



GEORGETOWN

Georgetown Station

Georgetown Reservoir

WEST SHORE R. R.

Georgetown

South

Leburn

Otseley

VII

Lake

PP 1598

1519

394

1700

2600

1800

1700

1800

1800

1800

1800

1600

1000

1700

1700

2700

2000

1000

1000

1800

1600

1600

1600

1600

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1600



Breakwater and jetties



Bridges



Cable bridges



Ferry



Ford



Triangulation or primary monument

U.S. mineral monument

Boundary monument

Boundary monument



Life-saved stone



Lighthouse or beacon



Lightship



Life-saved stone

WATER



Canals or waterways



Canals or waterways



Canals or waterways



Canals or waterways



Canals or waterways





CONVENTIONAL SIGNS

CULTURE
(printed in black)



Road or path



Railroads and stations



Electric railroad



Tunnel



Wharves



County line



Civil township or district line



Reservation line



Land grant line



Oil wells



Mine or quarry



Prospect



Shaft



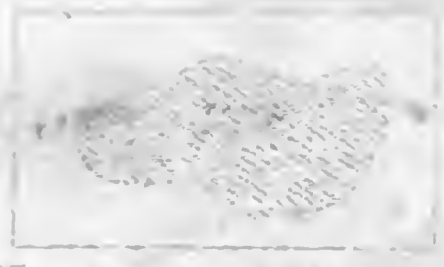
Steepness



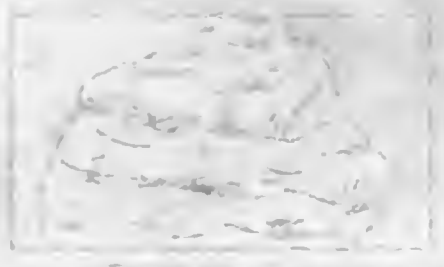
Falls and rapids

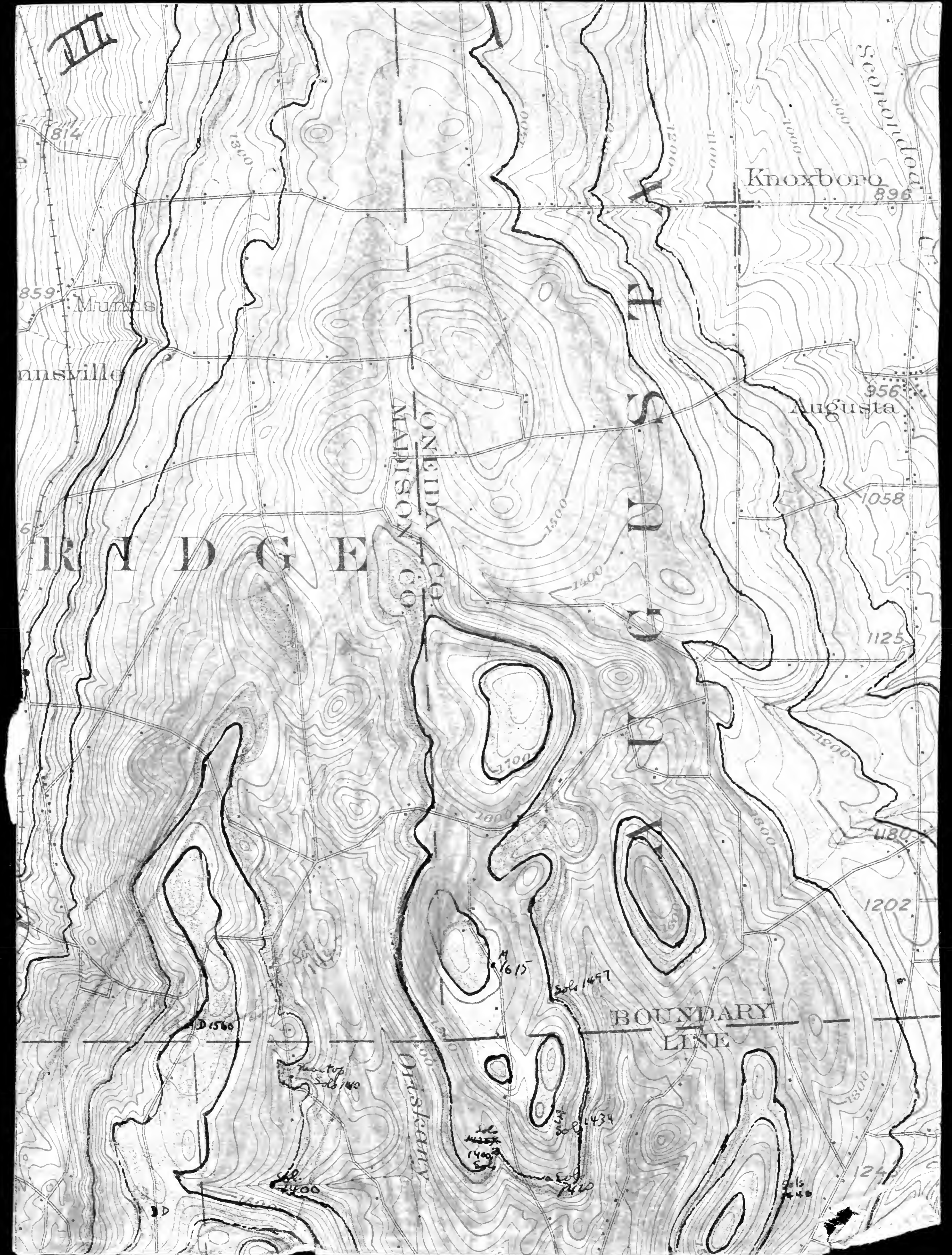


Intermittent stream



Intermittent





III

814

859 Munnsville

Munnsville

Knoxboro 896

956 Augusta

1058

1125

1180

1202

1245

RIDGE

MADISON CO. ONIDA CO.

BOUNDARY LINE

D 1560

M 1615

Sols 1457

BOUNDARY LINE

Sols 1434

Sols 1400

Sols 1440

Sols 1440

Geological Survey of the United States

1832, and its results comprise a series of maps of

per cent of the country, exclusive of carrying

topographic atlas is published in the form of maps on sheets about 16 1/2 by 20 inches. Under the general name of the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude.

These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the maps are of nearly uniform size, they represent areas of different sizes.

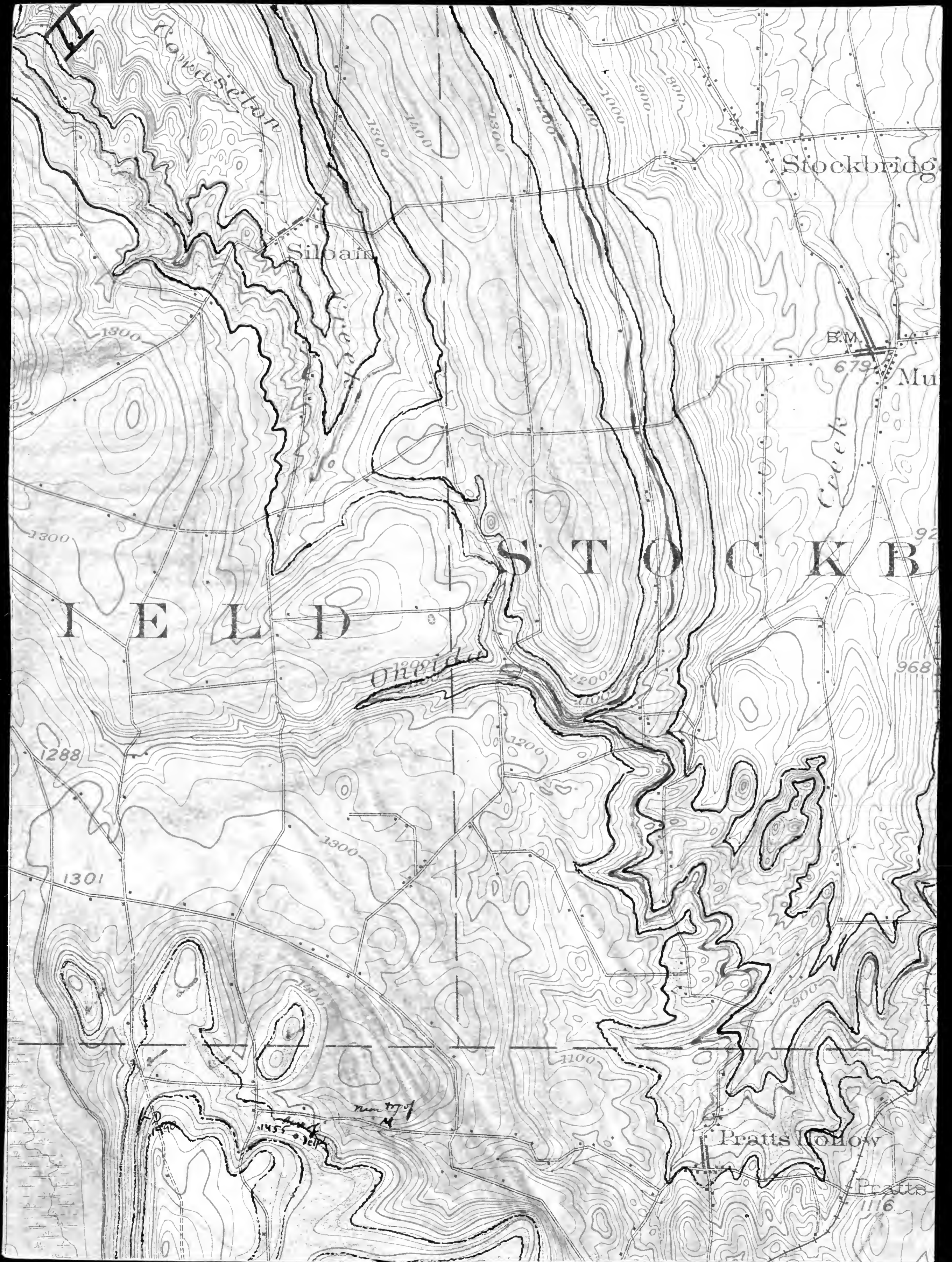
On the lower margin of each map are graphical scales showing distances in feet, meters, and miles.

The scale of the map is shown by a fraction expressing the ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale 1 inch = 62,500 feet represents 62,500 similar units on the earth's surface.

Though some maps are surveyed and some maps are compiled and published on special scales for special purposes, the

topographic surveys for the past many years have been

made as follows: In the years in which there are problems of great



Stockbridge

Siloam

B.M. 679
Mu

Creek

I E L D S T O C K B

1455

968

1288

1301

Pratt's Hollow

Pratts
1116

UNITED STATES GEOLOGICAL SURVEY

The conventional signs and symbols used on the maps are shown and explained below. Some of the features are shown on some earlier maps, and some features are shown on some special maps.

All the water features are represented in blue. The smallest streams are shown by single blue lines and the largest streams by double blue lines. The sea is shown by blue water lining or blue flat. Water features whose beds are dry for a large part of the year are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The sea level itself is a contour, the datum or zero altitude being mean sea level. The 20-foot contour would be the high water line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as the altitude. Successive contour lines that are far apart indicate a gentle slope, lines that are close together indicate a steep slope; and lines that run together indicate a cliff. The manner in which contour lines express altitude, to an

above



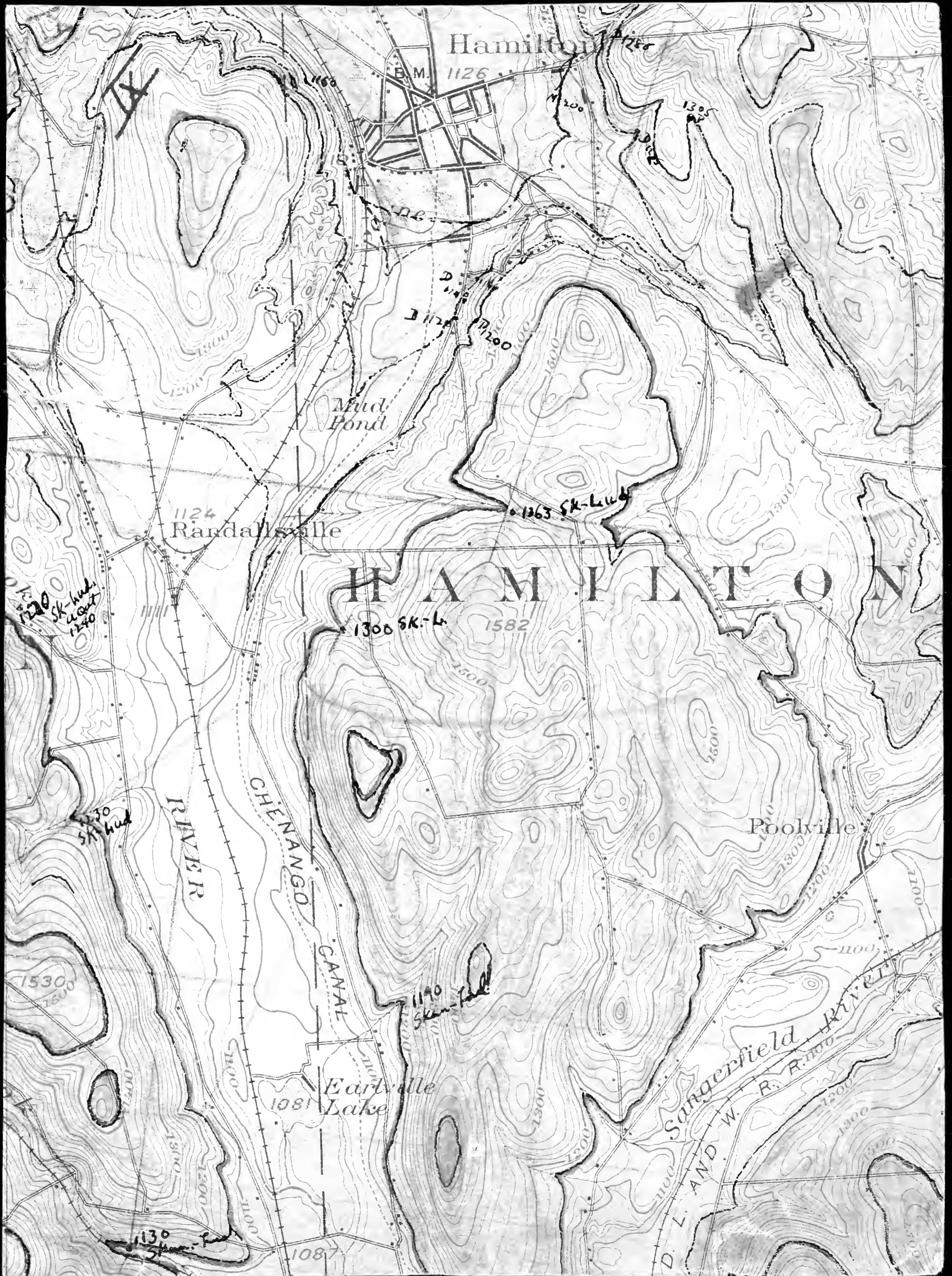
The sketch represen

the [unclear]

of [unclear]

the [unclear]

of [unclear]



Hamilton

B.M. 1126

Mud Pond

1124 Randallsville

HAMILTON

1300 SK-L 1582

Poolville

CHENANGO RIVER

CHENANGO CANAL

CANAL

Earlville
1081 Lake

Sangerfield RIVER
D. L. AND W. R. R.

1530
1600

1230
SK-hud

1220
SK-hud
about
1240

1130

1087

1190
SK-L

1200

1307

1200

1300

1400

1500

1600

1700

1800

1900

2000

2100

2200

2300

2400

2500

2600

2700

2800

2900

3000

3100

3200

3300

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3500

3600

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4000

4100

4200

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19900

20000

20100

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20400

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22400

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26300

26400

26500

26600

26700

26800

26900

27000

27100

27200

27300

27400

27500

27600

27700

27800

27900

28000



City or village



Roads and buildings



Ruins Cliff dwelling



Metalled road
(distinguished on recent maps only)



Dam



Dam with lock



Canal lock
(arrow upstream)



U.S. tower
section IV
and located centers



State line



Bench mark



Cemetery



Church
(distinguished on recent maps)



School

Cake ovens

Benches for surface shown in brown, and black lines as shown on map

RELIEF

(printed in brown)



Figures

showing height above mean low level in feet or locally determined



Contours

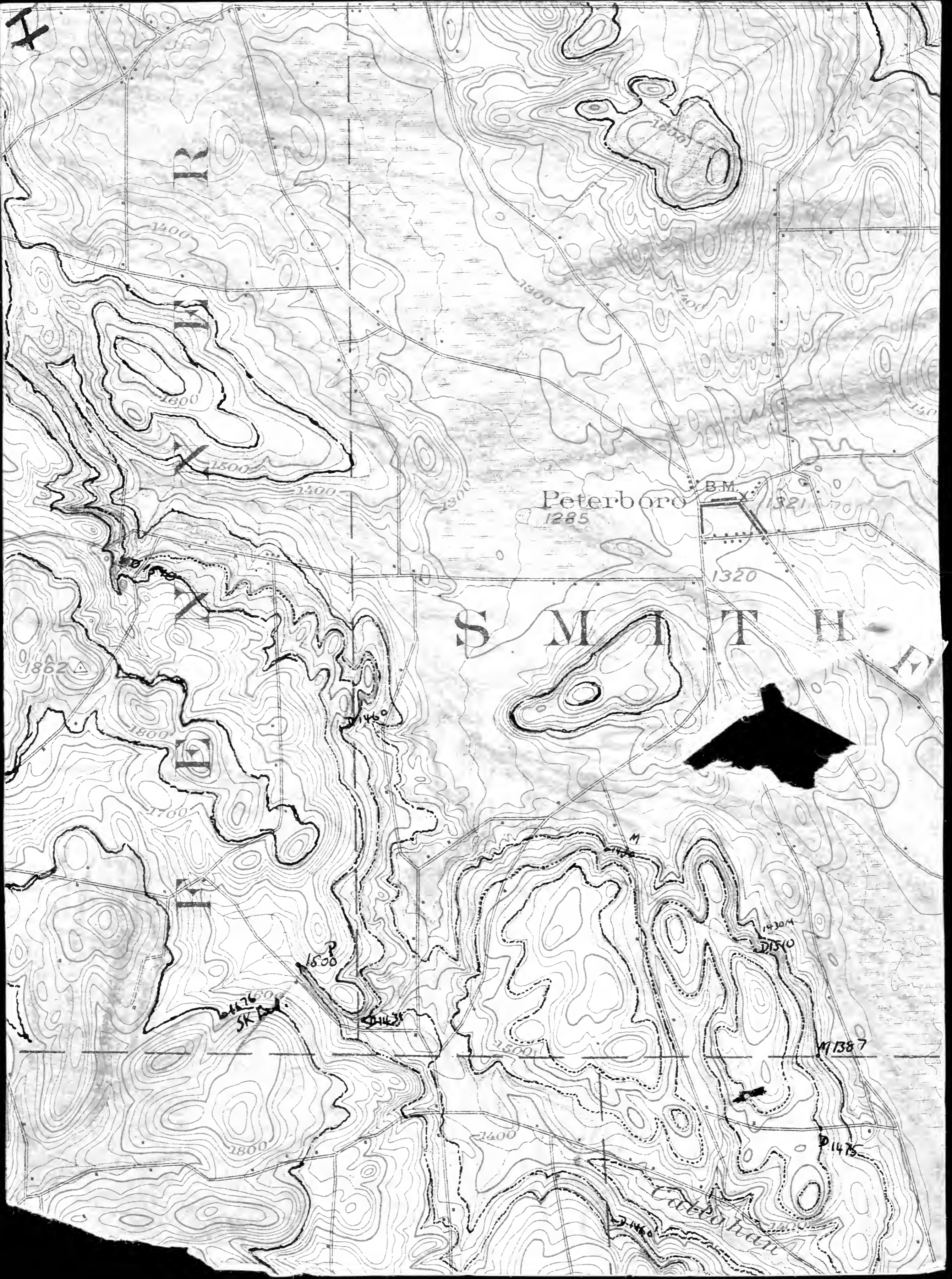
(Contours showing depth of water are shown in blue)



Depression contours



Levee



them... the valley is a steep scarp, from which it gradually descends and forms an inclined table-land, crossed by a few shallow gullies. On the approach to the valley is represented, directly beneath it, by contour lines.

The contour interval, or the vertical distance between one contour and the next, is stated at the bottom of each map. This interval varies according to the topography of the country. On a flat country it may be as small as 1 foot, and on a mountainous country be as great as 250 feet. Contour lines, or fifth one, are marked with numbers, accompanied by figures showing the elevation of the points—such as road corners, streams, and bench marks—are also given on the map, and show altitudes to the nearest foot. Only the use of bench marks—as well as the geodetic triangulation stations, are published in the Geological Survey.

The works of the Geological Survey in the State, county, city, and town, are shown by continuous or broken lines, and are distinguished by double lines, private trails by dashed lines, and...



VII

NELSON'S ISLAND

Eaton
1500

Light

1500

1468

Eaton
Reservoir

Eaton

1468
Hatch

1468
Br
R

Each quadrangle is identified by the name of a city, or prominent place, and on the margin the name of adjoining quadrangles has been published. Over 2,000 quadrangles have been surveyed, and many more are on the other side of this sheet have been published.

The topographic map is the base on which the general resources of a quadrangle are represented, and maps showing these features are bound together with descriptive text to form a folio of the Geologic Atlas of the United States. More than 200 folios have been published.

Index maps of each State and of Alaska and Hawaii show the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be gotten free. Copies of the standard index maps may be obtained at different prices each; some special index maps are sold at different prices. A discount of 40 per cent is allowed on orders for folios amounting to \$5 or more at the retail price. Folios are sold for 25 cents or more each. The price of the folio. A circular describing the

or folios should be written to the Director, United States Geological Survey, Washington, D. C.



importance—relating, for example, to mineral dev-
elopment, or reclamation of swamp areas—are made
with sufficient accuracy to be used in the publication of
maps on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile),
with a contour interval of 10 to 25 feet.

Topographic maps in which there are problems of average
importance, such as most of the basin of the Mississippi
River, are made with sufficient accuracy to be used
in the publication of maps on a scale of $\frac{1}{62,500}$ (1 inch = nearly
1 mile), with a contour interval of 10 to 25 feet.

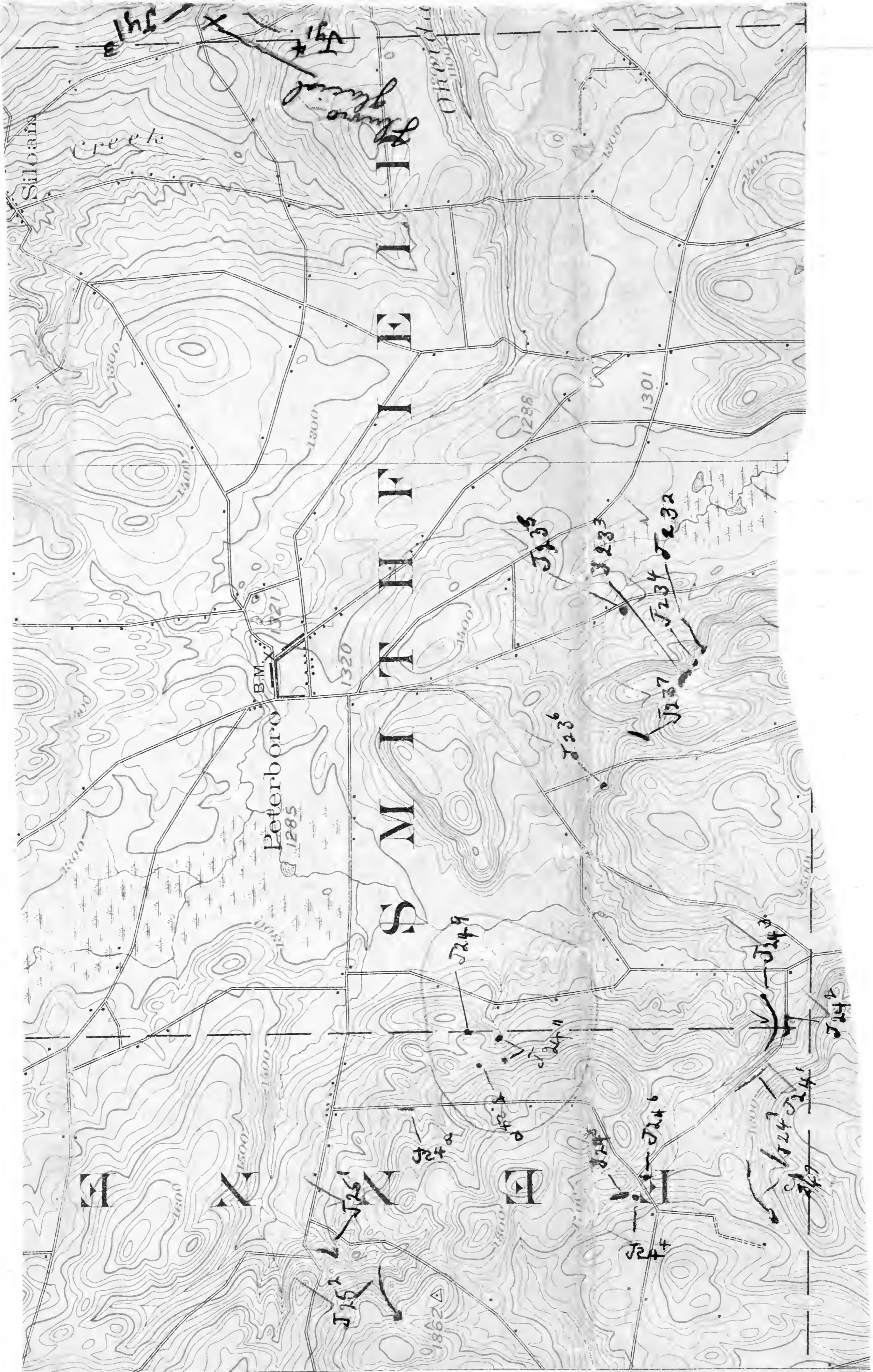
Topographic maps of areas in which the problems are of minor
importance, such as much of the mountain or desert
regions of Arizona or New Mexico, are made with sufficient
accuracy to be used in the publication of maps on a scale of
 $\frac{1}{125,000}$ (1 inch = nearly 2 miles), with a contour inter-

The topographic survey of Alaska has been in progress since 1899,
and nearly 37 per cent of its area has now been surveyed.
About 40 per cent of the Territory has been covered by recon-
naissance maps on a scale of $\frac{1}{625,000}$, or about 10 miles to an
inch. Most of the remaining area surveyed in Alaska has
been mapped on a scale of $\frac{1}{250,000}$, but about 4,000 square miles
has been mapped on a scale of $\frac{1}{62,500}$.

The Hawaiian Islands have been surveyed since 1899, and
the maps are published on a scale of $\frac{1}{62,500}$. The features
shown on these maps may be classified as follows: (1) water,
including seas, lakes, and other bodies of water; (2) land,
including valleys, mountains, and other features of man.

