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1912

Ontario

Book II.



3194

doc. 0103

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U.S.A.

1912







Collingwood August 20 1912 Tuesday.

Left Meaford at 9.30 for Collingwood.

Packed the two boxes left at the Glace Hotel and with the one brought from Meaford and the four shipped from Manitowaning shipped seven boxes by freight to Yale University. Another box was shipped by Express from Meaford and there will be another one from the Toronto area.

Limehouse, August 21-1912. Hed.



Limehouse, August 21-1912. Wed.

Left Collingwood at 6.30 A.M. and got to Seafordtown at 10.05. It is raining as I leave Collingwood. Run over 30 miles to the southward.

At Terra Cotta  $5\frac{1}{2}$  miles to the north of Seafordtown the top of the Seafordtown is widely exposed. Here the brick-red shales are burnt for brick and drainage tiles. It is all red shales with an occasional green shale a few inches thick some of which appear to have very thin limestone sandstones and may hold fossils. One sees here at least 100 feet of these red shales.

To the southwest about one to 2 miles on the hill top about 100 feet over the railway is quarried the thin bedded "Clinton limestone". It is evident the Limehouse exposures. At Limehouse I saw that these few feet of thin bedded li. are the introductory strata to the Niagara.

There is at least 16 feet of "Clinton" at  
Limehouse, Parks called it Medina but  
it is the Lower Medina of the Niagara base.

From the Falls of Credit exposures one  
learns that the Clinton at Limehouse only  
shows the topmost beds, Parks tells me that  
none of it down to the Queenston can be  
seen at Lincolnton which is but a short  
distance to the northeast on the edge of the  
Puente.

Limehouse is about 3 miles west of Georgetown on the road to the west. The Clinton is at



① These lower argillaceous <sup>magaliesian</sup> limestones are  
dotted with <sup>other</sup> trilobites and under  
them are light green. Above them the top 2 feet  
were used for cement burning.

In looking through the specimens found in these lower  
beds Halysites catenulatus (large corallites and loose  
ones) and a Semioscincium. These fossils are  
unknown to me in the "Clinton" below.

In the basal dolomites Iliaenius heads and  
tails piled together like saucers occur in  
places. Have a sample, and the Halysites.

take to be of Mio. an age <sup>or less</sup> ~~or less~~ with a  
head upon the "Clinton series." ① as above.

Nowhere in the region of Limehouse could I  
see contact between the "Clinton" and the  
Queerstown. In the cut  $\frac{1}{4}$  mile east of the  
Station one can evidently see an old raised  
beach line at the base. On both sides of the cut,  
<sup>which is</sup> <sup>and is</sup> the upper level of the cut is occupied  
with loose rocks of all kinds laid flat as on  
a beach and cemented together by the percolating  
water. At first diggings of the railway had ~~not~~  
in this material touched the sand below but there  
is, nevertheless, too much of this material to  
hold the view. The railway men said the same.

Georgetown lies 300 feet lower than the  
cut at Limehouse. All of this is apparently in  
the old Richmond = Queerstown, or in the  
Lorraine. Could find no exposures about  
Georgetown.

It is more evident that in Clinton time one  
was of against the southern shore and the

Constituents of the north have now changed to  
at Lige House

at Limehouse

limestones of the north have now changed to sandy shales, red in color and with the presence of but little lime. At Niagara Falls it is mostly sand with but little lime.

I saw no Amphi-sthen planumosa but an abundance of Lep. abdominalis which leads me to regard the Limehouse beds as the higher beds seen at Owen Sound.

The Niagara ridge can be seen all the way on the west side of the railway going from Collingwood or Oran Dale to Hamilton from the mountain out of Collingwood, Terra Cotta to Limehouse.

Left Georgetown at 3.50 for Toronto.

Catawack is 48 miles northwest of  
Toronto on the trip. The distance from the  
P. & O. connection to the river is 18 miles  
west of Georgetown.



Forks of Credit, Aug. 22 - 1912, Thursday.

Left Toronto on the C.P.R. at 7.20  
A.M. for Cataract where we would arrive at  
9.37. Professor Parks is with me.

Let us go to the upper track <sup>that goes</sup> with the Elora river  
 $\frac{1}{8}$  mile beside a cliff, one sees the contact  
between the heavy bedded Niagara limestone (rock-  
pool) and the fine grained limestone of the li-  
ng. The latter is followed <sup>below</sup> by a part of  
green shales.

