



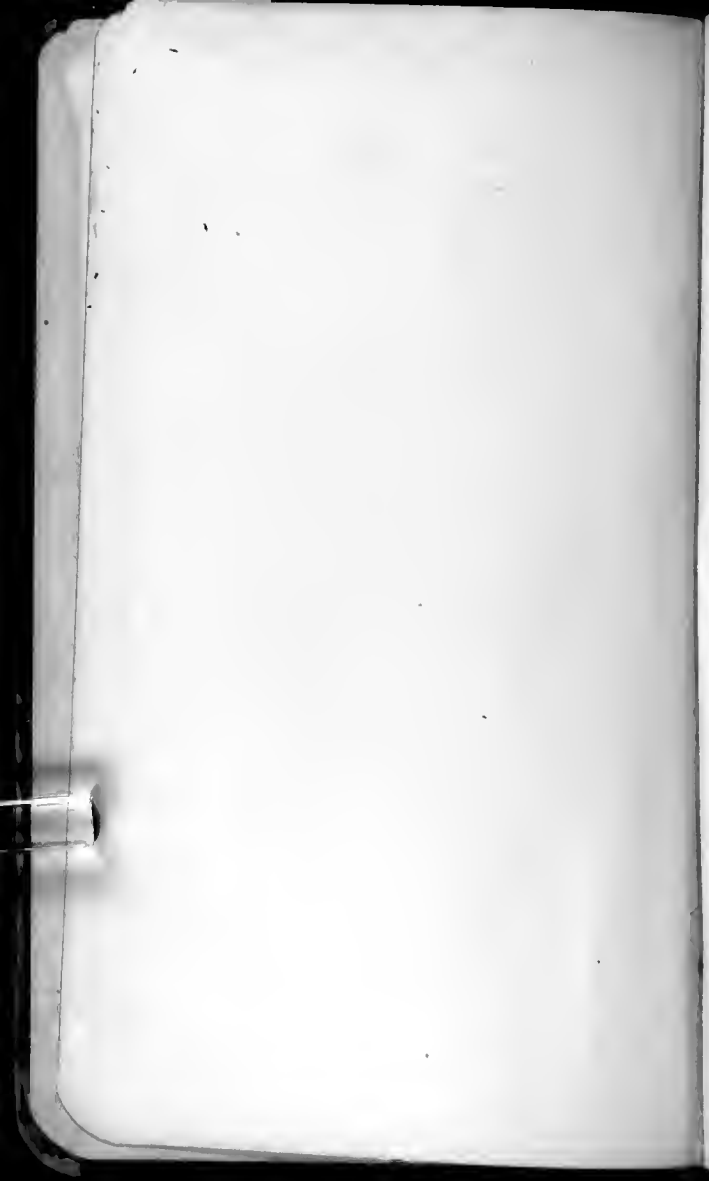
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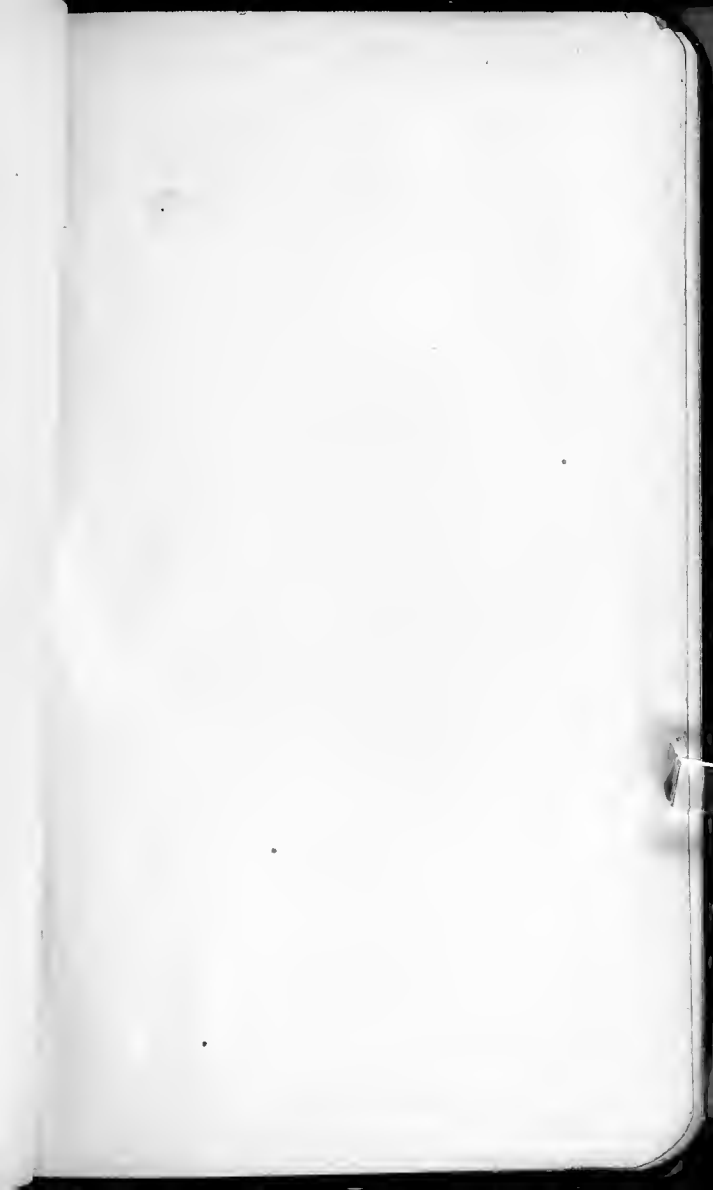
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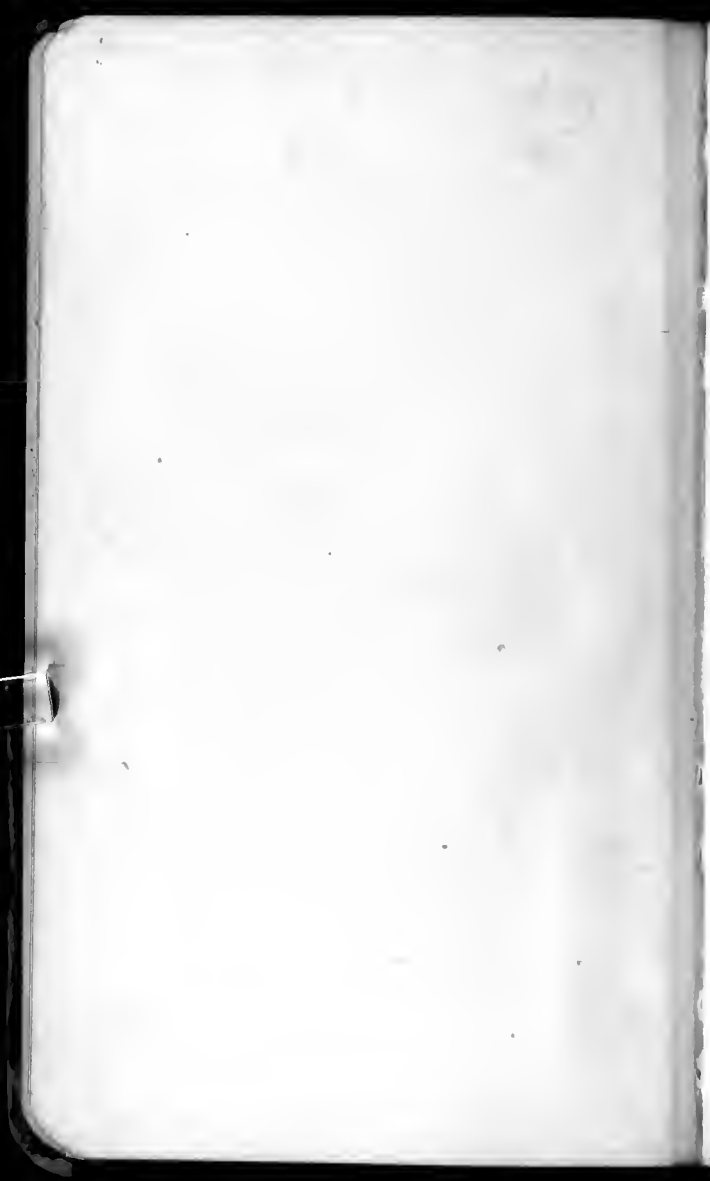
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Charles Schuchert  
Geol. University  
New Haven  
Conn.

August 1913







Toronto August 15 1913

Left back house for Georgetown on the 8.40 A.M. train. Was to meet Williams at the train but he failed to show up. I saw that he left a letter for me at the Hotel and they failed to give it to me.

At Georgetown I saw at the corner of the a small country farm. Williams appears to have stopped at the one above.

ate on the train and turned at having missed the morning train.

See trace from.



Timehouse August 15-1913

Spent the afternoon collecting here and restudying the section. The section is as follows:-

Coarse limestone. A heavy bedded grey crumpled limestone with much fragmentary fossil material. Not a great thickness. Conformable contact but section broken. Basal 2 to 4 inches a basal argillaceous, the shells of the <sup>invertebrates</sup> below, and more or less rounded in the dolomite. The regularity of the strata appears above a high above base.

Thinly bedded grey to light blue and more or less impure (shale) limestone. <sup>weathered, yellowish, bluish-white</sup> Thickness  $6\frac{1}{2}$  feet. <sup>bedded</sup> and a part cut about  $1\frac{1}{2}$  inches for fossils. It is about  $1\frac{1}{2}$  inches. I saw a cast about two inches in diameter of

Sit in any of these 100 + a.

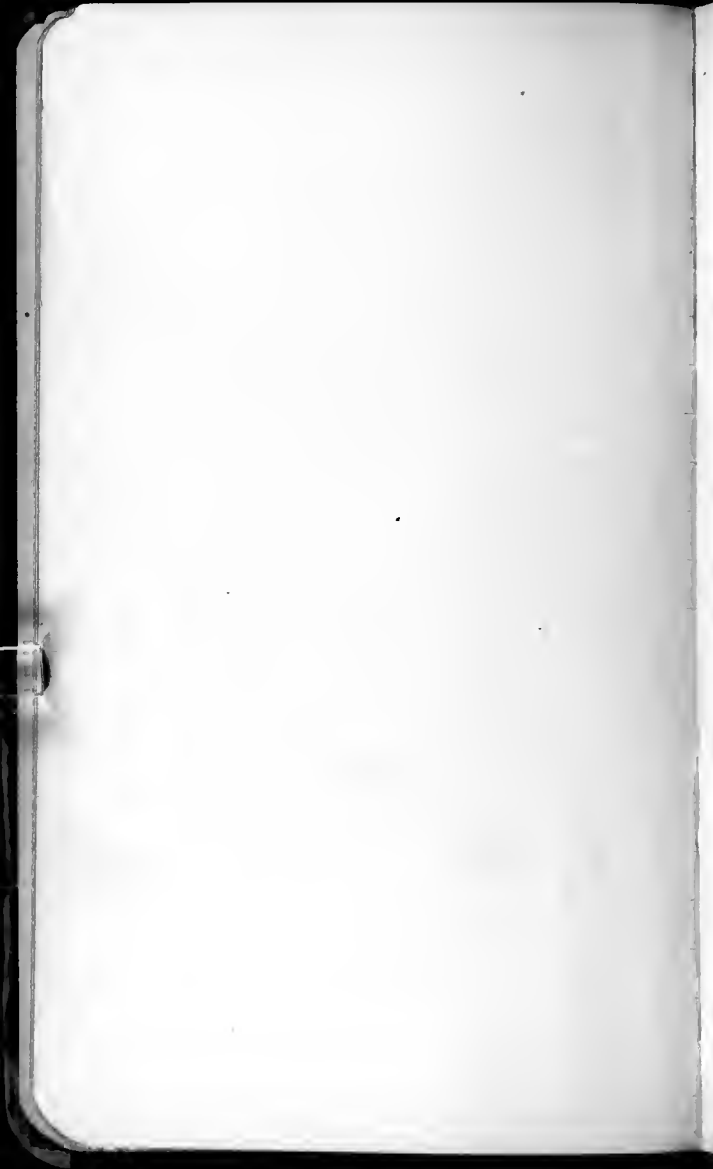
The ancient sandstone Dithmarschen  
 is common in the Wiederstedt. Otherwise  
 collected some sand and gravel, a  
 few Hydra and some Trilobites.  
 Found also some Hydra in the  
 tal at Leibor office. This is also 6  
 feet Trilobites Dithmarschen at the base  
Trilobites Dithmarschen. See Leibor in  
 it has at Leibor use but Leibor in  
 one has found it.

Medina from the absent.

Cataract formation.

At top of Hydra Hydra Hydra  
Hydra. Hydra Hydra Hydra Hydra  
Hydra Hydra Hydra Hydra Hydra  
Hydra Hydra Hydra Hydra Hydra

that are more a Hydra Hydra Hydra  
Hydra Hydra Hydra Hydra Hydra  
Hydra Hydra Hydra Hydra Hydra  
 and Hydra Hydra. Hydra Hydra Hydra



Red and green halos, 1/2 ft. to track. Thickness 5 feet.

Aledo, Ontario.

Aledo is 12.15 miles south west of  
Lindsay, and 2 miles north of  
Wentworth.

Rolling

Clinton 6 feet. In clay, and

shale. The above is the

Clinton. 92 feet. As follows

100 feet, 9 feet.

100 feet, 39 feet. At the same

100 feet.

100 feet, 18 feet

100 feet, 17 feet

100 feet, 1 foot

100 feet, 8 1/2 feet

In the cross bedded sandstones occur  
a small *Urdiopsis*. This is common  
and is the same one that I got at  
the Fort of Credit. *Trochilites* and  
crossed tubular are more especially  
abundant in these upper most sand-  
stones of the *Wainwright*.

Shenandoah August 16-1903

The quarries in the Whitcomb sandstone occur about five miles to the north-west of Lexington.

The Whitcomb sandstone is here about 12 feet thick. The lower 2 to 4 inches are rather soft and irregular and fit into the Queenston shale. About 9 feet of the sandstone is regularly bedded and in the middle might be a shale. As a rule the color is grey, but in places it becomes blotched with red or passes over into a light red color. The upper 3 feet are much more bedded and is harder.

Over the sandstone follow the Clinton shales that here are more sandy and pass into the Catoctin.





The most interesting are the small  
 ones in the variety great. Small  
is, Rhipidomella, is when bridally and  
 delicate is are the only common  
 fossils. is is is  
 or a is is is small  
is and is is is  
is. is is is  
 are more common and is is is

The Queenston or is is  
is is is is  
is is is is  
 the sandstone and is is  
 color. Below we have is  
 with red is is  
is, is is is  
is is is  
is.



Barton Leds. August 17-1913.

William tells me that the Barton  
beds according to C. S. Grant are 83 feet  
thick over by the 18 feet of ~~beds~~ near  
the base of the ~~mountain~~. ~~There are~~  
there are ~~quite~~ ~~some~~ ~~of~~ ~~the~~ ~~beds~~  
that but ~~and~~ ~~that~~ ~~is~~ ~~not~~ ~~the~~  
with the ~~beds~~.

The local Barton beds in the ~~area~~  
are 1/2 mile west of ~~the~~ ~~mountain~~ ~~with~~ ~~the~~  
incline railway.

