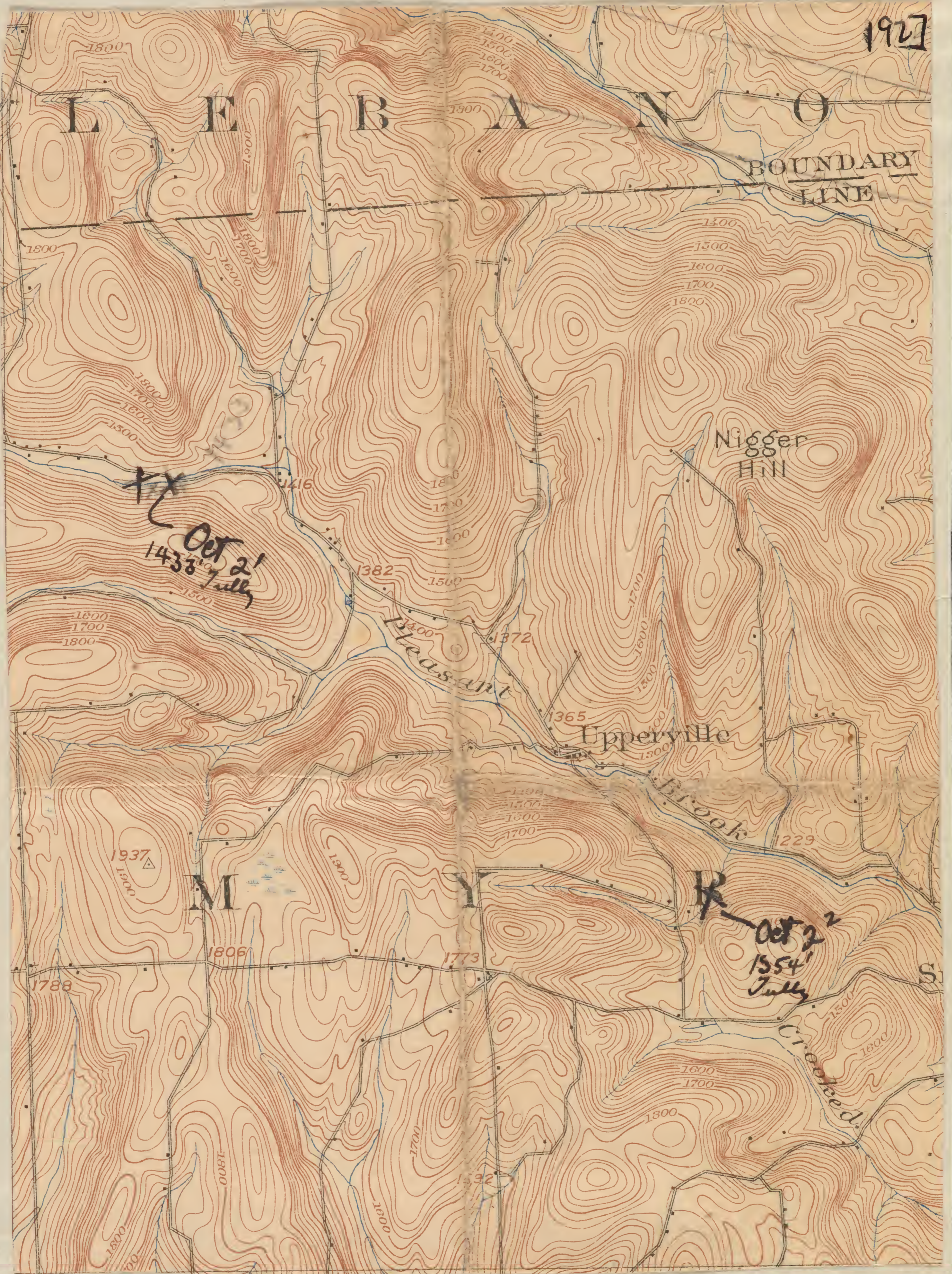




473a



4736



Oct. 2.

## Otselic

Tully ls. - exposure in a branch of Otselic Creek in the village at 1435' A.T. Bottom bed with *Hypothyrids* - this layer is transitional with the Moscow below as Moscow *Pelecypods* were seen in the shaly portion of the ls. Bottom bed quite granular. Much of the ls. next is shaly with small corals, *P. rana* & *C. boottii*.

The whole section is 28' 1" thick. Top bed shaly & has many small corals. Charley makes it 28' 6". The whole layer is predominately shaly.

Bridge over creek at 1375' A.T. Tully is at 1435' A.T. (11 hand level steps above bridge)

8 hand level steps above top of Tully comes on ss into the sh. 10 steps above ss layers are present. Dark sh are seen as far above the Tully as 20'.

Oct 2'

Tully, 3 1/2 miles east of Otselic along Otselic-Snyder's Road Elevation about 1433' A.T. Thickness = 22' + almost completely shaly - ls. layers thin some are nodular or concretions. Fossils in shaly ls. rare. Dark ls. jointed - also Moscow dark jointed. Tully shaly ls. breaks into shaly chips which are very brittle.

*P. rana**A. spinosa**R. f. brach**C. boottii*

Platyceras

Small corals

Fossils in Moscow below Tully, for  
 2' — *V. pustulosa* & *S. pennator*  
       *C. coronatus*       *T. caninatus*  
       *A. reticularis*

The Tully ~~is~~ is becoming shaly to the south & east

Oct. 2<sup>2</sup>

Benyona Township, — near Upperville (1 mi. E)  
 Elevation 1354' A.T. (25 hundred steps + 3' above  
 stream-level). 28' 1" thickness — similar in  
 character to both exposures noted above.

Genesee — 8' hundred-level steps of black sh.  
 between 8 & 9 hundred-level steps some sandstone  
 beds. Most of upper part of 9 is ss.

### Remarks.

The Tully appears to be becoming thicker & shaly to the south and east. The ls. layers are thin and in some cases exist as concretionary limestone nodules. Also the Genesee in the upper part becomes a thin ss before it gives way to the Sherburne sands. There is considerable black shale in the Sherburne as was noted in a ravine a mile and one-quarter south of Sherburne Four-Corners.

Nearly the whole of the Moscow is exposed along Pleasant Brook. The thickness indicated in Pleasant Brook is 273' from Benyona to bottom of Tully 2½ miles west of Upperville

The thickness from Smyrna to ~~476~~<sup>478</sup> 6  
bottom of the gully in the glen 2 miles  
west of Smyrna is 193'. This suggests  
a bulge along the Creek.

An outcrop of Hamilton was noted  
in a hillside, Sugarloaf Mountain  
along a terrace in the hillside. This  
is opposite a schoolhouse which  
is at an acute angle road crossing  
opposite Sugar-loaf Mtn.

Oct. 11.

## Mad Brook &amp; Rexford Falls.

At first bridge across Mad Brook on the dirt highway - (St.) is an exposure of soft blue grey shales containing occasional calcareous concretions. The shales crumble into small bits and are not unlike shales seen in the western part of the state except that the chips are coarser, and the shale is quite gritty. Fossils are quite abundant.

<i>A. umbonata</i> r	<i>C. acutulus</i> r
<i>Pterinopecten</i> sp. nov	<i>C. tenuicostatus</i> r
<i>C. lepidus</i> r	<i>P. radiata</i> c
<i>M. pygmaea</i> c	<i>S. pinnatus</i> r
<i>P. constructa</i>	<i>C. coronatus</i>
<i>A. spiniferoides</i>	<i>Pan. lepidulturnica</i>
<i>M. oblongatus</i>	<i>M. corbuliformis</i>
<i>M. bellistriata</i>	<i>H. acis</i>
<i>P. muta</i>	

The *A. spiniferoides* was found about 5' above stream level.

300 paces from bridge are exposures of similar shales. On the north bank were some not examined but they were photographed. Fossils at 300 paces are -

<i>C. coronatus</i> c	<i>P. constructa</i> r
<i>Lox. lam.</i>	<i>M. pygmaea</i> r
<i>S. caninata</i> r	<i>J. lobatus</i> r
<i>P. radiata</i>	<i>P. muta</i>
<i>M. lepta</i>	<i>A. umbonata</i>
<i>M. bellistriata</i>	<i>M. oblongatus</i>

*P. emarginata* r  
*H. cuneata*  
*G. capillaria*  
*H. triquetra*

*C. setigerus*  
*R. vanuxemi* (loose)

The shales are rusted on the surface suggesting much pyrite. *Cicoronatus* is very abundant.

750 paces from bridge are blue grey shales breaking into rather irregular lumps - These shales are harder than those below

*C. boethi* r  
*P. emarginata* r  
*H. bellistriata* r  
*B. arcuata*  
*C. setigerus*  
*G. capillaria*  
*Lof. lam.*  
*Plectroptenia* sp.  
*M. pappinacea*  
*P. minuta*  
*H. corbuliformis*

*P. cylindrica* r  
*B. laevigata* r  
*P. constricta* r  
*H. acis*  
*C. tenuicinctus*  
*P. tenuis*  
*Linguleta* sp.  
*H. oblongatus*  
*R. vanuxemi* r  
*Lingula* sp.  
*H. Dekayi* (Siberski)

1317 paces above the bridge the shales are quite sandy - indeed a progressive sandiness may be noted. The split into irregularly flat or sometimes wedge-shaped slabs.

*Cyrt. lam.*  
*G. obsoleta*  
*C. vicinus* a  
*B. pinnata* a  
*B. perplana* r  
*C. setigerus*  
*P. carinata* r

*A. unobovata* r  
*C. micronatus*  
*G. capillaria*  
*B. leda* r  
*Lof. lam.*  
*C. tenuicincta*  
*Plectroptenia* sp.

1577 paces bottom of Rappahannock Falls. Cliffs  
about 80' above stream at bottom of  
Falls. Shale at bottom of fall  
is somewhat limy with

<i>C. elongata</i> n.	<i>S. perwasa</i>
<i>S. granulatus</i>	<i>A. umbonata</i>
<i>M. concentrica</i>	<i>C. mucronatus</i>
<i>P. huan</i>	<i>S. pennatus</i>
<i>B. leda</i>	<i>C. coronatus</i>
<i>Hyalites striatus</i>	<i>B. leda</i>
<i>M. triquetra</i>	<i>M. lamellata</i>
<i>C. indenta</i> ?	<i>M. pygmaea</i>
<i>H. aelis</i>	<i>S. perflava</i>
<i>P. radiata</i>	<i>P. tenuis</i>
<i>Pholidops</i>	<i>A. decussata</i>
<i>R. wamburni</i>	<i>R. frimbriata</i>

The Falls is 38' high and bellies  
out like that at Delphi. A hard ridge  
about 2' thick is present about 25'  
above the base of the Falls.

<i>T. cuneatus</i>	<i>B. leda</i>
<i>M. mytiloides</i>	<i>M. concentrica</i>
<i>C. bellistriata</i>	<i>Don. sp. (large)</i>

The bottom of the falls & below  
represent about the horizon of  
1895' at Moore's Mine in  
Georgetown.

5'5" above base of falls: - sandy sh,  
blue grey - few fossils.

<i>S. bisulcata</i>	<i>M. elongatus</i>
<i>Leiopteria</i> sp.	<i>C. tenuistriata</i>
<i>T. cuneata</i>	
<i>P. radiata</i>	
<i>P. rana</i>	
<i>S. capillaria</i>	



5' 5" - 15' 15" above falls - sandy sh - almost a ss: -

<i>T. carinatus</i>	<i>A. spiriferoides</i>
<i>S. granulovus</i>	<i>R. vanuxemi</i>
<i>Cyrt. lina</i>	<i>M. mytiloides</i>
<i>S. pinnatus</i>	<i>A. umbonata</i>
<i>C. vicinus</i>	<i>A. decussata</i>
<i>N. bellistriata</i>	

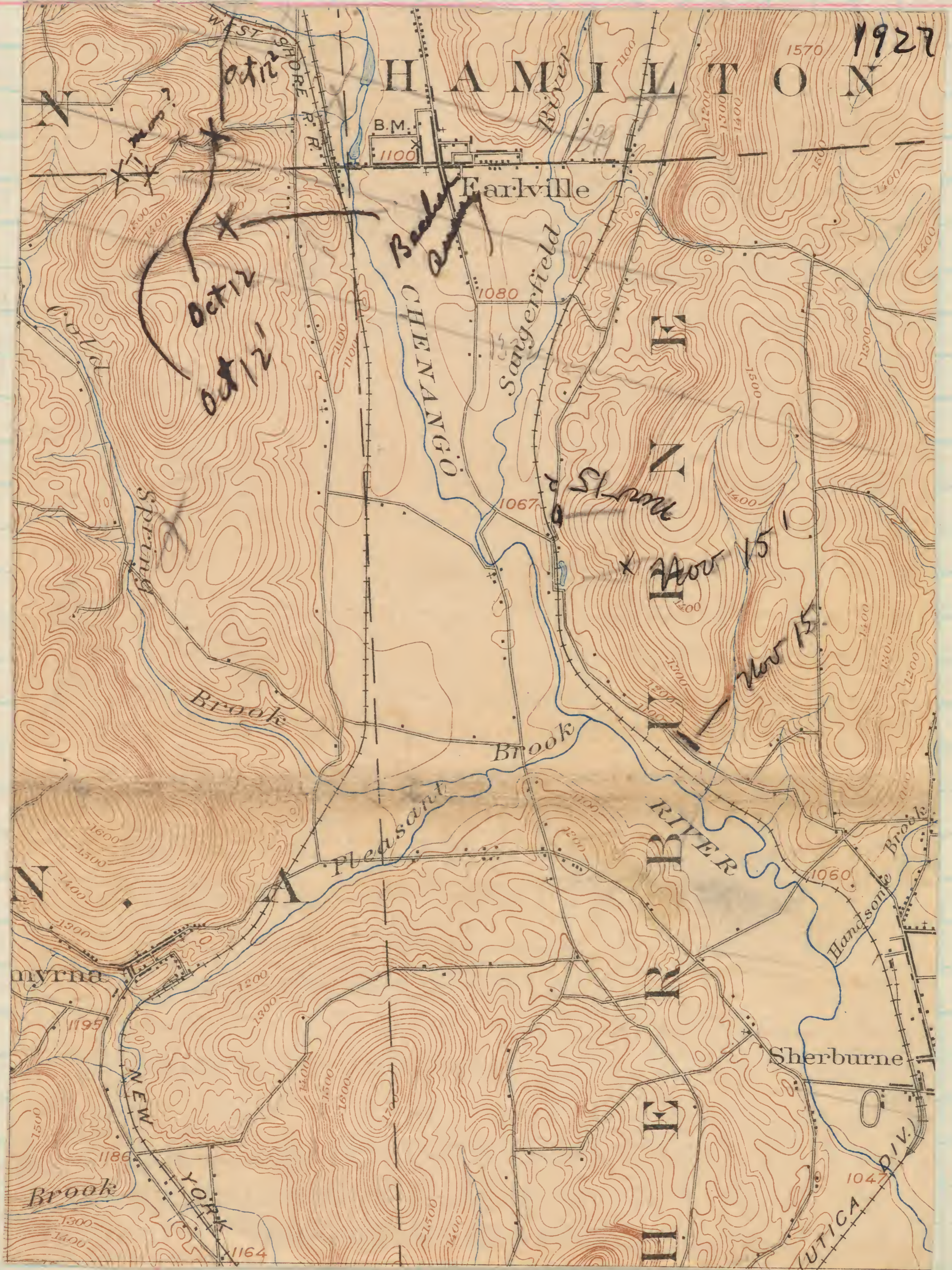
Fossils very abundant in the layers.

On top of the hard layers above the falls come softer shales with:

<i>A. umbonata</i>	<i>R. fimbriata</i>
<i>C. scintillus</i>	<i>R. vanuxemi</i>
<i>P. patulus</i>	<i>T. carinatus</i>
<i>C. mucronatus</i>	<i>A. decussata</i>
<i>N. varicosus</i>	<i>S. pinnatus</i>
<i>S. perplanus</i>	<i>R. vanuxemi</i>
<i>Cambrotrechia</i> sp.	<i>R. fimbriata</i>
	<i>C. complanata</i>

Examination stopped at blue ss 15' above brink of falls.

480a



3700

4  
35  
8  

---

2.80

4500  
1000  

---

3500

900

150  
200  
150  
150  
150  
150  

---

600

Road between Carville  
481  
Sherburne

481

Nov. 15'

Section at S-curve  
Hand-leveling begun at 1080' A.T.

1080' - ~~1160'~~ 1160' 80" - hiatus

1160' - 1165' 85" - blue grey arenaceous sh  
with

*S. pinnatus*  
*S. cuneatus*  
*A. spiriferoides*  
*S. perplanus*

*N. triquetra*  
*S. andaculus*

1165' 85" - ~~1180' 90"~~ 1180' 100" - same - about 3'  
lack at top. Thus there are here about  
17' of sh. Additional fossils are:

*Orn. harr.*  
*Cyst.* "  
*M. concentrica*  
*S. tellus?*  
*C. induta*  
*F. laura*  
*Taonurus*

*P. flabellum*  
*J. carinatus*  
*P. constructa*  
*C. coronatus*  
*A. umbonata*  
*C. bellistata*

1180' 100" - 1200' 125" - hiatus

1200' 125" - 1205' 130" - coarse blue  
grey sandy sh. with

*J. carinatus* *G. cuneata*  
*Spirifer* sp.  
*S. sphenoides*

1205' 130" - 1240' 165" - bluish shales  
crumbling to small fragments, light  
rust spots. Blue shaly shale  
below

## Fossils

<i>C. mucronatus</i>	<i>Pholidops</i> <i>hann.</i>
<i>P. cyclas</i>	<i>S. pinnatus</i>
<i>C. vicinus?</i>	<i>C. coronatus</i>
<i>Aviculoplecter</i> sp.	<i>A. umbonata</i>
<i>H. arcuata</i>	<i>M. bellistriata</i>

Fully 70 or 80' of rocks are more or less continuously exposed above 1240' 165" to the top of the hill. The rock is predominantly a soft sh especially for the first 45' above 1240' 165". Then there is an interval of about 540' of no exposures, then patches are seen in the gully up to the top of the hill. Fossils are -

<i>I. carinata</i>	Crinoid stems
<i>Cyrt. hann.</i>	<i>S. crotalum</i>
<i>D. capillaria</i>	<i>C. tenuistriata</i>
<i>S. granuloseus</i>	<i>Leiopteria</i> sp.
<i>Toburnus</i>	<i>S. pinnatus</i>
<i>P. muta</i>	<i>A. reticularis</i> -
<i>H. dekonji</i>	(about 60' from top
<i>I. submarginata</i>	(hill)
<i>P. rana</i>	<i>M. concentrica</i>
	<i>C. indenta</i>
	<i>C. boottii</i>

The Moscow must come in near 1205' 130"

Nov. 15<sup>th</sup>

Quarry near the Earlville station  
of the Jameson Dairy Co.

Exposures of about 10' vertical  
and about 100 yds horizontal, mostly  
of shabby blue-grey ss. with some  
intercalated shell ls. and shaly ss.

Fossils:-

*P. flabellum*

*Camacotrichia* (large) c

*T. constricta*

*H. alveata*

*T. constricta*

*C. coronatus*

*H. andaculus*

*T. exigua*

*R. cyclops*?

*H. Dehaji*

This section is the same as  
Becher's Quarry at Earlville. The bottom  
is at about 1090'.

The ss is cross-bedded, the shell ls.  
is in the form of lenses, often of  
large size and are composed  
mostly of large *Spirifer*,  
*Camacotrichia* + *P. flabellum*

191 paces from 1<sup>st</sup> cascade to top  
of "Jully"  
Jully occupies 11 1/2 paces.

Nov. 15.

5-8' vertical of blue grey sandy  
shales at roadside between E-turn  
and Sherburne.

Fossils: -

*S. andaulus* cc  
*S. pennatus* cc  
*J. exigua*  
*C. bellistriata*  
*L. rogersi*  
*P. patulus*  
*R. stolonifera*  
*Orithoceras* sp.  
*M. oblongatus*  
*Cyst. harringtonensis*  
*B. cuneatus* ?  
*A. erectum*  
*S. angulatus*

*J. carinatus* c  
*P. flabellum* cc  
*S. shenungensis*  
*M. oviformis* ? or  
*Pal. constructa*  
*N. triquetra*  
*C. stitulus*  
*S. perversa*  
*P. vertumnus*  
*S. solenoides*  
Wood  
*M. mytiloides*  
*R. cyclus*

20'

40' } covered

~~1245~~

1240' 160"

1235' 155"

1230' 150"

45'

1225' 145"

1220' 140"

1215' 135"

1210' 130"

1205' 125"

5'

1200' 120"

1200
1
1216
1100
116

19'

Covered

1195' 115"

1190' 110"

1185' 105"

1180' 100"

1175' 95"

21' 8"

1170' 90"

1165' 85"

1160' 80"

1080'



485

485

Norwich Sheet

Oct. 12.

150' 150" above road - a small exposure  
 of arenaceous shales weathered to a  
 light yellow gray.

*S. pennatus* d

*A. ventricata*

*T. carinatus* a

*R. vanuxemi*

*C. induta*

*Productella* sp.

*C. boothii*

*A. decussata*

170' 175" - <sup>sand</sup> gray shales with *S. granulosa*  
 *S. pennatus*, *L. orbiculatus*

180' 180" - a small patch of the same  
 sandy sh. weathering light gray  
 with *S. carinatus*, *S. granulosa*,  
 *M. concinna*, *Productella* sp., *S. exigua*,  
 *A. serpens*, *M. concentrica*.

I believe that these exposures are  
 Missourian, but otherwise quite  
 valueless.

1240' A.T. + 150' + 13' = 1403' first outcrop

Oct. 12<sup>1</sup>

Beecher's Quarry 1188' A.T.

Small quarry ~~14'~~<sup>14'</sup> high in coarse shales and sandstones. The lower part of the quarry is in sandstones and abounds in *Camarotoechias* of large size, the same as along the Georgetown - West Eaton road.

Other fossils are -

*S. granulosa**S. andaculus**D. eucharis?**P. flabellum*

Wood.

In the upper part of the quarry the rock is a *crumpled* siliceous shale abounding in *Sipernatus*, *T. carinatus*. Other fossils are *M. triquetra*.

This is the same sequence as the upper 10' of Oct. 5. The upper 2' has the *S. pernatatus* + *T. carinatus*.

22' above the top of the quarry <sup>cross-bedded</sup> are ss. which break into thin <sup>crumpled</sup> flabs. They are exposed for about 3' vertically. These, with sand, shales are exposed to 38' above the top of the quarry when about 10' of blue grey, coarse shales are encountered. These have -

*T. carinatus**G. erectum**Leiopteria* sp.A loose slab had *M. concentrica*,*S. perversa*, *P. flabellum*.*M. triquetra* (large)*C. bellistriata**P. radiata*

Between 45' 45" + 50' 50" above the  
quarry there is a lister of 3'.

50' 50" - 55' 55" above quarry - lister.

55' 55" - 60' 60" - sandy shales now a  
light grey but when fresh a blue grey.  
The blue color may be from Call.

✓ <i>P. flabellum</i> or	✓ <i>C. bellistriata</i> or
✓ <i>S. pennatus</i> a (longer)	✓ <i>M. concentrica</i> or
✓ <i>S. carinatus</i> a	✓ <i>A. liata</i> or
✓ <i>P. l. constructa</i> or	✓ <i>A. spiriferoides</i> or
✓ <i>T. acuminatus</i> c	✓ <i>A. reticularis</i> or
✓ <i>R. princeps</i> or	✓ <i>S. angulatus</i> or
✓ <i>P. productella</i> sp. or	✓ <i>S. p. plana</i> or
✓ <i>M. oblongatus</i> or	✓ <i>S. p. venosa</i> or
✓ <i>S. carinata</i> or	✓ <i>M. triqueter</i>
	✓ <i>A. superus</i> (or <i>P. flabellum</i> )

60' 60" - 65' 65" - 70' 70"

✓ <i>C. scitulus</i> c	✓ <i>S. granulatus</i>
✓ <i>S. pennatus</i> a	✓ <i>H. deKayi</i>
✓ <i>S. carinatus</i>	✓ <i>S. rugosa</i> ?
✓ <i>P. l. h. h.</i>	✓ <i>L. h. h.</i>
✓ <i>P. flabellum</i>	✓ <i>C. bellistriata</i>
✓ <i>M. concentrica</i>	✓ <i>A. reticularis</i>
✓ <i>A. superus</i>	✓ <i>J. bellulus</i>
✓ <i>M. liata</i>	✓ <i>C. coronatus</i>
✓ <i>S. carinata</i>	✓ <i>P. tenuis</i>
✓ <i>M. oblongatus</i>	✓ <i>O. parvula</i>
✓ <i>S. p. plana</i>	✓ <i>P. lucasiana</i>
✓ <i>P. patulus</i>	✓ <i>C. setigerus</i>
✓ <i>P. emarginata</i>	✓ <i>P. laevigata</i>
✓ <i>P. radiata</i>	✓ <i>T. acuminatus</i> sp.

70' 70" - 75' 75" - same

The gully ends in a flat at about 80' 80" - the high hill to the west has most outcrops.

These rocks are very much like the Fairville shales.

Quarry on Fred Beecher's property - 48' above the road.

Oct 122

About 1240' A.T. just where stream crosses under the highway is a 5' exposure of arenaceous shales with abundant *D. carinatus*, *S. pennatus*. Other fossils are *A. princeps*, *C. scitulus*, *S. subcaulus*.

*D. carinatus* is by far the most abundant fossils.

A few small exposures of blue gray arenaceous shales in the stream on the south side of the road just below its sharp bend to the N.W. have the following:

*D. carinatus*

*D. carinatus*

Just at the bend of the road at about 1270' A.T. a tree has fallen and exposed the shales which are also exposed in the stream bed. All of the exposures have been unfavorable for collecting. When the tree fell it loosened many blocks and revealed the following:-

*Strophomena?*

*D. carinatus*

*S. pennatus*

*A. reticulatus*

<i>P. flabellum</i> c	<i>A. princeps</i> re
<i>C. complanata</i> r	<i>S. granulosa</i> r
<i>R. valdeyemii</i> r	<i>C. bellistriata</i>
<i>M. concentrica</i> re	<i>S. perversa</i> r
<i>A. serpens</i>	<i>Pa. lam.</i>
<i>Proditella</i> sp.	<i>P. tenuistriata</i>
<i>S. papilosa</i>	<i>S. tullius</i>
<i>M. bellistriata</i>	<i>S. denissae</i> ?
<i>P. radiata</i>	<i>C. scutulus</i>
<i>C. coronatus</i>	

These are exposed for about 100  
 13' vertical or up to about 1290' A.T.

At the base of the hill along this  
 road and for about 25' below it  
 are abundant exposures. The top of the  
 hill on the road is at about <sup>11460</sup> 1470' A.T.  
 On the shales here were found:-

<i>P. dissiduum</i>	<i>T. carinata</i>
<i>O. undulata</i>	<i>L. solenoides</i>

Rock is also exhibited at the bend of  
 the road on top of the hill.

<i>T. submarginata</i>	<i>C. boottii</i>
<i>B. lida</i> I	<i>C. bellistriata</i>
<i>C. elongata</i>	<i>T. annua</i>

I believe these shales to be Missourian  
 as they have that lithologic appearance  
 with the purple weathering surface

Sept. 29, 1928

491

0' 15' 5" - covered

15' 15" - 20' 30" - log 2' in  
cross bedded ss.

20' 20" - 30' 30" - heavy cross bedded ss.

30' 30" - 35' 35" - arenaceous sh.

ss. Some very fossiliferous  
limonite. See last page notes.

35' 35" - 40' 40" - mostly clayey  
massive sh.

40' 40" - 45' 45" - same

- |                     |                     |
|---------------------|---------------------|
| <i>O. coronatus</i> | <i>S. truncatus</i> |
| <i>P. flabellum</i> | <i>S. trullis</i>   |
| <i>O. laeta</i>     | <i>B. crinitus</i>  |
|                     | <i>P. petulus</i>   |

45' 45" - 50' 50" - same

50' 50" - 55' 55" - cross bedded ss.

55' 55" - 60' 60" - cross bedded ss  
with *Camantocaria*

60' 60" - 65' 65" - heavy, massive

blue grey sh, breaking in thick  
lumps.

- |                      |                         |
|----------------------|-------------------------|
| <i>O. undulata</i>   | <i>S. stigma</i>        |
| <i>G. costellata</i> | Wood                    |
| <i>C. coronatus</i>  | <i>P. verticillatus</i> |

Small black concretions  
common.

65' 65" - 70' 70" - same shale

with thin and discontinuous

beds of cross bedded ss

75' 75" - 80' 80" - ~~fine~~ - bedded ss  
at top top ~~fine~~ ~~bedded~~  
80' 80" - 85' 85" - ~~fine~~ - bedded ss

492 492

85' 85" - 90' 90" - heavy-bedded  
ss. containing

*S. pinnatus* *S. pinnatus*  
*C. conjugata* *M. styliloides*

90' 90" - 120' 120" - covered

120' 120" - 125' 125" - covered

*P. ornitholites* *T. exilis*  
*P. flabellum* *M. pugnax*  
*P. constricta* *L. optima*

at bottom blue-grey shale 3'  
but upper 4' cross-bedded  
rippled ss.

125' 125" - 130' 130" - heavy bedded  
ss + blue sh.

*A. erectum*

130' 130" - ~~ss~~ 135' 135"

Coarse sandstone sh.  
*A. erectum* *O. parvula*  
*S. pinnatus* *T. constricta*  
*C. coronatus*

135' 135" - 140' 140" - shale bearing  
a ss. *B. alveata*?

Just exposures?



The shell was a green

493

493

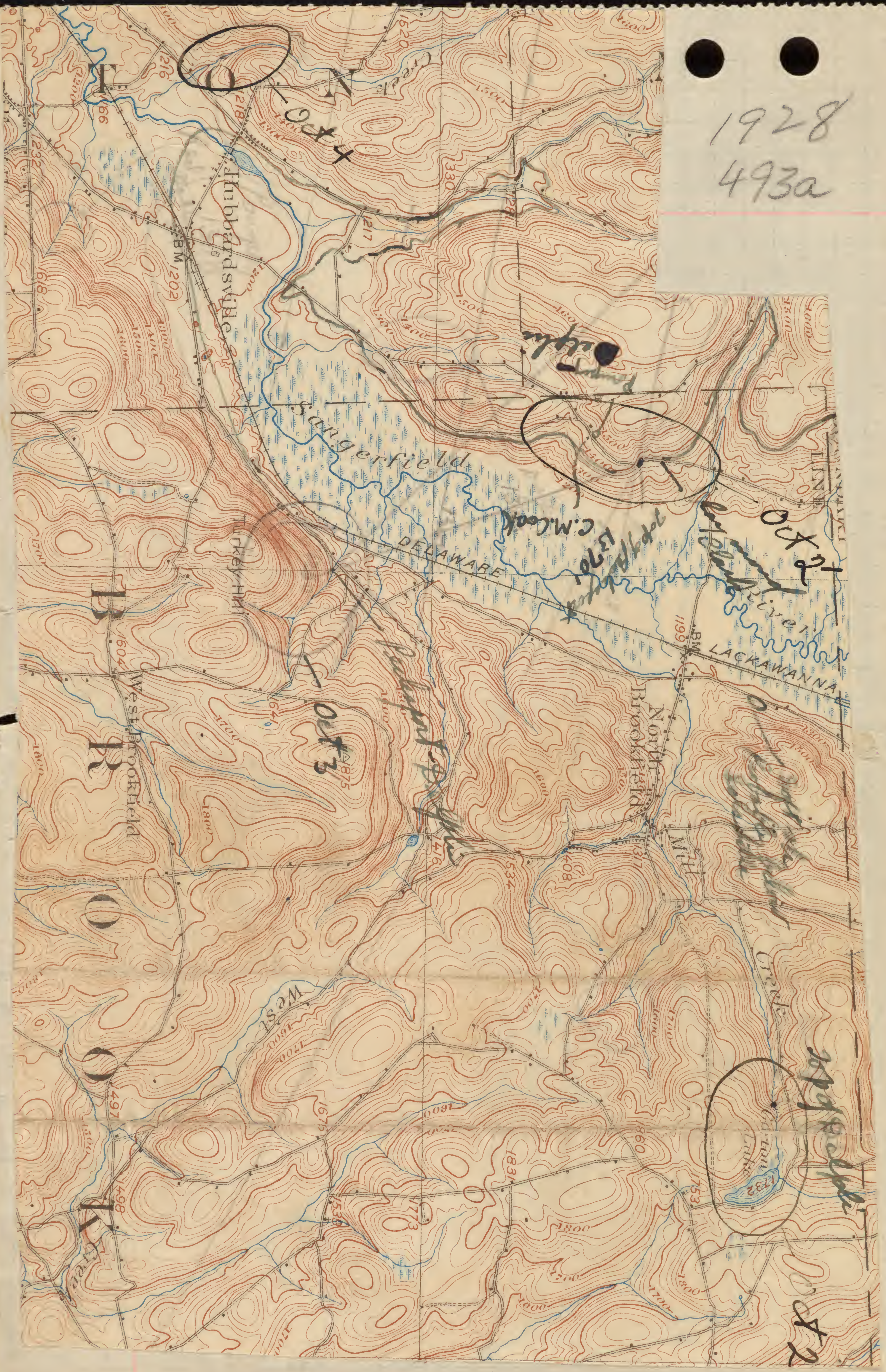
water gullies north of

the main bar about 45' 45"

Above the wash-stream

intersection.

1928  
493a



Ox 1

Ox 2

Ox 3

Ox 4

Lackawanna River

C.M. Cook

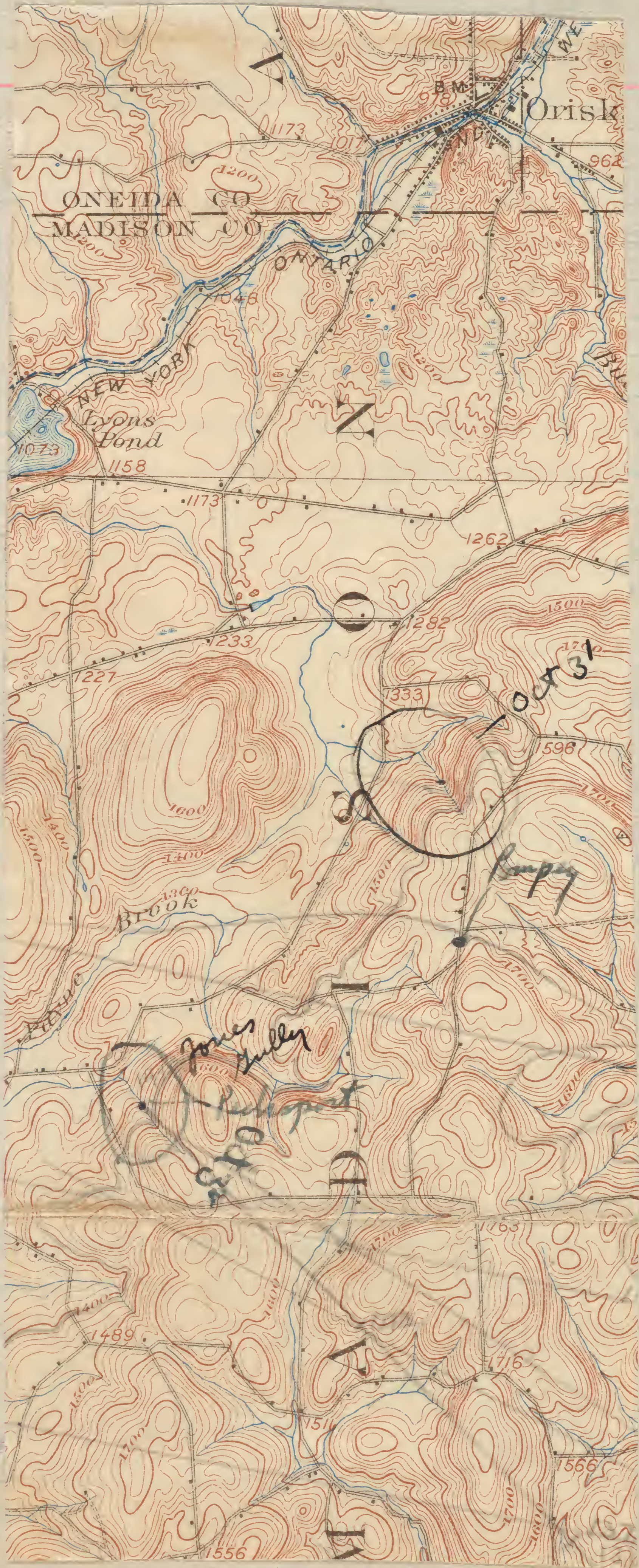
Ox 3

Hubbardsville

Ox 2

1928

4936



493c

1928

This ledge of  $l$  is above  
X bedded as probably  $c$  Colgate ss followed by  $l$ .



71

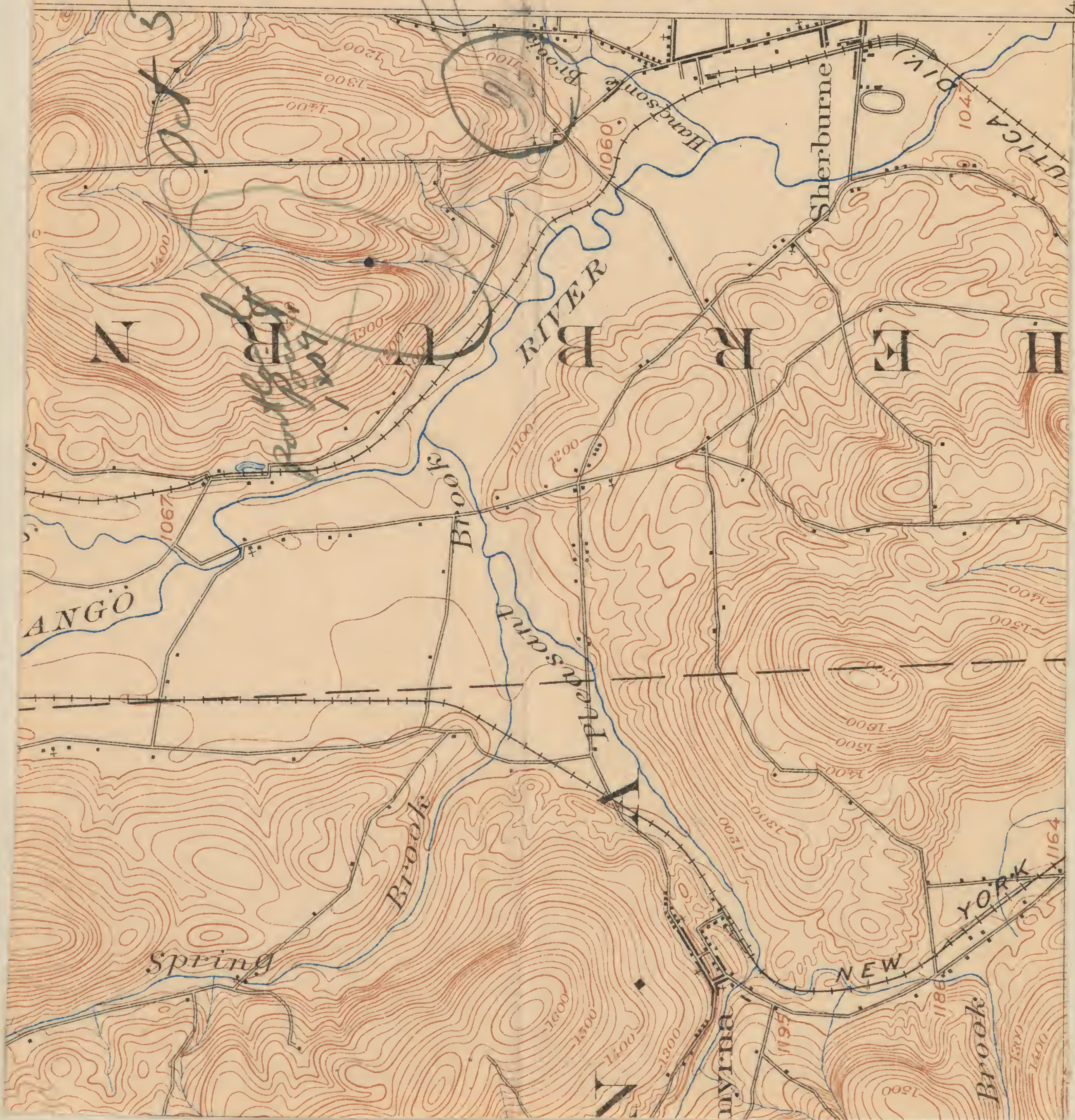


493d

2-1928  
oct 5-21

Moscow  
Elev 1180'  
Lynchville  
1125'

Moscow - had contact about  
1895 1150' A.T.  
30-  
1125



494  
Sangerfield Valley 494

Oct. 2, 1928

Boston Lake outlet

Handlogging begun at 1580' AT

0' - 30' 30" - covered. The upper 1' of this interval is in calcareous arenaceous rock - heavily bedded ss. with the following fossils:

- |                             |                      |
|-----------------------------|----------------------|
| <i>M. multisepta</i>        | <i>A. andreae</i>    |
| <i>M. contracta</i>         | <i>L. perplana</i>   |
| <i>P. flabellum a.</i>      | <i>T. virgata c.</i> |
| <i>M. signata</i>           | <i>C. umbonata</i>   |
| <i>S. bipunctata (var?)</i> | <i>C. congregata</i> |
| <i>S. bialata</i>           | <i>M. subobovata</i> |
| <i>A. umbonata</i>          | <i>C. uncinata</i>   |
| <i>T. virgata</i>           | <i>M. delanyii</i>   |
| <i>A. fasciatus</i>         |                      |

This is clearly the top of the Delphi and at about 1580' AT. On top of this is a few inches of softer shale.

30' 30" - 35' 35" - covered

35' 35" - 40' 40" - mostly dark arenaceous shale containing *A. umbonata*, *T. submarginata*

40' 40" - 45' 45" - dark ~~arenaceous~~ arenaceous sh.

- |                      |                       |
|----------------------|-----------------------|
| <i>Panurella</i> sp. | <i>M. triplicata</i>  |
| <i>C. setigera</i>   | <i>M. subobovata</i>  |
| <i>M. oblongata</i>  | <i>Orthoceras</i> sp. |
| <i>P. discoides</i>  | <i>T. virgata</i> sp. |

This is an exposure of 3' at the top of this interval.

45' 45" - 70' 70" - covered. The top of this interval is the very base of the Delphi at the outlet.

70' 70" - 75' 75" - arenaceous sh. dark, soft

- |                       |                           |
|-----------------------|---------------------------|
| <i>L. lancea c.</i>   | <i>Orthoceras</i> sp. 1/2 |
| <i>A. umbonata c.</i> | <i>M. signata</i>         |
| <i>M. oblongata</i>   | <i>S. planata</i>         |

*M. arguta* from here  
 in the collection  
 probably found  
 by 495

495

75' 75" - 80' 80" - same sh, a little coarser

- |                        |                       |
|------------------------|-----------------------|
| <i>S. pennatus</i>     | <i>Ostraceras</i> sp. |
| <i>A. umbonata</i>     | <i>P. discoideum</i>  |
| <i>T. submarginata</i> | <i>H. triquetra</i>   |

80' 80" - 85' 85" - dark arenaceous sh

- |                         |                    |
|-------------------------|--------------------|
| <i>P. lineata</i>       | <i>H. pygmaea</i>  |
| <i>T. submarginata</i>  | <i>P. costata</i>  |
| <i>H. costuliformis</i> | <i>S. pennatus</i> |

~~85' 85" - 90' 90"~~

- |                    |                     |
|--------------------|---------------------|
| <i>P. rugulata</i> | <i>A. umbonata</i>  |
| <i>P. costata</i>  | <i>H. rindelli</i>  |
| <i>P. rana</i>     | <i>C. setigerus</i> |
|                    | <i>H. deherzi</i>   |

85' 85" - 90' 90" - shale somewhat coarser

90' 90" - 95' 95" - same shale

- |                    |                    |
|--------------------|--------------------|
| <i>H. concinna</i> | <i>S. pennatus</i> |
|--------------------|--------------------|

95' 95" - 100' 100" - coarse sh.

100' 100" - 105' 105" - arenaceous sh.

- |                        |                      |
|------------------------|----------------------|
| <i>H. oblongatus</i>   | <i>V. pustulosa</i>  |
| <i>P. costata</i>      | <i>A. umbonata</i>   |
| <i>S. pennatus</i>     | <i>C. mucronatus</i> |
| <i>Ostraceras</i>      | <i>P. lineata</i>    |
| <i>T. submarginata</i> | <i>P. flatulum</i>   |
| <i>L. laeva</i>        | <i>P. rana</i>       |

The Vitulinas occurred at the very bottom of the step.

105' 105" - 110' 110" mostly covered.

110' 110" - 125' 125" - mostly covered and in the latter face in heavy bedded arenaceous sh hardly any fossils.

- |                           |                     |
|---------------------------|---------------------|
| <i>Camerozochis</i> small | <i>P. lineata</i>   |
| <i>T. magna</i>           | <i>P. flatulum</i>  |
| <i>Unilopecten</i>        | <i>H. arguta</i>    |
| <i>S. truncatus</i>       | <i>S. subtrunc.</i> |
| <i>C. mucronatus</i>      | <i>P. costatus</i>  |
| <i>C. recurva</i>         | <i>L. breiplana</i> |
| <i>S. costata</i>         | <i>S. pennatus</i>  |
| <i>C. elongata</i>        |                     |



125' 125' — 135' 135" — The top of this interval is at the brink of the falls. At the brink of the falls the following were seen:

<i>A. umbonata</i>	<i>M. arguta</i>
<i>S. pinnatus</i> c	<i>C. mucronatus</i>
<i>P. flabell.</i> c	<i>R. vanuxemi</i>
<i>C. notochia</i> small c	

135' 135" + 4' — top of exposure, in ~~is~~ being bedded shaly ss. or arenaceous sh. At the bottom of this interval is 1/2 - 1' of ss. abounding in moulds of corals, apparently *Cyrtophylus* from the cyst imprint. These have all been disintegrated out. The brink of the falls is 120 paces from the edge of the lake, but bedrock forms a projection near the west end of the lake between the falls & the lake. This rock is similar to that at the top of the falls. Hence this top may be taken as lake level 1732'. This would put the top of the Dalphin at about 1609'. I guess there is about 5' between the top of the falls & the level of the lake.

1732  
1609  
—  
123

$$\begin{array}{r} 1485 \\ 1375 \\ \hline 60 \end{array}$$

Oct 21

Along roadside at Raymond Clark's  
top of Peck's part at 1375' about 15' of  
Delfi is exposed above it at  
end of road about 150 yards from  
H. Clark's.