The Niagara limestone is a heavy bedded  
rock, and is a good example of a  
type of rock in the Niagara region.  
It is bedded like a green limestone.

We then descended to the lower track - the  
road we came over this morning - and we see  
that here must be the top of the green shales  
below the limestone. To have seen  
to be not far from the limestone with the Elora.

Mio. and d'omite

"Clinton formation"

① Upper green shales (maybe 20')	15 feet
(Red ferruginous limestone)	5 "
② Middle green shales,	35 "
Lower green limestone	15 "
③ White or red basal sandstone	12 "
Total	<u>82 "</u>

① Pass up section to the stratiolite shale

② " " " "

③ " " " " (limestone)

See ... .. at

These other green shales I saw yesterday at  
Limehouse are only seen at that and there as here  
are abundant in limy zones with Helvona.

Then below red decidedly ferruginous  
shale limestone with some shale zones having a  
uniform thickness of 5 ft. In these layers that  
I gathered a lot of my fossils of.

Below is a thick zone of green shales  
with occasional zones of <sup>thin</sup> limestone. Then a lot  
of 35 ft. is decidedly more shale  
material than below by 50 ft. of  
decidedly green limestone with <sup>thin</sup> green shale  
partings. This part has usually a thickness of  
a few feet.

Below this is about 12 ft. of heavy bedded  
dippled <sup>and decidedly con bedded</sup> shale in the  
massive.

Large thin bedded - Gulerston and beds.

The sandstone has been oxidized, and  
is also in part and all along the  
coast from the Limehouse. It is a rule



It is a white fine grained sandstone but  
in places it is pink to red and in some  
quarries it is all red and has been used  
to build the ~~road~~ ~~around~~ buildings at  
Towson.

As far as I can see this basal sandstone  
rests actually on the Richmond and Parks tells  
me that the contact is not little irregular.  
The change from the sandstone to the green  
"Clinton limestone" is gradual and the transitional  
zone is ~~one~~ ~~or~~ ~~two~~ 2 to 3 inches in thickness.

The ~~lower~~ ~~Clinton~~ limestones consist of  
a series of thin beds from 1 to 10 or even 12  
inches separating from one another by thin  
beds of shale. When weathered the feature  
comes out ~~very~~ ~~clearly~~ ~~in~~ ~~the~~ ~~fact~~ that the beds  
are more dolomite than some limestones, the  
fossils are all distinct, and in places there are  
thin ~~beds~~ ~~of~~ ~~shale~~ ~~or~~ ~~clay~~ ~~parting~~ ~~the~~ ~~beds~~ ~~apart~~ ~~and~~ ~~all~~  
of the fossils ~~seen~~ ~~today~~ are from these



Lower Clinton beds. At about 8 feet above the  
sandstone occurs the thin zone of 1/2 inch with  
many small Fieldellas. On this layer  
also occur many Agonostrophia, A. major, etc.  
etc. Parks thought that Fieldella does not  
occur in these lower beds but they cer-  
tainly occur in the Fieldella slots and  
they are common in the Fieldella zone and  
are also common in the rest of the  
section although maximum in the red beds.

My material is in part from the wash  
from the dam at the Cataract  
and from the quarry in front of the mill,  
which is less than 3 miles south of Putworth.

Another Fieldella is also common here as at  
Dover's down and  
at about 8 feet above the sandstone and  
occurs in the same zone as the Fieldella -  
above the sandstone. They seem to have a restricted  
zone of about 1/2 foot and possibly even less.

No. Middle Green shales in the thin Penn-



The Middle Green shales in the thin lime-  
stone abundant in Heliconia and on these  
spots occur thin bachelopods, but they are  
far less numerous than elsewhere.

In the ferruginous layers Heliconia are  
exceedingly dominant, and while they are  
also present in the upper green shale they are  
less abundant.

Of the Greenstone deposits about 200 feet  
can be seen about the station of the Falls of  
Credie. They are all much well bed, with an  
occasional green zone of an inch or so in  
thickness. The part of the deposit above the  
junction of the river is a thin oblique strata.

Parts suggest the same character as  
these "Greenstone" because they are well ex-  
posed in the Cataract & the river is  
within a half mile of the Cataract & the  
river is the same.