The ~~local~~ ~~Barton~~ ~~beds~~ ~~are~~ ~~found~~  
near ~~Mount~~ ~~Allison~~  
which is ~~about~~ ~~1/2~~ ~~mile~~ ~~west~~ ~~of~~ ~~the~~  
incline railway.

The Barton beds consist of ~~bedded~~  
sandstone with shaly or ~~con~~ ~~cret~~ ~~aceous~~ ~~beds~~  
and ~~partly~~ ~~is~~ ~~not~~ ~~clear~~ ~~in~~ ~~the~~  
beds. ~~Probably~~ ~~these~~ ~~are~~ ~~heavy~~ ~~bedded~~ ~~quartz~~  
sandstone.

From 6 to 8 miles above the base there  
is an irregular <sup>in local pockets</sup> ~~area~~ showing that  
the sea bottom had not yet become clarified  
due to the Bonaventure shale still being in  
evidence. Above this point we see no more  
shale.

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started on ... street ... the

mountain. At the head of the mountain to  
see the road <sup>up the face to the right</sup> one sees a good exposure of  
through contact with the ... shale  
The contact at base consists of thin  
bedded crystalline, cavernous (fossils) dolomite  
with ... for five feet. In the next 18  
feet there are a few chert nodules and  
then the ... white ... fine grained  
... with chert nodules and  
...

At the base of the ... there is a  
thin ... sandstone, fine grained sand,  
... 1/2 inch to 3 inches thick. On this  
follows a dolomite bed from 2 to 4 inches  
thick, crystalline, ... porous  
and ... shale ... included <sup>up to 1/2 inch in diameter</sup> that are  
derived from the Rochester below. There is  
no transition between the Rochester and



2  
Lorraine as the former is a light blue shale  
thin breccias and readily leaving the <sup>massive shaly</sup> <sup>trifoliate</sup>  
stratification in some fragmentary cliffs.

The R. Clinton-Lorraine contact is clearly  
a horizon one. The evidence is not on the  
physical side and is as well torn out by  
the fauna.

Is the shaly of the Lorraine due to  
diagenetic changes? How in these beds that  
the changes were formed. Also <sup>diagenetic</sup> <sup>changes</sup> <sup>are</sup>  
the <sup>changes</sup> <sup>are</sup> <sup>hardly</sup> <sup>due</sup> <sup>to</sup> <sup>weathering</sup> <sup>con-</sup>  
ditions and is probably due to diagenetic  
and <sup>changes</sup> <sup>are</sup> <sup>largely</sup> <sup>from</sup> <sup>the</sup> <sup>sponges.</sup>

The Rochester shale is from 15 to 16  
feet thick. It comes in suddenly as a shale  
above the very thick bed of Clinton and then  
the same alternates between thin beds of very  
fine grained dolomite and shale that may  
or less is hardened with <sup>some</sup> fossils  
are practically absent in the upper 6 feet  
directly below in a zone of a few inches

As there is no break between the Clinton and Rochester, it seems to follow that the Clinton is the time of sea invasion and deeper water while the Rochester is of sea withdrawal. Under these circumstances the chances are that the Clinton will be more persistent in the various sections than the Rochester. The latter will vanish from the top downward in the sections finally leaving the Clinton.



thick ripple and Trilobite stems  
and some small Trilobites. C. hochepods &  
I see only a few Trilobites. The commonest  
forms throughout the Rochester are similar  
or single.

In at least one zone the Rochester has  
a "jelly structure" layer = sea churning.

The change from the Clinton heavy bedded  
limestone to the Rochester is <sup>also</sup> sudden in  
appearance and yet there appears to be no  
horizontal here. Above the heavy bedded Clin-  
ton there is a shale zone from which to we  
with the old fossils of a thin bedded limestone  
with G. reticularis that is little different  
from the Clinton. This is a thin shale zone  
some 100 ft. or more thick. It is a thin  
stone shales but is a thin bedded. These  
thin bedded rare shale with the inclusions  
and as these do not come from the Clinton  
limestone must be intraformational in char-

Have been two days of No. 1, all  
of this season in the State.

acter. Therefore the phenomenon is in favor  
of our break here between the Clinton and  
Rochester.

The top of Rochester here must re-  
present either all of the top of Rochester  
or Niagara Falls or only some portion of  
the lower Rochester. In all probability it is the <sup>lowest, Rochester.</sup>

The Medina in nearly its full force is to be  
seen beneath the large road cut <sup>about 400 ft. long</sup> <sup>at the head of John Street between the two stone</sup>  
crackers and east of the corner Reservoir  
building. At the top <sup>(Ch. Hill, and all is seen)</sup> about 4 feet of thin bedded  
light greenish sandstone interbedded with shale. Then  
an irregular and broken zone of some 4 to 6  
feet of "broken thin" heavy bedded sandstone.  
The thickness of the sea stone was extensive,  
the caps <sup>is</sup> all the way up to 2 feet deep  
into which the <sup>shale</sup> sand was deposited.  
See for 200 feet of thin bedded sandstone  
alternating with shale. The basal layer is  
about 12 in. <sup>at the bottom of</sup> <sup>the</sup>

This sharp and regular contact is rather suggestive of continuous deposition and all the more so because Leptaena occurs in the basal Medina.

The lentils has a thickness of about 9 feet of thin bedded limestone and a top heavy single bed of  $4\frac{1}{2}$  feet =  $13\frac{1}{2}$  feet of lentils.

Stromatolites in great abundance. Fragments are  
especially abundant.

The contact between the Clinton and Catalpa  
is as sharp as can be. The Catalpa ends in  
fine shales green to 6 to 8 inches and then goes red.  
About 5 feet beneath the contact zone is the red  
shaly Clinton beds. See sketch.

At the head of Westport street <sup>roadway</sup> Clinton  
plane is on the lower contact of the Clinton.  
The Medina thin bedded greenish sandstones and  
shales are exposed along the steps but a short dis-  
tance down. The Clinton comes in abrupt line  
having a sandy argillaceous glauconitic base  
of Clinton the rocks more a less. The sand  
then becomes less, the glauconite and pyrite  
continues into the limestone (more argillaceous),  
and at about 18 inches from bottom occurs  
Platystrophia <sup>in abundance</sup> Medina shale <sup>of age</sup> Medina  
as <sup>and smaller</sup> scarce. The sharp and diverse lithologic  
contact with the difference is fairly marked.  
The contact is with the Clinton.

Angul

Kumbas

26

6-7 Feb.

13

14 Feb.

18

? 12 Feb

78

12

Hamilton

The section <sup>at Hamilton</sup> there is as follows:-

Lockport

Break.

Rochester, lower reds only 15 feet.

Clinton 13 1/2 feet.

Break

Medina About 12 feet. See if correct.

Partially no break

Cataract About 50 feet. (8 feet basal li.)

Millbrook sandstone 8 feet.

Break

Queenston thick red shales.

The Medina one made out not to  
be thicker than <sup>(about 13' or 14')</sup> the base one  
- thick sandstones the three beds together  
making about 25'. Then come green  
shales with some sandstones to the  
Clinton. There is no yellow sandstone here.  
Billings found a small piece of  
- brownish Ammonoites. At  
Hemlock the section is about five feet  
thinner than at Clinton, it seems to  
the highest beds are Clinton.



Lundas Monday August 18-1913

Electric cars for crabs, 15-  
minutes after the time. Left at 2:15.  
Lundas is 5 miles to the north north-west  
of Hamilton. I went to the top of the  
mountain in the high school, about 100 feet  
the sea level.

On the lower quarry level they are into the upper  
Catawack. On <sup>at the bottom of the quarry</sup> seen <sup>is</sup> 10 feet of red shale with  
some limonite bands, and some 11 feet of  
red shale with some slight limonite bands, followed  
by the top of red shale, about 3 feet. Above them  
occur more green shales with harder limonite beds  
interbedded with a further thickness of 6 feet.  
At first I had these as the Medina but they  
are more probably of Catawack time. If this is  
so then the Catawack above the red beds is  
here far thicker <sup>(apparently)</sup> than at Hamilton (18  
inches). It may be better to regard these beds  
as Medina, making the thickness about 12 to 13  
feet.

On Tuesday, a team came over to Hurden  
to see the sandstone at the head of the gulch and  
where the falls are. The thin bedded Clinton sandy  
stone at the head of the gulch and there is 8 feet of it  
exposed by the high head of 6 feet to 16 feet below.

The Medina evenly bedded sandstone can be  
seen on 5/2 feet down to the base of the falls.

The strata were about 1/2 distance from  
the head of the gulch into shale  
material. The thickness is 6/2 feet.

of which is 5 feet.

At the base the Clinton is a little  
with fine white sandstone. The  
shale. As usual, the Clinton base  
occurs in a little distance. Clinton  
Get the shale and the Clinton base  
above the base of the Clinton.

The <sup>at thickness</sup> ~~is~~ <sup>about 8 feet thick</sup> ~~is~~ always fine here with the same  
character as at Hamilton. Below are the thin bedded  
sandstones <sup>eliminated above by the same bed of</sup>  
limestone which here is about 6 <sup>at the Falls.</sup> feet thick. Contact  
below with the ~~beds~~ <sup>was</sup> ~~was~~ <sup>markedly</sup> made out.  
Did not see any Hyattella <sup>or</sup> any <sup>other</sup> trilobites <sup>or</sup> any <sup>other</sup> trilobites  
to occur here (did not look hard for them).

The Rochester is here easily mistaken  
for the Ludlow, <sup>but</sup> <sup>is</sup> <sup>not</sup> <sup>at</sup> <sup>all</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>at</sup> <sup>Hamilton.</sup>  
6 to 7 feet <sup>thickness seen at Hamilton.</sup> <sup>is</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>at</sup> <sup>Hamilton.</sup>

The limestone <sup>is</sup> <sup>not</sup> <sup>at</sup> <sup>all</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>at</sup> <sup>Hamilton</sup> but  
basal conglomerate as at Hamilton but  
the spiral conglomerate <sup>is</sup> <sup>not</sup> <sup>at</sup> <sup>all</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>at</sup> <sup>Hamilton.</sup>

Cataract. At base is the bedded sandstone  
as at Hamilton followed by the same thin bedded  
limestone series. Between 10 and 20 feet above the  
sandstone occur the fine trilobites. This  
is the locality for the specimens.

Notice of ... sandstones  
and the ...  
...  
California ...

As ... the ...  
... of 10' ...  
...  
...

Stoney Creek, Tuesday Aug. 19-1913

A fine cool day to see this some upland  
and exceptional  
silurian section. It is back directly of the village  
of the creek of a stream runs dry. But a step from  
the C. P. R. and a little farther from the electric mill, are  
Quebecton is well exposed at several places  
near the base of the Cataract. It is the charac-  
teristic red shales with here and there a green Cracked  
band.

Whitford sandstone rests in an almost con-  
tinuous bed on the Quebecton. Here as elsewhere the basal  
beds are very and regularly bedded forming up-  
ward into the thin bedded beds, see elsewhere.  
The underside of the Whitford is marked by joggling  
into the semi-cracked surface of the Quebecton.  
The basal beds have seen Quebecton shale inclusions  
as at other localities

of these  
the sandstone is <sup>richly (shaly)</sup> <sup>light</sup> shales  
crystalline and <sup>thinly bedded</sup> green shales with thin  
bands of more or less <sup>thinly bedded</sup> white with fossils.  
Phinella curvica and Leptæna blanda are  
abundant within ten feet of the sandstone.



The layer with the abundance of Medusa near Atata comes in about 30 feet above the Phalipot sandstone.

At the top of the Cataract occur again the red shales with some harder green <sup>shales</sup> finally at the very top remain red and bear trilobes and Delphos.

Medusa. Resting with absolute continuity on the Cataract is a layer of light green sandstone <sup>these are marked by Delphos burrows.</sup> 3-4 feet thick for a distance of one mile in total thickness.

This shows no sign of break other than the first sandstone is 1-1 1/2 inches thick, shale 2 in, ss 2 in, shale 2 or 4 in. The appearance is a sandstone on green shale. This follows for 10 feet variegated red and green thin bedded sandstone. In the middle of this at about mid zone of an <sup>just up the valley at the Phalipot</sup> Delphos will be structure.

Overlying are about 7 feet of light green sandstone that are decidedly cross bedded at the very top in a thickness varying from nothing to about 5 feet. It is again a case of channel sands channeling into the softer dirty sands.

The basal Medusa sandstones are replete with Delphos. See the specimen.

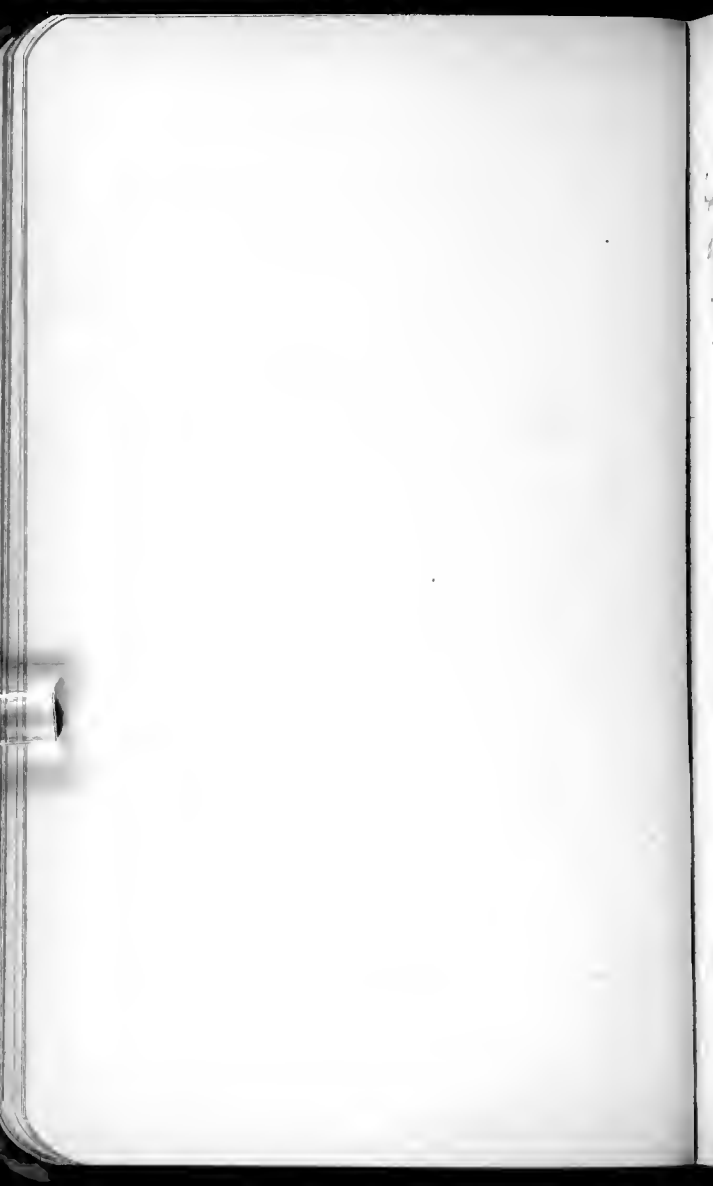
The bottom center is clearly a clean  
marked <sup>decaying form</sup> substrate on the bed in color and in  
place. There is a small amount of the  
sand; usually less than 2 inches. Further  
there are some small pieces of the green  
Madinia sometimes included at bottom.