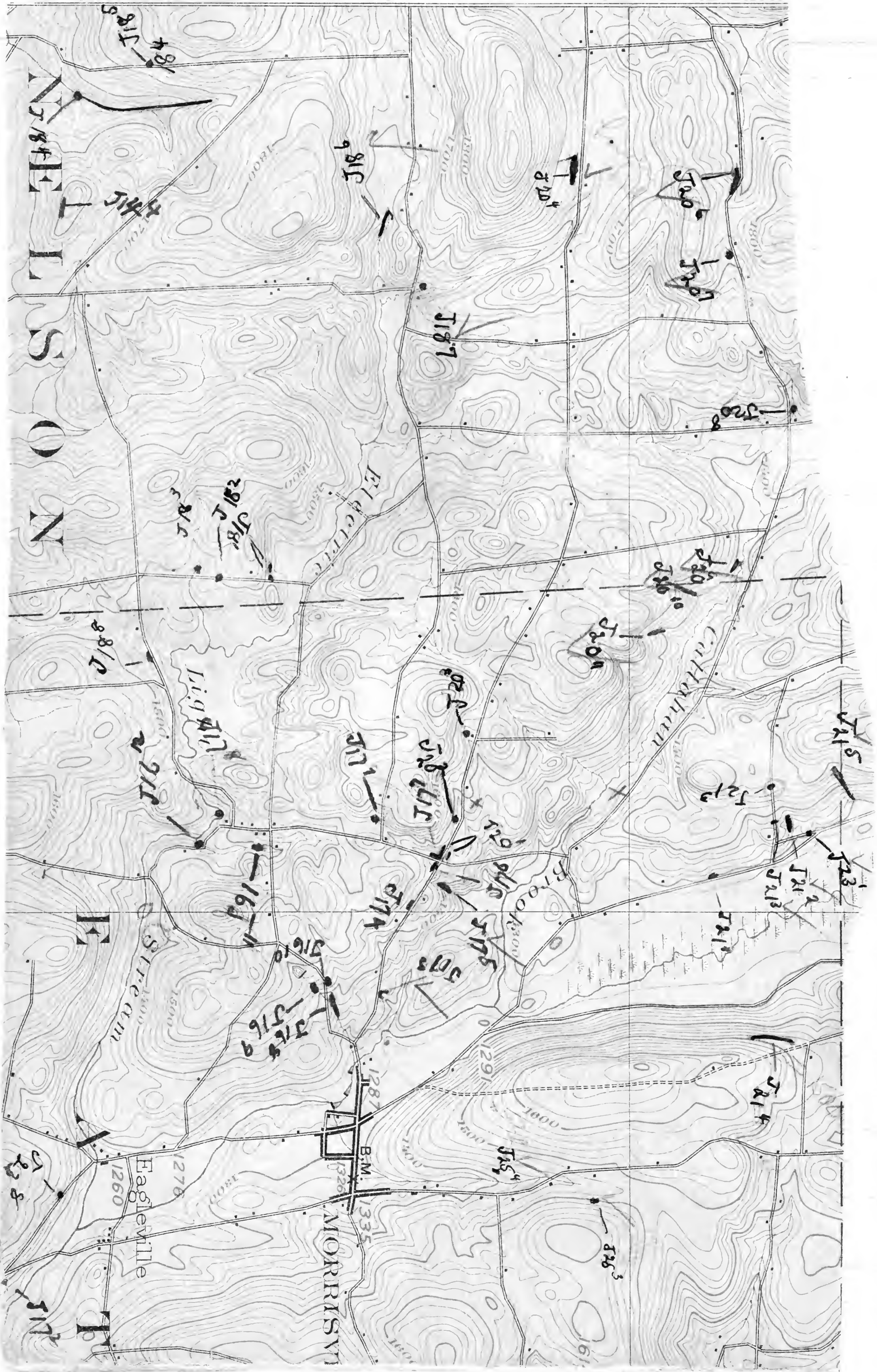
1927

802d



1927

802C



1928

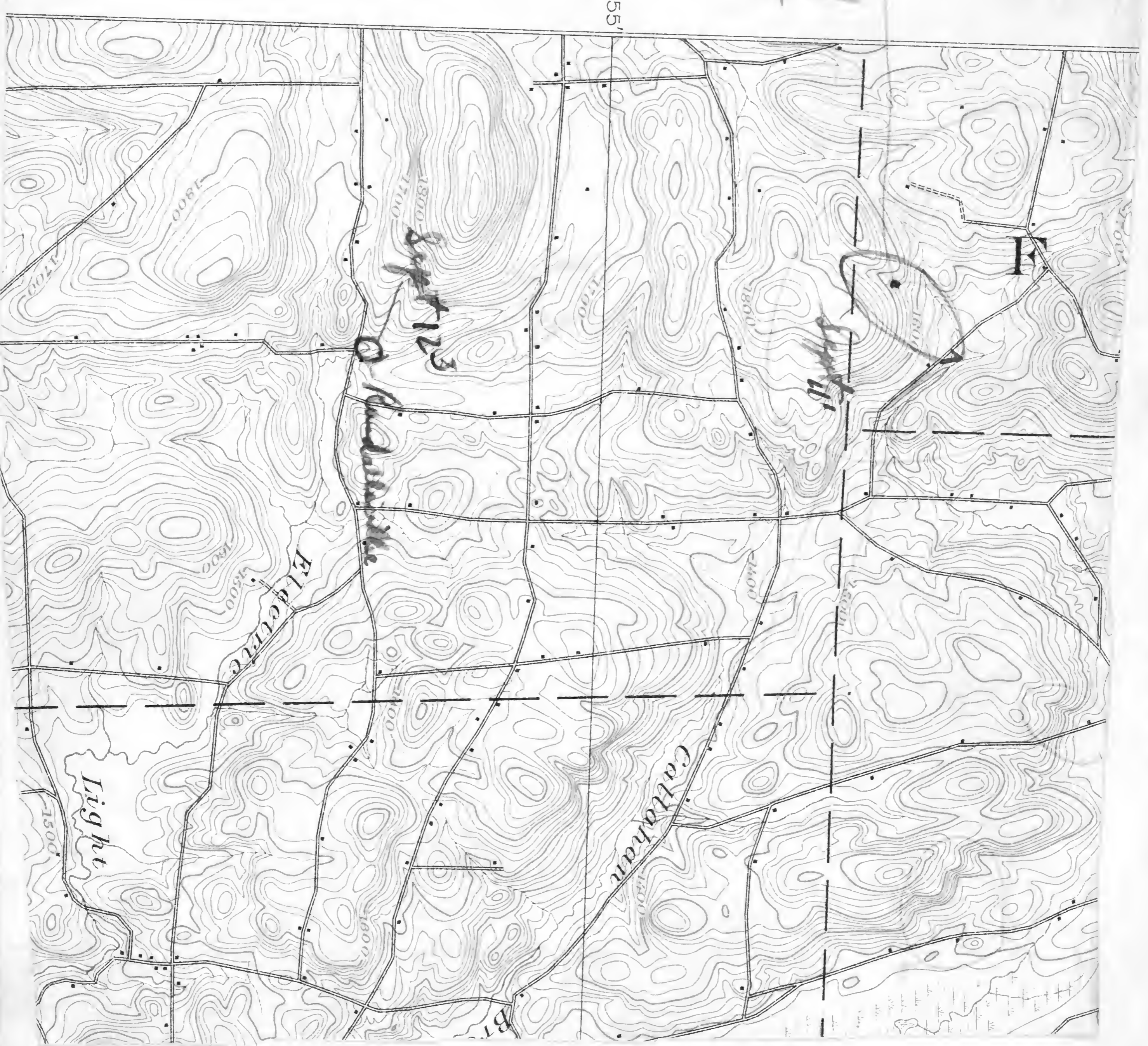
802 m

187
60
227

1960
20
1540

1876
187

1676'
Steam-ford
Contact

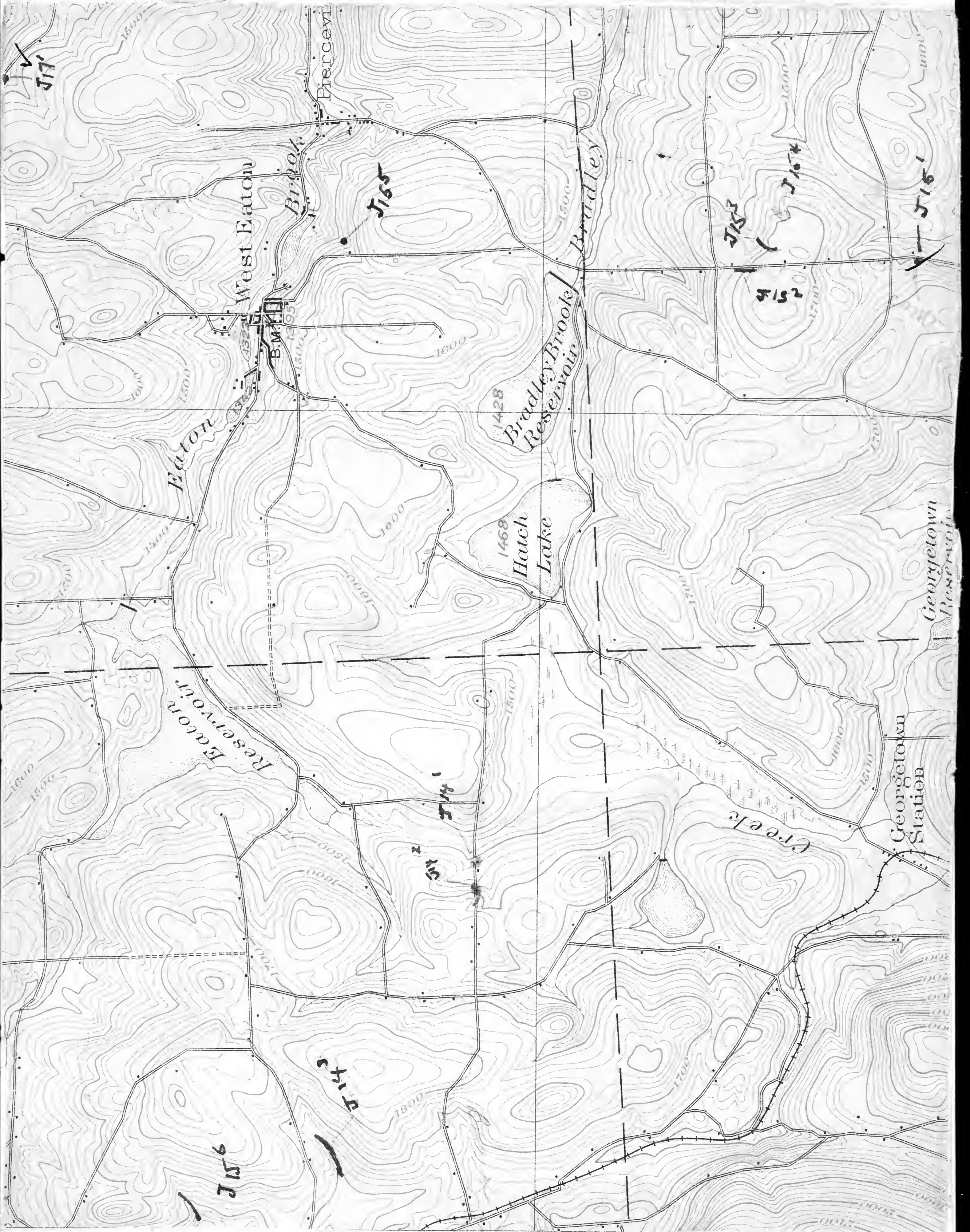


514
5
2 70

24
5

1927

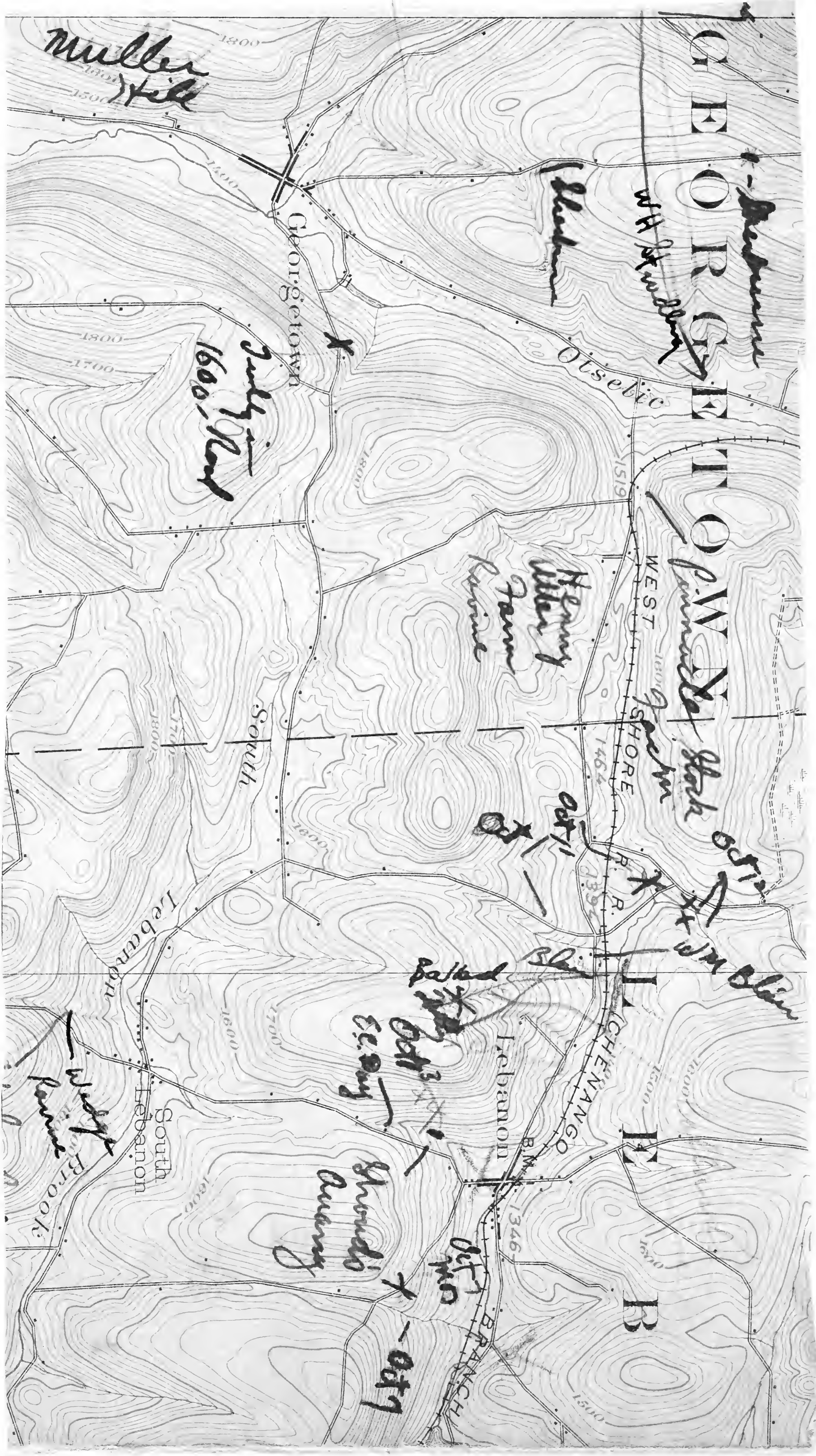
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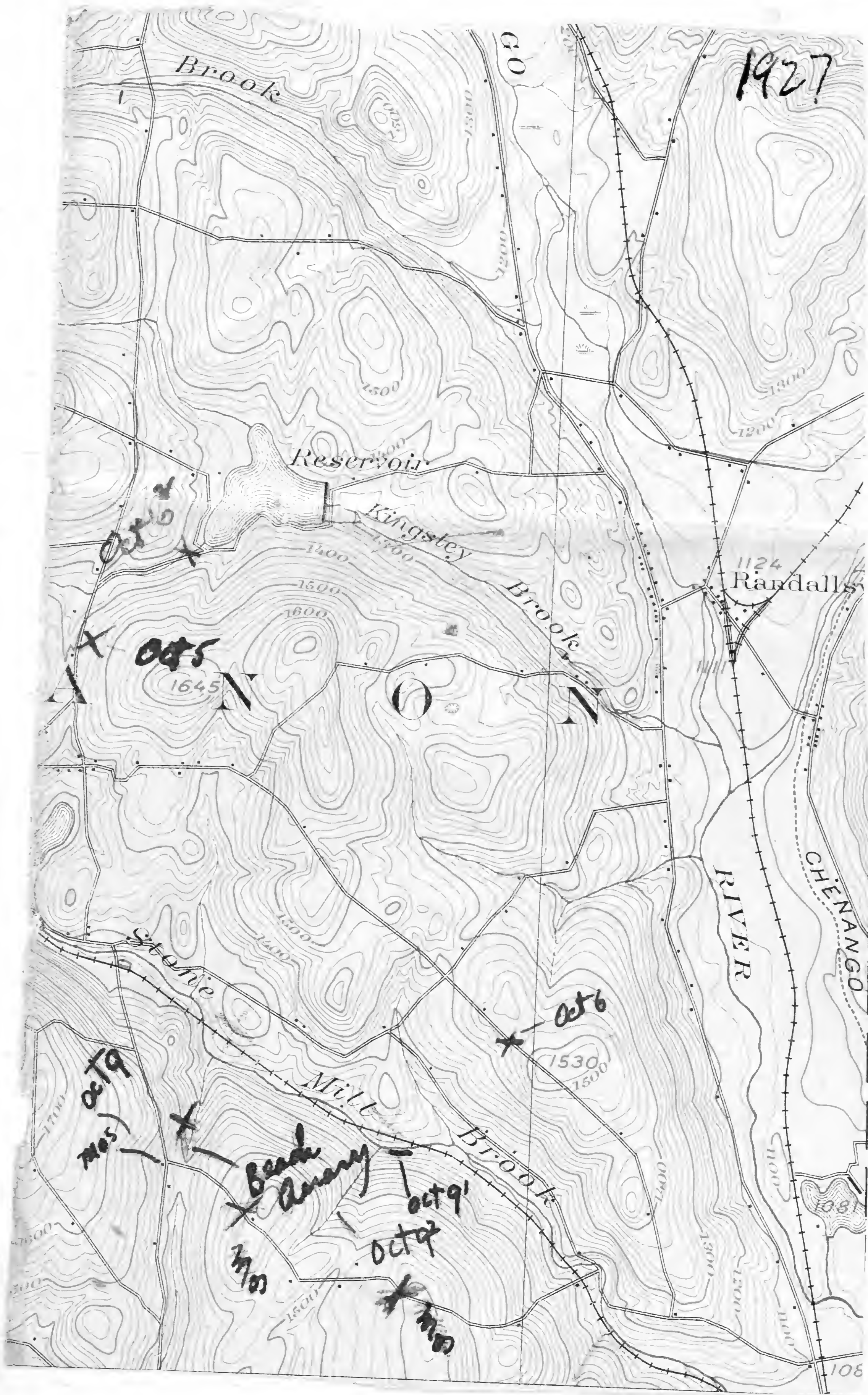


1927
8208

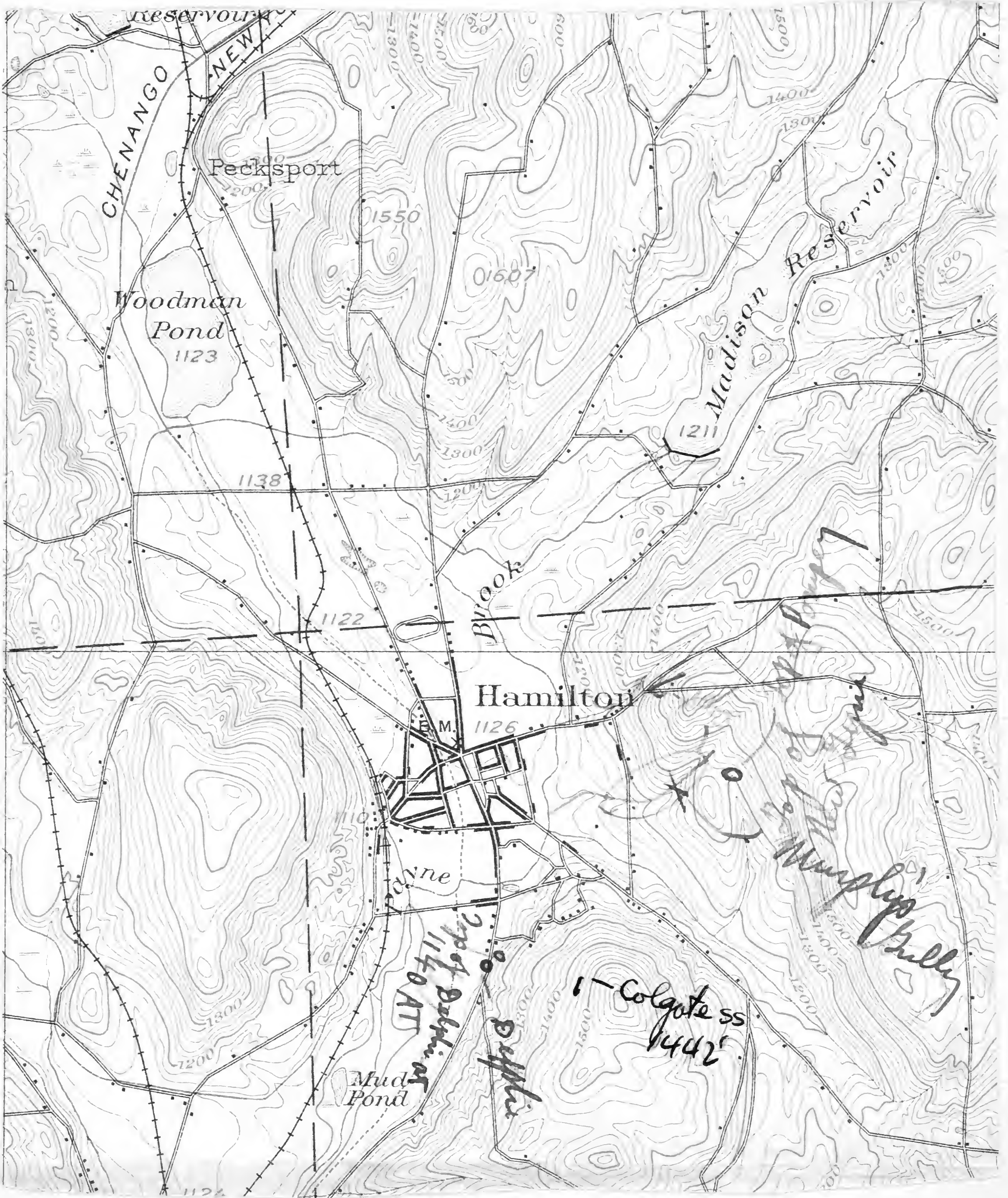
Sept 19

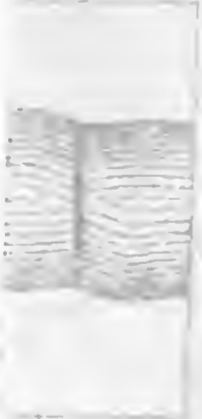



















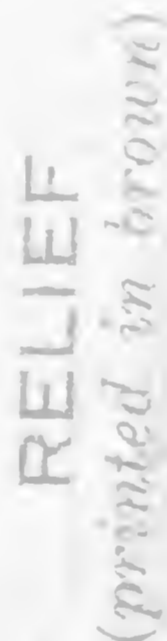

85

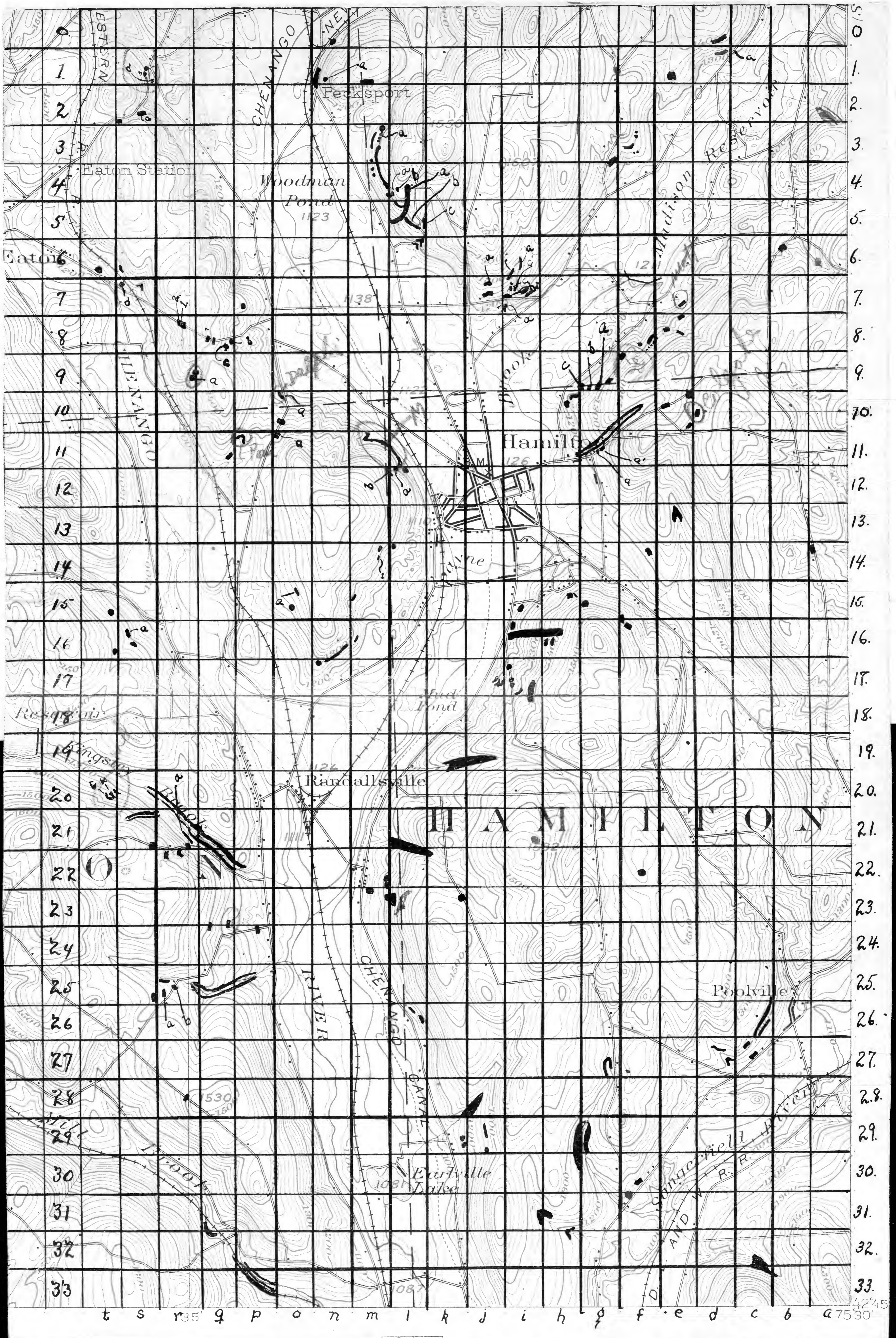




1928
802 f

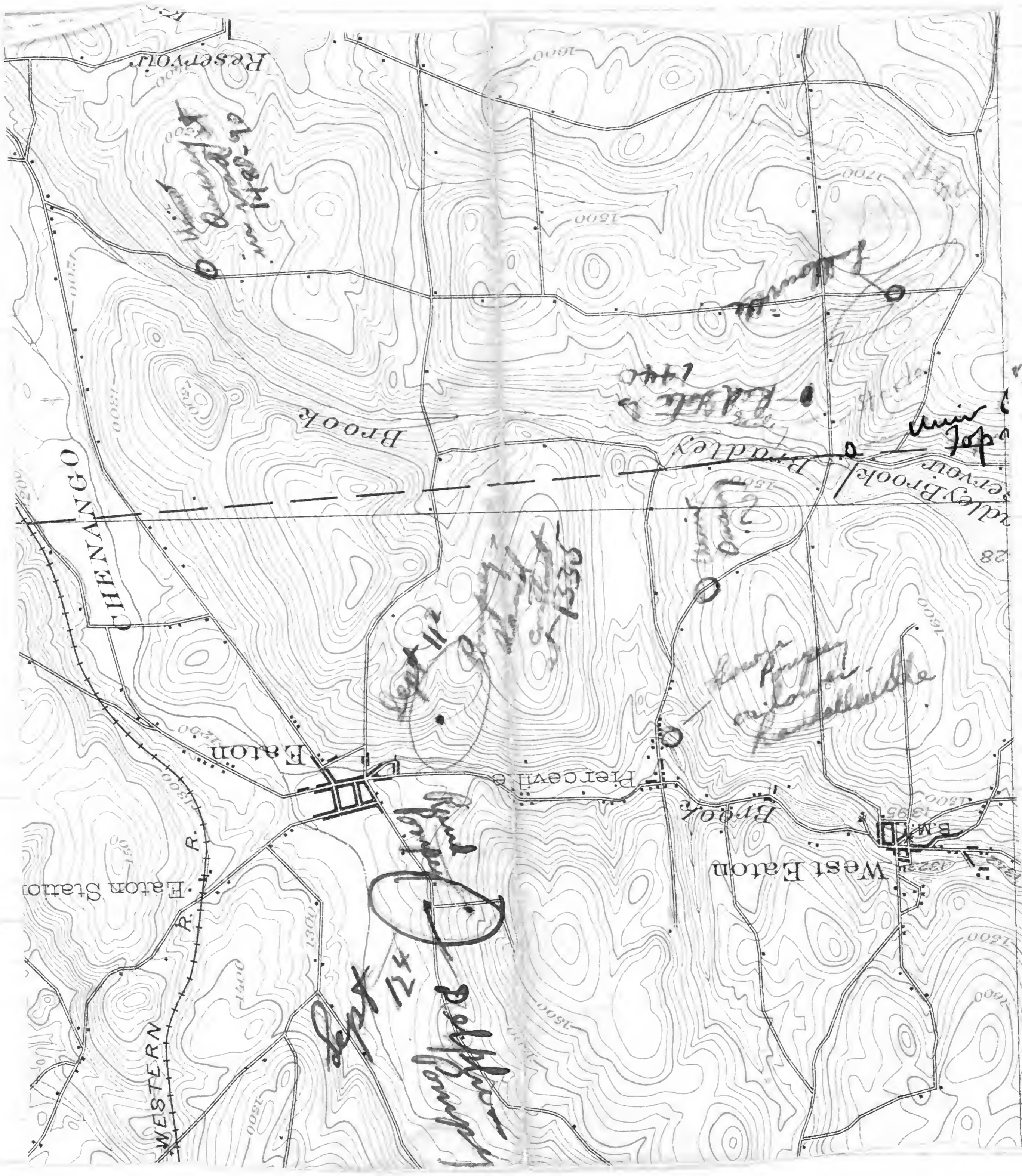


	Daw		Canal lock <i>(point up stream)</i>		U.S. township and section lines and located corners		State line		County line		Civil Territory or district
	Bench mark <i>(Temporary bench marks shown by brown cross and black figures without lettering)</i>		Cemeteries		Church		School		Coke ovens		Mine shaft
	Figures <i>(showing heights above mean sea level instrumentally determined)</i>		Contours <i>(showing height above mean sea level instrumentally determined and steepness of slope of the surface)</i>		Depression contours		Levee		Sand and sand dunes		Wash
	Mine dumps		Cliffs		RELIEF <i>(printed in brown)</i>		Stream				



HAMILTON

t s r35 q p o n m l k j i h g f e d c b a7530

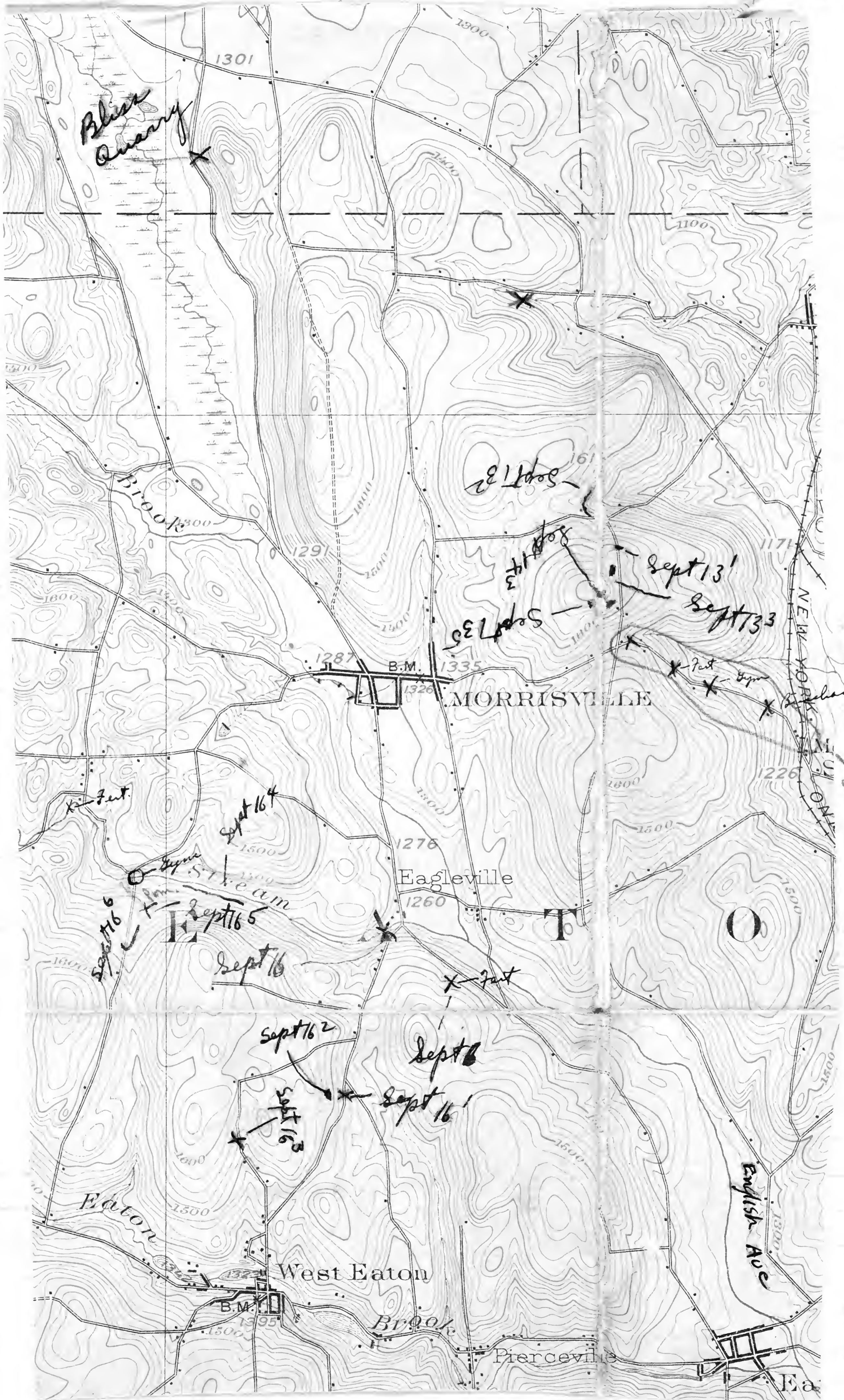


8026

1928

Sept 11

802m



[Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is too light to transcribe accurately.]

June 12, '27
Werners Quarry

Langston Quarry

See a list of fossils which were revealed

by the weathering of the rock

Revised

Arthroacantha?
Gilbertsocimus?
Starfish?

- C. scabra
- S. pumila
- P. fruticosa
- M. concentrica c
- S. pumila
- J. constrictus c
- D. circularis
- P. scabra
- P. scabra
- C. bothei
- P. scabra
- P. scabra pater

June 13, 27

Georgetown - Lebanon P.R.

10-15' blue shales. These correlate with the horizons shown in the bed of the brook at 70 E 2 (see map N). Along the level of the track the shales are like those in the stream bottom near the road but about 15' above they are like those in the ravine at the first falls.

Window

<i>P. lina</i>	<i>M. nyctalis</i>
<i>A. constricta</i>	<i>H. acis</i>
<i>P. sinuata</i>	<i>Paralichon sinuata</i>
<i>P. spinifer</i>	<i>C. boottii</i>
<i>S. planifrons</i>	
<i>A. bellifrons</i>	
<i>O. nodulata</i>	
<i>G. terminatus</i> (C. in lower beds)	
<i>S. fenestrata</i>	
<i>S. punctata</i>	
<i>M. concentrica</i>	
<i>Schistotheca</i> <i>degeneri</i> (C. in upper beds)	
<i>H. oblongatus</i>	
<i>G. terretriatus</i>	
<i>P. unguis</i>	
<i>A. parvula</i>	
<i>A. decussata</i>	
<i>C. indenta</i>	
<i>H. plicatissima</i>	
<i>Pal. concentrica</i>	
<i>L. exigua</i>	

June 13. 27

70 ft. above railroad tracks (7a. 111) (map?), about
5 or 6' thick, shale, coarse from weathering. These
form ridge of first terrace in hill. Fossils
are abundant but not in great variety. The
commonest are -

S. pennatus

S. carinatus

Large *Spirifer* (& *gracilior*, one of them)

Curved stems

R. vanuxemi

M. concentrica

C. virens

C. mucronatus

A large *Phlegeton*

This horizon may be seen as Geyser
away but is probably lower.

807

807

June 13, 27

7BC3

A. erectum C.*T. carinatus**S. salenoides**L. pectinatus* sp.*L. pectinatus**L. pectinatus**O. undulata**P. patulus**P. maxima**C. coronatus**L. rogersi**P. altiporus*

joints

N34E

N71E

In places the outcrops are polished & striated. Direction of strike is -

N44E

N44E

Coarse blue shale, weathering brown to purplish, exposed along roadside. Notable for large numbers of *T. carinatus* & *A. erectum*. This rock looks like the shale just visited at 7B55, but is much lower down.

June 13, 27

76D5 about 9' of bluish weathered shale
 The fauna is only notable because
 of the large numbers of *T. carinatus*.
 I believe the horizon to be near that of
 the Georgetown quarry?

T. carinatus c.
A. princeps
S. perplana
O. undulata
Taonurus v.c.
S. pennatus
Siphonia r.sp.
Nereis bellinotata
Chonetes sp.
M. pygmaea r.
H. deharzi
P. sectifrons
S. chenungensis

June 13 Ludlowville

7802 + 7803

About 50 yds^N from 7803 is another
 land outcrop of rock lower in the series.
 Here at the bottom the stone is a heavy
 coarse shale but about four feet
 from the road level there is a thin
 local band of shell ls. composed of
S. pennatus, *C. coronatus*,^{very small} and *Camerothechia*.
 Above this and exposed for about 3'
 vertically is a thin slabby ls. which
 breaks into flat plates less than an
 inch in thickness. In this layer
 are also found large concretions (small
 sandstones) like those of the University
 Quarry. This fauna here has large
Camerothechia and also *P. flabellum*.

50 yds N of this outcrop and on
 the opposite side of the road and in
 the fields are coarser shales weathered
 to a blue gray on the fracture but
 brown on the surface. Fossils here are

A. princeps
Camerothechia - very large
G. obsoleta
R. grandis
P. patulus
A. erectum
P. flabellum
S. pennatus
S. perplanus
C. bothi

The slabby sandstone gives way
 to shale like itself again about 12' above
 road-level.

See next page

49 ft above the road-level is a small outcrop of arenaceous shales like those below. The shale is light grey from weathering.

Fossils

M. concentrica

L. pennatus

T. carinatus

A. acutus

P. flabellum

Large *Spirifer* - granular?

Ludlowville June 14. (1)

(1)

Small outcrop in road, of grey weathered shale. Fossils are rare, ~~one~~ ^{one} species being identified. This ledge could not be correlated

Camurotoechia sp.
H. dehayi

Ludlowville June 14 (2)

Coarse arenaceous weathered shales exposed in the road-bed. These are characterized by an abundance of *Lepteria*s and *Tropidoleptus*. The rock is exposed in road gullies for fully forty or 50'.

The fauna for the first 15' of the exposure is as follows. -

L. rogersi c
L. pennatus c
A. erectum c
T. carinatus c
N. triquetra
B. constriata
H. dehayi
P. flabellum
Pal. concentrica
L. granulans
Stromatopora (Range)
C. corobatus
S. perplana

over

June 14 (2) cont

About 30' from base, the same kind of weathered shales.

<i>E. bisulcata</i>	<i>M. concentrica</i>
<i>S. magna</i>	<i>H. dehayi</i>
<i>S. pennatus</i>	<i>P. radiata</i>
<i>S. perplana</i>	<i>C. corrugata</i>
<i>A. phragm</i>	<i>J. caninatus</i>
<i>C. poothii</i>	<i>N. triquetra</i>
<i>A. erectum</i>	<i>P. flabellum</i>
<i>C. liothii</i>	<i>S. granulosa</i>
<i>P. emarginata</i>	<i>S. chermungensis</i>
<i>C. coronatus</i>	

At top of hill about 30' from base

<i>C. complanata</i>	<i>H. dehayi</i>
<i>N. triquetra</i>	<i>S. pectinata</i>
<i>S. pennatus</i>	<i>P. flabellum</i>
<i>J. caninatus</i>	<i>S. granulosa</i>
<i>H. globosa</i>	<i>P. maximum</i>
<i>C. coronatus</i>	<i>S. perplana</i>
<i>N. lirata</i>	

On the very brow of the hill the shales are very sandy and split into flat layers.

June 14⁽³⁾

Gorge just SE of Curville. In bottom of ravine. Bluish shales splitting irregularly

*O. undulata**T. submarginata**O. carinata**S. perplana**A. erectum**Leiopteria* sp.*M. oblongatus**T. carinatus* cc*M. mytiloides**S. pennatus* cc

✓

16' above base a local hard band with *S. pennatus* has formed a flat or cascade joints at this level read:

N26E

N30E

And have a complementary set.

On the hard layer the stone is sandier and has many *Clonetes*.

The top of the falls is 27' from the base of the first exposed rock. The falls are found by the lower numerous rock.

At about 29' from base of ravine, and forming a flat in the ravine is a hard band about 1' thick, responsible for the falls. This band contains

Large *Strophodonta junia* (3)

Aulopora *serpens**R. vanuxemi**M. concentrica**S. pennatus**Fenestellid* *bygonia**A. decemata*

Near top of
Lud.

The topmost 6" layer of this L. which here is blue and has been heavily worked. Station is with

on the lower rests more argillaceous
blue shales, which are considerably softer
Their fauna ~~is~~ follows.

Edinburgia sp. small.

S. pennatus (~~small~~ ~~thin~~)

D. carinata

C. tenuisecta

B. lida

C. bellistriata

J. curvatus

P. sectiformis

N. oblongatus

N. bellistriata

A. erectum

L. coronatus

P. radiata

P. plana

M. concentricum

S. cheringensis

M. mytiloides

Orbiculoides sp.

Orbiculopictus sp. small

H. abasata

S. granulosa

G. bisulcata

About 10-15' of this soft shale
is exposed. These soft shales
may correlate with those in
the pavine at Georgetown (7CE)

June 14 (4)

Coarse arenaceous shale, weathered
to a light grey

Cyrtina humilis

C. mucronatus

S. pennatus

Plant stems

Chonetes coronatus (1/2" along hinge line)

S. granulosis

This stone splits into coarse irregular
slabs. The horizon could not be identified

East side Eueville Reservoir, 1 mi. NNE of Eueville

June 14⁽⁵⁾

Coarse bluish grey arenaceous shale
with few fossils. Large *Amarostrophia*
like this known with BC 3 visited.

June 13.

Amarostrophia sp.

M. oblongata

G. angulata sp.

G. arcuata

P. flabellum

C. coronata

Planostoma

P. emarginata

S. perovatus

June 15⁽¹⁾

15' soft blue shale having the appearance of that found in Stone Mill Brook

Lower Moscow

A. umbonata
 N. lirata
 M. pygmaea
 C. scitulus c
 N. oblongatus
 C. boothii
 N. bellistriata
 Lox. hamiltoniae
 Crinoid stems
 S. solenoides
 O. carinata
 M. concentrica
 J. submarginata

S. pennatus c
 C. coronatus
 J. carinatus
 P. emarginata
 M. anguloides
 P. mutata
 C. setigerus
 N. corbuliformis
 N. vanessa
 C. ~~terminata~~
 P. radiata
 H. deKayi

Moscow

June 15⁽²⁾

Blue shales, exposed in road gully for ' These have the same appearance as the shales observed at J 15⁽¹⁾. A few specks of well at Eaton, Milk station. The splits into irregular slabs

C. scitulus ()
S. pennatus .
O. thrausa sp.
A. umbonata
C. coronatus
C. boothi
P. emarginata
O. undulata
S. perflava

M. concentica
 Plant stems
S. granulosa - abundant
 at top of hill

June 15⁽¹³⁾

The same interval of shales is exposed
in a small gully or ravine just east
of the farm house⁽⁴⁰⁻⁵²⁾

June 15⁽⁴⁾

Second ravine just E of J. 15⁽¹³⁾, not
visited, but according to farmer (Mr. Finer)
it contains fossils at the same level
as on road and J. 15⁽¹³⁾.

June 15 (5)

About 13' of alternations of shales
(dark) and blue-grey sandstones. The
bands of ss. are 1" - 2 1/2" in thickness.
No fossils were discovered in the
sandstones.

In a thin layer of shale *C. mucronata*
was identified.

In the shales a *D. carinata* and
Cinroids stems were located.

The bottom of these beds is at 1437'

p?

9" ss

4' bluish sh

with few chert

1' heavy ss

7" sh

9" ss

1' sandy sh

2' ss heavy bedded for 1'

15" dark sh

1437'

2 1/2' shaly blue ss

↓ ?

J. 16⁽¹⁾

About 3' of grey arenaceous shales.
Old fossils was located and the horizon
could not be located in the section.
Pterinea flabellum. The horizon maybe the
New York horizon? No

June 16⁽²⁾

Small exposure of flat slabby ss.
with *J. carinatus*. A harder level at
road level has *P. flabellum*, *C. arguta*
and *Camarotoechia*. This may be near
the top. June 22. No

June 16³

7' of grey sandstones splitting into
irregular slabs. These contain masses
of fossils that ~~was~~ formerly found
elsewhere but are now much leached.