The Niagara Gneiss can be traced all the  
way from the Cataract to the river. The C.P.R.  
abundant of the Gneiss from a little west of

Employed to look for credit and in 3 miles  
with the ... of about 10 miles ...

Inglwood to Falls of Credit and for 3 miles  
further to Cataract Junction. It is a pic-  
turesque valley and all about Falls of Credit  
may be seen the quartzites of the Clinton.

It is interesting to note that the upper  
green shales of the Clinton are at Cataract  
15 to 30 feet thick while at Limehouse there  
is only 6 feet. In a way at a distance I  
should think that the difference is due  
to erosion. The break between the "Clinton"  
and the Lockport is as long as the Dickson  
ter and a part at least of the Clinton.

Not in the notes, but in the book  
is false and wrong.

Quincy, Aug 23-1912. Friday.

Erinonty August 23-1912. Friday.

Left Toronto with Parts at 8 A.M. for  
Erinonty, Ontario which is 57 miles south of Toronto.

We crossed up the "Crest" or "Mountain"  
by the road east of the "Hills & Down" and up  
the run by the east or the north <sup>or west</sup> side of the run.

At the top of the Mountain occurs the Lock-  
port dolomite that passes below into thin bedded  
magesian limestones just as in the Onondaga  
zone. Could not make out the thickness but  
at least 10 feet <sup>of thin bedded dolomite</sup> - all the cliff.

Then <sup>follows</sup> thin bedded magesian limestones without  
shale <sup>that</sup> <sup>series</sup> pass into a transition <sup>series</sup>  
with some shale, as at Onondaga. Thickness  
about 15 feet.

Then Rochester shale with thin beds of  
a <sup>series</sup> <sup>of</sup> <sup>thin</sup> <sup>bedded</sup> <sup>shale</sup> <sup>with</sup> <sup>thin</sup> <sup>beds</sup> <sup>of</sup> <sup>limestone</sup> <sup>with</sup> <sup>fossils</sup>.  
These are the Rochester shale <sup>series</sup> <sup>as</sup> <sup>at</sup> <sup>Onondaga</sup>,  
with some <sup>of</sup> <sup>the</sup> <sup>same</sup> <sup>series</sup>. Thickness about  
30 feet. The <sup>series</sup> <sup>is</sup> <sup>found</sup> <sup>in</sup> <sup>the</sup> <sup>east</sup> <sup>at</sup> <sup>Onondaga</sup> <sup>and</sup> <sup>Erinonty</sup>.

D. ... side of the ... had a  
good chance to break the limestone. It had un-  
usually a Rochester fossil in the upper 3 inches  
while at the very base I got large Urogonia reticularis  
and Chonetes ... Therefore this limestone  
correlates with the Rochester shale but may represent  
the so-called Clinton limestone in the Niagara  
zone. Well see later about it. It is undoubtedly  
by the Clinton li. of the Niagara zone.

These data ... without transition clearly.

These holes rest without transition sharply  
 upon a fossiliferous bed of limestone that is hard  
 and crystalline, with pinkish crinoid stems,  
 and other undetermined brachiopods <sup>beside</sup> some  
 strobilite zones. Below this <sup>same fossiliferous</sup> limestone gradually  
 changes into an arenaceous li., with no  
 fossils. This sandstone <sup>is from foot</sup> will not  
 make out but it resembles coming the Clinton  
 limestone in a large degree. Deer Creek

Clinton. This <sup>limestone</sup> ~~is~~ <sup>is</sup> above the thin  
 bedded Clinton mesesian <sup>limestone</sup> with green shale  
 layers. There is <sup>10</sup> <sup>inches</sup> ~~12~~ <sup>15</sup> feet <sup>10</sup> <sup>feet</sup>  
 just below it. <sup>There are 10 feet</sup>  
 at the base <sup>of these beds are</sup> <sup>some</sup> <sup>of</sup> Plectambonites Morris. Medina  
 a 2 foot zone  
 of completely <sup>solid</sup> <sup>shaly</sup> <sup>limestone</sup>  
 rocks <sup>with</sup> <sup>many</sup> <sup>of</sup> <sup>the</sup> <sup>same</sup> <sup>archimedes</sup>  
 forms. <sup>in</sup> <sup>under</sup> <sup>see</sup> A.  
barlane <sup>seen</sup> <sup>a</sup> <sup>part</sup> <sup>of</sup> <sup>thin</sup> <sup>bedded</sup>  
 green sandstones and shales. Below <sup>follows</sup> <sup>up</sup> <sup>to</sup>  
 12 feet <sup>red and yellow</sup> <sup>bedded</sup> <sup>limestone</sup>  
<sup>is</sup> <sup>the</sup> <sup>usual</sup> Medina <sup>member.</sup>