Eighteen inches above the base there  
an abundance of *P. flavus* and a few  
specimens.



Clinton. The <sup>upper</sup> <sup>part</sup> <sup>of</sup> <sup>the</sup> <sup>Clinton</sup> <sup>district</sup> overlaps the <sup>bedrock</sup>. The contact is more or less conformable but with distinct bottom irregularities. The contact is very marked where the Medina or Cross-bedded. It looks as if there is here 8 to 9 feet of <sup>hard</sup> <sup>bedded</sup> Clinton <sup>overlaid</sup> <sup>by</sup> <sup>the</sup> <sup>bedrock</sup> which here may 4 1/2 feet thick.

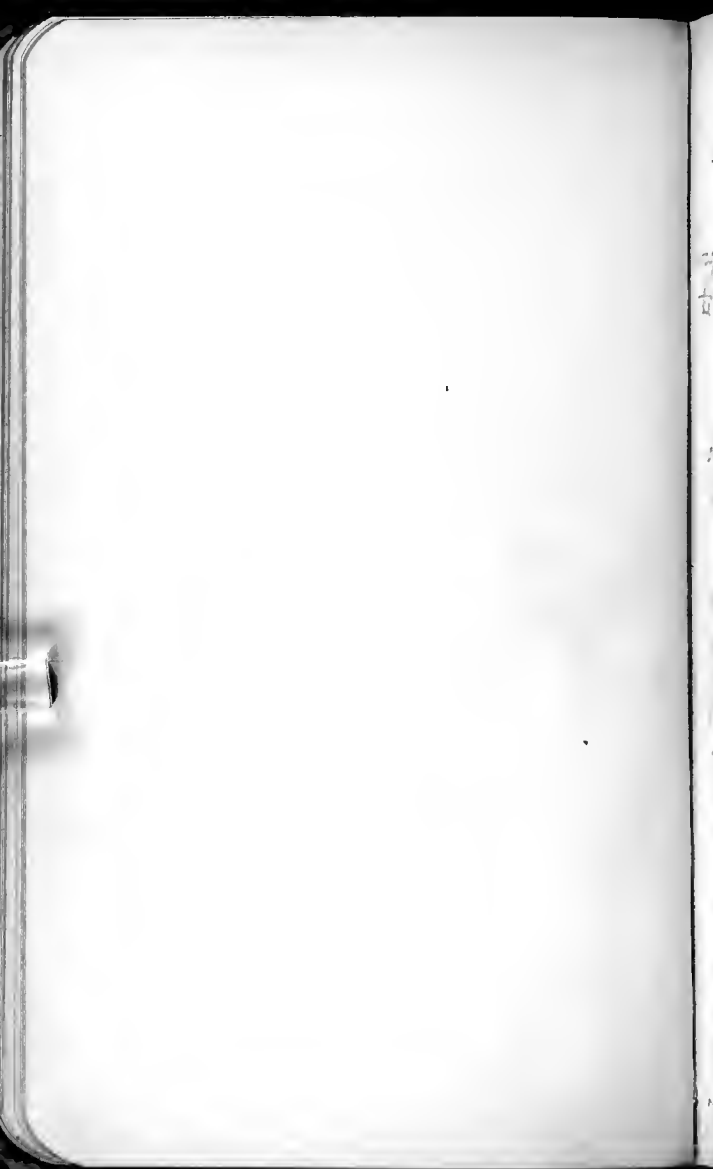
Richston. <sup>no usual</sup> <sup>contact</sup> <sup>on</sup> <sup>the</sup> <sup>lean</sup> <sup>red</sup> <sup>of</sup> <sup>Clinton</sup>. The latter is a hard grey crystalline limestone <sup>bedded</sup> <sup>without</sup> <sup>transition</sup> <sup>with</sup> <sup>the</sup> <sup>bedrock</sup> <sup>above</sup> by the Richston hardened blue shales <sup>reflects</sup> <sup>with</sup> <sup>the</sup> <sup>normal</sup> <sup>aspect</sup>. There may be 26 feet of Richston.



Lookport. The contact is absolutely conformable  
but the lithology on each side of the contact is very  
different. The Rochester Pine Shales are followed  
by thin bedded grey dolomites and all along  
the contact line one can see weathering out  
the iron white sandy basal layer we saw  
yesterday at Hamilton. Could not get at it to prove this.

Here a thin bedded dolomite is <sup>basal</sup> <sup>at</sup> Lookport  
and then come in the chert bearing much  
thin bedded dolomites. The latter preserve  
here about 12 feet.

Top of Mountain.



Grimsby, Ont. August 20 - 1913. Wednesday  
Left Hamilton at 10.10 by electric rail-  
road and got to Grimsby at 11.30. Stopping at  
the "Village Inn" a first class lunch.

The section is along Forty Mile Run.

Queenston shale occurs up the gulch some  
distance. Down the southeast wall we get the  
last continuous exposure of the Silurian.

Whirlpool sandstone rests upon Queenston in  
angular conformity. Under surface of sandstone is  
a fine film in the sun cracks of Queenston. Basal  
four inches with much iron oxide and the green  
shale pebbles of the Queenston occur in the  
basal 1/2 inches. The lower heavy bedded sand-  
stone is 7 feet thick and then follows thinner  
bedded sandstone 2 or 12 feet more.

Cataract not well exposed, but the <sup>thin</sup> occur  
small red sandy shales <sup>and fragments of thin sandstone</sup> and directly upon these  
without transition rests <sup>the</sup> mottled red and grey  
<sup>conglomerate</sup> sandstone in heavy beds. These are  
12 feet thick followed by more than

See post on the Ninth Diastylus emadi  
P. Heringus and St. Lardier's.

11. 1. 1900. Found a nest of the same kind  
as that of June 1899 at the station. It is  
about 18 inches high. One was it  
nest on the west side of the gulch  
but I saw another on the west or  
east side. All the same as the first  
but the nest is in the ground here.

bedded Medina sandstones for ten feet more.

Clinton. The basal Clinton is again highly fossiliferous and the thin bed. have been a thickness of a foot followed by the thick bed of  $\frac{1}{2}$  foot thick. P. elongus. occurs here again about 18 inches above the base.

At the head of the gulch where the falls are one again see the Clinton and very fossiliferous. Here the basal layer is not very fossiliferous with a little shale between it and the Medina below also somewhat irregular but not much so.

Medina. At the falls the Medina looks different from where one sees it further down the gulch probably  $\frac{1}{3}$  mile farther east. At the top one sees sandstones and green shales for about 6 feet. Then a red sandy shale series from 2 to 4 feet thick, followed below by cross bedded mottled sandstones all of which are marked by the translation ripples ~~which are~~. Fucoids & Archaeocyons are rare here. At the abandoned quarries on the side of gulch all is a very little greenish sandstone with





some shales in the upper part, while the lower part is the heavy bedded mottled red and white sandstone.

Rochester. Saw a very large surface of the uppermost Clinton on which considerable Rochester shale was still sticking. It was the correlation Rochester fauna with pieces of Carosaurus erectus. This means that most of the Rochester fauna is also present in the upper Clinton.

For the Clinton fossils are more limestone and hard dolomite. Fossils are common and especially thick in the lower part. The fauna 15 feet above the base is essentially Rochester. Hebertella endura, S. radiatus, Euclyptocrinus crassus, many Hydr.

Section of ...

... ..

... ..

... ..

... ..

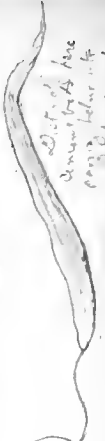
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... ..



Dip of ... here ... into ... shale.

Niagara Falls, Thursday Aug 21-1913.

Left Brimley at 9.30 A.M. after shipping four  
rocks of fossils. Arrived at Suspension Bridge at 11.

Took the Hamilton Trolley line to end just above  
the large section along the N.Y.C. R.R. begins.

We first studied the contact between the Lockport  
and Rochester. Aspinwall had it show the heavy  
bedded crystalline somewhat magnesian  
limestones overlies the cement beds. At the base there  
is a li. has but the smallest <sup>bedded</sup> shale inclusions, there is no  
pyrite, and all in all there is no convincing evidence  
that there is a break here. Beneath the layer from  
place to place there is hard sand shale or even an  
interstratified conglomerate from 0 to 5 inches. In  
other places there is not more than a thin shale  
parting followed below by the 3 1/2 feet bed of pitted  
rocks = mud chert seen below. Clearly then  
they are a layer over with the cement series and  
are <sup>directly</sup> with the Lockport. Then follows below a more  
regularly bedded cement zone about 3 feet thick,  
succeeded by another chert layer, about 3 feet

Just east of ...

about ...

... ..

...



thick.

Am now one of the first reaches but about  $\frac{1}{2}$  mile east of the end of the strike-slip line. Here the contact between the cement beds and the vegetation Rockström comes out very clearly and reveals a very irregular contact, the most marked one seen. The Rockström is very irregular at the top with depressions of three feet and one is <sup>hardly</sup> over a doubt as to what is Rockström, being the vegetation then bedded blue shales. On the top of this irregular surface rests the cement beds and shows all sorts and irregular distribution. We were all down divided in my opinion here although at first yesterday we laid the contact at the crystalline limestone line above. Now this lower contact line <sup>here at Higgarra</sup> one has also cement beds (see illustration) so that after all the lower contact is no better than the upper one. In general we can say that the whole conditions may be coming into deeper waters and that it is in this deepening that brings on strong sea bottoms and from the

I think it best to regard the Cement-Protective  
the rest contact. The upper line is or much like  
than line, the other part is can be made  
of it. In lower one certainly stays in a turbulent  
condition, a near contact, and always a  
line, easily recognized in good exposures. The  
upper line <sup>however</sup> will be more easily found in  
overturned exposures.

From the information standbriar it is  
more probable to be in the Lockhart above the  
cement beds, but in structural points the  
evidence is in favor of being the line  
of the case in the cement series. If a  
break in distribution occurred, then the  
upper part will be more common and  
the lower part will be more common.

While changes were made in the water, the  
 shore and town were in store. According  
 there is no land here or at [unclear], and there  
 for here is the area of the meeting of the  
 northern sea with the [unclear] & Gulf sea.

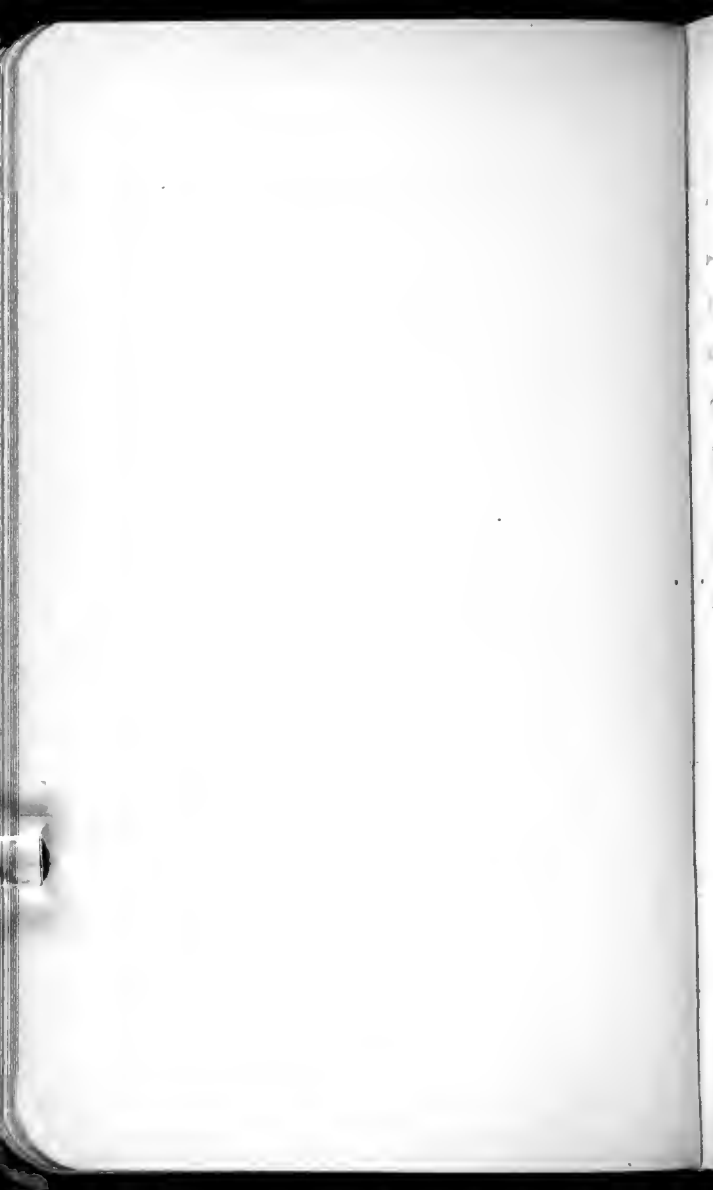
Catawact. Whirlpool sur... days

Over it lies thin bedded fissile blue shales for  
 feet, then a zone of the same color with a few very  
 thin beds of impure dolomite holding the fauna I  
 collected some years ago, about 5 feet thick, followed  
 by more shale of the same color for 10 feet.

I saw 5/11 [unclear] then [unclear] [unclear]  
 got a large [unclear] bed with the tip, the limestone  
 [unclear] [unclear] [unclear] and a [unclear] shale  
 [unclear]. [unclear] [unclear] [unclear] [unclear] L. curvata.

then more blue shales for 5 feet where very  
 then sandstone and red shales of the Medina appear.