Fossils in Delfi are:

<i>H. delavayi</i>	<i>P. biata</i>
<i>P. spiniflora</i>	<i>A. andalucia</i>
<i>C. congregata</i>	<i>P. flabellum a</i>
<i>C. brachy</i>	<i>T. lamina</i>
<i>A. insculum</i>	<i>B. acuta</i>
<i>T. rotaria</i>	<i>C. tenustrata</i>
<i>C. communis</i>	<i>B. submarginata</i>
<i>P. patulus</i>	<i>Schiz. perversa</i>
<i>T. conus</i>	<i>M. concentrica</i>
<i>N. arguta</i>	<i>P. contracta</i>
<i>M. trigonata</i>	<i>T. rotaria</i>
<i>P. dischordum</i>	<i>T. signata</i>
<i>A. fasciculatus</i>	<i>O. exilis</i>
<i>T. subulata</i>	
<i>L. neplana</i>	

Above the top of the Peck's part about 54' of  
Delfi is exposed above and farther  
back at the top of the hill by the  
schoolhouse which is 350 paces north  
of C. M. Cook's Mountain View house.  
Opposite Cook's house on the west  
side of the road the bottom 10' of the  
Pompey is exposed. It is a dark grey  
arenaceous shale crumbling to small  
pieces in contrast to the lumpy  
weathering of the Delfi. The outcrop  
of Pompey is at about 1440' at a ridge  
along the top of the hill opposite Cook's  
is probably the top of the Pompey.

Both Delfhi + Komper, have a  
purplish feathering line, most  
characteristic in the case of the upper  
Delfhi

Fossils in the bottom of the Pompey are:  
*Lingulella* *C. setigera* *H. corbuliformis*  
*M. angulata* *A. umbonata* *A. th. n. n.*  
*P. subquadrata* *P. bicolor* *P. dentata*  
*N. oblongata*

### Reflections

The Gorton Lake exposures are mostly all in the Pompey. The *V. pustulosa* is apparently in the Pompey, A.K. and represents a new development. I believe that all of the rock in the Palmer's gully probably belongs to the Pompey. However, the Pompey is considerably changed. I have lost the *Emella* beds and the *Myassa* beds. The Pompey as indicated at Gorton Lake is at least 120' thick. It is quite possible that all of the Pompey is not exposed at Gorton Lake.

Oct 3.

## Turkey Hill

Handlevelling begun at about 1250' AT.

1250' - 1255' 5" covered.

1255' 5" - 1260' 10" - About half way up in this step is top of Pecksport at about 1259'. Above the Pecksport there is about 20' of the lumpy arenaceous shale of the lower Delphi. Fossils here are:

*P. rectifera*      *Spizur* sp.      *P. spinulosa*  
*A. subquadrata*

1260' 10" - 1270' 20" - covered in stream but exposures on banks. At 1270' 20" is base of an 11' fall.

1270' 20" - 1280' 30" - Top of small falls, rock sandy and hard.

1280' 30" - 1315' 65" - Delphi, top of Delphi at 1320' AT. This includes the Delphi 6' thick.

1315' 65" - 1335' 85" - covered. The top 3' of this interval is the basal 3' in a falls 6' feet high.

1335' 85" - 1355' 105" - coarse arenaceous shale gray, ~~with~~ irregular fracture

<i>N. bellistriata</i>	<i>O. thurman</i> sp.
<i>L. longicauda</i>	<i>E. longicauda</i>
<i>C. congregata</i>	<i>M. subulata</i>
<i>A. andulata</i>	<i>S. subulata</i>
<i>A. fasciculata</i>	<i>S. caninata</i>
<i>A. truncata</i>	<i>A. bulbosa</i>

1355' 105" - 1375' 125" - covered

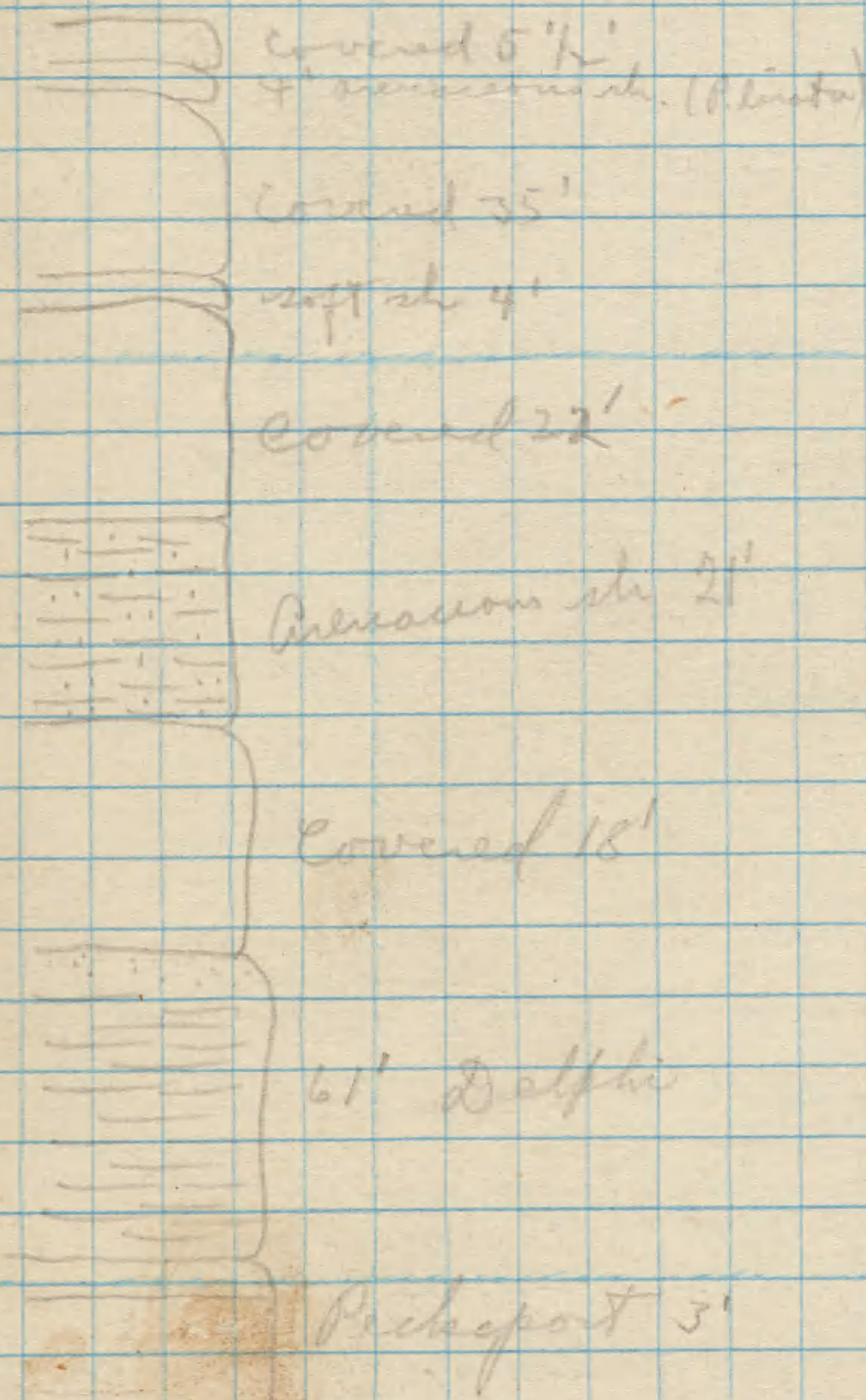
1375' 125" - 1380' 130" - upper 4' in soft arenaceous shale with

*M. subulata*      *P. fusca*

1380' 130" - 1400' 150" - covered. Between 1400'

150" and 1405' 150" comes a side gully

Section at Turkey Hill



1400'150" - 1415'165" - covered

1415'165" - 1420'170" - arenaceous shale  
breaking into irregular pieces.

<i>S. pinnatus</i>	<i>P. lineata</i>
<i>P. costata</i>	<i>M. concinna</i>
<i>L. laeva</i>	<i>J. submarginata</i>
<i>R. vanuxemi</i>	

1420'170" - 1425'175" - covered

1425'175" - soft 1430'180" soft arenaceous,  
dark shale,

<i>S. pinnatus</i>	<i>M. oblongata</i>
<i>V. punctulosa</i>	<i>C. multonata</i>
<i>J. submarginata</i>	<i>P. lineata</i>

1430'180" - 1440'190" - arenaceous shale

<i>L. concinna</i>	<i>P. lineata</i>
<i>C. multonata</i>	<i>P. discoides</i>

1440'190" - 1445'195" - same, mostly covered

*S. pinnatus* abundant.

The dully was followed to the road at its  
head. Rock was exposed at intervals for 100'  
At the lowest 55' the rock was glaucous  
arenaceous shale, then there were

<i>C. congenerata</i>	<i>Leptina</i>
<i>A. North</i>	

a covered interval for 32' and from the  
top of this covered interval to the road  
the rock was mostly a shaly  
Between the first Roubidoux bed and last  
Pompey seen in at least 50' covered



## Side gully Turkey Hill

1405' 155" - 1425' 175" - mostly covered but  
a few patches of soft arenaceous shale  
actual

1425' 175" - 1430' 180" - soft dark grey arenaceous  
shale:-

<i>P. lirata</i> c	<i>C. mucronatus</i> c
<i>L. laevis</i> c	<i>A. umbonata</i>
<i>S. pennatus</i> c	<i>T. crenatus</i>
<i>C. boethi</i>	<i>A. umbonata</i>

1430' 180" - 1435' 185" - same soft shale -

<i>S. pennatus</i>	<i>P. lirata</i>
<i>P. lirata</i>	<i>R. vanuxemi</i>

Upper 3 1/2' covered.

1435' 185" - 1445' 195" - covered

1445' 195" - 1450' 200" - rock coarser

<i>P. flabellum</i>	<i>S. pennatus</i>
<i>P. marginata</i>	<i>A. umbonata</i>
	<i>C. prolifica</i>

1450' 200" - 1455' 205" - coarse arenaceous shale

<i>M. concinna</i>	<i>C. concinata</i>
<i>S. arctostriata</i>	<i>P. flabellum</i>
<i>C. mucronatus</i>	<i>V. pustulosus</i>
<i>C. prolifica</i>	<i>A. umbonata</i>
<i>R. vanuxemi</i>	<i>C. indenta</i>
<i>C. resinosa</i>	<i>A. spiniferoides</i>
<i>T. exiguus</i>	<i>T. attenuatus</i>
<i>M. concentrica</i>	<i>L. papilosa</i>
<i>Cyrt. laevis</i>	<i>A. b. laevula</i>
<i>T. bellulus</i>	

1455' 205" - 1460' 210" - thin-bedded calcareous  
arenaceous rock in lower 3'

<i>S. pennatus</i> c	<i>C. mucronatus</i> c
<i>A. umbonata</i>	<i>Cyrt. laevis</i>

Upper 2 1/2' covered

1460'210" — 1470'220" — covered

1470'220" — 1475'225" — lower 3' covered.

Upper 2' platy massive ss. probably somewhat calcareous.

1475'225" — 1495'245" — covered but in gully but no boulders in a platy arenaceous sh or thin ss.

1475'225" — 1480'230" — platy arenaceous ss.  
*L. longicauda* *A. conjugata*

1480'230" — 1485'235" — platy arenaceous sh & thin ss.

*L. longicauda* *A. conjugata*  
*A. boydi*

1485'235" — 1555'305" — covered.

1555'305" — 1615'365" — mostly arenaceous sh and shaly ss.

Oct 3'

Hand drilling begun at 1255' AT

1255' - 1325' 70" - covered

1325' 70" - 1330' 75" - soft crumbly shale, argillaceous  
Murchisonia (sharp pointed) / C. scintillus  
N. corbuliformis

1330' 75" - 1345' 90" - mostly covered some soft

1345' 90" - 1350' 95" - soft brownish, lumpy shale  
C. scintillus L. laevis1350' 95" - 1365' 110" - mostly covered but some soft  
arenaceous sh.1365' 110" - 1370' 115" - rock now hard, sandy  
breaks into thick slabs1370' 115" - 1375' 120" - coarse heavy bedded sandy  
sh

Kaige Ottoceras

1375' 120" - 1385' 120" - same.

1385' 120" - 1390' 125" - hard calcareous arenaceous  
rock. P. lutea This is probably the top of  
the Solonville

Top Solonville at 1401' AT

1390' 125" - 1410' 155" - soft crumbly shale with  
C. scintillus L. laevis1410' 155" - 1435' 180" - same shale  
N. sandalli P. lutea P. lutea  
P. lutea L. laevis P. lutea  
L. laevis P. lutea

1435' 180" - 1440' 185" - same

Rest of gully covered

$$\begin{array}{r} 14 \\ 5 \\ \hline 70 \\ 6 \\ \hline 76 \\ 8 \end{array}$$

Oct 3<sup>rd</sup>

Hand levelling begin at 1295' A.T.  
1295' - 1409' A.T. Pelesport and at top corner.

The *Canavotachia* - *Spizella* horizon  
has a small quarry in upper Delphi near corner.

<i>P. flabellum</i>	<i>C. pulchra</i>
<i>M. contracta</i>	<i>C. elongata</i>
<i>R. decurata</i>	<i>M. angusta</i>
<i>C. muricata</i>	<i>L. edwardsi</i>
<i>C. subtilis</i>	<i>L. obsoleta</i>
<i>A. perobliqua</i>	<i>A. fasciculata</i>

Top Delphi  
between  
14 + 15 steps.

The Delphi is 79' thick here and the top of  
contains considerable cross-bedded ss.  
The top of the Delphi and contact with the  
Pompey is at 1489' A.T.

Contact with uppermost Pelesport is  
exposed in a quarry 8-10' high.

Fossils at Pelesport-Delphi contact,

<i>M. multiloba</i>	<i>L. macroptera</i>
<i>A. princeps</i>	<i>H. dekanji</i>
Coral	<i>P. flabellum</i>
<i>P. contracta</i>	<i>A. fasciculata</i>
<i>L. perplana</i>	<i>C. induta</i>
<i>R. furcata</i>	<i>C. congregata</i>

Fossils in upper Pelesport

*L. obsoleta* *A. princeps*

In the upper Pelesport is about 900' of  
the heavy bedded ss.

At 17 steps there was below this about  
20 or 30' of ss, then soft ss rapidly  
changing to ss.

Jones gully - On property of J. W. Jones

Font<sup>2</sup> Creek

Oct 4.

Handbelling began at 1190' A.T

1190' - 1210' 20" covered.

1210' 20" - 1220' 30" + 3'

Heavy bedded shaley ss. no.

D. euchaeris

A. publiqua

C. lutea

A. densata

C. uncinata

H. delayi

A. princeps

L. by. channingi

P. Halliwelli

C. coronata

C. congregata

P. marginata

A. cora

C. prolifica

A. quadriloba

L. macroptera

L. lobata

M. concentrica

T. bellula

L. planaria

M. asquata

G. truncata

A. boydi

T. exigua

M. aculeolata

C. tenuicosta

B. submarginata

T. coronata

C. boethi

There are about 15' of heavy massive ss exposed, in places showing lining lenses nearly completely made of fossils. This is the top of the Delphi and comes at 1225' A.T. Lithologically and faunally this bed is like the Quarry behind the New Gym at Hamlet.

Conspicuous -

D. unbrata

C. legatus

1220' 30" - 1240' 50" covered

1240' 50" - 1245' 30" - Heavy bedded massive sh breaking into heavy irregular pieces. Rock has been exposed in the banks of the creek, rather soft, lumpy and is a dark slate dark grey in color. Below 1240' 50" - 1245' 30" is the beginning of a small cascade + gorge. Fossils seen in this interval are:

C. coronata

A. boydi

1245' 55" - 1250' 60" - heavy arenaceous sh.

*C. congregata*

*M. bellistriata*

*A. fasciculatus*

*C. congregata*

*P. patula*

*M. concentrica*

1250' 60" - 1255' 65" - same heavy bedded

arenaceous sh.

1255' 65" - 1260' 70" - same rock

*M. concentrica*

*F. lobulus*

*Cyt. lani*

*M. bellistriata*

*A. fasciculatus* a

*P. patula*

*M. mytiloides*

*P. maxima*

1260' 70" - 1275' 85" - falls - rock at top

much more arenaceous and somewhat

platy. ~~some ripple~~

1275' 85" - 1280' 90" - Arenaceous platy sh +

shaly ss, rippled

*A. fasciculatus*

*Leiopteria*

*P. flabellum* c

*Ostracods*

*Spirifer* sp. (in ss)

1280' 90" - 1285' 95" - same coarse arenaceous sh.

forming top of small cascade. At the top is

1/6" of calcareous ss having:

*D. mannyptera*

*A. conica*

*M. concentrica*

*A. decussata*

*E. linchblau*

*S. pennatus*

*C. mucronatus*

*Schiz. cheery*

*C. congregata*

*P. flabellum*

*C. incisa*

*Cyt. lani*

*C. remora*

*A. boydi*

*C. mitella*

*Prana*

*H. dekanji*

*M. manston*

*L. perplana*

*C. boottii*

1285' 95" - 1300' 110" - mostly covered

1300' 110" - 1305' 115" - near the middle of

this interval flat thin slabby sandstones are

in the stream. They break into extremely

~~flat~~ thin pieces and are clearly

Randallville! Below this at about 1295' 105'

were seen slabby ss. On the bank above

the thin ss between 1300' 110" and 1305' 115"

is a soft, dark, nearly black shale,

Breaking into very thin plates. This is  
clearly Randallville. Fossils are -

*T. cuneata*

*T. laevis*

*A. multicauda*

*M. pygmaea*

*L. gemmatus*

*N. corbuliformis*

*C. setigerus*

*T. cuneatus* (small)

*N. oblongatus*

This bank of shale here extends up for  
fully 20'.

Above these first exposures seen above  
the top of the Essex beds are some  
sandy shales abounding in *C. setigerus*.  
These may belong to the Pompey.



Oct. 4'

Hubbardsville at 1270'

1270' - 1360' 90" - covered

1360' 90" - 1365' 95" - lower 3' covered - upper 2 1/2' in arenaceous blue grey sh. with:

*P. radiata* a*S. piper* sp.*H. acilis**Schiz. oblongatus**B. loda**P. patulus**H. truncata**S. parvatus*

1365' 95" - 1390' 40" - shale

*C. coronatus*Oct 4<sup>th</sup>

Hubbardsville

Roadside Section

Sherburne Road

Hubbardsville began at 1258'

1258' - 1288' 30" - covered

1288' 30" - 1293' 35" - light grey ss. *C. coronatus*

1293' 35" - 1298' 40" - blue grey arenaceous shale, weathered purple - grey sh. at top.

*S. acutus* a*T. constrictus**H. acutus**H. oblongatus**Schiz. oblongus**P. erectus**O. undulata*

1298' 40" - 1303' 45" - sandstone &amp; arenaceous sh.

1303' 45" - 1313' 55" - covered

1313' 55" - 1318' 60" - at the base calices - arenaceous rock with

*T. constrictus**S. parvatus* *S. piper* sp.

Above this is a platy blue-grey shale.

Fossils observed in the Ludlowville  
in this cut.

*L. variata*  
*T. carinatus*  
*C. elongata*  
*A. arducula*  
*A. undulata*  
*A. erectum*  
*M. concentrica*  
*M. septentrionalis*  
*C. costatus*  
*S. alvata*  
*A. princeps*  
*R. vanuxemi*  
*A. spiniferoides*  
*S. l. l. l.*  
*A. perplana*  
*C. col.*

*P. radiata*  
*G. curvata*  
*M. elongatus*  
*P. vestimentum*  
*H. delongi*  
*C. bellistoma*  
*T. bellulus*  
*P. emarginata*  
*Pan. l. l.*  
*M. concinna*  
*P. flabellum*  
*S. tullius*  
*T. annuus*  
*C. indentata*  
*Esch. l. l.*

Oct 4<sup>3</sup>

Below dam.

10' cross-bedded ss, very thin-bedded. Fossil.

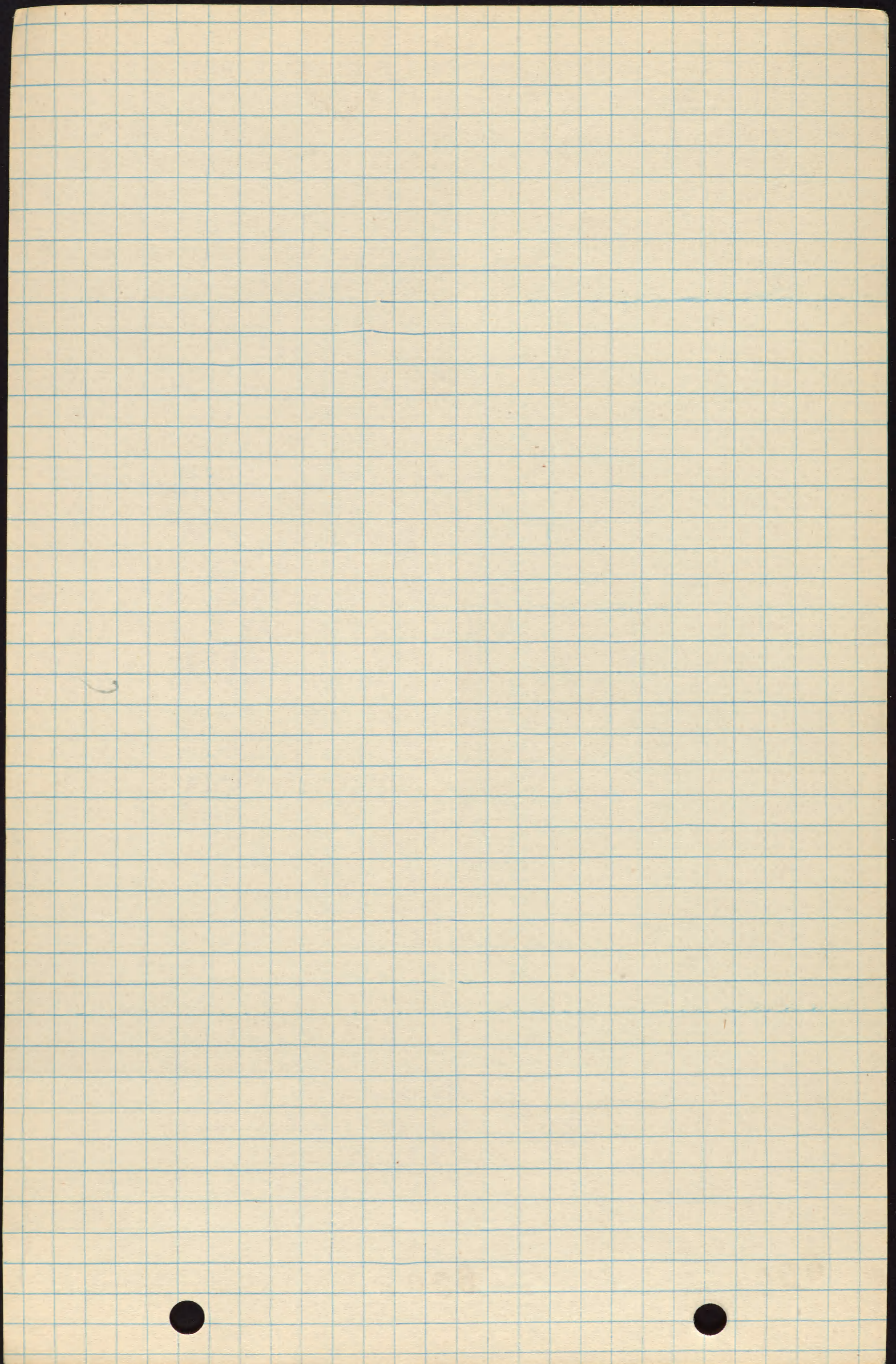
*A. erectum*      *T. carinatus*  
*S. solenoides*      *C. congregata*

At the top of the ss & just below the dam  
is 6" irregular ls. in place, a shell bearing  
*C. costatus*, a probably red state ls.

Above the ls. is a coarse blue grey dark  
arenaceous shale with

*P. maxima*  
*C. congregata*  
*S. carinata*

This may be the Shaver-Ind  
contact



In the gully of Hunt Creek the Pompey was like that seen elsewhere on the Morrisville quad. but the Emella zone was very thin. In ten feet above it, it was followed by ss. + arenaceous shale. This was followed by soft shale, typically Randallville. Apparently what has happened in the Knatchell Valley is that the lower or Vitulina beds of the Randallville have become sandy, the Emella zone is gone so that the Pompey and the lower Randallville cannot be divided.

Below the dam at Oct. 4<sup>3</sup> the cross-bedded ss may belong to the Red Gate or Colgate and the 6" of ls. may be the Red Gate ls. *S. sculptilis* & *S. divaricatus* were not seen however.

Oct. 5.

Handlevelling begun at 1180' AT.

1180' - 1260'80" - covered

1260'80" - 1265'85" - at base 2' of soft, dark grey shale with *T. curvatus*. 4' of hard calcareous ammonaceous shale forming a ledge in the stream. Fossils are:

<i>S. plumatus</i>	<i>C. complanata</i>	<i>A. granulosa</i>
<i>T. curvatus</i>	<i>H. ciliolatus</i>	<i>C. helictata</i>
<i>R. vanuxemi</i>	<i>P. lam.</i>	<i>C. coronata</i>
<i>D. inaequata</i>	<i>B. bisulcata</i>	<i>A. spinifrons</i>
<i>P. lam.</i>	<i>A. decussata</i>	<i>R. furcata</i>

1265'85" - 1270'90" - soft, fissile dark, nearly black shale, fossils scarce.

1270'90" - 1275'95" - mostly covered. At the top of this interval is a dark ammonaceous sh. breaking into plates with:

<i>A. umbonata</i>	<i>R. plumatus</i>	<i>P. radiata</i>
<i>P. constriata</i>	<i>P. parallelus</i>	

1275'95" - 1280'100" - covered

1280'100" - 1285'105" - mostly covered. Small patch of dark ammonaceous sparsely fossiliferous shale.

Handsome Creek

Sherburne Hubbardville

Lud

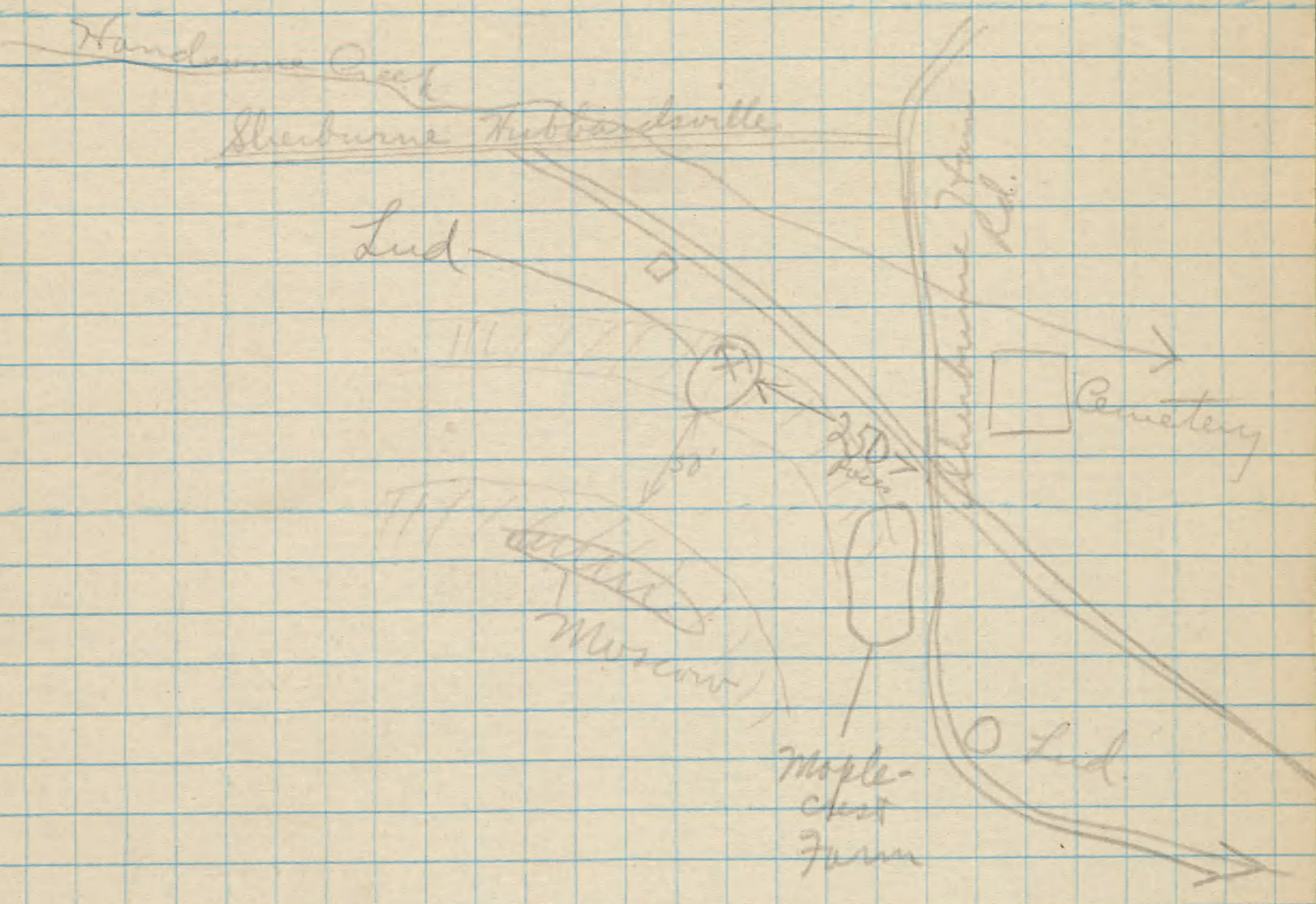
Sherburne Rd.

Penitentiary

Museum

Maple-  
chest  
Farm

Lud



Oct 5'

<i>U. triquetra</i>	<i>D. capillaria</i>	<i>P. flabellum</i>
<i>S. pennatus</i>	<i>F. carinatus</i>	<i>A. spiniferoides</i>
<i>P. radiata</i>	<i>M. concentrica</i>	<i>A. reticularis</i>
<i>A. princeps</i>	<i>C. bellistriata</i>	<i>A. granulosa</i>
<i>P. venturinus</i>	<i>Par. harr.</i>	<i>P. patulus</i>
<i>A. umbonata</i>	<i>L. perplana</i>	<i>H. arcuata</i>
<i>S. tullius</i>		

This fauna belongs in a quarry of Ludlowville, coarse arenaceous blue-grey, dark sh.

55' above the top of this quarry are ledges of soft arenaceous sh. also lying in small clonites.

<i>C. mucronatus a</i>	<i>G. bisulcata (small)</i>
<i>C. setigera</i>	<i>R. fimbriata</i>
<i>A. umbonata</i>	<i>L. pennatus</i>
<i>M. bellistriata</i>	<i>C. coronatus</i>

At Bend in State Rd. just north of intersection with county rd. is outcrop of heavily bedded arenaceous sh. having

<i>L. pennatus</i>	<i>P. flabellum</i>
<i>M. concentrica</i>	<i>P. maxima</i>
<i>L. perplana</i>	

The top of the Lud. ledges are ~~30~~ 30' above intersection crossed with State Rd. and 250 paces from same place.

Contact of Lud + Mv. is about 25' above the top of Lud ~~ledge~~ ledge. There is about 15' of Lud. ~~ledge~~ sh. and about 20' above main ledges comes another small patch of Lud. About 10' of Mv. is exposed. The base of the Mv. exposures is 55' above the top of the Lud. exp.

Oct 5<sup>th</sup>  
Barbers Gully (On his property)

Portland Point

1. Basal bed - 6" thick - grey sandy ls. with conchoidal fracture, ~~but~~ and no fossils for 5" but at the base about 3/1" of crinoidal ls. This basal crinoidal ls. contains:

*T. caninatus*

*L. pearlyana*

2. 13" - calcareous, arenaceous shale.

*S. pennatus*

*T. caninatus*

*C. bellistriata*

*Pan. lam.*

*E. lincklaeni*

*R. vanuxemi*

3. Bed 2 is exposed upstream for 50 paces. About it is 4" of calcareous sandy sh or ss. with

*R. vanuxemi*

*S. pennatus*

*E. lincklaeni*

*C. bellistriata*

*A. decussata*

*T. caninatus*

*Platyceras*

4. The next layer is 27 paces upstream from 3 and is 2" thick

*S. pennatus*

*R. vanuxemi*

coral

calcareous sandy sh.

5. 65 paces from 4 - 9" thick

calcareous sh.

*L. pearlyana*

*R. vanuxemi*

*A. decussata*

Corals

also 25 paces more back 5 is seen in the stream bed

*S. pennatus*

*M. concentrica*

*E. lincklaeni*

*A. spiniferoides*

*C. bellistriata*

*R. vanuxemi*

*L. pearlyana*

*Phacela*

*C. coronatus*



$$\begin{array}{r} 32 \\ 5 \\ \hline 110 \\ 9 \\ \hline 119 \\ 1070 \\ \hline 1209 \end{array}$$

The layers of Portland Point exposed here are simply all of 10' in the gully but as the dip is upstream there is ~~an~~ an error in thickness. Actually the bed must be near 3 or 4' in thickness.

Fossils seen in Ludlowville

*S. gemmatus*

*C. scitulus*

*T. caninatus*

*C. boottii*

*P. sinuiformis*

*A. granulosa*

*L. perplanis*

*C. coronatus*

*Taormus*

Base of P.P. is 22 paces above road. Excellent cascades in Ludlowville all way to P.P. except lowest 20' from State road which are partly covered P.P. at 1209' A.T.

Gully on property of Wesley Barber just north of entrance for State Rd. to Brookside Crest Sanitarium

95  
8  

---

103

Oct 5<sup>3</sup>

- 0' - ~~10'~~ - 60' 60" - covered.  
 60' 60" - 65' 65" - at the top is 2' of very  
 hard arenaceous rock with corals. This  
 is top of *Atrypa spinifera* zone  
 65' 65" - 70' 70" - massive dark grey  
 shale  
 70' 70" - 75' 75" - same  
     *M. corbulariformis*      *I. cuneatus*  
     *C. boethi*                *S. tellus*  
     *S. pumilus*                *P. emarginata*  
 75' 75" - 80' 80" - same dark sh  
 80' 80" - 85' 85" - same " "  
 85' 85" - 90' 90" - sand arenaceous sh  
 at the top extremely hard  
 90' 90" - 95' 95" - 95' 95" - 100' 100" -  
 calcareous rock  
 100' 100" - 105' 105" - covered  
 105' 105" - 110' 110" - bluish fine sh  
 like Gully at W. Brook / This is  
 exposed to where the gully crosses  
 the road

Top of Hamilton 19 steps above road  
 into section  
 Top of Hamilton is at 1463'  
 Gully appears to be 4 or 5' of hard  
 impure ls.

Blue sh. like Genesee was exposed  
 from top of Gully to where Gully  
 crossed road at about 1490'. There was  
 fully 50' of the bluish sh.

1928

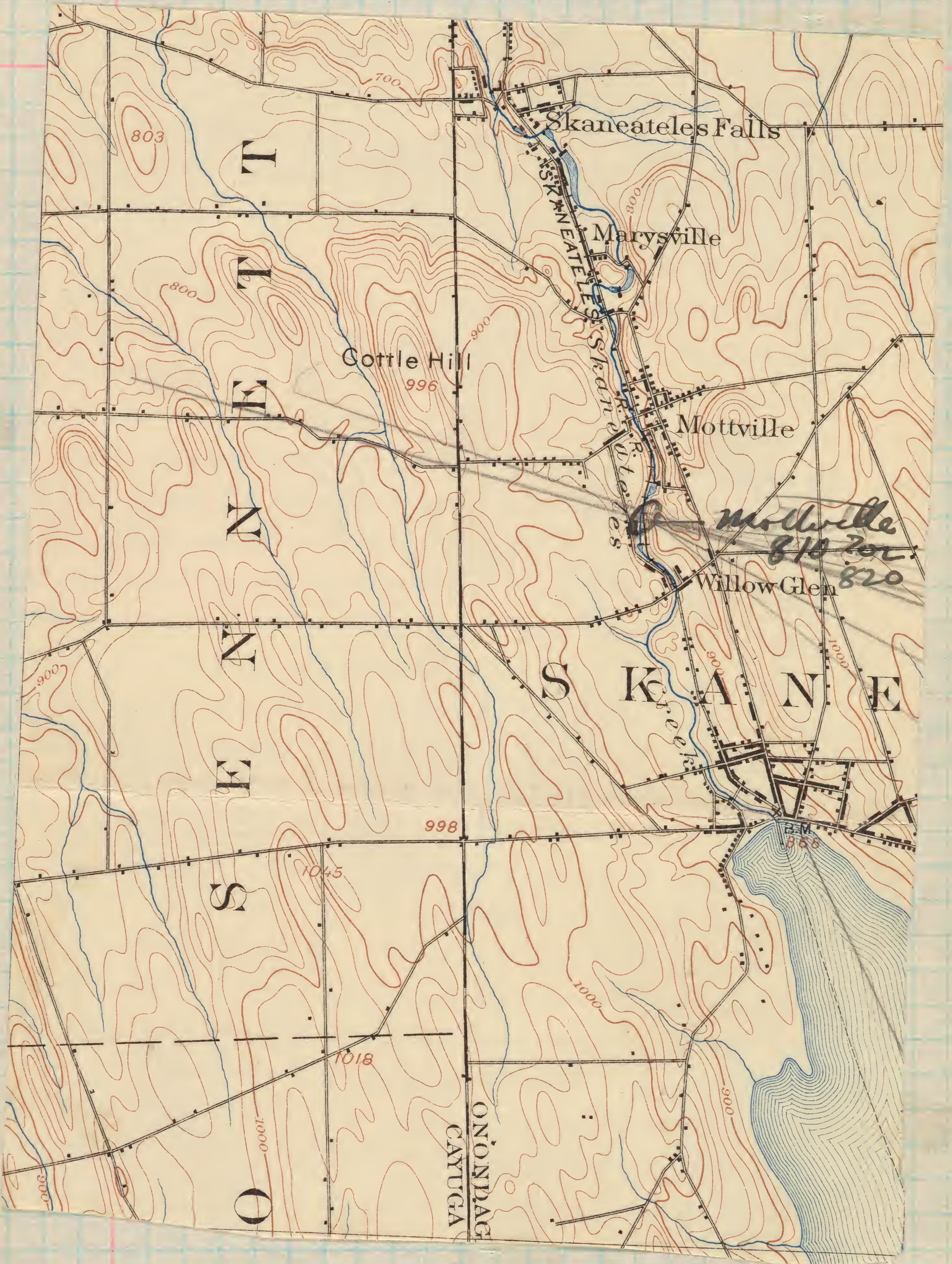
515a



1928 515a



515a



42  
15  
327  
135

136  
146  
151

49  
145  
127  
151  
308  
154

516

516

August 13

1078

155  
135  
15

Marcellus Jackknife Ravine

At road intersection marked A the Onondaga, probably the top is exposed. A quarry is situated 300 paces east and 95 paces south of the intersection A. Top of Onondaga at about 690 A.T. Onondaga is exposed for 130 paces south of A. At 256 paces is exposed the black ls. of the lower Marcellus. At 556 paces comes the division of the Argoniatites, which is at 13' feet A.T. from the top of the Onondaga to the base of the Argoniatites the hard level is about 43'. The Cherry Valley is about 89 paces north of end of road carrying intersection A.

In a ravine one mile southwest of Marcellus village Argoniatite is exposed about 15-20' above stream in valley. The black fulvicolor color, red-rust spots. Hard level layer out top of Argoniatites.

21-20'20" - covered. At 20'20" comes a cliff of about 20' of black fine grained shales standing in large vertical columns.

20'20" - 60'40" - same

60'40" - 75'25" - black Marcellus. At the top of 75'25" or at 81' the shale gives a lighter streak. Between 31 + 32 a *Leiodon* and *P. fragilis* were seen.

31-38 steps - *L. limitans*, *C. mucronatus*, small trilobes.

From 32 steps + 5' comes the Matville hard layer. This yields a thickness for the Cardiff of to the base of the hard layer of 147 feet. If 10' below the hard layer belong to the Matville the Cardiff would be 137 feet thick. The first fossils were seen at 87' above the top of the Marcellus.



$$\begin{array}{r} 42 \\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 42 \\ 5 \\ \hline 210 \\ 18 \\ \hline 228 \\ 81 \\ \hline 147 \end{array}$$

$$\begin{array}{r} 12) 210 \\ \underline{12} \\ 90 \end{array} \quad (12)$$

Fossils seen in the Mottville are:

Corals.	<i>N. concinna</i>
<i>R. vanuxemi</i>	<i>A. andacula</i>
<i>E. itys</i>	<i>A. umbonata</i>

Off the Mottville there appears to be 5' of the calcareous stuff with a layer of concretions at the base. I could not make out the exact limits of the hard layer here.

Fossils in the shale above the hard layer are:-

<i>A. umbonata</i>	<i>N. oblongatus</i>	<i>P. rugulata</i>
--------------------	----------------------	--------------------

*Levichynchus* comes in about 10' above the hard layer.

10' 10" - 15' 15" above the hard layer were seen:-

<i>A. umbonata</i>	<i>Levichynchus</i>	<i>C. boothii</i>
<i>N. oblongatus</i>		

Between 25' 25" - 30' 30" above the hard layer were seen *Ceratopora*, *P. rava*,

About 45' of shale is exposed above the hard layers of the Mottville.

The top of the Onondaga also appears at the elevation of 600 where the short highway goes south from Main St. in Manlius.

On the road between Marcellus and Skaneateles the Mottville hard band occurs between 50' 57" and 55' 55" above the stream and highway intersection, in other words at 892' A.T.

The Agoniatites in this ravine occurs about 20' above the valley floor at about 700' A.T. which would bring the Mottville hard layer at 943' A.T. (actually measured at 935' A.T.) The average of the two is probably correct.

42 + 5  
 220  
 226  
 18  
 243  
 65  
 308  
 680  
 988  
 + 20  
 1008

65'  
 81  
 157  
 238  
 700  
 938

Ideal section in vicinity of Marcellus

519

519

95  
 943  
 1878  
 939

140' of Shalestones

185  
 15  
 200  
 680  
 880  
 908  
 1791  
 895

Mottville

Mottville

680  
 300  
 980  
 700

Cardiff - 154'

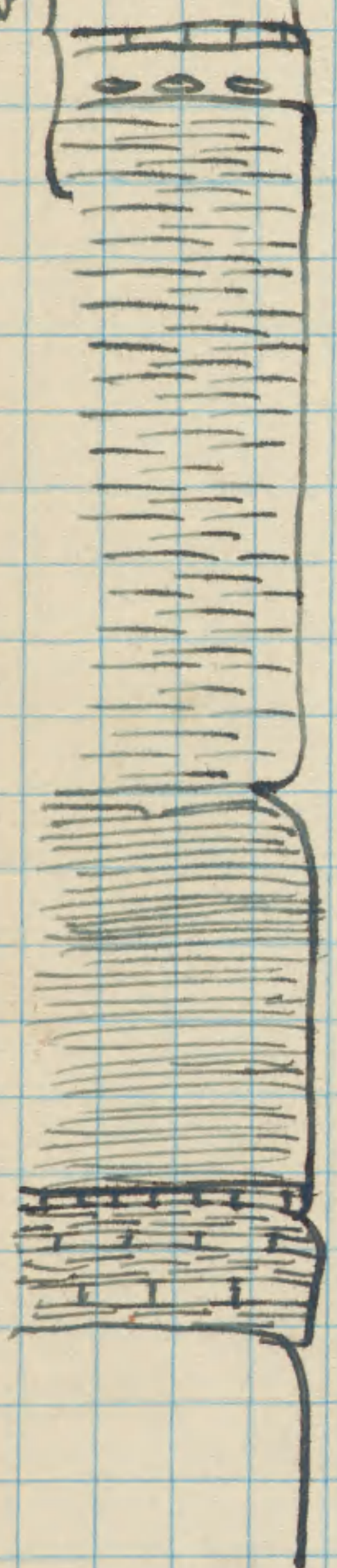
Marcellus 81'

97'

Cherry Valley 3'

ls + shale alternations 13'

Ondaga



Aug 14

First ravine SE. of that studied August 13.  
Hand-leveling begun at approximately 680' A.T.  
0-65' 65" - covered

65' 65" - 70' 70" - First rock exposed, shale with white streak - no fossils. 70' 70" - 100' 100" - same

100' 100" - 105' 105" - In the shale here *P. fragilis* was noted. The shale is dark grey, very finely gritty.

BT 185-185 - Comes to concretions under the Mottville hard layer, which is 2-3' above them. Here the hard layer comes at about 883' A.T. Fossils noted in the hard layer are:

Small conchs	<i>R. vanuxemi</i>	<i>L. perplana</i>
<i>P. tenuispectus</i>	<i>P. rana</i>	<i>C. undulata</i>
<i>P. reticulata</i>	<i>N. concinna</i>	<i>A. undulata</i>
<i>M. subulata</i>	<i>M. concentrica</i>	<i>C. concentrica</i>

The hardest crinoidal part of the layer is about 4" thick, but two calcareous shale must aggregate one foot. Fossils and little shrapnel come about at the concretions about 3' below the hard band.

In the first 5' 5" above the hard layer were seen:

<i>A. umbonata</i>	<i>M. pygmaea</i>	<i>A. sublongicauda</i>
<i>S. pygmaea</i>		

The layer comes in about 8' or 9' above the hard layer and I believe the shale of the Chenotles begins here. All steps now will be referred to the hard layer as a datum.

10' 10" - 15' 15" - 55' 55" - same shale - fossils not abundant.

<i>L. leana</i>	<i>B. leda</i>	<i>Orthoceras</i>
<i>M. pygmaea</i>	<i>S. pygmaea</i>	<i>Crotalaria</i>

175

$$\begin{array}{r} 1020 \\ 175 \\ \hline 908 \end{array}$$

$$\begin{array}{r} 883 \\ 160 \\ \hline 1043 \\ 13 \\ \hline 1058 \end{array}$$

The shale is becoming sandier at 50' above the hard layer and does not fracture into a mass of thin brittle chips.

*H. triquetra*      *P. al. constricta*

at 75' 25" an abundance of *Productella* was noted and at 80' 80" was found:

*P. fragilis*,      *E. punctata*,      *M. pygmaea*

Between 85' 85" - 90' 90" - *P. dividua*, *L. laura*, *A. umbonata* were noted.

at 100' 100" - *H. achis*.

Rock terminated between 130' 130" + 135' 135"

Road came at approximately 160' 160" above the hard Mottville, or at about 1055.

The 150 feet of *Stenostele* here does not differ strongly from the Cardiff, but does however lack the large concretions of the Cardiff. This would make the hard layer at 908' A.T.

The ravine visited Aug 13. was revisited and the Marcellus established at the identical place by working downstream. There were 145' 145" to the hard layer or 157 feet to the hard layer, subtracting about 13 for the Mottville leave the Cardiff about 144' thick in this ravine. The Mottville hard layer in this ravine is at 935 feet A.T.

August 14'

Handlevelling from about 790'

Clintonville Ravine, 2 1/2 mi. NNW of Manietta

0 - 15' 15" - covered

15' 15" - 20' 20" - grey shale, weathers light-blue grey, breaks into thin brittle chips when fractured.