Fauna

*C. recurva**C. coronatus**C. vicinus**S. audaculus**A. erectum*

Tentaculites

*C. congregata**A. pterinea**S. purpureus**S. ventricosus**C. coronatus* *crystallus*

June 16⁽⁴⁾

Thin bedded shaly sandstones with
Spirifer, *S. pennatus*, *C. mucronatus*, *C.*
M. mytiloides, *Goniatites* sp., *P. flabellum*
 all were noted in the lower layers.
 The stone above splits into very
 flat slabs. Rock is revealed inter-
 mittently both vertically and horizontally.
 The total vertical distance is about
 15'

June 16⁽⁵⁾

On road just east of J 16⁽⁴⁾ a
 horizon just below that of J 16⁽⁴⁾. The upper
 layers of about 10' ft of rock exposed
 are sandy & split into flat slabs. The
 lower layers are darker and some-
 what shaly, although they are coarse. No
 fossils were noted here.

June 16⁽⁶⁾

5' black shales, no fossils noted.
 These may be the black shales below
 the U. Anagy.

June 16⁽⁷⁾

About 75 yds from 16⁽⁶⁾ dark shales
 in stream bed.

S. pennatus at 102 yds from 16⁽⁶⁾, also,
C. setigerus, *C. mucronatus*.

120 yds from 16⁽⁶⁾ *A. umbonatus*, *M. triquetra*.
 This name is mentioned behind the
 old mine house at Eaton.

The dark shales are those
 found at above locality W. S. 1, 10'

June 16¹⁰

A small ledge of calcareo-arenaceous stone with many fossils. This is the same stone as in the upper ravine of J16⁹.

Fossils here are numerous as
Tenostellid byzova *Cyrtina hamiltonensis*
P. rana

C. mucronatus

S. pennatus

Crinoid stem segments

S. puerilana

H. DeKayi

June 16¹¹

Berwyn Black, soft, fissile shales exposed in a stream bank, about 8' vertically. The fauna is sparse and consists mostly of *A. unilobata* and a few *P. flabellata*, among them *H. obliquatus* and *H. subalata*. Other fossils are

Atypis sp.

R. lida

A large snail

S. pennatus

June 16¹²

1340' 24' exposure of shales and sandstones, shales at base and ss. above. In the upper ss *S. hamiltonensis* + *P. flabellata* are common. In ls. bands + lenses *Emella* + abundant *Comantocchia* are present.

Excellent for collecting + zones

in the thesis as the Eaton shales.
 The last shales seen are at about 1340-
 1360'. The shales at the head of this
 ravine must represent the transition
 into the rocks of the University Quarry

June 16th
 Whitesville

Outcrop of sandy shale weathered
 grey with the typical assemblage of
 of the *Gym* fossils. 1390'

<i>N. arguta</i>	<i>G. debayji</i>
<i>L. obsolita</i>	<i>L. macroptera</i>
<i>P. flabellum</i>	
<i>A. boydi</i>	
<i>A. pindrops</i>	
<i>P. bicolor</i>	
<i>D. cratellum</i>	
<i>L. munitum</i>	
<i>Camarotoechia</i> sp.	

In the ravine below this outcrop
 about 30' of shales are exposed that
 are typical of those seen at other
 localities

June 16th

In upper ravine above the
 new *Gym* horizon are ~~shales~~ ^{weathered} shales
 very sparse in fossils. The shale
 crumbles to small pieces.

<i>Lingula</i> sp.	<i>Quarta</i> sp.
<i>Camarotoechia</i> sp.	<i>P. fragilis</i> .
<i>Productella</i> sp.	

The first rock encountered in this
 little ravine was at about 1400, a black
 shale falling to chips. Here *P. fragilis* was
 found. The rock becomes harder till
 at 1428 the rock is a hard sandstone,
 some of it is also probably limy

June 17¹

At fork of Morrisville road to Eagleville a small exposure of hard calcareous arenaceous rock which represents the top of the New Gwyn horizon. Here were found *C. coronatus* in abundance and *A. boydsi*, & *P. flabellum*.

June 17²

In a small cascade just below June 17¹, an exposed nearly 20' of shales belonging to the New Gwyn and to shales exposed in Upper Chasis Glen. No attempt was made to collect fossils.

June 17³

Small outcrop just west of Morrisville representing rocks very near to the top of the New Gwyn horizon. Here *L. macroptera* and *N. arguta*, *P. flabellum*, *S. exigua* were noticed.

June 17⁴

nr. Top of Pompey.

Shales on roadside weathered and grey. I cannot place this shale in the section. It is too much weathered to identify lithologically and the fauna is too sparse. I have noted some

C. scitulus? *Camurostecchia* sp.

Leiopteria sp.

Spizella sp.

Hedionella sp.

N. corbuliformis

This may belong to the uppermost shales along Payne St.

June 17⁵

A ravine giving excellent exposures of rocks. This was examined by hand-level steps.
 1st step - ^{2nd} soft bluish shales breaking into chunky fragments with rounded outlines. This is the shale exposed so well in upper Chocoma Run and forming the falls. Fossils noted in the 1st 5' of stone -

S. submarginata *S. murinum*
N. oblongatus *G. arcuata*
B. submarginata *P. sectifrons*
N. triquetus
B. concentrica

2nd step - ^{3rd} The shales here are somewhat bluish and softer, breaking into chips.

H. multiloides *S. submarginata*
H. dekeyi (small) *Lepteria* sp.
C. boottii
Hormotoma sinuata
B. submarginata

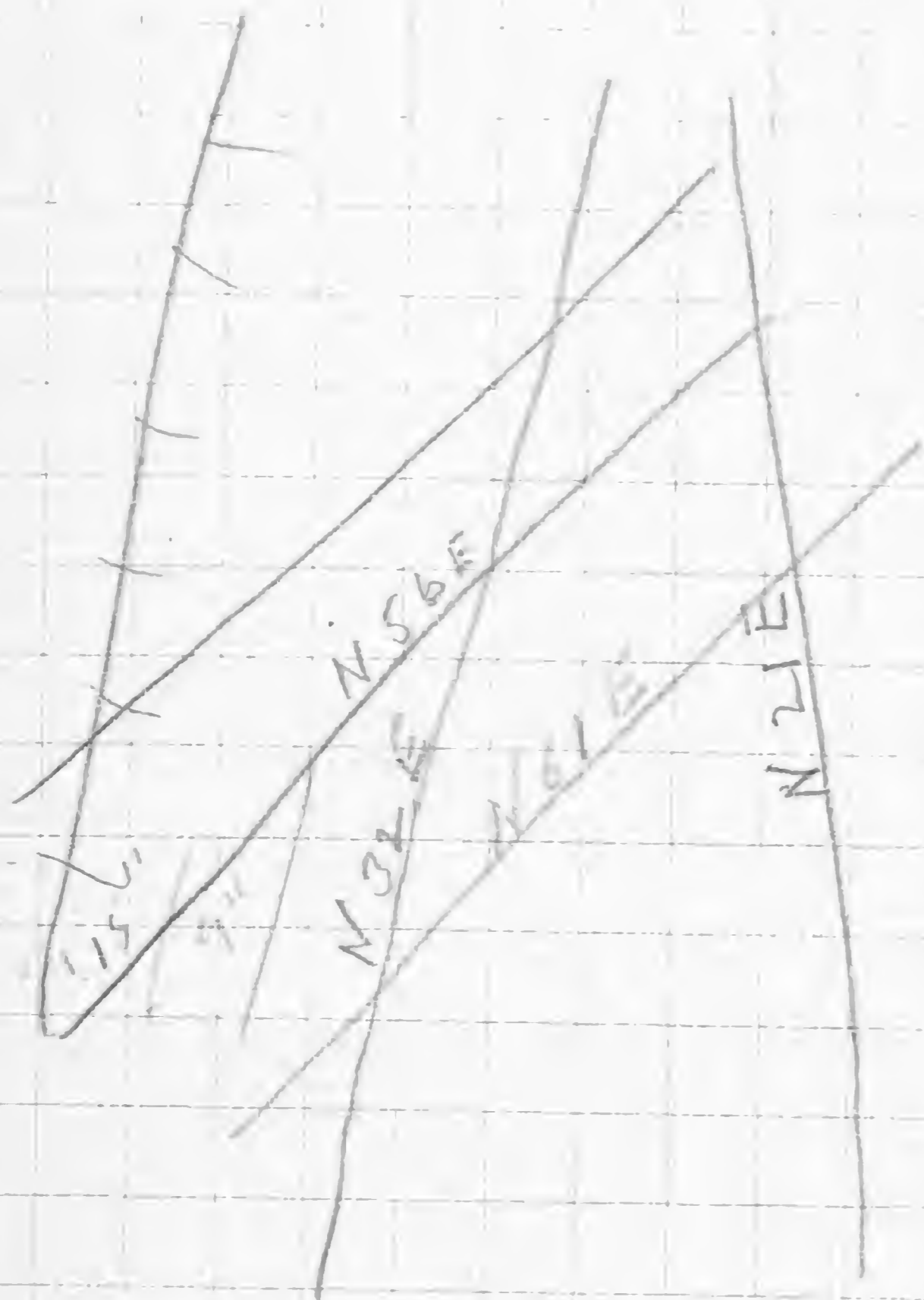
3rd - 4th step - Shales here in places somewhat harder.

4 - 5' step - The shales form larger slabs on weathering, and are gray-blue in color on fractured surface joints - see over.
H. dekeyi - large form

5 - 6 step - Caonurus c shale like those in former step.

6 - 7 step - *A. fasciculatus*, *C. congregata*

7 - 8th step - *P. flabellum*, *B. submarginata*
 The stone has become hard and breaks naturally into large irregular blocks.



8-9 step - same as 7-8.

9-10th step - calcareo-arenaceous shale
of top of New Gypsum.

M. subtiloides

S. psopiana

S. granulosa

Camanopecten sp.

10-11th step - 5' of hard massive
rock with large *Salenyptera*.

M. subtiloides

A. princeps

Saonurus

11th step to 3' vertical - very top of N. Quarry
horizon. Here are ss, thin and lathy
with *P. flabellum* and great numbers of
C. coronatus. This hard top layer forms
a flat just below the road intersection

About 63' vertically are exposed in this
ravine

The very top of the New Gypsum horizon
is here at about 1400' - 1410'

June 18¹

Small sections of dark shales. In the lower of the two outcrops there is a band of sandstone about 1 1/2" thick. In the upper outcrop one or two fossils were found.

C. mucronatus

A small species

These shales probably belong to the black shales on top of the lss. at J 17¹.

June 18²

At 1505-1510' about a foot of shale is exposed at the roadside. The stone is grey and breaks into large irregular slabs, and is much coarser than that found at June 18¹. Fossils were found but they are not abundant.

Spreifer sp.*Orthoceras* sp.*T. signa**Actinopteria* cf. *boydi*June 18³

At about 1470' in stream below farmhouse thin grey shales with abundant *Camarotoechia* spp. the "congregata". These shells are rather small, less than 1/2" wide. Other fossils are *C. mucronatus*, & *Crinoid* stems. Further up the bank there were no exposures. These shales may be the same as those exposed below the U. Quarry on the golf links.

Ludlowville

June 18⁵

Shales in road-bed, weathered and
baked to grey color. These have abundant
fossils and are of the same kind (shale)
as that in the ravine.

S. pennatus c

P. emarginatus

Crinoid stems

T. carinatus c

S. granulatus

M. dehayi

M. concentricus c

Bygonia

C. bottoni

S. cf. demissa

coarse plications

P. flabellum

S. papilosa

T. carinatus

This outcrop occurs at about 1735'

June 18⁶

At about 1560-80' an outcrop of rock
about 20' vertical. The rock is a hard one
forming the flat in the valley. The
exposure is about 10' vertical. The
lower part breaks into thin slabs.

P. flabellum

T. carinatus

W.D

A small exposure on the SW side of
the ravine shows the slabby nature
of the rock when weathered.

June 18[?]

Small exposure in ravine of shales
belonging to the Sym. quarry horizon
Fossils are numerous

<i>Taomurus</i>	<i>A. cora</i>
<i>N. arguta</i>	<i>P. emarginata</i>
<i>S. crotalum</i>	<i>C. congregata</i>
<i>M. mytiloides</i>	<i>Cystolites</i> sp.
<i>Spirifer</i> cf. <i>granulosus</i>	
<i>L. macroptera</i>	
<i>P. flabellum</i>	
<i>A. princeps</i>	
<i>L. obsoleta</i>	

Much of the rock in this outcrop is
in the form of huge blocks but they
must be in place as they are too
huge to have been moved by man. *L.*
obsoleta and *P. flabellum* in the stream-
bed, however, make this a same horizon.
The outcrop is about 8' vertical and is
at about 1490-1500'. It does not
represent the very top of the Sym. quarry.

June 18⁸

About 3' of hard ss. on which rest
about 4' of black shale. This sequence
was also seen at J 179. No fossils were
seen in either rock. The shale could
be seen in the road gully to the top of the
hill and here are about 15' thick.

Lower Ludlowville

June 20th

Shales in road on way from
Morrisville to Cayuga. The shale
is typically blue grey in cross-section
and fossils appear to be abundant.

<i>A. umbonata</i>	<i>P. gona</i>
<i>S. pennatus</i> c.	<i>R. vanuxemi</i>
<i>Taraxacum</i>	<i>S. pearlyana</i>
<i>T. carinatus</i>	<i>C. bellistriata</i>
<i>Bryozoa</i>	<i>A. coral</i>
<i>R. costata</i>	<i>C. scitulus</i>
<i>H. delavayi</i>	<i>T. submarginata</i>
<i>N. bellistriata</i>	<i>Camastorchia</i> sp.
<i>Strophomena</i> sp.	<i>H. corbuliformis</i>
<i>Strophomena cf. acutata</i>	<i>Cran. diam.</i>
<i>Crinulopactum</i> sp.	<i>M. pygmaea</i>
<i>M. multicauda</i>	<i>S. chilmungensis</i>

The shale on weathered parting surface
is a purple-grey color. In some places the
rock contains small black concretions.
Stone in the bottom of the exposure is
massive, somewhat calcareous &
does not easily split.

About 10' vertically from the bottom
of the formation fossils become scarcer
but *S. pennatus* still persists.

<i>H. oblongatus</i>	<i>M. concentrica</i>
<i>Strophomena cf. acutata</i>	<i>A. reticularis</i> in a hard calcareous (?) ss. (Probably lower ¹⁹²⁹)
<i>R. fimbriatus</i>	
<i>B. lida</i>	
<i>Productella</i> sp.	

In places in the last 5' of the 15'
of rock exposed were noted bands as
bands, about 2 of them were about 5-8"
thick the other being the lowest
band was only exposed out its upper surface.

June 19 Rain

June 20¹

A short distance (50') from road intersection are outcrops of shale weathered to an olive gray and containing very few fossils. *Camarotoechia* sp., *Nucula* sp., *Leiopteria* sp., *Merulites* sp., *Orthis* sp., *P. concentrica*.

20' above road intersection in stream gully was noted a boulder of ss. with *P. flabellum*, many snails, *P. emarginata*, *M. concentrica*, *Camarotoechia*, representing some of the assemblage & the lithology of the rock found in Electric Light Stream.

June 20²

38' above road intersection is hard rock in which fossils have been abundant. This rock appears sandy and when fresh is probably somewhat calcareous. Fossils noted here are *P. flabellum*, a corals, *Camarotoechia* sp., *S. pennatus*, *C. coronatus*, *N. bellistrata*, *R. Vanuxemi*.

June 20³

Outcrops in small gully behind farmhouse ^{of S.E. Palmer}. About 20-25' of shale like that of June 20¹ is exposed with an occasional band of exceedingly hard sandy stone.

J 20²

5' 2' sh.
2' ss 2'
1' matrix

76' ± Silty shale

10" 11" hard brownish gray
3' shale

Fuller's Hill

833

833

June 20th

Rocks at brow of hill in road gutter shows glacial striae

N 34 E

N 34 E

N 43 E

The rock is a blue-grey shale with fossils

S. pennatus

C. barthi

S. perplana

M. concentrica

T. annuus

A. vinctus

P. flabellum

L. lamina ?

June 20th

About 1650' dark shales with some sandstone bands. Fossils are sparse

Trigona sp.

Productella

Leptodesma ? possibly a diptera. The exposure is about 10' - 15' vertical in a brook and along its banks.

Another similar exposure is found a little higher up to the south.

June 20⁵

Shale in stream flowing west ^{to Nelson} ~~from~~ containing abundant *L. laura* and *L. pennatus*. The shales are only exposed for a short. ~~The~~ interval the rock in the bottom of ~~which~~ the exposure is very resistant to the hammer.

June 20⁶

7-8" of dark blue to black shale that crumbles into small fragments. A section of a small piece of this shale shows thin laminae. This outcrop occurs at about the 1700' contour.

Fauna

C. bellistriata
L. laura Judlowville *Productella* sp.
C. citulus
Amantocochia sp.

Within the dark shales are bands of a massive sandstone. Fossils are quite rare in this rock and the exposure as a whole. The same rock runs almost to the top of the hill to about 1745 or 1750'.

June 20⁹

Delphi

Small exposure of blue crumbly shales
in the back of Callahan Brook. The rock
is abundantly fossiliferous. Here are found

*H. miculus**P. potulus**Lophaniltonia**P. concentrica**H. acclis**Conantocchia**J. submarginata**Aviculopecten* sp.*M. subalata**Tropospira rotalis**H. delphica*

June 20th 10

Magnificent section of Chase's Glen
& New Hymn rocks. The section is about
60' thick and the top of the New Hymn horizon
is at about 1460' AT. At 1465' is a small
outcrop of soft, fissile black sl. which
breaks into flat chips. The typical Hymn
horizon appears at about 21' from the
top. After the Hymn horizon comes the soft
black sl.

At 1470' dark sl. but appear slightly
more massive, rather break into larger
slabs. It is probably that the appearance
of these is due to their protection from
the sun.

Fossils

Nautila conbuliformis

Spirifer common at 1476'

1481' an excellent exposure at least 70'
high with slabby ss. at the top.

At 1497' the rock is a hard slabby
sandstone which forms a fall
about 15-20' high.

At 1519' the hard sandy stone gives
way to a more shaly rock with

Spirifer

M. pygmaea

M. subtilis

Platystrophia sp.

C. siliolus

This sequence also occurs
on the New Hymn but as yet so well
shown. Excellent for zoning interval
between the many & at Fortland strata. Fine
horizon. To be collected again.

This is just west of yellow fault line at road inter-
section.

June 20th

A similar exposure to J. 20th but not
as well exposed

10/11/19

June 21¹

Small outcrop of bluish shale, soft and argillaceous. In fracture section it is bluish but a very dark greenish grey. Fossils noted here are

*A. fimbriata**A. carinatus**C. mucronatus*

Large brachiopods

C. scitulus

Coraloid stems

The shale crumbles to bits easily under the hammer. These shales belong either to the Cardiff or to the Peckersport sh.

June 21²

Small ravine near deserted house and road with bluish shales exposed for about 25'.

June 21³

In old deserted road by unused farmhouse several exposures of shale occur at about 1380' and higher. At 1380 is a small exposure with

Camptostrophia sp.*Lox. hamiltoniae**N. oblongatus**Orthoceras* sp.

Ostracoda

Shales same also at 1390

A. fimbriata

At about 1405' the rock is more massive and does not split into the small fragments as below. The fossils yielded in the interval between 1405 and 1413' are as follows.

Lycopodium *hamiltoniae**H. dekeyi*cf. *M. subulata**S. lirata**C. scitulus**J. submarginata*cf. *B. sulcomarginata**P. patulus**N. oblongatus**P. lirata*cf. *C. erckunum*

June 21³ cont

Interval between 1413-1416

Comanotocchia sp. cc*H. debayi**Aviculapecten* sp.*C. tenuistriata**N. oblongatus**C. congregata* probably cc.The shales in this interval consist of strongly of the *Syringozon*

1418-1424'

*Bulcomarginata**Comanotocchia**S. submargin.**M. macrostromus**C. boethi**H. debayi**L. londa*

1424-1430 - still coarse sh. with

B. flabellum (loose) Plant stems*Taenurus* *A. boydi**Aviculapecten**C. tenuistriata**Liopteria* sp.

Interval 1441-1450'

Very coarse shales

*A. princeps**Glyptothecium**Cycloceras* sp.*S. cratellum**M. mytiloides**S. granulosus**A. minutum**N. arguta**M. concentricum**L. obsoleta**B. flabellum*

This horizon appears to be about the New Hym, near the top. To correct elevations distribute 25' among those cited. The top of this Hym horizon is only about 5' below ~~top~~ of hilltop and this accords with observations across the valley. This hard rock has caused the flat hilltop hereabout.

June 21⁹

Outcrops observed across valley on hill at level of about ~~146~~ 1470-1490.

June 21⁵

Another outcrop of Hym Quarry stuff at about 1475-1480'. This does not represent the exact top.

Starting of bottom of ravine at about 1310' are shales with

<i>A. subrotunda</i>	<i>Tremignea</i> sp.
<i>S. pernatus</i>	<i>C. satulus</i>
<i>M. concentrica</i>	<i>T. ovata</i>

Shale here is exposed for about 8' due to erosion and numerous of fractures. This shale is like that of the shale below the New Hym horizon.

13-19-1321' - soft shales with *S. pernatus*
C. satulus

At 1320' is a band in which large *Spirifer*, *S. pernatus* are very abundant. The band is calcareous. *Crinoid* stems abundant here too. A few snails, *M. angulata* are also found here.

1321-1326 - soft bluish shales on the surface which are brittle and break into irregular flakes of large dimension. They are bluish in fractured section also. What appear to be a *Liorhynchus* and *S. truncata* are found here between 1321 & 1326.

1331-1336' the shale is characterized by abundance of *Strophalosia* & *peckhami* fragments. There are also noticed also *H. triquetra* & *C. subconata*. *S. geminata* appears to have disappeared at least in abundance.

At 1343 *Ambocoelia* is small but very abundant. *C. subconata* & *H. triquetra* were also noted here.

1343-1354' *liatus*

1354' - 1359' - the rock is much harder here, probably containing some fossils are scarce - *C. scitulus* in the bed of the stream some of the weathering forms are spherical and indeed all of the rocks show rounded weathered edges.

1359-1365 - same as above but two fossils were found and a specimen of *H. deloayi* was noted.

1365-1376 - Practically no fossils.

1376-1387 - The rocks remain hard and fossils are difficult to discover at about 1385 or 87' is a hard calcareous band made up almost completely of fossils.

H. deloayi c

P. rana

C. boottii

Platyceras

Spilifer

Guthriea sculptus

P. flabellum

C. indenta

C. elongata

Microplora

Ammonoitidia

Actinopteria

On top of this band with its many fossils is a soft shale with an abundant fauna.

In the soft shales are

M. concentrica

P. flabellum

N. arguta

J. carinata

L. perplana

Zonitophora sp.

A. princeps

C. mucronatus

H. dekeyri

Spirifer sp.

M. oblongatus

Leioptelia sp.

Bedonkocia sp.

Productella cf. *spina*.

The deserted house at the abandoned road is on these ls.

1510
1439

73

June 22

Rain

June 23

All exposures of rock in valley
Peckport shales the same as the
lower part of the ravine of 21st

June 23rd

Passing opposite C. C. Knight's
mine. The first rock exposed is at
about 1380' and is a rather soft shale
with *S. punctata*, *P. flabellum*, *L. striata*,
Gastropoda, *Trilobites* *planus* *sp.* *sp.* *sp.* *sp.*
1380' of shale - soft but only slightly
exposed

1385 - *Antrocoelium* *undulatum* is quite
common

From 1400' up the shales are better
exposed. *Trilobites* was observed here

1407 at 1430' the shales are very fossiliferous
with *Trilobites*, *Spizella*,
M. concentrica, *Pard.* *tellus*, *P. laticosta*,
P. latilobus, *Trilobites*, *etc.* These

1370 1375 are exposed 15' from first on west side
of ravine. At the shale dipping
westward of hill but only a small
outcrop of shale was observed
westward here at about 60' from base
of exposure

June 23rd

Harder rock this is almost at the top
of the New Hope horizon as exposed at New Hope
p. 239 some 100' above *Trilobites* with large *Trilobites*
This is probably a small amount at about 1500-1510'

J. 23² cont.

The basal quarry horizon is at about 1510'. At 1365' that is 5' lower than rock noted as lowest before is an exposure almost unnoted. This contains fossils as follows.

C. scitulus

P. flabellum

Large *Spizipis*

M. concentrica

S. fenestrata

J. 23⁵

Small exposure of dark-blue crumbly shales with *L. laura*. When exposed to the weather these crumble to small fragments.

June 23⁶

Ravine on property of L. G. Brooks. At about 1380' soft dark shales, crumbling readily under the hammer. 2' above these soft shales is a band composed of larger fossils with *M. digitata*, *Pectinids*, some *Pelagopods* but most noticeably many *Spizipis*. 25' above this is a hard shaly stone, resistant to the hammer. The stone contains noticeably *Leptaena* till 50' from bottom. There is a 6" layer of blue ls like the Fall. This ls is exposed at about 1420'. Mottville

Shale on this ls has *Pentastella*, *Spizipis*, *Actinopteria*, *Saracotheca* etc. *P. laura*, *Leptaena*, *Pentastella*

June 23⁷

In a small drain shales are exposed like those of J 21⁵. Above these and at about 1420 is a blue ls which forms a flat between the hills.

Montville

June 23⁸

Along road from Eaton to Montville a small outcrop of Hyacin Quarry rock. The highest at the house is very near to the top.

Oncida Creek.

844

844

June 24'

Along flat topped hill in road are
found on the west side of the road
somewhat numerous shales with
practically no fossils. The only ones
observed are *M. triquetra* and *Bathyrina*
sp.

June 24'

About 1450' in road shaly sandstones,
gray-blue in color bearing *Tentaculites*
and *M. arguta*. These continue for about 10'
over a small rise in the road. On the
downhill slope of the rise going west
the same rock is exposed again but
here fossils are seen to better advantage.
Those noticed in the ss. are *S. insignis*,
C. recurva, *P. flabellum*, *C. benthii*,
A. cf. cras, *E. luciblaeni*,

At about 1470' a blue shale with many
fossils has replaced the sandstones
Here we find

C. benthii

C. uncinata

S. uncinata? cc

Chaetetes sp.

Chaetetes

P. constricta

soft shales, which are quite similar
to found about half-way between this
horizon and the shales noted on the
traverse of the hill along the road.

About 20' should be added to the above
elevations to make them in accord
with those in the stream.

June 24³

★ 1393' Black shales of the New York horizon
 with characteristic fossils
C. coronatus
P. fasciculatus
Pachydictya sp.

At about 1410 there is a 15' cascade
 of rock composed of the more sandy
 layers found at the New York horizon.
 This is very near the top of the New York
 at about 1427' the New York horizon
 has been reached. In places or bands with
C. coronatus in abundance and on
 these are sandy stone. Besides *C. coronatus*
 are *P. flehlingi*, *Thyridites*, *Serpentaria*,
Actinopteria and *Styria reticularis*.
 These hard calcareous rocks, with some
 interbedded shales are exposed up to about
 1435-1438' when they give way to a
 soft, friable (?) black shale.
 These soft shales continue to about the
 middle of the second cascade where
 they become harder and then at about
 1488' the S & G (part of stone from horizon)
 has taken their place. This ends at
 about 1488' and forms a flat in the
 stream bed.

This is the best section seen of
 these particular rocks and should be
 revisited for zoning.

1451' *Serpentaria*, *Styria*, the shales here
 are like those along the road from
 Morrisville to Cazenovia, weathering
 purple.

at 1467' the sand shales (blue) give way to the sandy stone containing calcareous lenses. This sandy stone from 1467-1485 contains

<i>M. arguta</i>	} shale just (2') below 1st. sh. ledge
<i>P. flabellum</i>	
<i>A. strobilata</i> sp.	
<i>Macrurhynchus maculatus</i>	
<i>Chonetes cf. muricata</i>	

at 1475' there are large spherical concretions in the ss. and also ls. lenses.

above the last falls and at about 1495' are bluish shales, an exposure of 3' containing

M. mytiloides
S. subulosus
M. arguta
P. flabellum
S. pennatus
Pithyris cf. cora
M. concentrica
Chonetes
S. papilion
M. blairi

Along stream bed at about 1500' is found an exposure of ^{15' or more} exceedingly fine ls. which breaks into thin flinty sh. There are noted especially *S. laura*, *S. pennatus*, *P. subulosa*. This shale is exposed on the west bank of the stream nearly to the end of the road, but at that point it is somewhat sandy. The exposure is about 40' vertical.

June 24⁴

A small exposure 10' of weathered
fine-grained sandstones. The fossils
were observed in them.

J. 24⁵ In the main stream rock is exposed
intermittently for at least $\frac{3}{4}$ and is
predominantly a sandy shale or slaty
sh. The fossils have been noted.

June 24⁶

Just south of the road in a small exposure
of grey silty shales. Fossils were not
observed but there were noted

P. lineata

S. perplanus

P. rana

Chonetes cf. *siculus*

L. laura

N. trigoniter

This rock is exposed for about 20' below
the road. In the lowest layers
L. submarginata was found.

June 24⁷

About 10' of bluish shales in which
L. laura is abundant. *S. perplanus* and
C. mucronatus, and an *Avicula* were
also noted. The lowest exposure here is at
about 1600'.

1605' *P. rana*

1621' *P. flabellum*

The lower *L. lauras* continue for about
¹⁶⁰⁰30' from the base of the exposure but after
this and for about 10-15' sandy stone
is exposed that does not have abundance
of fossils. ~~The above~~ These are exposed
for 10 or 15'.

The above holds for the southern
of the two ravines.

14 28
147
1120
350

1670¹
1500
170

7

In the northern ravine the rocks continue above that of the south lower off and here as one progresses up the slope in the stream gully the stone becomes a sandstone with ~~numbers of~~ *P. flabellum* ^{sp. nov.} The stone on the top of the hill has much *Trematis* in it. *Actinopteria* up to about 16^{70'}. The sandstone probably belongs in the N. Quarry.

The uppermost stone has many fossils

<i>D. sculptilis</i>	<i>S. perplana</i>
<i>F. stellata</i>	One of the <i>P. trindae</i>
<i>S. decoratus</i>	<i>D. tubulata</i> (small)
<i>T. cristatus</i>	
<i>R. fimbriata</i>	
<i>S. murina</i>	

Probably the member in the N. has *A. erectum*. This upper layer (16^{70'}) is entirely unknown to me before.

June 24⁸

Hard arenaceous shale rocks exposed in the road gutter for about 10' vertically. There is a great abundance of *P. flabellum* in this rock. Other fossils are

<i>A. bydi</i>	<i>M. concentrica</i>
<i>M. schubertii</i> sp.	<i>T. cristatus</i>
<i>S. channingensis</i>	<i>A. fimbriata</i>
<i>H. implexa</i> sp.	<i>C. tenuistriata</i>
<i>C. congregata</i>	<i>C. constricta</i>
<i>T. orbis</i>	<i>C. elongata</i>
<i>A. erectum</i>	

This resembles the appearance of the *Cym. quarry* but specific characters in the above almost the *dentatus* suggest that it belongs here and in that case this is not the *N. Quarry*.

A little higher up about 10' vertical
the same kind of rock is seen with
Strophodonta, *A. fastuolatus*, *A. brydi*,
A. erectum.

June 24th

Belden farm

Weathered shales that crumble
to irregular large fragments. Some
contain

H. delavayi

Comastrophia sp.

June 24th Between ~~1540-1560~~¹⁵⁴⁰⁻¹⁵⁶⁰ occur rocks near the top
of the New Lynn horizon

June 24th

Near top of New Lynn horizon in
quid along stream. About at top as it
has its top out bed with *C. orientalis*
and *A. brydi* in abundance

At about ~~1580-1600~~¹⁵⁸⁰⁻¹⁶⁰⁰ a shale is encountered
which contains a number, this must be
the shale described by Brown at a first
where it is becoming massive. Many
small stones were noted but not
not wrapped. They occur between

June 25'

At about 1470 shales referred to the New Lynn horizon are encountered. Intermittent outcrops are found up the hill to about 1505 or 1510'. The topmost outcrops are of grey silty shales, probably quartz cemented. These contain *M. agitata* & *C. granulosa*.

Between 1450 and 1470' rock is found that is referred to the New Lynn horizon. It is shaly, and is found in thin layers. Probably all of the rock exposed here is referable to the New Lynn horizon. The topmost layers may rest about 2' from the base of the shales shown with many *C. cordata* was found in the debris of out the exposures at about 1470'.

In the stream about 30'-40' of rock are exposed and the top of the outcrop is at about 1500-1510'. This is also the top of the New Lynn horizon. About 20' above this is a soft shale in the stream with many *C. cordata*, *C. granulosa*, *C. cordata* in the debris, *M. agitata*, *M. granulosa*.

These shales exposures are seen in the stream. It is possible however occupies the flat between the hill and this is probably caused by the Fe-rich (iron) sands.

On a small gully running out from the main brook are exposed shales which are soft and break into chips. These are exposed almost continuously up to 1600'.

June 25th

About 1425-1430 the shales of Eaton
(located below High Lagoon) with
Bamburghia, Leptomeniscus etc.

Brachiopoda

- Ambocoelia umbonata* c
Tropidoleptus carinatus
Schuchertella chemungensis
Cyrtina hamiltonensis
Spirifer granuloser.
Reticularia fimbriata
Schuchertella perversa
Rhipidomella cyclos
Athyris spiriferoides
Atrypa reticularis
Orbiculoides doria
Cranella hamiltoniae
Chonetes scitulus
C. mucronatus
Rhipidomella varruxemi

Pelecypoda

- Palaeoneilo maxima*
Orthonota carinata
Modiomorpha mytiloides
Plethomytilus oviformis
Sphenotus archaeiformis
Phthoria cylindrica
Sphenotus cuneatus
Nucula varicosa
Grammysia obsoleta
Leda rostellata
Nucula lamellata
Cunitaria elongata
Nuculites triquetra
Nucula corbuliformis
Grammysia constructa
Orthonota undulata
Actinopteria decussata
Palaeoneilo plana
Nucula lirata
Cunitaria recurva
Modiomorpha concentrica

Palaeoneilo muta
Cypriocardella bellistriata c
Pholadella radiata c
Palaeoneilo constricta
Orthonota parvula
Nucula bellistriata
Modiella pygmaea
Cypriocardina indenta
Cypriocardella tenuistriata
Palaeoneilo emarginata
Prothyris lanceolata
Nuculites oblongatus.
Parallelodon hamiltoniae
Telliopsis subemarginata

Gastropoda

Coleolus terminatus
Hyalithes acis
Stomatia patulus
Hyalithes striatus
Buccanopsis leda
Erygonia itys

Aphalopoda

Orthoceras sp.
Pecticeras discoidemum

Crustacea

Echinocaris punctata
Phacops rana cc
Cyphacis boothi
Homalonotus dekeyi

Taonurus.

Crinidea

Gilbertocrinus spinigerus (Hall)
Poteriocrinus cf. *diffusus* Hall.

855

855

Red Gate

Contact

Quite regular, and lithologically very abrupt, the bluish crumbly shales being in strong contrast to the hard crinoidal stone. However crinoid remains are exceedingly abundant in the blue shale. In the shale just on top of the ls. occurs a layer of shale containing many crinoid stem segments and a few corals.

Fauna of 1st foot $\frac{1}{2}$ of blue sh.

Leda

Camarotoecia CC

R. varanensis CC

D. sculptilis

Actinopteria

f. 30

Course blue grey shales thrown out from the excavation for the new water-tower. The most abundant fossil is *Leiorhynchus*, but it is not profuse. The rock here is much grooved by the glacier and exists on a gently sloping bench, the surface of which is marked by the N.E.-S.W. trending joints.

Unsorted glacial drift here is from 7-10' in thickness. It is deeper toward the west where the rock plunges under it.

July 1st

A very small outcrop of shale in the road gully. The rock is soft and fissile crumbling very readily under the hammer or in the hand. The color on the surfaces of the pieces is a purplish brown but in fracture is an olive grey. Fossils are very rare in this small exposure and only one, a *Seriolynchus* was found. Many of the surfaces of the naturally fractured pieces are curved and some show splitting along the bedding break with very uneven surfaces. *Cinoidal* stem. Probably Cardiff. This outcrop is at about 1285'

July 1st

In a dry stream course a few patches of black shale chips were seen, notably about a woodchuck's hole, indicating *Marcellus*.

July 1st

Small ravine with intermittent exposures of dark shales between 1230-1260'. The shale from a woodchuck burrow at about 1270-1280' is a brownish grey. It most certainly is not black and may represent the Cardiff division. The shale below at about 1260-70 appears darker and more fissile.

July 1st

About 1265' shales blue on surface but olive in fracture where weathered.

858 Onondaga Creek 858

July 1⁵

1110' - lower Onondaga, light grey
x-ls. with cup corals. West along the
road no exposures were found.
Glacial debris comes as high as 1240'
and evidence of it shows that it covers
the hill.

July 16⁷

Shale chips along road suggest
that Cardiff may be in gullies.

July 1⁸

Ravine behind Wrights.

1130' black, thinly laminated fissile
shales.