I would lay the Medina there, 32 feet above  
 the Whirlpool. It is true that the Medina [unclear]  
 there is no [unclear] between the Catawact  
 and Medina. [unclear] [unclear] [unclear]



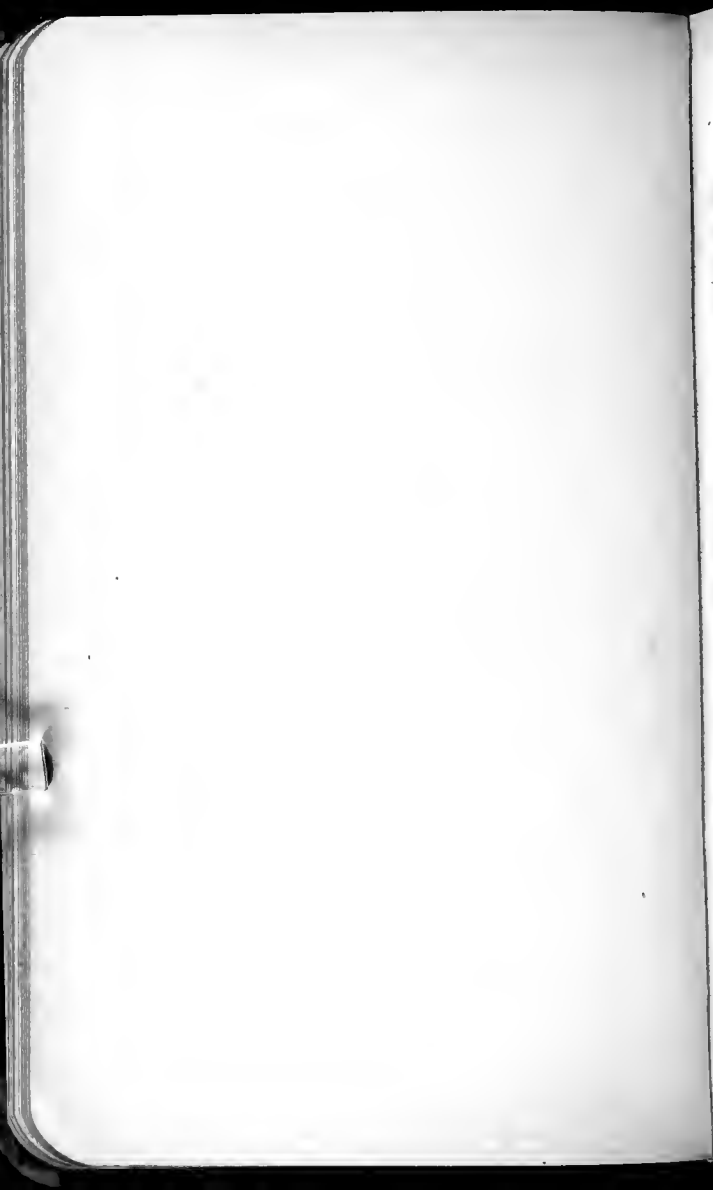


independent character of the sandstone, at the base  
of the dolomite. In an earlier stage, there  
was a thin layer of shale, in  
some places, the sandstone, some is definite  
and remains so, in other the sands were  
scarcely so that the red shales are more  
persistent than the sandstone.

The upper part of the dolomite series is  
upheld with minute shale and small shells  
and many fossils, all well preserved. Some  
Lebertia, Lebertia, Lebertia, Lebertia,  
Lebertia, Lebertia, Lebertia, Lebertia,  
and many, small gastropods, Lebertia,  
Lingula fragments, and Trilobes.

There is a thin layer of shale  
at the base of the dolomite.

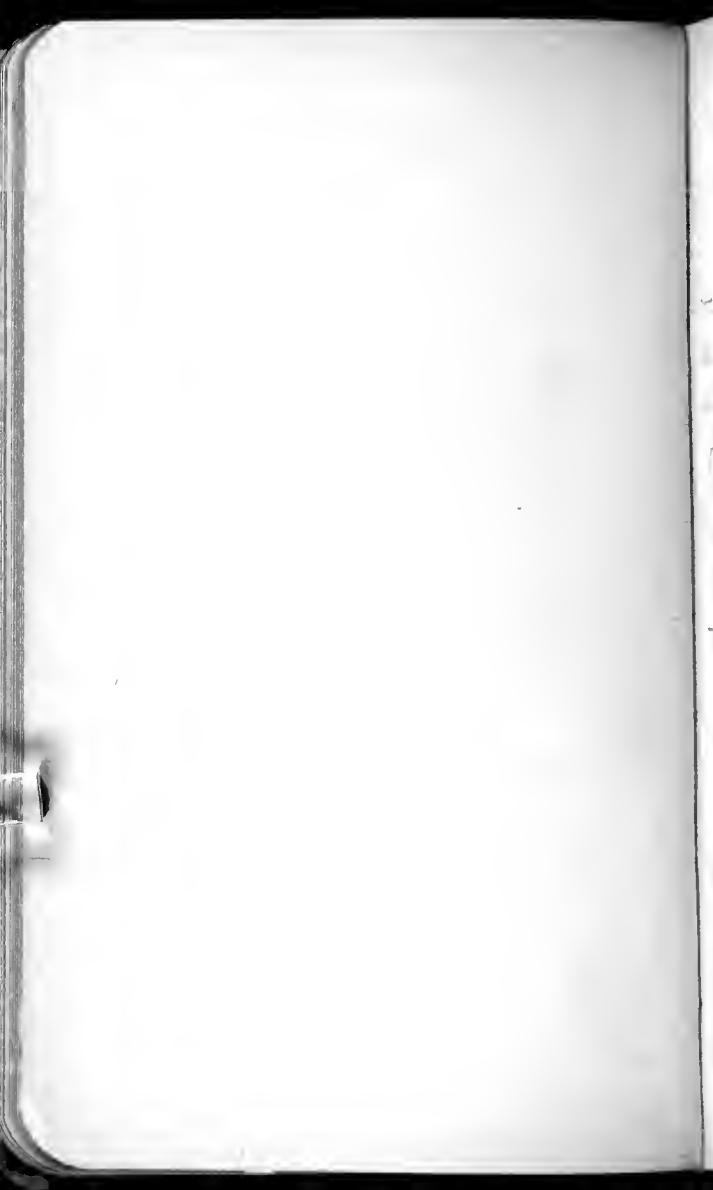
There is a thin layer of shale  
on the west side of the Wolfeburg Peak at Stony  
Brook.



In the Medina there are a few  
groups of oval-bell settings. These are found  
everywhere in the Medina in front of the  
tomb walls. They have a lateral extent of  
less than 100 ft. It is the same with the  
one in the little garden which the tomb gate  
at the Medina is less than 100 ft  
in length.

Went to the Medina at 10.30 am. and  
then to the Medina at 11.30 am.

Left Medina at 5.30 pm. on arrival  
on the Buss's line and then stayed over  
at Liverpool. Arrived here at 10.00



Lockport, Friday Aug 30 1913

Rained all morning.

In the afternoon it cleared some but we started out for the quarries about one mile north of the town. After rain we could all afternoon we finally made out the following section from the lower part of the section and it is seen that the United Indurated Pipe Co. is on the level of the water in the tunnel to the turbine no less about 4400 ft. elevation.

Over the latter lies the white limestone sandstone here also filling in the same level of the Decatur. This is followed by the bedded sandstones. Williams got down over the hill side and made out these thin layers.

The next higher beds would be the shale and no tubes I saw them from the other side of the hill they appear like an alternating series of beds.

This seems to be the main fossil  
designs. L. concata and L. undulata  
are most common. These fossils occur in  
both the same white sandstones but more  
often in the red and even the ferruginous  
beds.

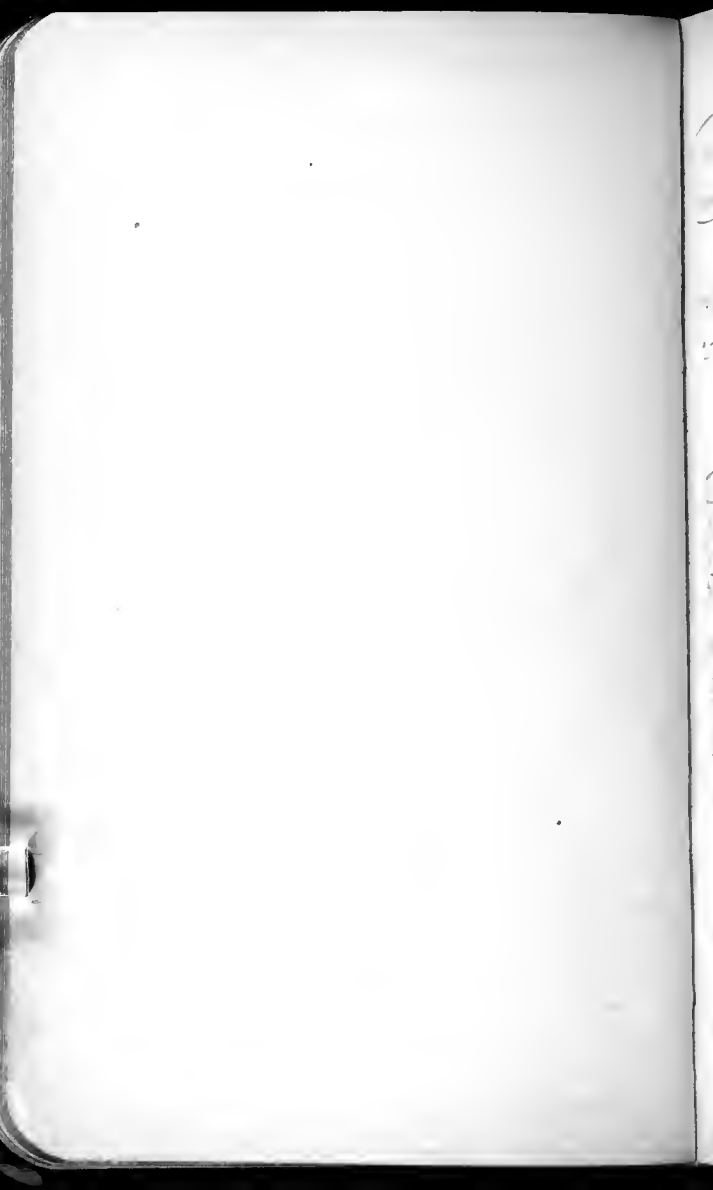
green shale, or ...  
... are essential ... but  
... the ...  
... 10  
feet. Certainly these beds are not red.

Then come in red sandy shales  
and ...  
... in the ...  
... more ...

Then ... layers of ...  
Archimedes ... thickness  
of 30 inches ...  
...  
and it is here that ...  
vanish in a distance of 200 feet.

Over these ...  
sandy shales and ...  
...  
... more ...

At the top is the ... about

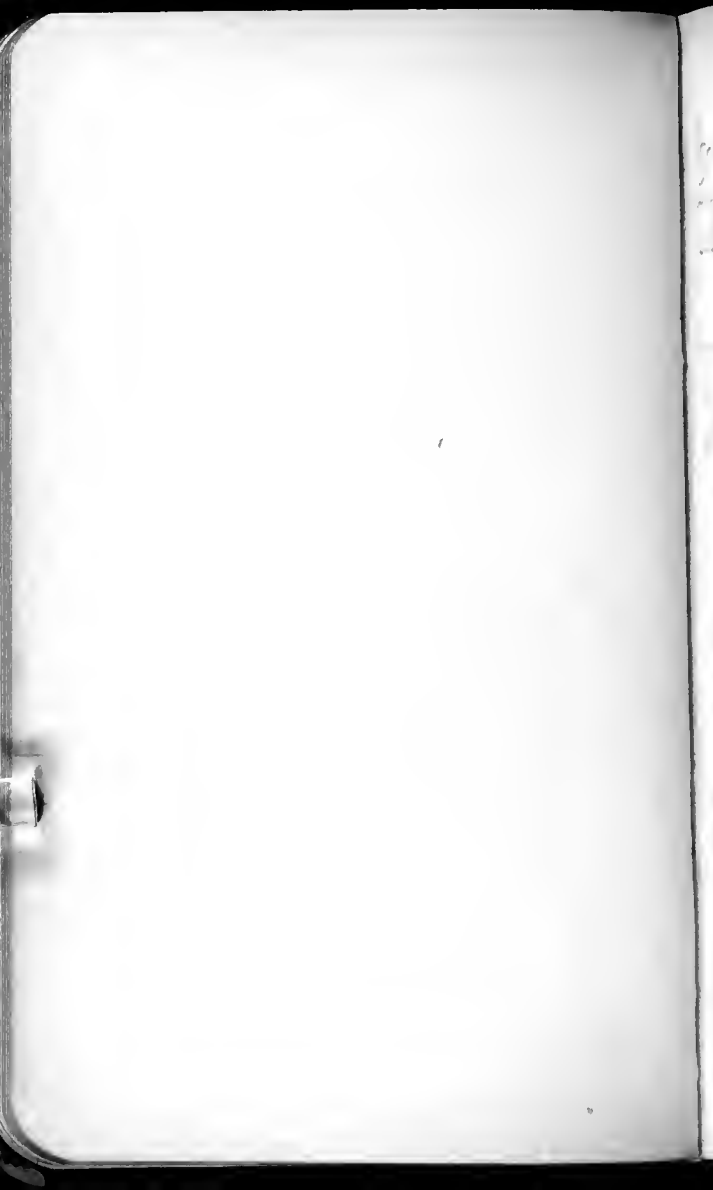




The at of. and as it are one u.  
bar

Accordingly we made up about 60  
feet of bedrock of the same type  
of material as the bedrock

One type of rock is the succession of  
the beds. The beds are in a series  
of shales with clips in the  
strata is the same as the  
strata that we see in the stranded  
beds in a trach marked surface.  
Even so there are some shale beds.  
The red sandstone is full of red shale  
pebbles and has very red and thin  
appears to be 2 or 3 inches thick made up of  
rounded shale pebbles and small is about  
1/2 inch in diameter and is very red  
in color. It is very red and is  
very red in color. There is a  
ferrous iron beds that to the appearance  
is like the iron beds of the Clinton



On a conglomerate of red shale pebbles,  
Lingula fragments and tiny trilobites are  
superficial with few crinoids.

The Medina sandstone, more especially  
near Lockport is a series of sandstone  
layers, thin bedded, alternating in color  
shale etc.







Above the section is at the top thin bedded red sandstone with shale partings for 10 feet. Above these are more than bedded <sup>beds</sup> instead of the same kind in at 15 feet and then the first seen above the <sup>is at level of</sup>. Below are white sandstone thin bedded above with one or more thin shale zones and then heavy bedded sandstones. One sees what here but there are at least 20 feet down to the level of the creek. At the top of the <sup>is</sup> regular concretion is common. They also occur in the <sup>is</sup> fine part of the thin bedded red shales and sandstones.

In the distance below the white sandstone I could see about 5 feet of Queenston shale down to river level.

Above the Falls one sees the upper red sandstones and sandy shales through a thickness of 10 to 20 feet. Near the top of the 30 inch zone of A. c. dimidiata while throughout the main we see more or less of A. dimidiata.

As I did not see the large band saw no Dictyonites or fossil fern cracks.

This is a little piece of the ... some sand and less of lime, ... of these ... The ... is decidedly ... It is ... This ... contains some ... fragments of ... The ... show some marks ...



Rochester, Sunday Aug 24-1913.

Just below the Driving Park Bridge one has a fine view of the entire Clinton, and most of the Medina.

Resting directly upon the bedrock of the Medina and without base rock is the Jodus shale here 24 feet thick. This is a green shale derived almost entirely from the same source.

Ferracville iron ore = 12 1/2 ft thick. Toward the base of the Jolcott limestone, iron nodules are recognized as an irregularly distributed mass of iron ore.

Jolcott limestone. A series of green or blue bedded limestones that come in sharply over the Jodus shale, including the iron ore bed. 14 feet thick. Toward the top the limestones become thin, and more than will partings and rapidly change into the Williamson shale. 21 ft.

Williamson shale here 24 feet thick. The lower part of this shale (Pomoretta bed) is 12 feet thick. The upper part is 12 feet thick. The lower part of this shale is 8 feet thick. The division of Ammonoites clintonia and Pomoretta clintonia. 3 ft forms the very common



Indisguant limestone. There is a complete transition  
from the Williamson shale in that thin bands of limestone  
appear at the top of the latter, and the limestone becomes  
more and more dominant and in thicker beds upward  
throughout the Indisguant. Finally at the top there  
is a first a mass of blue shales and then comes  
in somewhat sharply the thin limestone series of  
the Rochester shale. The thickness is 18 feet.