Fossils rare:

*P. fragilis**N. oblongatus**Epyroceras**Lairdhyuchus**C. setigenis**B. leda*20' 20" - 25' 25" - same shale. *N. triquetra*25' 25" - 30' 30" - " " *Lairdhyuchus*, *P. discoides*?, *N. triquetra*

Very faintly gritty, fossils rare,

30' 30" - 35' 35" - same

35' 35" - 40' 40" - "

40' 40" - 50' 50" - " shale poorly exposed

50' 50" - 55' 55" - covered.

55' 55" - 65' 65" - same *S. crocatus*.65' 65" - 70' 70" - *B. leda*, *N. triquetra*, *J. submarginata**M. pygmaea*, *B. sulcomarginata*70' 70" - 75' 75" - *N. oblongatus*, *N. triquetra*, *B. leda*,  
*Lairdhyuchus*, *B. sulcomarginata*

A side gully at the top of 80' 80" shows the following sequence:

Fossils of 25' 25" above 80' 80" - in a sandy shale are: *B. sulcomarginata*, *N. triquetra*, *M. pygmaea*, *P. discoides*.125' 125" - *C. scitulus*150' 150" - *C. scitulus*, *P. p. p.*, *P. patulus*, *B. sulcomarginata*,  
*S. pumilus*, *N. oblongatus*, *N. bellistriata*,  
*P. stolonifera*, *C. tenuistriata*, *M. pygmaea*,  
*A. spiriferoides*, *M. subalata*, *C. subobovatus*These shells occur at the top of 150' 150" some of the shale is limy & extremely fossiliferous. A few concretions in the limy part were noted. *C. scitulus* is especially common.



150' 150" - 155' 155" - Dark soft sandy shale

*M. pygmaea*

*M. triquetra*

*C. scitulus*

*B. sulcomarginata*

*M. subulata*

Ostracod

The top of this side gully came at 85' 85" or 115' 165" above the road (969' A.T.)

Main face - 90' 80" - 110' 110" - same shale

Between 110' 110" - 115' 145" shale fossiliferous

*M. pygmaea*

*M. triquetra*

*B. sulcomarginata*

*C. scitulus*

*P. disiderum*

*O. parvula*

115' 115" - 125' 125" - at 125 the shale becomes what coarser and forms a cascade in the stream.

*L. lamina*

*M. pygmaea*

*M. triquetra*

125' 125" - 130' 130" - a 5 1/2' cascade

*Lamella* sp.

*L. oblongatus*

*Lamella* small

*M. subulata*

*L. biculata*

*L. lamina*

*M. pygmaea*

*B. sulcomarginata*

*M. triquetra*

*C. scitulus*

130' 130" - 140' 140" - same shale as below

5 1/2' cascade

140' 140" - 160' 160" - covered

160' 160" - 170' 170"

*C. scitulus*

*S. pinnatus*

*B. leda*

*M. triquetra*

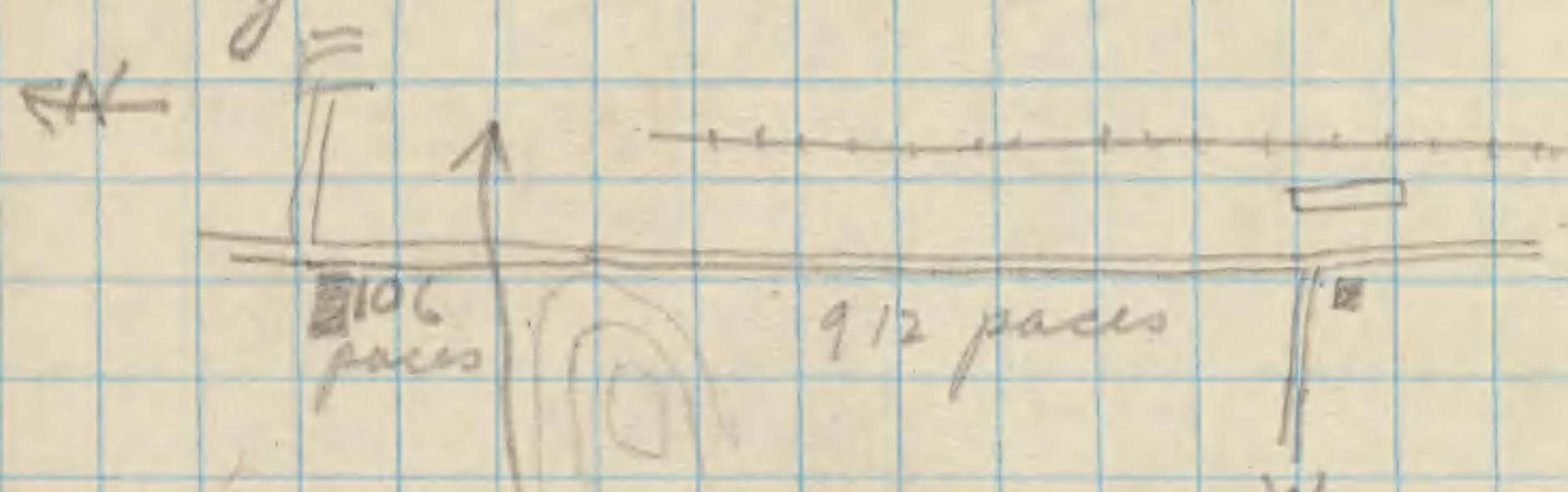
*C. mucronatus*

*M. oblongatus*

at 170 large (6") spherical concretions are common.

Aug 15. = Harlands Gulf

Gully is located 912 paces N of roadway with exposures and 106 paces south of a road passing E across the valley



First exposures come 7 steps above highway (38')  
Handlevelling begun at 780'

0-35'35" - covered

35'35"-40'40" - dark grey shale, fracturing into pieces, fossils rare, *L. laura*, *H. triquetra*, *B. submarginata*

40'40"-55'55" - same. *B. lida*, *H. oblongatus*, *B. submarginata*

55'55"-75'75" - " *S. crotalum*, *B. submarginata*, *H. triquetra*

*H. acris*, *M. pygmaea*, *O. parvella*, *P. discoidum*

Small concretions are abundant in the shales in this interval especially between 65-75'

75'75"-80'80" - first 5' of a falls - *C. actulus*, *M. pygmaea*, *P. discoidum*

80'80"-85'85" - *L. laura*, *H. triquetra*, *P. discoidum*, *S. crotalum*, *H. oblongatus*, *M. subalata*

At the top of this step the shale is much sandier, altho the fauna is the same

85'85"-90'90" - *L. laura*, *C. actulus*, *M. pygmaea*, *H. triquetra*, *H. oblongatus*, *S. crotalum*, *Leopteria* (*Athyris?*)

90'90"-100'100" - The fauna in the shale between 90'90" and about 2' below the top of the falls at 100'100" has *L. laura* in great abundance together with its common associates. In the upper 2' of the falls the rock is hard, sandy and has *A. boydi* in some abundance

15<sup>2</sup>  
38  
~~114~~

1000  
1000

100' 100" - 105' 105" - coarse shale continues  
for 7/8 above ledge of falls.

<i>M. subbalata</i>	<i>C. scitulus</i>	<i>P. disjuncta</i>
<i>M. multilobata</i>	<i>M. oblongatus</i>	<i>S. pennatus</i>
	<i>M. triquetra</i>	<i>C. curta</i>

105' 105" - 110' 110" - shale is softer and breaks  
into brittle chips like that at the beginning  
of the section. The shale becomes  
gradually sandier from about 80' 30" up  
till it is laminated in the sandy shale at  
the brink of the falls and for 7/8 above  
it.

110' 110" - 120' 120" - soft brittle shale  
*M. triquetra*, *M. oblongatus*, *P. fragilis*, *C. scitulus*

120' 120" - 135' 135" - same. *L. Curca*.

135' 135" - 140' 140" - 2' above top of 135' 135" comes  
a calcareous-concretionary layer abounding in

<i>S. pennatus</i>	<i>C. scitulus</i>	<i>M. oblongatus</i>
<i>L. Curca</i>	<i>M. pygmaea</i>	<i>L. sinuata</i>
<i>B. silca</i>		

found, the same layer as exposed near  
the top of the section at Aug 14'. Fossils  
noted in the one foot layer are:

<i>P. rana</i>	<i>M. subbalata</i>	<i>M. angusta</i>
<i>C. scitulus</i>	<i>M. oblongatus</i>	<i>B. submarginata</i>
<i>P. constructa</i>	<i>S. pennatus</i>	<i>M. pygmaea</i>

The layer in fauna resembles somewhat  
the concretionary bed at the top of the  
Bear Mtn. ravine. This is the first  
*M. angusta* I have seen in this  
skandale section.

In the shale above the Hyassa bed occur  
*M. oblongatus*, *M. sandalli*.

140' 140" - 145' 145" -

<i>M. oblongatus</i>	<i>M. pygmaea</i>
<i>M. triquetra</i>	<i>C. submarginata</i>
<i>A. umbonata</i>	

385  
 32  
 417  
 332  
 85

*Athyris*  
*spiriferoides* c } 85'

soft shale  
 mostly covered

35' sandy sh capped by 2' hard calc sandy sh.  
 sandy shale

Dark shale *L. loma* 90-98' (Ledyard?)

hard layer 6-9"  
 shale *S. punctatus* & *A. umbonata* 8 1/2'  
 shaly fossil shale 3" & *concretion* (*S. punctatus* bed)  
 shale 2'

25'

*Nyassa* bed 146

shale 114'

3  
 11  
 146

138  
 115  
 29

Ludlowville?

Carterfield?

145' 145" - 155' 155" - slightly sandy grey shale.  
*C. mucronatus*      *T. triquetus*      *M. subalata*  
*M. pygmaea*      *M. oblongatus*

155' 155" - 160' 160" - coarser shale than that above the Niassa bed.

*C. mucronatus* a      *T. triquetus*  
*M. subalata* c      *B. submarginata*  
*A. umbonata*

At the top of the step is a layer of large concretions some of them 1' across. The shale containing the concretions has:

*C. scitulus*      *Bactrites*      *L. dubium* (?)  
*T. triquetus*      *C. curta*      *S. pennatus*

Between the concretions at 160' 160" is a layer of blackish fissile shale shale 2' thick and then a shaly-limy layer abounding in fossils as follows:-

*S. pennatus* a      *C. scitulus*      *C. vicinus*  
*M. oblongatus*      *M. subalata*      *P. rana*

The calcareous part of the bed is about 3" thick and very fossiliferous. The black shale contains *C. scitulus*. The shale above the calcareous (*S. pennatus* bed) is soft & dark and has:

*S. pennatus* a      *A. umbonata*  
*C. scitulus*      *M. subalata*  
                          *M. oblongatus*

This shale continues to 170' 170" at the top of which is a 6-9" layer of harder rock. Fossils seen in the 8 1/2' of shale between the *S. pennatus* bed & the hard layer are:-

*A. umbonata* c      *C. mucronatus* c      *L. perplana*  
*S. pennatus* a      *P. licata*

This shale is mostly soft & closely jointed but calcareous accumulations are common in it.

Fossils in the upper 6" hard bed are:-

*S. pennatus* c      *C. mucronatus*  
*A. umbonata*  
*L. perplana*

280 260  
170 170  
90 90  
96

170' 176" - 175' 175" - The shale succeeding this bed  
 consists of 6-9" is block, much-jointed breaks  
 into small sub-cubical blocks.  
*L. loma* a.

This may be the Ledyard shale with the  
*Hyassa* and *S. pennatus* ~~representing~~ beds  
 representing the Centerfield.

175' 175" - 200' 200" - same, some <sup>specimens in</sup> *Hyassa*, *Hyassa*.  
*B. lida*  
*B. reticulata*

200' 200" - 210' 210" - same dark shale -

*C. vivans*

*P. fragilis*

*B. reticulata*

*L. loma*

210' 210" - 220' 200" - The shale up this far has  
 been uniformly dark, faintly gritty, sparse  
 in fossils. It is darker than the *Phanerozoetes*  
 below.

220' 200" - 240' 240" - shale perhaps a little  
 coarser. *L. loma* abundant, and large

240' 240" - 245' 245" - *L. loma*, *M. subalata*,

an occasional thin *Hyassa* band at 240-245'

This dark shale ends at about 260' 260" - 265' 265"  
 and is then 95' feet thick or 100' thick. The

exact contact with the bluish sandy  
 shale with *P. flabellum* was not observed

Probably 98' is the correct figure. The  
*P. flabellum* was found at 265' 265", hence

the black shale ends below this, probably  
 five or 10' below. The black shale is

probably 90' thick. The shale succeeding  
 it coarser, breaks into large slabs

abounds in *Hyassa* markings.

*P. flabellum*

*J. carinatus*

*L. loma*

*C. mucronatus*

*G. bellectriata*

*A. boydi*



$$\begin{array}{r} 315 \\ - 75 \\ \hline 240 \end{array}$$

$$\begin{array}{r} 315 \\ - 21 \\ \hline \end{array}$$

$$\begin{array}{r} 240 \\ - 24 \\ \hline 216 \\ - 216 \\ \hline 0 \end{array}$$

2

245' 245" - 280' 280" - falls.

280' 280" - 285' 285" - coarse sandy blue grey shale marked by *Zonitoides*.

*L. perplana*

*Pal. constructa*

This rock is not very fossiliferous and must represent the zone above the *Planodictyon* zone. The latter was not seen and as in the face of the falls a block from it was seen which contained *P. flabellum* + *A. granulosa*. The *P. flabellum* found at 265' - 270' must be near the top of the *Planus*-zone.

At about 332' is a hard layer in the stream about 3' thick forming a cascade and a flat in the valley floor. Fossils found at the base of it are

*F. hemisphaericus*

*A. granulosa*

*Favosites* sp.

*M. concentrica*

In the upper part

*F. carinatus*

*S. sculptilis*

at 325' - 328" - 330' 330" the hard sandy shales are followed by soft shale containing

*S. pennatus*

*V. pustulosa*

*C. scitulus*

330' 330" - 335' 335" - 5 1/2' of soft grey shale like that above:

*A. spiriferoides*

*L. perplana*

*Loph. lam.*

*P. rana*

*S. pennatus*

*C. scitulus*

335' 335" - 340' 340" - light sandy sh., hard

*M. sulcata*

*S. pennatus*

*A. spiriferoides*

340' 340" - 345' 345" same shale

*M. liata*

*L. laura*

*a*

*P. trimaculata*

*Productella*

*A. spiriferoides*

345' 345" - 350' 350" - same shale

*A. spiriferoides*

*A. umbonata*

*L. laura*

*A. mucronata*

*C. andacula*

350' 350" - 360' 360" -

*A. spiriferoides* c

*B. leda*

*A. andacula*

~~*P. tenustrata*~~

*D. cainatus*

360' 360" - 365' 365" -

Bluish grey sandy shale, reminding one of the Earlville shale:

*A. spiriferoides* c

*L. penhatus*

*C. mucronatus*

365' 365" - 375' 375"

*A. spiriferoides*

*L. laura*

*S. derhissa*

*Strophomena*

*R. penelope*

The road comes at 385' 385" with rock exposed nearly all of the way.

F.A. Harland. This gully is located 550 paces south of the first west rd north of Rose hills. The "New gulf" road is 1200 paces south of this intersection.

The section seen today has few elements in it that aid in determining the section. I have not found any rocks that I believe is the equivalent of the Centerfield. The band with *Myosias* probably represents the thinned equivalent of my Pompey, and the layer with *A. boydi* may represent the Delpia. These would be risky correlations. The shale above the *Myosias* bed may represent the 5' above the Pompey, and the ten feet in the Bear Mountain Ravine that has calcareous lenses.

The dark shale above the *Spirifer pennatus* bed I believe is the representative of the Ledyard. It is 90-98' feet thick. It has *B. detrostata* which is rare in other horizons. It is succeeded by shale carrying *P. flabellum*, then sparsely fossiliferous coarse shale for a number of feet and the calcareo-arenaceous shale containing corals. These corals are diagnostic of the Centerfield, but may also represent the coral beds or Ford's Hill member. The shale above this I do not place but with *S. demissa* in it it appears to be the shale above the coral beds at Fellows Falls. The *V. pustulosa* is a mystery.

Aug 16.

Marietta

195  
125  
20

First rock seen between 75' 75" and 80' 80" above road. At the very top of 125' 125" was seen the one foot concretionary and calcareous layer. Fossils seen below the Nyassa bed were:

<i>C. scitulus</i>	<i>L. laevis</i>	<i>Productella</i> sp.
<i>N. oblongatus</i>	<i>N. trigonatus</i>	<i>L. laura</i>
<i>S. pennatus</i>	<i>M. pinnata</i>	<i>L. dubium?</i>

Fossils in the Nyassa bed are:-

<i>A. bulbosus</i>	<i>N. trigonatus</i>	<i>Attheyia</i>
<i>C. scitulus</i> a	<i>H. dolis</i>	<i>Trinoptera?</i>
<i>N. arguta</i> c	<i>N. oblongatus</i>	
<i>P. laura</i> c	<i>Fenestellids</i>	
<i>B. sulcomarginata</i>	<i>S. pennatus</i>	

The shale rock of the Nyassa bed is a shale made up mostly of shells and contains fossiliferous concretions embedded in it.

About 1' above the Nyassa bed is a thin layer abounding in shells

<i>S. pennatus</i> f	<i>C. scitulus</i>	<i>Trinoptera</i>
<i>N. trigonatus</i>	<i>Attheyia</i>	<i>N. oblongatus</i>
<i>P. laura</i>	<i>A. subovata</i>	<i>C. subovata</i>

125' 125" - 130' 130" - The first 2' of shale contains calcareous masses of fossils as noted above, but in the shale above these the following were seen

<i>C. scitulus</i>	<i>N. oblongatus</i>
<i>C. boottii</i>	<i>N. trigonatus</i>
<i>Pal. constructa</i>	

130' 130" - 135' 135" - covered

135' 135" - 140' 140" - partly covered, bluish dark shale

140' 140" - 145' 145" - a layer of concretions with black fissile shale above

Section of Aug 16.

125 125  
75 75  
50 50

soft sh ?'  
S. sculptilis c

60' sandy shale

Transition 7 11'

97' Ledyard

hard layers  
shale 11'

shale 21'

Wagon Bed 1'

shale 50'

concrete

245  
155  
90

145' 145" - 155' 155" - to upper hard layer <sup>Ledyard</sup> & base of bed  
 This 21' of shale between the concretionary bed  
 and the Ledyard bed is like the hills of the  
 Shaverston. The concretions are about 6" thick  
 and some are 1 1/2" in diameter embedded  
 in a soft dark shale which is highly  
 fossiliferous.

*Orthis*, *Orthis*

*C. minutus*

Between the concretionary bed & the hard layer 6'  
 thick are 11' shale containing

*Spirifer*

*L. loma*

*C. boethi*

*C. scutulatus*

*M. trigonatus*

*D. subulatus*

*P. lirata*

*M. pygmaea*

*D. elongatus*

*A. subcostata*

The hard layer here caps a cascade of 1500 20'  
 Above this hard layer is a decided change  
 in the lithology, the shale being slaty and  
 nearly black. I believe this to be the  
 beginning of my Ledyard shale.

155' 155" - 160' 160" - five feet of Ledyard

160' 160" - 175' 175" - covered

175' 175" - 185' 185" - dark shale.

185' 185" - 245' 245" - same

245' 245" - 250' 250" -

*A. subcostata*

*Non. truncata*

*C. punctatus*

*Spirifer*

*C. boethi*

*P. loma*

*A. subcostata*

*L. perplana*

*S. junia*

*P. loma*

*P. subbellum*

*C. scutulatus*

*S. junia* sp.

*M. arguta*

*O. loma*

*A. granulosa*

*A. princeps*

*P. lirata*

*C. elongata*

*P. l. constructa*

*M. subulata*

*M. constructa*

*M. concinna*

*C. minutus*

*C. induta*

*A. loma*

*C. bellus*

*A. strobilatus*

*A. depressa*

*P. ramus*

*P. frimbriatus*

*S. junia*

*P. rotatus*

*C. recurva*

*S. rectus*

*C. submarginatus*

*Cyrt. loma*

*P. loma*

*D. hemithorax*

$$\begin{array}{r} 300 \quad 300 \\ 245 \quad 245 \\ \hline 55 \quad 55 \\ 60 \end{array}$$



This fauna is from a loose block on the side of the cliff at 250' 250". The last of the *L. Agassiz* was seen at 240' 240" and from here to where the fossils were found the rock becomes sandier. The ledge is thus about 97' feet thick.

245' 245" - 300' 300" - Falls. The rock forming the ledge over which the water falls is a hard calcareous sandy rock without fossils above it a short distance upstream are hard sandy rocks containing the following fossils. *S. dominatus*, *Laomurel* c, and *C. bellistriata*. ~~This rock when~~ *S. sculptilis*. This rock when fresh apparently was hard and calcareous. The rock fades upward into a dark bluish grey sandy shale having:

*P. Jona*

*R. varnuxemi*

*M. concentrica*

*S. pennatus*

*A. granulosa*

*S. sculptilis*

*D. inaequistrata*

*C. bellistriata*

*Camarotoechia* sp.

Roadside section New "Gulf Road".  
Lowest rock exposed is in the Ledyard shale  
Fossiliferous dark shale, brownish streak.

Fossils:

<i>P. fragilis</i>	<i>A. umbonata</i>	<i>N. tuqueti</i>
<i>L. laura</i>	<i>C. setigera</i>	
<i>B. pinnatus</i>	<i>C. mucronatus</i>	

0' - 70' 70" - Ledyard

70' 70" - 80' 80" mostly covered

80' 80" - 85' 85" - Arenaceous shale, blue-grey in color  
fossils abundant.

*A. umbonata*  
*C. mucronatus*  
*B. globosa*

85' 85" - 90' 90" - same shale

<i>P. flabellum</i>	<i>Gon. truncata</i>	<i>S. sculptilis</i>
<i>N. arguta</i>	<i>P. ruata</i>	<i>J. ciliatus</i>
<i>A. decussata</i>	<i>C. scitulus</i>	<i>A. macronota</i>
<i>B. fimbriata</i>	<i>C. coronatus</i>	<i>Pav. haueri</i>
<i>L. perplana</i>	<i>C. indenta</i>	<i>P. rana</i>

90' 90" - 95' 95" -

Roadside section



sandy shale 60'

covered 10'

Ledyard shale .76'

47  
 $\frac{70}{215}$   
 87  
 $\frac{168}{168}$

1170  
 $\frac{158}{1002}$

7070

1170  
 $\frac{109}{1061}$

27  
 $\frac{3}{135}$   
 $\frac{11}{146}$

255  
 $\frac{146}{109}$

135 135  
 $\frac{80-80}{55 55}$

There are 47 steps (255') from the lowest exposure to the Rose Hill road intersection. Plus the Hedyard-King Ferry contact comes at about 1002' A.T. The coarse shale continues to ~~27~~ one foot below 27 paces (146') placing the calcareous <sup>3</sup> layer at 1061' A.T. giving 59' thickness for this interval.

bb

$$\begin{array}{r} 55 \quad 55 \\ 25 \quad 15 \\ \hline 40 \quad 40 = 44 \end{array}$$

$$\begin{array}{r} 100 \\ 100 \\ 100 \\ 100 \\ \hline 400 \end{array}$$

Aug 17.

Study along the New Shelf Road

The beginning of the study is at the Nyassa band exposed at 868' feet A.T. It is 19 H.L. steps above the intersection of the New Shelf road & the Marcellus-Mainetta road. Fossils seen in the Nyassa layer here are:-

<i>C. scitulus</i>	<i>P. constricta</i>	<i>Athyris</i>
<i>M. aranta</i>	<i>C. mucronata</i>	<i>P. flabellum</i>
<i>S. pinnatus</i>	<i>A. vanuxemi</i>	<i>M. oblongatus</i>
<i>C. boottii</i>	<i>P. rana</i>	<i>S. trichota</i>
<i>A. reticularis</i>	<i>B. sulcata</i>	<i>S. pumila</i>
<i>P. lirata</i>	<i>M. subulata</i>	<i>M. pygmaea</i>

15-15' above Nyassa band - dark shale, much jointed, soft fissile

<i>P. bella</i>	<i>M. sandalli</i>	<i>M. oblongatus</i>
<i>C. scitulus</i>	<i>M. pygmaea</i>	<i>B. sulcata</i>
<i>S. pinnatus</i>	<i>A. subulata</i>	

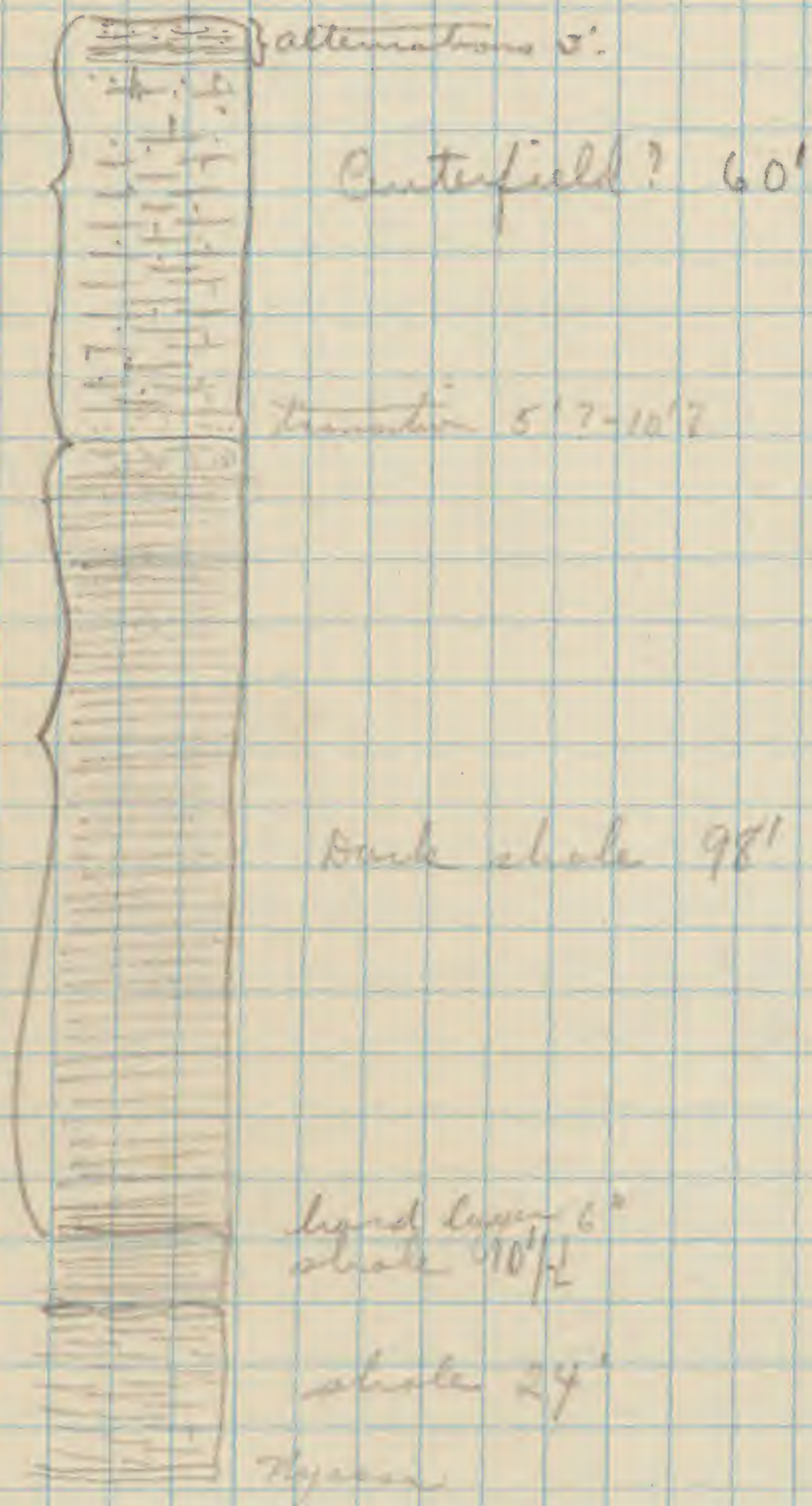
At 20' + 2 1/2' above the Nyassa layer is a band of fossiliferous shale. The shale for this interval is like the Shannettian below.

Above the fossiliferous layer is 10" of soft, blackish fissile shale containing in the upper part *S. pinnatus*, capped by a hard layer of 6" containing the sand fossils. This is immediately followed by black fissile shale. The last *P. bella* was seen at 17 steps above the hard layer & the bedrock ends at about 90' 90" above the hard layer or at 1001 feet A.T.

0' - 15' above top of bedrock

<i>P. flabellum</i>	<i>S. carinatus</i>
<i>P. rana</i>	<i>P. emarginata</i>
<i>S. globosa</i>	
<i>C. setigerus</i>	
<i>P. lirata</i>	

About 13' above the top of the bedrock is a layer made up of shale & crinoid stems and other fossils. It is probably local.



13  
 60  
 100

and is but 2" thick. The fauna of Aug 16 applies below this calcareous band. Fossils above the 2" calcareous layer are:

*J. emarginatus*  
*C. bellistriata*

The rock is a soft bluish argillaceous shale like the Earlville

15' 15" - 20' 20" above Ledyard.

*J. carinatus* c

*D. sculptilis*

*M. concentrica*

*C. hamiltoni*

*C. bellistriata*

*Platyceras*

*P. flabellum*

*C. mucronatus*

20' 20" - 25' 25"

*C. bellistriata*

*P. patulus*

*E. cuneata*

The shale here seems much less fossiliferous than that below.

25' 25" - 35' 35" - shale becoming finer & harder, & few fossils. It strongly resembles the calcareous shale of the Centerfield. The fauna is also much like that of the Centerfield.

35' 35" - 45' 45" - rock hard, massive, strongly resembles Centerfield. *T. mucronatus*, *J. carinatus*, *C. mucronatus*

45' 45" - 50' 50" - same hard massive shale

*A. granulosa*

*A. mucronata*

*E. lincklaeni*

*P. patulus*

*A. imbricata*

*Par. ham.*

*T. mucronatus*

*J. carinatus*

*P. rana*

*L. perplua*

*C. boothi*

*S. sculptilis*

*V. pustulosa*

*Zou. hamilton*

*E. arcuata*

*L. perversa*

*H. dekeyi*

*Proetus*

About 2' above this step is a layer of shale about 8" thick. The *Vitulinas* were found exactly at the top of this step and below the thin shale band, dark, soft bluish gray.



35-35

Above this thin layer of shale comes the hard calcareous sandstone rock. Thin ls layers made up of shells also occur. In the last 2' of the Centerfield the following fossils occur:

*J. carinatus*                      *M. concentrica*  
*Cran. ham.*

50'50" - 55'55" - the Centerfield ends here

*J. carinatus*                      *C. bellistriata*                      *N. oblongatus*  
*R. vanuxemi*                      *N. varicosa*                      *M. concentrica*  
*C. mucronatus*                      *S. sculptilis*                      *L. perplana*  
*Pal. emarginata*                      *Par. ham.*

Top of Centerfield 1061' A.T.

On top of the Centerfield comes a soft dark shale with which it alternates for 3' from the thin shale band noted above. This shale is soft crumbly and contains:

*J. carinatus*                      *C. coronatus*  
*S. pennatus*                      *Comarotoechia* sp.  
*S. sculptilis*                      *C. boothi*  
*A. andacula*                      *P. patulus*  
*L. perplana*                      *Par. ham.*  
*Cran. ham.*                      *Cyt. ham. var. recta*  
*Pal. constricta*                      *C. scitulus*  
*D. inaequistriata*                      *L. laura*  
*A. spiriferoides*                      *C. bellistriata*  
*M. subalata*

43  
47  
2  
51  
867  
      
918

87  
5  
918

95  
48  
51

Aug 17'

Gully S of Borodino

Handlevelling begun at Lake level 867'

0 - 35'35" - covered

35'35" - 45'45" - hard calcareous sandy rocks

These rocks are exposed 2' above 45'45" and thus are at 918' A.T. Fossils observed are:

*Favosites**S. sculptilis**Taonurus**R. vancouveri**J. carinatus**S. perplena**A. granulosa*

This is blue grey sandy limestone and is correlated with the same rock on the New Gulf Road, although *Vitulina* was not seen here. Hand-hall captures from the top of the Centerville (?) at 918' A.T. Some of the rock locally is a blue semi-rlu ls.

0' - 5'5" - This rock is succeeded by softish blue arenaceous shale abounding in *J. carinatus**S. sculptilis**P. stylopomum**Comarotoechia*

5'5" - 10'10" - covered

10'10" - 15'15" - same shale

*A. granulosa**S. pennatus**O. carinata**J. carinatus**N. bellistriata**R. vancouveri**C. reticularis?**Taonurus**M. concentrica**C. scitulus a* (at 10'10" - 15'15")

At about 15'15" corals are common and with them were seen:

*A. reticularis**A. spiniferoides**C. scitulus**P. radiata**A. granulosa*

The corals appear to be but a local patch, but may also represent part of the reef of farther down the lake

Section Aug 17'

24' shale culminating in  
fiss.

sandy shale 3' — a granular, R. vancouveri, S. penetrans  
sandy rock 2'

35' covered

coarse sandy shale  
+ coarse shale  
mostly covered 54'

S. demissa

sandy shale 146'

crab.  
shale 15'

Centerfield?

135  
200  
146  
54

15'15" - 20'20" - same shale

*S. pennatus*  
*A. granulosa*  
*C. scutulus*

*Gon. hamiltonensis*  
*Ostroceras*

20'20" - 30'30" - "

30'30" - 35'35" - "

*C. scutulus*      *C. cincta*

35'35" - 40'40" - shale a little coarser at the top of this step.

40'40" - 45'45" - "

*A. spiriferoides*  
*S. pinnatus*  
*L. laura*

45'45" - 55'55" - 60'60" - 65'65"

*A. spiriferoides*  
*Ostroceras*

*S. pinnatus*  
*M. subolata*

At 65'65" the rock is harder forming a cascade :-

*S. pinnatus*  
*P. flabellum*

*A. spiriferoides*  
*Prone*

65'65" - 70'70" - rock coarser than below.

*A. spiriferoides*  
*S. pinnatus*

*M. lirata*

*S. rectum* or *angula* ?

70'70" - 75'75" -

*A. spiriferoides*

*S. pinnatus*

75'75" - 80'80" -

*C. bellistriata*

80'80" - 85'85" - 90'90" - 105'105"

*Sheptasma*  
*R. fimbriata*  
*Pal. constricta*  
*C. mucronatus*

*A. spiriferoides*  
*A. reticularis*  
*L. laura*

105'105" - 125'125" - 130'130" - 135'135"

*S. pinnatus*  
*A. reticularis*  
*Pal. constricta*

*D. macquistrata*  
*B. leda*

$$\begin{array}{r} 145 \\ 12 \\ \hline 157 \\ 158 \\ \hline 315 \\ 1013 \end{array}$$

$$\begin{array}{r} 146 \\ 92 \\ \hline 238 \\ 1064 \end{array}$$

$$\begin{array}{r} 1054 \\ 27 \\ \hline 1081 \end{array}$$

$$\begin{array}{r} 185 \\ 2 \\ \hline 370 \\ 313 \\ \hline 683 \end{array}$$

The rock has been becoming continually coarser till at 135' 135" it culminates in a 1' of arenaceous layer showing the following fossils:-

*A. reticularis*

*S. gemina*

*S. demissa*

*P. perplana*

*S. plumatus*

*M. concinna*

*B. capellina*

*C. complanata*

*P. carinatus*

*C. recurva*

135' 135" - 140' 140" - This brings softer shale again with the following:-

*S. plumatus*

*Mammisia*

*A. spiniferoides*

*S. demissa*

*A. reticularis*

*Orthis*

*A. umbonata*

*P. carinatus*

*S. gemina*

140' 140" - 145' 145" -

*A. reticularis*

*Pal. concentrica*

*A. spiniferoides*

*C. tenuistriata*

*S. plumatus*

The rock at the base of this interval is becoming harder and sandier.

*Trochus*

*Streptelasma*

*S. plumatus*

*P. carinatus*

*S. demissa*

*C. mucronatus*

*A. reticularis*

*P. fimbriata*

*P. flabellum*

145' 145" - 165' 165" - covered -

At the top of this interval is 8' of coarse shale fracturing into thick blocks.

It is very coarse and sandy.

165' 165" - 170' 170" - covered

170' 170" - 175' 175" - same coarse rock, 3' exposed

*B. bisulcata*

*P. flabellum*

175' 175" - 185' 185" - at the top about 1' of very coarse sandy rock is exposed, forming a ledge in the stream. This rock is essentially a sandstone. This is probably the layer exposed at 1104 in Aug 18.



$$\begin{array}{r} 245 \\ 20 \\ \hline 265 \end{array}$$

$$\begin{array}{r} 34 \\ 18 \\ \hline 52 \end{array}$$

$$\begin{array}{r} 24 \\ 20 \\ \hline 44 \end{array}$$

$$\begin{array}{r} 245 \\ 20 \\ \hline 265 \\ 268 \\ 911 \\ \hline 1176 \\ 177 \\ \hline 1353 \end{array}$$

$$\begin{array}{r} 245 \\ 20 \\ \hline 265 \\ 918 \\ \hline 1183 \end{array}$$

$$\begin{array}{r} 185 \\ 95 \\ \hline 280 \end{array}$$

$$\begin{array}{r} 245 \\ 20 \\ \hline 265 \end{array}$$

$$\begin{array}{r} 245 \\ 918 \\ \hline 1163 \end{array}$$

185' 185" - 220' 220" <sup>base of</sup> falls over hard sandy  
rock.

220' 220" - 225' 225"

At the base of the falls is 3' of hard  
arenaceous rock like that at 185' then  
3' softer sandy rock followed by soft  
shale.

225' 225" - 245' 245" + 3' face of falls

*M. concavata*

*A. decussata*

*S. scriptura* sp.

*A. reticularis*

*A. frumosa*

*I. carinata*

*C. scutulata*

*S. pennata*

*P. oviformis*

The brink of the falls & also the top of the  
Hudonville is at 1186' A.T. This 24' of shale  
becomes increasingly sandy till it terminates  
in a 2' ledge of hard sh.

Above the brink of the falls is a part  
of sandy ls. capped by 17"-11" of crinoidal  
ls. referred to the Portland Point. The ls. is  
followed by 2.4 feet of rock culminating in a  
hard sandy layer ~~possibly~~ about 5' thick.  
This layer is followed by soft shale the  
~~the~~ beginning of the Oxford shale.

My Randallville shale may disappear  
in the same fashion as the Hedyard,  
by appearance of *U. pustulosa* at  
bottom & *Orthis* etc. Randallville  
here is a typical *Levinsynclonus* zone.  
Apparently Hedyard when becoming  
sandy receives influx of fossils &  
disappears

$$\begin{array}{r} 215 \\ 18 \\ \hline 237 \\ 867 \\ \hline 1104 \end{array}$$

$$\begin{array}{r} 146 \\ 918 \end{array}$$

$$\begin{array}{r} 51 \\ 867 \\ \hline 918 \end{array}$$

Aug 18

867' + 80'80" - covered

0.9 mile NW of 10-mile Pt.

80'80" - 85'85" - bluish grey sandy shales belonging above  
the Centerfield -*A. spiniferoides**A. reticularis**S. rectum**Pal. pumida**P. rana**C. mucronatus?*

85'85" - 90'90" - 100'100"

*L. laura**Pal. constructa*

100'100" - 110'110"

*L. laura**A. spiniferoides*

110'110" - 120'120"

*P. flabellum**A. spiniferoides*

140'140" - 175'175" - same

*L. pumila*

175'175" - 180'180"

*S. pennatus**N. triquetra**C. boothii**N. bellistriata**A. spiniferoides**C. mucronatus**S. demissa**A. reticularis*180'180" - 185'185" - rock bed, rather sandy  
forms a cascade at the top of this step.

185'185" - 195'195" - arenaceous shale

195'195" - 210'210" covered

210'210" - 215'215" + 4'

*A. reticul.**S. demissa**N. oblongatus**A. spiniferoides**C. bellistriata**S. pennatus**P. flabellum**Pal. laura*

This interval is capped by a hard calcareo-  
arenaceous layer 1' thick which occurs at  
1104' A.T. This rock is hard and lumpy but does  
not ~~appear~~ appear to be the layer  
with *S. junia* + *S. demissa*

$$\begin{array}{r} 25 \\ 20 \\ \hline 51 \\ 867 \\ \hline 1180 \end{array}$$

$$\begin{array}{r} 265 \\ 220 \\ \hline 485 \\ 523 \\ \hline 1008 \end{array}$$

215' 215" - 235' 235" - coarse sandy rock  
for 18' above the hard layer. It breaks  
into thick chunks. 3' below top of step  
in softer shale *P. iowanensis* abundant

235' 235" - 265' 265" - falls over sandy shale

265' 265" - 270' 270" - softer shale containing

*S. demissa*

*A. spiciferoides*

*A. quadracula*

At 295' 295" - comes hard sand cap rock,  
Portland Point rests

30  
1/2



August 19.  
Fall Brook

At the mouth of Fall Brook the Centerfield is exposed along the lake forming a low cliff for several hundred yards. What appears to be the same rock can be seen on the opposite side of the lake from Fall Brook forming low cliffs.

0' - 30' 30" - top of Centerfield, thus at 900' A.T.

It is at the top a calcareous shale and sandstone extremely hard, difficult to collect and ~~also~~ breaks naturally into large slabs.

30' 30" - 40' 40" - covered

40' 40" - 45' 45" - sandy, crumbly shale -

*A. andacula*      *S. pennatus*

*C. scitulus*      *C. lepidus*

*D. lineatum* ?

45' 45" - 50' 50" - covered

50' 50" - 55' 55" - Upper 2' of this step has sandy sh.

*P. rana*      *M. liata*      *S. pennatus* c

*C. scitulus*      *C. bellistriata*      *L. cuncta*

*A. spiriferoides*

55' 55" - 60' 60" - small calcareous concretions are very abundant at the bottom of this step.

*S. pennatus*, thru all of this shale fossils appear to be limited to thin bands made calcareous by the accumulation of shells.

60' 60" - 65' 65" -

*A. spiriferoides*

*S. pennatus*

*M. concentrica*

*C. boothii*

*A. umbonata*

*C. bellistriata*

*Par. lam.*

*Par. lam.*

*M. piquetana*

*M. tuberculata*

*M. mytiloides*

*Pl. pumila?*

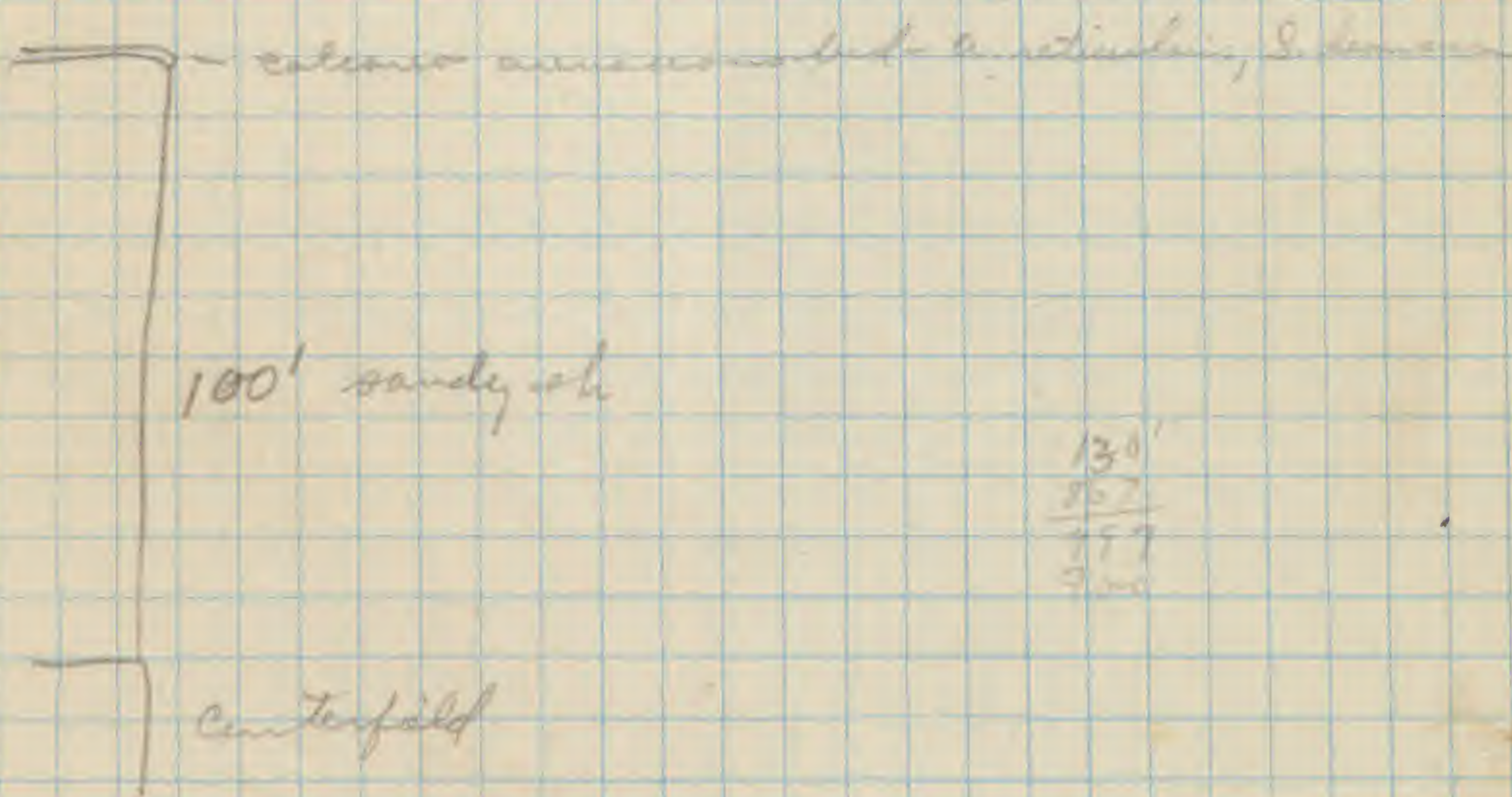
*A. reticulata*

65' 65" - 70' 70" - 2' below the top of this step

a thin sandy layer in the shale is distinctly ripple-marked.