1145 the shales are becoming more
massive & 1160 the rock for 130 or 4' is
quite hard breaking into massive irregular
flat blocks. At 1170' the shale is fissile
where weathered. The shales from 1145
up have been a very dark grey in color,
not the jet-black of the Marcellus. The
Cardiff may be in these upper shales.
These shales are exposed up to the 1200'
contour. The upper ones are certainly
olive in color. Fossils are practically
absent.

July 1⁹

About 1100' black shales exposed in the hillside. These are very thinly laminated and break into flakes thin as paper. In section they are jet black. They also show an external rust that is rich red-brown.

July 1¹⁰

1120' Marcellus shales, fissile paper thin, in fineness of lamination. Some of the laminae are thickly coated with rust. At about 1157' there is a sharp change in the color and kind of rock. The thin, laminated jet black gives way to a dull olive-colored rock which has septaria at about 1172'.

July 1¹¹

Between 1170'-1175' the shale becomes olive in a second draw about 100 yds from July 1¹⁰. In a gully between these Marcellus was followed up to 1166' when all rocks ceased to be exposed.

July 1¹²

Fourth gully from July 1¹⁰. Cardiff comes in between 1170'-1175'. At 1170' were noted small nodular concretions in abundance.

5th gully from July 1¹⁰. Cardiff comes in at 1170' or 1/3rd hand-level step.

Note - West along Orinda Creek the material is glacial. Many springs along base of hills on both sides of valley have deposited calcareous tufa.

Lake Moraine - July 2 - afternoon

In the first 5,5" of shale all fossils are quite rare and the symbols must be taken to show the positions. A number for *Orthis* and all other fossils.

- ✓ *T. cuneatus* r
- H. dehaage* r
- ✓ *A. umbonata* c
- ✓ *A. large* small, possibly 2 kinds c.
- H. triquetra*
- P. pygmaea*
- A. rugosa* r
- M. pygmaea* r

Logically the rock is composed of hard and soft shale, the fossils occurring mostly in the latter. The shale is intricately mixed with the harder rock, which may be somewhat calcareous. When weathered the rock splits readily into shaly and flatish slabs.

2nd 5" -

- C. scutellus* A
- M. subobata* r
- M. pygmaea* r
- Palaeoneilo* sp. r
- Dranaspina* sp. r
- Camarotoechia* sp. c

at about 1' from base of outcrop the *Orthis* species disappear and give way to *C. scutellus* in large number. *H. pygmaea* is more abundant than *Orthis* was. The lithology continues to be the same. At about 15" from top

begin to come in, together with *P. linearis*
+ *S. myaia*.

Next 5'5" + 2' —

<i>Camarotoechia</i>	A
<i>T. constricta</i>	C
<i>S. pennata</i>	r
<i>H. chrysi</i>	ra
<i>Spirifer</i> sp.	r
<i>S. perplanus</i>	r.

In the upper beds *C. constricta* has
dropped out and *Camarotoechia* become
the abundant fossils.

July 5' Lebanon

Sandy stone in road gully with some bluish shales, fossils are not numerous
A. acuminatus ^{foliis}

A small species. Some of the stone is like the Leitchville sh., but others are fine ss. This section of about 8' probably represents a horizon somewhat older than Leitchville sh.

In the gully at about 1400' a slab was found with

C. complanata
A. pennatus

Species from this region are -
L = lower zone & U = upper 1-13

- | | | |
|-----------------------------|-------------------------------|------------------------------|
| <i>P. linearis</i> L | | <i>P. contracta</i> U |
| <i>N. elongatus</i> L | | <i>C. muscivorus</i> U |
| <i>L. sp.</i> L | | <i>C. vicinus</i> U |
| <i>N. truncatus</i> L | | <i>S. hamiltonensis</i> L-C |
| <i>P. flabellum</i> U | middle | <i>Cyst. hamiltonensis</i> L |
| <i>A. erectum</i> U | In the upper part of the zone | |
| <i>A. ovata</i> L | | <i>H. dekeri</i> L-C |
| <i>C. boothii</i> U | in | <i>M. subulata</i> L |
| <i>C. tenuis</i> M | | <i>M. pygmaea</i> L |
| <i>P. stipulatus</i> L-C | | <i>P. lachrymans</i> sp. L |
| <i>L. sp.</i> L | | <i>P. longi</i> U |
| <i>T. subulata</i> large | | <i>S. peruvianus</i> U |
| <i>L. mentum</i> U | | <i>S. ciliatum</i> U |
| <i>P. pinnulata</i> | | <i>B. sulcomarginata</i> L-C |
| <i>P. sp.</i> | | <i>L. maculatus</i> U |
| <i>L. obelata</i> U | | <i>P. scitulus</i> L & U |
| <i>N. crata</i> U | | <i>N. scabellii</i> L |
| <i>Phylloph. (P. sp.)</i> | | <i>I. crinitus</i> |
| <i>M. subulata</i> (P. sp.) | | <i>C. congepta</i> U = 4pp |
| <i>A. pinnatus</i> | | <i>C. ad. tubus</i> |
| <i>L. subulata</i> | | <i>A. fasciculatus</i> U |
| <i>Cyst. lites</i> | | <i>P. elongata</i> U |

Report of Curcoids sent
Miss Hildring - 1946, and Apr. 14, 1947.

Locality	Name
New York Quarry	cf. <i>Leptogonimus</i> <i>neglectus</i> (Hall)
Georgetown - Labrum loc	<i>Leptogonimus</i> <i>obovatus</i> (Hall)
Georgetown, N.Y. (72 F11)	<i>Amisocricus</i> <i>subchans</i> (Hall) <i>Thamnocricus</i> <i>spingus</i> ^{Hildring}
Georgetown, 7ECL	<i>Potamocricus</i> cf. <i>diffusus</i> Hall <i>Hilbertocricus</i> <i>spingus</i> (Hall)

Red Gate - lower shales

Bucanopsis *leda*

867

867

Review on Stephen Wedge property now
owned by Fred Cather.

~~Haines~~ Werner, William - Quarry
at Georgetown
Mr. Werner also owns most of the
quarry line. Business is carried on
out of his house - stone for
road from Georgetown to 5th Avenue
taken from this quarry.

Sept 13² V

On top of hill on north side of ravine at about 1515' A.T. top of New Gym horizon (as exposed at New Gym). Here the sandy shales have been bleached to a light grey sandy stone. *L. obsolita* & *M. nyltides* were seen. This horizon is exposed at the head of the ravine about 10' below the deserted house west of the road intersection. This brings the top of the horizon at about 1515' A.T.

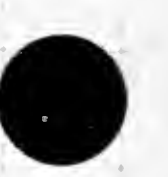
at the road intersection 1500' is also exposed an excellent outcrop of the rock. Fossils observed here are

<i>S. granulatus</i> (?)	<i>M. concentrica</i>
<i>L. obsolita</i>	<i>R. grandis</i>
<i>G. truncata</i>	<i>B. sulcomarginata</i>
<i>A. decussata</i>	<i>C. congregata</i>
<i>A. boydi</i>	<i>N. arghuta</i>
<i>P. flabellum</i>	<i>J. digna</i>
{ <i>A. reticularis</i> at 1503 or 4'	<i>A. celsa</i>
	<i>G. on hamiltoni</i>

8-9' above the intersection, travelling south this horizon ends as a hard, resistant, calcareous, sandy rock. In the top layer here was seen *J. cuminatus*, *P. D. perplana*, *P. flabellum*, *C. boottii*.

The exposure on the north side of the ravine can be easily seen from the top of the exposure 8 or 9' above the road intersection. This gives a level sight when

Handwritten marks at the top of the page, possibly initials or a signature.



standing on this exposure, hence its elevation is about 1514' A.T.

Top of New Syn horizon as exposed here does not have the layer with *C. coronatus* & *a. reticularis*, or else it is not exposed. The top is at 1509' and at the intersection about 20' of rock are exposed

Going south

1509 - 1519' 10" - hiatus

1519' 10" - 1524' 15" - dark unfossiliferous shales in the road gully. These shales become sandier as progress is made up the hill to the south

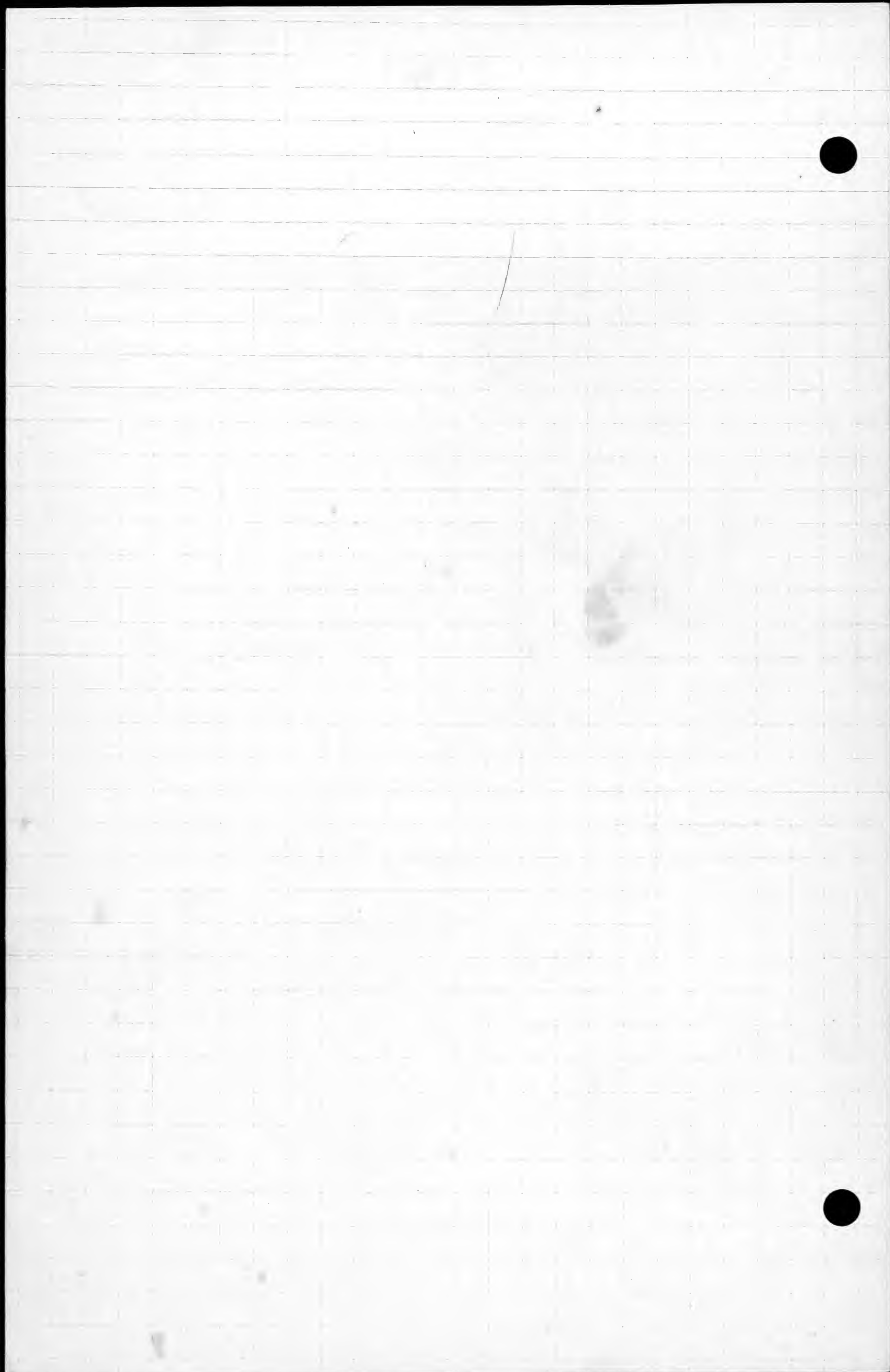
At 1559' 50" comes a shaly ss. At 1564' 55" is seen a coarse sandy shale abounding in *Nyssonas*, *S.*

pennatus, *C. imperonatus* etc. Just below this is a hard calcareous rock with *S. pugnana*, *S. pennatus*, *N. arguta*, *P. flabellum*, ^{R. *domingensis*}. The horizon with the *Emillia* was not seen. This was hand-levelled twice

from the top of the ^{Delphi} horizon to the top of the ^{Poupey} horizon & gave 11 steps each time. Thus this interval is 59' 7" and is practically the same at Delphi Falls. A foot should be added to include the upper shales.

soft shales follow but are only intermittently exposed.

about 1590' a 2' exposure has *L. laura*.



Fossils here are *P. flabellum*,
H. deSoye, *Camarotoechia* sp., *P. spinulicosta*
 30' above this exposure others are
 seen running the hill. These are
 very close to the top of the New Gynon
 horizon, perhaps 20' below. The
 rock here at this level (1423') forms
 a distinct terrace or flat. ~~at the top of~~
~~the ninth step the rock is hard~~
~~and smooth forming a small~~
~~cascade. Here were seen:-~~

T. carinatus re *A. princeps*

S. perplana re

Schuchertella

S. nodosulus

H. boydi

The rock is a lumpy sandstone?

Above the New Gynon there is a hiatus
 of about 15'. At this ravine about 5-5'
 off the New Gynon rocks are shown

1610' A.T.

Sept 13³

Sandy shales or ss. without fossils

Sept 13⁴

A small exposure of dark grey
gritty or sandy sh. without fossils
This horizon must be near that
at the new water tower? 1640' A.T.

Sept 13⁵

Between 1680-1700 bleached sandstones
probably belonging to the University Quarry
horizon. The slope of the hill is
covered everywhere with these slabs.
These in the hillside facing south
at about 1690' but are only exposed
vertically for 1 or 2'. It is not probable
that these rocks belong to the ss.
exposed near Electric Light Brook
and between that place & the Loganville
road.

Sept 13⁶

A large exposure of the limestones
that exposed in Burchard's quarry.
Bottom of exposure at 1348'. About
75 or 76" in. of the sandy ss. are exposed.
The exposure is fully 100 yds. long.
On top of the ls. come soft shales.
Along the ridge of the hill & steps on
43' above the ls. are found sandy
shales that belong somewhere below
the gray horizon.

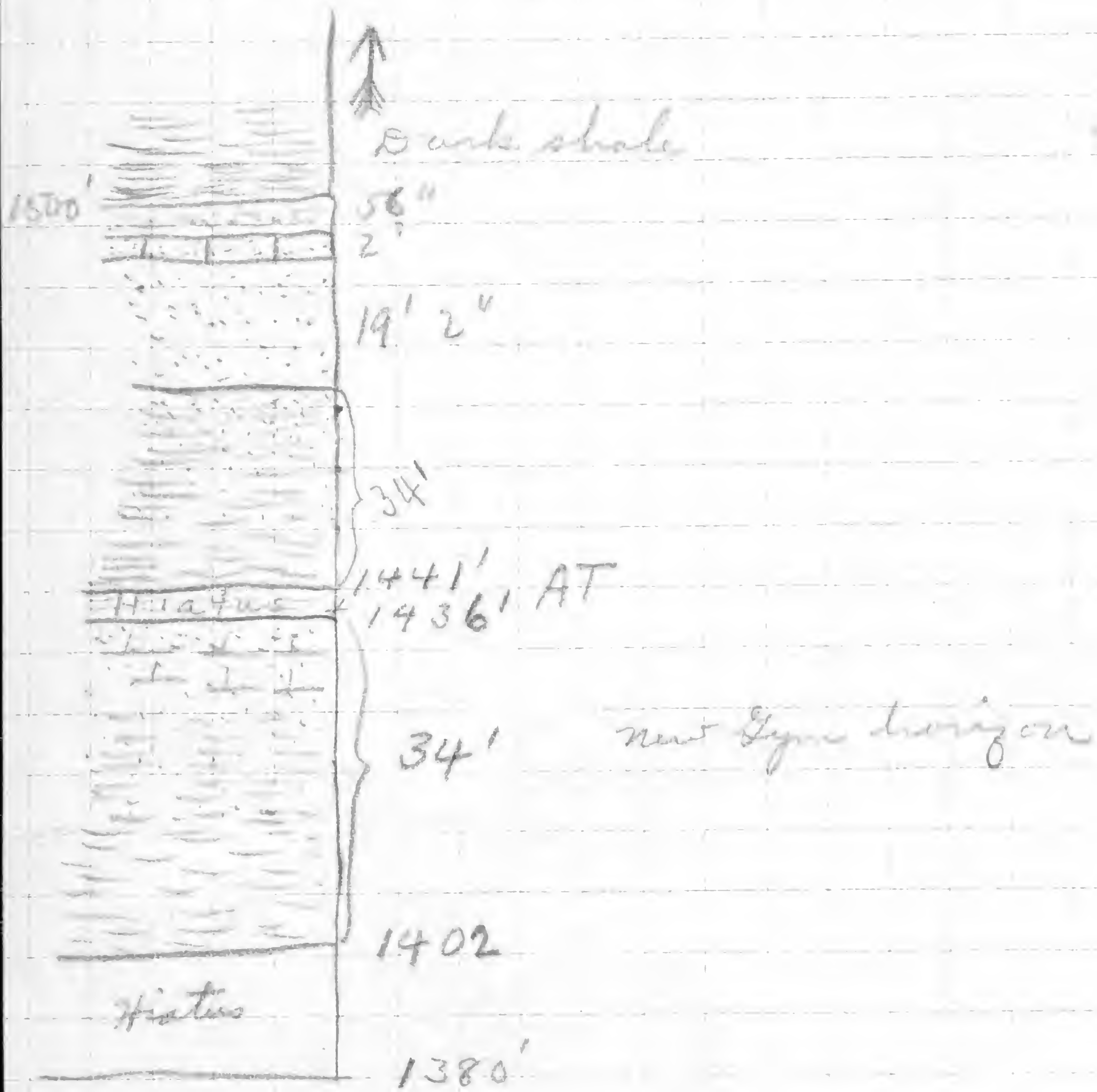
Oneida Ck

Sept 14.

Hand-leveling begun at 1380' A.T.

The first rock in this ravine is seen at about the bottom or middle of the 4th step. It consists of sandy shales belonging at about the same horizon as the rocks behind the Badger House at Morrisville. The rocks become increasingly harder as they approach the top of the New York horizon. There must be some 20' of the very hard sandy rocks. When exposed in the woods these rocks are commonly an ash grey, being covered by lichens. The fracture of the rocks is very irregular. Large slabs may be wedged up but they have no definite shape, but are very irregular with one or two other surfaces \perp to the bedding. The color is commonly a light grey, when exposed in the woods, or in the streams it is somewhat darker. In the open fields the rock on the fresh fracture is sometimes very light grey almost yellow white.

The top of the horizon is very resistant & commonly forms falls and cascades in the streams on ledges & ridges on the sides of hills. Tabular is very common in the upper portions but is not found commonly in the lower beds.



Each square 10'

At about 1427' A.T. comes the brink of the first cascade. This passes over rocks belonging almost at the top of the New Gyn. Above the cascade there are about 3' of rock exposed. The cascade is about 9 or 10' high and the stream passes for a short distance through a gudge about 15' vertical. *Taourus blanda* at the top of the 8th step.

About 1' 3" below the 9th step there is a 3" band of calcareo-arenaceous rock bearing *C. coronata* in great abundance and *P. cora* and *A. reticularis* in lesser amount. This band occurs at just about 1431' A.T. (See other notes 1427). Above this are exactly 5' of hard calcareo-arenaceous rock of the New Gyn horizon. *A. reticularis* was seen at the road intersection yesterday at just about 5' below the top of the New Gyn. This horizon with *A. reticularis* does not seem to be continuous as many horizons do not yield it. At the New Gyn *A. reticularis* was present but is very rare. Other fossils from this horizon are:—

- P. flabellum*
- ✓ *A. boydi*
- ✓ *D. perplana*
- B. subconicigata*
- P. rana*
- M. concentrica*
- Pal. emarginata*
- Lox.*



The very top of the New Gynn here is a sandstone. About 1' from the top it is somewhat slabby. The transition into the black shales was not seen. At the top of 9th step the rock is hard and sandy forming a small cascade. Here were seen:

<i>T. carinatus</i> re	<i>A. boyde</i>
<i>S. perplana</i> re	<i>Tacurus</i> re
<i>Schuchertella</i>	
<i>S. andaculus</i>	

Above the New Gynn, a hiatus of about 5'. At this ravine there is about 34' of New Gynn rock exposed.

The fauna of the dark shales is not very abundant and is a fauna of small Pelecypods. The shales when wet appear quite black. As one progresses vertically the animals become bigger as the rock becomes coarser and of a lighter grey.

21' above the top of the New Gynn the shale has become quite sandy and here were seen

Bellerophon
Orthoceras sp.
Large Leptotermis
N. Strigaster

Fossils from 1436' - 1451' 15" - see collection
 Fossils from 1451' 15" - 1458' 20" are
N. corbuliformis c *Macrochilus* sp.
Lingula sp *P. sulcomarginata*
Leopteria sp.

1458' 20" - 1461' 25" - not favorable for
 collecting. *M. macrostromum*.

1461' 25" - 1466' 30" - *P. emarginata*,
 At the top of this step the rock is a
 coarse sandy shale. *Leopteria* sp.,
M. macrostromum, *N. trigona*. At the
 top of this step there are 10-12" of
 ss. and then the coarse shales are
 seen again. The sandstones are a lens.
 but 2 1/2' above the sandy shale the
 sandstones come in to stay. The
 shales in the 2 1/2' bring in a new fauna

1466' 30" - 1471' 35" - in the 2 1/2' of sandy
 shales *N. arguta*, *P. flabellum*, *C.*
marginatus, *Comarotoechia*,

1471' 35" - 1476' 40" - ss. large round
 concretions

1476' 40" - 1486' 50" + 2' - at 1486' 50" the
 ss which are slabby end, bringing to a
 close the horizon that apparently
 carries lenses of *Emella* and
Macrochilus. ss. lenses were not
 noted here. The ss begins at 1471 and
 continue to 1490' 2"; thus there are
 nearly 20' of sandstones.

On the sandstones are 2 1/2' of compact calcareous sandstone abounding in fossils:-

S. granulosa, re

S. perplana c

R. cora? c

S. pennatus re

R. vanuxemi

At the top of the last falls the stream has produced a prominent flat. This upper bed is in 3 layers the bottom two contain *S. perplana*, *S. pennatus* & *R. vanuxemi*, these are diagnostic of this zone & mark the passage into the Ludlowville. I do not believe that the fauna of these upper layers can rightfully belong to the Shaverdale but must mark the incoming of new animals. *S. pennatus* & *R. vanuxemi* are not common, the former not present in 100' or more of rock below.

On top of this rock comes 56" of sandy shale abounding fossils. In the lowest 6" the fossils are

S. granulosa

x *N. arguta* c

Athyris sp.

S. pennatus

A. serpens.

Modiolozepha large sp.

C. mucronatus c

x *M. concentrica*

S. perplana

Orthoceras sp.

In the 50" of coarse shale above this half foot are found

- | | |
|------------------|--------------------|
| * C. umbonatus c | Orthoceras sp. |
| * S. pennatus cc | A. umbonata cc |
| * S. granulatus | * C. scitulus |
| * M. mytiloides | * S. perplana |
| Arcinopecten sp. | * Pal. concentrica |
| * Leiopteria sp. | M. concentrica |
| * A. scabridus | * Athyris sp. |
| N. arguta | * G. arcuata |
| | Pterinopecten |

About 150 paces upstream from the bank of the falls, are seen closely jointed argillaceous ~~lately~~ shales like the Genessee, about 15' vertical. The Nyassa zone goes upstream for about 100 paces from the top of 1486' 30". These argillaceous dark shales must come at about 1500' A.T.

P. duroidem

A. umbonata

The shale in the stream bed at the bottom of the exposure is crowded with *L. laura*; *M. subalata*, *P. fragilis*, *S. truncata*, *M. pygmaea*, *Leiopteria* sp.

The upper part of the exposure is not very fossiliferous.

A. erectum seen in sandstones belonging to Feet. horizon.

Sept. 14. '27

Road from Morrisville Station to Morrisville

Railroad crosses highway at 1226' A.T.

1226' - 1236' 10" Blue grey shale chips and a few small exposures of rock in the west side of the road embankment. The shale is very slightly gritty when crunched in the teeth. This rock cannot be far above the Pine Woods hard band and is certainly very near the base of the Shannockites. On the slope at this interval fully 8' of chips and rock are exposed. The chips are rather chunky and very irregular, assuming no definite shape. The fauna is in my notes of last year.

1236' 10" - 1276' 30" - similar shales. One large exposure 100 paces long on the side hill where the rock is being quarried for road packing or for farm uses. This is an excellent exposure for collecting. The rock is the same as that at Pechaport and is about the same horizon. *L. laura* is very abundant and in places is found in ~~exposures~~ on the surface of slabs. The fossils are not well preserved however. The shale has some grit but is not a sandy shale. Fossils seen in a hasty survey are:

*M. pygmaea**P. fragilis* n.*L. laura* c.*D. subulatum*

40' 207'

4' 8" } Sandy sh.

2 1/2'

19 1/2' } ss.

14' } Sandy sh.

16' } Soft sh.

5' } Covered 1437' 35" (1440')

5' } 1436'
Styppa retinosa 1432' 50"

34'

1437' 2"

1432' 20"

1417' 25"

1417' 25"

1402'

13
30
7

76
2
30

(54)

828

828

*A. umbonata**Productella* etc

The *L. laura* here are not as large as those seen at Pecksport but are much more abundant as there may be 3 or four layers of them in a single slab of $\frac{1}{2}$ " thickness. Much of this shale breaks with a rounded or curved fracture. The slabs with a curved surface can only be broken with difficulty when attacked from the curved side, but split readily into flattish slabs when fracture from the side toward a joint plane. About 10' vertical are shown in the quarry but if the slope of the road is taken into consideration about 20-25' vertically may be studied.

When thoroughly weathered these rocks become a very light brown or olive color.

1276'30" - 1286'60" - same

1286'60" - 1291'65" - hiatus

1286'60" - 1296'70" - "

1296'70" - 1301'75" - here are exposed about 3' above 1301'75" - 6" - 9" of gritty shales breaking into small slabs. These contain *A. umbonata*, *C. scitulus*, *M. pygmaea*, & *L. laura* & *S. truncator*.

1301'75" - 1306'80" - hiatus - at 1306'80" come shales with *A. umbonata*.

1306'80" - 1311'85" - chips of this shale in bank, some in gutter.

1311'80" - 1316'90" - chips & a few small exposures in the gully

1316' 90" - 1326' 100" - limestones
 1326' 100" - 1331' 105" - "
 1331' 105" - 1336' 110" - shale and thin layers
 of blue grey limestone weathering to a
 brownish, slightly sandy clay on
 exposure. The ls is lenticular, in
 form and local in the sandy shale in
 which it is contained. Most of this
 rock weathers down into coarse
 irregular lumps, the color of which
 is yellow-grey or "olive". The ls. on
 weathering also chucks into irregular
 lumps. A markedly different fauna
 enters here at 1331' 100". It has
P. flabellum, *Spirifers*, ^{*Trinonychia P. productella*} and *Camarotoechias*
 1336' 110" - 1343' 115" comes similar rock
 but increasingly arenaceous and
 chipping into heavy lumps. At the top
 of this interval was found a band of a
 few inches in thickness of blue grey
 sandy ls. abounding in fossils
Amalopteron? sp. *H. deSaugi*
C. congregata *C. coronatus*
S. andabulus?

This rock has the appearance
 of that at Burchard's Quarry, and
 was my former horizon between
 the Skansates + Tiddsville.

Occasional layers of light brown,
 (weathered) shale are seen between
 the heavier - calcareous - arenaceous beds.

At 1343' 115" - heavy calcareous -
 sandy rock is seen which is
 glacially scored. This is just in front
 of the first house (white) on the
 south side of the road as one
 goes west up the hill.

The road has apparently been altered here, a matter of about 10' vertically + 30' horizontally. This white house used to be on the road but is now a considerable way back. The present Morrisville road is only a short distance north of the former one, traces of which can easily be seen.

1343' 115" - 1346' 120" - hiatus

1346' 120" - 1351' 125" - " North of the road in front of the house the hill flattens out, probably due to the hard layer.

1351' 125" - 1406' 180" - hiatus

1406' 180" - 1411' 185" - in a gutter under the road - coarse - calcareous - arenaceous rocks with *P. flabellum*. This horizon is actually just at about the top of 1406' 180"

1411' 185" - 1416' 190" - similar rocks but impossible to collect.

1416' 190" - 1421' 195" - same with *S. perplanus*, *P. flabellum*, *N. arguta*

1421' 195" - 1426' 200" - rock in place but loose slabs here abundant in

A. boydi. Also *S. perplanus*, *A. princeps*, *P. lirata*, *M. concentrica*, *S. andalusis*?

● 1426' 200" - 1431' 205" - *C. congregata*,
L. obsoleta, *Spirifer*, *P. arguta*, *A. cora*
 At the top of 1431' 205" the rock is
 blue grey calcareo-arenaceous, weathering
 to a rich brown soft sandy material.
 This must represent the top of the
 New Gynn horizon or very near it,
 that is the top as exposed at the
 Gynn. This is also at the second
 house on the south side of the
 road as one travels west. My hand-
 levelling does not here check with
 the contours, but the top occurs at
 the house on top of the hill. I found
 the top of the hill by hand-level to be
 at 1436' 200"

The thickness of the Eaton + New Gynn
 rocks by hand-level then is 95' or 96'
 By the map it is 80-85'. I believe that
 the figure 96' is the nearer correct.

Hand-levelling resumed at curve at
 sid house on south side of road.
 Started at 1415' according to map. At
 the curve and for a short distance
 up the hill dark shaly pieces are
 seen in the road bed. These have
 been taken from the rocks above the
 New Gynn horizon.

1415' - 1440' 25" - hiatus

● 1440' 25" - 1445' 30" - dark grey sandy
 shales with few fossils, they have
 a strong purple weathering on the
 surface.

1445' 30" - 1450' 35" - same

1450' 35" - 1455' 40" - here the rock
 contains many orange brown

rust spots or pockets of it, probably from decomposed pyrite.

At just about 1455' 40" can be seen a small exposure of sandstone that are slabby, and, when fresh, quite bluish, but when decomposed are brownish grey with many brown rust spots. This rock contains *P. flabellum*, *C. mucronatus*, and a small *Spinifer*. This small exposure in the dirt represents the bottom of the Fertland Stock Farm horizon. The rocks below yielded no fossils here as they are only exposed as a bank and in the narrow road gully.

1455' 40" - 1465' 50" - at the top of this interval is exposed imperfectly about 2' of rock which represents the top of the Fertland Stock Farm horizon just as seen on the west side of the hill along the Eaton Road. The rock is a hard calcareous sandstone rock containing *D. vanuxemi*, *P. rana*, *Athyris* sp., *S. truncata*, *S. perplana*. In places the rock is very calcareous.

1465' 50" - 1515' 100" - *hister* 1465
 At 1515' 100" - almost at 4 corners of road intersection come dark gutter shales with a purplish varnish to their exterior. These are exposed as a single NW facing joint face, a gully a few protruberances of rock from the joint face. The shales also rust yellow & brown

as well as purple. In the gully some 8 or 10' are exposed, while in the joint face fully 15' of rock must be shown up.

Fossils

S. arctostriatus c*A. umbonata**M. subalata**N. oblongatus**P. discoidium* (large)*C. indenta* r*S. pennatus* r*C. boothi* r*C. setigerus**C. mucronatus*

These rocks are not very profusely fossiliferous and particularly not in the upper part of the exposure. The fossils are poorly preserved. The exposure terminates almost at the four corners on the side south of the Summit Farm Tea Room.

Sept 13'

About 1615' AT. sandy shales with *N. hirtum* exposed in the road bed. They are grey and about 15' vertically. Further down the road they have *A. umbonata*, *S. pennatus*,

C. mucronatus - about 1580' here the rock is shaly.

At about 1560' on this road the rock is very fossiliferous, containing *S. pennatus* c.c., *C. mucronatus* c.c., *N. arguta*, *Pal. concentrica*, *A. princeps*, *Attheyia*. The rock is rather coarse and sandy here and from the fauna appears to belong to the rock just above the Fertile horizon. ss. slabs appear at about 1557' 0

886

886

Sept. 15 - Rain

Sept 16

Electric Light Stream - 200' horizontally from the bridge on the Eaton-Morrisville Road rock is exposed. It is here at the bottom blue grey calcareous rock with productella. It represents the bottom of the Syn. horizon. This lowest rock is at an elevation of about 1250' A.T.

at about 312' upstream and just below the dam can be seen a larger exposure of these rocks. The rock in the first 5' is a hard sandy shale of very massive appearance and in which I saw very few fossils. But at 10' above 312' the rock becomes a rather soft shale carrying abundant fossils, as:

- | | |
|-------------------------------|--------------------------|
| ✓ <i>B. bellulus</i> | ✓ <i>M. subalata</i> |
| ✓ <i>T. carinatus</i> c | ✓ <i>Tricopteria</i> sp. |
| ✓ <i>M. oblongatus</i> | ✓ <i>M. concentrica</i> |
| ✓ <i>C. boethi</i> | ✓ <i>S. andersoni</i> |
| ✓ <i>P. lirata</i> | ✓ <i>Son. hamiltoni</i> |
| ✓ <i>P. spumilucosta</i> | ✓ <i>L. perplana</i> |
| ✓ <i>Nephritoceras</i> sp. | ✓ <i>P. rana</i> |
| ✓ <i>C. indenta</i> | |
| ✓ <i>P. flabellum</i> | |
| ✓ <i>S. granulosa</i> | |
| ✓ <i>H. bekayi</i> | |
| ✓ <i>S. pygmaea</i> | |
| ✓ <i>Per. hamiltoni</i> | |
| ✓ <i>Strophomena perversa</i> | |
| ✓ <i>C. scitulus</i> | |

● Corals were noted at approximately the top of the interval 10' 10" and the list above belongs to the coral horizon.

10' 10" - 15' 15" at the very bottom of this interval comes softer shells crumbling to small fragments and bearing small animals.

<i>Pholidops</i> <i>hann.</i>	<i>H. delavayi</i>
<i>A. erectum</i>	<i>N. oblongatus</i>
<i>C. mucronatus</i>	<i>S. perplana</i>
<i>A. umbonata</i>	<i>N. triquatus</i>
<i>Poly. concentrica</i>	<i>S. arcuata</i>
<i>C. boothi</i>	<i>M. pygmaea</i>
<i>J. cymatulus</i> <i>n.</i>	<i>O. parvula</i>
<i>P. lirata</i>	<i>B. submarginata</i>
	<i>C. vicinus</i>

The zone of very abundant *Pholidops* only continues for about 2'. Rock is exposed at this locality to about 12 85' A.T.

The rock just on the coral horizon which is only about 3" thick but crumbles into very small fragments. About 2-2 1/2' above the coral zone abundance *Pholidops* becomes less and fossils are scarcer and larger. Here *Hyomenas* + *Bembexias* come in but are not as abundant here as at Delfhi Falls.

● *A. erectum* is common in coasts, just like those at Delfhi. Debris here is rich in fossils + this is easily the best locality for the study of this horizon.

30-35' of rock are exposed mostly all of the softer shales except for the 10' below. At the top the shales are just becoming so that they break in large slabs.

Concretions of small size & irregular shape are common on these lower beds. Also thin-rod-like pyrite concretions. *Pholidops* ranges for a short distance above 15' 15". *H. micula* was not seen here but a diligent search should reveal it.

Sept. 16'

Sandy shales in road gutter. They belong somewhere below the New Syn as the stone walls here are of ss slabs.

S. pennatus

L. laura

A short distance south up the hill at about 1470' sandy shales are seen at the road side. They have a purple weathering and are like those opened on the new water tower. *P. fragilis*. These rocks crumble to small bits and are not very fossiliferous.

Sept 16²

In the woods 45' above Sept 16' is a rather extensive exposure for several hundred feet. 15' 10' AT. This consists of weathered medium gray shales for about 5' and then a 7" band of slabby sandstone with

● Shales above ^{then more ss.} 3' 15' above this exposure is another similar one, but less extensive with sh + slobbly ss. This must represent a portion of the alternations below the U. Quarry horizon.

Sept 16³

1540' A.T. grey sandstones with irregular fracture, split into the flat slabs characteristic of the upper beds of the U. Quarry. Also on south slope of hill above the exposure

Sept 16⁴

coarse shales of New Hymn horizon, lying south (steep) bank of Electric Light Stream. Exposed poorly for about 25' vertically. The top of the Hymn is 25 or 30' above the stream or at 1340'

Sept 16⁵

Top of New Hymn horizon at about 1403' A.T. It is here composed ss which are shabby + calcareous arenaceous stone.

Sept 16⁶

● In the road adjacent to this gully at about 1460 - 1470' A.T. come ss. shabby which must belong to the Fritland horizon. These were found 312 paces from the house on the hill. And where the gully flattens slightly 400 paces from the house but to the east in the gully are grey sandy shales becoming less sandy.

Downstream. They are exposed in a series of cascades from the 400th pace below the house in the stream for about 20-30' vertical.