Clinton <sup>red</sup> lenses. Just below the Living Pass bridge  
on the east bank one sees one of these reefs. It begins  
down in the Indisguant about 5 feet and extends  
not more than 3 feet into the Rochester. Have  
a photo of it.

Top of Medina. There is an absolute sharp con-  
tact between the <sup>(5 to 7, thick)</sup> Living Pass and the  
Jocles shale. I stuck my knife in at the contact  
and found it to be as sharp as can be. On one side  
is the white sandstone and on the other fine grained shale.  
Below the reef and are heavy beds of  
red <sup>impure</sup> sandstone more or less mottled. These have  
markings of Centronites, archimedes

Mrs. J. na

my hand

4 Feb

return of ...

16

... ..

30

---

50

Queenston,

Post ... ..

40

... ..

10

Post ... ..

---

50

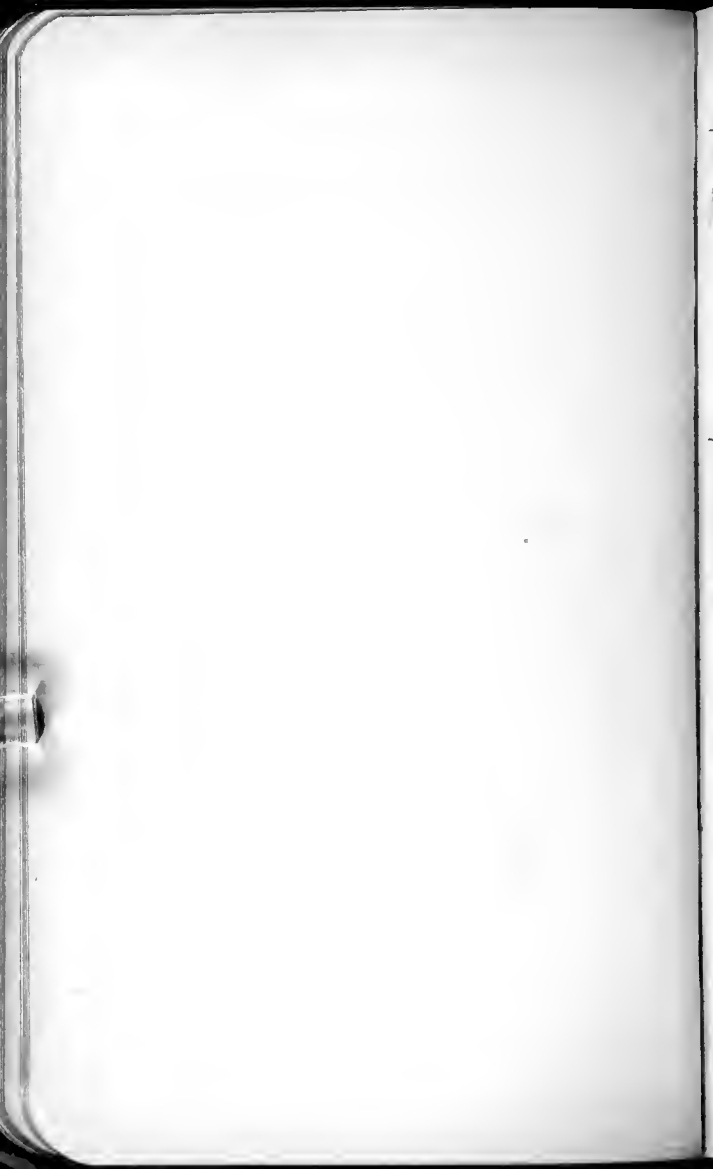
in the lamellar form. A. barlane also occurs.  
 Thin mottled sandstone with many small pebble  
 inclusions is about 6 feet thick. Below it appears  
 still dirtier mottled  
 red sandstone at 100 feet. One sees the A.  
arch rocks forming in all of the sandstone down  
for 25 feet beneath the grey band.

At about from 25 to 45 feet beneath the top is  
 a mass of decidedly heavy bedded sandstone that are  
 much un bedded. Among the grey is  
 no Orthophychus though they may occur now  
the top where there are them is at the top  
of the grey is at the top of the grey is at the top

Beneath for about 40 feet sandy or less beds are  
 when another grey stone zone (tending to be shaly) comes  
 in for a thickness of 10 feet.

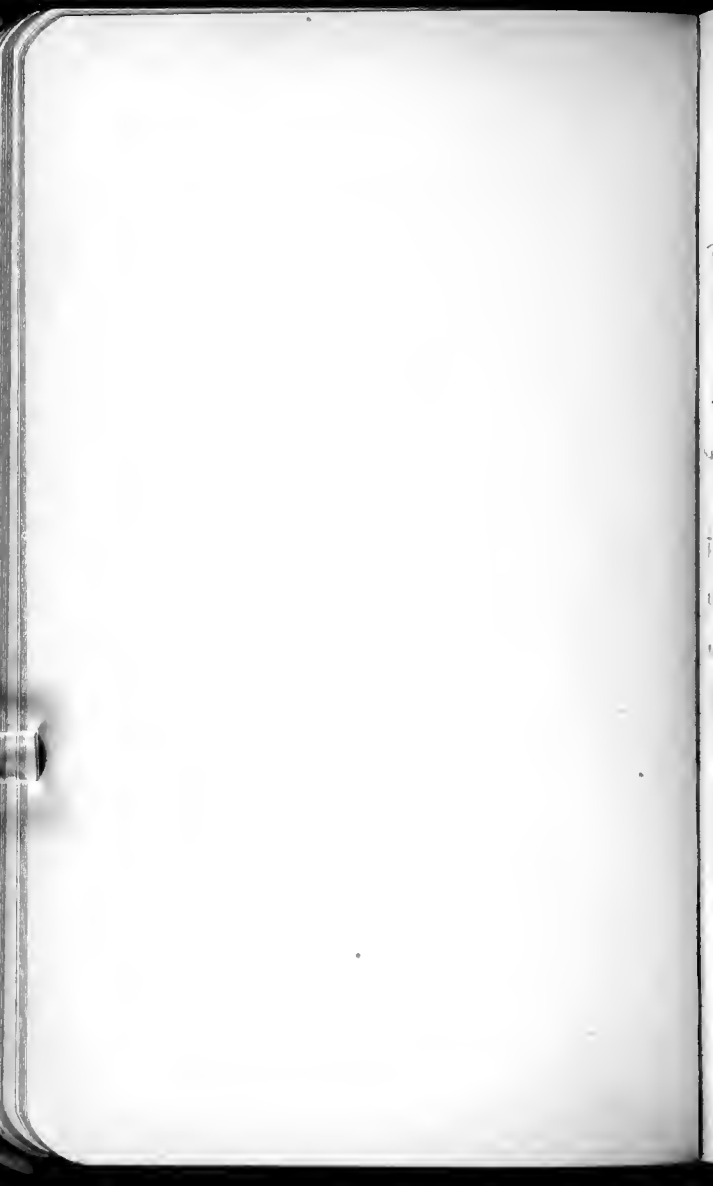
Charles says at 31 feet is at 31 feet is at 31 feet  
 while that is at 31 feet is at 31 feet is at 31 feet  
 certainly at 60 and 95 feet.

Foot of the grey is at the top of the grey is at the top  
 to be upper face of the grey is at the top of the grey is at the top  
 to be seen in contact between the red part and the grey part  
 I could not get near enough to make out the  
 nature of the contact but no crystal rocks  
 cement has been seen here. There is no crystal rocks seen here.



To be a better transition here than at Niag-  
ara Falls. Howson Huetzel states that the  
resol bed. are irregular in deposition, will see  
these beds in the morning.

Richards hole here is from as 85 feet  
high and as 80 feet at Niagara Falls.



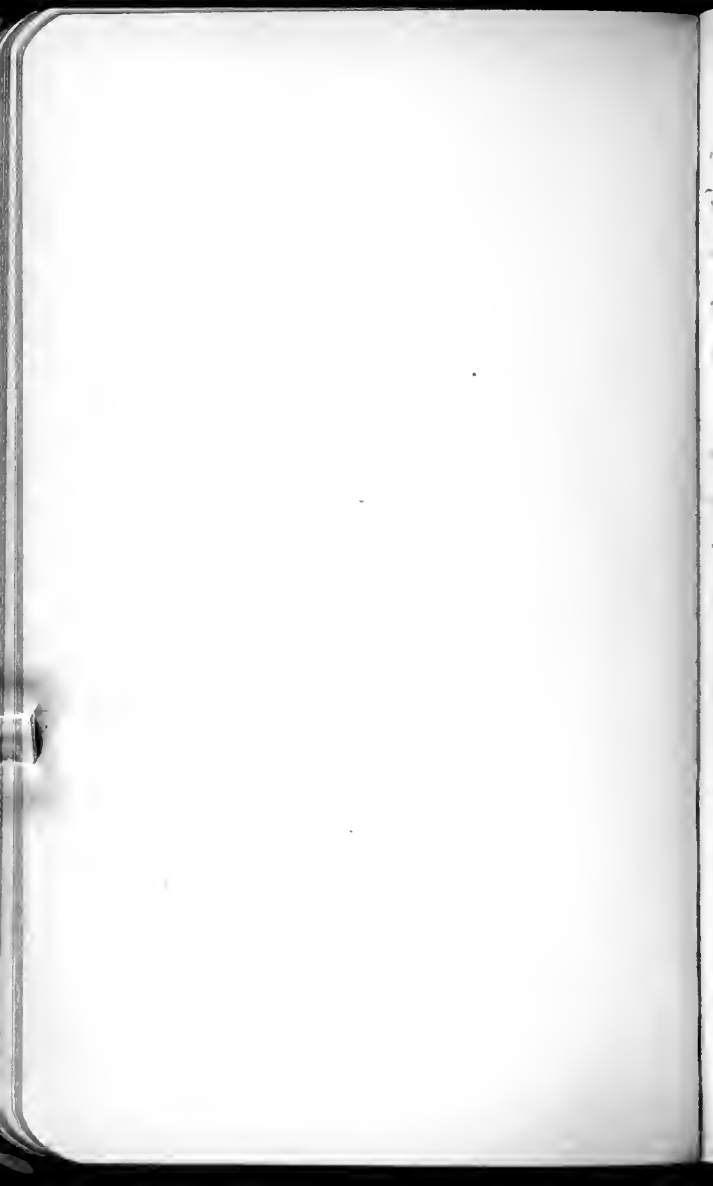


Rochester, Monday August 25 - 1913.

Returned to the Lower Falls of the Genesee to make out if possible the contact between the Medina and the Queenston.

It is now clear to me that the LeRoy bedded, much cross-bedded <sup>coarse</sup> sandstone makes the base of the Medina. This sandstone is of very coarse material, much coarser than any sandstone beneath or above it. It is also <sup>well</sup> bedded and in two places I saw on the river side, gullies into over-casts of the Queenston.

The Queenston starts in under this sandstone as a <sup>thin</sup> <sup>bed</sup> <sup>of</sup> <sup>fine</sup> <sup>grained</sup> <sup>sandy</sup> <sup>and</sup> <sup>mica-</sup> <sup>eous</sup>. Within three feet of the top there may be a <sup>very</sup> <sup>conspicuous</sup> <sup>bed</sup> <sup>of</sup> <sup>fine</sup> <sup>grained</sup> <sup>sandy</sup> <sup>and</sup> <sup>mica-</sup> <sup>eous</sup> <sup>may</sup> <sup>come</sup> <sup>in</sup> <sup>at</sup> <sup>any</sup> <sup>depth</sup> <sup>rather</sup> <sup>down</sup>. In any event none of these <sup>conditions</sup> persist but change <sup>rather</sup> <sup>within</sup> <sup>one</sup> <sup>hundred</sup> <sup>feet</sup> <sup>into</sup> <sup>the</sup> <sup>arenaceous</sup> <sup>shales</sup>. In general one can say that here at Rochester the Queenston

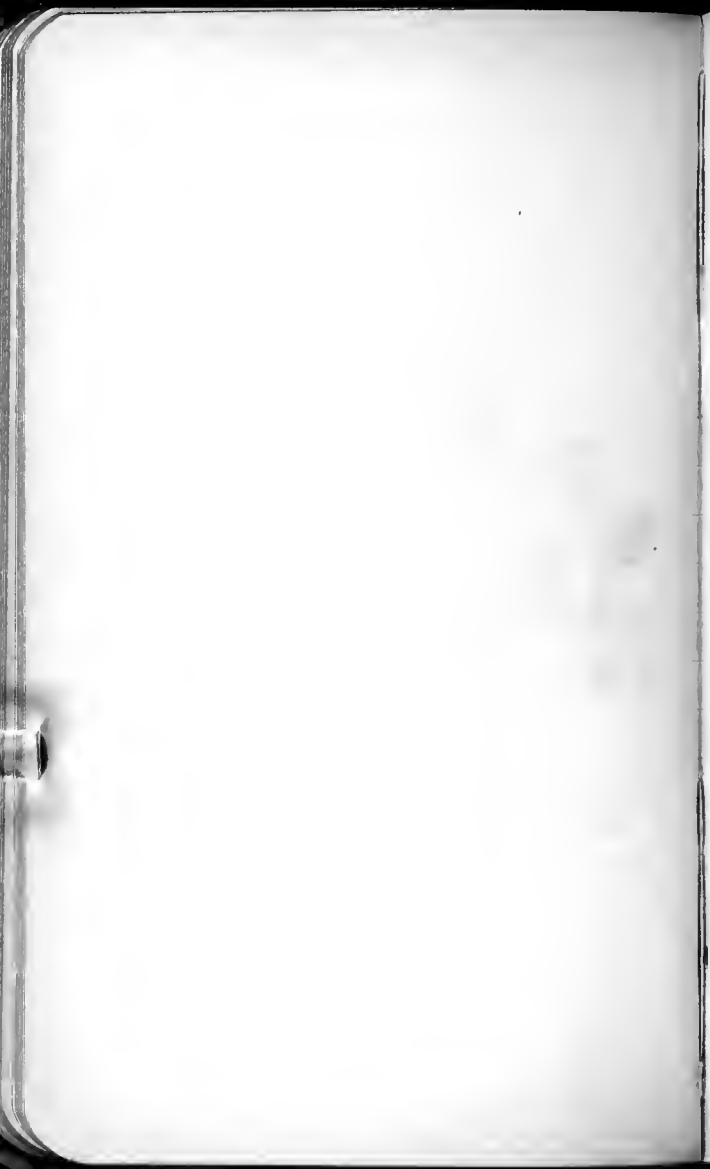


n of the same general character as at Queens-  
ton but more sandy, tending to go more and  
more into sandstones. This is in harmony  
with the character of the lower, as  
sandstone in Richmond age.

The Queenston shales have real sinuous  
irregular, much saucer'd and slicken sides (as  
when in shales, not in sandy shales), some  
tunnies but these are not at all of the  
character of the *Arthropods*.

Medina. The basal sandstones (bedded?)  
are made of coarse sandstone, coarse grained and  
Basal coarse grained sandstone bed. Regu-  
lar bedded, thin, thin bedded, and  
duply bedded. One bed 5' at top  
and 2 thick bed 3' at thick, also much  
cross bedded.