Section at Fall 13-14

130  
- 10  
120



70'70" - 75'75" - sandy shale

*L. laura* *C. bellistriata*  
*N. lirata*  
*A. spiriferoides*

75'75" - 90'90" -

*A. spiriferoides*

90'90" - 95'95" - 100'100" - 105'105" - ~~110'110"~~

*Pal. plana* *C. boethii*  
*P. flabellum* *A. spiriferoides*  
*L. laura*

105'105" - 110'110" - harder shale

*S. rectum* *r* *Pleuropecten* *r*  
*Taonurus* *c* *Orthoceras* *r*  
*A. spiriferoides* *c* *A. reticularis* *r*  
*C. bellistriata* *r* *S. pennatus* *r*  
*Pal. constricta* *r* *R. fimbriata* *r*  
*M. subalata* *r* *O. parvula* *r*  
*Productella* *L. laura*

110'110" - 120'120" - First occurrence *S. demissa*

*A. reticularis* *c* *S. demissa* *r*  
*L. laura*

*A. spiriferoides*

3' above 120'120" is a hard, calcareous-arenaceous layer containing

*A. reticularis* *D. inaequata*  
*A. princeps* *demissa*

120'120" - 125'125" - 2 1/2' of softer arenaceous shale like that below the hard layer

*M. mytiloides* *L. laura* *C. bellistriata*

125'125" - 130'130" -

*S. pennatus* *L. laura* *A. spiriferoides*  
*A. andacula* *S. demissa* *A. reticularis*

135'135" - 140'140" -

*S. pennatus* *L. perplana*  
*P. rana* *Cup coral*

140'140" - 145'145" -

Loose slabs from 140' 140" - 145' 145"   
 spindled

<i>A. reticularis</i>	<i>S. demissa</i>	<i>R. vanuxemi</i>
<i>N. concinna</i>	<i>L. peplana</i>	<i>A. spinifera</i>
<i>L. junia</i>	<i>S. pennatus</i>	<i>P. flabellum</i>

145' 145" - 155' 155" - same - at the top of 155' 155" the rock is a little harder so that it forms a cascade in the stream.

155' 155" - 160' 160" -

<i>S. pennatus</i>	<i>C. mucronatus</i>
<i>C. corrugata</i>	<i>B. leda</i>
<i>A. spinifera</i>	<i>S. demissa</i>
<i>N. concinna</i>	<i>Cyclonema luata</i>

160' 160" - 165' 165"

<i>S. pennatus</i>	<i>N. concinna</i>
<i>Pal. tenuistriata</i>	<i>Leiopteria</i>
<i>P. nana</i>	<i>B. leda</i>
<i>A. reticularis</i>	<i>J. carinatus</i>

165' 165" - 170' 170" - much covered

170' 170" - 175' 175" -

<i>S. demissa</i>	<i>A. spinifera</i>
<i>J. carinatus</i>	<i>G. exhalata</i>
<i>S. pennatus</i>	<i>Pal. constricta</i>
<i>N. autiloides</i>	<i>P. flabellum</i>
<i>C. bellistriata</i>	<i>C. cincta</i>

At the bottom of this step the rock is hard and sandy

175' 175" - 185' 185" - the rock a foot below 185' 185" is hard, sandy, calcareous. for about 2' 185' 185" - 190' 190" + 2' - brings us to bridge. The last 7 1/2' above 185 are very coarse sandy rocks, essentially sandstones breaking into coarse, rough layers. The bridge is at 1708' above the lake or at 1075'.

175' 175" 175'

192' 190" - 217' 215" - covered.

217' 215" - 222' 220" - at the base is a hard layer of sandy rock breaking naturally into large thin / coarse slabs.

*B. pennatus* c

*A. princeps*

Gen. low.

*A. andaula*

*C. bellistriata*

Tully

11' shale

32' shale

S. marcyi zone

1. lam 11'

9' shale

1. lam 1st seen

Layer of concretions

40' shale

49' shale

S. coral

11' shale

S. rectum, A. reticularis, Strophodont

soft sh. 5' no fossils noted

33' covered.

A. umbonata zone 49' thick

11' soft sh.

hard sandy rock 1'

sandy sh 6' P. radiata abundant

shale 5' S. punctata a

shale + ls. 6'

ls 15"

4th falls 23'

2nd falls 8 1/2'

2nd falls 29'

sandy beds 15-20'

P. lowensis

2nd falls 40'

125'

lake level 867

Three-mile Point Ravine

183' for Marcy

60

783  
487  
1150

183  
152  
335  
867  
1202

35'

Aug 19'

## Threemile Pt. Ravine

Lake-level 0' - 30'30" - covered

30'30" - 35'35" - blue-grey arenaceous shales of the  
Hullsville*A. spiniferoides**L. laura**A. reticulatus*

35'35" - 40'40" - same

40'40" - 45'45" - The rock here breaks into thick  
lumps and is quite ~~calcareous~~ fossiliferous*A. reticulatus**S. perversa**S. laura**A. spiniferoides**A. andersoni**S. pennatus*~~*A. reticulatus*~~*M. subulata*

45'45" - 80'50" - same

80'50" - 115'15" - the shale gradually becomes  
sandy and culminates in the top of the first  
falls in a hard sandy rock in places containing  
some lime. The <sup>very</sup> sandy layers extend for about  
15' and at the top is a very hard layer 1/2" thick.  
Fossils at the top of the falls are*S. junia**M. concentrica**A. spiniferoides**C. coronatus**A. princeps**S. pennatus**P. flabellum**P. iowensis**A. macronota*?*L. perplana**L. perplana**P. erinatus**P. iowensis* is especially abundant  
the 1/2' layer on the very brink of the  
falls. The hard rocks of the first  
falls are followed by soft shales  
that pass gradually upward  
into sandy rocks. Fossils seen  
the soft shale within 5' of the  
contact are:-*S. pennatus**A. spiniferoides**M. pygmaea**P. concentrica**P. erinatus**M. corbuleformis**M. subulata**M. lirata*





*P. radiata*  
*M. concentrica*  
*A. reticularis*  
*A. erectum*  
*T. submarginata*

*P. flabellum*  
~~*Pal. truncata*~~  
*M. bellistruata*  
*M. elongatus*

Top of the 2nd fall is at 5 + 2' steps, or 29' high. The upper 5-8' <sup>50'</sup> supposed to be the sandy rock over which the water falls. At the top were seen:

*P. flabellum*      *A. granulosa*  
*Idonurus*

The sandy rocks of the 2nd falls are followed by soft arenaceous shales for 4' but these become sandy for 3' forming a falls 8 1/2' high. Fossils near the contact of the 2nd & 3rd falls are:-

*S. pennatus*      *A. granulosa*  
*A. erectum*      *M. pygmaea*  
~~*Pal. constructa*~~

At the top of the 3rd falls in a hard calcareous rock were seen:

*P. flabellum*      *S. demissa*  
*S. pennatus*      *A. reticularis*  
*A. umbonata*      *S. perversa*  
*A. spiniferoides*      *M. concentrica*

The hard rock of the 3rd falls gives way to soft arenaceous shale again

*A. granulosa*      *S. perversa*  
*S. pennatus*      *C. bellistruata*

Portland Pt.

The 4th falls is 23'. The upper beds are sandy but the falls is over a 15" bed of hard crinoidal ls.

*S. pennatus*      *Camarotoechia*  
*S. cuneatus*  
*A. pustulosa*

The ls. here rests on a ripple of sandstone.

For the Moscow all sites are referred above the limestone.

0' - 5 5" - 10' 10" - 15' 15"

*R. vancouveri* c

*P. rana*

*C. boothii*

*S. pennatus*

*T. papilosa*

*H. dekeyri*

*I. cuneatus*

*R. cyclops*

*C. bellota*

The crinoidal ls. is followed by 5 1/2' of arenaceous and calcareous shale abounding in fossils, especially *R. vancouveri*, *I. cuneatus* and *S. pennatus*. The 1/2' of calcareous arenaceous rock, followed by 5' of shale and then by 6' of arenaceous shale abounding in *P. radiata*. Apparently the Porttrot Point is the lowest 7 1/2' including the crinoidal ls. Fauna seen in the

6 1/2' of sandy shale

*S. pennatus*

*C. boothii*

*Pterinoptera*

*P. radiata* c

*Oriculopora*

*C. mucronata*

*S. granata*

*U. corbuliformis*

*M. pygmaea*

The *P. radiata* bed is followed by 1' of hard calcareous arenaceous shale in 2 layers 1/2' each forming a fall. This hard rock also contains *P. radiata*, *S. pennatus*, *C. coronatus*.

$$\begin{array}{r} 278 \\ 12 \\ \hline 301 \end{array}$$

2.

Following the Pholadella bed is 3' soft shale with

<i>M. concentrica</i>	<i>C. setigera</i>	<i>C. mucronatus</i>
<i>S. punctatus</i>	<i>Can. laevis</i>	<i>Pal. concentrica</i>
<i>R. vanuxemi</i>	<i>C. dentulata</i>	<i>P. rava</i>
<i>A. granulosa</i>	<i>L. pupillana</i>	<i>A. spiniferoides</i>
<i>T. minutus</i>	<i>C. coronatus</i>	

At the top of the ~~5~~ step the shale is soft blue gray, base shaly red-brown rust, and *C. mucronatus* is common. *Ambracilia* appears about 10' above the Pholadella bed. From 11' above the Pholadella bed to 43' above the bed the rock is covered.

At the top of 45'45" above the Pholadella bed was seen

<i>A. reticularis</i>	<i>S. punctatus</i>
<i>L. junia</i>	<i>R. vanuxemi</i>
<i>D. inaequatrata</i>	<i>A. granulosa</i>

Between 45'45" & 50'50" *S. section* is common. To the bridge from the lake it is 308' 49' above the *S. corallina* bed. *L. laevis* was noted in abundance. *L. laevis* evidently only ranges for 17' here as the next step after *S. laevis* was seen first brings the typical things of the *S. marcijana* zone. In the *S. marcijana* zone feet thick were seen

<i>R. fimbriata</i>
<i>R. vanuxemi</i>
<i>A. audacella</i>
<i>Pal. contracta</i>



32' up in the S. coralline zone and  
 for 2 feet is a hard sandy calcareous  
 layer forming a cascade. I saw no  
 black Vitulina shale below the Tully  
 here and there ~~the~~ Leiorhynchus -  
 Vitulina zone does not appear on this  
 side of the lake, at any rate not  
 at this place. The Moscow is here about  
 147' thick. The Tully comes at 1236' A.T.  
 The Tully is 54' above the fork of the  
 stream according to my leveling & the  
 fork of the stream comes 30' above  
 the bridge. *C. praecumbens* is located  
 in a calcareous layer at the fork of  
 the stream at the base of the fall  
 over the Tully.

August 26 Hall's Landing (Du Bois Cottage)

The very top of the Centerfield is at  $\frac{1}{2}$ ' above lake level, disappearing below the lake a short distance south of the ravine. The contact of the Centerfield with the soft shale is excellently exposed.

0' - 5' 5" (base is the Centerfield)

*A. granulosa*

*J. carinatus a.*

*R. vanuxemi*

*A. spiriferoides*

*M. mytiloides*

*D. indequistata*

*S. pennatus*

*E. lincklaemi*

*A. bulbosus*

*Taonurus*

*A. decussata*

*Camerozoechia c*

*R. cyclus*

*S. perflava*

*M. concentrica*

*Par. liam*

*S. sculptilis c*

*A. andacula*

*Pal. constructa*

*P. styloporum* 2' above Centerfield

Fossils seen in the top of the Centerfield are

*Taonurus*

*C. corobatus*

*J. carinatus*

*S. sculptilis*

*S. perversa*

*J. hemisphericus*

*Camerozoechia*

The Centerfield and the shale above are transitional for 4 to 6". The shale above is soft, blue grey, crumbly, sandy.

0' - 50' 30" - same shale.

30' 30" - 35' 35" - same shale at top has small black concretions with *Spirigula*

*S. pennatus*

*R. scitulus*

*S. rectum*

35' 35" - 40' 40" - same

40' 40" - 45' 45" - "

*L. lunata*

*M. liata*

*Orthoceras*

*C. bellistriata*

*M. pygmaea*

45' 45" - 55' 55"

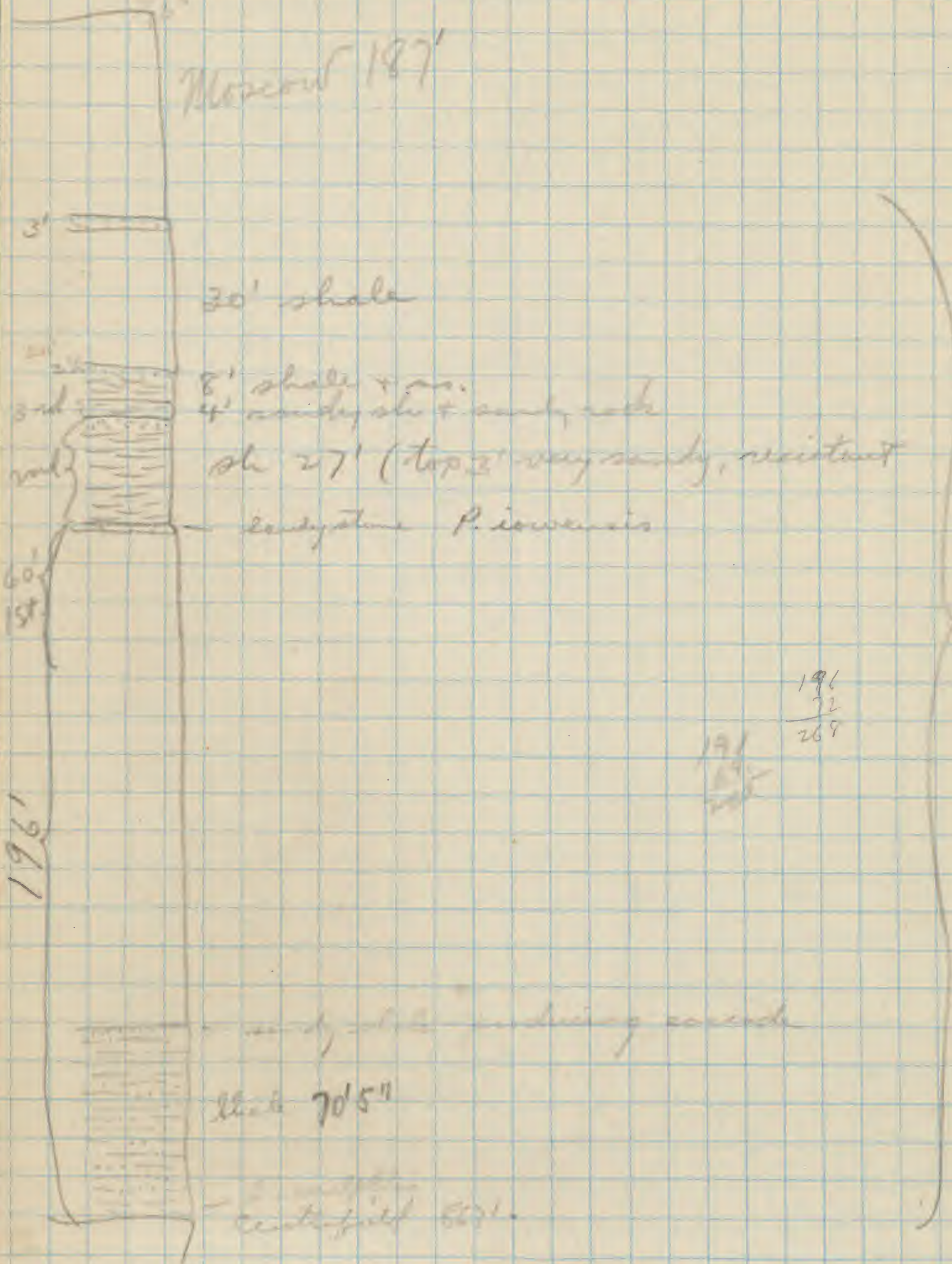
*A. andacula*

*A. spiriferoides*

55' 55" - 65' 65" - local limestones at top of 65' 65"

Section at North Landing

Moscow 187'



30' shale

8' shale + ss.

4' sandy sh + sandy rock

sh 27' (top 3' very sandy, resistant)

conspicuous *P. iowensis*

70'5"

centrifuge ss.

196  
72  
268

1961

265



65'65" - 75'75" - soft shale like that below  
*O. throssus* *A. spiriferoides* *C. bellistriata*

75'75" - 85'85" - same  
 85'85" - 95'95" - same

95'95" - 105'105" -  
*S. pennatus* *L. perplana* *S. parvica*  
*L. laevis* *Phenacops*

105'105" - 125'125" - mostly covered. The top 3' from  
 the base of the first falls. In upper 3' -  
*L. junia* *Orthis* *Pal. tenuistriata*  
*S. pennatus a* *P. oviformis* *B. lida*  
*P. flabellum* *S. depressa*

125'125" - 130'130"  
*S. pennatus* *A. spiriferoides*  
*L. perplana* *J. carinata*  
*S. depressa* *A. decussata*

130'130" - 135'135" - *S. depressa*, *S. rectum*

135'135" - 140'140" -  
*Cystophyllum* *S. pennatus* *P. flabellum*  
*S. depressa* *C. mucronatus*  
*C. bellistriata* *Pal. contracta*

140'140" - 145'145" - same shale  
*A. spiriferoides*  
*S. pennatus a*

145'145" - 150'150" -  
*S. depressa* *S. pennatus* *M. subolata*  
*A. spiriferoides* *R. vanuxemi* *H. lirata*  
*Pal. contracta* *P. flabellum*  
*L. perplana* *C. recurva*  
*M. oblongatus* *Pal. tenuistriata*  
*R. vanuxemi* *L. junia*

187  
1196  
27  
48  
30  
3  
867  

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1320

170  
175  

---

130  
12  
30

170  
175

11  

---

150

195  
1  

---

196  
101  
3  
547

150' 153' - 155' 155" - same  
 155' 155" - 180' 180" - 185' 185" falls - hard sandy  
 rock forms about 21' of the falls. Photo-  
 strophic bed forms brink of 15' falls  
 which is 6 1/4' thick

The sandy rock at the top of the falls  
 is succeeded by soft shale, *S. constrictus*  
 and *S. pennatus* abundant, many small  
*Pelecypoda* list of Aug 19' good.

185' 185' - 190' 190" - 195' 195" - soft crumbly sh  
 195' 195" - 200' 200" -

<i>C. bellistriata</i>	<i>Pal. constructa</i>
<i>P. acutum</i>	<i>C. scutulus</i>
<i>Agonostrophia</i>	<i>M. concentrica</i>
<i>Pan. harr.</i>	<i>A. decussata</i>
<i>S. pennatus</i>	<i>D. variata</i>

200' 200" - 210' 210" - Top of second falls, over  
 3' of sandy rock, hard & resistant.

Above the second falls is 4' of arenaceous  
 shale grading into very sandy, irregular  
 partings, a type of cross bedding.

210' 210" + 4' - top of 3rd falls.

214' 210" + 8' - top of 4th falls, includes  
 5 1/2' of soft shale grading into sandstone or  
 very sandy shale. This is the same bed  
 as the small red falls in Aug 19'. Fossils  
 in this bed are:

<i>M. concentrica</i>	<i>P. flatellum</i>
<i>Pal. marginata</i>	<i>H. debrayi</i>
<i>S. constrictus</i>	<i>S. pennatus</i>

The 5th falls is 20' high has 3' of  
 coarse sandstone

Elevation of Portland Point 1132' A.T.

$$\begin{array}{r} 34 \\ 5 \\ \hline 170 \\ 14 \\ \hline 184 \\ 3 \\ \hline 187 \end{array}$$

$$\begin{array}{r} 867 \\ 265 \\ \hline 1132 \\ 187 \\ \hline 1319 \end{array}$$

July at 34 days 7:31 or 187' makes it  
at 1320 A.T.

D W Trainer, Jr.  
218 Wait Ave.  
Ottawa, N.Y.

Best Ludlowville section is that located  
in Hall's Landing Ravine where the  
Centerfield is at Lake-level. The Ludlowville  
here is 265 feet thick. It is divisible into  
three distinct divisions - 1

1. The softish shale from the top of the  
Centerfield to the end including (perhaps  
individual) the *Pholidostrophia* band.
2. 27' - 30' above the *Pholidostrophia* bed to
3. The 8' falls - and the shale + ss to  
the base of the Portland Point ls.

The top of the Moscow on the west  
side of the lake did not have any  
representative of the *Vitulina*-*Leiorhynchus*  
zone, the shale being essentially bluish  
right to the contact. On the east side  
of the lake at Hall's Landing two or three  
feet of dark <sup>shale</sup> were noted but on Otisco  
lake the upper 55" (5 1/2') of the Moscow  
contained *S. Jullis*, altho *V. pustulosa* &  
*L. laura* were not seen this is one of  
the important elements of the *Leiorhynchus*  
*Vitulina* zone.

$$\begin{array}{r} 1471 \\ 12 \\ \hline 213 \\ \hline 652 \end{array}$$

Aug 21.  
Barber Point

10' above lake-level in the soft shales above the Centerfield is a thin bed of corals, probably representing the tail end of one of the thin reefs. The layer is about 3-4" thick & abundant in corals. Other fossils are:

<i>P. rana</i>	<i>S. punctatus</i>	<i>L. lina</i>
<i>A. spiniferoides</i>	<i>M. corbuliformis</i>	

The coral bed is followed by soft rather unconsolidated shales containing:

<i>P. fragilis</i>	<i>S. punctatus</i>
--------------------	---------------------

4 1/2' above the first coral bed occur some discontinuous patches of corals at different levels within two feet of each other. Connections are not uncommon in the shale between the two coral horizons. From lake-level to the *Pholidostrophia* bed is 25' top - 2' or 155'. The fall is about 15' or 75' of hard sandy rock.

The *Pholidostrophia* bed is 1 1/2' thick and the *P. vivensis* ranges at least as far down as 6" from the top, but appears most abundant at the top. Other fossils in this bed are:

<i>A. granulosa</i>	<i>S. punctatus</i>	<i>L. papilosa</i>
<i>C. coronatus</i>	<i>A. princeps</i>	

Fossils in shale above *P. vivensis* bed:-

<i>S. punctatus</i>	<i>P. radiata</i> or	<i>S. punctatus</i>
<i>M. triquetra</i>	<i>A. erectus</i>	
<i>M. bellistata</i>	<i>I. subequata</i>	
<i>A. spiniferoides</i>	<i>A. princeps</i>	
<i>I. coronatus</i>	<i>P. glabella</i>	
<i>C. scutellus</i>	<i>M. concentrica</i>	
<i>C. bellistata</i>	<i>L. papilosa</i>	
<i>M. blonardus</i>	<i>B. laticosta</i>	

Section at Santa Rita  
Continued on next page



M. pygmaea zone 5-6'  
~~S. ... zone 5-8'?~~

49' a. umbonata zone 103  
23  
76

1' sh + sandy sh  
 6" sandy sh  
 massive bluish sh 5 1/2' *Pholadella* bed

11' sandy sh bed  
 5' soft sh  
 10' hard sh, ls + limy sandy sh 11'

29' sandy sh

8' sandy sh

4'

280' - shale + ls

11 1/2'

144' Arenaceous  
 sandy blue gray sh

11' sh  
 cherty bed

158  
 23  
 281  
 225  
 56  
 121



The top 3' of the bed above the Rhynchonellid bed is of hard sandy rock forming a fall. This hard rock gives way to a softer shale and then to sandy rock again for 1 1/2'. Then the layer above the Rhynchonellid bed is a soft shale passing gradually into a very hard sandy rock rather calcareous in places at the top and breaking naturally into irregularly chunky blocks, very frequently having a curved surface.

In the sandstone of the 4' layer are:

<i>P. flabellum</i>	<i>S. pennatus</i>	<i>E. bannockensis</i>
<i>T. carinatus</i>	<i>S. demissa</i>	<i>A. granulosa</i>

The 4' bed is followed by about 5' of soft, sandy shale, and then by 3' of irregularly bedded sandy rock. In the shale above are:

<i>S. pennatus</i>	
<i>A. erectum</i>	
In the 3' of ss:	
<i>C. bell-shaped</i>	<i>T. ballulus</i>
<i>P. flabellum</i>	<i>A. carinatus</i>
<i>A. erectum</i>	<i>S. pennatus</i>
<i>T. carinatus</i>	
<i>A. granulosa</i>	

The 8' fall is followed by 2' of shale softer than the hard ss rock forming the ledge above. This shale is harder than the soft shale that follows it. It contains:

<i>P. flabellum</i>	<i>T. carinatus</i>
<i>S. pennatus</i>	<i>M. americana</i>
<i>S. demissa</i>	
<i>A. bannockensis</i>	
<i>E. bannockensis</i>	
<i>A. granulosa</i>	

Fossils seen in Portland  
Point in side of stone blocks

<i>C. vicinus</i>	<i>S. gemmatus</i> c	<i>H. vanuxemi</i> c
<i>L. perglans</i> c	<i>C. impressa</i> r	<i>T. cassinata</i> a
<i>C. colorata</i> a	<i>C. blattii</i> r	<i>V. punctulosa</i> r
<i>S. perversa</i> r	<i>P. latyca</i> r	<i>P. rana</i> r
<i>S. stultus</i> r	<i>H. delsoni</i> r	<i>Pholidops</i> a
<i>P. isorensis</i> r	<i>A. maculata</i>	<i>C. indenta</i>

Lully



3 1/2' soft dark shale

5 1/2' arenaceous sh. blue

10 1/2' / 10 1/2' / 2 1/2' / 30'

30' shale passing up in  
class arenaceous rock

*L. laura* 9'  
*m. pygmalus*

For fully 5' above the 8' falls there are alternate hard & soft sh. Fossils in this 5' include those above and the following:-

<i>A. undulata</i> r	<i>A. granulosa</i> r
<i>A. spiferoides</i> r	<i>S. lamiosa</i> r
<i>A. pinnatus</i> r	<i>P. oviferans</i> r
<i>L. periplana</i> c	<i>L. lamia</i> r
<i>P. cincta</i> r	<i>P. rana</i> r
<i>Actinopteria</i> sp.	<i>S. perversa</i> r
<i>A. decussata</i> h	<i>M. concentrica</i> r
<i>S. pinnatus</i> c	<i>P. carinatus</i> c
<i>C. bellistata</i> r	

Fossils seen between sand 16' above the 8' falls are:

<i>P. lamia</i>	<i>C. cincta</i> c	<i>P. cincta</i>
<i>P. labellum</i>	<i>C. bellistata</i>	<i>A. cincta</i>
<i>Productella</i>	<i>P. bellistata</i>	<i>M. concentrica</i>
<i>S. pinnatus</i>	<i>C. cincta</i>	<i>L. periplana</i>
<i>P. carinatus</i> c	<i>P. rana</i>	

The uppermost division here is 29' thick and has about 3' of hard sandstone at the top. Cardinal ls of the Portland Point is at 1092' A.T.

The upper 30' interval of the Fullonville is like the same interval on the Caymanian quadrangle at Fabius. The rocks just below the Portland Point cardinal limestone is a hard heavy ss. containing a spirifer which appears to be *trullus*.

The basal bed of the Portland Point is 16' thick, abundant in fossils, it is a serriphe shell breccia for corium which weathers to a brown-grey color. *Utricularia* was most common in the lower 4". The *Centronella* were found near the top.

Above the crinoidal bed the rock for  
 5'5" was covered  
 0'-5'5" - covered  
 5'5"-10'10" - sandy shale with some calcareous  
 sandy shale:

*I. carinatus*

*R. vanuxemi*

*G. capillina*

*C. tenuistriata*

*M. oblongatus*

*R. vanuxemi* ranges as high as 10' above  
 the crinoidal stone and should refer at  
 least this much rock to the Portland  
 Point member.

10'10"-15'15" - This interval is of soft sh  
 abounding in *S. pennatus* & *I. carinatus*,

*M. triquetra*

*Pal. costata*

This zone is terminated by a foot of hard  
 sandy shale and is followed by a foot  
 of blue gray sandy shale. The lower hard  
 layer has *G. arcuata*. In the shale  
 between the hard layer and the soft  
 hard layer above were seen:-

*B. leda*

*Pterinopecten*

*Pal. costata*

*C. mucronatus*

*Avicullopecten*

*M. corbuliformis*

*S. pennatus*

*P. tenuis*

*C. setigerus*

*Par. laevi*

*M. triquetra*

*M. costata*

*C. bottii*

*P. calva*

*P. radiata*

*M. bellistriata*

*M. pygmaea*

*S. of bivalvia*

~~2'15"~~ 15'15" - This step has about 2' covered &  
 shows 2' of the *Pholadella* bed followed  
 by a 6" layer of hard sandy shale  
 followed by 9" of soft sh and 3" of  
 hard sandy sh.

In the 4" arenaceous bed on the  
*Pholadella* bed were seen:-

*S. pennatus*

*I. carinatus*

In the 9" shale above it occur:

*I. carinatus*

*M. pygmaea*

*Lophonema*

*Taronus*

*C. mucronatus*

*Sch. druingensis*

*Gammyia* sp.

*P. diisidum*

*P. radiata*

*S. pennatus*

*C. coronatus*

3' 3" sandy bed  
 S. punctatus  
 Pal. contracta  
 C. mucronatus

The *Platystrophia* bed is followed by soft  
 shale which begins with *C. mucronatus*  
 0' - 5' 5" of this sh. - This rock is blue and  
 crumbly.

*A. umbonata* *M. orbiculiformis* *C. mucronatus*  
*C. boothii* *Pal. contracta* *P. rana*  
*C. setigera* *I. submarginata* *C. boothii*  
*S. reversa* *M. lirata* *Platystrophia*  
*L. p. plana*

5' 5" - 10' 10" small *Chonetes* are especially  
 abundant in this interval

5' 5" - 10' 10" - covered

10' 10" - 15' 15" - same soft sh. Small  
 concretions are common.

*H. triquetra* *P. tenuis*  
 Shale rests red brown.

15' 15" - 20' 20" - same

20' 20" - 25' 25" -

*P. rana* *Lingula delia* *P. marginata*  
*C. bellistriata* *S. gemmatus* *C. umbonata*  
*Pal. contracta* *C. mucronatus* *M. lirata*  
*P. plana* *I. submarginata*  
*C. acitulus* *C. setigerus* *O. media*  
*M. bellistriata*

25' 25" - 30' 30" -

*A. umbonata* *P. radiata*  
*S. gemmatus* *R. compressa*  
*C. boothii* *I. contracta*  
*C. setigerus* *M. lirata*  
*P. rana*  
*S. reversa*  
*C. bellistriata*  
*L. p. plana*

30' 30" - 35' 55" - covered

35' 35" - 40' 40" -

*P. rana*

Parham

*A. umbonata**C. subrotunda*40' 40" - 45' 45" - The *Ambonata* zone, right up to the top of this interval. The *Ambonata* zone is about 50' thick.

45' 45" - 50' 50" - At the base of 45' 45" is a 4" bed of somewhat calcareous shale abundant in the following fossils:

*A. reticulata* c*S. rectus* c*S. inequistrata* c*S. capillaria**A. andrea**C. antiquus**A. spiniferoides**S. plana**R. vancouverensis* c*P. contracta**L. furia**M. constricta**A. granulosa**P. rana**L. punctata**A. umbonata*50' 50" - 55' 55" - The *S. constricta* zone does not reach the top of this step & must not be much more than 5" thick. I could not determine the thickness exactly.

Fossils in the top 2' of this interval are:

*A. umbonata* c*S. punctatus**P. contracta**M. bellistata*

Parham

55' 55" - 65' 65" -

*M. triquetra**S. capillaria**T. rana**A. umbonata*

65' 65" - 75' 75" - same shale

This shale exhibits no bedding in the weathered sections and has all the appearance of a sandstone, fractured into irregular masses, but crumbles into small fragments on weathering.

105  
8  
123  
57  
56

75' 75" - 85' 85" - same

85' 85" - 95' 95" - same

<i>S. pennatus</i>	<i>M. concentrica</i>
<i>A. umbonata</i>	<i>M. trigonata</i>
<i>A. mucronata</i>	<i>P. rana</i>

<i>S. crotalum</i>	<i>A. granulosa</i>
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<i>Schiz. chumensis</i>	<i>P. rana</i>
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<i>Pal. costata</i>	<i>C. mucronatus</i>
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<i>Platyceras</i> sp.	<i>A. spiniferoides</i>
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At the top of this interval is a large calcareous concretion.

95' 95" - 100' 100" -

*N. liata* c*S. tullius* c*C. setigerus**Pal. costata**G. arcuata**N. capillaria**A. spiniferoides**N. lamellata**C. boottii*

C. in plate

*A. umbonata**P. rana**N. oblongatus**N. variosa**S. crotalum**Leiziteria* sp.*S. pennatus**A. reticularis**C. mucronatus*

100' 100" - 105' 105" -

*L. laura**P. discoidium**A. umbonata**S. tullius*

The *L. laura* comes in 3' below 105' 105" or at 56' above the top of the *S. coralline* zone. At the very top of 105' 105" is a layer 2" thick having the following fossils:

*A. spiniferoides**A. praecumbona**A. granulosa**M. concentrica**L. laura**C. mucronatus**S. cusinatus**N. liata**N. oblongatus*



$$\begin{array}{r} 1092 \\ 186 \\ \hline 1278 \end{array}$$

$$\begin{array}{r} 140140 \\ 110110 \\ \hline 3030 \end{array}$$

105' 105" - 110' 110"

Soft dark shale

<i>L. labiosa</i>	<i>A. plicatula</i>
<i>L. tellus</i>	<i>A. thuracula</i>
<i>A. umbonata</i>	<i>M. concentrica</i>
<i>M. subalata</i>	<i>P. rana</i>
<i>R. campylo</i>	<i>C. spinifera</i>
<i>A. reticulata</i>	

A layer of concretions is above the *A. plicatula* bed. The zone with *A. thuracula* is *L. band* is about 9' thick terminating at the top of 110' 110".

110' 110" - 115' 115" - mostly covered

115' 115" - 120' 120" - 140' 140" - Top of falls just below fully hard calcareous layers. These are about 5 1/2' thick. Fossils seen in the hard ledge below the fully are:-

<i>L. junia</i>	<i>C. coronatus</i>
<i>R. campylo</i>	<i>A. granulosa</i>
<i>L. plicata</i>	<i>S. gemmatus</i>
Massive <i>Bygonia</i>	<i>M. concentrica</i>
<i>P. cuneatus</i>	<i>B. decussata</i>

140' 140" - 145' 145" This interval includes 4 1/2' of the hard rock forming the ledge and a foot of sandy shale. Above the hard ledge is 5 1/2' of arenaceous shales. This is followed by 3 1/2' of dark soft shale and this is succeeded by the fully, the base of which is at 1278' A.T.

567

567

In the 3 1/2' of black shale were seen  
*S. cristatum*  
*C. setigerus*

Aug 22, -

Fossils in 15' of shale above Centerfield contact:-

<i>P. vertummus</i>	<i>A. macronota</i>
<i>D. macquatrata</i> c	<i>R. limbriata</i>
<i>J. cinctus</i> a	<i>Pal. emarginata</i>
<i>A. decussata</i> c	<i>L. junia</i>
<i>Pan. haueri</i> r.	<i>A. reticularis</i>
<i>A. spiriferoides</i> r.	<i>Schiz. cheunungensis</i>
<i>R. vancouveri</i> c	<i>L. perversa</i>
<i>P. iowensis</i> r.	<i>L. perplana</i> c
<i>C. ridentia</i>	<i>G. capillaria</i>
<i>A. granulosa</i>	<i>N. concinna</i>
<i>P. radiata</i>	<i>G. capillaria</i>
<i>C. bellistruata</i>	<i>P. rana</i>
<i>Cammarotoechia</i>	<i>C. boothii</i>
<i>P. patulus</i>	<i>B. cretaria</i>
<i>Pal. plana</i>	<i>M. concentrica</i>
<i>Pal. contracta</i>	<i>P. styloporum</i>
<i>C. planirostris</i>	<i>Cran. haueri</i>
<i>R. cyclos</i>	<i>A. princeps</i>
<i>O. parvula</i>	

Fossils 8' above the	<i>Pholidostrophia</i> bed:
<i>P. flabellum</i>	<i>C. bellistruata</i> c
<i>Pal. perplana</i>	<i>A. spiriferoides</i> c
<i>L. penetrata</i> a	<i>P. contracta</i>
<i>M. cinctus</i>	<i>P. tenuis</i>
<i>C. coronatus</i>	<i>A. reticularis</i>
<i>P. emarginata</i>	<i>L. perplana</i>

569

569

Fossils in the ss. of the 81 falls are;  
P. flabellum S. lamiosa  
A. granulosa

Recollections on the Senecaates Region.

Marcellus - The Marcellus-Onondaga contact is in the village of Marcellus near the elevation of ~~640~~ 640' A.S.T. Between this contact and the Agoniatites ls. is about 13' of limestone and shale, both jet-black. For this division I would suggest the name Union Springs member. Then follows the Agoniatites ls. only seen in the Jochems mine but said to be about three feet in thickness. Then comes the black fissile shale of the Marcellus which I make to be 81' thick. This is followed by the Cardiff shale here 137' thick. The Marcellus & Cardiff formed by my Marcellus formation but for this I would substitute the name Chittenango formation, which would be subdivided as follows:

Chittenango	}	Cardiff member
Chittenango formation		Marcellus member
		Cherry Valley Member
		Union Springs Member

The section about Chittenango is excellent and would form a good type section.

Cardiff - The Cardiff is well exposed in the fallsquirt ravine and the one next southeast of it. 137' of soft grey shales, barren of fossils for a considerable distance but becoming fossiliferous near the top. This division is limited at the top by the Mottville member, fossiliferous for 10 or 15', containing *Agoniatites* and a calcareous band. This is clearly a representative of the Stafford to the west and forms the base of the Senecaates.

Total

Shanectetes: The Shanectetes in the Shanectetes, the type region was a great surprise and consists of more divisions than I had dreamed of. At the base is the Mottville, which is followed by soft shale like the Cardiff for approximately 160' where a thin concretionary layer abounding in *Hyassa* is seen. 20+ feet above this layer is a concretionary bed and then 11' of shale abounding in *S. pennatus* and *A. umbonata* followed by a 6" bed of sandstone, making of this division in all 290' ±. The *S. pennatus* beds are followed by 98' of blackish shale like the Ledyard in fauna and lithology but clearly referable to my Randallville shale. This terminates in about 10' of beds transitional lithologically to the Centerfield member. Thus the Shanectetes is about 389' thick

Shanectetes { Randallville member  
 Unnamed division which is the equivalent of the Peckport, Delfia, + Pompey members

Be careful about securing a name for this division as it may cause trouble. The Bear Mountain member or Marietta member might be permissible, altho taking the name Marietta would probably encroach on Prof. Smith's rights.

Ludlowville - The Ludlowville opens with the Centerfield, which I make ~~to~~ 60' thick and is followed by shale and sandstone for 265', making at total for the Ludlowville of 325'. The Centerfield is a very sandy stone, but extremely limery in places. The presence of *Vitulina* and *Emella* convinced me of its

identity with the Centerfield of the Cayuga Lake region. Prof. Smith claims to have followed this along the shores of Oswego Lake to the back of the hotel at Enmore, and eastward down the shores of Skaneateles Lake as far as Barber Point on the east side of the lake. He has also followed it down Otisco Lake where he finds it at the mouth of the Bucktail ravine and at the top of the Fellows Falls. Eastward it must be the equivalent of the campus Quarry sandstone.

The Centerfield is succeeded by bluish-grey sandy shales with *P. acinatus*, *B. sculptilis* in abundance. This is also the only occurrence of *P. styliporum*. It is interesting to note that this fossil was only found above the Red Gate ls. on the Morrisville quadrangle. Hence this is essentially the same position as at Skaneateles Lake. This shale continues to the top of most of the <sup>first</sup> falls in the gullies where a bed with *Pholidostrophia* occurs. This division capped by the hard rocks of the *Pholidostrophia* bed forms a natural division and should receive a name. This is followed by soft shale grading into ss., and this by the same sequence each division about 30' thick. These likewise could receive names. Hence the Ludlowville of the territory between Skaneateles Lake and Cassenovia could be subdivided into 4 members.

			Morrisville
Ludlowville	}	New member	Earville shale
		" "	
		" "	
		Centerfield member	



Moscow formation - The Ludlowville formation is succeeded by about 16" of hard shell breccia containing among other fossils *Centronella impressa* and *Vitulina pustulosa* 2 shells diagnostic of the basal limestone of the Portland Point member. This is succeeded by sandy shale, calcareous sandy shale and limestone containing essentially the same fauna as the limestone. These aggregate about 11' and are referred to the Portland Point member.

The Portland Point is followed by 5' of soft shale abounding in *S. pennatus* and then by about 7' of the sandy shale containing especially *Pholadella radiata*. Then comes the *Ambocoelia* zone for fully 40', followed by the *S. coralline* zone, not clearly differentiated by me and the *Modiella* zone for fully 50', followed by a *Liorhynchus*-*Spirifer* *Gulliver*-*Ambocoelia* zone for about 11', then the *S. morayi* zone. On the west side of Slavesdale, Lake in Three-mile Point Ravine there was seen no black shale, fissile, below the July, but on the east side of the lake there was 3' of it and on the west side of Otisco Lake about 5 1/2' of it containing *S. tullus* in abundance. Apparently then my unconformity is more clearly defined than I realized, the Hamiltons having been domed & placed off in the Slavesdale region. East of Otisco Lake the *Liorhynchus*-*Vitulina* zone comes in in full force and is an important part of the Ovid.

Note: - *V. pustulosa* was also noted above the Centerfield and the upper foot or two of the Centerfield contains the same fauna as in the shale above it. The two beds are clearly transitional, faunally & lithologically.

574

Section on Skaneateles Lake 574  
22  
667

Hamilton

Moscow formation { Ovid member 175'  
Portland Point member 11'

Ludlowville shale formation { New member 30'  
New member 42'  
New member 196'  
Centerfall member 60'

Skaneateles formation { Randallville member 98'  
Bear Mountain member 280'

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~~84~~ Total Hamilton — 892'

Clutterango formation { Cardiff member 137'  
Marcellus member 81'  
Cherry Valley member 3'  
Union Springs member 13'

Total Hamilton & Clutterango — 1126'

1060  
958

575

1927

575

Aug 18.

Along the east shore of Shauwates Lake a short stop was made to look at some shales about 2 miles south of the village. In the water and three feet above were dark grey shales that broke into fairly large slabs. The shale was a dark grey and was soft. It contained masses of *Lecorhynchus*. Other fossils noted were *E. subulatum*, *Panuka* sp. Above this came shales that were a dark-blue-grey but were soft and broke into very fine chips by natural agencies. The shaliness of the 3' of lower shales was in marked contrast to the friability of the upper 8 or 10' of shales. Soft shales were noted for a considerable distance down the lake.

Altho' I have never seen the coral reef on the east side of the lake I believe that it belongs to the Centerfield and not to Encinal as Luther early supposed. In Cleland's pamphlet on page 85 (USGS Bull. 206) he states that the reef is located 2 1/2 miles from the head of the lake. With the low dip of the rocks, coupled with the low relief of the land along the north end of the lake, I believe that stratigraphically the coral horizon (is that) of the Centerfield. I noticed fine shales like the Shauwates for at least 2 1/2 down the lake road. Some at least may have been in the lower Ludlowville.

July 17

Smoke Creek at Window

Beds at 0' below highway bridge are soft shales containing small fragments. at 490' the shales are the same but *S. pennatus* and *P. rana* were seen. At 580' <sup>feet</sup> and for about 4' vertical the shales are crowded with grotesquely formed concretions. In this bed corals (*Strophomena*?) and *P. stylipora*, *S. spiniferoides* & *P. penelope* were seen. There is also a thin band of ls. very hard, with *P. scitulus*, *P. rana* & *A. umbonata*.

Between 800 + 900 there are exposed in the bank about 15-20' of shale. The stream bed & the bank 12' above yielded the richest fauna:-

- |                           |   |
|---------------------------|---|
| <i>P. iowensis</i> c      | <i>M. concentrica</i>                   |
| <i>C. scitulus</i> c      | <i>M. subalata</i>                      |
| <i>A. umbonata</i> c      | <i>Productella</i>                      |
| <i>S. granulatus</i> r    | <i>S. demissus</i>                      |
| <i>S. pennatus</i> cc     | <i>B. loda</i>                          |
| <i>C. spiniferoides</i> c | <i>P. penelope</i>                      |
| <i>P. concentrica</i> r   | <i>C. brottoni</i> var <i>collitata</i> |
| <i>S. perplana</i> r      | <i>Platyceras</i> sp                    |
| <i>P. rana</i> cc         | <i>Sphincterites</i>                    |
| Small corals              | <i>C. bellistriatus</i>                 |
| <i>M. conicina</i>        | <i>A. princeps</i> ?                    |

Bed: *Bellevue*  
*Substrate*  
 Dec. 15

The shales here were somewhat harder. *Tasmanus* was observed at 988 feet. also at the same place a large lens of blue grey ls. with

- |  |                         |
|--|-------------------------|
| <i>A. boydi</i>                            | <i>S. pennatus</i>      |
| <i>C. scitulus</i>                         | Many bryozoa            |
| <i>P. rana</i>                             | Cinoid stems            |
| <i>A. umbonata</i>                         | <i>C. spiniferoides</i> |
| <i>Platyceras</i>                          | <i>C. narutoechus</i>   |
| <i>P. flabellum</i>                        | <i>P. stylipora</i>     |
| Aggregative of ls lenses in Electric Light |                         |

At 1100 paces the band with *P. ionensis* crosses the stream. 17 paces above another band of ls with *P. rana* crosses the stream. A shale of a few inches thickness intervenes.

At 1300 a ls band with many *Spirifer* & *P. rana* causes a cascade in the stream. At 1775 paces the highway bridge at Douhaiges Park is encountered.

On the upstream side of the bridge is an exposure of upper Ludlowville about 20' vertical showing rounded calcareous concretions. This exposure is like those on 18 mi Cole.

300 paces upstream is another exposure and the *Dickerson* is in it about 15' up. Here the Ludlowville has *S. pinnatus* & *A. squifera* in abundance.

596 paces upstream the *Dickerson* is only 6' above the stream. Here the bottom of the block has large nodules & branching masses of fossils. At 725 paces upstream the *Dickerson* crosses the stream & forms a fall. It is 21" to 2' in thickness & has a very pitted uneven surface.

## Moscow

The first 2 inches of shale on  
the Dickerson ledge

*S. tullius?*

*S. pennatus*

*A. spiriferoides*

*A. unilobata*

Corals

*P. rana*

The *A. spiriferoides* of the lower  
Moscow do not seem to have  
reached the perfection of size  
as those in the Ludlowville

3' up hard band with *Streptelasma*  
corals forms a ledge in the  
stream.

1180 paces a bank of Moscow  
about 30-35' high. Too dark  
now for fossils

at 2100 paces the second highway  
bridge crossing of the Electric  
railroad is met. Here a ls.  
ledge in the uppermost Moscow  
crosses the brook on the downstream  
side. The Genesee ls. must  
be on the upstream side of the  
bridge E. 130 200 yds. above  
bridge a limestone ledge was  
observed & is probably Genesee

All of the streams here about  
form wide exposures on their  
floors and the beds are exposed  
for great distances.

Time prevent a critical study  
of the upper contact of the Moscow  
as dusk came before this was  
reached.



$$\begin{array}{r} 300 \\ \hline 600 \\ 75 \\ 3 \overline{) 675} = 225 \end{array}$$
  
$$\begin{array}{r} 68 \overline{) 225} \\ \underline{204} \\ 21 \end{array} \quad (3)$$

197580

580

July 21

## South Branch Susquehanna Creek.

Examination begun where creek passes under

Townline road.

10-248 paces from bridge - 10 feet soft shale, dark brown in cross section, faint petaloid color. *S. fenestella* abundant, *C. setigerus*, etc. These are exposed up to 48 paces, thus 180-248 paces, and vertically for 10'. In places they are fissile.