The top of the ~~Q. Pompey~~ in the gully is 325 paces from the Electric Light Station. This would make it 1380'-1400' A.T.

Sept. 16th

Rock of the New Gym horizon exposed on both sides of the bridge which is just below (south) of the road intersection. Here the rock must be at about 1335' A.T. It consists of a cascade about 3' high in low steps, the upper one being 1 1/2' high. 100 paces upstream from the bridge are to be seen soft dark shales which belong to the bottom of the Fertiland horizon. These are here exposed for about 8'.

The continuing on this stream must be wrong. The gym horizon certainly terminates a short distance above this bridge and is surely found at 1390'-1400' in the gully not in Sept 16th.

The change in lithology is not as abrupt as the change in fauna as the shales are somewhat sandy and compact although they become soft on weathering in contrast to the hard rocks below.

Electric Light Stream

About 20' of the sandy shales are exposed here below the sandstones. The soft shales on the Egan were only exposed for a short distance about 400 paces upstream from the bridge. At the 10' 10" of ss. in the ss. were seen *A. erectum*, and *P. flabellum*, the former of gigantic proportions. *P. flabellum* is the most abundant fossil of the sandstones. Others are *M. concentrica*, *N. arguta*.

At 3 steps + 2' the calcareo-arenaceous rock of the top of this horizon is seen. I saw no *Emella* lenses in this portion of the exposure but they were seen before at about 1360' A.T. at the bend of the road in a small side stream.

Here are 18' 3" of ss. exposed here and 2 - 2 1/2' of calcareo-arenaceous rocks with *A. spinioides*?, *S. pennatus*, *S. granulosa*, *C. mucronata*, *R. vancouverii*, *Abiclopecten* etc. 73 paces above the base of the 2 or 2 1/2' of calcareo-arenaceous rock, softer rock contains hosts of *N. arguta*, also *S. granulosa*, *N. trigonata*, *S. pennatus*, *A. mucronata*, *M. concentrica*, *P. lirata*, *H. dehayi*.

About 470 paces upstream from top of falls comes the highway - bridge

The hard sandstones & calcareous lenses continue up to 43 above base of exposure. In the ss. may be found *P. flabellum*, *M. angusta*, *D. lamella*, *S. granulosa* but best fossils are found in the ls lenses, also *C. recurva*. The total thickness of the rocks exposed is about 43-ft. From J 16 it would appear that the lenses bearing *C. recurva* are near the top of the top, and at the top is a stone like that of at J 16¹⁰.

14 } 34' ss
with calcareous
lenses

19'  sh

7

which bore many *Strophodontes* & *Bygonia*.
These observations must be checked.
To be revisited for collecting.

June 17⁹

A large quarry with about 5' of hard blocky sandstones mounted by about 10' of soft black shale. This sequence may be the black shale that normally rests on the sands of J 17⁸. About 3' from top of ss bed in the shale is a 6" sandstone stratum. All *Bygonia*.

Joints

N 31 E

N 30 E

N 26 E

3-7' apart

They are spaced from
The joints do not

June 17⁶

Grayish weathered shales with few fossils, the same horizon as at J 17⁶
Leiopteria sp.
N. corbuliformis

Note - specimens of the various rocks must be collected, both weathered and fresh, for determining alteration on weathering

June 17⁷

Same shales as J 17⁶ in road gully.

June 17⁸

Electric Light Brook

The lowest rock in the stream is a blue gray sh. where fresh with few fossils. This is the same shales in the road at J 17⁶

*N. corbuliformis**H. deloayi**Leiopteria* sp.*N. triquetra**Lingule* sp.*B. retrofracta*

A specimen of *Bucina* links thin up with the dark shales of Upper Chocoma Glen. This specimen was found at about 19' above the base of the rock which is here exposed at the top of the second cascade about 24' from bottom, the shale has changed to a hard slabby sandstone which breaks into large blocks. Between 27 and 33' above base of outcrop was found a calcareous bed abounding in corals and *Nyssa arguta*.

run up into the shales. A hasty examination revealed no fossils in the black shales. Plants

This quarry is located between 1520-1540'

Sept 17.

Livermore Proprietors of
Ravine of the Elmview Farm.

Livermore Ravine

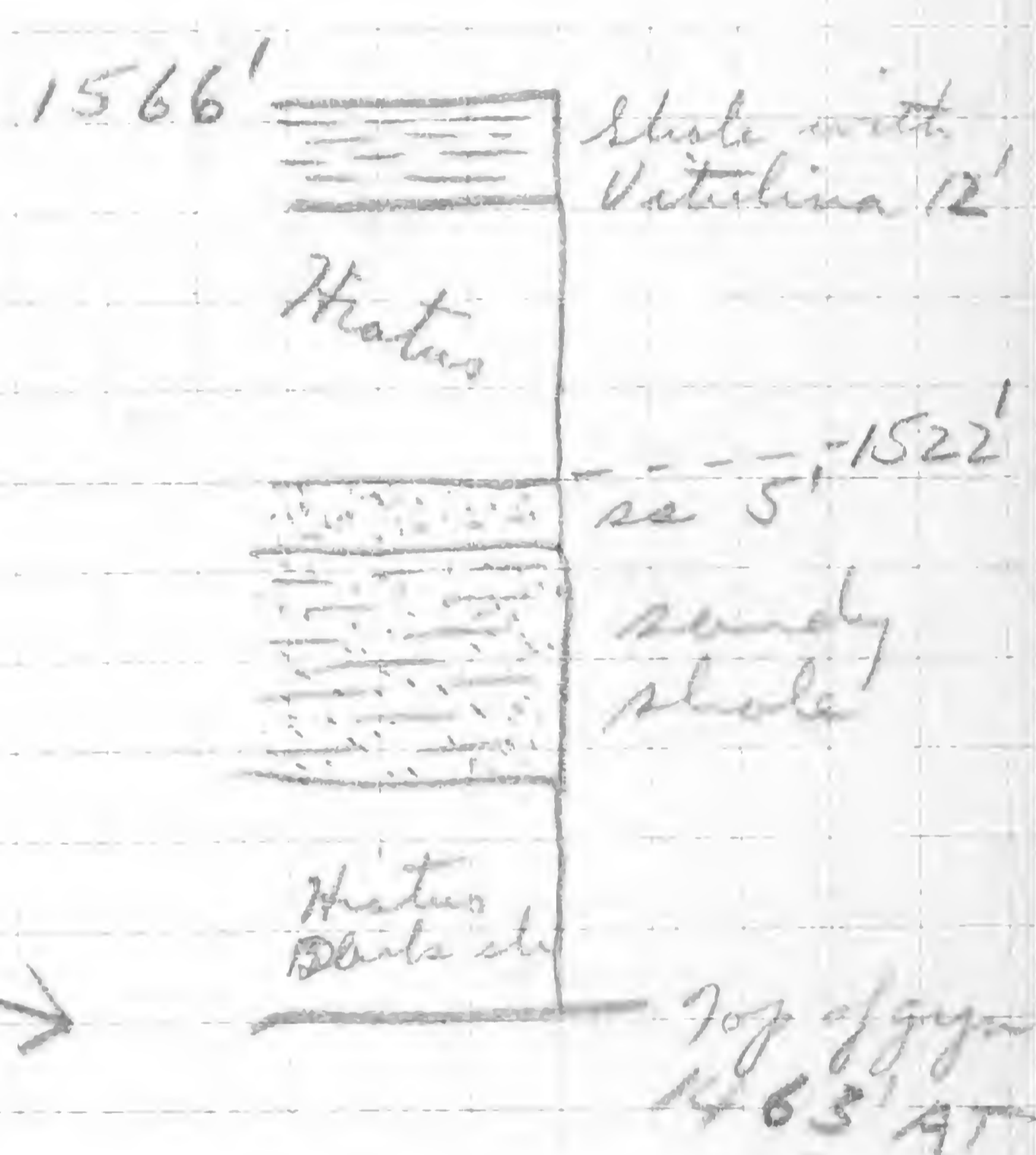
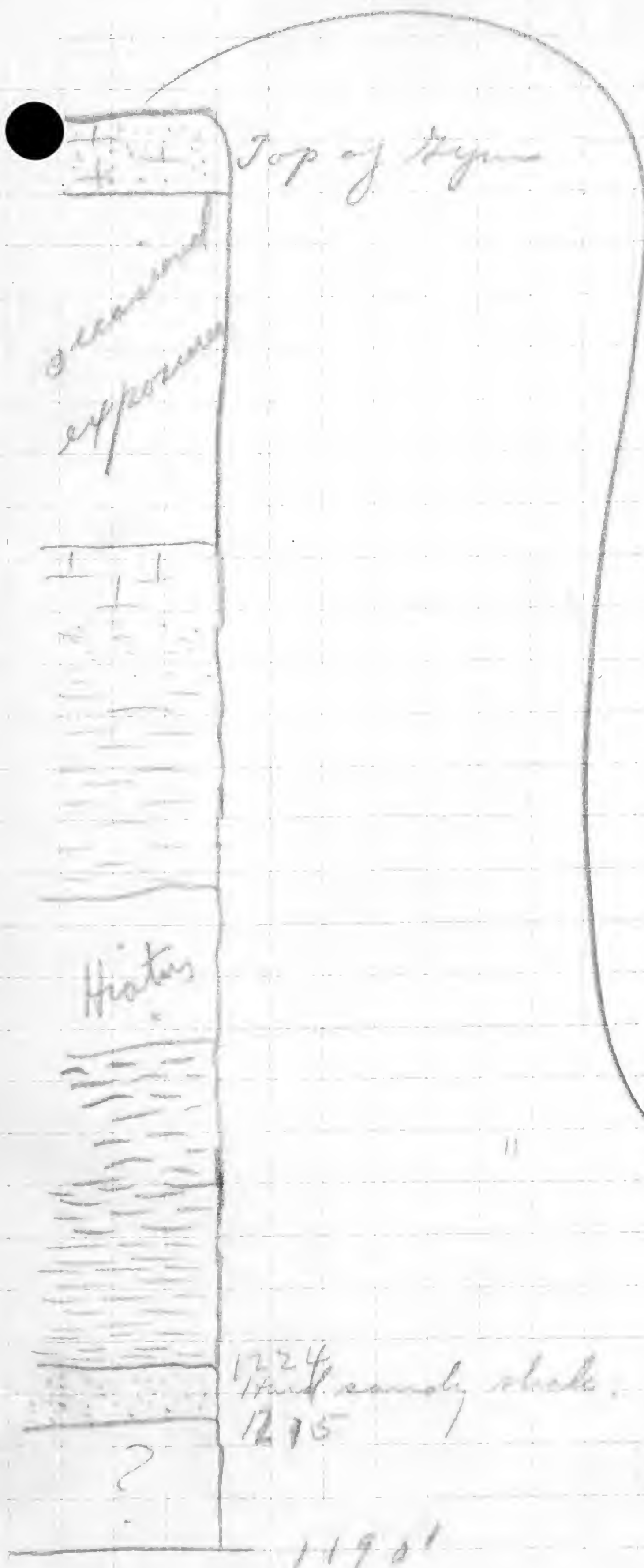
25' above the road is found a hard sandstone rock. The road intersection at the entrance to the ravine is at about 11 20' A.T. Hence, this hard band is found at 12 15' A.T. I had no success at collecting the hard rock here. At 12 20' 5" the band forms a cascade in the stream. The thickness of the band as exposed here is about 10'. *S. cristatum* and *U. imbricatus* stems were the only fossils observed. Also wood fragments.

Top of hard band at 12 24' A.T.

These are succeeded by a soft, gritty shale that crumbles into small fragments. On the north side of the ravine, just above the Pine Woods hard band, these are exposed for about 15 or 20' vertical and chips strewn the slopes. Fossils found in the chips on the slope are:

<i>N. rondallei</i>	<i>S. cristatum</i>
<i>C. mucronatus</i>	<i>L. laevis</i>
<i>C. setigerus</i>	<i>H. pennatus</i>
<i>A. imbricata</i>	<i>P. lirata</i>

12 30' 40" - 12 35' 45" The rock in this interval is only sparsely fossiliferous but *G. subulatum* and *L. laevis* were seen. The rock is dark grey and only slightly gritty. With acid at 12 35' no effect observed.



Each square 10'

1235' 45" - 1240' 50" - *L. laura* was the only fossil seen in this interval. The individuals are very large, the largest of any in the lower part of the Hamilton.

1240' 50" - 1245' 55" - Practically no rock exposed in the stream bed, but in the cliff on the narrow sides 35' or 40' of rock can be seen.

1245' 55" - 1250' 60" - large *Leontyneles*, and more of them. Other fossils becoming more abundant.

✓ <i>L. laura</i> cc.	✓ <i>C. scitulus</i>
✓ <i>A. umbonata</i> r	✓ <i>M. corbuliformis</i>
✓ <i>M. oblongatus</i> r	Orthoceras sp.
✓ <i>C. setigerus</i>	Crinoid stems.
<i>Lox. hamiltoniae</i> $\frac{1}{20}$	<i>S. murinum?</i>

1250' 60" - 1255' 65" -

✓ <i>L. laura</i> c	✓ <i>A. umbonata</i> r
<i>Lox. ham.</i> r	✓ <i>C. scitulus</i>
✓ <i>S. pennatus</i> r	✓ <i>C. setigerus</i>
✓ <i>A. densa</i>	

1255' 65" - 1260' 70" *locatus*

1260' 70" - 1265' 75" - collecting difficult but numerous *Pleurotomaria*, *M. sandelli*, *L. laura*, *Bellerophon* sp.

1265' 75" - 1270' 80" - a couple feet of shales exposed at the top of this interval are softer and crumble more readily than the rocks below. Small concretions

are quite abundant. Fossils noted are: - *C. scitulus*, *S. pennatus* c, *L. densa*, *Pal constricta*

1276'80" - 1278'85" - hiatus
 1275'85" - 1280'90" - poor exposures but excellent collecting and here the fossils are rather large. The exposure is at the top 3' of the this interval: -

✓ <i>S. granulosis?</i> or	<i>Pal. hamiltoniae</i>
✓ <i>S. pennatus</i> rc	✓ <i>Cyrt. hamiltoniae</i>
✓ <i>C. scitulus</i>	<i>C. scitulus</i>
<i>J. exigua</i>	<i>P. flabellum</i>
<i>J. microptera</i>	✓ <i>S. perplana</i>
<i>Homioptera</i> sp.	<i>P. lirata</i>
<i>M. concentrica</i>	<i>Productella</i>

1280'90" - 1285'95" - *Productella*, *Pal. constricta* - large snails.

1285'95" - 1290'100" - hiatus.

1290'100" - 1295'105" - hiatus

1295'105" - 1300'110" - "

1300'110" - 1305'115" - "

1305'115" - 1310'120" - "

1310'120" - 1315'125" - "

1315'125" - 1320'130" - the shales are crowded with *L. laura* - other fossils are *H. triquetra*, *C. scitulus*

1320'130" - 1325'135" at the bottom of this interval *L. laura* disappears & *C. scitulus* takes its place in abundance. Snails are also present

here. The rock is becoming coarser

1325' 135" - 1330' 140" - In a soft grey shale

- L. laura*
- A. umbonata*
- M. pygmaea*
- C. scitulus*
- A. snail*

1330' 140" - 1335' 145" - Small Ambocoelias abound in the rocks here

- C. scitulus*
- H. dehaui*
- Large *Plectonaria*s
- M. pygmaea*
- M. orbuliformis*
- Stromylocera* sp.

1335' 145" - 1340' 150" - No fossils

1340' 150" - 1345' 155" - *C. scitulus* sp., *P. radiata*, a few calcareous concretions were also seen. This permits naming the exposure on the Lake Moraine Road near the Jones' Farm. It must represent this horizon by virtue of the presence of *P. radiata*. The abrupt change of an Ambocoelia zone to a *C. scitulus* zone was also noted at Lake Moraine.

1345' 155" - 1350' 160" - Rock hard & resistant - no fossils

1350 - 1365' 175" - Top of this horizon, top of state Rd. ^{Waverly} ~~Dundee~~ The top is then at 1380' A.T. JH

The hand levelling down the ravine does not check with that up the ravine. The elevation should be about 1370' A.T. to the top of the congl. bed.

The gym horizon here appears to be thinner than it is in other places, but the Festiland horizon is just about 60'. There should be about 10' more of ss here and this would take off some thickness from the shales above. The sandy rock above the *Vitulina* zone was hard and had very few fossils.

Switzerland

98

$$\begin{array}{r} 13 \\ 1215 \\ \hline 156 \\ 116 \end{array}$$

$$\begin{array}{r} 13 \\ 1215 \\ \hline 156 \\ 116 \end{array}$$

$$\begin{array}{r} 79 \\ 10 \\ 32 \\ 22 \\ 8 \\ 10 \\ 30 \\ 33 \end{array}$$

5'5"

No find

1340'1150"

1335'1145"

5'5"

Small
amberina

1320'1130"

$$\begin{array}{r} 136 \\ 215 \\ \hline 351 \end{array}$$

5'5"

C. antitab.
L. longifera

1305'1125"

5'5"

1320'1130"

5'5"

1315'1125"

✓ 12'

Vitulina 321

✓ 32'

Covered

$$\begin{array}{r} 1285 \\ \hline 1293 \end{array}$$

$$\begin{array}{r} 101 \\ 152 \\ 1193 \\ \hline 34 \end{array}$$

Covered

1285'95"

✓ 8'5"

Very
fossil

1280'70"

30' ✓ 51'

✓ 8'5"

2 1/2'
Rotted

1275'85"

✓ 27' Sandy ph.

1270'80"

10'10"

3 1/2' Covered
5'5"

1265'95"

$$\begin{array}{r} 1350 \\ 227 \\ \hline 153 \end{array}$$

25' Covered

1260'70"

5'5"

Covered

1255'45"

1440'250" 21459'

36' 2 1/2"
85'

1250'60"

1245'55"

$$\begin{array}{r} 1100 \\ 1200 \\ \hline 1500 \end{array}$$

71' 79'

1240'52"

1235'45"

1260
1224

1230'40"

1225'38"

1224'30"

$$\begin{array}{r} 1260 \\ 1224 \\ \hline 36 \end{array}$$

20'20'

1220'30"

1224
1224

5'5"

1215'25"

$$\begin{array}{r} 1380 \\ 1224 \\ \hline 156 \end{array}$$

1350'260"

1345'80"

1340'150"

9

9 ✓
 125 ✓ (100)
 65 ✓
 14 ✓
 27 ✓
 25 ✓
 3 ✓
 32 ✓
 12 ✓

 349
 16
 53

1285
 6

 1291

1225
 1290

 32

1285
 1228

 56

902

902

The last exposure here on the map is at 1860' A.T.

1240
1125
4

Sept 19.

Recheck on height of New Gym at Upper Chase's Glen - From top of hard layers 65' above road to top of hard layer where glen flattens above was $13\frac{1}{2}$ steps or 73'. Top of Camarotoechia coral band is at 1220' A.T. Top of gym is at 1293' A.T. Probably all of Gym not exposed.

At Payne St. Ravine ss with corals occurs at 1200' A.T. By hand-level it is just 16 steps to top of New Gym, 86' 6" and occurs at 1286' 6". The dark shales exposed belong to the Fertland horizon.

Fossils here are - *Neoblougatus*
A. umbonata, common in lower part, small
Neoblougatus sp.
N. trigonatus

The shales above the New Gym are exposed for 390 paces upstream or about 50' vertical. The upper ss. were not seen here.

The top of the New Gym comes about 10' below the apex of the [] in the road just above the residence of Carpenter & Parry. This is at about 1285' A.T. A check down hill gave 16 steps for New Gym horizon.

6b 112

Page 904

904

1212' hard sandy sh. of bl. gray
 1213' hard ledge, more massive
 at 1215
 1220' the soft sandy sh. of bl. gray
 1225' natural, rounded, sh. of bl. gray

2 points in north west
 Some sh. capped by a calcareo
 mass of sh. at
 containing many spines and
 shells

20' above fall of sh. dark soft
 sh. of bl. gray with
 shaly part

20' above fall of sh. dark soft
 sh. of bl. gray with
 shaly part

114' above 1st fall. Bl. sh. shaly
 with few fossils

40' above 1st fall. The sh. shaly
 because of sh. part
 sh. that is to be seen. 70'
 the sh. shaly part. The sh. shaly
 sh. the 1st fall. at 1279'

906 18

Livermore's Row

906

66 H12.

Solville

Restudied

1200' compact sandy rock.

1212' hard compact so probably calcareous fossils flat at entrance to ravine. The rock has few fossils.

d + forms cascades for about 10' upstream. This band also noted in stream N.E. where Comblina was found.

Liver

at 1217' rock is more extensively exposed and well jointed, very hard & compact. Fauna is very common, but other fossils are scarce.

Prevailing joints N42E
N39E
N43E
N36E

1223' same

1228' soft, dark shales, weathering when exposed to small chips! These have *L. laura* of the same kind as the shales at the Pecksport railroad intersection and are referred to them.

These shales weather to a rich red-brown color.

Fauna

- A. umbonata*
- C. setigerus*
- C. mucronatus*
- L. harriottiana*
- Crinoid stems

1200'
 1212'
 1217'
 1222'
 1228'
 1230'

1200' to 1230'

1263'

1328
 1342
 134

1350'
 1362'

1350' to 1362'

1390' to 1400'

1427
 1467
 14

1467'

1467' to 1477'

1503' to 1513'

When first the slide was
gray blue in color and of very
soft texture being
composed of a clay. When
partially broken in large
irregular fragments with
a subconchoidal fracture.

at 1238' fully 30' of rock is exposed
1255' s. Laminar abundant
of large size.

20
16 28
17 12
17 00
11 10
150

at 1353' the stone becomes
progressively harder till

McBottle
1362

at 1362' the break comes
over a fall made up of
hard calcareous sandstone

17
17 10
17 00
130

which belongs to hard layer at Birchard's
at 1363' shales are again
encountered, somewhat
calcareous with abundant
fossils contrasting with the
comparatively unfossiliferous
rocks below.



1390' is on Eaton sh.

1448
Delfi

1436' 12' cascade in bed
rock some of it may
represent top of New Hope

6 b d 12

37
163
17 10
17 00
130

1503' 30' of rock
representing top of black
shale resting on New Hope
and beginning of Awaraj
horizon. No fossils were
found in any of the slabs.
Slabby as much on top.

Sept. 21

Potterman's

Joint rock is between ST 9 steps, at bottom of 9th step this is at 1158' 4" AT

1158' 4" - 1163' 9" - grey sandy shale of irregular fracture

1163' 9" - 1168' 14" - mostly covered

1168' 14" - 1173' 19" - grey sandy shales

1173' 19" - 1178' 24" - same

1178' 24" - 1183' 29" - These shales from 1168' 14" - 1183' 29" are the ones that carry *H. unguis*, *C. corals*, *L. laura*, *Chyris* and *C. induta*. At 1183' 29"

1183' 29" - 1188' 34" - layers of ss a few inches thick are becoming prominent in the shales. A couple 1183' 29" caused a cascade. These are the beginnings of the ss that form the Old Quarry. Some of the shales at 1188' 34" are of ss with a very irregular surface and are veneered by a shale surface on the parting planes.

1188' 34" - 1193' 39" - sandy sh with an occasional ss layer 2" thick

1193' - 1198' 44" - at the top of this interval the ss have become more prominent, and are beginning to dominate over the shales

1198' 44" - 1203' 49" - same

1330'

Blue Hill
Eastville
sh.

15" 1298' 9" 1300

Red Gate

1300

1268' 114"

U. Thompson

1233'

1200



1330 cont'd

1193

1158' AT

Each square 5'

The rocks in the last two intervals are best described as sandy shale and sandstone alternations. 1203'49" - 1233'79" - sandy shale and sandstones in alternation, but at the top of this interval slabby ss have become established and it is now here that the U. Quarry comes in. The latter comes in at about the top or middle of 1233'79" - 1238'. The U. Quarry stone continues up for about 1238'54" - 1268'114" or for about 32'6" + about 2 1/2' above the 1238'54" - 1268'114" making about 35' thickness for these ss. 1268'114" - 1273'114" - a half of this belongs to the U. Quarry, the other half to the Red Gate horizon.

1273'114" - 1288'129" - Red Gate
1288'129" - 1289'131" - Calcareous - micaceous rock. The lower layers are very calcareous & show the fluted weathering characteristic of a ls. One characteristic fossil obtained here was *D. sculptilis*. This horizon (bottom) occurs at 1298'9".

In blue grey rocks 20' above the ls. were seen:-

R. fruticosa
T. carinatus C
S. channingensis
A. depressata
Pholidops
S. divaricatus
S. granulosa

P. sama
A. reticularis

There are about 34' of blue grey Earlville shales exposed up to the point where the ravine flattens out.

1289' 131" — 1323' 161" blue grey sandy sh. of Earlville horizon. 10' above 1323' 161" there are about 1 1/2' of shales 30' 30" above 1323' 161" there are about 8' of shales exposed up to about 1367' 161". These shales on the west side hill are very sandy. — They contain:

Camarotoechia sp. c

P. marginata

N. corbilliformis

These rocks are only sparsely fossiliferous

Sept 23. 1927

The top of the Pine Woods hard band occurs at exactly 1200' and is seen at the bend of the road just before it starts down hill. At the road passing north just at the brink of the Pine Woods hill the top of the layer is at 1205'. The rock extends down the hill to 1162' A.T. becoming softer down the hill and it is proved here that the Cardiff - Shannateles - line must come in. The shales are sandy - blue-grey.

In the hard layer below 1190' were seen *C. mucronatus*, *D. perplana*, *P. liata*, snails.

In the hard layer at 1200-1205' were seen *P. liata*, *L. obsoleta*, *L. macroptera*, *P. flabellum*, *D. perplana*, large *Nepruticeras*, *Spirifer granulosus*, *Trochoneura*.

Above the hard band, on the north road at 1250' A.T. outcrops were seen in the gutter & on the roadside of soft, earthy, blue grey sh. with *Fox*, *brum.* and large *Triorhynchus* of the Pecksport horizon.

512
Solsville

912

Sept 24. 1927

Collected in hard band north of Solsville. This band runs the hill north and west of Solsville with a discontinuous wall of sandstone or sandy-shale between 150-200' high. The stone breaks readily by the processes of weathering to irregular slabs. The rock is exposed for fully $\frac{3}{4}$ of a mile around the hill. On weathering the stone inside becomes a yellow grey but on the outside is a dirty grey. Often on a flat surface there are pits suggesting solution weathering. The rock stands on the hillsides as very stout pillars all checked to a mass of small fragments. This effect is produced by the breaking off of large joint blocks and then the corners are weathered off. Large flat masses also break off and slide down the steep slope of the hill. This rock is very resistant and forms a conspicuous ridge wherever it occurs. It accounts for a ^{major or less conspicuous} breach on the hillsides from Pine Woods to Solsville.

Concretions are quite common & are rounded calcareous masses containing fossils. Tronchons is abundant also. Other markings unfamiliar to me.

Fossils are mostly brachiopods & Pelecypods. They are not abundant only moderate ss.



Many of the fossils are peculiar to this horizon.

- | | |
|--------------------------|----------------------|
| ✓ M. concentrica r | ✓ C. mucronatus r |
| C. contuens r | ✓ S. granulatus r |
| ✓ N. concinna r | ✓ S. audaculus r |
| ✓ P. flabellum cc | Spirifer sp. |
| Luniptera sp. r | ✓ R. princeps r |
| S. triquetra r | H. dekuje r |
| P. lirata r | ✓ S. perplana r |
| ✓ R. grandis r | S. crotchum r |
| ✓ Calmarotocchia sp. r | ✓ Grammysia armata r |
| Ostroceras (several sp.) | Nephriticeras sp. |
| Lingula sp. | Toxonema sp. |

Sept 24'

Creek 1 mile N.W. Solville

Between 475 steps soft, dark blue grey shales, very faintly gritty. A very small exposure. They are Cardiff 1270'

At 1293' the same shales are seen in a small exposure about 3' vertical in the stream bed.

Between 1310 and 1315 in the stream bank are seen dark blue grey shales that crumble into small thin chips, but not the paper thin flakes characteristic of the Marcellus. These are considerably rusted on their surfaces. The complete fragmentation of the stone prevents

the discovery of fossils. About 10' vertical are shown here on the south side of the gully.

1320' the same

Between 1348 + 1353 same, no fossils - seen

Sept 24³
The top of the hard layer is here at 1434' A.T. It forms a terrace on the side hill. The rock appears at the surface along much of this terrace.

In another Sept 24² small gully not far north of the one previous nearly 30 or 40' of true Condiff can be seen in patches. *L. laura* of large size was seen in the shales there.

N. oblongatus, *N. trigonatus*

Sept 24⁴ at top of hill, bottom of small quarry of Pechesport shale at 1460' A.T. Quarry about 10' vertical shales quite gritty, jointing very irregular

Sept 26

Hard, massive arenaceous rock
 with *J. carinatus*, *C. coronatus*, *P. flabellum*,
Cranella homittoniae, *C. mucronatus*,
Allyrus sp., *A. princeps*, *A. fasciculatus*,
Boothia, *M. concentrica*, *D. arcuata*,
H. dekaaji, *C. congregata*, *A. boydii*,
U. arguta, *A. bulbosata*, *Leipostoma*. The
 horizon I believe, belongs to the
 New Gyn. *S. abnormis*, *C. vicinus*.
 This is at about 1535' A.T. - 1540' A.T.

Sept 26'

Top New Gyn horizon 1560' A.T.

Sept 26²

Top New Gyn horizon -

J. carinatus
P. flabellum
L. macroptera

C. congregata
 Crinoid stems
H. dekaaji
S. perplena

Sept 26.

Remains on the Woods' property

Strata meets across stream at

1350'

1350' - 1395' 45" - limest.

1395' 45" - 1400' 50" - soft dark brown grey shales - no fossils - about 1/2" thick

1400' 50" - 1410' 60" - limest.

1410' 60" - 1415' 00" - soft grey shales at top for 3' breaking in rounded masses. Quite gritty when crunched. Fossils not abundant:

*C. scintillus**L. laura**M. pygmaea**C. setigerus*

1415' 00" - 1420' 20" - same shales

C. scintillus c*M. oblongatus**L. laura* c*M. pygmaea*

1420' 20" - 1425' 25" - same shales

L. laura c*M. oblongatus* n*C. setigerus**C. setigerus* sp.*C. scintillus*

Wood

M. corbuliformis

1425' 25" - 1430' 50" - some small concretions are not uncommon

1430' 50" - 1435' 55" - Orthoceras sp. in rocky lens at the bottom of shales with well preserved into the middle

of the next is more resistant
and more granular.

1435' 85" - 1440' 90" - *Aulopora*, *Meruliformis*,
Orthis, *L. laevigata*, *M. oblongata*,
shale decidedly gritty. *L. laevigata* is not
very abundant here, but *Aulopora*
is rather common.

1440' 90" - 1445' 95" - These seem to
be the commonest fossils with
fragments of *Orthis*. The shale
is quite hard & gritty.

1445' 95" - 1450' 100" - Beginning of first zone

<i>Aulopora</i>	<i>M. oblongata</i>
<i>P. lirata</i>	<i>M. truncata</i>
<i>C. sinuata</i>	<i>Singhla</i> 2 sp.

1450' 100" - 1455' 105"
Aulopora
P. lirata

1455' 105" - 1460' 110" - similar coarse
shale like that of lower zone.

1460' 110" - 1465' 115" - *C. sinuata*,
P. lirata - coarse shales

1465' 115" - 1470' 120" - The shales are
coarse and sandy here and only
have small stony. This slope
however is not favorable to
collecting.

1445' 105" - 1485' 145" - top of falls.

Paracyclas is very common from the bottom of the falls to the top. Fossils are rare in the first 15' of the falls. *P. flabellum* comes in about 20' below the top. *Nucleospira* was found 10' below

The top of the falls is at 1485' 145". *Spongia* comes about 1460'. The hard layer makes quite a flat base

1485' 145" - 1490' 150" - 2' soft gritty shale with 2' lamina of large sized *Sty* from a purple weathering

1490' 150" - 1495' 155" - same as a small patch in middle of step

1495' 155" - 1500' 160" - 10' same

1500' 160" - 1525' 165" - same

1505' 165" - 1510' 170" - *Sty*

1510' 170" - 1515' 175" - *Sty*

1515' 175" - 1530' 190" - between & 1515' 175" + 1520' 180" - the soft shales truly have *P. flabellum* & large winged *S. pennatus*.

145
1485
12
1497

979

919

Fossils seen in lower slab of
hard band:-

P. flabellum
C. pinnatum
S. pinnatum
H. dehayi

D. triquetra
S. pinnata
R. grandis
C. pinnatum
N. concinna

At the head of the ravine at about
1550' a hard band about 1' or 1 1/2"
thick occurs. This has *S. pinnata*
Productella, *N. concinna*, *C. pinnatum*
C. pinnatum, *S. pinnata*. This layer
is probably local.

Sept 26³

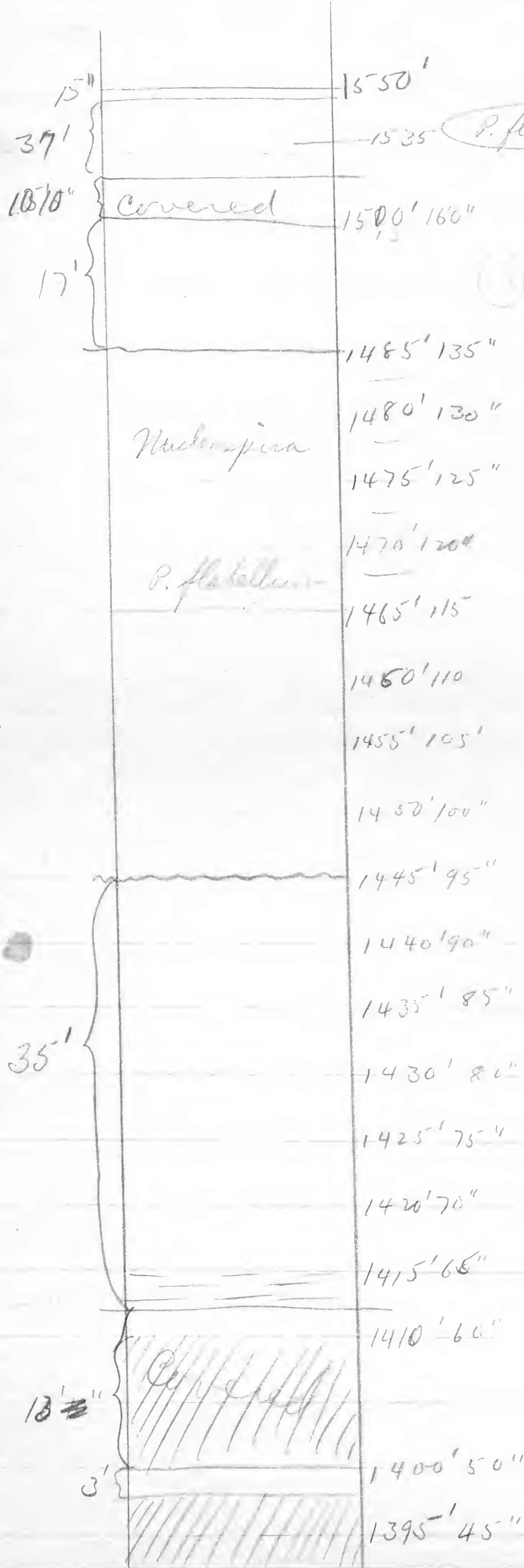
At about 1610-1615' A.T. coarse
shales with a thin sandy
layer. *Spirifer*, *H. dehayi*, *P. flabellum*
Canarotolchius. This is the ^(Mottville) *Butcher*
Orange horizon just below the
coral bed. 250 paces north of the
Woods residence. It is nearer 1610 than
1615' A.T.

Sept. 26⁴

Top of hard band.

Woods Ravine

510
1870
149
114



P. flabellum

1550
1513

1513
1496
17

1485
1496

10
54

180
11
199

510
1875
1496
119

1380
1496

190

40

32'

920

920

1485' 20" - 1490' 25" - The shale is softer and darker in this interval. Here the *A. umbonata* is most abundant and also *P. rana*. Other abundant fossils are small *Schuchertella* and *Cloneta*. This interval yielded also *H. delagei*, *E. punctata*, *Silbertoceras* and other crinoids identified by Mrs. Bellamy.

1490' 25" - 1495' 30" - *A. umbonata*, *P. rana*, *Pholidops*, *D. subulatus*. This interval is particularly the top of it has *C. indenta*, *A. spiriferoides*, *P. oviformis*, *R. humbani*, *A. reticulatus*, *A. dissectus*, *A. umbonata*. This *A. umbonata* was noted also at *D. crux*.

1495' 30" - 1500' 35" - This interval is the same as that below it but the fossils are becoming less abundant toward the top. *A. umbonata* is quite common. However, this fossil seems to be as abundant as it is in the western part of the state.