Then irregularly bedded coarse grained  
sandstone 8' at thick Top of ? Medina.  
Regularly bedded, thin bedded, lighter  
colored sandstone, with shale partings,



with some shales at the top,  
x about 15 feet thick. A. barlowi es-  
sentially occurs in the zone 2 of zone 2 at 100  
feet. Small semi-circular at least in the  
upper 2 feet.

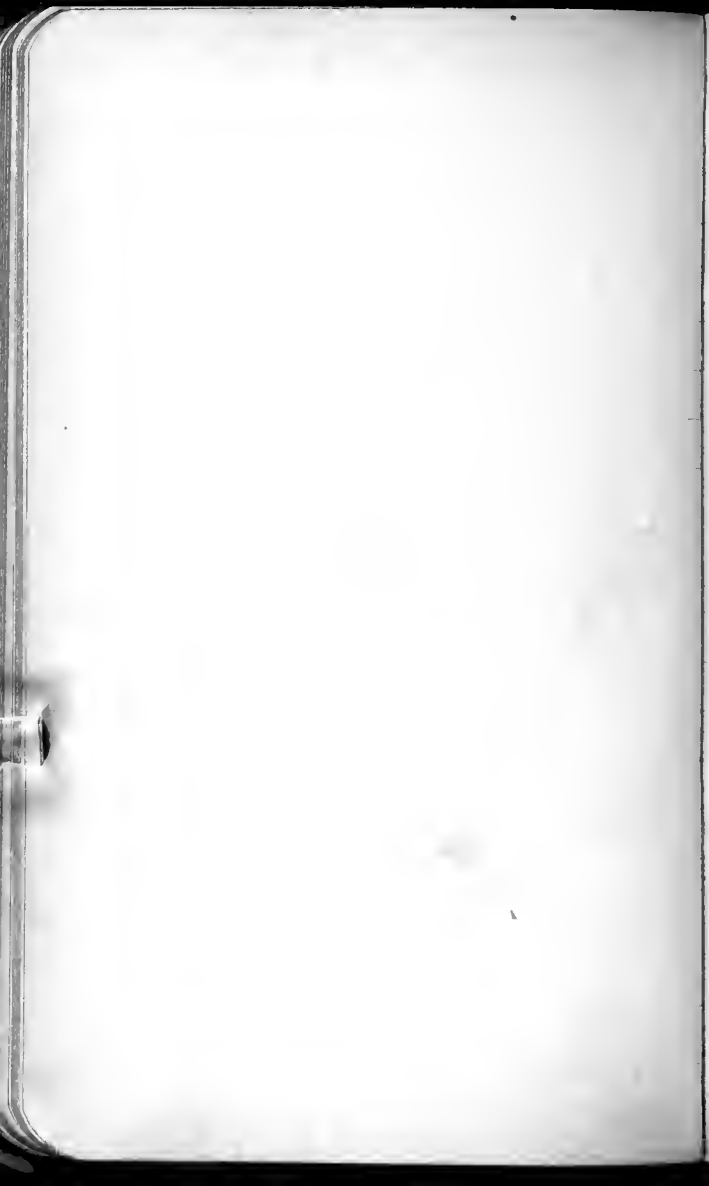
There is a very well developed zone with  
less dominant shale units which  
are generally characterized and are marked with  
a number of small units, these beds are all marked  
with green stratification or alteration etc.  
About 15 feet.

Bry Band not over 4 feet thick.

The top of the band is in no way 50  
feet thick. These beds cross are characteristic.

General contact. In the general  
on North London Street we see a fine stratification  
through the Proctor shale, are marked by small  
(are) about 1 foot of red stratification.

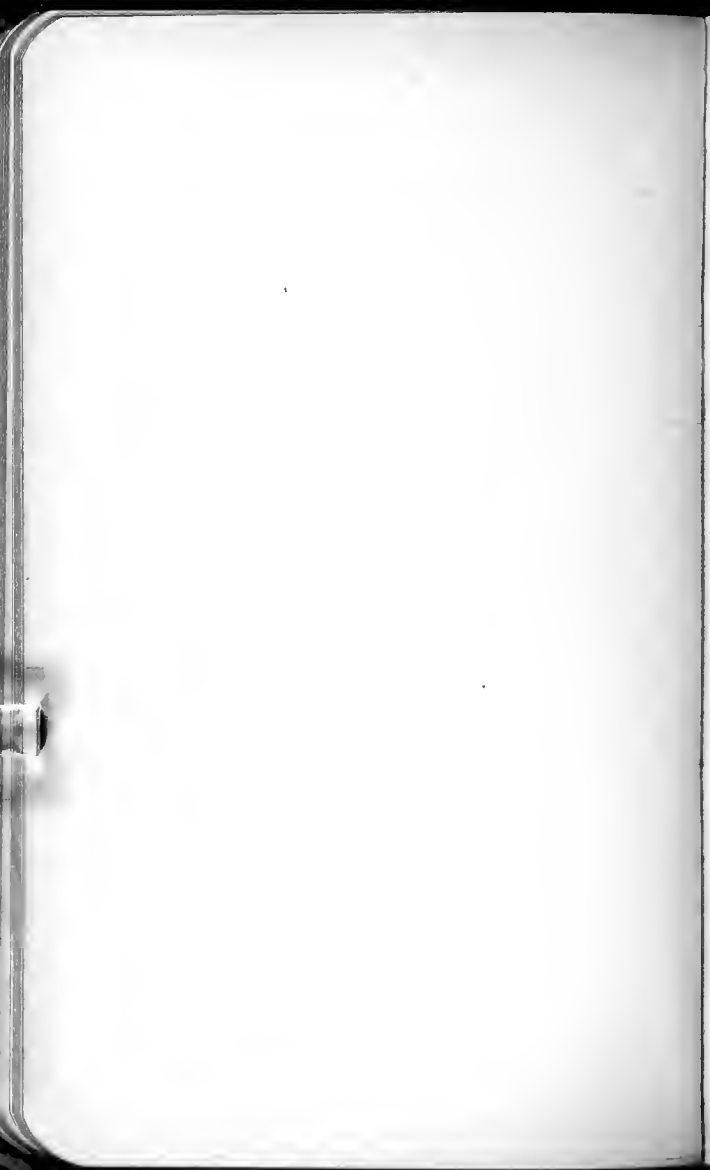
The top of the Proctor is wavy irregular  
the extent of at least 4 feet. Then it follows a  
well differentiated layer of about 2 to 3 feet, all



them into irregular masses and in places into  
round balls, <sup>which</sup> <sup>is</sup> <sup>the</sup> <sup>most</sup> <sup>common</sup> <sup>form</sup> <sup>in</sup> <sup>the</sup> <sup>depression</sup> <sup>and</sup>  
bituminous <sup>thin bedded</sup> sand shale filling the depressions and  
the <sup>irregular</sup> bedded, laminated in appearance,  
fine grained <sup>brittle</sup> sandstone. There is no doubt  
that the section is here broken, and that the  
irregular layers go with the <sup>contact</sup> <sup>point</sup>.  
Have a piece of <sup>irregular</sup> sandstone above the  
irregular layer.

The sand <sup>is</sup> <sup>of</sup> <sup>medium</sup> <sup>grain</sup> <sup>and</sup> <sup>the</sup> <sup>beds</sup>  
become a fine grained <sup>and</sup> <sup>dense</sup> <sup>and</sup> <sup>compact</sup>  
sandstone. All of this is <sup>of</sup> <sup>the</sup> <sup>same</sup> <sup>age</sup> <sup>and</sup> <sup>the</sup> <sup>same</sup>  
beds have no fossils of any  
kind.

The same thing is <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>  
Rochester and <sup>is</sup> <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>  
at Rochester, <sup>and</sup> <sup>is</sup> <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>  
is. The best of evidence for a <sup>short</sup> <sup>time</sup>.  
As usual the most striking contacts <sup>is</sup> <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>  
seen, <sup>is</sup> <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>  
and certainly but a few grains at <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup> <sup>at</sup> <sup>the</sup> <sup>same</sup> <sup>place</sup> <sup>as</sup>





Left Plover Hotel at Rochester  
at 6.55 for Albany. Will  
stay overnight to take the boat  
on Tuesday morning.

Went to Albany at 12.45 P.M.  
and got in home hunting around the  
about for the night. Traced at least  
six places and finally got into the  
Ten Eyck Annex. A very nice  
at 10.0. Summer tourist price  
in trouble.

Albany N.Y. Tuesday 26-1913

On the Hendrick Hudson line to  
Hudson at 8.30. New York at 10.45.  
Had dinner at the Hudson Hotel  
and to New Haven at 8 P.M. Home  
at 10.15.



West Chester, Ohio.  
September 20 - 1913

Had the use of Jimmie Kubijs auto to West Chester station on the Big Four Railroad, out of Cincinnati about 20 miles. Visited this place to see the contact between the Mount Auburn beds of the Mississippian and the basal beds - Arnheim of the - of the Richmondian.

The exposure is a fine one, but just north of the station a cut nearly 500 feet long and nearly 30 feet deep.

From the geological side no one would judge that two formations are here separated and certainly no one would look here for a time break. All is a series of blue then bedded limestones interbedded with shales of which the latter makes up more than one half.

At the base of the section, the

The tibiae zone has also commonly  
Rafinesquina alternata mesuta. I am not  
certain of their occurrence for they may occur  
a little lower. From the strata association I  
should say they are very near the base of the  
Auriferous, having descent to lower levels.

Mount Auburn beds have more limestones than the Ripon group. One can say that in general the Mount Auburn becomes more and more shale and that finally in the highest five feet all is practically a blue shale. In general the section may be described as follows:

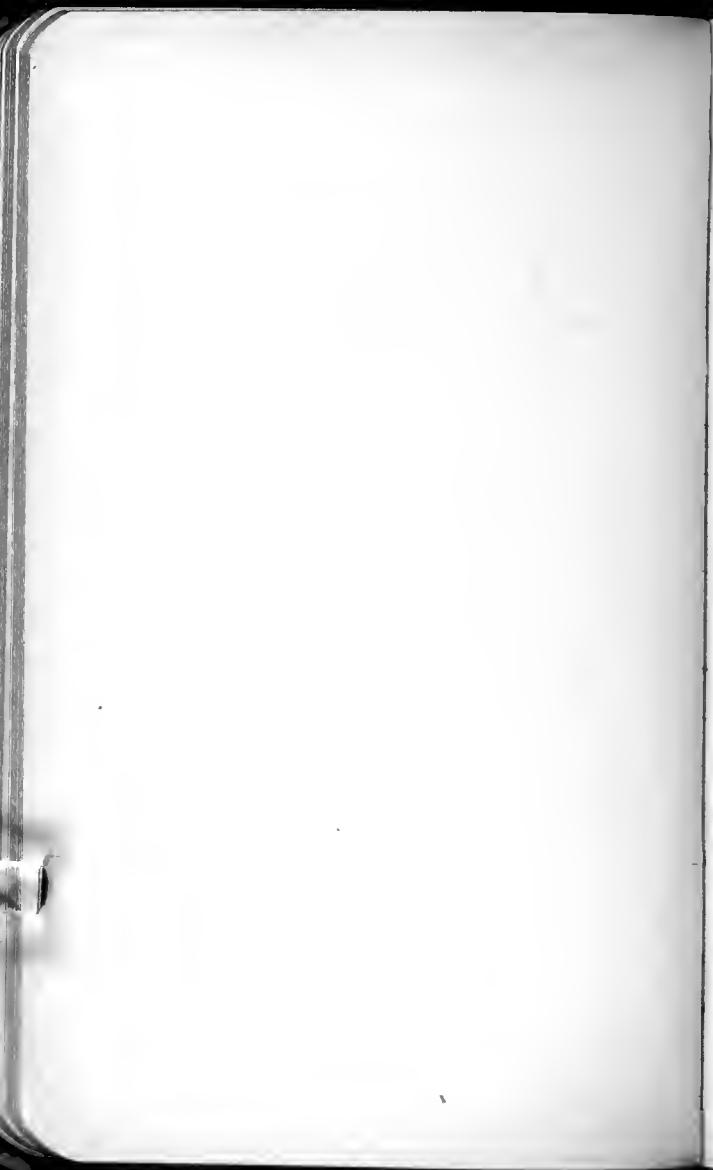
Archeim 8 ft. Archeim. Decidedly fissile, more than bedded, with shales, etc. with more li. than sh. Definite with *Lygonia* and one zone just below center with *Trilobes*. 8 feet.

---

Mt. Auburn 18-19 feet heavy-shaly limestone with fossils - 3-5 inches

all soft blue shales. 2 feet  
 Li. 2 to 2 1/2 inches  
 Mass of blue shales. Some thin li. 2 1/2 feet.  
 Blue shales, with more and more li. downwards. 9 feet.  
 These beds contain some *Platystrophia* *hex.* (R. further a shaly region, other but with scales of li. with the base, standing like saucers on edge.)

Blue shales and thin bedded limestones about half a mile. Most of the fossils collected are from here. 5 feet.  
Platystrophia occurs here like those found to get on Vine Street Hill.



The contact does not show a decided  
break but does show a change in sedimentation.  
The Onit Auburn beds become more and more  
shale and finally all shale <sup>at the top.</sup> Sharply upon  
the shale and but slightly irregular appears  
a blue sandy (very fine sand), shaly limestone  
devoid of fossils, a bed from about 3 to 5  
inches thick. This is all that one sees in  
the physical change, and the fact that there  
is also a much limestone deposition as in  
the Onit Auburn at the level goes to  
show further change and shows rather than  
had seen the conditions such as in the  
Auburn time. There is however here a  
marked change for now the *Bryozoa* are  
of different species, there are new *Trilobes*,  
and *Cyrtolites* <sup>and *Cyrtolites* disappear</sup> and  
at least but otherwise one sees no *Trilobites*  
or other members of *Trilobites* to call  
attention to here in a *Trilobites* con-  
dition.





It is therefore plain that a marked  
change had gone on here and locally the  
fauna may be interpreted two ways. First  
that Anthonian <sup>time</sup> began with deepened waters,  
opening of new sea ways with the immigration  
of a new fauna, the Richmondian fauna.  
Second that in Ant Anthonian time the sea  
had moved going into land conditions, and  
in Anthonian time there was a re-invasion  
of the sea. From local conditions I  
prefer to adopt the former view and to  
hold that here in the <sup>local</sup> <sup>fauna</sup> the  
Meyersvillean sea continued whether at  
Richmondian time.



# Letamon, Ohio

September 22-1913

Again had the use of Huber's automobile for the day. Got to Letamon at 9.30 A.M. after a 26 mile drive. Came here to see the contact between the Grant Linton and Ansheim formations.

At the north end of the village of Letamon is Reservoir Creek and it is along this stream that the following observations were made.

Did not succeed to positively locate the contact zone as no limestone seen was of a sandy nature as at West Chester. This is evidence rather for continuous deposition than otherwise.

On going up the Reservoir Creek I saw about 5 feet of thin li. with shale below the Rafinesquina ponderosa beds. Then these li. beds of 2 feet thick in which I saw no P. lynx. Then the P. latystrophia lynx beds of more shale than li. with a thickness of 5 feet. This zone is wonderfully rich in thin shells, 99% of single valves and many

Top of level.