248-435 - covered

435 - 590 - same fissile shale. At 547 paces the shale is the same, it is dark grey with a brownish cast to it, weathering a shaly grey. *C. lepidus* etc. 11' above stream-level at this place is 1 1/2' of shaly limestone containing very few fossils. This bed is probably the Centerfield equivalent. It is 11' above stream-level at 547 paces. Additional fossils in the shales are:  
*Liorhynchus* sp. etc.

590-650 - ~~shale~~ covered

650-684 Shale - *Nuculites* sp. - all exposed at stream-level.

684-819 - covered

819-843 - at 819 the top of the *Styliola* band or Centerfield is exposed. *S. fenestella* is abundant. *Pithoceras* sp. was seen. It is a brownish grey shaly ls., quite hard. It is thus exposed about 4 miles upstream from Townline road bridge.

*Eucampylus**N. oblongatus**Liorhynchus* sp.*M. myssa?**Pithoceras* sp.*C. lepidus**C. setigerus*

Section at 575 paces  
soil cover

6' soft gray sh. - fossiliferous. Ladysard

1 1/2' Centerfield ?

10' soft brownish gray sh. Shinarump

Stream level

843-1060 - Covered

1060-1160 - cliff of Ledyard sh, soft grey sh.  
15' high.

1160-1303 - Covered but for about 15 paces at  
stream level at 1160.

1303-1387 - 5' cliffs sparsely fossiliferous - much  
like shale below *Stylolela* bed.

1387-1580 - covered

1580-1630 Shale soft, argillaceous, weather to  
a blue grey. Fossils, more abundant and  
typically Hamiltonian -

*B. umbonata* or

*H. corbuliformis* or

*C. setigera* or

*B. ledya* or

*S. pennatus* or

*P. rana* or

*C. boothii* or

*C. lepidus*

New Bridge is at 1630, not shown on map  
but may be a continuation of short road  
at end of h in word branch.

From this bridge to the next bridge I  
shall not note all exposures as previously  
and believe it is practically all shale.

1630-2264 - same intermittently

2264 - pyrite and calcareous concretions  
abundant at a, at entrance to a small draw  
Photo - *L. perplana*, *S. pennatus*,

A few of the concretions are very fossiliferous  
containing *C. sutulus*, *P. stylophorum*, *S. rana*,  
*L. hamiltoniae*, *C. spiciferoides*

Bridge 1630

1630 - 1780 - blue shale -

1780 - 1835 - covered

1835 - 2270 - continuous exposures at 2270  
 comes concretionary beds and small gully  
 concretions very irregular. *Murchisonia* bed must  
 be a short distance below the concretionary  
 bed and is probably covered.

2270 - 2353 - shale containing concretions and a  
 few *P. styliformis*. At 2353 is a layer of  
 shale abundant in a small trilobite, and  
 containing *T. carinatus*

2353 - 2517 - soft shale at 2517 *S. granulosa*  
 appears associated with *P. styliformis*.

Fossils in the part of soft shale below  
 the 1st trilobite bed are:

*A. spinulosoides* c

*S. granulosa* re

*R. frimbriata*

*A. lowensis*

*A. decussata* re

*S. pennatus*

*N. concinna* re

*H. delavayi* vr

*S. rectus* c

*T. carinatus* r

*L. perplana*

*R. wanneri*

*C. boothi*

*C. scutellus* re

*C. induta* r

*L. perplana*

*C. bellistriata*

*M. concentrica*

*T. concinna*

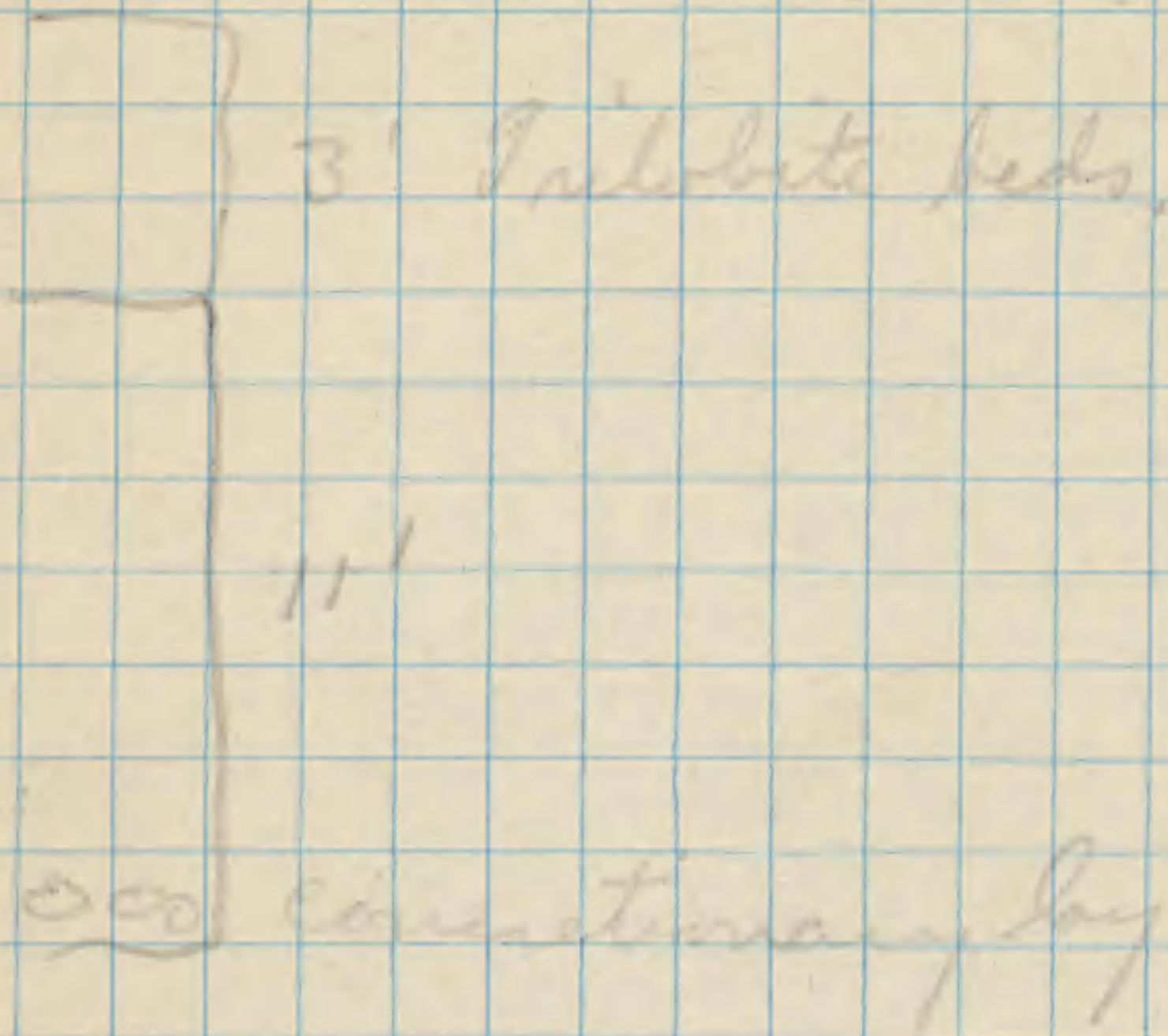
*A. princeps*

*A. macronota*

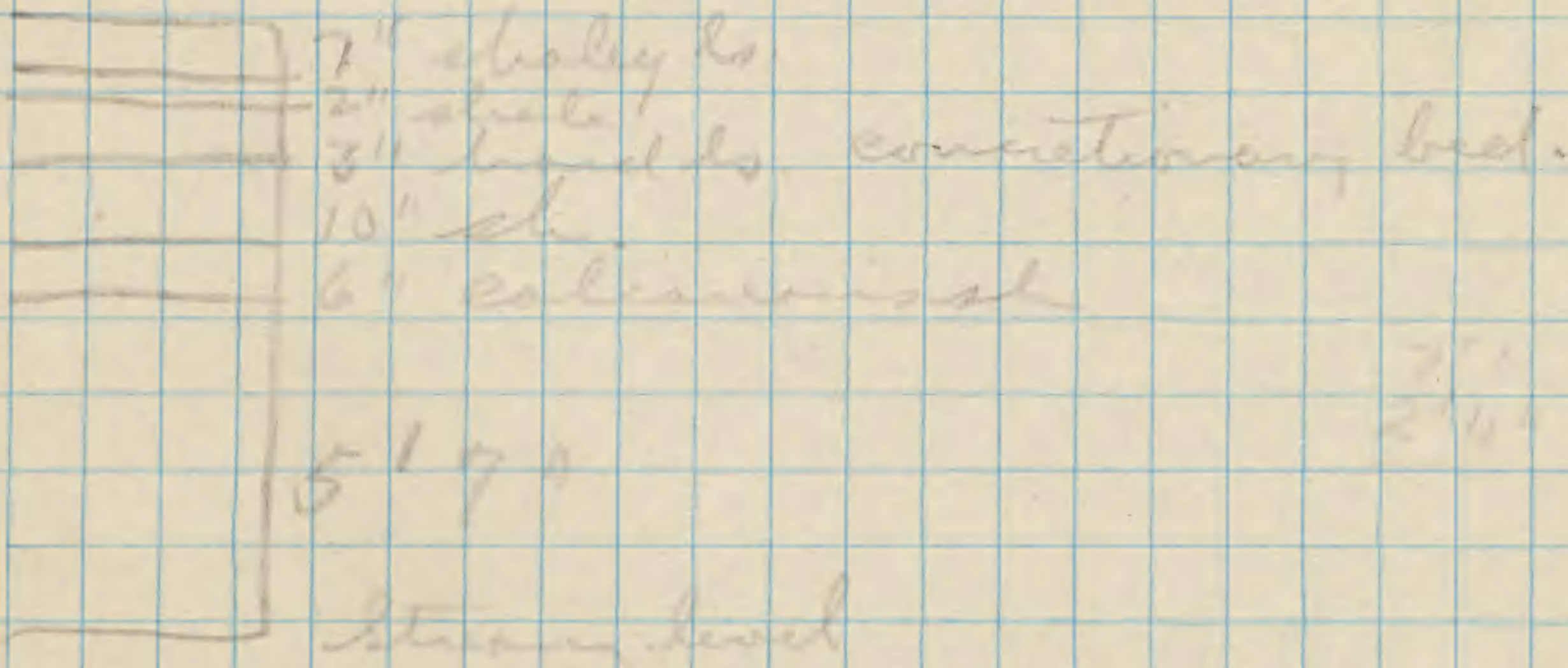
*S. junia*

*C. coronatus*

Section in small gully -



Section at 2517



$$\begin{array}{r} 2517 \\ 345 \\ \hline 2862 \end{array}$$

3000

$$\begin{array}{r} 2940 \\ 129 \\ \hline 3069 \end{array}$$

Lower Trilobite bed - Fossils -

*P. iowensis* c

*P. rana* c

*H. limbata*

*H. velis*

*O. leda*

*C. bellistriata*

*P. contracta*

*S. subretum*

*M. subalata* c

2861 - Lower Trilobite bed in stream, Fossils  
in 10" of shale between Lower Trilobite bed  
and concretionary bed

*A. unlongata* c

*S. pinnatus* c

*S. retum*

*A. spinifrons* c

*P. rana*

*C. setigenus*

Fossils in concretionary bed -

*M. subalata*

*P. rana*

*B. leda* c

*C. brockii*

*C. setigenus*

*S. pinnatus*

2899 - concretionary bed in stream

2899 - 3079 - soft blue shale

At 3079 a hard concretionary band  
in stream this must be the top of the  
top of the Spring Brook Bed "iii" is  
4-5" thick & contains:

*S. pinnatus* (very long) c

*P. contracta*

*M. subalata*

*P. rana*

*H. limbata* c

9' 10" above bed "iii" is 1/2" limestone

like bed "iii" but containing

*M. pinnata*

*M. subalata*

*L. edna*

*P. rana*

*P. contracta*

Bridge at 3529

Bed in stream at 450 paces down stream from bridge at Donhauser's Park Tichenor at roadside north of creek at RR crossing - 212 paces N from bridge, elevation about 670'

765 paces from bridge at Donhauser's to the Tichenor Tichenor in 2 layers, the lower 14 inches thick, the upper about 1 foot thick. The upper surface is extremely irregular and in the stream bed shows sandy lumpy masses. These do not appear to be a weathered surface.

1. Fossils in 3' of soft shale are:-  
In the 1st 2 1/2' =

*A. spiniferoides*  
*S. plumatus*  
*S. rectum*

*P. rana*  
*A. umbonata c*  
*C. indenta*

Below Calaveras sh - *D. consobrinus*, *A. spinosa*,  
*A. andacula*, *A. reticularis*,

6<sup>-10</sup> inches shaly ls. 2.

3' soft shale 1.

Tichenor



2. Fossils in the calcareous shale are:  
*P. rana* a *S. erectum*  
*P. unyeni* *P. andanula*  
*D. consobrinus*

Small corals dominant faunal element.

The section is slightly folded here so that it is exposed 125 yds upstream. At 125 paces the hard layer forms a 6" cascade.

125-187 cliff of blue shale - fossil, as seen at stream bed:

<i>P. rana</i>	<i>C. setigenus</i>
<i>C. epidius</i>	<i>A. umbonata</i>

187-353 - Practically no fossils, soft bluish crumbly shale

353-740 - mostly barren blue shale. At 740 a 1 1/2" ls band is at stream bed breaking into irregular pieces about the size of a cobble.

740-828 - same shale

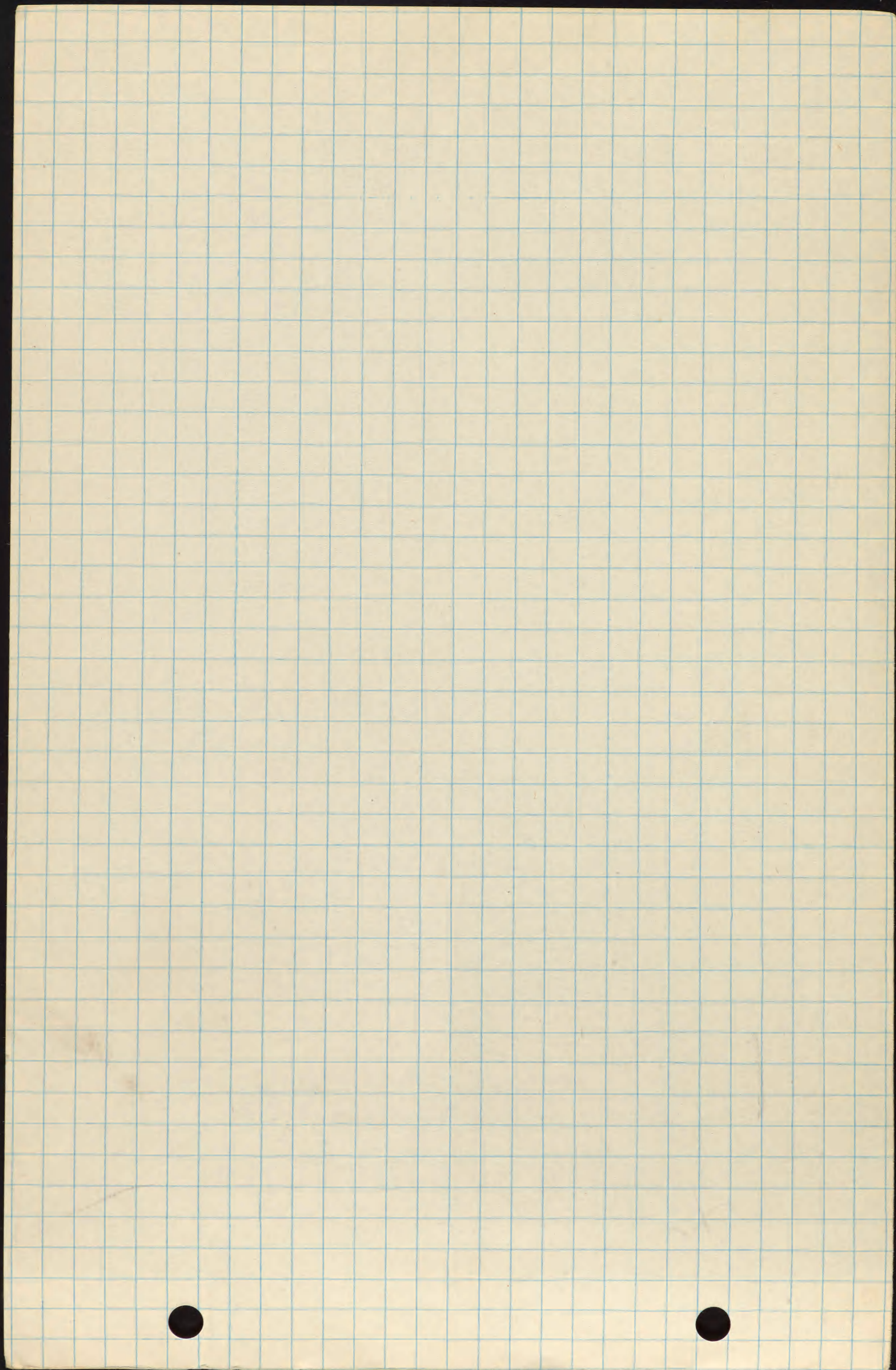
<i>A. umbonata</i>	<i>C. setigenus</i>
--------------------	---------------------

828-1010 - same

1010-1300 same

1300 - 2 thin ls. bands separated by shale. The lower ls. is 2 1/2" thick and contains

*C. boethi* and *S. fusisella*



The shale is 9" thick and contains  
*P. a*                      *A. praecumbosa* &  
*S. frimilla*              *A. umbonata*

The uppermost layer of ls. is 2" thick  
 and abounds in *P. a* and *A. praecumbosa*

Gemundewa ls at 161 paces south of  
 Windsor bridge. *A. praecumbosa* beds are  
 about 25 paces N of same bridge. A layer  
 of concretionary ls 3 inches thick  
 occurs below the Gemundewa and  
 beneath it the blue Hamilton shale.  
 The Gemundewa is 8" thick. About 6' of  
 shale between Gemundewa and  
 preceding ls. This sh. abounds in  
*A. praecumbosa*

587

587

July 24

Stafford

Large outcrop of Onondaga under the village. Stafford not shown in the village itself. A short collecting trip was undertaken with a Mr. Gillard but the collecting was in a stone-wall. It was good however. The exposed ls. in places is chocolate brown but on a fresh fracture is grey. *Ministellas* are very abundant.

Fauna:—

*M. barisi**S. audaculus**Pterinopecten* sp.*Lilentalia* sp.*B. sulcomarginata**P. rana**C. boothi**S. inaequistata**Ambocoelia* sp.*Productella* sp.*C. boothi*

south of the hill. My location is fully  
a half mile south of the Shanton-ful line  
of Litcher.

August 2

### Litcher Point

There appear to have been some changes  
in the highway at the ravine. At the time of  
the map was made there was a distinct  
bend in the road and a house at the bend.  
The bend and house are still here but  
abandoned. The Litcher is found in the side  
of the ravine just north of the house  
and has nearly 16' of shale above it  
and about the same below. It is just  
about on the 200' contour.

### Shale below the Litcher

At 30 paces from the old bridge 6'  
of shales are exposed below the Litcher.  
The lowest of them for about a foot are  
very hard and have corals, one of which  
appears to be *Eridophyllum*. The next 4' are  
covered and the last foot just below the  
Litcher is a slightly calcareous shale  
with few fossils. The exposure is not  
worth more time.

### Litcher ls.

#### Fossils

*D. sculptilis*

*S. pennatus*

*A. spiriferoides*

*Rhipidomella* sp.

The stone here has a thickness of about  
1' (11" - 13") for the compact ls. and  
about 3' of grey shaly ls below with  
*C. st. nella*. At 95 paces up the

Tichenor limestone crosses the brook  
 In places it splits into two layers, the  
 lower 3" and the upper one 9" thick.  
 The former is very fine grained, grey and  
 has *M. concinna*.

On the Tichenor rest about 15' of sh.  
 the first foot of which are hard and  
 form a ridge in the stream - bank.  
 The shales above are softer and some-  
 what less calcareous. This bed carries  
 some cup corals, *Fardruscula*, *P. lineatum*,  
*A. decussata*, *P. pavilionensis*, *P. rana* (large).  
 At 126 paces the Tichenor is again met  
 and is here tilted, dipping off to the  
 south but flattening out a short  
 distance to the north. *R. fimbriata*, *M.*  
*concinna*,

At 240 paces a bank about 65-70'  
 high exposes bluish shales all the way  
 up but 48 <sup>3</sup>/<sub>4</sub>' up there is a thin bed  
 of hard blue ls. These shales here carry  
 large *T. caninatus*. At 300 paces another  
 large bank shows about 40' of rock  
 with the limestone above. Fossils  
 here in the stream bed + for 10' up  
 are rare. The following were found.

<i>L. laura</i> ?	<i>O. trossus</i> sp.
<i>P. rana</i>	<i>C. vicinus</i> .
<i>C. boothi</i> var <i>callitela</i> .	<i>T. caninatus</i> .

At 479 paces is a cascade and here  
 the liquid level must be used. The  
 height to the top of the cascade is 30' 7".  
 Paced along the rim of the Chocoma this  
 30' represents 25 paces, hence the  
*Melastoma* occurs at 504 paces. The  
 ledge here is not favorable for  
 collecting, it is a fine-grained limestone  
 of no open texture and abounding in

fossils. The surface is very irregular <sup>9" 11"</sup>  
 from uneven solution weathering.  
 Below this Menteth limestone in the  
 shales of the cascade only *C. vicinus*  
 and *Pal. concentrica*? were found  
 150 paces from the Menteth ls.

were found grey shales somewhat  
 lighter in color than those below.  
 I found no fossils in this small exposure

240 paces from the Menteth, the  
 bluish grey shales contain an abundance  
 of *J. carinatus* - large & transverse, also  
*Cryptonella*, *S. pennatus*, *C. coronatus*, *C. mucronatus*  
 It is possible that the ls 10' above the  
 Tichenor at Wheeler Gully is the Menteth  
 and that the Moscovite is thickening  
 there.

At 272 paces the land-level was  
 resorted to, and here 10' 10" above  
 the 272nd pace is a bed characterized  
 by many concretions, and 5' 5" above  
 this there is a limestone that forms  
 the falls. Fossils just below the ls.  
 are *S. concavus* common <sup>11' below ls.</sup> *J. carinatus*  
*Parhamittonia*, *R. frimbriata*, *C. mucronatus*,  
*S. pennatus*, *C. coronatus*

The limestone is quite hard and is  
 blue grey. It is about 4" thick and  
 contains

*S. pennatus*  
*C. boothii*

*P. rana*

*C. mucronatus*

*S. perversa*

*C. setigerus*

At 231 paces above 2nd cascade are  
 shales, both the bottom beds of  
 which abound in *A. umbonata*,  
*P. rana*, *R. spinifrons*, *C. boothii*

thin layers. This shale breaks  
into thin shingles

At 295 paces in patches and  
thin layers.

*S. granulosa* C

*S. pennata*

*C. vicinus*

*A. umbonata*

*A. spiniferoides*

*R. fimbriata*

*P. rana*

*S. perversa*

At 500 paces there are still about 20'  
of Hamilton rocks. There appear to be  
two ls. bands in them, but the whole  
exposure is pretty well covered. A small  
*Streptelasma* was found in the lower layers.

544 paces in stream bed

*A. spiniferoides*

One of these bands is an ~~actuality~~  
and lies about 11' above the ~~stream~~.



592 WOH. Valley

592

Aug 24

1978

## Gully Valley Ravine

First rock in ravine seen at 15 hand-level steps over road or at 550 paces upstream.

75' 75" - 80' 80" - ~~85' 85"~~ - dark grey, crumbly shale, few fossils

80' 80" - 85' 85" - covered

85' 85" - 90' 90" - covered.

90' 90" - 120' 120" - mostly covered. At 1' above 120' 120" the hard layer of the Mattville occurs, in other words at 701' above sea-level. Fossils seen in the 7' of shale below the limestone band are:

<i>L. laura</i>	<i>P. regulata</i>	<i>L. perplura</i>
<i>N. triquetra</i>	<i>S. truncata</i>	<i>A. umbonata</i>
	<i>C. mucronatus</i>	<i>J. limitaris?</i>

The limestone band is about 15" thick. Above it the shales are very fossiliferous containing:

<i>J. carinatus</i>	<i>J. Pal. constructa</i>
<i>P. rovensis</i>	<i>M. subalata</i>
<i>S. sculptilis</i>	<i>Loc. laura</i>
<i>Par. laura</i>	<i>S. cuneatus</i>
<i>N. triquetra</i>	<i>P. radiata</i>

120' 120" - 125' 125" - brings to 3' above hard layer.

125' 125" - 130' 130" - grey shale

<i>M. concinna</i>	<i>C. induta</i>	<i>R. fibrata</i>
<i>J. carinatus</i>	<i>L. perplura</i>	<i>A. umbonata</i>
<i>M. concentrica</i>	<i>R. vancouverii</i>	<i>P. spinulosa</i>
<i>C. mucronatus</i>	<i>P. flabellum</i>	<i>C. boathi</i>
<i>A. andacula</i>	<i>Par. laura</i>	<i>C. mucronatus</i>
<i>P. rovensis</i>	<i>N. arguta</i>	Cup corals
<i>Loc. truncata</i>		

130' 130" - 135' 135" - covered

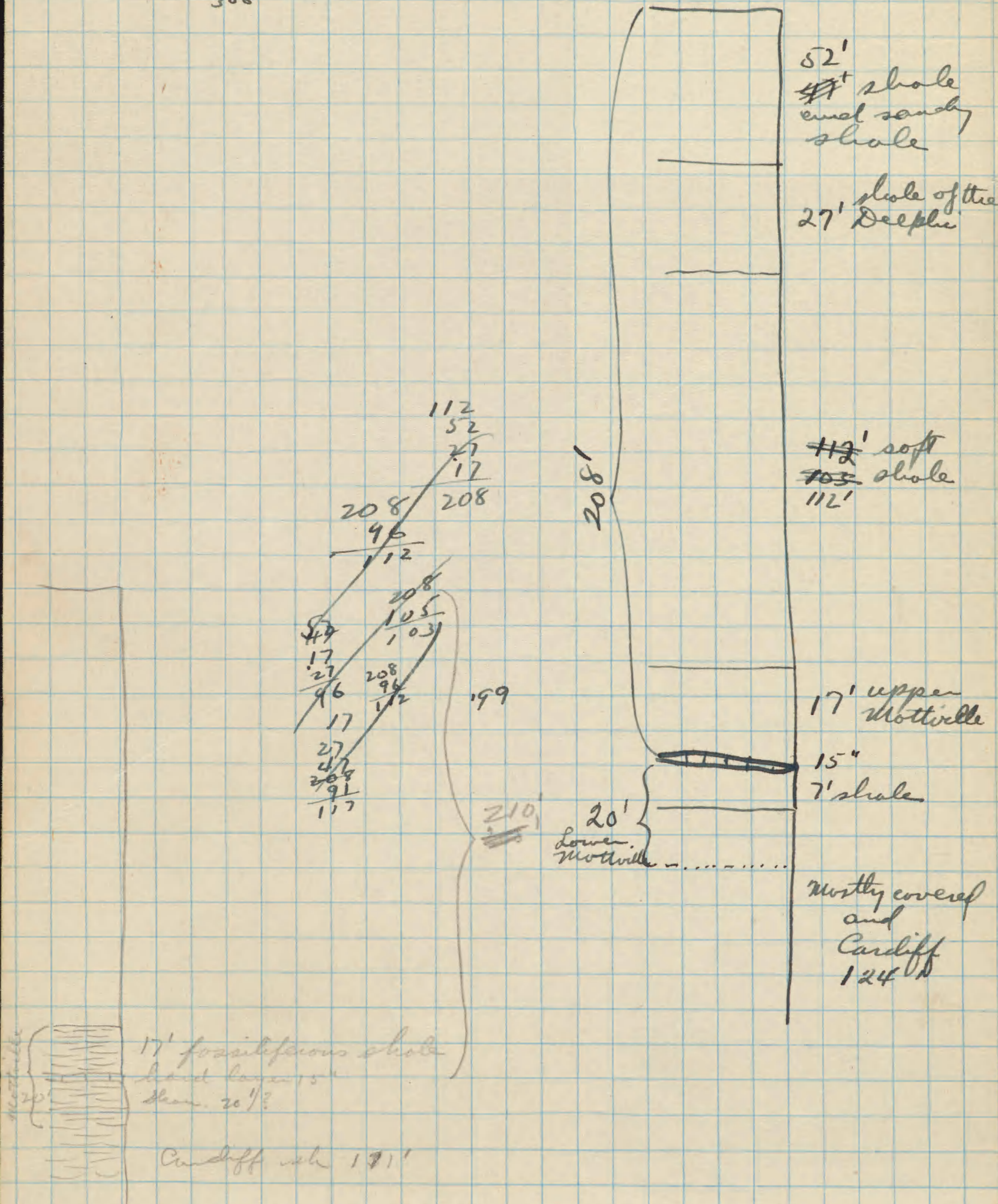
135' 135" - 140' 140" - The rock in the lower part of 140' 140" is the same as that just above the hard layer. Fossils are abundant:

<i>R. vancouverii</i>	<i>A. umbonata</i>	<i>Loc. laura</i>
<i>M. concinna</i>	<i>Par. laura</i>	<i>C. mucronatus</i>
<i>Strophelasma</i>	<i>C. setigenus</i>	<i>E. setigenus</i>

100  
175  
350  
180  
805

1111  
805  
306

Section at Valley Valley



P. rana

The fossiliferous shale zone of the  
Wattville ends about 3' below the top of  
140' 140" - Thus above the Wattville hard layer  
are 17 feet of very fossiliferous shales.  
On a mass of rock exposed from 10' above  
the top of 140' 140" were seen

B. submarginata c      C. setigenus sp.

H. sandalli c

C. umbonata a

140' 140" - 145' 145" -

R. umbonata

C. setigenus

B. submarginata

Spirifer sp.

145' 145" - 150' 150" - same

150' 150" - 175' 175" - mostly covered by thin  
cliffs and patches of the crumbly grey shale  
were seen but these would not pay  
working. 3' above the top of the Wattville  
L. laura was seen

175' 175" - 180' 180" - same dark grey shale -

No fossils were seen small corals abundant.

180' 180" - 190' 190" - sandy grey shale: -

L. laura c

H. oblongatus

H. truncatus

L. laura c

S. cristatum

B. submarginata

M. subalata

C. setigenus

C. curta c

Cystolites

Panderia sp.

H. acris

C. tips

Schuchertella

190' 190" - 230' 230" - same shale exposed in the  
banks and cliffs. At about 220' 220" is a rock stratum  
that shows large boulders of the Pompey and  
Delfin members

230' 230" - 240' 240" -

L. laura

M. subalata

B. submarginata

L. perplona

L. decussata

Spirifer - large

B. submarginata

P. conatella

P. rostrata c

$$\begin{array}{r} 208 \\ 151 \\ \hline 167 \end{array}$$

$$\begin{array}{r} 275 \\ 23 \\ \hline 298 \end{array}$$

Many of the elements of the Delfia  
can be seen in this interval.

240' 240" - <sup>255</sup> 255" - 255' 255" -

M. mytiloides c	C. mucronatus	P. cylindrica
L. laeva c	A. bozardi	G. arcuata
M. concentrica	E. punctata	N. bellistriata
N. oblongatus	C. boethi	A. decussata
B. ledai	A. fasciculatus	A. granulosa
Schuchertella	S. cristata	P. spinuligosa
P. flabellum	O. doria	Pal. constructa
A. andacota	C. mucronatus	A. parvula
M. pygmaea		

265' 265" - 265' 265" - Apparently the Delfia  
member ends here and the shale becomes  
finer and more crumbly and the large  
fossils have disappeared. There is no  
well-marked division line between the  
Delfia & the Pompey, but may be  
taken just about where the big fossils  
 cease to be common. This would put the  
top of the Delfia about 167' above the top of  
the Mottville hard layer.

265' 265" - 270' 270" -

S. gemmatus	O. thoceras c	M. subulata
C. setigerius a	M. pygmaea	L. laevis
C. nitidulus	M. triquetra	M. oblongatus
C. curta	C. maculata	

This shale also has tiny Pterines such as are  
seen in the bottom of the Pompey at  
Delfia or on the head of Orinda creek.  
In debris at the base of this falls were  
seen.

M. triquetra	C. mucronatus	L. optima
Pal. constructa	<del>M. ...</del>	L. ...
<del>M. ...</del>		

This is probably belongs to the Pompey  
and is the fact with the calcareous  
lenses.

$$\begin{array}{r}
 940 \\
 1020 \\
 \hline
 200 \\
 2370 \\
 \hline
 2570 \\
 \hline
 285
 \end{array}$$

$$\begin{array}{r}
 45 \\
 133 \\
 85 \\
 \hline
 163 \\
 \hline
 347
 \end{array}$$

$$\begin{array}{r}
 183 \\
 18 \\
 \hline
 198
 \end{array}$$

$$\begin{array}{r}
 310 \\
 26 \\
 \hline
 936 \\
 \hline
 202
 \end{array}$$

$$\begin{array}{r}
 526 \\
 520 \\
 \hline
 946
 \end{array}$$

$$\begin{array}{r}
 951 \\
 200 \\
 \hline
 1151
 \end{array}$$

The falls over the top of the Pompey is 32' high coming at 300' (300"). This would give a thickness to the Shinarump up to the Pompey of 225', to this should be added about 15' at the top hence the soft dark shale at the base becomes gradually sandier till at the top the rock is a sandy shale, but not a flaggy one as on the Moberly quad.

Fossils seen on the bank of the falls are:

<i>C. mucronatus</i>	<i>P. subulata</i>	<i>M. arguta</i>
<i>B. submarginata</i>	<i>A. pinnatus</i>	<i>L. pinnatus</i>
<i>P. flabellum</i>	<i>M. concentricum</i>	<i>P. patulus</i>

In the 5' of sandy shale above the falls were seen:

<i>A. granulosa</i>	<i>M. subulata</i>	<i>L. pinnata</i>
<i>A. ovata</i>	<i>P. flabellum</i>	<i>M. concentricum</i>
<del><i>P. flabellum</i></del>	<i>C. mucronatus</i>	<i>M. arguta</i>

This belongs to the upper part of the Pompey member. In this 5' of coarse shale some better shale but it is not accessible. For 200' above the top of the Pompey no exposures were seen. *L. pinnatus* is fairly common in the Pompey at this locality.

Hand levelling again from the Moberly hard layer to the top of the <sup>falls</sup> over the Pompey gave 36 steps @ 5' or 198'.

The section exposed in this ravine does not appear to be as thick as that in the Bear Mountain ravine, but apparently there is considerable shale looking at the top which would add some, but not sufficient to bring the total up to 300'. I believe that this section is locally thinner. It apparently will not match the section in the Bear Mountain ravine. It will not do to use this section at all.

Fossils in Moscow of exposures on State  
Road to Syracuse

*Cybellistrata*

*C. indenta*

*Inexigua*

*R. fimbriata*

*P. rana*

*S. capillaria*

*R. vanuxemi*

*C. mucronatus*

*Par. harr*

*R. andacula*

*C. incisurata*

*S. perversa*

*T. cornutus*

*S. pennatus*

*S. arctostriata*

*Pal. costriata*

I believe my hand-leveling was O.K. as I climbed the hill from 220' / 220" ~~out~~ or ~~20~~ 100' / 100" above the hard layer and there were just 16 hand-level steps up to the Nyassa bed. But beyond this bed the shale for some thickness contained *Athyris*, *C. mucronatus* and *R. vanuxemi*. I believe that there must be 30 or 40 feet more shale above the brink of the falls which belongs to the Shaenoteles and I would put the total thickness here at 250-260'. According to my recollection the Shaenoteles in the Bear Mountain Ravine was just 300' thick.



Fossils in the Eucinal are:-

<i>C. nigrescens</i>	<i>S. papilion</i>	<i>C. bathystrata</i>
<i>V. punctatosa</i>	<i>S. perversa</i>	
<i>T. laminatus</i>	Small snails	
<i>R. vanuxemi</i>	<i>S. perversa</i>	
<i>S. tellus</i>	<i>A. granulosa</i>	

Fossils in B - Upper part:-

*S. papilion* The top 2' are a blue-grey calcareous arenaceous

At the base were seen:

<i>S. perversa</i>	<i>A. andada</i>
<i>Thomsonia</i>	The bottom is hard & sandy
<i>P. flabellum</i>	but apparently not calcareous

Fossils observed in the course 20 of C. are:

*S. perversa* There are 10' or 12' of 20 in C. of the massive shaly bed.

The *Pholidostrophia* beds in 2 layers, the upper one of 6" carries the *P. ichnium* & the large *Leptostrophia*. The lower bed was not carefully examined for fossils but seems to carry less of them. It is 8" thick. The 6" interval is not clearly defined and probably had better not appear in a columnar section.

Below the *Pholidostrophia* bed are 21' of sandstone the upper 11' of which are cross-bedded and contain small sandstone concretions like those of the University Quarry. The rock for 13' below the cross-bedded series is hard shaly or is not exhibiting its bedding clearly but exhibiting irregular horizontal cleavage.

Fossils in the 13' of shaly ss are:

<i>A. decussata</i>	<i>A. andreae</i>
<i>P. flabellum</i>	<i>Tacumnus</i>
<i>T. carinatus</i>	<i>A. granulosa</i>

The ~~shale~~ <sup>rocks</sup> below the shaly ss. to the brink of the falls becomes ~~the~~ <sup>so</sup> more argillaceous but at the falls a calcareo-arenaceous ledge holds up the falls for an indeterminate distance probably 8 or 10'. In the rock at the edge of the falls + for about 10' above it were seen:

<i>L. junia</i>	<i>S. pernatus</i>
<i>A. spiniferoides</i> c	<i>M. concentrica</i>
<i>P. flabellum</i>	<i>T. carinatus</i>
<i>A. princeps</i>	<i>M. concentrica</i>

In the shale on the Centerfield were seen *T. carinatus* a, *S. divaricatus* c, *P. stylipomum*, *R. vanuxemi* c, *D. inaequata* c. The correlation of this shale with that above the Centerfield in the Shannock quad. is unquestionable. A shell referable to *P. hirsuta* was also seen.

Centerfield:— The following on the brink of the falls:

<i>Cyath</i>	<i>H. dehayi</i>
<i>P. lowensis</i>	<i>A. princeps</i>
<i>C. mucronatus</i>	<i>L. perplana</i>
<i>P. aqua</i>	<i>S. pernatus</i>
<i>C. lincklaeni</i>	<i>A. reticulata</i>
<i>A. spiniferoides</i>	<i>A. macronota</i>
<i>R. fimbriata</i>	<i>M. concentrica</i>
<i>P. spinulicosta</i>	
<i>P. aqua</i>	
<i>A. decussata</i>	

Aug 25  
Section on Follows Falls

The Pholidostrophia bed was noted exactly 8 steps above the brink of the large falls that contains the coral beds at its base. In the Pholidostrophia bed were seen:

<i>T. cuneatus</i>	<i>P. spinulocosta</i>
<i>P. waveris</i> a	<i>S. perversa</i>
<i>G. bisulcata</i>	<i>C. complanata</i>
<i>Gon. harr.</i>	<i>P. patulus</i>
<i>L. junia</i>	<i>T. novus</i>
<i>L. pumila</i>	<i>P. flabellum</i>
<i>C. tenuistriata</i>	<i>T. submarginata</i>
<i>R. wagneri</i>	<i>C. bellistriata</i>
<i>C. coronatus</i>	<i>A. decussata</i>
<i>S. pennatus</i>	<i>R. fructuata</i>

Above the Pholidostrophia bed are 27' of soft shales that ~~at~~ at the bottom pass into sandy stone for 11' then become again ~~soft sandy shale~~ soft sandy shale but inclinate in 5' or more of sandstone. Above this falls is a 4' falls over 20' of hard sandy rock, the lower 2' being a softish shale. The brink of this 4' falls forms the base of the bridge, hence the Pholidostrophia bed is 32' below the level of the bridge which is at 1140' A.T.

Fossils seen in the upper 10' of A are:

<i>M. concentrica</i>	<i>C. plicata</i>
<i>S. pennatus</i>	(Also common)
<i>C. scitulus</i> c	<i>S. arcuata</i>
<i>Par. harr.</i>	
<i>B. rugosa</i>	
<i>C. setigerus</i>	
<i>T. cuneatus</i>	
<i>O. pumila</i>	
<i>B. reticulata</i>	

29' <sup>curved</sup> Fellows Falls

Fabius member A

27'

location of bridge over ravine } B

4'

27'

C

Plioliteostrophia bed 15"

cross-bedded ss.

~~cross-bedded ss.~~  
shaly ss or very coarse shale

Falls 81 or 85'

125'

125  
59  
181

coral bed 7'

hard-calcareous - arenaceous bed 2'

50' soft sandy shale

S. divanatus

Centerfield

Total above Centerfield 275'

Centerfield ss.  
127'

In the Centerfield here there are  
 exactly 12' of cross-bedded ss. at the  
 top and at least 11' of calcareous  
 shale with corals. All above fauna  
 was ~~all~~ obtained in a calcareous  
 mass on the very brink of the falls  
 about 7' below the ss. There must be  
 somewhere about 20 or 25' of the hard  
 shale the notes of last year will  
 indicate the exact amount. It is my  
 belief that the cross-bedded ss here  
 represents that of the University  
 quarry which replaces the Centerfield  
 eastward. *Trisulca* difficult to find  
 in the ss. but the *Trisulca* seen are like  
 those of the Univ. Quarry.

*C. alberta*

*T. ciliata*

*P. flabellum*

*Trisulca*

*D. sculptilis*

Toward the top the ss is somewhat  
 calcareous.

113  
~~115~~  
115  
~~115~~  
115

890  
~~23~~  
913

July Aug 26.

Bucketail Ravine at Hafford Valley  
Top of Centerfield is at 35'35" + 4' above the bridge  
of stream crossing, in other words at about  
932' above sea level. Between 25 and 35' above  
the Centerfield were seen the dark blue gray  
shales of the lower Embelle, the contact of  
however being missing at 45' above the  
Centerfield was seen a hard arenaceous layer  
which is calcareous at the top and forms a  
fall of about 5' in the stream. This layer is in  
the position of the sandy beds below the coral  
layer. Fossils here are:

*S. pennata*

*L. lina*

*T. cainatus*

*L. perplana*

*S. demissa*

*Sten. ham.*

*A. spiniferoides*

Between 55'55" and 60'50" above the sandy layer 45'  
above the Centerfield is a 3' patch of rather  
soft sandy shales containing:

*S. demissa*

*B. capellaria*

*S. octostriata*

*A. reticularis*

*L. finis*

*S. pennata*

*B. umbonata*

*T. cainatus*

*Cyloceras lobata*

*P. flabellum*

*A. spiniferoides*

65'65" - 70'70" - above sandy bank - at 65'65" begins  
a continuous exposure, sandy shale, for 5'.

*S. demissa*

*A. spiniferoides*

*T. cainatus*

*P. constructa*

70'70" - 90'90" - covered

At 105'105" + 3' comes the *Pholidostrophia*  
bed: - This is then 160' above the top of  
the Centerfield at this place. It forms  
the uppermost bed of the first layer.

Falls above the Centerfield. This falls is somewhat less than 50' high over ~~and~~ shaly sandstone. The *Protodictya* bed is about 18" thick.

Above the *Protodictya* bed is a fall 28' high over about 5' of sandy stone. I did not bother to collect this for the next falls.

Above the 28' falls is another 8' high over a ledge of sandstone about 2' thick. Above that 8' falls is one 21' high and at the top the Portland Point occurs. It is in 4 layers each about 6" thick. It is not so much of a shell mass here as at Yellow Falls. However *Vitulina* was collected.

### Above Encinal

~~5' 5"~~ Encinal - 5' 5" - shale, sandy sh. ls. -  
*I. caninatus*                      *S. pinnatus*  
*A. andacula*                      *E. hirsuta*  
*P. rana*

5' 5" - 10' 10" - mostly covered

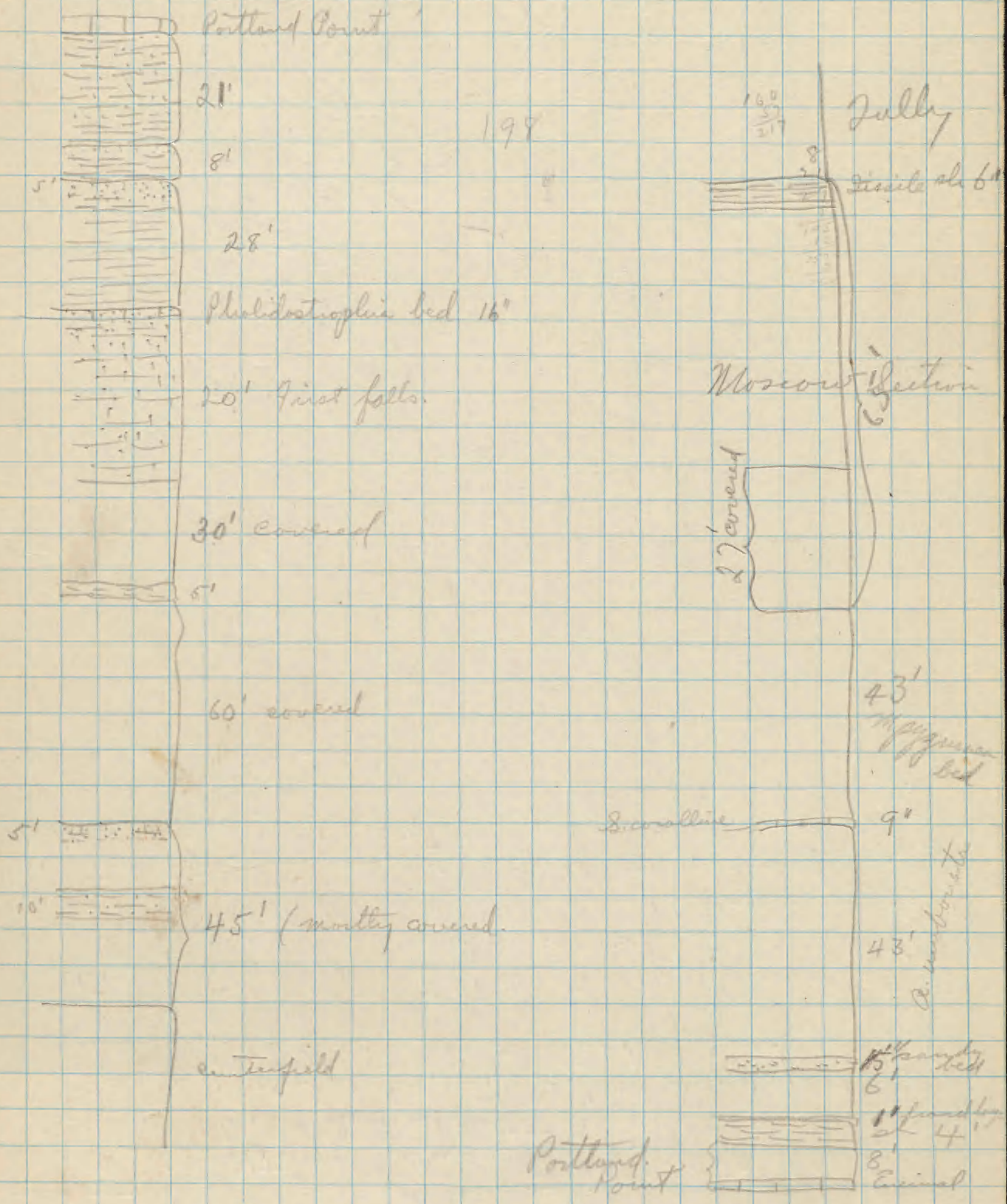
10' 10" - 15' 15" - Presumably fossiliferous shales:

*I. caninatus*                      *M. birsta*  
*S. pinnatus*                      *P. patulus*  
*P. l. constructa*                      *M. corbuliformis*  
*M. arcuata*  
*V. bryulcata*

The Portland Point is in view for fully 700' but about 3' are covered and in this 3' it ends. It must be about 8' thick. The shale abounding in *I. caninatus* culminates in a sandy layer about 1" thick. This is followed by about 6' of sh. terminating in another sandy layer.