1500' 35" - 1505' 40" - *A. umbonata*, *C. brachy*, *C. umbonata*, *C. brachy*, *S. punctata*, *P. fimbriata*, *E. squarrosa*, *Pholidops*, *C. cristata*, *P. tubus*, *H. punctata*, *C. umbonata*, *A. reticulatus*, *C. brachy*, *A. umbonata*, *S. punctata*, *P. fimbriata*.

C. tenuistriata, S. pumila, C. coronata
A. spiniferoides, R. variegata
Par. hank., C. variegata, C. unicolor

1505' 40" — 1510' 45" —

Same lithology — S. pumila, S. pumila
S. pumila, R. variegata, Par. hank.,
H. fimbriata, C. unicolor, S. pumila
A. spiniferoides, C. scitulus, S. pumila
C. unicolor, H. oblongata, C. coronata
M. pumila, ~~H. hank.~~, P. hank.
C. hank., P. hank., P. coronata,
H. acris, P. hank., P. hank.,
C. unicolor, H. acris, P. hank., M. hank.
S. pumila, S. pumila.

1510' 45" — 1515' 50" — R. fimbriata,

S. pumila, C. coronata, R. variegata,
P. hank., C. hank., S. pumila
C. unicolor, C. scitulus, S. pumila
S. pumila,

1515' 50" — 1520' 55" — S. pumila, C. coronata

H. delavayi, A. hank.,
P. hank., P. hank., C. coronata,
H. bellistriata, S. pumila, C. coronata
C. coronata, S. pumila, M. hank.
H. oblongata, S. pumila, H. hank.
H. coronata, H. hank., S.
C. tenuistriata, P. coronata, S. pumila,
H. hank., H. hank., A. hank.,
S. pumila.

The shale here is hard and
resistant, forming a step or
a cascade.

C. unicolor seems to have
disappeared at the bottom of this zone.

1520' 55" - 1525' 60" - *C. coronatus*,
B. lida, *H. coronatus*, *H. acies*,
C. booby, *Lophophora* sp. Fossils
are rare in this interval except
in the hard stone at the bottom.

1525' 60" - 1530' 65" - 7 3/4' thin
ends to the bottom of a hard
constant ledge 15" thick. Fossils in
the soft shales for the 7' 5" above
1525' 60" are:

S. penetratus, *M. triquetra*, *B. coronatus*
S. diderum, *S. cherm*, *J. ensis*
S. radiata, *Lophophora* sp., *S. multilata*
C. booby, *C. coronatus*, *C. coronatus* &
Cystodonta, *Lida* sp., *Lophophora* sp.,
P. rana, *S. caninus*, *S. pectus*, *S. contracta*
S. radiata, *S. subulidica* sp., *B. lida*,
H. lida, *C. bellistata*, *C. pectus*,
A. caninus, *S. pectus*, Small
chonetes are by far the most abundant
fossils here.

1530' 65" - 1535' 70" - The hard layer is
about 15" thick and is 2' up in this
interval. It contains:

S. granulosa, *S. pectus*, *S. caninus*,
M. canaliculata, *S. canaliculata*.
It is a hard calcareous sandstone

in the sandy sh. on this hard
layer were seen:

M. corbuliformis, *S. caninus*, *S. pectus*,
C. scitulus, *S. penetratus*, *C. multilata*,
S. capillaris, *C. coronatus*, *H. bellistata*,
B. lida, *M. triquetra*, *Lophophora* sp.,
S. radiata, *M. coronata*, *S. subulidica*

M. multilobes, C. bellistriata, P. tenuis,
Hedichia sp., H. deSazys, H. bellistriata,
L. rotellata, G. carinata

1535'70" - 1540'75" - same - P. carinata

1540'75" - 1545'80" - same

1545'80" - 1550'85" - In rock heavy
and hard - sandy shale with
L. perovskites, P. carinata, C. succrosea,
P. desiciduum, P. tenuis.

1550'85" - 1555'90" - sand calcareous
arenaceous rock meeting the
beds of the shale. This stone for
5' to 10' hard and arenaceous. It has:
R. variegata, P. variegata, P. carinata
after in calcareous lenses, P. perovskites,
L. granulosus. Also in the shale this
bed with the cement rock exposed
in the ravine with the full of 1854.

On the surface of the rock about 11' of blue
gray shale which has L. perovskites,
P. tenuis, H. deSazys, P. carinata,
C. succrosea, P. carinata, P. tenuis,
P. desiciduum, P. carinata, P. tenuis,
L. perovskites, H. deSazys, P. carinata,
P. tenuis.

This horizon has many small
black concretions in it.

1555'90" - 1560'95" - blue gray
sandy shale with
favorably exposed fossils

1330' 95" - 1505" - 100" - Blue grey
 shales with *M. concentrica*, *S. pennatus*, *A. imbricata*
Guthriea sp., *C. hirtellus*, *C. uncinata*
M. pinnata, *M. elongatus*, *A. reticularis*
A. elongata, *M. concentrica*, *Gastrodactylus*
S. capillaria, *S. hirtellus*.

1505' 100" - 1520' 105" - same shale
S. cana, *S. pennatus*, *M. subulata*
M. triquetra, *S. caninatus*. This whole
 horizon looks like a continuation
 of that at 1485' 10".

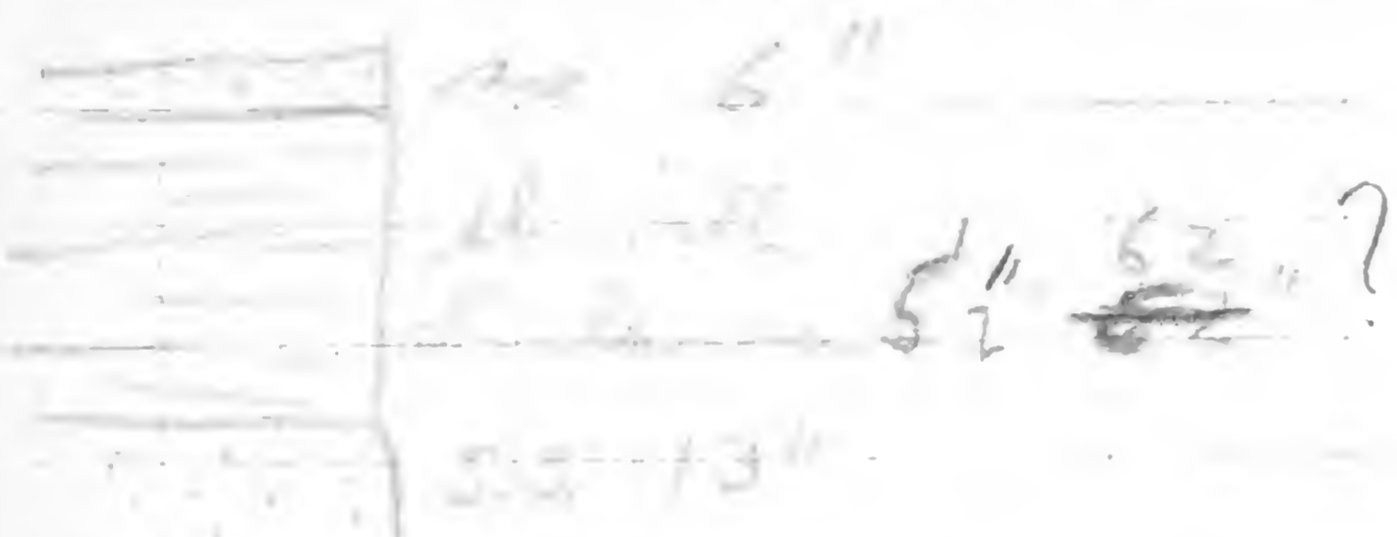
1570' 105" - 1575' 110" - same

1575' 110" - 1580' 115" - Supermassive
S. rotundum, *S. caninatus*, *C. subulata*
S. magna, *P. cana*, *S. pennatus*
C. subulata, *C. imbricata*, *M. concentrica*
C. subulata sp., *P. caninatus*
C. spinifrons.

1580' 115" - 1585' 120" - The horizon
 of this is a piece of layers of one
 One, the lower is 2' thick, the upper
 5" thick. This is a continuation of the
 numbers of *S. pennatus* in both
 layers, at this horizon is about
 3' of dark shales with the following
 fossils: *P. caninatus*, *S. caninatus*,
S. pennatus, *A. lastus*, *C. subulata*,
M. hiata, *A. spinifrons*, *S. hirtellus*,
S. subulata. The shale here
 is dark with a reddish rust, at it
 is exactly like the *S. cana* band
 noted in the ravine with the
 hills at 1600.

The shale is somewhat like the Senessee but appears lower, also appears that the center of the other ravine.

1585' 120" - 1590' 125" - One foot above the top of this last interval comes a 6" ss band terminating temporarily the fossiliferous band with a lister above the 6" of ss.



1590' 125" - 1595' 130" - lister

1595' 130" - 1600' 135" - blue-gray shale with *M. liata*, *S. punctata*, *T. submarginata*.

1600' 135" - 1605' 140" - same as bank - no collecting - lister in thin

1605' 140" - 1610' 145" - lister

1610' 145" - 1615' 150" - lister

1615' 150" - 1620' 155" - "

1620' 155" - 1625' 160" about 2 up in this horizon there is a layer of calcareous - magnesian stuff, and fossils with a few *S. punctata*, *T. submarginata*, *R. submarginata*, *S. punctata*.

O. curvatus. This stone becomes fluted then smooth & looks like the *quartz* or *travertine*. The shale on this is rather sandy & has *D. curvatus*, *Foraminifera*, *Ariculopora*. This probably represents the *Stange* town *Quartz* horizon.

1625' 160" — 1630' 165" — about 2' of coarse arenaceous shales at the bottom of *Stange* horizon. *C. bellistriata*, *Foraminifera*, *Ariculopora* & *Spirifer*, possibly *marginifera*?

1630' 165" — 1635' 170" — a few patches of arenaceous shales but they cannot be collected. A hard bit thin layer 2" of calcareous ss exists in the middle of this interval.

1635' 170" — 1640' 175" — At the very bottom of this interval the shales become soft again. They have in this interval —

Spirifer
Stenodonta
C. bellistriata

Fossils are rare in this interval.

1640' 175" — 1645' 180" — *Spirifer*, *F. lawsoni*, *M. costaliformis*. Connections are not common in the rock here.

C. tenuicostata, *M. obtusata*. The rock here is much better exposed and more difficult to find fossils in it.

1645' 180" - 1650' 185" - at summit of
only, *Arctostaphylos*, *P. decumbens*
J. carinata, *Roch. pumila* by *Myrica* for
collection.

1650' 180" - 1655' 190" - *V. fulva*
S. crataegum, *A. erectum*, *H. bellistriata*
P. unguiculata, on the upper 2' of
this step. *S. laevis* as usual above

1655' 190" - 1660' 195" - summit of
this as a hill but at the top
of the step the following were
seen:

- | | |
|------------------------|----------------------|
| <i>A. reticulata</i> | <i>C. truncata</i> |
| <i>R. variegata</i> | <i>C. complanata</i> |
| <i>C. bellistriata</i> | <i>M. coccinea</i> |
| <i>S. pumila</i> ? c | <i>S. pumila</i> |
| <i>R. pumila</i> | <i>R. variegata</i> |
| <i>R. pumila</i> | <i>V. pumila</i> |
| <i>S. pumila</i> | |

1660' 195" - 1665' 200" + 6"

Height of Tully from road is
1665' + 17' = 1682' A.T. for bottom
of Tully.

C. pumila in the last interval are:
S. pumila, *S. tallina*, *S. pumila*
H. hirta, *H. bellistriata*, *R. pumila*
at very unfavorable for collecting
from a layer of Tully there is
granulata, *C. bellistriata*

Hint: - Quarry at Georgetown -
Lebanon line probably represents
the rocks above the sandy layers with
abundant *J. carinata*, those seen
above first rocks at Ravine with Tully at 1845

October 1.

Ravine west of Blair's, along the road.

Hand levelling begun at 1400'

1400' - 1480' 80" - hiatus. If there were any *Tedmon* here it should have come at about 1455' A.T. The first rock in this ravine comes at 1480' 80"

1480' 80" - 1485' 85" - The rock in this interval is a soft, bluish grey, shaly, waxy brown on the surface and breaks into irregular lumps. Fossils are:-

<i>C. acutulus</i> c	<i>M. conchuliformis</i>
<i>A. acuta</i>	<i>P. rana</i>
<i>C. mucronatus</i> c	<i>C. tenuinotus</i>

Plus appears to me to be a part of either one of the *Antrochelia* zones or one of the *P. rana* zones.

1485' 85" - 1495' 85" - same.

1495' 85" - 1500' 100" - *P. rana*, *T. acutus*, *S. pinnatus*, *C. mucronatus*, *C. acutus*, *P. tenuis*, *P. angustata*, *C. bellistriata*, *S. pinnatus*, *P. rana*, *M. bellistriata*, *Par. harringtoni*

1500' 100" - 1505' 105" - *C. bellistriata*, *P. rana*, *S. pinnatus*, *M. acuta*, *T. acutus*, *A. acuta*, *M. conchuliformis*, *P. radiata*, *S. pinnatus*, *H. calis*, *G. capillaria*

1505' 105" - 1515' 115" - same rock
At about 1515' 115" the ravine forks. At this fork the following were seen:- *P. conchuliformis*, *Par. harringtoni*, *S. pinnatus*, *S. granulatus*, *A. pinnatus*, *M. concentrica*, *P. rana*, *T. acutus*

1515' 115" — 1520' 120" — ~~same~~

1520' 120" — 1525' 125" — *A. umbonata*

1525' 125" — 1530' 130" — *R. vanuxemi*
M. concentrica, *J. carinata*,

1530' 130" — 1535' 135" — *similar sh.*

1535' 135" — 1540' 140" — *C. tenuistriata*. Rock
 in general less fossiliferous

1540' 140" — 1545' 145" — This interval is
 capped with a calcareous-sarcaceous
 shale band with *R. vanuxemi* + *J. carinata*

1545' 145" — 1545' 145" — a harder more
 arenaceous shale forming a escarpment
 Above this the valley flattens very
 perceptibly. This ravine was very
 hastily examined as the small exposures
 in it did not warrant careful
 examination. I did see, however, enough
 to convince me that the ~~lower part~~
 of this ravine is similar to the lower
 part of the ravine at Georgetown.

Oct. 1st

Exposure below dam on Morgan's property on Stone Mill Brook.

The exposure just below the dam consists of coarse ss. that are very hard and apparently form a flat which probably flooded the pond which has now disappeared. The rocks in this exposure for the most part are arenaceous shales of a blue grey color:-

Fossils:

P. flabellum
N. concentrica
G. tenuistriata
Roniphora sp.
P. tenuis
O. undulata
N. traqueter

J. cuneatus
Pal. unmarginata
S. pennatus
N. oblongatus
C. coronatus
S. channingensis
Pal. constructa
P. sectifrons

In the stone under the dam, which is a coarse and rather massive sandy stone *S. pennatus*, *C. coronatus*, *J. cuneatus*, *P. flabellum*, *P. erectus* are rather common.

This exposure I believe is quite definitely Ludlowville 16' of rock are exposed

Oct 1st

About 1420' A.T. ss. with *S. pennatus*, *J. cuneatus*. Undoubtedly the same as at top of dam at Oct. 1st

Beneath these are rather soft blue grey shales with

G. scutulus cc
J. submarginata
N. ligo
Roughla sp.
Uncoolata

O. undulata
N. oblongatus
J. cuneatus
N. livata
S. pennatus

The upper ss. at about 1400' have the same faunal assemblage as the rocks at the dam at Oct. 1'.

M. concinna c
R. flabellum re
C. coronatus re
H. dekeyi

S. pinnatus c
S. carinatus cc
C. scitulus
A. princeps
S. pinnatus

The soft blue grey shales occur about 70' below the upper ss. or at about 1400'.

Additional fossils in the lower soft shales are -

A. erectum
V. constricta
M. bellistrata
B. crenistria
O. carinata

M. pygmaea
O. parvula
P. hammondi sp.
P. nodocostata

This horizon has every appearance of the one that rests on the *Pholidostrophia* bed at Creeville.

There are exposed down to 153 paces from the junction of this gully with Stone Mill Brook.

Oct. 1st

Ranve up the village of Lebanon
 Hand-levelling begun at 1355' A.T.

1355' — 1425' 70" — liates

1425' 70" — 1440' 85" — about 15' of sandstone
 and sandy shales. The following fossils
 were found here:—

✓ <i>S. carinatus</i> <i>ca</i>		<i>A. princeps</i>
✓ <i>S. pennatus</i>	<i>G. bivalvata</i>	<i>M. concolorata</i>
✓ <i>S. granulatus</i>		<i>C. boottii</i>
✓ <i>P. plicatus</i> sp.		<i>T. exigua</i>
✓ <i>P. flabellum</i>		✓ <i>Cyrt. Hamiltonianus</i>
<i>H. dorella</i>		<i>A. erectum</i>

This list from about 1425'

Fossils at about 1440' 85" are:—

✓ <i>S. granulatus</i>	✓ <i>S. pennatus</i>
<i>M. mytiloides</i>	✓ <i>S. perplana</i>
<i>P. muta</i>	✓ <i>R. Vancouveri</i>

The middle and lower part of the
 exposure are sandy shales and ss.; the
 upper part is calcareous arenaceous, and
 fossils are hard to collect.

A large slab of ls. composed almost
 completely of shells is somewhat like
 the ls (Tulahoma) seen at Fabius.

about the stratum:—

1425' 70" — 1435' 80" — calcareous sandstone
 and ss. The calcareous stone at
 about 1435' 80" —

Here were seen:—

<i>T. carinatus</i>	<i>S. bivalvata</i>
<i>S. pennatus</i>	<i>P. dorella</i>

1435' 80" — 1440' 85" — The lower 3' of this interval are ls., shales & calcareous sh. lenses of ls. with abundant fossils occur occasionally. The upper layers are hard calcareous sh. The one ls. lens seen could not be collected. It contained a rug coral.

P. emarginata was seen here.

S. pinnatus *T. carinatus*

1440' 85" — 1445' 90" —

On these calcareous shales & ls. softer phos. of a blue grey color. These have *T. carinatus*, *S. pinnatus* and *C. scitulus*.

1445' 90" — 1450' 95" — 2 patches (small) of these shales which could not be collected

1450' 95" — 1455' 100" — *linatus*

1455' 100" — 1460' 105" — blue grey shales

H. acunata, *C. scitulus*

H. biata

C. vicina

E. pinnatus sp.

A. umbonata

C. bellustrata

M. mytiloides

H. capillaria

H. corbuliformis

1460' 105" — 1465' 110" — same sh.

A. umbonata

H. capillaria

C. coronatus

T. carinatus

Lyostechya

1465' 110" — 1470' 115" — *Stonites* is very abundant about 1' below the top of this interval

1470' 105" — 1475' 120" — same shale a very thin band of sandstone come in here about 1' below the top.

1475' 120" — 1480' 125" — Bully ends 4 steps above 1475' 125" or at 15 1/2' A.T. It still ascends but is very gentle.

I believe that all of these shales belong to the Moscow and also about 5' of the calcareous sandy shales that rest on the sandstones with *P. flabellum* and abundant *J. carinata*. It seems to me that the Moscow comes in with the calcareous sandy shales & w. with the coal. Of these there are about 5 or 6'. The Moscow-Hallowville line comes at about 1437' A.T. or there about.

Fossils noted between 1480' 125" & 15 1/2'

<i>A. serratus</i>	<i>S. pectinata</i> sp.
<i>C. bicincta</i>	<i>P. radiata</i>
<i>C. bellistriata</i>	<i>P. ovata</i>
<i>A. umbonata</i>	<i>C. imbricata</i>
<i>C. coronata</i>	<i>N. coralliformis</i>

Some fossils found in the calcareous stone that would refer to the lower Moscow —

<i>A. emarginata</i>	<i>A. princeps</i>
<i>A. declivata</i>	<i>A. strobilifera</i>
<i>J. carinata</i>	<i>C. cyclops</i>
<i>J. granulosa</i>	<i>C. boethi</i>
<i>A. serratus</i>	
<i>C. bellistriata</i>	
<i>N. coronata</i>	

~~Sept~~
Oct. 4.

Day

1st step above sandy-calcareous.
Tachypteris - rock abruptly becomes a soft
bluish shale in which Spermaturia,
is abundant. Also small Chonetes.
Characteristic forms are Leptotaria,
B. lida, S. potatilis, S. biconcata - these
all were seen at ^{Derry} ~~folly~~. Indeed
this step is identical to that at ~~Folly~~
Derry.

1st - 2nd - practically all covered
only two patches of shale which were
not here. These could not be collected.

2nd - 3rd step - small Chonetes and Spermaturia
seen. No other Chonetes shale soft.

3rd - 4th - A. biconcata, Spermaturia
sp. found here do not seem abundant
enough for collecting. B. lida
Spermaturia

4 - 5 - Chonetes abundant. shale
lucy with its shells.

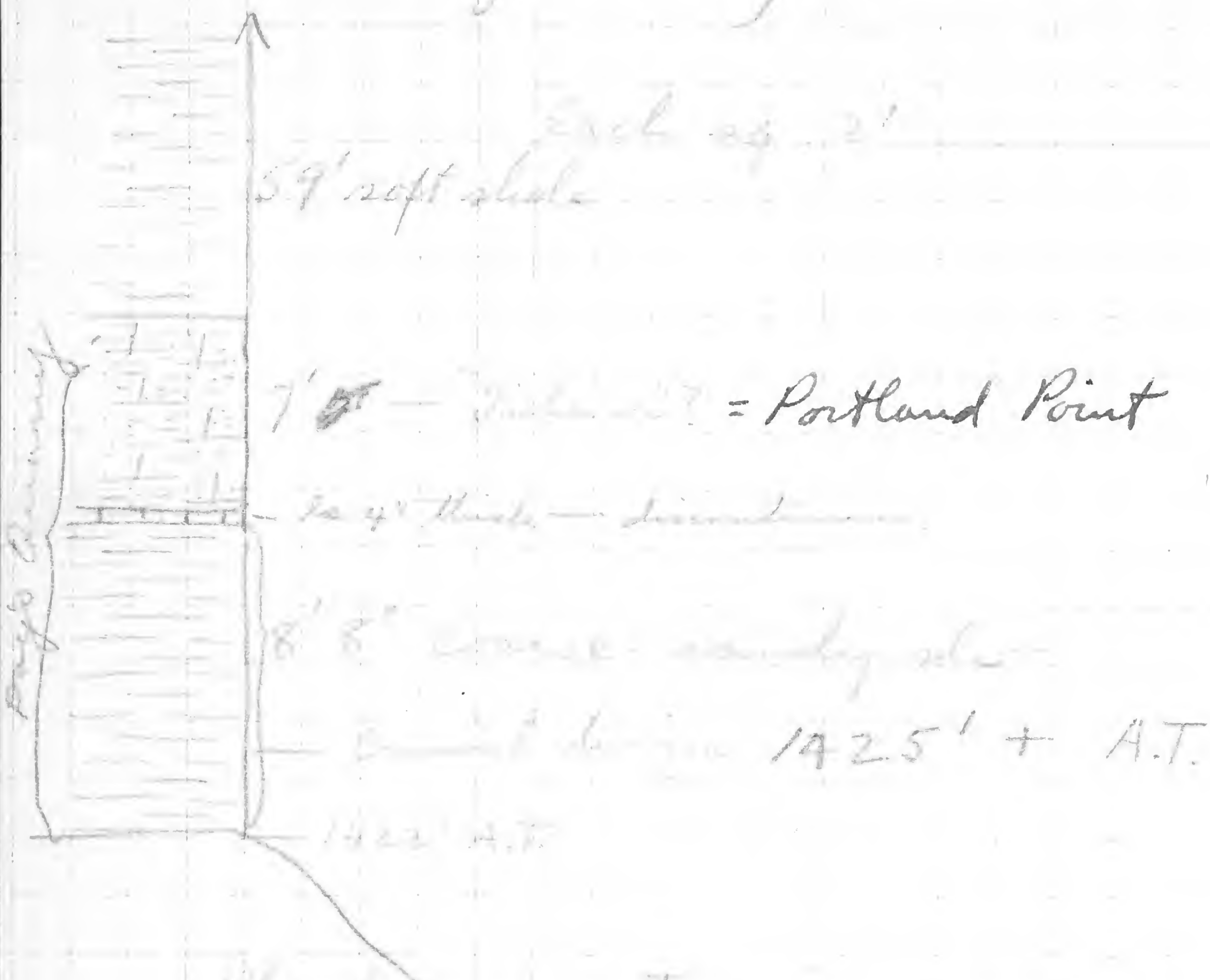
5 - 6 - Similar - P. lanceolata

6 - 7 - unfavorable to collecting

7 - 8 - J. biconcata, M. pygmaea
M. elongata, S. Chonetes
abundant.

These shales go up to 11 steps.
C. induta was found at 10.
Where P. lanceolata was found
must be the bottom of Moore's
Barrow. A. spiniferoides first
seen at 10.

Days Quarry Lebanon



The lower stone is a coarse sandy sh-blue gray in color - fossils are common in layers. Most abundant is *T. carinata*. *P. flabellum* is common. The layers bearing fossils are usually thin and sometimes calcareous. The fossils are often in thin sh masses. The sand here is not a ss.

Above these coarse shales there are 7 1/2' of heavy sandy shales in striking contrast to the rock below. This rock is tough and very hard, breaking with difficulty into irregular lumps. The shale below is brittle & splits readily into flat slabs. *Rhipidomella* is rare in the shale below but common in the upper stone. The shell ls. at the base of the upper stone may be the Trilobite but it appears to me to be discontinuous.

A short distance upstream there is another exposure which shows 6 1/2' of this shell ls. It is therefore probably a continuous layer.

This exposure is also in the bank of the stream. In another place the layer in this exposure the layer is 8" thick. Probably it is about 9 or 10" in thickness, but is not exposed here in its entirety.

This ls. is not exposed in the stream bed.

Quarry outside of Lebanon is the beach quarry.

7 steps from last exposed rock in gully to debelling of E. C. Day's tower.

Oct. 5

Blair's Ravine

Hand-belling begun at 1400' A.T.

1400' - 1435' 35" - Limestones

1435' 35" - 1440' 40" - at the very bottom of this step - bluish gray sandy shales with *T. carinatus*, *B. cuneata*, *P. lanceolata*, *S. piperis* of *trilobis*, *S. andruschus*, *P. flabellum*. I believe that this shale belongs to the upper part of the Ludlowville - about 1' is exposed at the very bottom of this interval. In the bed of the *O. stream* in this interval a slab of blue ls. was seen just like that at Howard's quarry at Lebanon. The name of the Lebanon quarry as Howard's is not known for long only shows the upper part of the gully. 2 feet of blue gray shale with *trilobis*, *T. carinatus* on top.

1445' 40" - 1445' 45" - The stone on this is a tough calcareous - arenaceous shale with *C. bellinotensis*, *T. carinatus*, *S. gemmatus*, *S. piperis*, *R. Vanuxemi*, *C. viridula* here.

Character of contact with the shales here is *S. piperis* and *trilobis*, but the shale in the last foot of 1445' 40" carries a shell especially like *V. punctulosa* and may really be. There is a contrast in the weathering of the two rocks, the calcareous arenaceous kind above being much more resistant. About a foot above the contact of the two kinds of rock, was found a layer that has considerable shell. This horizon must represent that at Howard's quarry in Lebanon, but the ls. at the base, here cannot be identified. It must be limestone.

Each square \$5



2.5
4.3

Stone is exposed here for only about 3' the ls. in the collection is from about the middle of the 3'.

1445' 45" — 1450' 50" — hiatus.

1450' 50" — 1455' 55" — hiatus

1455' 55" — 1460' 60" — hiatus

1460' 60" — 1465' 65" — a small patch of soft bluish sh.

1465' 65" — 1470' 70" — bluish grey sh., soft, rusted.

Fauna:—

<i>Lox. lam.</i>	<i>S. cf. arcuata</i>
<i>S. copellana</i>	<i>Cyrtolites</i> sp.
<i>C. coronatus</i>	<i>B. leda</i>
<i>R. vanuxemi</i>	<i>S. arctostriatus</i>
<i>S. pennatus</i>	<i>H. corbuliformis</i>
<i>C. scitulus</i> s	<i>P. radiata</i>
<i>M. pygmaea</i>	<i>P. rana</i>
<i>C. tenuistriata</i>	<i>C. mucronatus</i>
<i>A. umbonata</i> c (at top of interval)	
<i>Lingula</i> sp.	

C. mucronatus must outweigh *Ambococha* in abundance.

1470' 70" — 1475' 75" — same sh.

S. pennatus c, *A. umbonata*, *C. coronatus*,
C. scitulus, *P. constricta*, *C. mucronatus*,
Lox. lam., *H. triquetra*, *P. radiata*,
P. distans, *C. tenuistriata*, *C. bothei*
Chonetes *ambococha* *Ambococha*.

1475' 75" - 1480' 80" - Same - poorly exposed

1480' 80" - 1485' 85" - limited, in stream - boulders not collectable. A small ledge in the stream yielded: - ~~S. pennatus, C. muricatus, C. submarginata~~ P. plang, C. umbonata, Pal. constricta, C. scitulus, P. radiata, S. perversa

1485' 85" - 1490' 90" - limited

1490' 90" - 1495' 95" - C. scitulus, S. pennatus, C. umbonata

1495' 95" - 1500' 100" - C. umbonata, S. pennatus, C. scitulus, C. setigenus, J. submarginata

1500' 100" - 1505' 105" - Somewhat harder sh. -
Pau. hanae
C. bellictrata C
S. perversa
P. tenuis
P. radiata
Pholidops
Ostracod sp.

1505' 105" - 1510' 110" -

C. bellictrata
N. bellictrata
S. perversa
J. pennatus
C. muricatus
N. lamellata
Pau. hanae
J. carinatus C
C. umbonata re
P. tenuis
P. constricta
Arviculopsis sp
Arviculoides sp.
P. radiata
S. perversa

N. triata
A. spiniferoides
N. concentrica
S. granuloseus
C. indenta
R. vanuxemi
P. rava

Shales here are hard & somewhat shaly forming a coarse

1510' 110" - 1515' 115" - liatus

1515' 115" - 1520' 120" - Ambocoelia still present - shale not favorably located to collect.

1520' 120" - 1525' 125" - liatus

1525' 125" - 1530' 130" - *M. convexa*, *P. ambonata*, *C. mucronatus*, *R. carinata* - *Pholidops*, *R. fibrinata*

1530' 130" - 1535' 135" - *E. punctata*, *Plithonia* sp., *S. punctata*, *P. rana*, *C. tenuistriata*, *Productella* sp., *C. boottii*

1535' 135" - 1540' 140" - *P. punctata*, *Cyrt. lam.*, *S. granulatus*, *S. punctatus*, *C. tenuistriata*, *Productella*, *R. fibrinata*, *C. bellistriata*, *M. pygmaea*, *P. patulus*, *P. rana*, *P. tenuis*, *R. lamosus*, *A. ambonata*

1540' 140" - 1545' 145" - same

1545' 145" - 1550' 150" - *M. mytiloides*, *B. leba*, *R. emarginata*, *J. curvatus*, *Cyrt. lam.*, *R. fibrinata*, *S. punctatus*, *C. bellistriata*, *C. tenuistriata*

Only about 1' exposed - hard sh.

1550' 150" - 1555' 155" - liatus except for 2' at the top - which have *S. punctatus* - very unfavorable for collecting.

1555' 155" - 1560' 160" - liatus

1560' 160" - 1565' 165" - These zones at the bottom of this interval a cascade about 10' high. *P. bilobata*, *J. carinata*, *P. emarginata*, *S. pennata*, *H. bilobata*

1565' 165" - 1570' 170" - hard rock with *C. bilobata*, *H. carinata*, *M. concentrica*, *J. carinata*, *S. pennata*, *P. emarginata*, *S. granulosa*. This rock is very hard & many concretions with the hard layer above the Ambrosia zone of Moore's ravine.

1570' 170" - 1575' 175" - On the bank of the ravine which is 1' above the bottom of this step *S. papposa* is common in the sandy shales. Above this layer with *S. papposa* are sandy shales with *E. imbricaria*, *S. pennata*, *J. carinata*, *C. sumnerensis*, *S. angulata*, *Productella* sp. At the top of this step the ravine comes out into the open.

1575' 175" - 1580' 180" - sandy stone forming the very top of the ravine in the open - about 2' of stone

S. granulosa

P. bilobata

J. carinata

The very top stone is hard, 6-7" thick, tough and with an irregular fracture.

1580' 180" - 1640' 240" - hiatus

1640' 240" - 1645' 245" - rock composed of very coarse sand shale with

some rather coarse ss. Fossils are rare: *S. gemmatus*, *S. granulatus*.

1645' 2454" - 1653' 250" - liates

1650' 2450" - 1655' 255" - Coarse sandy rocks, which must belong somewhere near the Georgetown sandy horizon.

1655' 255" - 1660' 260" - same for three feet but with *S. gemmatus*, *S. spiniferoides*, *S. carinatus*, *S. tellus*, *H. dekeye*, *Pholidops*, *P. emarginata*. At the top are about 2' of soft gritty ss. but I found no fossils.

1660' 260" - 1665' 265" - liates

1665' 265" - 1670' 270" - liates

1670' 270" - 1675' 275" - grey weathered sandy shales with: *S. pustulosa*, *S. tellus*, *S. carinatus*, *R. fimbriata*, *P. rana*, *M. concentrica*, *J. exigua*, *R. vancouverensis*, *Strophodontia* sp. These are mostly from base of the interval. *L. laura* occurs in the middle of the interval.

1675' 275" - 1680' 280" - *S. carinatus*, *S. tellus*, *P. emarginata*, *R. fimbriata*, *R. vancouverensis*, *S. gemmatus*, *S. inaequistriata*.

1680' 280" - 1685' 285" - to bottom of Dully. Here Dully is at 1709' - Moscow = About 20' of Dully are exposed. It is very shaley. 6 steps above the Dully and all exposure of grey thin bedded ss. which is the *Chuburne*.

The Senessee appears to be quite thin. Only a small patch of Senessee is exposed in place, at about 1750' A.T. Shales from the flat, but I don't believe that they are the typical Senessee shales I & appears to me that the Senessee is only 30' thick here.

I believe that I am about 10' too high on the Tully location. The upper part of the Blair ravine according to Mr. Blair is the Ballard ravine.

If one works down from the head of the ravine, the bottom of the Tully must be at 1785' A.T. as there is 20' of Tully, and 32' up to the bottom of the first ss and 14' of ss & shales making about 66'

The Tully is very shaly, but the calcareous shales rather much like

The only observed Senessee in place was 8' above the Tully.

The Senessee consists of ss & shales forming the flat top of the valley on the hilltop.

I believe about 5' of Tully are missing at the bottom. Beds are very shaly. I saw few fossils, small corals.

L. lamar is about 15' below the Tully
V. punctata about 10'.

14 steps below the Tully are shales with *L. lamar*, *A. spiriferoides*. About 5' vertical. 15 steps below there is a ss ledge about 1' thick. Such a layer was noted between shales with *L. lamar* at Blosser and the other Georgetown ravine.

F. lanna was also seen in a few inches of shales below this layer.

Set about 16 steps below the Gully a 6" layer of calcareous-arenaceous rock has *F. lanna*: *S. punctatus*, with other fossils.

21 steps were covered from bottom of Gully to 1580 - 180" - This would mean that the bottom of the Gully is at 1685. This is in accord with the measurement down from the top of the Gully adding 285" - gives 1709 - to bottom of Gully.

The gully from the top, actually swings west to run down into stream.

Down to 1465 25' steps are 42 steps =
1675' 275" = 1698' from bottom of Gully
to top

Oct. 5 - a joint face exposure 30 yds long by 15' high of slabby, sandy rock - apparently an old quarry - to about the quarry are coarse sandy shales.

Oct. 5

Revisited

Coarse sandstones revealed along
a large joint face. Fossils were
preserved in ~~the~~ ~~lenses~~ ~~in~~ which
are a shell ls. Fossils present are
Camantochia sp. n. *Dendroites* sp.
Spirifer sp. bc *C. coronatus*
P. flabellum n.
S. granulosa

There are about 20' of the ss exposed
the ss is not particularly shaly as
in the W. part but breaks in
laminar clumps.

10' above the top of the ss about 5'
of hiatus with ~~the~~ ~~ss~~ ~~in~~ ~~the~~ ~~area~~
of shaly shales of irregular fracture
with the fall being of fossils -
S. serratus c. *H. rogersii*
S. coronatus c. *C. coronatus*
M. concentrica *A. eximius*
S. cf. andalus *Cyclonema*
S. perfluvium

The lowest stone in the 5' of shaly
shales exposed was a ss and the
contained the *H. rogersii*
The ss appears to me to
belong to the ss along the West
entry of Georgetown. Had and
in the D. Brown printed Oct. 9.
The rock is exposed 27' above the
level of the road.