Arnsheim  
18 feet seen.

Higher Arnsheim 7 feet.

Blue shale with increasing amount of li. beds.

*P. adonogone*. 3 feet

Lower Arnsheim mainly blue shale  
About 8 feet thick

big break in  
the section

Arnsheim  
23 feet seen.

*P. prodorsa* beds.

Li. and shales. Blue  
About 11 feet.

*Rapinogone prodorsa* beds.

*P. prodorsa* in abundance in  
the li. beds. Each from 2 to 6  
inches thick.

*P. longi* beds 5 feet thick.

Blue shales replete with these  
fossils, tending to make limestone.

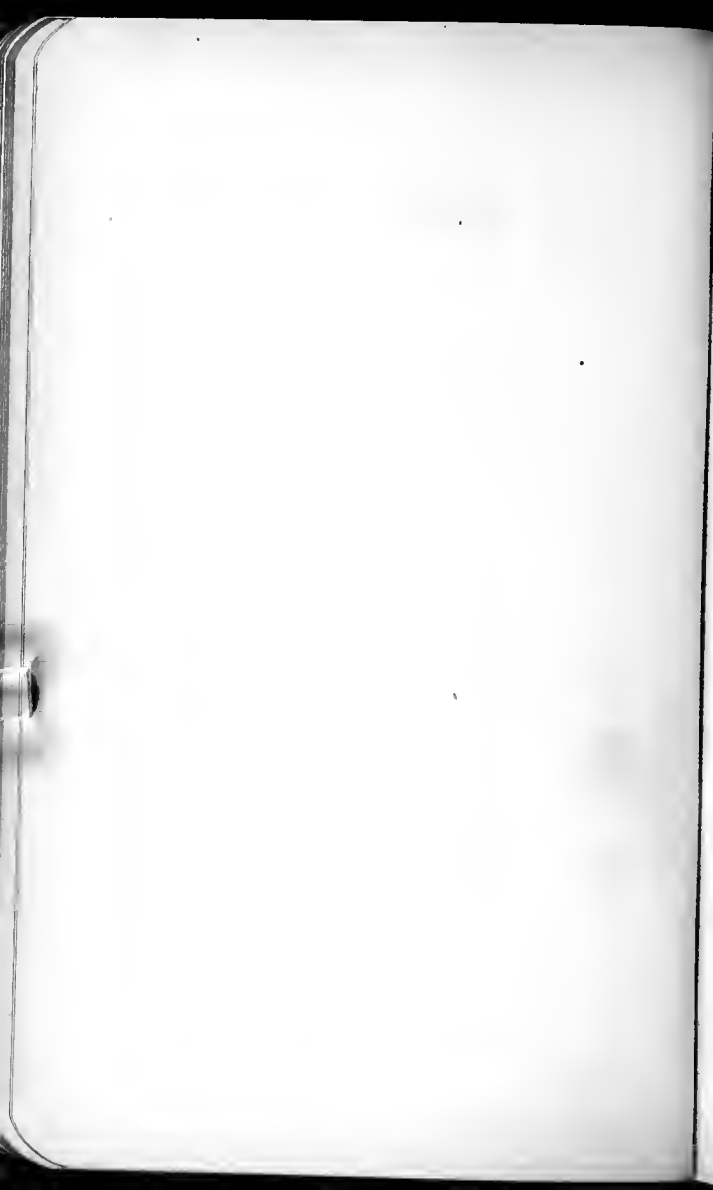
*P. prodorsa* beds in profusion.  
2 feet thick

Li. and shales  
About 5 feet.

mud more and more almost smooth. Orthis  
sinuata and R. ponderosa also occur here  
but the P. lynx make up 95% of the fossils.

Higher come in blue shales with more  
li. and in thicker beds than below for about  
11 feet. The li. are replace with R. ponderosa  
and here they usually occur piled together  
like saucers stratum on edge. This same  
species also occurs in the shales but here in  
far less abundance. In other words when  
R. ponderosa has clear waters they come in  
great abundance as to make li., but when  
the water is muddy they are far less nu-  
merous. On the other hand P. lynx grows  
in somewhat muddy waters and does not  
make li. beds.

At the highest and thickest <sup>of</sup> R. ponder-  
osa I laid the dividing line between the  
Big Antwerp formation and the Cambrian.  
There certainly is no fault to be seen here  
for the R. ponderosa continues upward



but less abundant. A physical change, but of little moment, occurs here for now the deposits are seemingly more than  $\frac{3}{4}$  blue shale with thinner laminations than usual.

In the first 4 feet of the Cornbeam one sees little in the way of fossils other than R. alternata and Platystrophia bifurcata. These fossils become more abundant and at about 8 feet above the base occur Cithus retrorsa. Here also L. subumbonoidalis (one small specimen) and Dalmanella multi.

The same type of beds occurs upwards for 10 feet with a tendency for more li. beds as one proceeds into grayish layers.

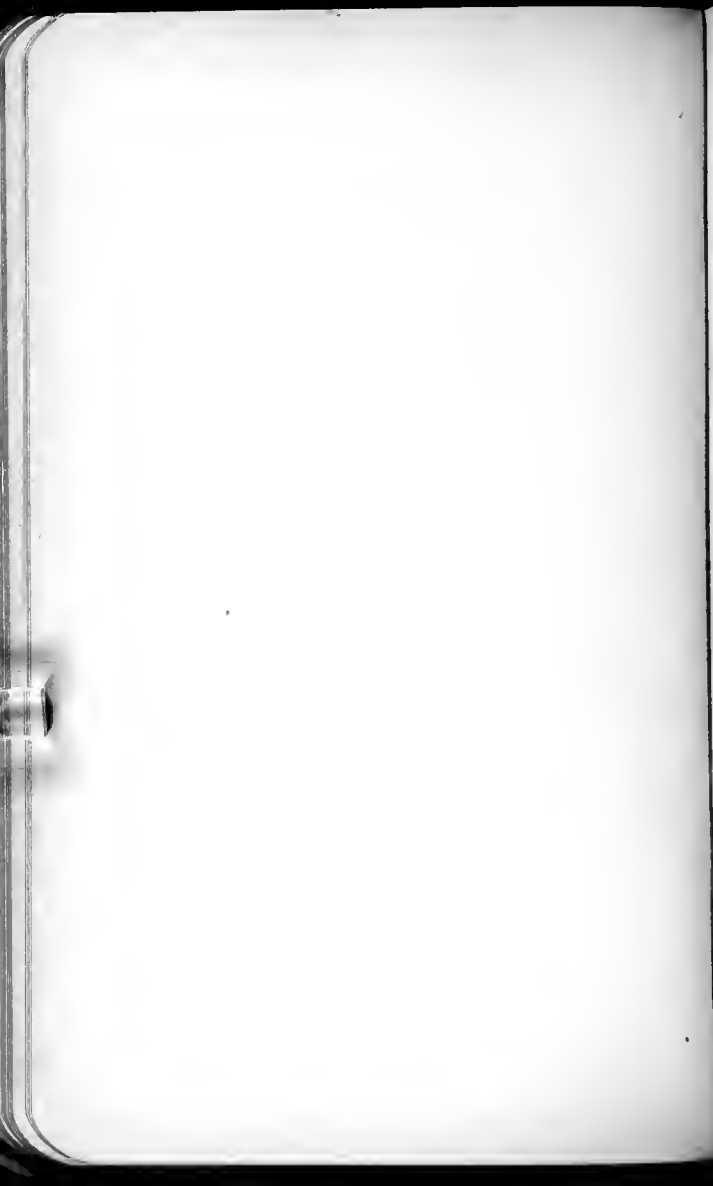
The Cornbeam layers are at a far rarer and less diverse than at West Chester. On the other hand in the det. Autumn P. producta and P. lynce are exceedingly abundant, which is not the case at West Chester.





The evidence as seen at West Chester and Lebanon is certainly not at all in favor of a time break between the Ontonagon and Ancestral formation. It is however clear that the great bulk of the Ontonagon fauna gradually die out and that but little of it is left at the close of this time. The sea was taken possession of locally by vast beds of P. ponderosa and P. lyaui with a scattering of other species in occasional specimens.

This faunal change goes on to the end of the Ontonagon and with the introduction of Ancestral a great migration wave appears. At West Chester this is <sup>marked</sup> <sup>with the fall of l. lyaui</sup> <sup>seen</sup> in the abundance of l. lyaui of many new species but at Lebanon where l. lyaui dominates one does not notice the change at all. I could not be certain that l. lyaui is the same form until I got l. lyaui above its base where I got l. lyaui and l. lyaui l. lyaui.



It seems to me that the sea was continuous but that Arnhem time probably introduced a slight deeping of waters in southeastern Ohio with greater changes elsewhere. It is these greater changes in foreign territory that caused the introduction of a new fauna, the Richmondian. The local Masspovillian fauna was dying out and may have come from a sea province independent of that of the Richmondian.



Pottsville, Penn.

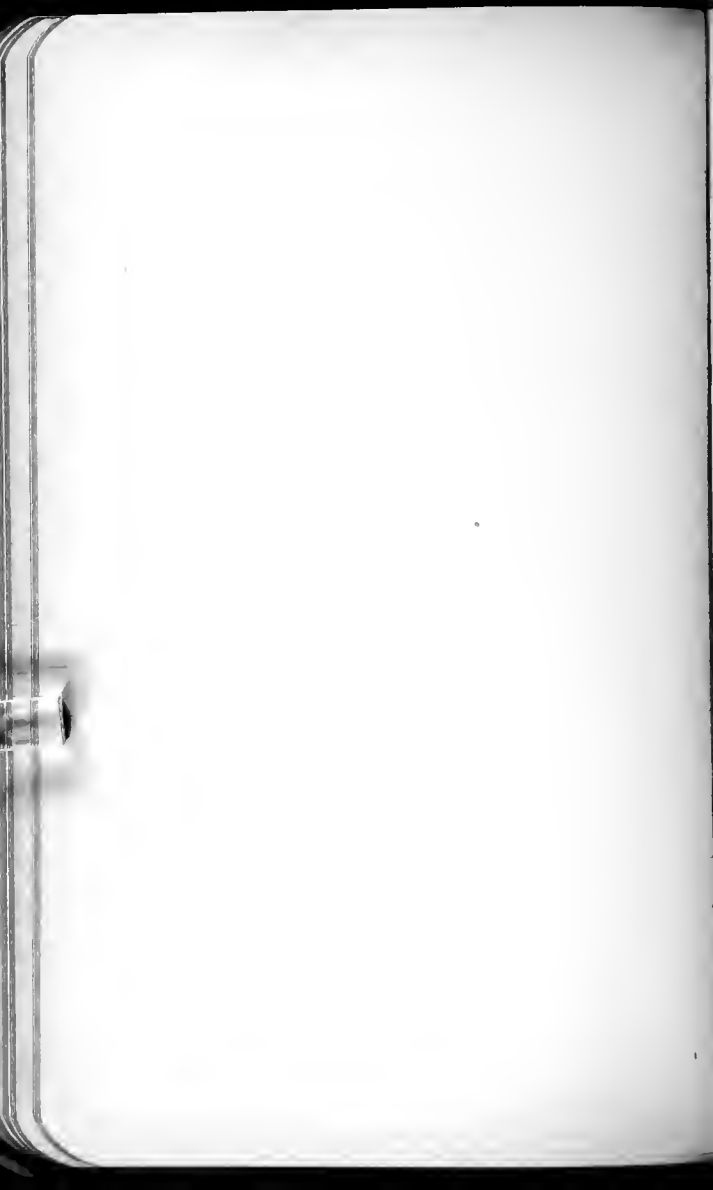
October 31-1913

Left New Haven at 2.11 P.M. and  
N.Y. on the Erie at 4.00. Got to  
Reading, Pa. at 8.30 and to Pottsville  
at 10.20, nearly 40 minutes late.

David Halberstadt was at the  
depot to take me to the Pottsville  
Club. It is Halloween night and the  
town is filled with young people in  
masquerade.

Pottsville Nov. 1-1913.

Started out at 8 with Halberstadt  
and Ungen to see the geological forma-  
tions. At the end of the main street south-  
east through the gap of the Skull Hill one comes  
upon the lower part of the Pottsville conglomer-  
ate. At or near the top it is largely bedded  
white quartz (cleanly washed of mud) sand



with small boulders. These are well rounded and in sizes from 1 to 4 inches averaging between 1 and 2 inches. In general it may be said as we go down in the Pittsville that the pebbles of white quartz become smaller and on the average are certainly smaller below than at the top. The top masses I only saw from the automobile but the lower beds have pebbles from  $\frac{1}{4}$  to  $\frac{3}{4}$  inch averaging about  $\frac{1}{2}$  inch. There are beds of 1 foot thickness up to several feet separated by coarse quartzose sandstones.

The basal Pittsville is a thick zone of conglomerate usually 5 feet thick. It rests on greenish shales somewhat sun-cracked and has sarned some into it. The question is not yet settled that this is the basal bed for there is a transition series below that may also be Pittsville.





This transition series is probably 200  
feet thick and consists of about 6 zones of  
Mauch Chunk like red shales separated  
by beds of sandstones or conglomerate like  
those of the Pittsville. Inger says there is  
as yet no local evidence to indicate  
that this transitional series is Mauch Chunk  
in Pittsville.

Below the Mauch Chunk is the fairly  
uniform series over 3000 feet thick of red  
shales and interbedded sandstones. The  
latter often have drifted plant stems and  
in the muddier sandstones roots in place  
No fossils I believe are known from these  
sandstones. The red shales present much  
evidence of continental deposition. They  
are at times rippled, always have evidence  
of plant material and roots, are usually  
thin cracked and often like thin dried  
pods of curled mud have been swept  
together into an intraformational mud



conglomerate. These same glistening mud  
beds are often rain-pitted, usually recog-  
nizable as ~~some~~ isolated drops but at  
times the pitting is decided and unin-  
dividualized drops indicating constant  
rain and not a passing shower. As a  
rule one may say that the rain was  
scattering and of no great force or  
duration. It is the condition seen in  
the sub-Triassic shales of Connecticut.

The amphibian tracks occur thin-  
out to Grand Haven and are restricted  
to the glistening sun-cracked beds. There  
are certainly 4 and possibly 6 species  
according to Huxley. I saw the trace  
in Pittsville where *Sac* *Lea* *gr* *is*  
*Sauvages* *provincialis*. It came about  
1000 feet below the top of the Grand  
Haven

Huxley gets very rarely distinct im-



Foraminifera of plants from the Grand  
Chert and these are land plants. The one  
I have is *Spheerobolus* like. There is  
no carbonaceous matter connected with  
these plants and for that matter there is  
no carbonaceous matter in black shale,  
connected with the other Grand Chert  
Lec.

The Grand Chert Lec has not a  
trace of a marine animal. Nor are there  
any in the Permian range of this area  
though a few are known in the  
Artisanite area.