Section in the Bucktail Ravine



The sandy bed about 20' above the  
 Encrial is about 6" thick but has on top of  
 it 9" of sandy shale that are included  
 with it.

At 8 steps above the upper sandy layer is a  
 layer of calcareous about 9" thick abundant  
 in fossils as follows:

<i>P. sana</i>	<i>L. jurea</i>	<i>A. umbonata</i>
<i>R. vanuxemi</i>	<i>D. inaequata</i>	<i>S. gemmatus</i>
<i>A. spiniferoides</i>	<i>S. rectum</i>	<i>A. reticularis</i>
<i>C. maculata</i>	<i>C. bilobata</i>	<i>M. conica</i>
		<i>L. papilion</i>

The shale 3' below this layer has the  
 typical *A. umbonata* fauna.

55'55" - 60'10"

*M. mytiloides*  
*A. granulosa*  
*S. gemmatus*

I could not locate the boundaries of  
 the *S. coralline* and the *M. pygmaea* zones.  
 The rock for 18' above the *Strophodont*  
 band had few fossils & was diagnostic  
 of any zone. It would be best to refer only  
 the 9" of shale to this zone.

Fossils seen in *M. pygmaea* zone:-

<i>P. costata</i>	<i>C. bilobata</i>
<i>P. patulus</i>	<i>S. gemmatus</i>
<i>M. bellistriata</i>	<i>M. oblongatus</i>
<i>M. pygmaea</i>	<i>O. trochus</i>
<i>P. tham</i>	<i>C. boathi</i>
<i>J. submarginata</i>	<i>S. pteris</i> sp.
<i>J. cristatus</i>	<i>P. sana</i>
<i>J. sinuatus</i>	<i>A. spiniferoides</i>
<i>R. vanuxemi</i>	<i>M. conica</i>
<i>A. audacula</i>	<i>A. granulosa</i>

From 80' 80" above the sandy shelf of the  
*P. radiata* bed the rock is covered. In the  
 base of the Tully from the sandy beds was  
 28 steps or  $140' + 11' = 151' + 21' = 172'$   
 for thickness of Moscow

At the black shale beneath the Tully  
 there is 6' and there seems to be some  
 transitional to it. The black stuff is  
 rather highly metamorphosed. Fossils in the  
 dark fissile shale are:

<i>C. setigenus</i>	<i>M. pygmaea</i>
<i>P. emarginata</i>	<i>M. orbiformis</i>
<i>S. crocatus</i>	<i>S. carinatus</i>
<i>M. oblongatus</i>	<i>V. pustulosa</i>
<i>Lingula</i> sp.	

Fossils seen in the falls below the *Vitulina*  
 zone:

<i>M. oblongatus</i>	<i>L. perplana</i>
<i>S. perulatus</i>	<i>L. junia</i>
<i>O. thoreas</i>	<i>P. thoreas</i>
<i>A. reticularis</i>	<i>M. concentrica</i>
<i>T. submarginata</i>	<i>Cal. constricta</i>
<i>O. parvula</i>	<i>M. lirata</i>
<i>R. imbricata</i>	<i>M. mytiloides</i>
<i>Cybellistria</i>	<i>A. granulosa</i>
<i>S. carinatus</i>	<i>Calomys</i>

At Timber + on Shannette's Lake a ledge  
 appears below the Tully. Here the  
 rock is only 13' below the Tully but  
 it forms a ledge. The shale between  
 this ledge + the black shale is  
 transitional. The lowest 3' of the 13 clearly  
 belongs to the *S. margini* zone, but the  
 upper 7' belong to the *Vitulina* zone +  
 about 3' are transitional.

The parting surfaces of the dark shales are covered with small gypsum xls.

Centerfield -

At the first 5' of the falls face were seen:

*P. oviformis*

*C. bellistriata*

*P. flabellum*

*S. pinnatus*

*M. concentrica*

*P. pabulus*

*C. linchlaeni*

*R. fimbriata*

*C. retigens*

*L. papilosa*

*L. laevis*

*Par. laevis*

*N. cingula*

*S. channingensis*

*C. recurva*

*A. decussata*

*A. princeps*

*P. constata*

*A. spiciferoides*

*P. rhomb*

*C. boottii*

*A. princeps*

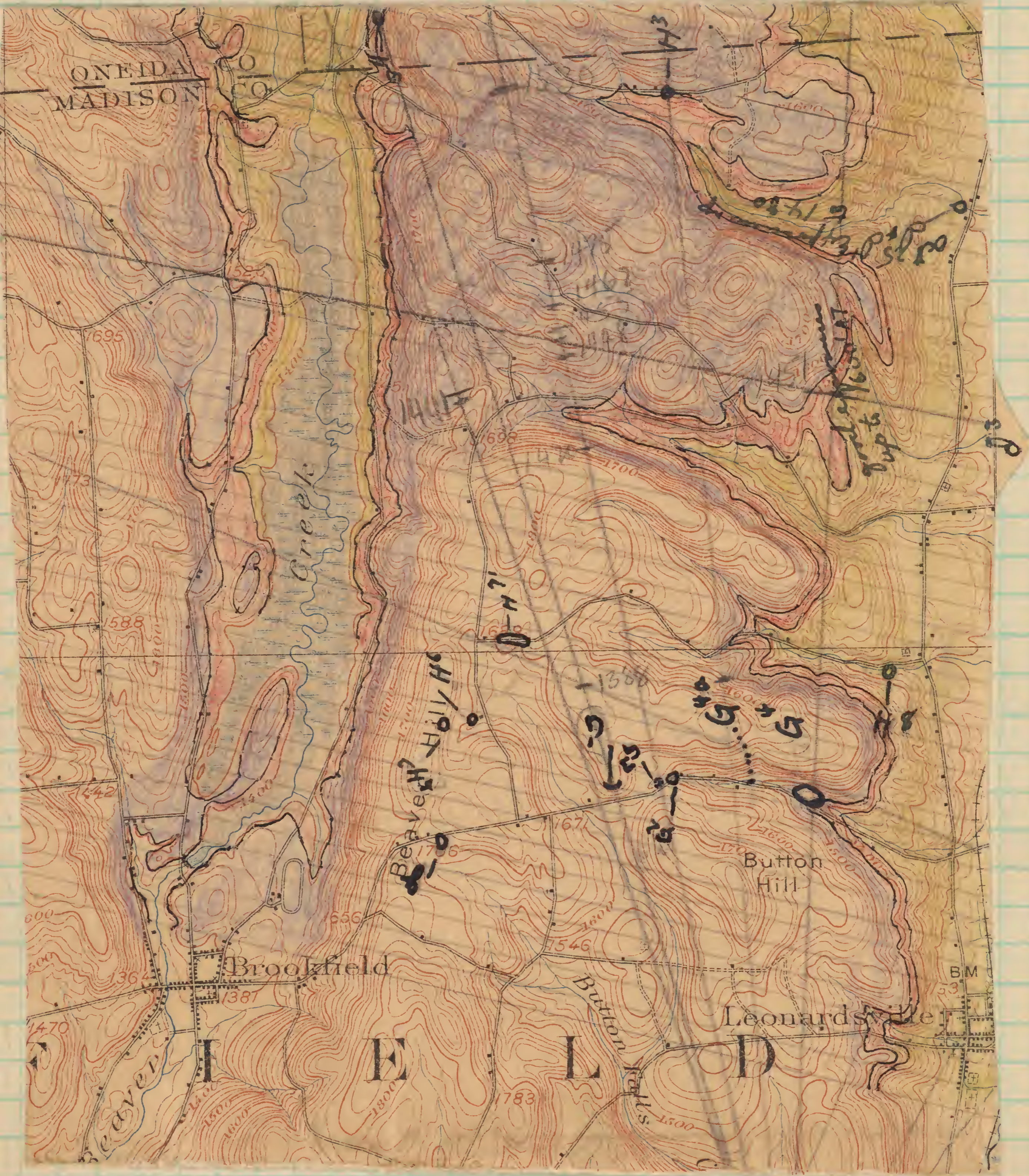
*A. reticularis*

*P. tenuis*

On the bank of the falls the rocks abound in *Schuchertella*. *S. sculptilis* is also present. I would assign 33' as the thickness of these beds. About 33' from the top of the falls *L. laevis* occurs in abundance.

On opposite side of road, Centerfield forms lower ledge on hillside about 100' above road-level. It is about 30' thick. Near the top is a small thickness of cross-bedded ss.

605a



73



6056



55

A field)

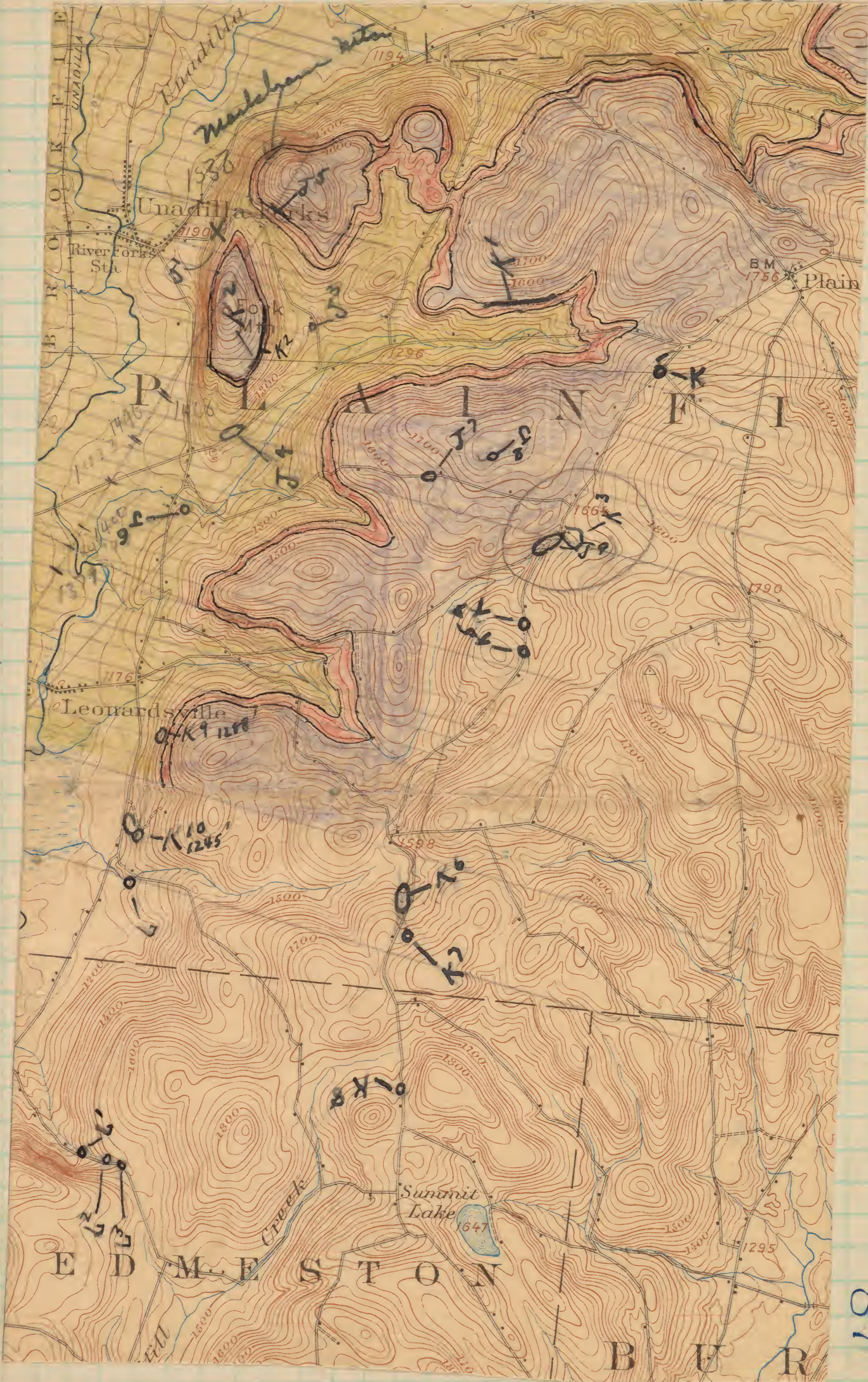
Bridgewater

Oct 24

75

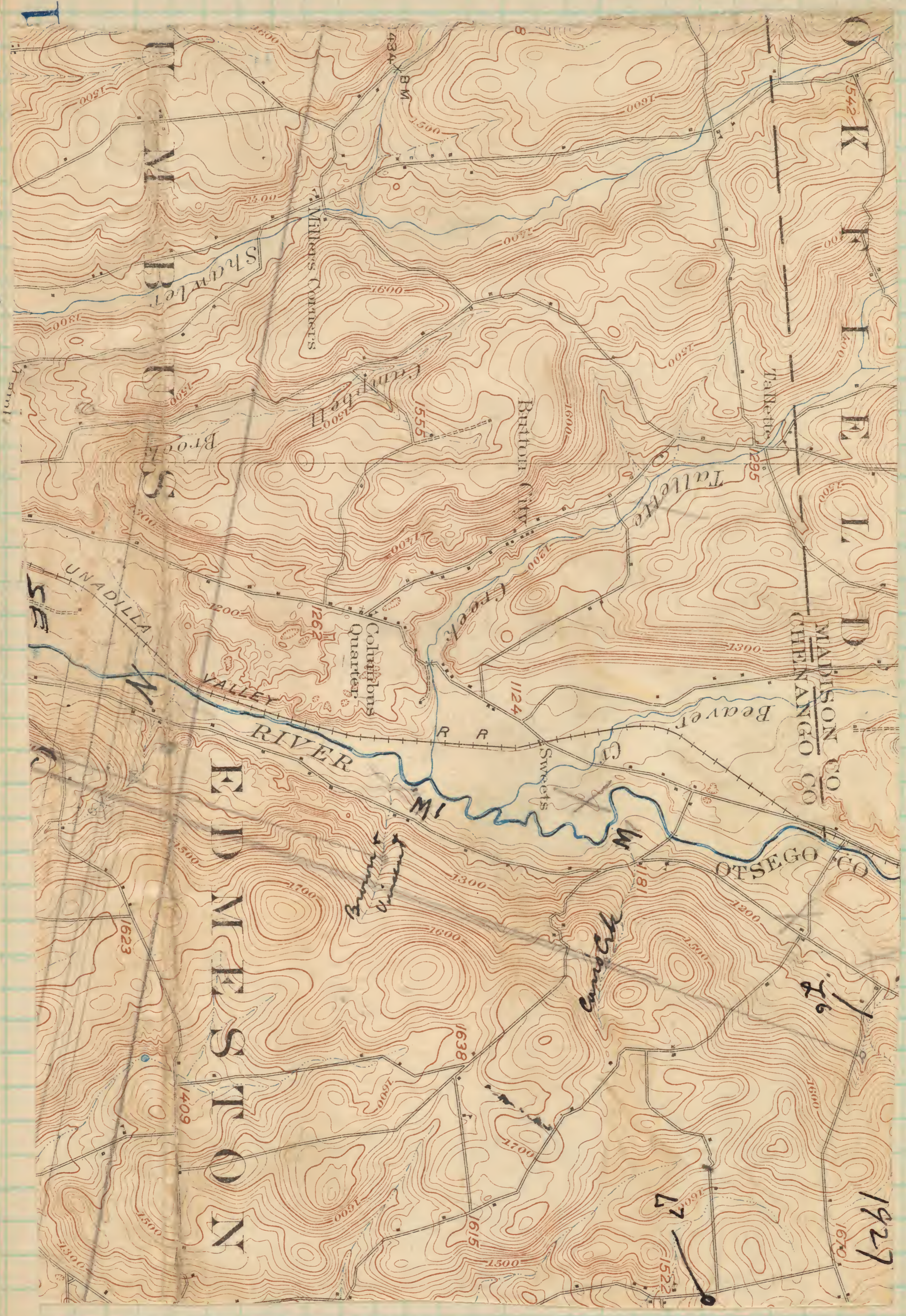






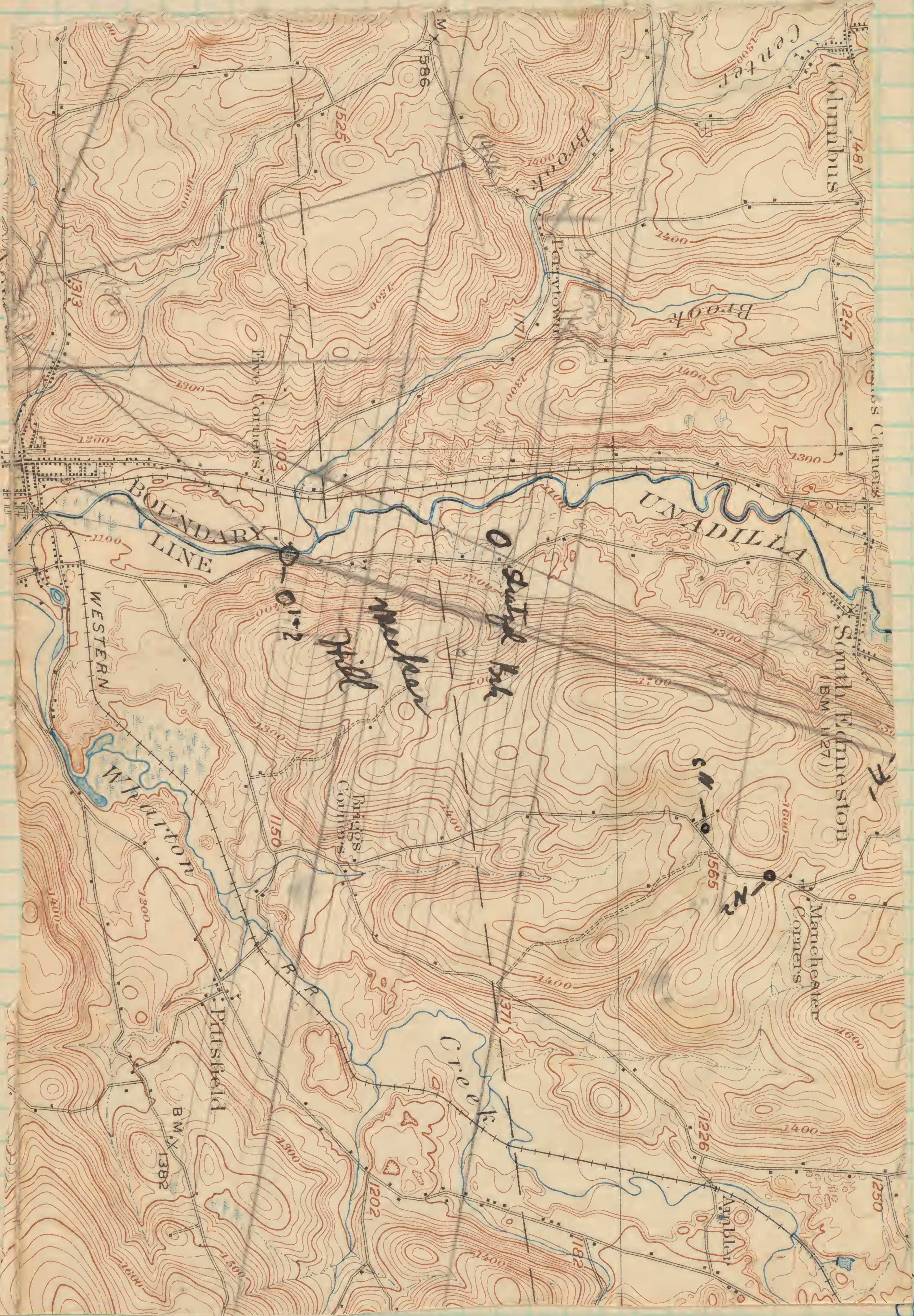


605 d





6509



79



605e

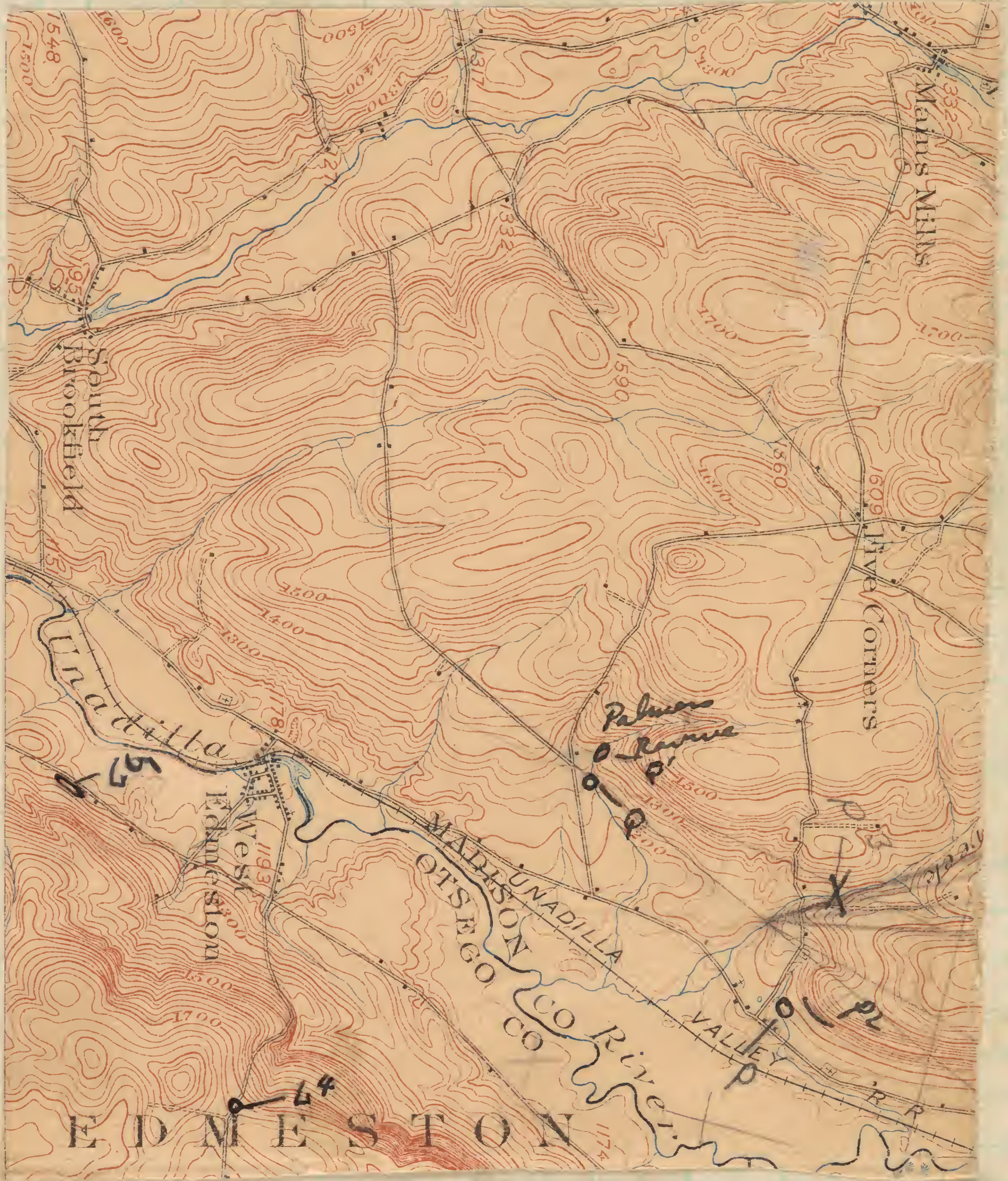


02





605-7





606/1927

A 19606

Unadilla Valley section

Oct 16

A:- Creek just N of Bridgeport - first exposure - blue grey shales on both banks of creek, dark grey in section bedded into chips about 1/4" - 1/2" in thickness, rather gritty to touch, the only fossil noted was a small *Leptæna*. The exposures I believe are Chadiff. The shales are largely jointed.

There are 1510 paces from the first creek exposure to the highway crossing west of the church. The first 310 paces of the 1510 are occupied by the shales which form the block of the creek. On the sides for about 5-10' vertical. The shales are exposed about 200 paces west of the lower part of the highway intersection. These shales had a white streak.

A<sup>1</sup> - about 200 paces west of Mr. W. Parkerson's house where hill starts to rise is a small exposure of gritty shales that crumbled into irregular chambers. These have a faint purple tint or reddish white. The topography is similar to the Parkport sh. I did not see *S. lampa*, *A. umbonata* or *unifera*? Another shell had the appearance of *S. parvulus* but crumbled to bits when touched.

A<sup>2</sup> - 1650' A.T. about 3 unfossiliferous sandy shales. They may belong at the base of the Sherburne. They divide into thin laminae. Some of the layers are marked by ripples.

Oct 16

A<sup>3</sup> - About 1/2 mile west of church near highway intersection and opposite two houses on hill just west of highway crossing with stream is a rather long exposure of soft gritty shales that weather a purple or brown but in cross-section are olive-color. The top of the exposure which has been just recently exposed is at about 15° 45' N. The exposure is on a gully where the water has channelled a gully out of a road that goes up the south side of the hill just south of the two houses at the hilltop. The section from the top down follows: -

10' - 5' 5" - This interval is of soft olive shale. The only fossil seen was *L. laura* (a fragment)

5' 5" - 10' 10" - About 6" below the top of this interval which is a shale, there is a 7" band of hard slabby ss. It is light blue grey weathering to brown. Fossils are not numerous but are present. An occasional large, round concretion was present. The uppermost 1 1/2" - 2" is a shaly ss. Beneath the ss. the shales are sandy, but soft & break into small irregular fragments.

*A. umbonata*                      *L. laura* (large)

10' 10" - 15' 15" - same shale.

15' 15" - 20' 20" - " " The shales when exposed to the weather commonly break into oval masses that split & finally into small fragments that are blocks, so that the

1621' A.T.

sh. wt. 2.1

10-21

Every square 5'5"

sh

lites

sh

lites

road level 1540'

the slopes would appear like a coarse earth. The small fragments are commonly angular

20' 20" — 25' 25" — same

25' 25" — 30' 30" — hiatus

30' 30" — 35' 35" — top half hiatus — bottom

same shale as above with a red rust, often a varnish. Here are found:—

*R. umbonata* c

*C. setigerus*

*L. laura*

*Lingula* sp.

35' 35" — 40' 40" — same sh - rusted to a

dull maroon red - sometimes with a distinct varnish. Above, where some of the shales are wet, the rust is a

brilliant yellow, but here, or where, sun baking has taken place the shales are a dull red on the surface. This suggests

that the rust is at first yellow and is baked red + varnished. There is a

possibility that the red varnished surface forms first + then is

hydrated to a yellow. In places reds + yellows are mixed. The latter idea is

supported by a new gully which has red rust but passed up to a gully that shows red colors. The wet shales are commonly red.

Fossils here are:—

*Amplexia* sp.

*L. laura*

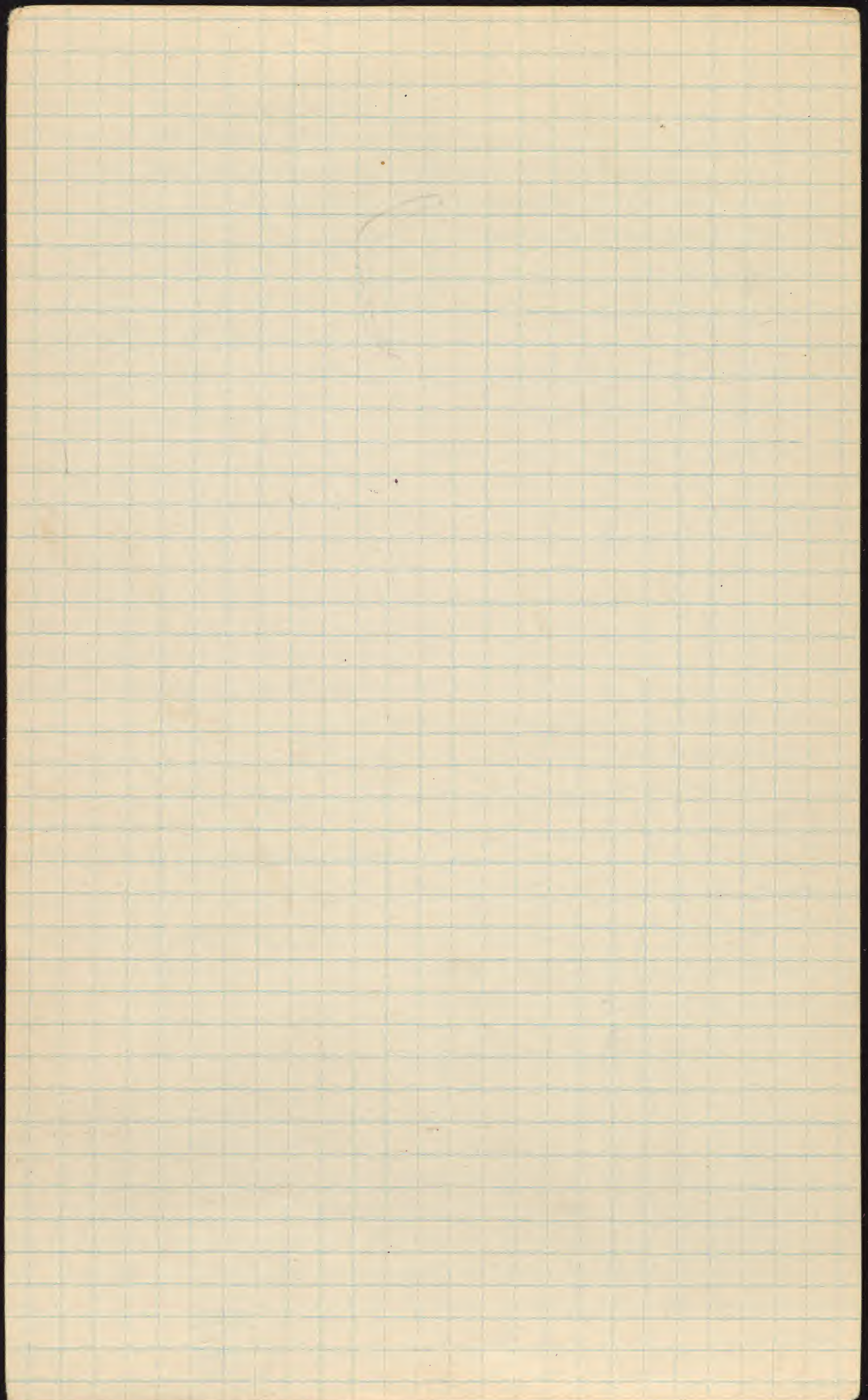
*Orbiculoidea* sp

40' 40" — 45' 45" — same

45' 45" — 50' 50" — *C. scitulus*,

50' 50" — 55' 55" — same concretions abundant

~~to~~ 55' 55" — 75' 75" — hiatus — to level of house at 1540.



Oct. 16

A<sup>4</sup> - ledges of hard sandy shales about 15' vertically + exposed around the hillside, the top at about 1700' A.T. *Taonurus* abundant in the sh. The rock breaks up easily into flattish irregular slabs. The ledges show the ~~flat~~ irregular fracture. Fossils are rare: -

*L. laura* var  
*Loponema* var  
*P. lirata* var

*L. rogersi*? var  
*Spirifer* sp.

I cannot place these in the sequence. Ledges of this rock can be seen near this level on the hillside on the north side of the road.

A<sup>5</sup> - Gitty sh, weathered, breaking into chunks like the Pedersport sh. Fossils *H. oblongatus*

A<sup>6</sup> - Marcellus - no new features noted  
Brown streak.

A<sup>7</sup> Onondaga - quarry on RR just south of N. Bridgewater - upper layers shaly with *L. rhomboidalis*, *Cb. reticularis*, an occasional coral, *Bryozoa*, etc. *Chonetes*, etc.  
Thick Gilbert Pice

A<sup>8</sup> - Onondaga - near 350 ± yds from Babcock Hill P.O. on road and on south side, as an old abandoned quarry. Flinty beds. Top at about 9390 - 95' A.T.



A<sup>9</sup> — Onondaga & Marcellus — exposures in road bed & gully, about 1/2 mile east of Babcock Hill. At an elevation of about 1450' A.T. is seen Onondaga which is shaly. On top of it in the gully for 10' or more the soil is jet black and has slabs of black ls. characteristic of the lower Marcellus. No evidence of the Agoniatites was seen.

200 ~~steps~~ steps to tower rd. 108' west up the road from the road which on the map is dotted gives the same location for the top of the Onondaga. The Onondaga is exposed in patches for fully 70' down the hill at this locality.

The best Marcellus exposure which was at Mapledale at about 1315' A.T. was of black fissile shales and probably belonged to the upper Marcellus. Pierce's quarry must be near the top of the Onondaga.

The shales seen in A must in the Cardiff, those at A' may be Cardiff or Sloan. The shales & sandy shales above it cannot yet place in the sequence.

The top ledges of Onondaga at A<sup>9</sup> contained many individuals of *Pentamerella*.

Oct 18 Winfield Quad.

B-370 passes from house (first house north of road 4 corners of Bridgewater and highway from Bridgewater to Babcock Hill) is an exposure of Onondaga, which about to reach the top as the following fossils indicate:-

L. shoulderensis cc	Pentamerella sp.
A. reticularis c	Chonetes
D. salomonensis	An occasional
Phacops sp.	cup coral.

The stone is bluish ls., some flint, shells colored red, some patches like those in field at Onondaga Ck. The top of the Onondaga here is at about 1365' A.T. - 1370' A.T. On top of the rise just about at the head of the road black shale chips were seen in the dirt at the roadside.

Just south of the center crossing we saw another mass of Onondaga at 1390' A.T. This may not be in place.

B<sup>1</sup> - Hills slope at about 5/8 of a mile N Babcock Hill P.A., on slope about 250 yds E of lone farmhouse, at about 1390' - 1410' A.T. Onondaga outcrops. This is probably Heidelberg.

Oct. 19.

C.  
Quarry — Tom Reilly

Location — 679 paces E of first house on road  
and 15 steps + 1' fork road to base of west  
end of quarry. Base at 1600' A.T. — top — 1655' A.T.  
Cardiff then boundary at 1837' A.T.  
Dip — 100 yds long — 55' high

Rock — at bottom a fairly soft  
arenaceous shale that breaks into  
irregular, chunky, angular lumps.  
The exact color cannot be  
determined as the rock is too wet.  
In the first 10' *L. laura* in large  
and excellently preserved forms  
was found. *Leptomena* was  
another fossil noted here. About  
15' from the base was found a  
large *Spinifer*. These do not become  
prevalent till near the top of the  
quarry. *Leptomena* is associated  
with the *L. laura*. The *L. lauras*  
are restricted to a single horizon  
on a bedding plane and are  
washed over the bedding plane  
in great numbers.

Between 4 + 5 steps the rock becomes  
harder gradually and splits into  
larger slabs, probably because of  
more sand.

The last *Leiorhynchus* was seen  
31' above the base of the quarry at  
the west end.

The transition to the upper <sup>sandy</sup> sh. was at about 31' above the base of the quarry at the west end, and 23-25' at the East end. The quarry floor slopes west rather quickly & accounts for this discrepancy, the east end is  $5\frac{1}{2}$  higher than the west end.

The upper beds are very coarse sandy sh <sup>or ss</sup> and are between 20 or 30' thick. About 5 or 10' at the top is covered, also the upper beds:—

<i>G. triquetra</i>	<i>N. maximum</i>
<i>L. undulata</i>	<i>P. dissiduum</i>
<i>P. liata</i>	snails
<i>S. granulosa</i>	<i>M. concentrica</i>

I believe the transition from the the Cardiff to the Sloan occupies the middle of the quarry <sup>31'</sup> where the shales become coarse & *Tourmaline* comes in & *Leiothyridus* drops out. *L. bursaria* was last seen 31' up from the base of the quarry on the west end.

*N. concinna*, *P. flabellum*, and *Complanata* were not found at this quarry. They may be in the rocks higher up as fully 70' more of the sandy rocks belong in this horizon.

The remarkable feature of this quarry was the great abundance of large *Nautitoids*, either *N. megista* or *N. maximum*. The former is reported from Leasardsville in N.Y. St. Mus. Rept. 46, 1893.

Oct 20. D + E.

D. + E Roadside gully and bank on the  
Cherry Valley R<sup>3/4</sup> miles west of Bridgewater.  
About 30' of sandy rocks that break into  
large slabs were seen along the north  
side of the road. *Taonurus* is very abundant  
in the rocks. Fossils were difficult to  
find here. Large *Spirifer* were rather  
common, *M. mytiloides* (possibly *concentrica*)  
some clams that I am unfamiliar  
with were also seen. Several specimens  
of *L. macroptera* of rather large size  
were found. The very top beds for  
a little less than a foot seemed  
quite calcareous. This band (36) is the  
same as that seen at Pine Woods.  
In the gully to the north of the road  
blue grey shale (Peck's port) with *P. liata*  
were noted.

Oct 21. (Oct. 20. D + E)

E. - section 3 miles W of Bridgewater -  
 along ravine S of roadway is a quarry with  
 a waterfall over bed rock. The total  
 section of rock displayed is 92'. At  
 the bottom for about 16' the rocks  
 are thin sandy shales breaking  
 into rather thin and flatish slabs.  
 Then for the next 22' the rocks are  
 soft arenaceous shales that split  
 into irregular lumps. The only fossil  
 found in these rocks a *S. laevis* of  
 large size. The next 5' was somewhat  
 doubtful but appeared to be similar  
 rock. The softish arenaceous shales  
 with the irregular fracture  
 passing into the sandy stone which  
 carries *Taraxacum*. Between 43 and 48  
 feet from the bottom the sandstones  
 begin in and begin to predominate.  
 The fauna of these rocks from  
*Taraxacum* could not be ascertained  
 as no fossils were seen. *Taraxacum*  
 was abundant. The stone breaks into  
 large irregular slabs. Along the  
 roadside is the best place for the  
 examination of the fauna. Here  
 near the top large *Spirifer* are  
 fairly common, *M. concinnus*,  
*M. subrotundus*, *S. macroptera*, etc.  
 The top layers are heavy and  
 massive being somewhat lumpy.  
 These break into heavy irregular  
 layers.

About 11' above the top of these beds are seen soft shales that crumble to rather small pieces.

The top of the hard layer is at 1640' A.T.

1640' — 1650' 10" — hiatus

1650' 10" — 1655' 15" — dark bluish grey shales, soft, somewhat gritty; crumble to small bits, brown rust. no fossils.

1655' 15" — 1660' 20" — same.

1660' 20" — 1665' 25" — crumbly, blue grey shales with fossils:—

<i>Comularia</i> sp. nr	<i>C. scitulus</i> nr
<i>L. luma</i> cc	<i>A. umbonata</i> nr
<i>M. oblongatus</i> nr	
<i>M. triquetus</i> nr	

Some of the *Leiorhynchus* strongly resemble *L. limitaris*. This list is from 15' of shales exposed at this interval.

~~1665'~~ 1665' 25" — 1670' 30" — same

<i>M. oblongatus</i> nr	<i>Chonetes</i> sp.
<i>M. triquetus</i> nr	
<i>Leiorhynchus</i> c	

The shale is somewhat harder here.

1670' 30" — 1680' 40" — same.

1680' 40" — 1685' 45" — much harder, an occasional *Taomurus*. Fossil,  
*C. scitulus* c  
*Leiorhynchus* nr  
*M. pygmaea* nr  
*Pal. Chstructa* nr

Low, sp.

*H. dekeyri*

1685' 45" - 1695' 55" - same - top is  
a rather hard sandy stone  
abounding in small *Ambrochus*

1695' 55" - 1700' 60" - same but with  
some poorly preserved snails. These  
snails found the point where  
*C. scithus* was very abundant  
have very appearance of the  
beds below the bridge at Lake  
Moraine.

1700' 60" - 1705' <sup>15</sup> - same sandy rocks  
with *A. umbonata* cc, a large snail,  
*H. dekeyri* (small), *M. pygmaea*.

1705' 65" - 1700' 70" - rocks disapppear  
in this interval. In small *Ambrochus*  
were noted here as well as *A. umbonata*  
On the other side were occasionally  
found slabs & blocks with large  
*Ambrochus* & *S. dactylus*. These  
those at Lake Moraine.

This section differs from the Pelesport sh  
at Hamilton in being thinner & having  
more abundant fossils. I did not note  
the horizon with *L. macropter* & large  
*Spinifers* just below where the beds  
begin to become sandy.



Ravine  
3 miles  
W. of  
Bridgewater

1695' 55"

1690' 40"

3'  
48  
372

1685' 45"

1680' 40"

1675' 35"

1670' 30"

1665' 25"

1660' 20"

1655' 15"

1650' 10"  
10' Covered  
1640'

(X)

48

Massive  
Sandy  
Shale

27'

soft

sandy  
sh-

10'  
18x6  
1687  
27  
49  
76

1685  
4  
1689

1710' 70"

1705' 65"

1700' 60"

1695' 55"

38  
82

618

618

Oct 21 E<sup>2</sup>

Section on the Seabridge Farm.

A small gully from the hill behind the  
farmhouse crosses the Cherry Valley at 15' at  
1500' - 1530' 30" - hits

15' 30' 30" - 1530' 40" - soft blue grey shales  
that wet and crumble into small  
fragments. These have:

*R. umbonata*

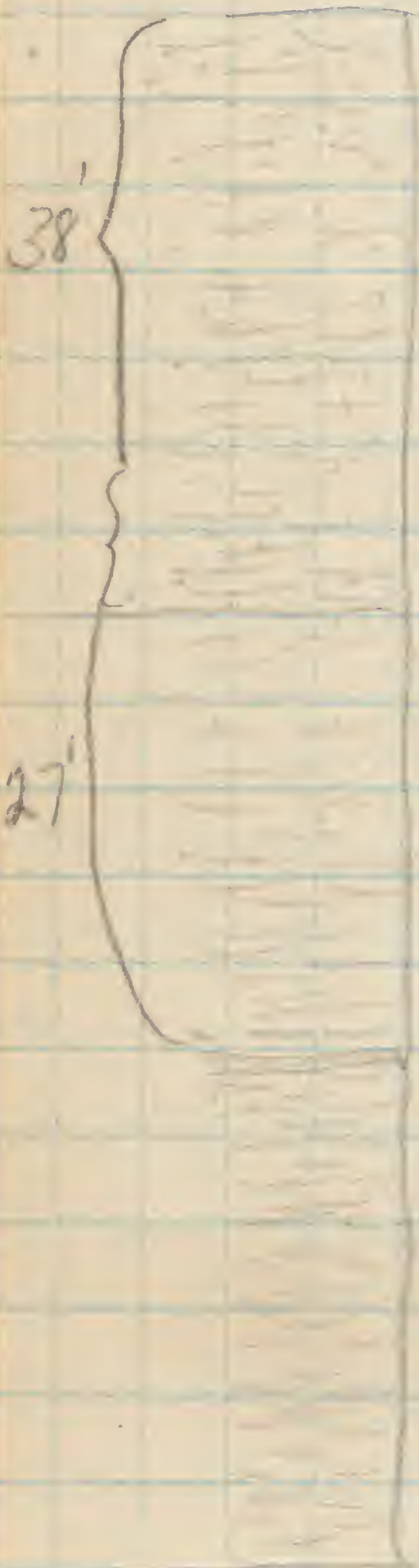
Small *Leptopygus*. These shales were  
poorly exposed up to 1559' 55" where  
there was a 6" ledge of hard ss. I believe  
that this band of ss is the same as  
that seen at Oct 16 A. Certainly the  
shales below are the same, with  
the characteristic wetting & crumbling.  
Above the ss band

Rock continues above the 6" ss band to  
1630' where are found hard sandy  
shales like those at Oct 20 (D & C) but  
I believe about 10' are missing as  
no *Leptopygus* were seen. Between  
37 + 38' below the top of the highest  
rocks here exposed the ss is  
because soft + had large  
*Leptopygus* in it. The *Leptopygus* shows  
contact must come at about 1595'

A.T.

Oct. 21 E'

Small exposure of the sandstones - no  
fossils noted. The outcrop must be  
near the top of the Pine Woods horizon.



65'  
Sand

15' 10' 10''

3 1/2' shale

15-30' 30''

Back up 5 3'

Oct 21. E<sup>3</sup>

## Ravine at Bridgewater

31 hand level steps from bridge to outcrop. At 1225 paces down to large exposure in Bridgewater from Oct 16 A paces from bridge, 49' vertical of shales that crumbled to thin fragments. Streak is white, blue grey, which fresh, weathers to an olive color. Very slightly gritty, large septaria abundant, found in stream, the large tentacles about 300 yds from highway bridge. The septaria weather to a light brown.

*L. lenticularis* cc*Rhipidomella* sp. n*Complanata* sp. n*Athyris* sp. n

Crinoid stems

364 paces from bridge to large exposure. For the 205 paces upstream from the bridge the shales have a black brown streak.

The total amt. of Cardiff exposed here is about

Rock is exposed up to about 1410' A.T. in the stream bed. The transition from shales with a brown streak to those with a white streak occupies 5-10' in the interval between the quarry and the stream level. The rock in the stream below the quarry has a brown streak, that in the lowest part of quarry a white streak. The Marcellus Cardiff line must come at about 1220-1225' A.T. Shales with a white streak are exposed in patches for 1946 paces upstream. The hand-level indicates these shales up to 1410' A.T. About 100 yds upstream

1410

$$\begin{array}{r} 1510 \\ 364 \\ \hline 1272 \\ 3146 \\ \hline 6292 \\ 788 \\ \hline 3 \overline{) 7080} \end{array} \quad (2360$$

621  
from the quarry in the bed of the creek  
six or 7 large septaria were noted,  
several had been broken but those  
that were entire were fully 5' in  
diameter, they were oval in section  
and greatly depressed. The ls. of the  
concretions weathers to a light tan.  
Agoniatite was found in one of the  
septaria.