Oct 6

Small exposures in road, gray sandstone
shales, etc. with fragments of crinoids
& other fossils. P. Mabile -
M. subulimaria

Randalsville Gorge

At road along the gorge we found the
sandstone shales of the U. Quarry group.
The layer of sandstone was about
1220' A.T.

Just below the sandstone the shale was
about 4' thick.

Crinoidal stone at 1288' A.T. ~~1175~~

at ~~1157~~ we saw the top of the
crinoidal stone bedded so. It is said to
be U. Quarry. Apparently the Red State
horizon is not exposed. By topography
the Red State is located at 1270' A.T.

The top of the U. Quarry are 27' below
the crinoidal stone at 1244' A.T. The
Red State stone does not appear. This
probably shale is not exposed. The very
top of the U. Quarry is about the same
level as the top of the sandstone.

The shale is thin, fine grained. Below
are thin sandy beds of ss. and
some shale. We doubt representing
the beginning of sandstone of
the valley.

287' above sandstone stream bed are
sandy shales, weathering yellowish
brown. Exposed c.c.
12' above sandstone, about 10' off

way between this & the 287 place was
a 9" layer of ss.

Fossils there are -

S. pennatus cc

C. brevis

Stromyria sp.

C. uncinatus

P. flabellum

C. indenta

600 paces from the dam as a dump
apparently where fossils were obtained
from the lower walls along the ravine
On the slope in the dump *S. laurans*
abundant, *C. indenta* less present. This
slope must be below the *S. laurans*
quartzite, a large *Spinifer* - see thesis.
Tectonically the walls are like the
stone (see) in the dump. *J. carinatus*
N. corbuliformis.

825 paces to first ravine - hand leveling at
1220' A.T.

1270' - 1265' 45" - hiatus

1220' 00" - 1265' 45" - thinly laminated ss of the
Quarry for about 1' at top of the interval

1265' 45" - 1270' 50" - same.

1270' 50" - 1285' 85" - same in patches,

layers thicker toward top. At top of
interval there is a flat in the stream
supporting the *Crinoid* (see note 2)
which is outside

1285' 85" - 1315' 95" - hiatus

1315' 95" - 1330' 00" - shales of Carlville
blue grey shales.

1330' 00" - 1330' 110" - shales becoming sandy
with some ss in the stream bed.

On side slope at 1365' 145" - same as

First Basin



coarse slabby ss. with *Camarotoechia* sp.

These are rhyolite-marked in places

Between 1395' 145" and 1410' 190" occur 3' of shales which are arenaceous. On the slopes of the gully there are innumerable ss. slabs.

At 1415' 195" - comes about 5' of ss with shales & ls. the latter made up completely of shells of

S. tallas ?

Camarotoechia

S. granulosa

T. carinata

C. coronatus

H. deKayi

Leopteria sp.

Strophodontia sp.

This material is in the form of lenses. There is also considerable black shale that breaks into flat flakes between the ss. The whole exposure is about 5-6' high.

Some of the shell ls. are 1/2" thick & contain some masses of black shale.

The first ss. mass is about 25' above the blue grey shales (Carville).

In the adjacent gully there are ss that have on them black shales probably of the Carville horizon. The top of these ss. is at 1376' They may be the Red Gate ss.

Exposure below dam at

Kinghy Brook Reservoir:-

1' of coarse ss with:-

A. cellulosus

Camarotoechia sp.

A. erectum

P. flabellum

T. carinata

C. coronatus &

H. deKayi

At the bottom of the layer the ss are ripple-marked. There are ls or calcareous lenses with many individuals of *Graptolites*, *Hemolobos*, *Spirifer*. Fossils are nowhere very abundant. These layers must represent the U. Quarry.

There are 35' of sandstones exposed here. The top 3' are of sandy shale and have *Camarotoechia* sp., *P. flabellum*, *Aviculopecten*.

Oct 12

shales along creek at west end of reservoir. Blue grey & very suggestive of the Earlville shales.

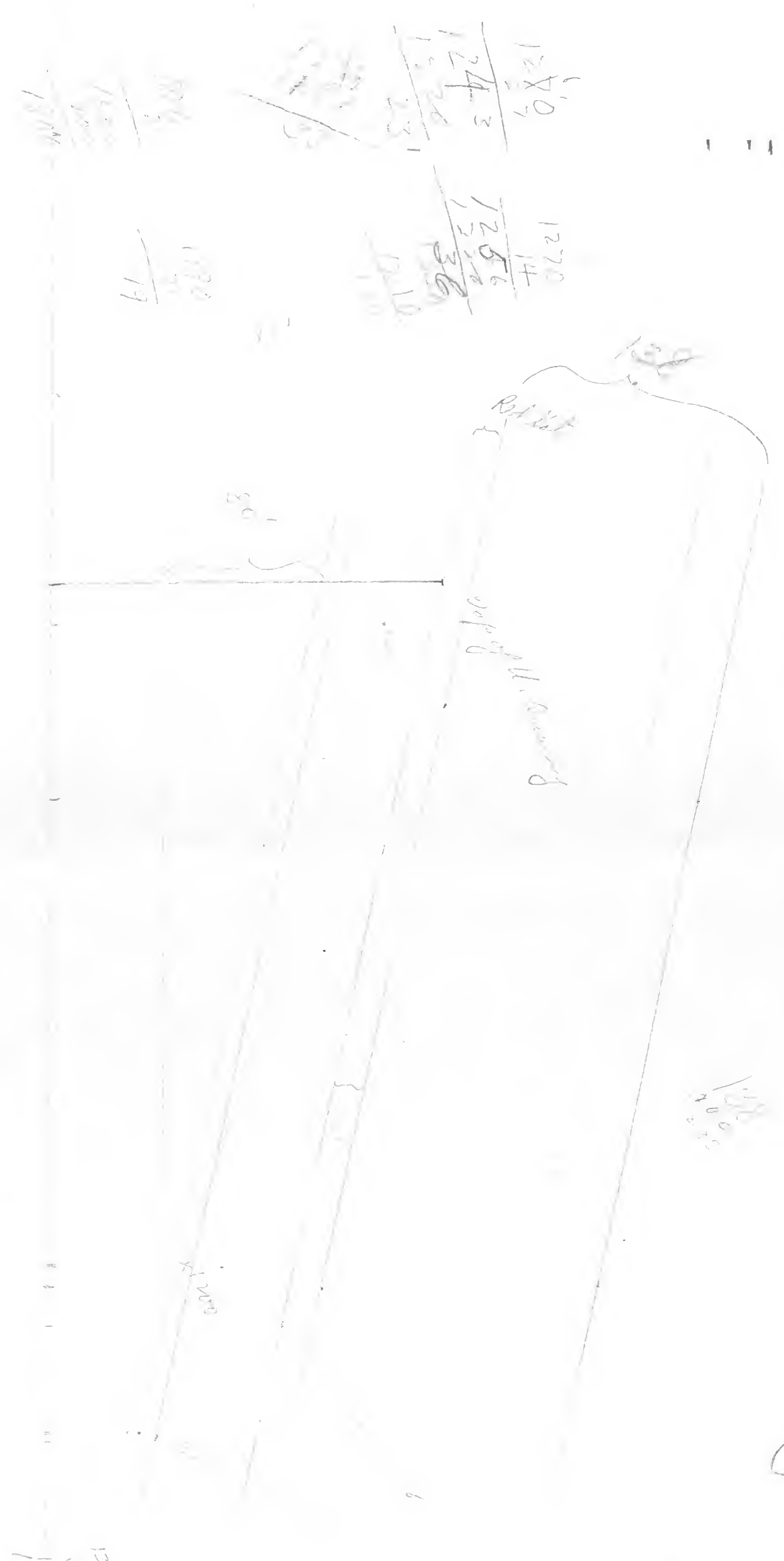
I could not place the ss under the dam. The ~~to~~ top of them must be at about 12³⁰' A.T. and the Red Gate sequence must occur here but be unexposed.

It strikes me as peculiar that 15' or so of hard rocks like those of the Red Gate should not be exposed. The ss in the second ravine (one nearest the Reservoir) may belong to the Red Gate horizon as not more than 5' intervened between them and the blue-grey shales.

The ss below the dam appear to differ from the U. Quarry stones in not abounding in *S. pennatus*, of which we found none, but our collecting was of short duration. The large *Actinodermas*, however were like those of the U. Quarry.

An *S. demissa* was found in the stream debris in the first gully, suggesting that this occurs higher up.

Rowlandville Topog



Ground Rivier E of Strands

$$\frac{265}{45.5}$$

$$\frac{65}{314} = \frac{2210}{2210}$$

$$\frac{37}{308} = \frac{262}{262}$$

$$\frac{65}{138} = \frac{157.5}{157.5}$$

$$\frac{370}{1385} = \frac{1844}{1844}$$

$$\frac{1134}{1341}$$

$$\frac{446}{735}$$

$$\frac{145}{1427}$$

$$\frac{145}{1361}$$

$$\frac{85}{115}$$

$$\frac{1217}{1217}$$

$$\frac{184}{184}$$

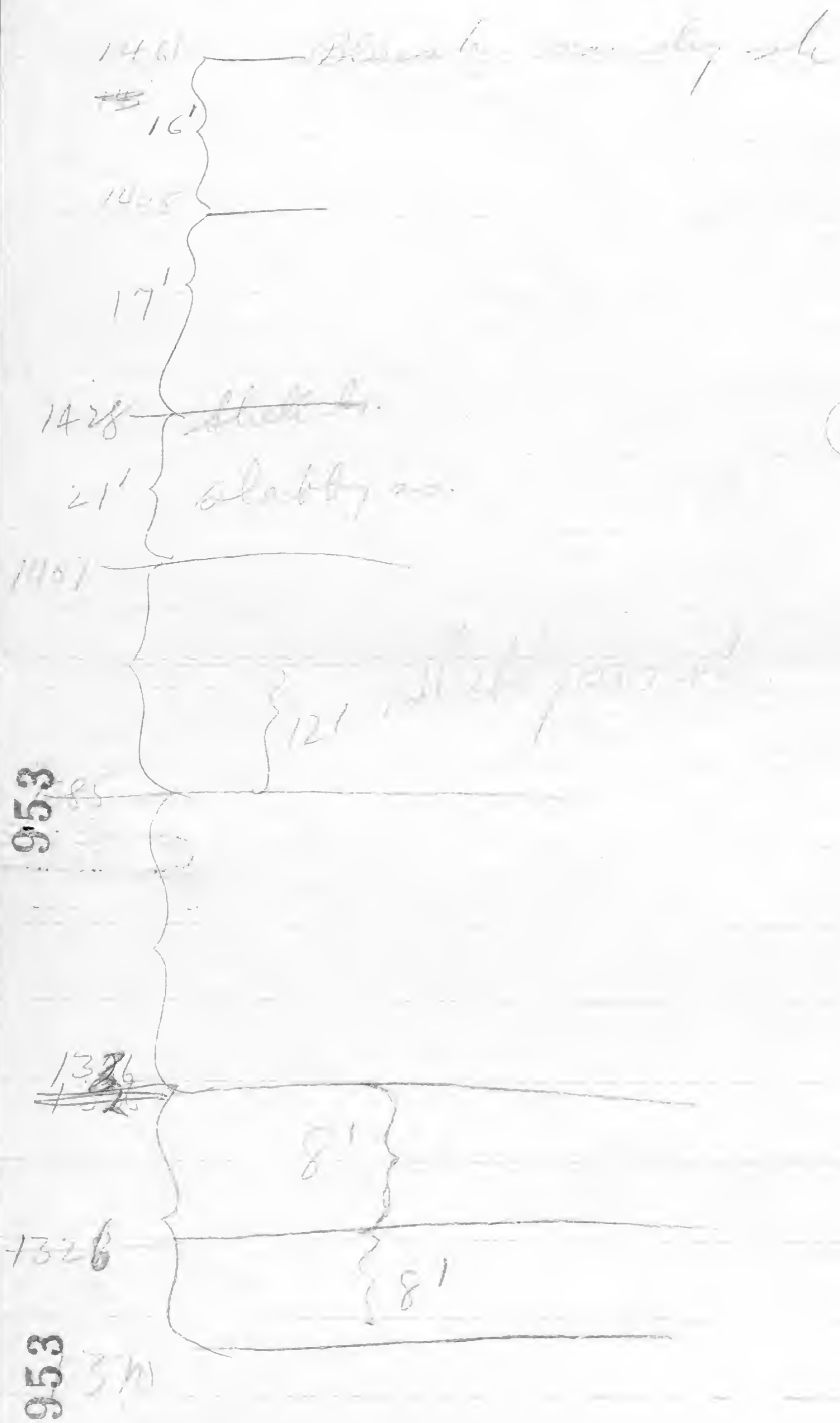
$$\frac{120}{120}$$

$$\frac{1136}{1136}$$

$$\frac{1487}{579}$$

$$\frac{113}{113}$$

West Ruine



39

140
137

1411
1320
1325
1311
248

Ravine east of ~~Day~~
Stoups

Oct. 7.

Hand-levelling begun at 1310' AT. at RR.

1310' - 1355' 45" - liat.

1355' 45" - 1360' 00" - liatus for 2' Upper E
is a rather calcareous - arenaceous ss
with *S. carinatus* a, *S. perplanis*, *S. pumilus*,
C. scutulus, *A. erectus*, *C. concavatus*.
Most of the stone is a coarse arenaceous
shale, *Bozophora* shells large but
especially like *S. demissa* but is
probably a more coarsely ribbed
S. perplanis. At the bottom are slabs of
S. perplanis like those seen below.
Below the Kingly section was also
seen.

1360' 00" - 1375' 65" - liatus

1375' 65" - 1380' 70" - 2' of coarse arenaceous
shales with *S. carinatus*, *S. pumilus*,
Bozophora sp., *A. erectus*, *C. scutulus*.

1380' 70" - 1385' 75" - *S. carinatus*
M. concavatus, *M. truncatus*, *C. concavatus*,
C. tenuistriata, *S. dudleyi*, *P. patulus*,
A. princeps, *A. erectus*, *Bozophora* sp.
The rock is a coarse ss, blue gray
in color.

1385' 75" - 1390' 80" - } sandy shales
1390' 80" - 1395' 85" - } 12' vertical
soft fossils - *S. carinatus* a,
A. princeps, *S. carinatus*, *S. pumilus*,
S. perplanis, *Bozophora* sp.
C. bellistriata, *B. crinita*, *P. oviformis*

Probably top of foot
Port. Pt.

1425' 115" — 1430' 120" — *I. caninata*,
P. radiata, *M. pyramida*, *C. subornata*,
H. bellistriata, *A. decussata*,
The rocks in this interval are hard
and sandy and are responsible for
a considerable flat in the ravine.
The uppermost foot of this rock
is of hard splintery arenaceous rock
like that seen in the upper part of
the Grand Quarry at Lebanon.

1430' 120" — 1440' 130" — hiatus

1440' 130" — 1445' 135" — in the middle
of this interval there is about ~~2~~
1/2' of soft bluish dark grey shales
like those of *I. pennata*. This shale
is soft and has very little grit.
About 1442' was seen a layer about
2" thick of calcareous shales
which may belong to the Dickerson
but is probably a slab out of place.
Other fossils in this shale are
I. caninata, *I. pennata*, *C. subornata*,
P. radiata?

1445' 135" — 1450' 140" — hiatus

1450' 140" — 1455' 145" — soft blue grey
crumbly shales with —

- | | |
|--------------------------|---------------------------|
| ✓ <i>H. bellistriata</i> | ✓ <i>C. subornata</i> |
| <i>P. bothi</i> | <i>P. radiata</i> |
| ✓ <i>Pholidops</i> | ✓ <i>M. corbuliformis</i> |
| <i>M. pyramida</i> | <i>M. mytiloides</i> |
| ✓ <i>C. subornata</i> | <i>H. caninata</i> |
| ✓ <i>A. subornata</i> | <i>P. plana</i> |
| <i>C. bellistriata</i> | <i>M. striata</i> |

October 9.

Beach's Quarry

About 25' vertical, 100' horizontal -
 calcareous sandy shales breaking along
 the bedding into thin slabs more than
 1/2' thick or into irregular chunks,
 jointing very irregular. In the middle
 layers are thin, stone hard, blue
 gray (dark), some dark shale, some
 cherty ls. unconformity content high
 Fossils most abundant in the
 commonly concentrated along layers
 of thin layers.

- | | |
|------------------------------|---------------------------------|
| ✓ <i>S. pinnatus</i> | ✓ <i>Lepteria</i> sp. |
| ✓ <i>A. acuminatus</i> | ✓ <i>R. triquetra</i> |
| ✓ <i>S. demissa</i> var | ✓ <i>S. granulosa</i> |
| ✓ <i>S. cornuta</i> var | ✓ <i>S. perplanaria</i> |
| ✓ <i>P. acutifrons</i> var | ✓ <i>P. oviformis</i> |
| ✓ <i>P. pectus</i> | ✓ <i>A. bulbosus</i> |
| ✓ <i>P. flabellum</i> var | ✓ <i>M. concentrica</i> |
| ✓ <i>P. physodes</i> sp. var | ✓ <i>M. mytiloides</i> |
| ✓ <i>P. tuberculatum</i> var | ✓ <i>A. dentata</i> |
| ✓ <i>P. erectum</i> var | ✓ <i>R. vancouveri</i> |
| ✓ <i>P. emarginata</i> | ✓ <i>C. coronatus</i> var (top) |
| ✓ <i>C. sp. 1</i> | ✓ <i>R. grandis</i> |
| ✓ <i>H. Schepferi</i> | |

Stone from this quarry used on
 road west of Lebanon between Lebanon
 & Georgetown. This quarry, the top of it
 is at about 1300' A.T. that 480' places
 on the glass south of its highway
 crossing.

2nd Ravine
East of ~~Day~~
Strods

Oct 9

Excursion with Moscovitz

Exposures from about 1430 - 1580 or 1600
Upper portion composed of 150' massive
sandstone. *Archaeolites* seen in the bottom.
A. decubata was noted at about
1490' A.T. It is common between about
Moses's ravine at about 1495'. The
exposure is excellent but was not
worked in detail.

The bottom of the Moscovitz here
must be near the road intersection
at 1435' A.T.

Oct 9

Excursion on Stone Mill Brook just
below ravine.

About 25' of exposure above *Archaeolites* probably
in the same formation.

- | | |
|-------------------------|------------------------|
| <i>Archaeolites</i> sp. | <i>Leptotrypa</i> sp. |
| <i>Spirifer</i> sp. | ✓ <i>S. puyplana</i> |
| <i>S. regalis</i> | <i>S. canasta</i> |
| <i>Leptotrypa</i> sp. | <i>S. subconjugata</i> |
| <i>H. bicolor</i> | ✓ <i>S. unangulata</i> |
| <i>H. laura</i> | <i>S. punctata</i> |

Oct 9

Excursion

Handbell at 1210' above Stone Mill Brook

1210' - 1255' 95' - *Archaeolites*

1255'45" - 1260'37" - blue gray massive shales exposed for 4' at bottom of step. Fossils are rare -

- B. biantonta*
- O. undulata*
- C. cf. congregata* etc.

1260'50" - 1265'55" - same as above cascade but distinct for lower 2 1/2'

1265'55" - 1270'60" - top of cascade sandy shales with or fine ss. did not find fossils although they must exist here!

1270'60" - 1275'65" - sandstone & shale with: - *Spirifers*, like those below *Hughesia* etc. *Cleronotus*

3' of ss at bottom with *Spirifer* (large) (*small*) *C. congregatus*

1275'65" - 1280'20" - brachiopods 2

1280'20" - 1285'75" - a couple feet of shaly ss at the top. 3

1285'20" - 1290'30" - 5' of shaly ss which have the appearance of *...* in the *St. Lawrence*? The layers of shaly ss have the appearance of *...* as some of the layers are *...* which often slope in the opposite direction

Fossils are *Camerozoucheia* sp.
C. coronatus, *Spirifer* (same as at
 Kingsley Brook) These stones look like
 those below the stone at Kingsley
 Brook.

1290' 80" - 1295' 85" - same - some of
 the *Camerozoucheia* in these layers
 strongly suggest the ss north of
 Amherst on the road to W. Eaton

1295' 85" - 1300' 90" - same but
 greatly covered and not workable.

1300' 90" - 1305' 95" - a hard brownish
 ss. in which I saw no fossils. This
 stone for about 7 or 8' is not shaly
 but breaks in chunks as though it were
 calcareous.

1305' 95" - 1310' 100" - hard as breaking
 into shales

1310' 100" - 1315' 105" - same but
 with - *Camerozoucheia*, *C. coronatus*
 and *L. rogersi*, *biguttulosa*.

1315' 105" - 1320' 110" - same sandy stone
 with *S. granulosa* & *L. rogersi*
S. parviflora

1320' 110" - 1325' 115" - hiatus

1325' 115" - 1320' 120" - "

1330' 120" - 1335' 125" - "

1335' 125" - 1340' 130" - "

1340' 130" - 1345' 135" - at top 4' of
 the grey sandy shales with ill
 ss. shaly.

S. pennatus c.
C. scitulus
P. constricta

P. flabellum c.
J. carinatus c.

Blair's stone is somewhat calcareous but is predominantly a sandstone.

1345' 135" — 1350' 140" — limestone

1350' 140" — 1360' 150" — limestone

1360' 150" — 1365' 155" — blue grey sandy sh. with *M. oblongatus*, *S. plicatus*

1365' 155" — 1370' 160" — sandstone & shale with

A. erectum c.

A. princeps

J. carinatus c.

C. coronatus c.

1370' 160" — 1375' 165" — Blue grey sandy sh. with *B. loba*, *S. pennatus*

1375' 165" — 1380' 170" — same - shale & limestone - regular chert - must belong near Peach's Quarry horizon

1380' 170" — 1385' 175" — *S. pennatus* c., *J. carinatus* c., *C. bellistriata*, *C. scitulus*

1385' 175" — 1400' 190" — same - The shale is, in these three steps, predominantly a sandy sh. with *Laconurus*. Fossil could not be extracted from this narrow & deep stream gully.

1400' 190" — 1415' 205" — hiatus

1415' 205" — 1420' 210" — hard ss, probably calcareous in thin patches — no fossils could be extracted

1420' 210" — 1445' 235" — hiatus — except at about 1423' 20" where there was a small patch of calcareous — arenaceous shale. Possibly P.S.

At 1445' 235" — were found shales with *A. umbonata*, they were thin gray & soft. This is the Moscow. The Moscow then comes in between 1423' 210" & 1445' 235" Moscow is shown in patches to the end of the ravine but was not studied.

1445' 235" + 90' 30" = 1515' 305" — to road
~~1540' 310" at road~~

964

281

964

$$\begin{array}{r} 1435 \\ 1210 \\ \hline 225 \end{array}$$

$$\begin{array}{r} 1210 \\ 278 \\ \hline 1488 \end{array}$$

$$\begin{array}{r} 1435 \\ 1210 \\ \hline 275 \\ 65 \\ \hline 285 \end{array}$$
~~27~~

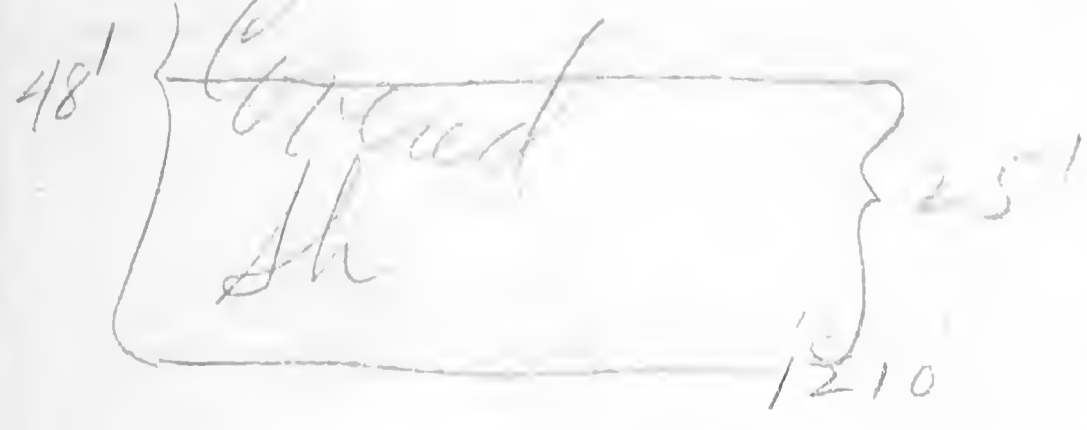
$$\begin{array}{r} 6 \\ 5 \\ 16 \\ 43 \\ 10 \\ 4 \\ 22 \\ 21 \\ 18 \\ 11 \\ 5 \end{array}$$

$$\begin{array}{r} 3 \\ 4 \\ 6 \\ 2 \\ 2 \\ 2 \\ \hline 245 \\ 27 \\ \hline 218 \\ 60 \\ \hline 278 \\ 3 \\ \hline 281 \\ 218 \end{array}$$

1318'

60'

3' sh.
4' sh.
1-2-1-45



60'
45'

$$\begin{array}{r} 140 \\ \underline{49} \end{array}$$

$$\begin{array}{r} 176 \\ \underline{60} \\ 206 \end{array}$$

At the top (and continuing to 2' above this interval is hard calcareous rock containing the following fossils:

S. diversitabula var. *S. pubescens*, *R. vancouverensis*,
R. fimbriata c. *C. sagitta*, *P. piniformis* var.
S. sculptilis a. *P. rana*, *M. concentrica*,
T. perminutus var. *L. p. plana* var. *P. exigua* var.
T. serratus c. *A. decussata*, *P. elongata*,
D. inaequitruncata var.

Indicate this 70' below. Buried down lower on hill or at 1665' A.T. by hand level from road above at 1667' A.T. The *Pittsburg* beds are calcareous arenaceous, & the lower bed is about 4" thick. However the rock splits up like a coarse shale.

Handlevelling from the road intersections puts the top' of the Pompey shaly bed with *S. perminutus* at 1489' A.T. Handlevelling directly from the top of the Pompey shaly bed to the base of the *S. sculptilis* bed yielded a thickness of 236'. I do not believe that this containing here is correct.

Sept 11²

Revis outside of Eaton near Pompey Road contact 851 above the small shaly zone at about 1340' A.T. 75' of sandstone is exposed above the same level var.

Sept. 14.

H. E. Suley for Red Gate to Red Gate in gully behind the house. The road to John Sterle's place having exposure of the Colgate is in an ~~exposure~~ exposure of the place. In the gully on Sterle's a small skull and one of the ~~Upper~~ ^{Lower} ~~Castville~~ ^{Castville}. Suley's is on the east side of the road.

Fossils in Red Gate at Suley's

- | | | |
|----------------------|----------------------|---------------------|
| <i>R. vancouveri</i> | <i>A. reticulata</i> | <i>R. marginata</i> |
| <i>Platyceras</i> | <i>P. rana</i> | <i>Cyst. lani</i> |
| <i>C. coronatus</i> | <i>Centronella?</i> | <i>P. granbora</i> |
| <i>S. parvica</i> | <i>S. parvica</i> | |
| <i>S. dominatus</i> | <i>T. carinatus</i> | |

969

Bradley Brook
1978
Sept 11³

969

Red Gate ls consists of about 10"-1' of hard ls.

Fossils -

Corals - *C. reticulata*

C. acuminata

S. acuminata

At the contact with the shale *S. divaricata* is not uncommon. One of the corals is a compound Cyathophylloid and looks much like *A. adriaticum*. This exposure of Red Gate ls. is about 5' above indented Union Quarry.

The lower part of the Red Gate consists of about 4' of very hard crinoidal ls with corals. The upper part is less pure crinoidal ls with corals. The upper bed had corals & a considerable admixture of dark shale.

29) 208
17
131

Sept. 13.

Murphy Gully

Top of Duffin 45' above ledge = 1225' above base

1225 - 1230 25' - 30' -

1230 - 1235 30' - 35' - bed is mostly white containing very few fossils (other than *S. p. pinnata*, *M.* & *A. pinnata*). The lower *S. pinnata* is a small *A. pinnata* like *A. p. pinnata* but also the *S. pinnata* is a little like *S. p. pinnata* lower. Pompey the Pompey is a *S. p. pinnata* - in the *S. p. pinnata* the first *S. p. pinnata* exposure seen in the Murphree Valley.

1255' 30" - 1265' 40" - with slight coarse layer *S. pinnata*

1265' 40" - 1275' 50" - main massive shale *S. pinnata*

1275' 50" - 1280' 55" -

1280' 55" - 1285' 60" -

1285' 55" - 1300' 75" - mostly covered at the top of this interval the *S. pinnata* coarse bed below *S. pinnata*

1300' 75" - 1305' 80" - with *S. pinnata* and the bed below.

1305' 80" - 1305' 85" - Top of Pompey

~~1305' 85" - 1305' 90" - bed of calcareous massive rock of the upper Pompey.~~

- Fossils are:
- S. pinnata* *C. mucronata* *C. constricta*
 - A. pinnata* *S. pinnata* *E. lindbladii*
 - C. pinnata* *A. pinnata* *A. cora*

Very top bed lower

- S. pinnata*
- S. pinnata*
- A. pinnata*

A few inches of an ~~unconformity~~ shale at the top here:

L. perplana *S. pinnatus*
R. vancouverensis *P. flabellium*

The Pompey here is apparently ~~just~~ ^{87'} thick and throughout presents no features not seen elsewhere, except in the bulk of more fossiliferous sandstone and the absence of ~~the~~ ^{a great thickness of} bedded layers at the top. There is some as at the top but it is not thick & shaly as at the exposures on Electric Light Stream. Bedding here is shown by layers of fossils. The upper 3' of rock seems to be calcareo-arenaceous and massive. The top of the Pompey is estimated to be at 1312' A.T.

Sept. 10.
Road to Eaton

Intersection of road on west side of valley with the Eaton road is at 1250'. 16' above the intersection was seen 3 1/2' of sandy and impure ls. containing irregular masses of blue grey pure sandy ls. It weathers to a brown sandy stone. In this rock *C. congregata*, *S. adductulus* abound. Other fossils seen are *P. flabellum*, *A. erectum*, *Bonniophora hamiltonensis*, *Platyceras* sp., *H. sculptilis*, *H. delanyii*. All of these except the *Camerozoechus* and *Spirifers* are in minor amounts. Other fossils are *S. granulatus*?, *M. concentrica*. This exposure has just recently been opened during the road building operations.

C. corruptus and *H. cuneatus* are very rare. *Favosites* lam., occurred at about 1270' associated with large and small *Spirifers* and *Camerozoechus*. The rock has an irregular fracture into thick layers of 1" to 6".

C. induta

Cran. lam.

S. papyriformis

S. macroptera

at 1270' 20" the same rock is seen but beginning about a foot above this interval the lime increment begins to disappear and the rock becomes more shaley. also different forms come in and others seen in abundance below disappear. Some that were uncommon in the hard sandy ls. become common in

the shales.

From 1270' 20" - 1275' 25" in a rock becoming increasingly shaly were seen

- | | |
|------------------------------------|------------------------------|
| ✓ <i>P. flabellum</i> c | ✓ <i>P. maxima</i> |
| ✓ <i>J. carinatus</i> (transverse) | ✓ <i>Pal. concentrica</i> |
| <i>C. boethi</i> | <i>P. patulus</i> |
| ✓ <i>Cran. hamiltoniae</i> | ✓ <i>G. truncata</i> |
| ✓ <i>M. concentrica</i> c | ✓ <i>Son. hamiltonensis</i> |
| ✓ <i>P. spinulicosta</i> | ✓ <i>A. princeps</i> |
| ✓ <i>H. deKayi</i> | ✓ <i>B. erotakum</i> |
| <i>Cyathophyllum</i> sp. | ✓ <i>S. perplana</i> |
| <i>Nepluticeras</i> sp. | ✓ <i>L. macroptera</i> |
| <i>Selmchertella</i> | ✓ <i>S. chemungensis</i> |
| ✓ <i>S. granulatus</i> | <i>C. boethi</i> |
| <i>P. patulus</i> | ✓ <i>C. complanata</i> |

Fossils found with the corals are:

- M. concentrica*
P. flabellum
 Same species as occurs below with the *Camerozoechias*

Tubellus.

Pal. concentrica

- The corals mark the end of the calcareous matter and about 1 foot below the top of the interval rather soft shales contain:
- | | |
|-----------------------------|-----------------------|
| ✓ <i>Pal. concentrica</i> | <i>B. erotakum</i> |
| <i>Prod. spinulicosta</i> ✓ | <i>M. subulata</i> |
| <i>C. mucronatus</i> ✓ | <i>P. flabellum</i> |
| <i>Pholidops</i> cc | <i>P. rana</i> |
| ✓ <i>J. carinatus</i> c | <i>M. concentrica</i> |
| <i>Camerozoechia</i> sp. | <i>C. boethi</i> |
| <i>M. pygmaea</i> | |
| <i>H. deKayi</i> | |

The zone with *Pholidops* is at
1274'25"

1275'25" - 1280'30" at about 1276'25" *Pholidops*
is still present in ~~an~~ argillaceous sh.
About 1279'30" a *Loxonema* was found,
also *H. aelis*, *T. submarginata*. 5'-8' above
1279'30" *H. micula* must come in and
there begins the Delfin Falls section.
8' above 1279'30" is a section of about 15'
of rock representing my Eaton horizon
below the New Gyrus.

1280'30" - 1285'35" - very little rock exposed
here but mostly soft blue grey shale
with *Lox. hamiltoniae*

1285'35" - 1290'40" - comes a large cut
exposing 15' vertical of shales.

1285'35" - 1295'45" - shale with following

<i>H. micula</i>	✓ <i>P. spinulicosta</i>
<i>H. dehayi</i>	✓ <i>P. liata</i>
✓ <i>P. sectifrons</i>	✓ <i>S. crotalum</i>
✓ <i>B. submarginata</i>	✓ <i>Lox. delphicola</i>
Mandible <i>P.</i>	✓ <i>A. erectum</i>
✓ <i>P. constructa</i>	✓ <i>C. boethi</i>
✓ <i>M. concentrica</i>	✓ <i>H. oblongatus</i>
✓ <i>Lox. ham.</i>	✓ <i>H. sandalli</i>
✓ <i>P. patulus</i>	✓ <i>S. bisulcata</i>
✓ <i>C. conjugata</i>	<i>Paranema</i> sp.
✓ <i>H. aelis</i>	✓ <i>A. umbonata</i> n.
✓ <i>T. carinatus</i> n.	

1290'45" - 1305'60" - here ^{between 1300 + 1305} was seen an
olive grey sandy shale rocks like
that at the New Syn.

1305'60" - 1385'140" Triassic
1385'140" - 1390'145" - In the middle of this
interval is a foot of sandstones, blue
grey with tiny brown weathering specks.
These contained *P. flabellum*, *Sou. cf.*
hamiltonensis and *Camarotoechias*. They
must belong to the Fertile horizon. They
are found just at the house. at the
~~end~~ bend in the road near the curve

1390'145" - 1400'155" - about 5' below the
top here soft shales are seen. and at
the top of the hill at the bend of the road
are about 15' of soft shales, my upper
Eaton horizon of argillaceous blue grey shale.

Sept. 10.

Section along Eaton cement road East from English Ave. English Ave intersects the cement highway at 1260'. At 1285' 25" - sandy shales of the Eaton horizon like those on the east side of the hill. Fossils here are

<i>M. debrayi</i> c	<i>C. congregata</i> n	<i>A. erectum</i>
<i>P. flabellum</i> c	<i>B. submarginata</i>	<i>J. exigua</i>
<i>C. tenuistriata</i>	Large <i>Spirifer</i>	

They are exposed here for 1 1/2 steps 1285' 25" - 1295' 35" - near top of *Syngon* as noted above, about 8' vertical

1295' 35" - 1305' 45" - hiatus

1305' 45" - 1315' 55"

rocks of New *Syngon* horizon. About 11' of rocks exposed very well on the south side of the road but also on the north side. These same rocks may also be found on the southern hillside above the dam at the small reservoir and just west of the Eaton station. The rocks are the same as those exposed at the *Syngon* as shown by *M. mytiloides* and *R. obsoleta*.

1315' 55" - 1390' 130" - hiatus

At about 1392' 136" is found slabby sandstone like that on the east side of this hill at 1390' 145". *N. arguta* was the only fossil noted here.

1390' 130" - 1395' 135" - noted above. At the top of this interval are 3' of rock. The lowest part of which is a hard

Compact ss. On top of this compact ss, which clearly belongs to the Fertile and Libizon and has *N. arguta* and *P. flabellum*, there comes 2' of hard calcareous sandy ls. with considerable shak in it. This rather abruptly rests on the ss.