The Permian is not as sharply se-  
parated from the Grand Chert as  
it would be. The transition zone however  
is dark - probably not over 15 feet - and  
then all is red shales. The Permian - how-  
ever is mostly all a siliceous mi-  
caceous <sup>crack</sup> sandstone with <sup>very</sup> rarely a shale  
band. These shale bands 6 to 12 inches

Wagner says that the Loran, Middle  
and Upper Proterozoic stages are different  
from one another, and even overlapped  
by  
51.

usually have hard parts and one had  
I saw <sup>found the bottom</sup> a dirty coral one 6 inches  
thick. Had a trace of a marine fossil  
last seen since here. Corrugatum  
corrugatum is the fossil although  
Linné has 70 species. Old lists do  
not have more than 20 species. This  
flow seems like the one at the  
Horton.

Then follows below the rock of the  
Catskills, again a great red shale  
lignim and greenish sandstones. The  
flow is <sup>very</sup> distinct <sup>trans-generically</sup> from the  
latter and is said to be the  
flow. Linné recognizes one Anemites  
and one with a small case attached. I  
did not see this formation except at a  
distance.

H. Herbin  
407 Garfield Sq  
Pottsville Pa.

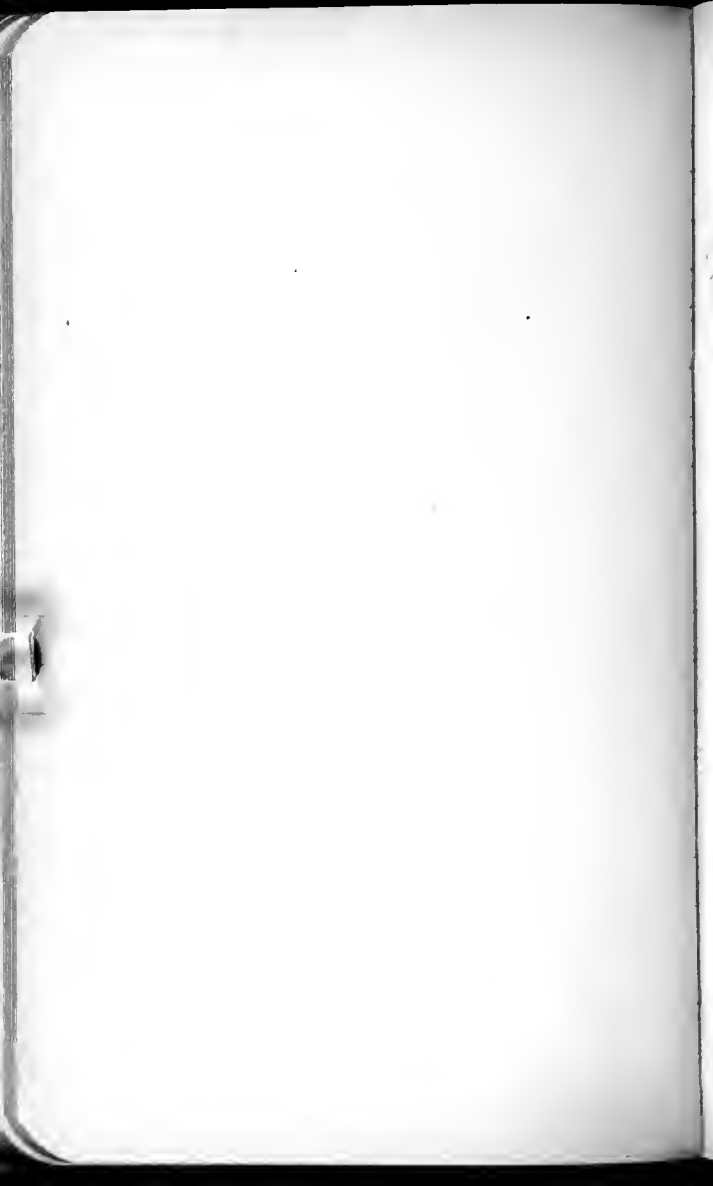
C. W. Huges  
Pottsville Pa



From Mill Hill Haven we saw  
Belderrugan. At the base it has Favosites  
(my prementia), Lygia, and an  
abundance of Lepidodictya larger than  
that of the Dalman. I could not make  
out this formation but think it is in the  
Kegon and built low in the forest.

Higher come beds of clay mud-  
stone, without fossils. This is not a  
part of either Cooran, or even the  
Scottland.

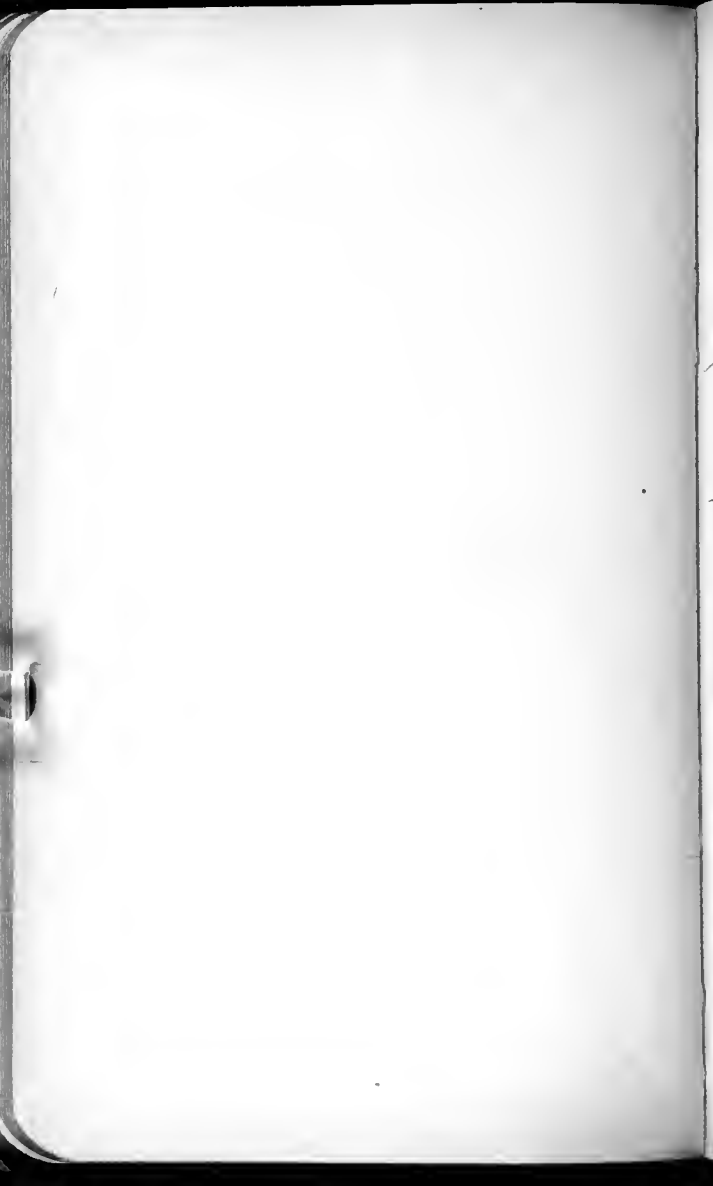
Shaly when the Belderrugan  
comes in the Christians white quartz pebble  
conglomerate, it rests shaly upon the  
- and there is not a trace of transition  
beds here. It may be that it is not Christian  
for I saw no fossils. It was however  
to be an important conglomerate of the time of  
the New Scotland. This conglomerate is of a  
character like the Pillsville.



Below the Helmsian zone in  
a thick series of red sandy shales that  
since Rogers' time is called Clinton.  
This is certainly the Solina shales.  
There are and iron ores connected with  
it and I did not have time  
to see them as I was in a hurry.







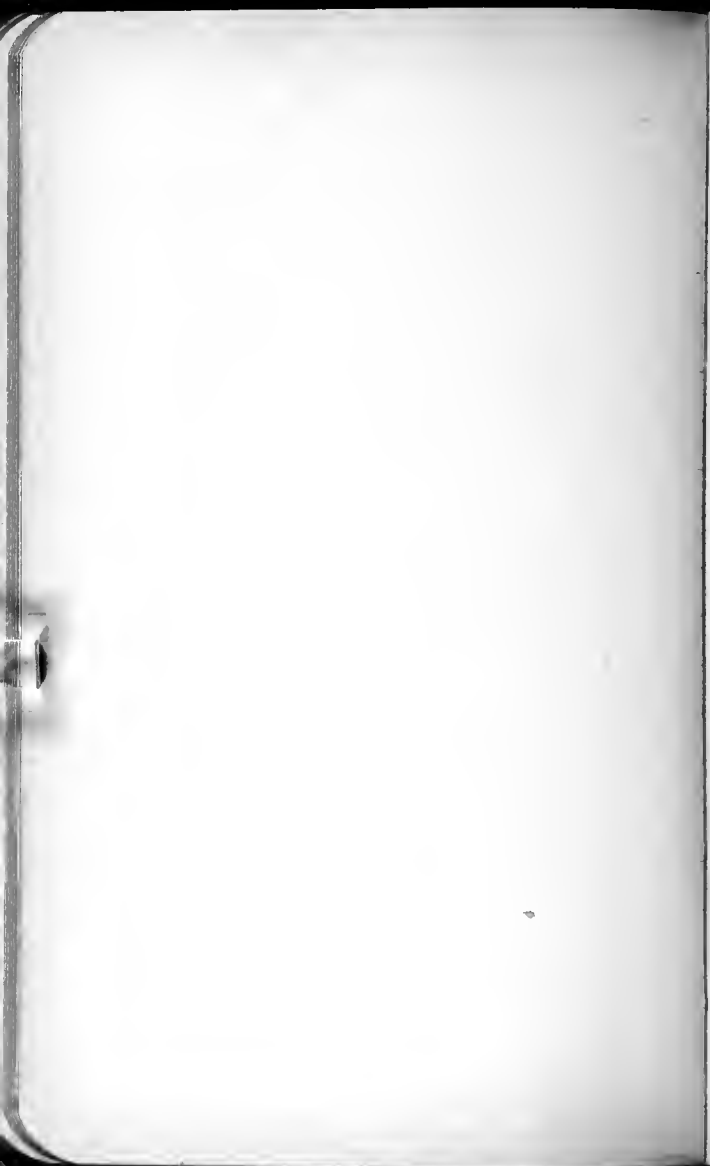
Dr. R. Atwood's paper no 4.

Tuff  
Tulluride conglomerate 90 feet

Boulder clay 90 feet

Tranversal etc

Tulluride conglomerate 90-100 feet.











Film IV or V continued, -

10 Hamilton, Rochester. - Looked out over the foot below gun  
to side of cliff over trees. Clinton is a high level li.  
shown among small bushes. In Cliff shadows.

11 Same form at Clinton. Note drill hole in it.  
It is a record. E.

12 Part of Medina on Cataract face of Reservoir beneath.  
to be shot away at head of form struck.  
100 feet 8 steps / 10.

## Film VI

1. ... ..

2. ... ..

3. ... ..

4. ... ..

5. ... .. (Medina li.)

... .. (some li.) ... ..



10. same as 9. - but from outside of body looking down  
 at a. Fr. members of lichen are in view.
11. Same as 10 but from body very down looking across  
 to rock bank.
12. Same as 11 but has a lichen ref. This the lumps  
 directly beneath the rock bank. See notes.

Film VIII.

1. The vacuole with one of spots. (second l. etc.)
2. Good view of that case in P. etc., to show lichen  
 structure. (actual lichen by way of etc.)

- 3-7 Farmington Wooded area
- 8-10 Good Chester by Farm R.R. cut.
- 11-12 Cloud.

Film 9.

- 1-3 Good Chester by Farm R.R. cut.

1/2

1/2

1/2

1/2

1/2

1/2

1/2

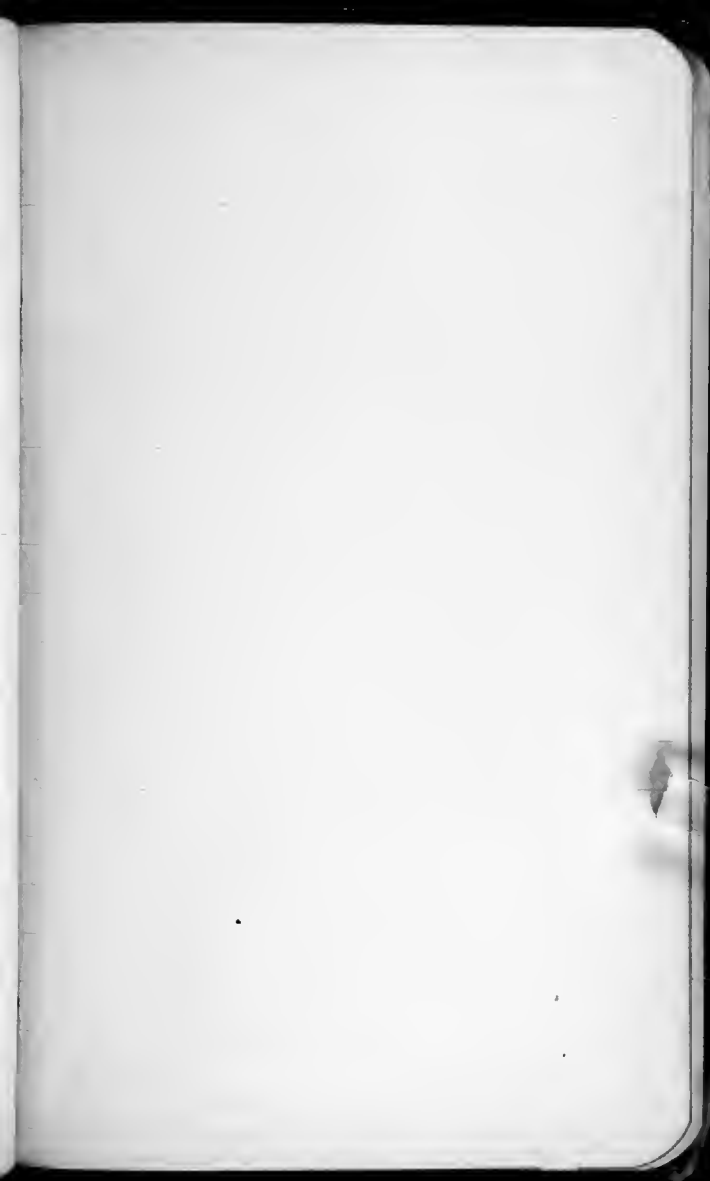
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Lackport No.

Whitmore quarry

Best section in Gulf from Lackport  
to top of Medina (down to Grey band)

Niagara Falls

Arenaceous Cataract limestone with  
hydra the fair shell. Has numerous  
other fossils.

Stops below down to Whitford lime-  
stone. Whitford made of 22 feet thick.

Island Green limestone. About 6 feet  
thick. Whitford sandstone.

Whitford sandstone. The cataract is fair  
above. Is a good limestone. A very sandstone.

Whitford sandstone comes in above. It reflects  
[It is from the top of the high by

Albion, New York.

Can get here by trolley from Rochester  
or Lockport. Do not stop on way  
here.

Medina in quarry east of town  
about  $\frac{1}{4}$  to  $\frac{1}{2}$  mile. On top from Red  
sandstone followed by red soft shale, but  
<sup>not</sup> along railway and quarry. About 40 feet  
thick. Near the top occur Arthro-  
hyous archiacoides.

Thick top or bottom is like seen at  
Albion.





1398½