The bank of shale or quarry 360  
paces upstream from the bridge is  
48' high and shows a section of  
shales which split into thin flakes  
but not so thin as the Marcellus. Much  
of the shale breaks into rather thick  
pieces which are tough & do not split  
easily. The color of the weathering is  
an olive. *L. limitaris*? is the most  
abundant fossil.

From the top of the Marcellus to the  
top of the hard (Pine Woods) layer is 420'.  
Therefore, either the Cardiff is very thick  
here or else the Sphaerostelea-Cardiff  
line comes in, somewhere in the  
shales, perhaps where the Ambocoelias  
run out, but this would add only  
about 60 or 70' to the Sphaerostelea.

The Pine Woods hard layer forms  
a terrace or platform in many of  
the hills in which it occurs.

Oct 22.

Matters Quarry

F<sup>1</sup> - Quarry in Onondaga - about 10' above road - 10-20' vertical, 50 yds. horizontal  
shaly ls. with much flint -

Platyceras

Palmanites

L. rhomboidalis

A. reticularis

F<sup>1</sup> Riders quarry

20-25 ls. - Helderbergs - lowest stone called "bleach stone" Coeymans or Mendon.

F<sup>2</sup> - patches of Onon. in field.

F<sup>3</sup> - on south bank of stream about a slope of 15' covered with chips of Marcella at about 95' above stream level some of the bed rock shows thru as a fissile jet black shale, rusted on the surface and with a pitted surface - no fossils

About 10' east of the highway a woodchuck hole had brought up weathered shales that had a brown streak.

On the next stream to the south into which this one empties and about 10' below the road some large Onondaga boulders were seen.



F<sup>4</sup> - At source of the gully was found a small exposure of about 1 1/2' of arenaceous shales that have

- |                         |                      |
|-------------------------|----------------------|
| 1. <i>R. vanuxemi</i>   | <i>H. oblongatus</i> |
| <i>A. spiniferoides</i> | <i>C. modestus?</i>  |
| <i>S. pectinatus</i>    | <i>C. coronatus?</i> |

Between 48 + 53' below the top of 5' are 4 1/2' of shales with:

- |                            |                       |
|----------------------------|-----------------------|
| <i>S. pectinatus</i> re    | <i>R. vanuxemi</i> re |
| <i>A. spiniferoides</i> re | <i>H. oblongatus</i>  |
| <i>L. larva</i>            |                       |

60-65' below top 5' of same but increasing numbers of *S. pectinatus*

2' of same 70's below top.

Between 17 + 18 ft steps below top are seen 2' of rather sandy shales splitting in flat slabs, only *L. larva* observed here.

Between 28 + 29 a mass of 4' of blue gray sh. with white streak. Breaks into thin chips - *L. larva*? only fossil seen.

44 steps below top ~~to~~ two streams come together. Behind the right stream the shales here have a faint brown streak, but crumble into rather thick pieces. The streak is more white than brown. It weathers to a very light brown.

61 steps to top, which is at 1616' A.T.  
Macedon-Landiff contact determined between 1367' and 1378' A.T.

1616  
1370  
246

F<sup>5</sup> - 1258' A.T. - patch of Onondaga at 4 corners about 1 1/2 miles N of West Winfield shaley ls. with *L. rhomboidalis*, *A. reticularis*, and *Pentamerella* - may be a large "boulder" but may be in place. Flat along road may be underlain by Onondaga!

F<sup>6</sup> - Marcellus for 103', when Cardiff comes in at ~~1343~~<sup>1343</sup>' A.T. Cardiff exposed for 264 paces upstream - no fossils seen in little bit of Cardiff exposed here. - a large Leptanian seen near the contact. Williams's gulf.

F<sup>7</sup> Clara A. Worden's Gulf - brown streak changed to white at ~~1254~~<sup>1274</sup>' A.T. At 1245 a white streak was also seen - the presence of the white in the two places is hard to explain - brown to white 59' above road.

F<sup>8</sup> - J. A. Perry's property ~~1254~~<sup>1254</sup> a cut of Cardiff below ~~along~~ the road - in a gully far up the hill which has recently formed a long sequence of shales can be seen, for which very few fossils were seen. Near the 1500' contour the weathering of the shales changes from a splitting into flat slabs to a lumpy fragmentation. In these shales, which are also sandier than those below, *S. parvata* and *L. laura* were seen. All of these shales have a brick red rust.

$$\begin{array}{r} 240 \\ 150 \\ \hline 390 \end{array}$$

$$\begin{array}{r} 1160 \\ 11 \\ \hline 1271 \end{array}$$

$$\begin{array}{r} 1260 \\ 150 \\ \hline 1110 \end{array}$$

$$\begin{array}{r} 1284 \\ 1110 \\ \hline 174 \\ 135 \\ \hline 2 \sqrt{309} \\ 134 \\ \hline 154 \end{array}$$

$$\begin{array}{r} 1280 \\ 110 \\ \hline 1190 \end{array}$$

$$\begin{array}{r} 1245 \\ 1110 \\ \hline 135 \end{array}$$

$$\begin{array}{r} 1843 \\ 1190 \\ \hline 153 \end{array}$$

$$\begin{array}{r} 1700 \\ 1820 \\ \hline 380 \end{array}$$

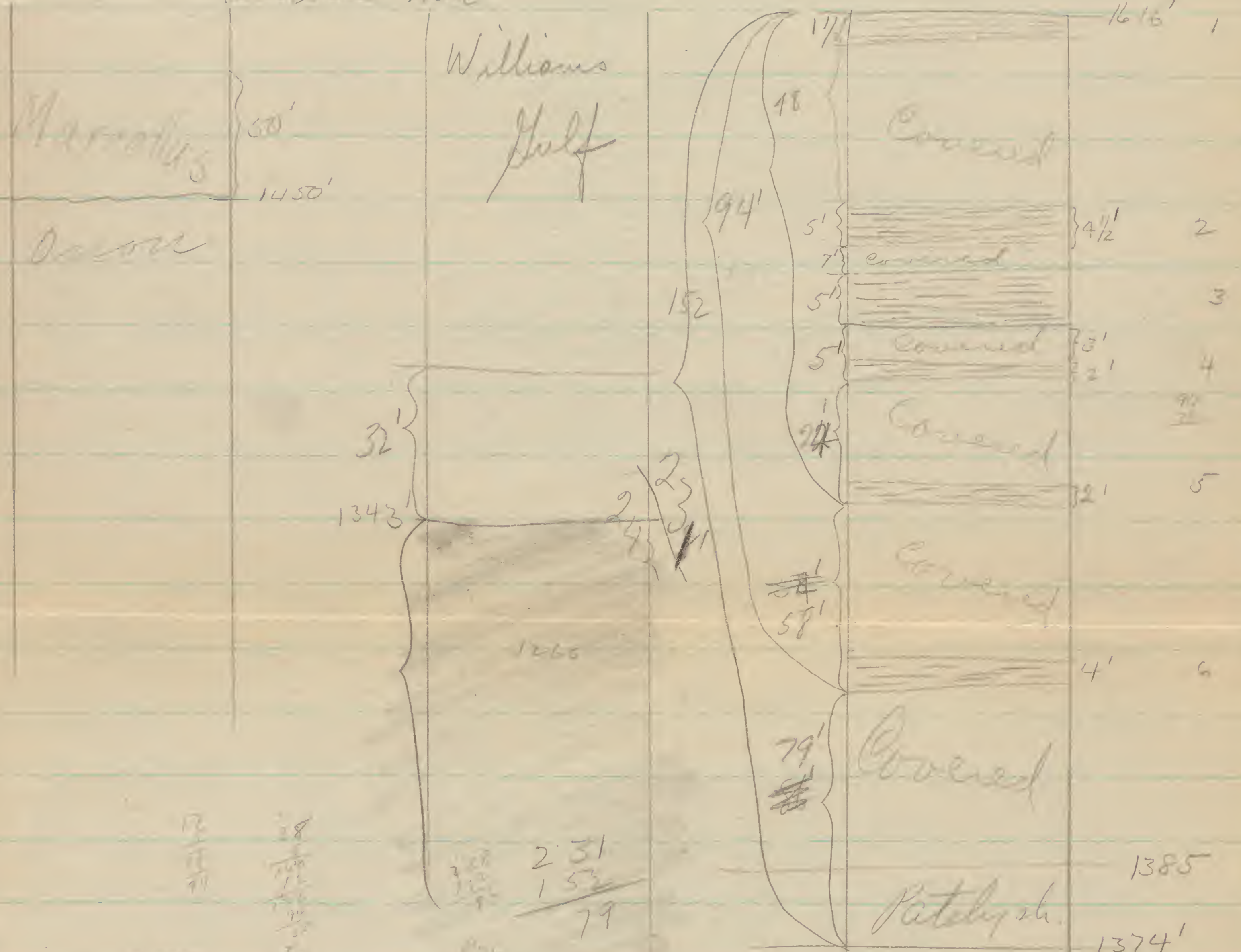
150

$$\begin{array}{r} 1800 \\ 1215 \\ \hline 485 \\ 80 \\ \hline 405 \\ 50 \\ \hline 345 \\ 395 \\ \hline 380 \\ 1200 \\ \hline 375 \end{array}$$

$$\begin{array}{r} 1630 \\ 1215 \\ \hline 415 \\ 20 \\ \hline 395 \end{array}$$

Rose Haven

Bobcock Hill



1385  
1230  
-----  
155

28  
100  
12  
25  
4  
29  
-----  
218

62  
31  
26  
-----  
57

231  
152  
-----  
79

1616  
1279  
-----  
338

1385  
1230  
-----  
1615  
1285  
242  
-----  
231

135

1280  
91  
-----  
1371

1385  
1230  
-----  
155

Wardens

1284

29'

1245

625

625

Oct 23.

G. — side-hill exposures on south side of hill, the rocks are exposed just below the road. The exposures are patches aggregating about 25' vertically of sandy shales with about a foot of thin ss slabs at the top. The most abundant fossil is *Cambricoecchia* (at least 2 sp.). Next in abundance is *Leiopteria*. These are also exposed at the roadside about 150 yds. from the <sup>lod</sup> house going up the hill at about 1730' A.T. These are also glacially grooved. A ripple marked surface was observed here.

G' — About 2 1/2 miles E of Brookfield, on the Brookfield - Leonardville road were seen sandy shales exposed up to 70' above the highway. The first exposures were about 30' up and were sandy shales with

<i>P. flabellum</i> c	<i>A. triquetra</i>
<i>H. deparji</i>	<i>Cambricoecchia</i> sp.
<i>Leiopteria</i> sp.	<i>Toonurus</i> sp.
<i>Cyrtolites</i>	

Higher up, from about 65-70' above highway were seen:

<i>H. thurium</i>	<i>A. umbonata</i>
<i>P. flabellum</i>	<i>S. pennatus</i>
<i>M. macrostomum</i>	<i>Toonurus</i> sp.
<i>Platyceras</i> sp.	<i>Leiopteria</i> sp.

Oct. 23, 627

627

G<sup>2</sup> 1580' A.T.

arenaceous shales with:-

*A. spiniferoides* a.  
*S. perplana* r  
*P. patulus* or  
*Anlopora* sp.  
*Cyrtolites* sp  
*M. macrostromum*  
*Mac. harringtoni*  
*P. sp.*  
*Cyrt. harr.*  
*A. umbonata* c

*C. recurva*  
*Nyassa*  
*R. vanuxemi*  
*C. indenta*  
*S. pennatus*  
*P. constructa*  
*P. flabellum*  
*M. concentrica*  
*Can. harr.*  
*L. macroptera*?

G<sup>3</sup> about 15' above G<sup>2</sup> - arenaceous sh. with

*Camacotectis* sp

*Nyassa*

*N. oblongatus*

*Leopteria* sp.

*N. costuliformis*

*S. pennatus*

The outcrop is glacially grooved & striated

G<sup>4</sup> - This number shall include all of the ledges along the north slope of the hill on the north side of the Brookfield road to Leonardsville. There are a series of ledges, the uppermost ledge is at 1690' A.T. but is only about 3' thick; the lowest ledge is at 1650' A.T. There are ledges scattered in between. The rock is a sandy shale. The bottom ledge is 10-20' thick.

Found - bottom ledge -

*H. deKaji*  
*Ligotia* sp.

Oct. 23.

628

628

Intermediate ledges—

*A. spiriferoides*

*N. arguta*

*P. lirata*

*M. concentrica*

*S. andaculus*

*S. pennatus*

Crinoid stems

*A. umbonata*

Uppermost ledge:—

*P. flabellum* c

*S. andaculus*

*T. carinatus* c

*R. vanuxemi*

*S. pennatus*

*H. deSoye*

*L. macroptera*

*Cyrt. Hamiltonensis*

*A. serpens*

*C. recurva*

*Grammysia* sp.

*A. spiriferoides*

*A. umbonata* re

*J. exigua*

*R. glauca*

*P. lirata* re

*M. concentrica*

*S. granulatus*

Along the Creek and on the slope of the hill at the Creek were found—

*Campanotrochia* sp.

*Grammysia* cf. *globosa*

It is difficult here to distinguish between rock in place in the large blocks that have drifted down from above. If the rock in the stream ~~bottom~~ <sup>is</sup> in place then there are about a hundred or two feet of these sandy shales which I cannot place in the section.

The top of the uppermost ledge is about 15' below the top of the hill and at approximately 1765' A.T.

There is a second ledge about 15' or 20' below the top of this uppermost one. These upper two ledges have *S. pennatus* and *P. lirata* and *Nyassa arguta*, *A. umbonata*.



Oct 23, cont'd

The second ledge from the top has about 20' exposed, it also has a 2' band of ss. below its top. Some of the large ledges have migrated from the present ledge and may be found below as "outcrops"

14 steps from top to a terrace which shows no rocks.

23 steps from top to a third ledge of rock. These figures are taken from the end of the hill between the two houses.

There are rocks exposed below this in the stream & its banks.

The ledges of rock here on this side hill form terraces but there appears to be no marked uniformity or regional character in the terraces except in the ~~top~~ <sup>105</sup> <sup>23</sup> of case of the uppermost terrace.

The shales along the creek bank had few fossils, the prevailing forms being *Canarotrichia* and *Grammysia cf. arcuata*.

The shales in the middle of the hill have *Canarotrichia* and a small *Spirifer*.

The upper beds, for about the upper 40 or so feet of the hill has a more prolific fauna. Here *S. gematus*, *P. lirata*, *Pamboluelia umbonata* are rather common. Other forms noted were *L. macroptera* and a shell that looked like a *Mytilarea*. These upper beds have some resemblance to the Red Gate fauna.

which is supported by the presence of a large *Lysipicata* like those at Red Gate. I could not place these beds in the sequence.

The last section comes at about the places where the dotted line was placed on the map.

Prosser reports *V. pectinata* in these beds but I found none. I did locate a number of *Cyrtina*s however and noted that the brachial valves of these had a strong resemblance to *Vitulina*.

October 24,

H-1331' - along first road south of Bridgewater on west side of valley - 25' of soft argillaceous <sup>shale</sup> in a bank on the south side of the road - They are soft, crumble to small flat pieces, not as fissile as the Marcellus, rust easily - weather to a brown color in section, white streak, curved joint faces, pieces commonly angular, some slabs break with a curved or rounded surface. Fossils rare - a few *Leiorhynchus* were the only forms noted. These shales must belong to the Cardiff division.

H' - 22' higher up the road (1353' A.T. is the bottom of another cut, which is 20' high, on the south side of the road - The lower 10' feet of shale breaks into rather fine fragments and near the top approaches fissility. In this lower 11" *Orbiculoides* is fairly common, also a small *Leiorhynchus* that may be *limitaris*. Occasionally one finds a large *L. laura* and an occasional specimen of *S. pennatus*. This 11' resembles the shales below <sup>at H'</sup>, much more strongly than those above.

At 11' there comes a zone of weathered concretions occupying about 15". Many of the concretions are very small. Some weather to small irregular lumps, others to elongate masses of brown gritty clay. Other concretions have smooth or shagreened surfaces like the surfaces of cone-in-cone. There are many concretions above this



11' AT

concretion  
11' soft sub-fine also with a few small concretions

1353 AT

zone but they are much more scattered. The shale above the concretions for about 12' is slightly more gritty than that below and weathers into irregular lumps in contrast to the weathering into flat chips characteristic of the lower shales. Fossils in this upper sh. are large *L. lamina*, *S. pennatus* c, and a single *D. spiriferoides*. I saw no shells that looked like *S. limitaris* above the zone of the concretions. The concretionary band and the lithologic change involved may mark the end of Cardiff conditions and the arrival of the Skaneateles. There is certainly a marked difference in the faunas of H + H'. I had Shively also collect H to see if I had missed anything but his search was fruitless also. The Skaneateles may thus come in between 1353 + 1363' A.T.

H<sup>2</sup> - 1400' - Patches of sh along the stream with *S. pennatus* cc, *N. corbuliformis* cc, *L. lamina* cc, *C. scitulus* cc. The creek bed along the roadside has shale up to about 1420' A.T. all but a large interior part of a *Spirifer* labelled H<sup>2</sup> belong to H<sup>2</sup>. H<sup>2</sup> specimens are those from the hilltop.

H<sup>3</sup> - sandy shale, hard + resistant, must belong to Pine Woods layer - a large *Spirifer*.

H<sup>4</sup> - arenaceous shales on hilltop just before descending down the hill into the Brookfield valley. i -

✓ *M. mytiloides* Ors,

✓ *S. solitoides*

✓ *M. arcata* n

✓ *P. bilobestrata* c

✓ *C. congregata*

*H. dehalpi*

✓ *Orn. harringtoni*

*M. macrostomum*

10 - 15' in patches on top of hill.

✓ *P. oblongatus* n

✓ *P. trigleter* n

✓ *Pal. constricta* n

✓ *Orbicularoides* sp. n

✓ *A. umbonata* n

*Cyrtolites* sp.

✓ *H. alveata*

✓ *Uromyria* sp.

H<sup>5</sup> - sandstones with large *Spirifer* maybe Pine Woods Layer - top at 1575' A.T. 15' in patches

H<sup>6</sup> - arenaceous shales behind house with -

*P. flabellum* c

*S. undanulus* n

*S. pycnopus* n

*Cyrtolites*

*S. macroptera*

*S. bisulcata*

*R. grandis*

*Cyclonema* sp.

*Orbicularoides* sp. n

*M. mytiloides*

*M. concentrica* n

*P. lirata* n

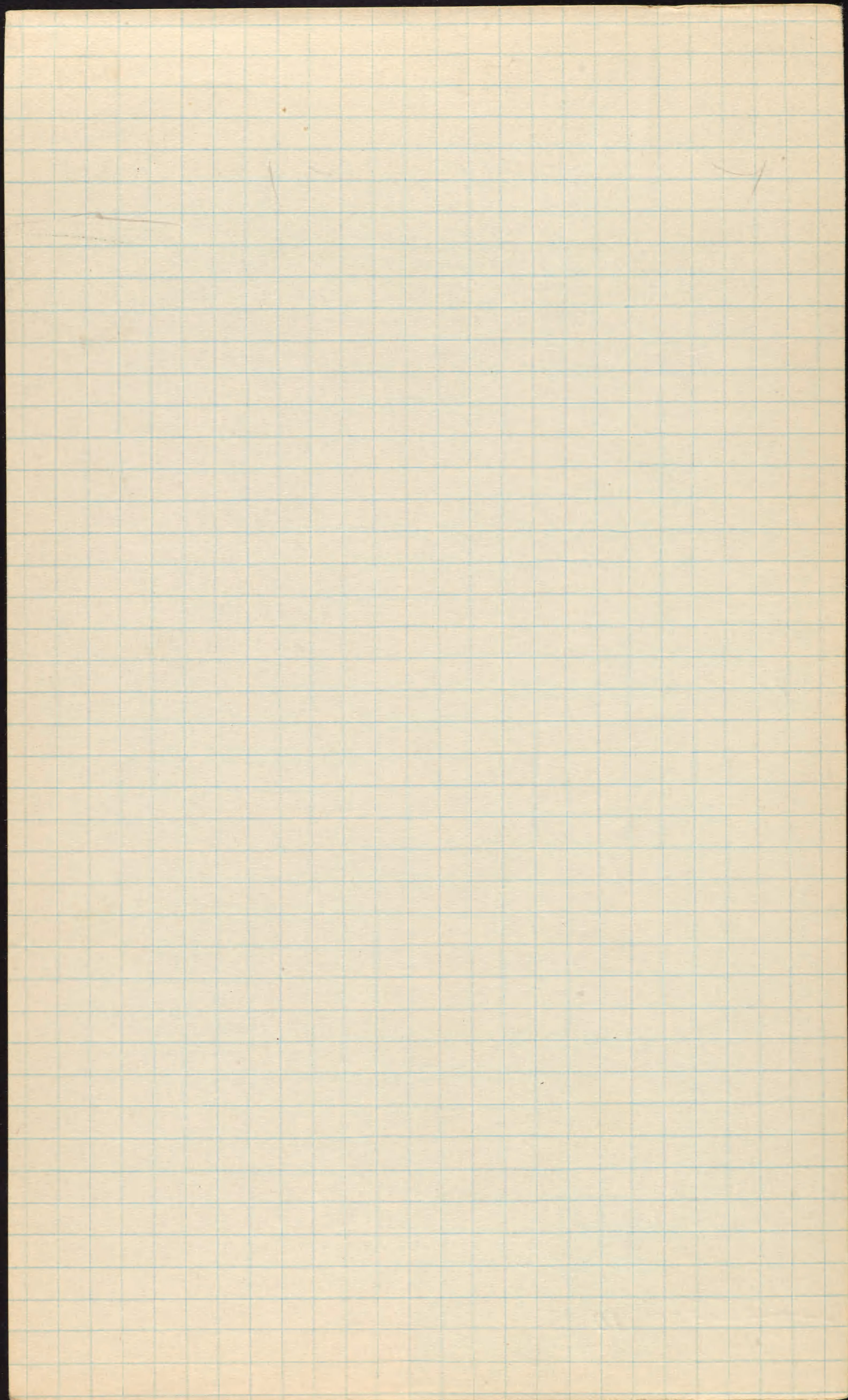
*Camarotoechia*

*P. emarginata*

*H. dehalpi*

*C. elongata*

H<sup>7</sup> - 75' above H<sup>6</sup> - sandstone, then at top, and very sandy shales below. *Spirifer* and *Camarotoechia* were the only forms noted. These shales have the appearance of those of the New York Ledge. H<sup>6</sup> as seen is along the road at its intersection with about the level of 1675' A.T. 1700' A.T. It is seen in the valley to the south of the road.



just beyond (E). of its intersection  
 of it accounts for the flat hilltops  
 for 1/2 mile to the east and probably  
 the other flattopped hills. Blasts from  
 this ledge cover the sides of the hills,  
 some having the appearance of  
 being ledges in place.

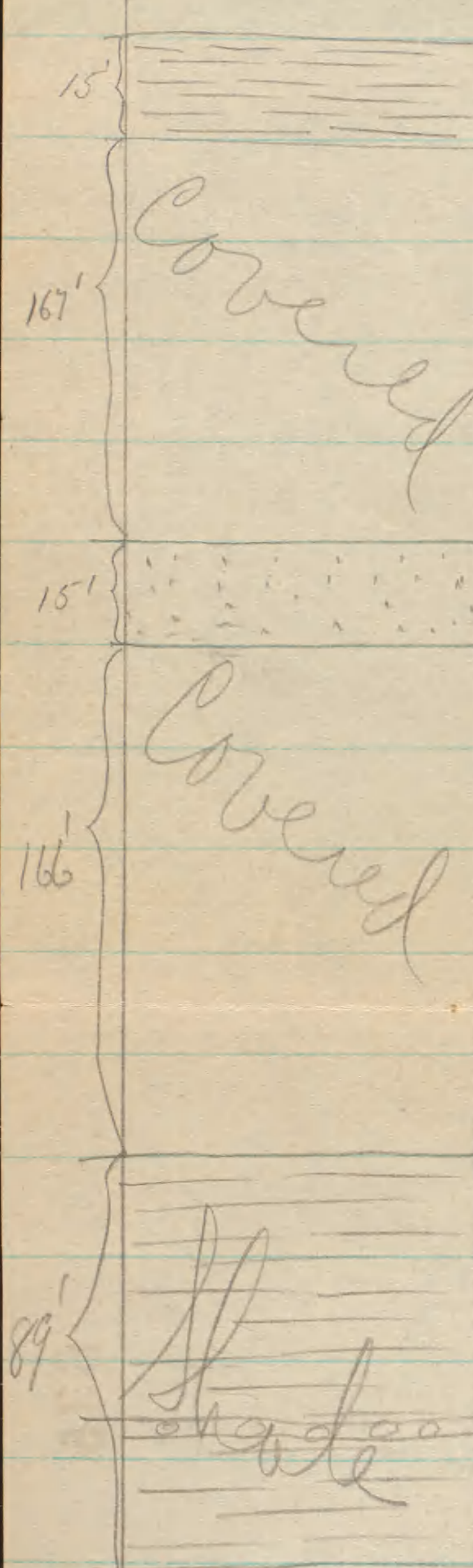
H<sup>8</sup> - small exposure in stream bed -  
 about 6' vertical in 3 cascades with  
 intervals of an exposure between. The  
 rock is blue grey, blocky shale contain-  
 ing many concretions. Those of the lower  
 cascade are small and irregular  
 in shape & often contain many  
 fossils. The concretions of the second  
 cascade are larger and more nearly  
 spherical - some are joined in a  
 dumb-bell fashion. They too contain  
 fossils. One had a drusy cavity  
 of calcite crystals. Calcite occurring in  
 some specimens to be septaria  
 fauna:

<i>C. coronatus</i> r	<i>L. laura</i> (large) c
<i>A. umbonata</i> c	<i>C. vicinus</i> ?
<i>S. pinnatus</i> c	<i>C. setigerus</i>
<i>A. cosa</i> (?) c	

16 1/2  
 15 25  
 12) 50 L 50



# Sections along 1st Road S. of Bridgewater



1750  
H<sup>4</sup> exposed on the top of the divide

1575'

1420'

56'

1353

33 soft *L. limitaris*  
22 67

615  
50  

---

3250

1750  
- 33  

---

1717  
15  

---

1702  
167  

---

1535  
15

1783  
~~15~~  
1768  
167  

---

1881  
15  

---

1586  
1420  

---

116

33  
56  
166  
15  

---

167  
15  

---

452  
1331  

---

1788  
33  

---

1753

~~1783~~  
25  

---

1758  
116  

---

1446  
1331  

---

89

1420  
1331  

---

89

1420  
1353  

---

67

1420  
1363  

---

159

1331  
25  

---

1356

25  
20  

---

45

7

1111

635

635

Oct. 25

I - Small exposure of blue grey shale near bridge along road south of Bordenwater towards wild road. No fossils - shales soft brittle when fresh - probably Cardiff. 1' Behind the base of the house to the south of the bridge is another exposure of about 10' of these shales, thin bedded. In the thin fragments that are easily crumbled in the fingers to an earthy mass the weather to a light grey if weathered for a long time to a brown color in massive thin. The matrix is white. The shales appear to be fissile as they break into thin flakes, but not so thin as in the case of the *Utraculus* shales: -

Fossils: -

*Rhipidomella* sp - a small individual  
*L. bisovella*

This exposure is about 5' above the I. 10' above the I. about 5' more of these shales.

These shales are exposed almost continuously for about 100' above the bridge and these at 100' above the bridge was found an exposure of about 5' of shale with a small *Leisnynchus* perhaps *L. birtan* and *L. bisovella*.

These shales were found together for 81'.

=240m

d<sup>2</sup> - about 35 steps upstream exposures are found in the creek bed. The first rock is 3' of lumpy sandy shale much rusted and breaking into irregular lumps. This has

<i>S. fragilina</i>	<i>Athyris</i> sp.
<i>L. laura</i> var.	<i>Rhipidomella</i> sp. (small)
<i>Leptostrea</i> sp.	<i>S. pinnatus</i>
<i>P. flabellum</i>	Calp coral
<i>C. coronatus</i>	

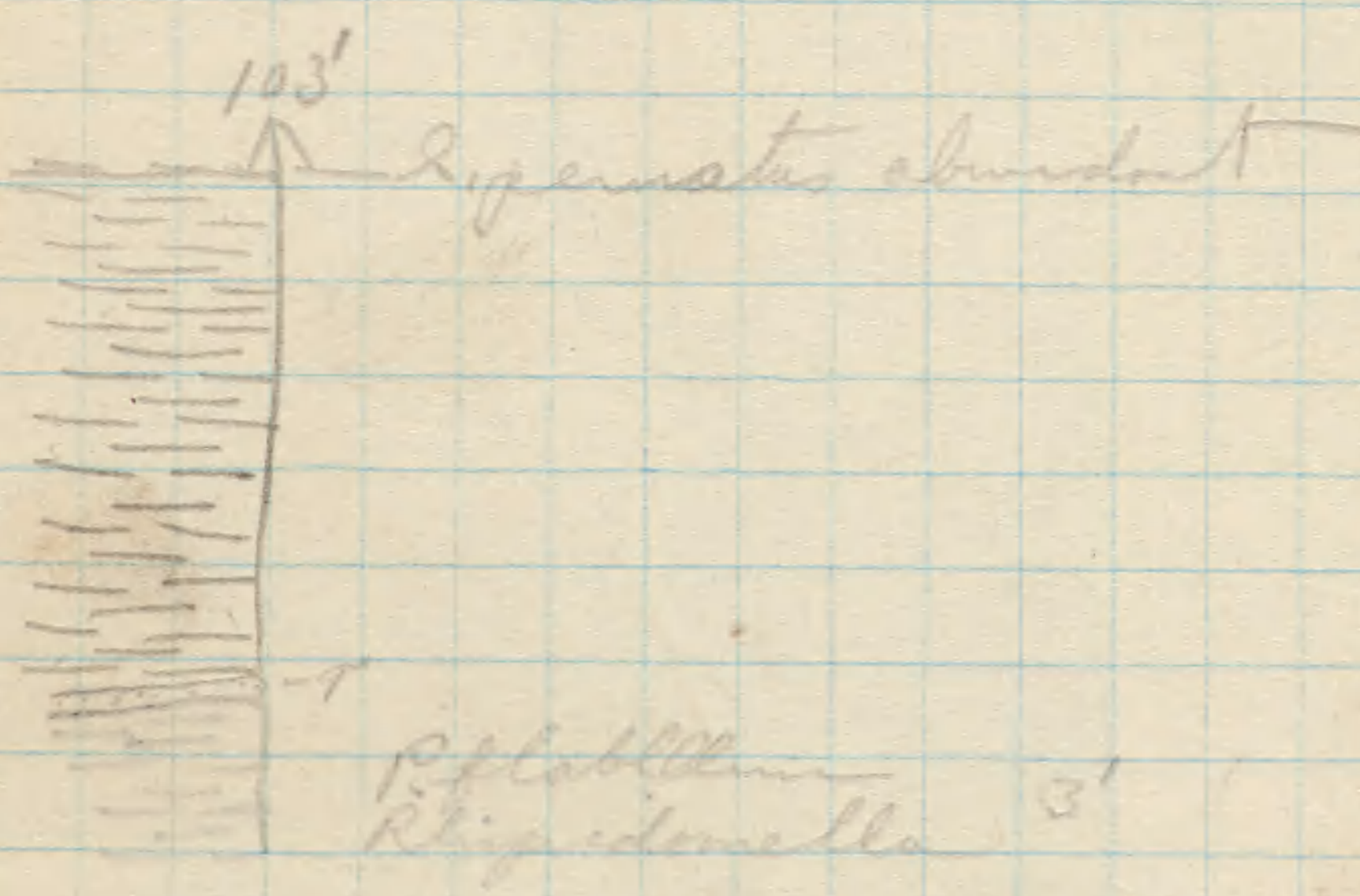
This is followed by 9" of sandy shale which is very hard and resistant and is responsible for a 4' fall here. This has *Taonurus*, *L. laura* and *Chonetes* cf. *coronatus* but fossils are rare. *Taonurus* is the most abundant.

In the next 5' interval the shales are sandy with many concretions that often have a shell of *S. pinnatus* as a nucleus. There are some septaria and some small irregular concretions. Fossils here are -

✓ <i>C. coronatus</i>	✓ <i>C. mucronatus</i> ?
✓ <i>C. scitulus</i>	<i>P. radiata</i>
✓ <i>C. setigerius</i>	<i>Pal. constructa</i>
✓ <i>S. pinnatus</i>	<i>Panoplia</i> sp.
✓ <i>C. lepidus</i>	

Between 5'5" + 10'10" above the 9" ss. were found:-

<i>A. fish spine</i>	Concretion a foot
<i>M. pygmaea</i>	+ 1/2' in diameter, were
✓ <i>L. laura</i>	seen about 2' below
✓ <i>C. scitulus</i>	10'10" above the 9"
<i>N. triquetra</i>	layer.
<i>N. oblongatus</i>	
✓ <i>A. umbonata</i>	



Each square =  
2'

10' 10" - 15 15" above hard layer  
*S. pennatus* very abundant :-  
*Lingula* sp. *O. ellipticus* c.  
*M. pygmaea*  
 Shales are here more  
 argillaceous.

8 steps above hard layer is a  
 small patch of closely jointed shale  
 in the center of bed :-  
*L. laura* cc. *M. subolata*  
*A. subornata*?  
 The shales break into elongate pieces  
 because of some shattering. About  
 2' vertical.

8-9 - similar soft argillaceous sh  
 in bank 30 or 40' -  
 along the stream the following were  
 seen :-

*L. laura* - in great profusion  
 and large size. *M. triquetra*  
*M. subolata*, *M. pygmaea*  
 The shale breaks into small chips  
 the *L. laura* cover the surfaces of  
 the blocks.

At about 14 steps there are 10' of  
 lumpy shales with *L. laura*, large  
*S. pedicatus* sp. *Grammysia* sp.  
*Orthis* sp., *C. scitulus* cc, *M. oblongatus*

Between 15 + 16 - 3' of lumpy sh  
 yielded :-  
*C. scitulus* a. *C. setigerus*  
*L. laura* *M. oblongatus*  
*S. pennatus*

This shale is exposed by the stream on <sup>the bank</sup> ~~the~~ up to 19' above the hard band or to about 1490' A.T. I walked the stream up to the house that is at the end of the dotted road on the map and thus walked it to about 1460' A.T. by the contours. Rock was seen about 15' above this or at about 1475' A.T. The hard level indicated the elevation at 1490' but the chance for error in the thick woods was very good.

C<sup>3</sup> - <sup>1265' A.T.</sup> small exposure of gummy shales which have a lumpy fracture: -  
*Atypis* sp. *Rhipidomella* (small)  
*Leptobryozoa* sp. *M. pygmaea*  
*A. umbonata* a

On the top of the hill at 1265' where the hills are flat are coarse sand shale rocks. A short search yielded no fossils.

From the top of the hill on down for 11 steps coarse shales are exposed. There is a thin vein of *Leptobryozoa* and I believe the stone about Brookfield is found in a *Leptobryozoa* would be like this stone. I think sunbaking bleaches the rock and prevents it from weathering into lumps. Got only fossils at about 1100' which is a *Leptobryozoa* of which several were seen and *Leptobryozoa*. Rock is exposed for 20' below the seventh step in a long cascade from the 11th to the 14th steps.

The last of this shale was seen 15' steps below the top. The lack of fossils may be due to the unfavorable character of the exposure. The shale seems to be finer as down progress is made. Under the hammer it breaks into irregular lumps. It is blue grey in color.

15-16 step consists of 5' of bluish shale that crumbles to finer fragments than that above and contains rather large numbers of *L. laura*. The *Lama stictica* reported from above may be *L. laura* much crushed.

18-19 - 5' shale - crumbly + lumpy -  
*L. laura*, large, *Asymbolota*, *Orbiculoides* sp., *C. setigerus*; *Lingula* sp.

At 21 steps is a gully with about 20' of crumbly sh. In pulling a block of this down it split into oval & irregular masses (concretionary) I saw no fossils that I could identify.

Between 40 and 41 there are 3' of rather coarse arenaceous sh. with *Trematis* & *L. laura*<sup>*C. coronatus*</sup>, no other fossils were observed. This 3' interval forms a cascade.

From the top of this cascade to the 46th step rock is exposed. A falls extends up from the 46th step for 8 or 10'. In the falls occur:-

<i>R. variciformis</i>	<i>C. scitulus</i>
<i>S. pennata</i>	<i>L. laura</i>
	<i>Crinoid stems</i>



1625  
925  
293  
20  
205  
155  
105  
76  

---

344

72 steps to all.

Fossils seen between 47 + 48 were  
*K. vancouverensis*                      *C. coronata*?  
*C. coronata*                              *A. umbonata*

Between 65 + 68 were some bluish  
 soft sh. with no fossils - *Dr. diff.*

12, 12,

35  
2175  
15

Bridge at 1200  
13

1385

1586

50'

45

Large shale

76'

1031

76

5' L. h.

10' Covered

53" L. h.

10' Covered

1483

700

20'

27

Covered

70'

Covered

16'

90'

1390'

32

31'

29'

R. v. v. v.

1337

46

48

48

53'

46

230

1400

248

377

Covered

55  
48  
17

92'

Covered

33

41

97

16

113

1390

1281

109

81'

16'

Soft sh.

1224

1586

1277

309

642

642

17

Oct 26.

Markham Mtn. (Roadway)

J.

At 1323' At. In the road gutter rather soft sandy shales may be seen which continue up to 1336' A.T. The rock is a sandy shale with faint *Taonurus* markings. *Athyris spiniferoides* and a portion of *C. succronata* were the only fossils noted.

J'

At 1377' come about 7' of arenaceous shale exposed in the road bed. These are rather coarse and have small concretions and a few *Taonurus*. Fossils are quite abundant: -

In the lower 3' were seen: -

<i>L. laura</i> c	<i>S. pennatus</i> v.
<i>R. vanuxemi</i> c	<i>C. coronatus</i> v.
<i>A. umbonata</i> v.	<i>L. perplana</i> v.
<i>C. setigenus</i>	

In the next 4' in addition to those above listed were seen: -

<i>Ayclonema</i> sp. v.	<i>P. liata</i> v.
+ <i>A. spiniferoides</i> v.	<i>M. concentrica</i> v.

J<sup>2</sup>

Between 1428 and 1433' A.T. come about 10' of soft dark blue shales that are slightly gummy. These shales crumble into small fragments like the Pecksport shales. Only a few fossils were seen.

<i>N. oblongatus</i>	<i>C. scitulus</i>
<i>L. laura</i> a	<i>O. thoceras</i> sp.

The *Orthoceras* was a living chamber which is constructed toward the aperture. It may be *O. constructa*.

The rock below the Pine Woods layer must consist of a series of shales alternately

sandy and less sandy - all have some grit, even the Cardiff.

These shales extend on the south bank along the road up to 1460' A.T. when they were found:-

*C. scitulus* a

*N. oblongatus* r

*L. laura* c

a large snail or

*P. lirata* r

*S. pennata*

These shales may belong to the Peckport horizon. Concretions are numerous, but they have been leached of their lime and fall easily to an orange brown powder contained in a hard shell. These shales extend to the crown of the hill where a *Bastute* was seen.

J<sup>5</sup>

On the side hill to the east of the roadway and opposite the house just beyond the bend over the top, 125' above the level of the road at the house is a ridge of about 20' of rock 5' of sandy shales are seen below. There about 5' of ss, the upper 1' of which break into thin slabs but the lower 4' into thick irregular lumps of large size. It is a very massive ss below. The massive ss. is grey brown in color. On the ss come n' of dendaceous sh. abounding in *Leomurus*.

The top of the outcrop is at 1558'. In places over 25' of rock were exposed.

12' sandy sh.

In upper layer only a few *Leomuridius* were seen.

5' ss

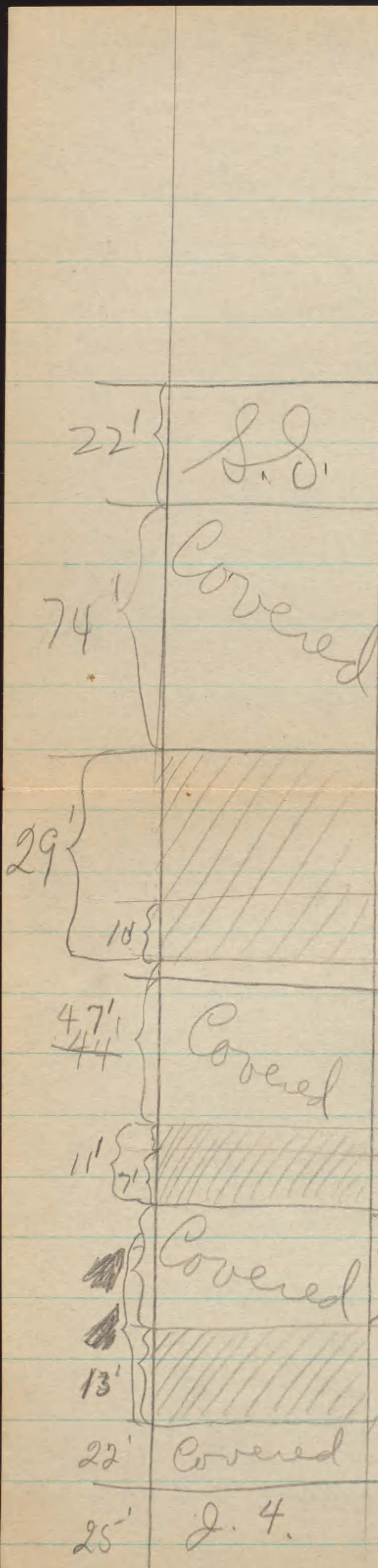
No. fossils in the ss.

13+ sandy sh.

In the lower sandy sh. -

*Campylodiscus* + a doubtful *P. lirata* + *L. laura*.  
+ *L. superna*

# Markham Mtn.



$$\begin{array}{r} 1556 \\ 25 \\ \hline 1531 \\ 1310 \\ \hline 221 \end{array}$$

$$\begin{array}{r} 1420 \\ 125 \\ \hline \end{array}$$

$$\begin{array}{r} 3.50 \\ 1556 \\ 1420 \\ \hline 136 \\ 17.5 \end{array}$$

$$\begin{array}{r} 5-1 \\ 5-1 \\ 12 \end{array}$$

$$\begin{array}{r} 1556 \\ 237 \\ \hline 1309 \end{array}$$

$$\begin{array}{r} 1556 \\ 1460 \\ \hline 96 \\ 22 \\ \hline 74' \end{array}$$

$$\begin{array}{r} 1556 \\ 237 \\ \hline 1319 \text{ A.T.} \end{array}$$

$$\begin{array}{r} 22 \\ 74 \\ 29 \\ 47 \\ 11 \\ 43 \\ \hline 237 \end{array}$$

$$\begin{array}{r} 08 \\ 15.0 \end{array}$$

$$\begin{array}{r} 1556 \\ 237 \\ \hline 1319 \end{array}$$

$$\begin{array}{r} 1250 \\ 50 \\ \hline 1325' \end{array}$$

$$\begin{array}{r} 1310 \\ 15 \\ \hline 1325 \\ 1317 \\ \hline 22 \end{array}$$

$$\begin{array}{r} 1451 \\ 60 \\ 29 \\ \hline 1428 \end{array}$$

$$\begin{array}{r} 28 \\ 84 \\ \hline 44 \end{array}$$

$$\begin{array}{r} 1310 \\ 18 \\ \hline 1328 \end{array}$$

$$\begin{array}{r} 1546 \\ 1323 \\ \hline 223 \end{array}$$

$$1384$$

$$1377$$

$$1336$$

$$1323$$

$$1280$$

$$\begin{array}{r} 1556 \\ 1460 \\ \hline 96 \\ 237 \\ \hline 259 \\ 237 \\ \hline 22 \end{array}$$

645

645



J<sup>3</sup> - rusted, sandy shales with *R. vancouveri*  
*S. pennatus*, 1310' A.T.

J<sup>4</sup> - about 25' of rock on the roadside  
 rather gritty, crumbly shales with:-  
*R. vancouveri* *L. laura*  
*C. numeratus* *C. scitulus*  
*Athyris* sp. *C. vicinus?*  
*A. umbonata*

J<sup>6</sup> - 5' + of crumbly shales with:-  
*S. pennatus* *H. oblongatus*  
*Chonetes* sp. *H. bellistriata*  
*Athyris* sp.

J<sup>7</sup> - 12' of lumpy, sandy sh and some ss.  
 interbedded:-  
*P. patulus* or *P. fragilis* or  
*T. carinatus* c *Aviculopecten* sp. small  
*Camarotoechia* c *M. subalata*  
*H. deharzi* or *Bellerophon* sp. or  
*P. flabellum* or *H. oblongatus* or  
*T. submarginata* or *H. triquetra* or  
*T. exigua* *S. audaculus*  
*Productella* sp.

J<sup>8</sup> - thin shaly ss - with abundant fossiliferous  
 markings - fossils scarce -  
*Leiopteria* sp.  
*Aviculopecten* sp.

These exposures may only be big blocks  
 out of place. The exposures of J<sup>3</sup> appeared  
 like the lower part of the New York  
 layer but these J<sup>3</sup> exposures did not  
 aid in ascertaining the truth.

J9 -

1560 - 1570' 10" - hard sandy blue gray shales with *P. liata*, *D. alveata*, *S. pedunculata*, *C. scitulus*. The rock is quite hard and probably somewhat limest.

1570' 10" - 1575' 15" - hiatus

1575' 15" - 1580' 20" - hard arenaceous shale with *Cam. arctochia*, *Lopteria*, etc. This forms a 4' cascade.

1580' 20" - 1585' 25" - hard calcareo-arenaceous rock abounding in *C. congregata*, *S. andaculus* and *A. erectum* (large). Also *Orulopora* sp.

1585' 25" - 1590' 30" - hiatus except that the bottom is floored by shaly calcareo-arenaceous rock with *C. congregata* and *S. andaculus*.

1590' 30" - 1600' 40" - hiatus

11'

1600' 40" - 1605' 45" - arenaceous shale with -

✓ <i>P. flabellum</i>	✓ <i>P. liata</i>
✓ <i>P. maxima</i>	✓ <i>D. alveata</i>
✓ <i>Sphenotus</i> sp.	✓ <i>Par. hamiltoniae</i>
	✓ <i>C. boothi</i>

1605' 45" - 1610' 50" -

✓ <i>P. maxima</i>	✓ <i>Cam. arctochia</i> sp.
✓ <i>P. liata</i>	✓ <i>A. erectum</i>

1610' 50" - 1615' 55" - falls just below road - cherty sh. -

✓ <i>O. parvula</i>	✓ <i>P. costata</i>
✓ <i>Orulopora</i>	✓ <i>P. radiata</i> sp.

1615' 55" — 1640' 80" — 25' of sandy sh  
with some ss.

✓ *P. liata*

✓ *A. erectum*

✓ *H. dekeyri*

✓ *M. yassa* sp.