1396
11
1407

The contact comes at about 1396' 135" AT. This calcareous sandy rock is compact and hard

and is brown on the weathered surface with irregular black splashes of dark sandy clay. It greatly resembles the sandy ls. of the Burchard quarry but has a different fauna:-

- | | |
|---------------------------|-------------------------------------|
| ✓ <i>Aviculopecten</i> | ✓ <i>A. terebratulid</i> (Eucella?) |
| ✓ <i>P. flabellum</i> | ✓ <i>A. princeps</i> |
| ✓ <i>C. mucronatus</i> | <i>C. mucronatus</i> |
| ✓ <i>S. perplana</i> c | ✓ <i>C. scutulus</i> |
| ✓ <i>R. vancouveri</i> c | ✓ <i>Athyris</i> sp. |
| ✓ <i>N. arguta</i> re. | ✓ <i>Cystodectya</i> |
| ✓ <i>T. exigua</i> | ✓ <i>P. rana</i> |
| ✓ <i>S. pennatus</i> | ✓ <i>C. boothi</i> |
| ✓ <i>A. spiriferoides</i> | ✓ <i>E. lindelaeni</i> |
| ✓ <i>M. concentrica</i> | ✓ <i>Conularia</i> |
| ✓ <i>S. granulosa</i> | |

On this the dark shales with *Vatulinia* in the silty part of this rock *Myosas* abound in association with abundance of *S. pennatus*.

15' } Soft
Sh.

1400' 155"

Dark
Shales.

3' } 3'

1395' 150"

1395' 135"

1390' 145"

1401
1370

3' } 2'

1390' 130"

90' } Covered

1395'
12
407

1395'
11
1406

83'
57
26

Covered

1315' 85"

11' 11"

11' } Lign

1305' 45"

1300' 55"

1295' 45"

1290' 40"

1285' 35"

1280' 30"

1275' 25"

1270' 20"

1265' 15"

1260'

1255'

1250'

15'

8'

Enter in
Lign

13' 8"

1295' 35"

8'

1285' 25"

1274' 25"

1" Phospho
concl

3 1/2'

1270
1277
43

1401
1276
130
54
17

1260'

826

826

East Glen

Top of Duffin is at 1120' A.T. on the Little River. First exposures in East Glen are in the shaly shales of the Pompey 30' above the highway. 70' above the road or at 1200' shows the top of the Pompey in the hard sandy loam bearing *R. thompsoni*. In the 70' interval is good large patch of *ammonites* and several exposures to bed of the stream. The dip of the Duffin would probably add 3 or 4' to the Pompey and there may be a fault or a top which is included. Hence a reasonable estimate of the thickness of the member would be 75'.

The first 5' above the Pompey is covered but in the next 5' it is not known the soft sandstone is. The following fossils were seen in the Randolphville between 45'45" and 50'50":

- | | |
|--------------------------|------------------------|
| <i>A. umbonata</i> | <i>S. piperina</i> |
| <i>P. spinifrons</i> | <i>R. thompsoni</i> |
| <i>C. (L.) (H.) (L.)</i> | <i>S. piperina</i> |
| <i>M. piperina</i> | <i>A. subuliformis</i> |
| <i>C. (L.) (H.) (L.)</i> | <i>P. costata</i> |
| <i>L. (H.) (L.)</i> | <i>D. (H.) (L.)</i> |

15' above the top of the Pompey comes 3' of hard sandstone - a sandstone with thin beds of sandstone from human clay shales to 66' above the Pompey. Hardening of the Randolphville begins here.

Exposures of shaly shale are good but 70' above this falls markedly 130' of nearly continuous exposures. At 130' above the Pompey is a road in the soft shaly stone which the gully of the stream is also shaped with

105
106

292
1200

1492

earth covering any exposures. From
this road for 95' to the base of a 10'
exposure of undoubted Colgate ss.
the rocks are largely covered. This Colgate
is ~~which~~ the top of which is at 1442'
must be near the top of the Colgate
as it forms a flat ledge.

Wahlellund in front is practically
started from the top of the Dalphi!

Sept 7, 1928

Univ. Quarry.

40' high, from capped, or cross-bedded. At base black shales and shales, the latter frequently containing *P. fragilis*.
 The top of the Quarry is at 1471' A.T. The top of the Quarry in the Gulf Lake area is at about 1340' A.T.

In small ravine E of campus is 17' of rock the top at 1310' A.T. The top contains *P. glabellum*, *R. vancouveri*, *L. perplana*, *Cetypis*, *Bryozoa*.

Assign this to the Pompey, although the complete sequence is not present. The rocks below the top are very sandy shales having very few fossils. A peculiar rosetted bryozoa and *P. costata* alone were noted. I believe that this is near the top of the Pompey, altho it may be in the Randallville.

Sept 7.

Gully in Penlock Grove. (Behind E.D. Murphy)

New Lynn (Delphi (top)) is at 1230' above sea-level. 84' above this comes the hard arenaceous layer with *L. perplana* and *R. vancouveri*, the top of the Pompey.

June 15⁽⁶⁾

C.W. Hamilton's Ravine

Grey shales occurring at 1575' 3' above base (at 1578') the shales are blue. These fossils are abundant as *S. pennatus*; large *Comarostrophia*s, other fossils here are:-

A. spiriferoides

M. concentrica

P. annata

P. flabellum

N. concinna

H. dekeyri

At 1591' the shales are somewhat harder forming a cascade in the strata. *P. flabellum* & *S. pennatus* were noted here. *S. pennatus* is not like that of the U. Quarry but more like Earlville kind. The top of the second cascade, which is at 1596' is composed of sandier stone which is flat and slabby in places but soon again gives the irregular fracture. *S. pennatus* is not the level, but fossils are quite scarce here. The very top of the second cascade is a conglomerate shale with *S. pennatus* and *T. carinatus*. The second cascade is at 1602'

At 1602' is the contact of the hard arenaceous shale with a soft argillaceous shale containing many fossils. A calcareous layer only a few inches thick rests on the arenaceous shale layers. This contains many fossils especially large *Strophodontes*. The other layer is a bluish shale with

S. pennatus

A. submarginata

T. carinatus

P. flabellum

P. reduta

C. perplanis

N. elongata

P. submarginata

C. perplanis

1618'



1602'

all the [unclear] [unclear]

1525'

Blue shaly [unclear] [unclear] [unclear]

The weathering of the two kinds of rock at 1602' is in strong contrast. The lower harder stone weathers into large irregular blocks, that above into small irregular chips or fragments.

At 1607' the stone is again harder and contains *S. pennatus* & *J. cuneatus* in abundance. An unusual *Cimitaria* was found here.

At 1613' the stone is hard and has *L. rogersi*, *C. coronatus*, *S. erectum*, *S. pennatus*. Small *Chonetes*, (*C. vicinus*) is very abundant here. Between 1607 & 1613 the stone has become progressively more massive. The same holds for the interval between 1613 & 1618'.

Sept. 28

Hamilton's Ravine - Restudied

Handliding again about 500' AT, or
200 paces N.E. of Hamilton's ravine.

1545' - 1545'5" - sandy sh.

1545'5" - 1550'0" - blue grey sandy sh
at the bottom, with *S. arcuata*,
S. pinnatus, *A. spiniferus*, *S. planus*,
C. bairdii, *P. pinnatus*, *T. quadrata*,
C. aculeata, *P. flabellus*, *H. concinna*.

1550'10" - 1555'15" - the rocks have
become very hard and sandy,
breaking into large flat slabs!
S. pinnatus, *S. arcuata* of large size
This is apparently the same as
as at the bottom of Hamilton's Ravine

1555'15" - 1560'20" - This interval +
3' brings us to the top of the
hard sandstone as described on
the top of the slabs ss. but at

1560'20" the rock is a softish
shale with appropriate fauna.

- | | |
|------------------------|--------------------|
| <i>T. quadrata</i> C. | <i>S. pinnatus</i> |
| <i>Pal. pinnata</i> | <i>C. bairdii</i> |
| <i>S. arcuata</i> | |
| <i>T. quadrata</i> sp. | |
| <i>S. pinnatus</i> | |
| <i>S. pinnata</i> ? | |

... has been recently checked
out at the contact.

[Faint, illegible handwritten notes]

1563

1574

[Faint handwritten notes]

[Faint handwritten notes]

This layer correlates well with the one in Burton's in which *S. dominica* & long *Strophodontes* were abundant.

1560' 30" - 1565' 25" - This shale on top of the ss. is seen for 5'. This interval includes 3/4 of the ss & about 1/4 of the lower part of the sh. *C. dominica* on top of ss.
1565' 25" - 1570' 30" - hiatus

- | | |
|-------------------------|---------------------------|
| 1570' 30" - 1575' 35" - | Very gray sh. |
| ✓ <i>J. cuneatus</i> a | ✓ <i>J. christi</i> |
| ✓ <i>P. tenuis</i> | ✓ <i>P. tripartita</i> |
| ✓ <i>B. pinnatus</i> | ✓ <i>B. cuneatus</i> |
| ✓ <i>V. oblongatus</i> | ✓ <i>V. acutus</i> |
| ✓ <i>P. emarginatus</i> | ✓ <i>C. conjugata</i> |
| ✓ <i>A. erectus</i> | ✓ <i>P. lanceolatus</i> |
| ✓ <i>S. pennatus</i> | ✓ <i>C. scitulus</i> |
| ✓ <i>S. purpureus</i> | ✓ <i>P. contractus</i> |
| | ✓ <i>B. submarginatus</i> |

This layer looks like the 4th Pelagian zone below the second division bed.

1575' 35" - 1580' 40" - near the top of this interval *S. pennatus* is very abundant, also *J. christi*. Less abundant are *P. subellipticus*, *A. tellus*?, *Pygidiopteris* sp., *V. pinnatus*. The whole is full of *Ammonoites* here.

1580' 40" - 1585' 45" - very sandy sh with *C. conjugata*, *C. subconjugata*, *S. pennatus*, and *J. cuneatus*. This is the last cycle seen.
~~1585' 45" - 1590' 50"~~
~~1590' 50" - 1595' 55"~~

1610' 20" - 1615' 25" - is - except for the
 one or two which are calcareous -
 arenaceous and have the
 following fauna -

- | | |
|----------------------------|------------------------|
| ✓ <i>S. periplaneta</i> | ✓ <i>R. vanuxemi</i> |
| ✓ <i>M. concentrica</i> | ✓ <i>P. flabellum</i> |
| ✓ <i>Terebellids</i> | ✓ <i>S. concava</i> |
| ✓ <i>S. granulosus</i> | <i>P. rana</i> |
| ✓ <i>C. tenuistriata</i> | ✓ <i>S. parvatus</i> |
| ✓ <i>Bou. hamiltoniana</i> | <i>C. boothi</i> |
| <i>A. decussata</i> | ✓ <i>P. marginata</i> |
| <i>Par. hamiltoniana</i> | ✓ <i>G. tubularis</i> |
| ✓ <i>S. solenoides</i> | ✓ <i>T. tuberculid</i> |
| ✓ <i>S. concava</i> | ✓ <i>S. rana</i> |
| | ✓ <i>A. spinifrons</i> |

The upper 4" here is composed of
 hard resistant shells. The stone is
 composed of the comminuted fragments
 of fossils. This stone is responsible
 for the flat in the valley. Fossils in
 the rock are:-

- | | |
|-----------------------------|---------------------------|
| <i>P. iowensis</i> a | <i>R. vanuxemi</i> |
| <i>Pholidops</i> (large) ca | <i>P. rana</i> |
| <i>C. boothi</i> | <i>H. dehayi</i> |
| <i>S. periplaneta</i> | <i>S. spinifrons</i> etc. |
| <i>A. decussata</i> | <i>Quadrilobus</i> sp. |
| | <i>C. concentrica</i> |

1615' 25" - 1620' 30" - a mass of shale
 on the S. has *M. concentrica*, *C. boothi*
 The shale is soft, blue gray. Has this
 for 5' 4"

1620' 30" - 1625' 35" - This interval
 is composed of soft dark blue
 grey shales, much like the
 Madison in appearance. They are
 quite gullies.

Logarithm

A. globosa

T. longicauda

M. ...

M. ...

C. ...

Pal. ...

S. ...

M. ...

S. ...

C. ...

O. ...

I. submarginata

M. ...

A. ...

C. ...

P. ...

C. bellistata

P. ...

C. ...

M. ...

C. ...

P. ...

in a small gully on the south

1625' 35" - 1630' 00" - same as above

1630' 45" - 1635' 45" - same as above

I. ..., *M. ...*, *S. ...*, *C. ...*

1635' 45" - 1640' 50" -

At the top of this interval the rock is ... sandy with a ...

1640' 50" - 1645' 55" -

In ... the upper part of this ...

- S. ...*
- M. ...*
- C. ...*
- P. ...*
- P. ...*

C. scutellus
S. unguatus?
M. subulata
S. patulus.

S. solenoides
M. pygmaea
S. chlorogaster

I believe that this bed above the
Pholidostrophia band corresponds to a
 similar one at the top of the first
 falls at Fabius and that the
 "Dickerson" should be about 60 or
 70' above the *Pholidostrophia*
 band. This layer from 1420' 30" -
 1445' 30" may represent this bed
 below the upper *S. dominica* layer

Calcareous band at 1420'. Same
 part calcareous in nature and
 whole 1 1/2' thick - note 1420'.

169

Sept 19.

Georgetown Ravine (west, with Dully at 1635). Hand-leveling was begun at the confluence of this creek with Otselet Creek and this is at 1440' A.T. The first rock is encountered at 8 steps + 3' above the confluence of these creeks. The first rock seen is at 1486' A.T. The lowest rock is a sandstone that contains considerable shale and many fossils. The fauna in the first 2' is as follows:-

T. carinatus cc.*Aviculopecten**S. perplana* cc.

At 1488' A.T. the rock is shaley and with ls. lenses and abounds in *T. carinatus*. Other fossils are:-

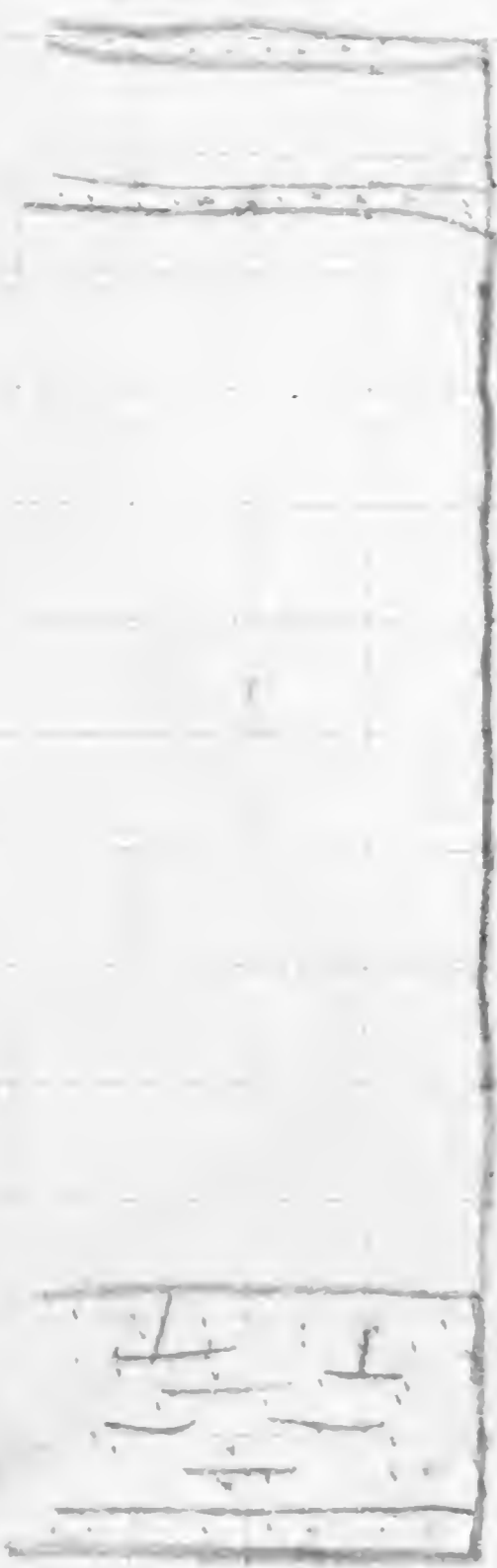
*T. carinatus**S. granulosa**S. pennatus**R. vanuxemi**P. oviformis*

The striking point of this lower 2' of rock is the large numbers of *T. carinatus* present. Abundance of *T. carinatus* was one of the characters of "Tichenor" at Fabius.

At 1488' 9" ¹⁴⁹⁴ the rock is a hard blue-grey shale and is such up to 1494' 2" Fossils in this interval are:-

*A. reticularis**S. pennatus* c*T. carinatus* cc*C. mucronatus* c*H. triquetra**H. acilis**M. pygmaea**M. nepheloides**S. granulosa**E. libchlaeni?*

1539'45



1486

Each sq 3'

991

<i>C. recurva</i>	<i>P. rana</i>
<i>R. vanuxemi</i> or	<i>O. thoceras</i> sp.
<i>Pal. constructa</i>	<i>Cyrtolites</i> sp.
<i>M. concentrica</i>	<i>T. exigua</i>
<i>S. arctostriatus</i>	<i>Grammysia</i> sp.
<i>S. granulatus</i>	<i>A. decussata</i> ?
<i>A. serpens</i>	<i>S. peresa</i>
<i>Camarotoechia</i>	<i>S. perplana</i>
<i>Cyrt. ham.</i>	

These beds are rather sandy and in places seem calcareous, but give no effervescence. However if the rock is crushed or powdered it gives a good effervescence.

1494' - 1499'5" - There are only 2' of rock exposed at the bottom of this interval. The rock is a coarse grey sandy shale abounding in *Brachiopods*:

<i>S. granulatus</i> cc	<i>Pal. hamiltoni</i>
<i>M. concentrica</i> r	<i>R. vanuxemi</i> or
<i>A. serpens</i> r	<i>H. capillaria</i> or
<i>S. arctostriatus</i> r	<i>A. reticularis</i> or
<i>A. spiriferoides</i> r	This stone when
<i>T. carinatus</i> c	fresh is quite
<i>S. pennatus</i> c	calcareous. One
<i>S. perplana</i> r	striking feature of
<i>O. thoceras</i> sp. r	it is the great
abundance of <i>S. granulatus</i>	

1499'5" - 1504'10" - hiatus

1504'10" - 1509'15" - the top 5' of this horizon commences the more typical Moscow

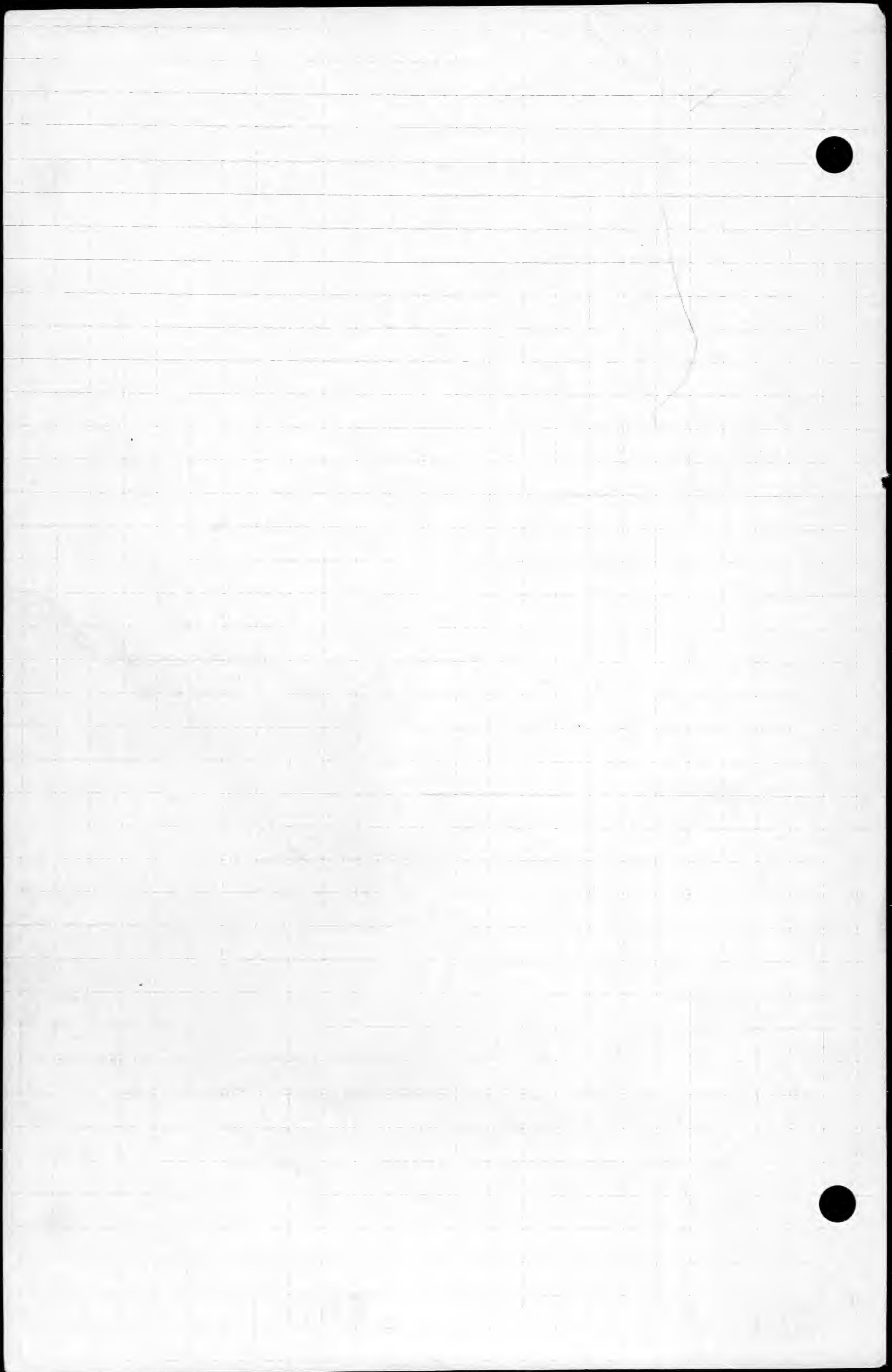
shale. It is a blue grey rather dark but soft shale with many fossils. Here were seen: -

- | | |
|------------------------|--------------------------|
| ✓ <i>S. pennatus</i> | ✓ <i>C. setigerus</i> |
| <i>Lingula</i> sp. | ✓ <i>N. bellistriata</i> |
| <i>P. hana</i> | ✓ <i>C. mucronatus</i> |
| ✓ <i>P. munita</i> | <i>C. boothii</i> |
| <i>Orbiculoidea</i> | <i>Pterinopecten</i> |
| <i>S. crotalum</i> | ✓ <i>M. concentrica</i> |
| ✓ <i>N. oblongatus</i> | ✓ <i>Pol. constricta</i> |
| <i>A. reticularis</i> | <i>P. patulus</i> |
| ✓ <i>N. lamellata</i> | <i>Cystodictya</i> |
| <i>Chaetetes</i> | <i>S. capillaria</i> |
| <i>S. arcuata</i> | |

The shale here was somewhat brittle and hard. No particular fossil characterized is zone. The rock weathers to a brown color. Fossils not very abundant.

1509' 15" - 1514' 20" - same shale -

- | | | |
|-------------------------|-------------------------|-------------------------|
| ✓ <i>S. pennatus</i> | ✓ <i>P. radiata</i> | <i>Crinoid stems</i> |
| <i>P. rana</i> | <i>P. plana</i> | <i>P. emarginata</i> |
| <i>Orbiculoidea</i> | ✓ <i>C. mucronatus</i> | <i>A. decussata</i> |
| ✓ <i>M. concentrica</i> | <i>P. constricta</i> | <i>M. mytiloides</i> |
| ✓ <i>R. fimbriata</i> | <i>P. discoidium</i> | <i>P. lanceolata</i> |
| <i>Cystodictya</i> | <i>S. granulatus</i> | <i>S. arcuata</i> |
| ✓ <i>N. carinatus</i> | <i>P. patulus</i> | <i>M. mytiloides</i> |
| <i>A. reticularis</i> | <i>Par. hana</i> | <i>S. subemarginata</i> |
| <i>S. crotalum</i> | <i>S. exigua</i> | <i>C. bellistriata</i> |
| ✓ <i>N. triquetra</i> | <i>N. bellistriata</i> | <i>N. corbuliformis</i> |
| ✓ <i>N. pygmaea</i> | <i>S. subemarginata</i> | <i>P. munita</i> |
| <i>Cystolites</i> sp. | <i>S. solenoides</i> | |
| ✓ <i>N. liriata</i> | <i>Lox. hana</i> | |
| ✓ <i>N. oblongatus</i> | <i>A. spiniferoides</i> | |
| ✓ <i>R. vanuxemi</i> | <i>Orthis</i> sp. | |



1514'20" - 1519'25" - *S. crotalum*, *P. radiata*
Crinidea, *Platyceras* sp., *S. pennatus* &
P. rana, *T. corinatus*, *P. nuda*, *S. crotalum* &
S. cheringensis, *C. boothi*, *M. mytiloides*
M. liata, *M. bellistriata*, *C. scitulus*.
S. granulatus.

The rock here fractures easily into
irregular lumps, is rusted and
weathered to a chocolate or purple
brown color.

1519'25" - 1524'30" - *liatus*
1524'30" - 1529'35" - "
1529'35" - 1534'40" - "

1534'40" - 1539'45" - Hard sandy rock
for 1 1/2' at the bottom. This
contains: - *S. crotalum*, *P. emarginata*
T. corinatus, *P. tenuis*, *L. laura*, *S. pennatus*
A. actinoides

The *Leiorhynchus* are very large
and belong to the shale on the 1 1/2'
sandstone, the fauna of which could
not be examined. The ss. causes a
small cascade. ~~The~~ 5'5" above this
ss band comes another only 6"
thick with no fossils. The shales
between are dark almost black
and abound in *L. laura* with
few other fossils. They are very much
like the Genessee and just below
the 6" ss. are soft and break into
very thin chips.



[Faint, illegible handwriting]

Just below the 6" ss: -

S. tullius

C. boothi

M. pygmaea

J. submarginata

C. situlus

P. emarginata

N. oblongatus

1539'45" - 1544'50" dark, soft shales.
with *S. tullius*, *P. discoidem*. About
2' above the 6" ss which is only a
large lens, and probably one of

1539'45" - 1634'140" = 1645' to base of July
Sept. 23.

a discontinuous series.

In the dark shales of this interval
fossils are thickly aggregated and
matted in the rock.

H. bellistriata

J. carinatus

P. emarginata

P. laura cc

S. pennatus

M. pygmaea

A. sphenoides

C. mucronatus

S. tullius c.

N. laeta

J. submarginata

A. praemontana

M. subalata

N. oblongatus

This appears to be a representative
of the *A. praemontana* zone (?).

$$\begin{array}{r} 39 \\ \hline 16 \\ \hline 23 \end{array}$$

1544' 50" - 1549' 55" - The shales are here blue grey, rusted red-brown and have less fossils than those immediately below. The Leiohyndus-Ambocoelia zone appears to end at about 1544' 50" - Fossils noted in the bottom 2' of this interval are:

M. concentrica cc	A. spiniferoides c.
R. vanuxemi	P. emarginata
S. andersoni	H. corbuliformis
P. productella sp.	C. undulata
J. carinatus	Orthoceras sp.
S. tullius	Fenestellid
B. leda	H. lirata

Top 2 or 3' hiatus

1549' 55" - 1554' 60" - blue grey sh. Top Hamiltonian

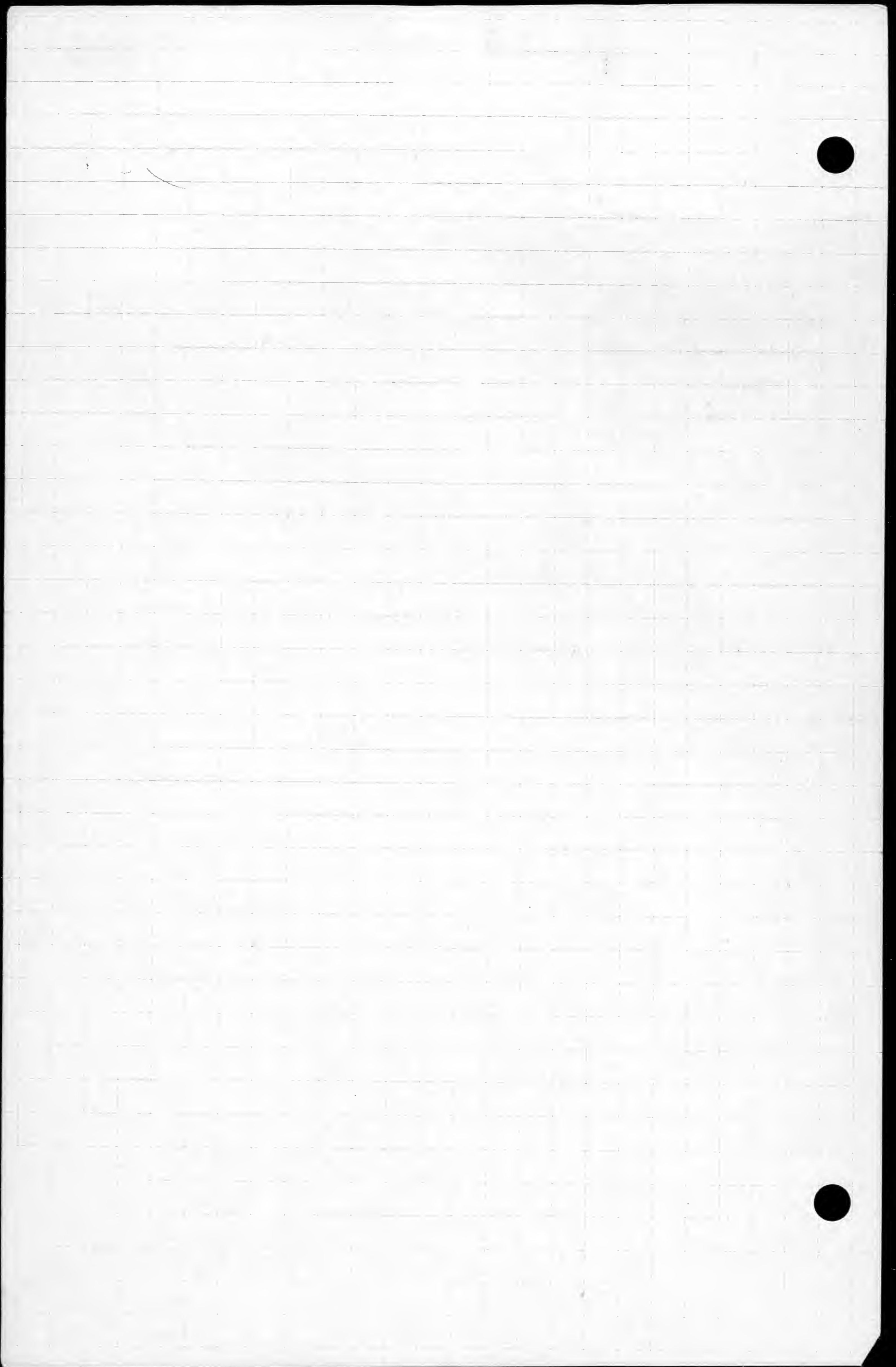
P. emarginata	P. rana
S. perbena	Leiopteria
Pal. constricta	S. tullius
Crinoid stems.	
J. subemarginata	

1554' 60" - 1559' 65" - blue grey arenaceous shales with few fossils - H. varicosa, G. constricta.

1559' 65" - 1569' 75" - blue grey sandy sh with some very resistant sandy bands.

Crinoid stems, Pal. constricta, S. tullius, S. perbena, J. carinatus, Fossils are not abundant in this interval.

1569' 75" - 1574' 80" - the rock at the top of this interval is very hard and sandy. It contains S. granulosa,



A. serpens, *J. carinatus*, *R. fimbriata*,
P. emarginata, *C. mucronatus*, *S. tullius*
Platyceras sp.
 1574' 80" — 1579' 85" —

The sandy stone band which is only a few inches thick is succeeded by blue grey sandy shales with few fossils.

1579' 85" — 1584' 90" — 5' of this interval is composed of sandy shale rock capped by 1 1/2' of calcareo-arenaceous rock, very resistant and with corals and calcareous lenses filled with fossils at the bottom:—

✓ <i>R. varnensis</i> c	corals.	r
✓ <i>S. granulosa</i> c	<i>C. bellistriata</i>	r
<i>S. perplana</i> re	<i>P. rana</i>	r
<i>J. carinatus</i> re	<i>C. coronatus</i>	r
<i>A. decussata</i> r	<i>P. maxima</i>	re
<i>M. concentrica</i> r	✓ <i>S. pennatus</i>	r
Favosites r	<i>C. boothii</i>	r

This rock has the appearance of that in the quarry on the hill east of Georgetown. The calcareous lenses are all thru the 1 1/2'.

Strophodontia sp. — large

1584' 90" — 1589' 95" — on top of the calcareo sandy rocks come dark blue grey softer shales. These have the following fossils:—

<i>W. carinatus</i> c	<i>Taormus</i> (small)
<i>Cyrt. luv.</i>	
<i>S. pennatus</i>	
<i>C. tenuistriata</i>	

1589' 95" - 1594' 100" - hard sandy shale, resistant and forming a flat in stream bed:-

<i>S. granulatus</i> c	<i>A. spiniferoides</i> c
<i>S. pennatus</i> r	<i>J. carinatus</i> c
<i>Con. hamiltoniae</i> r	<i>M. concentrica</i> r
<i>C. bellistriata</i> r	<i>J. bellulus</i> r
<i>S. serplana</i> r	<i>G. cuneatus</i> r
<i>M. subalata</i> r	<i>R. vanuxemi</i> r
<i>Comularia</i> sp. v	

1594' 100" - 1599' 105" - At the bottom of this interval the shales become finer and carry smaller fossils

<i>S. pennatus</i>	<i>P. discoideum</i>
<i>M. subalata</i>	<i>L. laura</i>
<i>J. submarginata</i>	<i>C. setigenus</i>
<i>N. corbutiformis</i> c	<i>N. oblongatus</i>
<i>N. bellistriata</i>	<i>Orbiculoides</i> sp.

The shales below are rather sandy & brittle but become darker & softer above

1599' 105" - 1604' 110" - same

1604' 110" - 1609' 115" - same - concretions are abundant in the soft dark shales. They contain *L. laura* in abundance & also *S. pennatus*, *Pholidops*.

1609' 115" - 1614' 120" - same but *L. laura* very abundant and of large size
J. carinatus, has now come in

1620

1642

1622

5

$$\begin{array}{r} 1619 \\ 1634 \\ \hline 1753 \\ 5-15 \\ \hline 1738 \end{array}$$

1642

$$\begin{array}{r} 7 \\ 1\frac{1}{2} \\ \hline 5\frac{1}{2} \end{array}$$

1635

1614' 120" — 1619' 125" — same sh.
L. laura cc, *N. oblongatus*, *Pal. emarginata*
J. carinatus, *C. bellistrata*, *C. setigerus*

1619' 125" — 1624' 130" — In about the
 middle of this step *L. laura* disappears
 and the shales become a lighter blue grey
 & do not break into such small
 chips. Also the fauna changes.

✓ <i>R. fimbriata</i>	✓ <i>S. perpallens</i>
✓ <i>V. pustulosa</i>	<i>C. bellistrata</i>
✓ <i>S. pennatus</i>	✓ <i>A. reticularis</i>
✓ <i>S. junia</i>	✓ <i>B. concava</i>
<i>C. boothi</i>	<i>Lox. sp.</i>
<i>R. vanuxemi</i>	<i>H. dekeyi</i>
✓ <i>S. inaequistrata</i>	<i>C. tenuistriata</i>
<i>A. serpens</i>	<i>J. bellulus</i>

The ls. specimens collected Sept. 21
 are from this horizon

1624' 130" — 1629' 135" — This step comes
 within 1 1/2' of the base of the Tully.
 This 1 1/2' has already been collected
 Tully is at 1642" A.T.

Fossils in this interval are

<i>Leiopteria</i> sp.	✓ <i>S. andaculus</i>
✓ <i>V. pustulosa</i>	<i>N. corbuliformis</i>
<i>S. solenoides</i>	✓ <i>J. carinatus</i>
<i>P. constriata</i>	
<i>C. boothi</i>	
✓ <i>C. coronatus</i>	
<i>J. exigua</i>	
<i>M. mytiloides</i>	
<i>S. pennatus</i>	

There are 156' of Moscow shales exposed almost continuously in this ravine. From the *A. praecumbens* zone to the bottom of the Tully there are about 93' of shales! The hard rock bearing corals and crinoids probably belongs to the Quarry on the road east of Georgetown. Above this horizon with corals came the 2nd. horizon with *L. laura* and this gives way near the base of the Tully to a layer with *V. pustulosa*!

Along the road here above the farmhouse at 1740 are to be seen in the road-gutter a hundred or more feet of the Sherburne sandstones and shales.