✓ *S. andacubus*

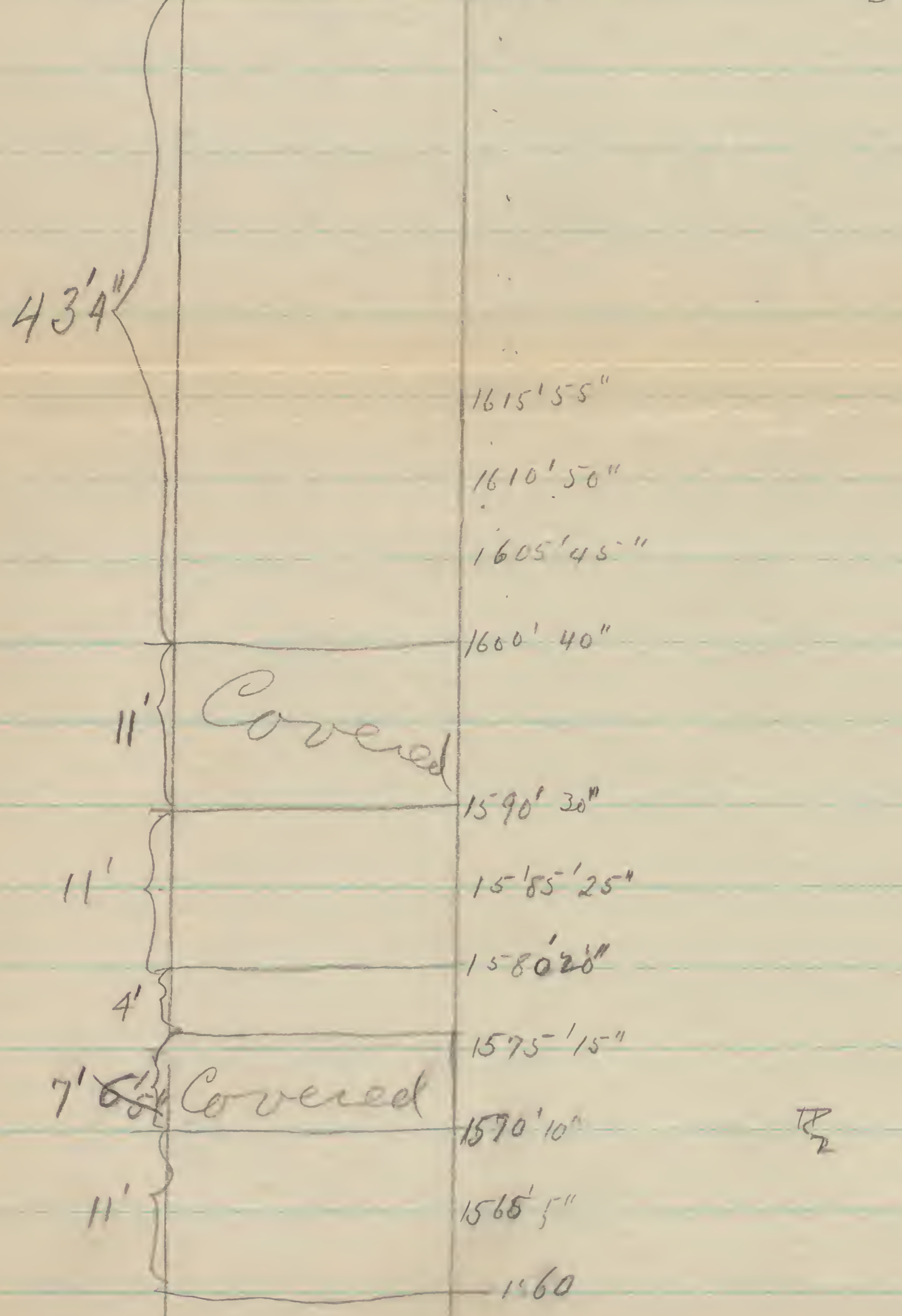
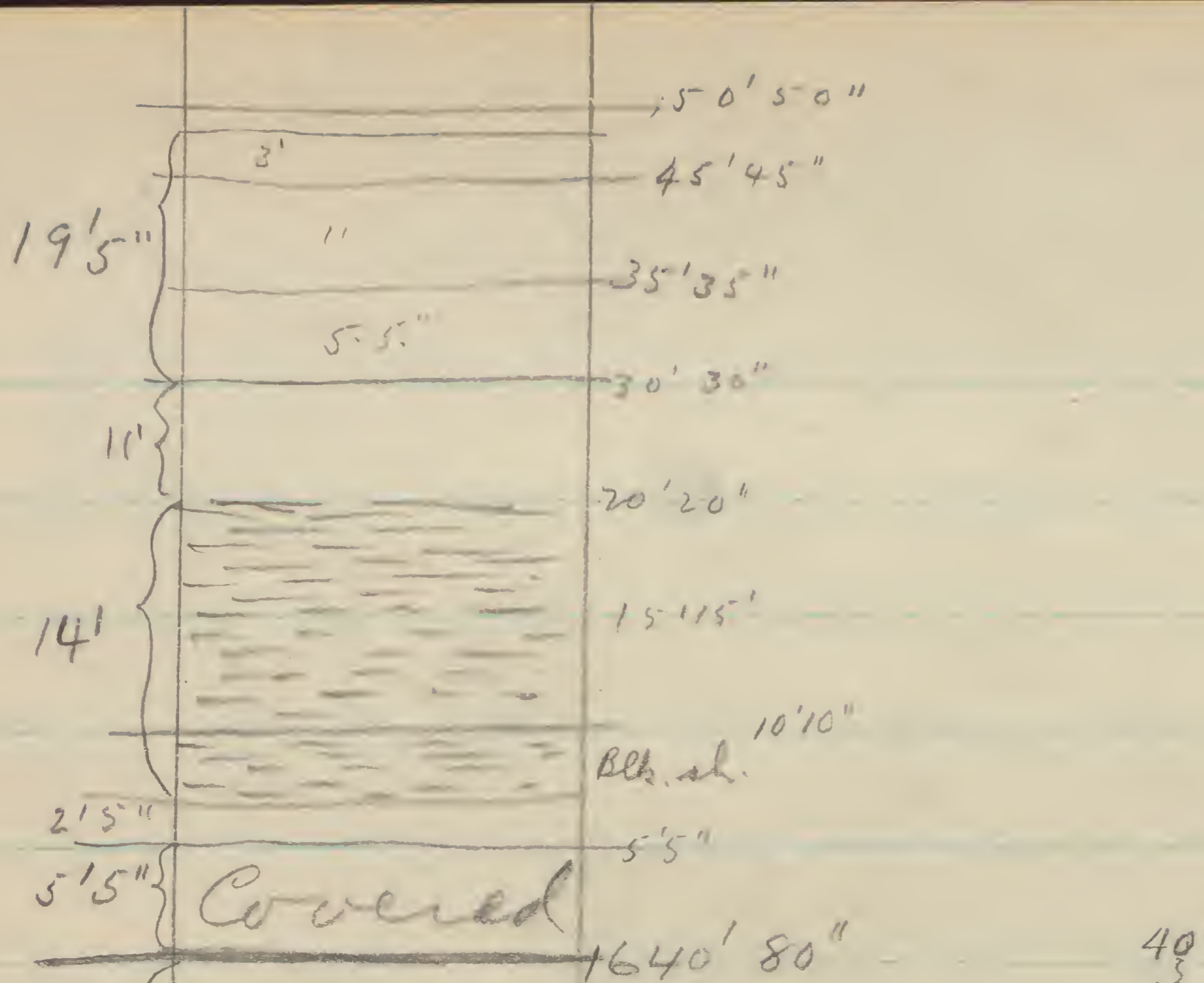
✓ *C. tenuistriata*

✓ *Camarotoechia* sp.

Remarks on the day: — On the top of Washburn  
Mtn. are apparently the rocks that are  
transition from the Packerport horizon  
to the New Gym layer. The lower portion  
of the New Gym layer, I believe, was  
seen in J? at least abundance of  
*P. patulus* and *H. dekeyri* are significant.  
The calcareous stone so well exposed  
along the Eaton roadway with the  
large numbers of *Spirifer* and  
*Camarotoechia* occurs at about 1570'  
A.T. in the stream bed.

1640  
- 7  
-----  
1647  
- 1560  
-----  
87

1640  
- 7  
-----  
1647



649

649

Oct. 27

K - ledges + exposures in the road and on the side hill between 1680 and 1630'. The rock is a sandy shale.

K' - ledges, <sup>the top of which are</sup> at about 1520 - 1530' A.T. They belong to the ledges seen at J<sup>5</sup>.

K<sup>2</sup> - same on Fork M.Tn.

Fossils seen at K are: -

*S. papilosa*

*S. andacubus*

*J. epigua*

*Pal. emarginata*

*O. parvula*

*A. erectum*

*M. subalata*

*H. dekeyi*

*S. bisulcata*

*P. flabellum*

*C. tenuistriata*

*J. carinatus*

*Camarotoechia* sp.

*Nyassa* sp.

Crinoid stems

I believe that this horizon clearly belongs to the New Hymn.

J<sup>9</sup> - rechecked by Charley who makes the height from bridge to bridge 87'

Nearly the whole gym horizon must be exposed here. From the top of the last small 5' falls to the road there is a hiatus of 5'5". Follow the stream south from J<sup>9</sup> the following sections are seen: -

J<sup>9</sup>

K<sup>3</sup> - From road to end of 1<sup>st</sup> hand level step - hiatus

5'5" - 10'10" - 3' of shale exposed in the bank of the brook, dark crumbly shale, quite argillaceous, breaks into curved slabs, nearly black in color

Fauna: -

*L. laura* a.

*M. pygmaea*

*J. submarginata*

*Pterinopecten*

*Leiopteria* sp.  
*Aviculopecten* sp.

*C. setigenus*  
*M. concentrica* or  
*N. bellistriata*

10' 10" - 15' 15" - same

15' 15" - 20' 20" - at the top of this interval there is about 2 1/2' of very fossiliferous shale which is much harder and sandier than that below. Fossils here are:

*L. laura* c  
*N. oblongatus* c  
*N. triquetus* re  
*S. andaculus*? r  
*G. bisulcata* or

*M. pygmaea* c  
*Leiopteria* 2 sp.  
*M. subalata* re  
*N. corbuliformis*  
*Spyroceras* sp.

20' 20" - 25' 25" - hiatus

25' 25" - 30' 30" - hiatus

30' 30" - 35' 35" - The rock in this interval is very much harder than any seen below. Sandy shales with seams of ss are present. The only fossils seen were a *Leiopteria* and shells that look like a *Umbonata*.

35' 35" - 40' 40" - same shaly sands with *N. bellistriata*

40' 40" - 45' 45" - same

45' 45" - 50' 50" - same for <sup>lower</sup> 3' - 2' hiatus

50' 50" - 55' 55" - hiatus. The last rock seen was at about 53' above the road.

K<sup>4</sup> - about 20' of sandy, lumpy shales with ss at the top. Fossils: -

*J. rotalia*  
*P. flabellum*  
*H. dehayi*  
*A. erectum*  
*M. subalata*  
*Pal. constricta*

*P. patulus*  
*B. lada?*  
*Camartorchia* sp.  
*Tycaimatus*  
*Productella* sp.

K<sup>5</sup> - at top of hill - a small patch of arenaceous shales probably in the New Syn layer. No fossils were found.

K<sup>6</sup> <sup>0-5'5"</sup> - sandy shales with: -

✓ *S. pennatus*  
 ✓ *Cyt. ham.*  
 ✓ *P. flabellum*  
 ✓ *S. andaculus*  
 ✓ *C. congregata*  
 ✓ *S. chesungensis*  
 ✓ *Sphenotus* sp.  
 ✓ *Pal. emarginata*  
 ✓ *J. exigua*  
 ✓ *S. pediplana*  
 ✓ *V. pustulosa*

✓ *Productella* sp.  
 ✓ *Camartorchia* sp.  
 ✓ *C. tenuistriata*  
 ✓ *C. mucronatus*  
 ✓ *H. dehayi*  
 ✓ *P. liath*  
*M. arguta*  
 ✓ *C. corrigata*  
 ✓ *A. boydi*  
 ✓ *C. sulcata*

5'5" - 10'10" - same - list above covers both intervals

10'10" - 15'15" - same with *S. pennatus*, *C. sirtularis*. At top of 10'10" came a 3 or 4" layer of blabby ss which has the sand fauna. This interval is mostly sandy shales.

In biologic under *Microspirifer*



15'15" — 20'20" — shales softer and apparently with a different fauna:—

*M. pyramidea*

*orbiculoidea* sp.

*N. oblongatus*

*Comularia undulata*

*N. triquetus*

*A. umbonata*

*L. laura*

At the top of this interval were thin ss. slabs with *L. laura* and *Leiopteria* sp.

20'20" — 30'30" — very coarse shales that break into thin plates. There are some thin ss layers interbedded.

30'30" — 40'40" — liatus

40'40" — 75'75" — blue grey shales breaking into flat slabs and becoming harder and sandier at the top. The softer shales contained:—

*S. andaculus*

*T. submarginata*

The harder shales at the top have abundance of *Camarotoechia* + *S. andaculus*

75'75" — 80'80" — liatus to road.

K<sup>2</sup> — small quarry in thin slabby ss interbedded with ~~ss~~ arenaceous shales — The only fossils observed were:—

*Camarotoechia* sp ✓

*Cyrt. ham.*

*L. laura* ✓

*L. rogersi* ✓

*P. flabellum*

*Cyrtotites* sp.

The checked ones are probably from in place, all were seen in loose slabs.

K<sup>8</sup> - very thin ss with *O. carinata* & parallel

K<sup>9</sup> - 97½' above highway is the top of a single  
 of ridges ranging from 5-15' in height. The  
 rock is a coarse sandy shale. About  
 10' above the ridge is another exposure  
 of similar rock. The top of the ridge is  
 at 1288' A.T. About 10' or 15' above the top  
 of the lower ledge a *Leptæna* was seen.  
 Fossils in the lower ledge as judged  
 from the debris from the ledge are: -

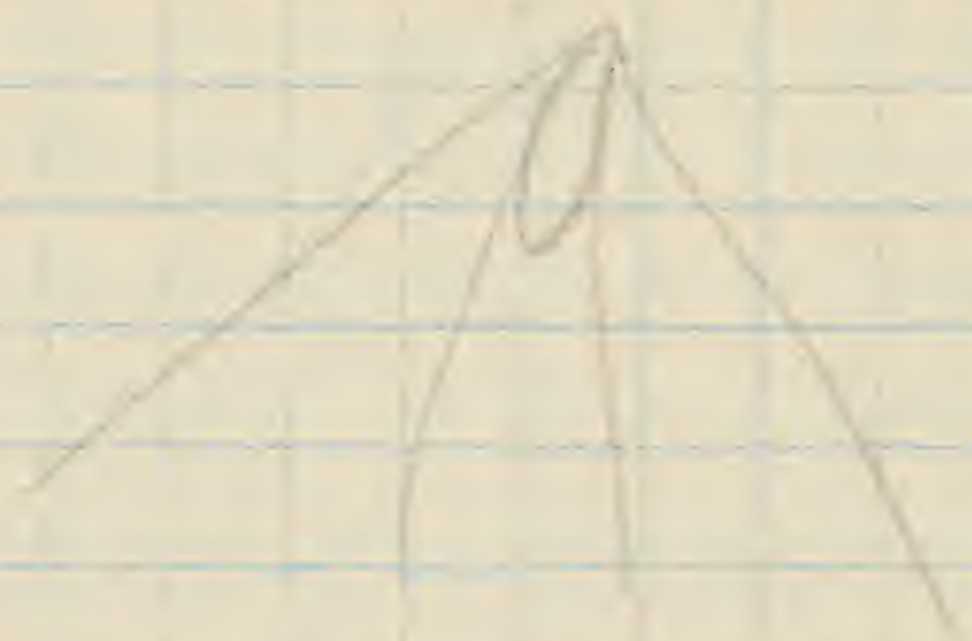
<i>P. lirata</i>	a snail
<i>Camarotoechia</i> sp.	<i>L. laura</i>
<i>S. arduus</i>	<i>L. rogersi</i>

In the lower ledge there was an 8"  
 layer of slabby ss about 10' from the top.

K<sup>10</sup> - at K<sup>10</sup> the top of the ridge is 60'  
 above the roadway or at 1248' A.T. Below  
 the hard sandy ledge along the road  
 are soft arenaceous shales with  
 large *L. laura*. The 8" sandy band  
 was again seen in the ridge and  
 this makes me believe that the ledge  
 is continuous from the Leonardville  
 road to the next road south across the  
 valley.

The rocks at K I believe belong to the  
 New Lynn horizon.

K<sup>6</sup> - presents a new problem with  
 the occurrence of *V. pustulosa* along  
 with *P. flabellum*, *A. boydi* and other  
 fossils. These must be above the New  
 Lynn horizon and probably fall  
 somewhere between it and the  
 U. Quarry horizon. At any rate the



rocks containing them present a  
new formal passage to me. I  
might be an altered Eaton horizon or  
an invasion of new forms in the  
New York horizon. It may be a  
modified Flatland horizon.

K3 - The beds of this layer resting on  
the sections of J<sup>9</sup> and similar to  
those beds at Hamilton. The sequence  
of fine to coarse also maintains here  
but the lower beds somewhat  
coarser than at Hamilton. About  
53' of shales were seen and this with  
the 19' of ss from the Morrisville area  
would indicate that this bed is  
thickening to the east.

The New York horizon below is not  
exactly like that of the Morrisville  
quadrangle as it seems here sandier  
and much less fossiliferous. The cord  
beds and *Pholidops* & *Rambria* zones  
were not exposed, but the  
*Spirifer* - *Cambric* zones at  
the bottom considerable calcareous  
matter was still present.

R  
6

38'

bluish gray  
sh.  
sandy  
at top.

75' 75"

$\frac{81}{38}$

11'

Covered

40' 40"

11'

30' 30"

16'

20' 20"

10' 15"

10' 10"

5' 5"

0'

656

656



L<sup>2</sup> - 75' above L<sup>1</sup> along the road and for 120 paces along road above L<sup>1</sup> are outcrops of a blue grey shale that splits into flinty slabs and contains few fossils. The shales are considerably rusted. When fractured they fall into flat pieces - some of the slabs have rounded edges. A single small piece found loose under a ledge on the bank contained: - *P. punctifera*, *Pas. harr.*, *P. fragilis*, crinoid stems.

The upper part of the exposures have a cherty parting. Rock is exposed for 8-15' along the bank by the roadside for 120 paces above 1475' A.T. Other fossils are *T. submarginata*, *C. setigerum*.

L<sup>3</sup> - Around the bend at about 1500' A.T. the rock is a rather coarse exposure for about 4' and has abundant fossils.

<i>D. carinatus</i>	<i>Leiopteria</i> sp.
<i>Spirifer</i> sp.	<i>Comastichia</i> sp. c
<i>P. laticulus</i>	Crinoid plate

The stone is brownish grey, so the fossils occur as rusted moulds. The plates + ss of L<sup>3</sup> are like those of K<sup>6</sup>.

L<sup>4</sup> - about 1725' A.T. about 5' of sandy shale are and weathered with some slabby shaly ss. Fossils are: -

*D. carinatus* a } in the first 2' of sandy  
*S. pennatus* c } layers. Also the top  
 three feet were seen: -

<i>Leiopteria</i> sp.	<i>C. vicinus</i>
<i>Pal. maxima</i>	<i>Cyrt. harr.</i>
<i>S. pennatus</i>	<i>C. mucronatus</i>
<i>S. sp. tallus</i>	



L<sup>5</sup> - about 3/4 of a mile S of West Edmonton on east side of valley - small exposures on side hill for 15 or 20' above road. Grey arenaceous, very weathered shales with:-

<i>L. rugosa</i> r	<i>Attheyia</i> sp. <sup>c</sup> <i>sp. sp.</i> ?
<i>C. prolifica</i> ? r	<i>C. boettii</i>
<i>S. penhata</i> c	<i>P. flabellum</i> r
<i>M. concentrica</i> r	<i>N. arguta</i> c
<i>Cyrtolites</i> sp.	<i>S. andaculus</i>
<i>R. vancouverensis</i>	<i>I. cuneatus</i> r

A little lower down and about 50 yds to the south of the <sup>northern exposure</sup> higher outcrops were found:-

<i>Lecytharia</i> sp.	<i>Grammysia</i> sp.
<i>P. flabellum</i>	<i>Camerozouchea</i> sp.

L<sup>6</sup> - *penine* (1<sup>st</sup> one on New Berlin Road) on east side of valley - hand levelling begun at 1240' A.T. Dresser Basal

1240' - 1255' 15" - *tratus* - but one foot of shale

1255' 15" - 1290' 50" - this long interval of about 38' consists below of blue grey shales that break readily into small pieces in the interval 1255' 15" - 1260' 50" a *Lecytharia* and a *Spirifer* were found. As one goes up thru the section to about 1275' 35" these shales continue with their flat parting and blue-grey color. They are however a little darker and more sandy. Between 1275' 35" and 1280' 40" just where the shales are becoming lumpy a small *Lecytharia* was found with the *penine* *Spirifer* and *A. penula*

At about 1280' 40" — the shales begin to become coarser and lumpy no longer breaking into the flat slabs or chips like those below.

Between 1280' 40" and 1290' 50" the shales are quite lumpy and are more fossiliferous the following fossils were observed:—

<i>Grammysia</i> sp.	<i>Pal. constricta</i>
<i>G. bisulcata</i>	<i>Spirifer</i> sp.
<i>Leiopteria</i> sp.	<i>Actinopteria</i> sp.
<i>T. submarginata</i> re	<i>Actinodroma exactum</i>
<i>Hederella</i> (pl. on snail)	<i>C. scutulus</i>
<i>T. bellulus</i>	<i>H. dehaeni</i>

All L<sup>6</sup> packages with red label belong here

1290' 50" — 1295' 55" — arenaceous shale and thin ss. alternating — for upper 3/2' lower 2' belong to the preceding interval.

*Spirifer* sp. was found in the shale just below the 1st ss. bed.

1295' 55" — 1310' 70" — ss — that are thin slabby, some breaking into rather thick slabs — *Camartoechia* is the prevailing fossil.

1310' 70" — 1315' 75" — coarse arenaceous shales or fine ss that break into lumps, with some thin beds of slabby ss. The top of the interval has a foot and one half of slabby sandstone.

<i>A. curvica</i>	<i>Leiopteria</i>
<i>S. granulosa</i>	<i>T. bellulus</i>

1315'75" - 1325'85" - arenaceous shales  
with shaly ss on top - *Lumatrochium*

1325'85" - 1335'95" - hiatus - a small  
patch of shaly ss in the middle of the  
interval.

1335'95" - 1340'100" - sandy shales  
with:-

✓ <i>T. caninatus</i> var.	✓ <i>S. pinnatus</i>
✓ <i>P. hirsuticollis</i>	✓ <i>A. scipens</i>
✓ <i>P. marginata</i>	✓ <i>P. flabellum</i>
✓ <i>T. exigua</i>	✓ <i>C. marginata</i>
✓ <i>S. palmaria</i>	✓ <i>A. umbonata</i>
✓ <i>C. vicinum</i> ( <i>P. vicinum</i> )	<i>P. umbonata</i> or <i>T. umbonata</i>
✓ <i>Schuchertella</i> sp.	✓ <i>E. linchlaeni</i>
<del><i>P. flabellum</i></del>	<i>M. oblongatus</i>

The fossils in this interval are  
considerable fragments and only  
occur in abundance in thin layers.  
One of the thin layers was in a  
very coarse but thin ss. layer. The  
bulk of the rock however is a blue  
grey sandy shale, rather soft,  
and breaking into thin irregular  
clips of rather large size.

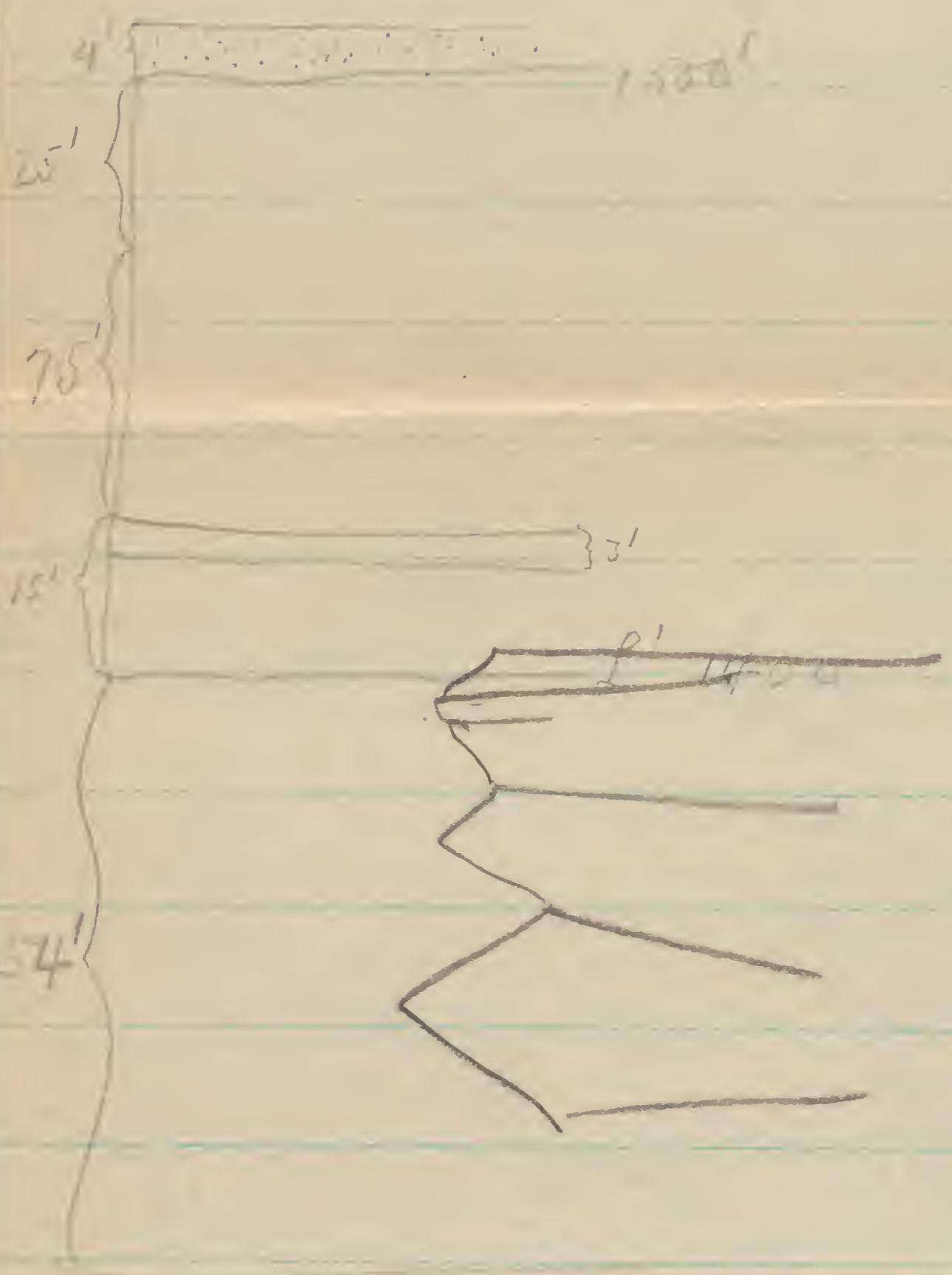
1340'100" - 1345'105" - same

1345'105" - 1355'110" - lower 5'  
pretty well covered and not favorable  
for collection but in the upper 5'  
6' *Pisidium* was found. It  
is not abundant, only 3 individuals  
being seen. The rock in this interval  
is of sandy shale & ss and the top  
of the interval has 9" of shaly  
ss breaking into thin shaly.

Hand-level does not check topography <sup>in</sup> stream-  
union.

L7- 9' blue grey shales that weather  
 to a light ash or grey with:-  
*P. bellum* *Camarotoechia* sp.  
*S. granulosa* *M. concentrica*  
*T. cuneata*  
 This may be the Eastville horizon

L6  
Ravine



11' } sandy sh + ss L. lava mostly covered

11' } same sh

11' } covered

16' } crumby sh. + ss. coarse sh.

20' }

40' } 1280-1290 limit of gravel

1355' 115"

1345' 105"

1340' 100"

1335' 95"

1325' 85"

1315' 75"

1310' 70"

1295' 55"

1290' 50"

1255' 15"

5' 1  
1384  
1238  
108

76  
33  
109'

1316  
1300  
16

663

663

Oct. 27.

M — Carr — Creek  
1185 — 1195' 9" — Diatom

1195' 10" — 1205' 20" — The first 5' 5" of this interval consists of very thin shales with some thin lvs but no fossils could be extracted from them.

In the next 5' 5" which includes about 4' above the small cascade there is a small con. fragment in the shales and then affords some collecting *Spizifer* sp. and *Leioptena* with an occasional *P. bellum* or the possible *P. hirsutum*. However just at the top of this interval fossils are abundant along a single stratum and here were found:

*Leioptena* (several sp.)*S. papulosa**P. bellum* c*Leioptena* sp.*P. hirsutum**Pal. constricta**A. brydi*?*P. erectum**P. androgynata**N. triquetra**H. dekalpa**Nyassa arguta*!

1205' 20" — 1210' 30" — same

1210' 30" — 1215' 35" — shaly sandstones containing *P. erectum* c and *S. androgynata*. The *Spizifer* referred to *S. androgynata* is rather small with numerous plications and a flatish fold bearing a septum etc. is quite abundant.

1215' 35" — 1220' 40" — this interval includes 45' cascade over shales so as hard sandy shales that break into rather thick irregular pieces. The only fossil observed was a *Remarotectia* in a loose slab.

1220' 40" — 1235' 55" — grey shales that break in flattened slabs with an irregular surface. At the <sup>middle of page</sup> bottom of the interval *Urbium* and *S. pennata*? Higher up as *Mucula bellistriata* was seen.

1235' 55" — 1240' 60" — some for 2 1/2' which brings in the top of the falls, which is about 20' high measured from the top of the 5' cascade below it. The top of the falls has some rather hard shaly sandstones. The upper 3' is a hiatus.

1240' 60" — 1245' 65" — hiatus.

1245' 65" — 1250' 70" — hiatus.

1250' 70" — 1255' 75" — mostly platy ss.

1255' 75" — 1270' 90" — sandy shales which are very coarse but do not have the platy fracture of the ss. These occupy 10' of the interval together with some ss. On top of this are 5 or 8' of coarse blue grey sandstones that break into thick brittle plates. These ss are cross-bedded. When exposed in the stream bed these in places give the appearance of having a strong dip down the stream bank a strip of ~~the~~ the plates is crossed as a ledge in another series of plates. <sup>a few small</sup> ~~there~~ <sup>are</sup> ~~are~~ <sup>to be seen</sup> small irregular flatish masses of clay.

1270' 90" — 1275' 95" — in somewhat platy ss in the stream bank were found abundance of *S. laura* of large size. Also *Conostictia* sp. — probably *prospira*. *A. umbonata* and *Pal. undigata*.



1275' 95" — 1335' 155" — hiatus

1335' 155" — 1345' 165" — mostly coarse lumpy ~~very~~ somewhat gritty shales with some interbedded sandstones. Fossils are not abundant but in the dark grey shale were seen: —

N. triquetra or	L. rogersi?
N. oblongatus or	✓ A. umbonata or
Leiopteria sp. or	Camarotoechia 2 sp. c
O. carinata or	O. parvula or
P. fragilis or?	Pal. emarginata
✓ C. acutulus	C. coronatus? (loose)
J. submarginata	S. andaculus?

1345' 165" — 1350' — 170" — same with platy ss on top.

1350' 170" — 1360' 180" — mostly covered for 7'

Then are found sandy shales with: —

S. andaculus? c	} in a } platy } ss	J. carinatus or
Blanchetella sp.		A. erectum or
Camarotoechia sp. c		P. flobellum or

The last 5' and those containing the fossils are ss, which are cross-bedded to judge from the irregular arrangement of the plates in the stream bed.

1360' 180" — 1365' 185" — platy ss.

1365' 185" — 1370' 190" — ss. that breaks in thick irregular curved lumps: —

S. <sup>var</sup> chemungensis	J. carinatus
S. andaculus?	Camarotoechia
P. flobellum	

all fossils rare.

1370' 190" — 1375' 195" — ss. rather coarse  
breaking in places into curved plates.  
On large layers shows a curved  
pocket of large size. These curved  
plates may be an expression of  
cross-bedding. In other parts of this  
interval the layers are flat.

1375' 195" — 1380' 200" — 3' of same as  
previous interval. After this no rock  
is exposed in the stream bed but  
in the bank high up are more  
exposures immediately above 138~~7.5~~' 195" —  
These exposures are about 25' above  
1380' 195" — and consist of about 12' of  
platy sandstones with the following  
fossils:—

*T. carinata*  
*Spirifer andaculus?* cc  
*Canarotrichia congregata?*

Altho this ledge is mainly of plate ss  
there are some chunky ss. with  
many fossils but none are  
recognizable. Some of the thin layers  
have thin seams almost wholly  
composed of fossils.

Carr  
Creek

1335  
13  
1348  
1283  
65

Carr  
Creek

1335' 155"

65'

Covered

1275' 95"

L. larva  
sandy rock

1270' 90"

27'

ss +  
sh.

1255' 75"

1280' 70"

14'

Covered

1245' 65"

1240' 60"

1235' 30"  
1240  
1223  
19

slabby ss.

1235' 55"

19'

Grey shales

1220' 40"

Escalade over  
slabby ss or hard

1215' 35"

1213'  
1196

slabby ss.

1210' 30"

1205' 20"

1195' 10"

12' } Platy  
ss

25' }

Covered

1412  
16  
1428

1250  
1374  
1264  
27

3'

1375' 193"

ss.

1370' 190"

ss

1365' 185"

ss.

1360' 180"

7' } Northy covered

1250' 170"

1345' 165"

16' }

Lumpy  
concrete

1335' 155"

668

899

Oct 29.

M' — Ravine on property of Burt Brown & Leland Vincent

1170' — 1205'35" — hiatus

1205'35" — 1215'45" — 10 or 12' falls of sandy shales with some ss. I found no fossils in the falls.

1215'45" — 1220'50" — blue grey arenaceous shales with some thin ss. Fossils are not abundant.

✓ *G. grammysia*

✓ *N. lirata*

*Loxonema* sp.

*Chonetes* (possibly *conatus*), poorly preserved.

Beyond the falls arenaceous rocks are exposed for 50 or more feet vertically.

1220'50" — 1225'55" — rather soft, somewhat lumpy blue grey arenaceous shales with some ss. beds and claylike concretions, that are soft and crumbly.

Fossils are scarce: —

✓ *N. lirata*

✓ *N. bellistriata*

✓ *Cammarotoechia* sp.

✓ *N. triquetra*

A little of the shale is soft and clay-like

1225'55" — 1255'85" —

✓ *N. oblongatus*

✓ *J. submarginata*

✓ *Cammarotoechia* sp.

✓ *P. umbonata*

✓ *J. carinatus*

✓ *Panambka* sp.

✓ *B. bruleata*

✓ *B. curvata*

*N. macrostromum*

✓ *S. andaculus?*

*P. fragilis*

*Pab. contracta*

✓ *Atypis spiniferoides*

*C. in deuta*

*S. cheungensis*

✓ *C. scitulus*

*P. emarginata*

*L. rogersi*

*Leizthia* sp.

The shales for this 27' are predominately bluish but the rock is quite deceptive. What may appear to be a particular slab of shale may prove to be a layer of ss. cleaved by shale. Or a lumpy shale may have, in a slab, a large proportion of thin slabby ss. that is only revealed on fracture. Toward the top of the interval the shales begin to decrease and their place is taken by slabby or massive ss.

---

1255'85" — 1260'90" — mostly slabby ss with some lumpy shale — fossils are abundant along the bedding or parting planes of some of the ss/slabs: —

<i>C. tenuistriata</i>	✓ <i>C. congregata</i>
<i>P. flabellum</i> var	<i>L. rogersi</i>
✓ <i>J. carinatus</i> cc	✓ <i>S. andaculus</i> cc?
<i>Pal. emarginata</i>	✓ <i>S. pennatus</i> ?
<i>Schuchertella chemungensis</i>	

I believe this layer is the same as that at 1350 in Camp Ravine

1260'90" — 1265'95" — same with: —

✓ <i>J. carinatus</i>	✓ <i>S. andaculus</i> ?
<del>Quartz</del>	Bryozoa
✓ <i>Camarotoechia</i> sp.	<i>C. tenuistriata</i>
<i>L. rogersi</i>	✓ <i>S. perplana</i>
✓ <i>S. pennatus</i> ?	✓ <i>S. andaculus</i> OK
<i>P. flabellum</i>	✓ <i>C. coronatus</i>
✓ <i>A. umbonata</i> ?	<i>Schuchertella</i> sp.

1265'95" — 1270'100" — same

---

1270'100" — 1280'110" —

Slabby and more massive ss. with curved fracture and joint faces. Fossils are very rare on the ss slabs but in

Thin shale layers they are quite common. In places cross-bedding is evident in the ss.

*C. coronatus* c

*A. erectum*

*Amantechia* sp.

*Leiopteria* sp.

*S. andaculus*

These ss have somewhat the appearance of the U. Quarry ss but do not have the requisite fauna.

1280' 110" - 1285' 115" - about 4' more of shaly ss shown in the bed of the stream. In places the here and below they are strongly rippled.

On the 4' of ss comes about 4" of shale with *Brachygonia* *caninata*? - lot of very large size.

*S. andaculus* *Leiopteria* sp.  
*Amantechia* sp.  
Fragments of a shell that looks like *P. verticillus*.

1285' 115" - 1290' 120" - lister

1290' 120" - 1295' 125" - a ledge of 10' of blue grey shale <sup>to (5')</sup> which passes upward into thin sandy shale. In places thin lenses of shells are evident. In the bluish shales were:

- ✓ *O. undulata*
- ✓ *T. submarginata*
- ✓ *C. tenuitubata*
- ✓ *S. andaculus*?
- ✓ *T. caninatus*
- ✓ *Pal. contracta*

1295' 125" - 1300' 130" - same with

- ✓ *Palaeonites* *peplana* v
- ✓ *P. l. bellina* v
- ✓ *C. tenuitubata* v
- Brachygonia* sp.
- ✓ *T. caninatus* c (pl. s.)
- ✓ *Pal. contracta* v
- L. ligo*
- S. andaculus* c
- ✓ *T. exigua*
- ✓ *C. contracta*

*Camarotoechia* sp.

*Pal. maxima* var

*P. ventrimus*? *P. scutiformis*

*G. alveata*

*S. ellipticus*

*O. undulata*?

*S. cuneata*

*P. emarginata*

*N. triquetra*

1300' 130' - 1305' 135" - cross-bedded ss in the stream bed, but I saw no fossils in them.

1305' 135' - 1310' 140" - rather lumpy blue grey shales with *O. parvula*, *N. deharja*, *Pal. constricta* and large *Camarotoechias* like those at Eiseville. Exposure 3 1/2'. This zone seems to have the fine to coarse sequence. *J. cuneatus*, *N. oblongatus*

1310' 140" - 1315' 145" - thin slabby blue ss. The shales above are apparently passing into ss. *O. undulata*



Burt  
House  
Passage

		1315' 145"
2'	ss. covered	1310' 140"
		1305' 135"
3 1/2'		
5' 5"	ss	1300' 130"
		1295' 125"
11'	shale passing into ss.	1290' 120"
5' 5"	Covered sh	1285' 115"
		1280' 110"
4"		
15'	ss.	1270' 100"
		1265' 95"
16'	slabby ss + sh concretion sh.	1260' 90"
		1255' 85"
38'		
		1225' 55"
		1220' 50"
		1215' 45"
11'	lumpy blue grey sh blue grey subconcretion sh.	
		1205' 35"
	sandy sh no fossils	

1424  
1220  
38

673

673

Nov. 2

## W. J. Palmer's Ravine

Q-

Small exposure about 4' vertical of  
blue gray rather lumpy and somewhat  
shaly shales of the lower Permian.  
Fossils are not abundant. These are found about  
1235' A.T. Fossils are not abundant.

*M. subulata**L. benettianus**T. pygmaea**C. setigerus**T. planus**T. submarginatus*

The shales are quite sandy, but soft  
and can be picked to pieces with the  
fingers.

1237' - 1278' - hiatus

1278' - 1282' 5" - hiatus

1283' - 1285' 10" - Q' at base where there  
occurs from south to west about 5' of  
arenaceous sh. without fossils.

1283' - 1298' 25" - hiatus except for 1/4'  
at top, 9" of soft sh + 4-5" of coarse  
ss.

1298' 25" - 1303' 30" - hiatus

1303' 30" - 1308' 25" - hiatus for 3' with  
2 1/2' of rather soft arenaceous shales  
mud colored to a dark red brown.

*M. bellistriata* n.*Camarotoechia* n.*A. umbonata* n.*M. arguta* n.*M. oblongata* c.*C. spinifrons* n.*Crinoid stems* *Cyrtolites* sp.

This shale crumbles very readily and  
is quite soft.

1308'35" — 1313'40" — this interval has about 3' of thin soft sh. and 2 1/2' — 3' of hard sandy shale. In the soft shale is a 1' band of hard grey ss. and then 2' of sandstone + shaly sh.

2' sh. & sh.  
 2' ss.  
 3' soft sh.

1313'40" — 1318'45" — hiatus, except for ~~1~~ one half foot at bottom, belonging to the previous steps.

1318'45" — 1323'50" — sandier blue grey shales with:—

*M. pygmaea*

*M. trisulcata*

*Sphelintus* sp.

*Orthoceras* sp.

*N. oblongatus*

*Leiopteria* sp.

*Q. umbonata*

*Camacotrochia* sp.

Near the top the shale has been worn smooth by the water and much rounded. When struck with the hammer a shell spalled off like the explosion of a boulder. This shale is much coarser than that below the 1' ss ledge. It weathers into irregular slabs which are very rusted.

1323'50" — 1328'55" — hiatus for 3' — then 3' of massive ss, 1' passing into the next interval. It breaks into irregular lumps. It is grey fine-grained massive ss. with a subhorizontal fracture.

1328'55" — 1358'75" — hiatus

1358' 75" — 1363' 50" — at the top about  
2' of sandy shale in the east bank of  
the stream. These may be huge slabs  
from the hillside not in place. Fossils

✓ <i>P. flabellum</i>	✓ <i>Camarotoechia</i> sp.
✓ <i>S. pennatus</i>	✓ <i>Cyttus</i> sp.
✓ <i>M. triquetra</i>	✓ <i>H. deppayi</i>
✓ <i>R. oviformis</i> ?	✓ <i>A. serpens</i>
✓ <i>L. rogersi</i>	✓ <i>Byozoa</i>

1363' 50" — 1373' 90" — similar sandy  
shales with:

✓ <i>M. argentea</i>	<i>C. vivinus</i>
✓ <i>P. flabellum</i>	<i>C. mucronatus</i>
✓ <i>S. pennatus</i>	✓ <i>Cyttus</i> sp.
✓ <i>M. triquetra</i>	✓ <i>A. spiriferoides</i>

1373' 90" — 1383' 100" — This also includes  
the first 5' of the falls.

Fossils:—

✓ <i>M. argentea</i>	<i>S. andaculus</i>
✓ <i>S. cyrtolium</i>	✓ <i>Leiopteria</i> sp.
✓ <i>S. pennatus</i>	✓ <i>Rhipidomella</i> sp.
✓ <i>Cham. linnitornia</i>	

1383' 100" — 1393' 110" — portion of falls at top  
of this interval.

✓ <i>Leiopteria</i> sp. c	✓ <i>S. pennatus</i>
✓ <i>P. flabellum</i> c	

1393' 110" — 1408' 125" + 2' top of falls at  
~~1419~~ 1420' A.T. and is 35' high. Fossils  
at the top of the falls are:

<i>M. contorta</i>	<i>A. umbonata</i>
<i>H. deppayi</i>	<i>C. mucronatus</i>
<i>P. acuta</i>	<i>C. boottii</i>
<i>S. pennatus</i>	Wood
<i>P. flabellum</i>	<i>T. exigua</i>

*E. lincolni**C. uncinatus**S. andacubus* (large)

~~1420'~~ The rock at the top of the falls is of a calcareo-arenaceous kind in which fossils are difficult to extract. A shell in the rock at the top here strongly resembles *P. uncinatus*.

1420' - 1425' 5" - stream flow passed with rock but could not be collected

1425' 5" - 1435' 15" - lister

1435' 15" - 1440' 20" - arenaceous shales breaking into large irregular slabs -

<i>P. flabellum</i> a	<i>M. agitata</i>
<i>P. uncinatus</i> sp.	<i>S. andacubus</i>
<i>L. perplana</i> a	<i>L. granulosa</i>
<i>P. linita</i>	<i>C. tenuis</i>
<i>P. emarginata</i>	<i>H. dehayi</i>
<i>M. concentrica</i>	<i>P. aptus</i>
<i>P. uncinatus</i> sp.	<i>Cyclonema linita</i>

1440' 20" - 1450' 30" - top of the ledge at a falls of about 10' that runs through a narrow rift in the rock. At the top of the falls the rock is a calcareo-arenaceous rock with the following:

<i>P. flabellum</i> a	<i>C. uncinatus</i>
<i>A. reticularis</i> a	<i>P. holiostraphum</i>
<i>L. uncinatus</i> a	<i>A. boydi</i>
<i>L. perplana</i> a	<i>P. flabellum</i>

1450'30" — 1460'40" — liatus

1460'40" — 1465'45" — thin sandy shales ~~coming~~ that break into very thin plates. Fossils

Orinoids		Lacopteria sp.
Echinoid? 2	<sup>1465</sup> 1465'40	Cammarotoecilia
N. trigonata		N. oblongatus
P. fragilis		M. pygmaea
P. flabellum		I. cuneatus

1465'45" — 1480'60" — These thin sandy shales breaking into plates line the stream bed and extend upward for about 20'.

1480'60" — 1495'75" — the ravine comes out into the open fields at 1495'75" and is very flat & rock is exposed at the edge of the woods for about 10'. Hence this rock here is about 40' or 50' thick.

Burdick's Run is Carr's Brook —  
by Mr. de Long

Cynell Petrology of S. Sta.

		1373' 95"			
3 11 1461 1363 <u>48</u> 50	Sandy sh.				
	2'	1363' 85"			1449 1582 1465 <u>37</u>
		1358' 80"	47'		
3 11 1461 1358 <u>63</u> 34 36	Covered				
			10' 10"		
3'	ss	1328' 50"			1466' 45"
3'	Covered				1461' 40"
5 5'	sandy flg. sh.	1323' 45"	16'		
5 5'	Covered	1318' 40"			1451' 30"
2 1'	2' sh	1313' 35"			
5 5'	5 5'				1441' 20"
6'	soft sh Yanna	1308' 30"			1436' 15"
	Covered		10' 10"		
8 5'	Covered	1303' 25"			1419 1365 <u>54</u>
1 1/4'		1298' 20"	5 5'		1426' 5"
10'		1293' 15"			1421'
		1288' 10"			1408' 130' + 2
Amaceous sh		5' 1283' 5"	60'		
17 8 108 <u>22</u>	Covered		58'		1393' 115"
			48		
1466 1235 <u>230</u>					1383' 105'
4'		1235'			1373' 95"



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