Krimak section

{ Heavy bedded	Trachypora dolomite	10 feet
{ Thin	"	15 "
	Rochester shale	30 "
	Clinton limestone (one bed)	4 "
	Clinton thin bedded li.	10 "
Break	Medina <i>Orthopyrus</i> bed	2 "
	Medina thin bedded sandstone	4 "
	Medina mottled heavy bedded s.	12 "
Break		
	Cataract formation	64 "
	Cataract basal sandstone	6 "
Break		
	Queenstown red shales	200 +

The heavy sandstone is on eastern side of the



We then went to the <sup>or eastern</sup> south side of the  
run and there saw the brown beds = Cataract  
formation. Above the Queenston comes in  
6 feet of clean, washed, white, fine grained  
and somewhat soft sandstone. This is the  
basal member of the Cataract formation as  
we saw yesterday but at Cataract it is 12  
feet thick.

Over the sandstone the exposure is not  
so good but sufficiently well to make  
out a <sup>thin</sup> bed of red shale, with thin bedded  
limestones. The shale is some 10 inches or so thick  
with dolomite. The amount of thickness is  
64 feet. At <sup>the top</sup> the shale is brick red and  
has some concretion. Some red beds are not that  
firmly bedded and are not  
bedded. The concretion is  
are no green shales above the red line.  
sandstone, and there

Clinton. Evidently the four foot limestone and  
the 10 feet of magnesian or concretionary thin  
bedded limestones with green shale partings are

of Clinton and compare with the Clinton  
of the 11th Nov 1862

of Clinton are and compare with the Clinton  
of the Niagara gorge.

Medina. Immediately beneath the  
Pentamerus horizon there is a sudden  
change in lithology for over ~~two~~ ~~feet~~  
~~feet~~ ~~the bedded~~ ~~green sandstones~~ with  
~~conglomerate~~ follows downward at  
<sup>the</sup> once, but zone of Uromyces archivedes  
below this and a bed was ~~of~~ ~~the~~ ~~same~~  
sandstone, and is followed by <sup>the</sup> heavy  
redish bedded sandstones. The ~~beds~~  
then have a ~~bedded~~ ~~bed~~ ~~of~~ ~~2x4~~  
 $\times 10$  to  $12 = 16-18$  ft. The ~~beds~~  
are ~~disrupted~~ by ~~two~~ ~~inches~~ ~~of~~ ~~gran~~  
organic ~~beds~~ Pentamerus ~~beds~~ ~~have~~ ~~the~~  
~~appearance~~.

Section is ~~to~~ ~~be~~ ~~traced~~  
truly at 2.40. Takes ~~some~~ ~~time~~ ~~to~~ ~~go~~ ~~the~~  
18 miles.

How often you are...

Hamilton August 23 1882 Friday.

Begin<sup>ning</sup> near by Mills and Rock<sup>er</sup> <sup>or south</sup> <sup>fall</sup>  
at base of <sup>the</sup> <sup>strat</sup> <sup>and</sup> <sup>local</sup> <sup>the</sup>  
facing south. <sup>There</sup> <sup>is</sup> <sup>nothing</sup> <sup>of</sup> <sup>it</sup>  
But <sup>is</sup> <sup>in</sup> <sup>the</sup> <sup>vicinity</sup> <sup>of</sup> <sup>a</sup>

of <sup>grey</sup> <sup>sandstone</sup> <sup>in</sup> <sup>one</sup> <sup>bed</sup>,  
of <sup>2</sup> <sup>or</sup> <sup>3</sup> <sup>feet</sup> <sup>thick</sup> <sup>with</sup> <sup>in</sup> <sup>it</sup> <sup>are</sup> <sup>many</sup> <sup>small</sup> <sup>conch</sup>.  
of <sup>2</sup> <sup>or</sup> <sup>3</sup> <sup>feet</sup> <sup>thick</sup> <sup>with</sup> <sup>in</sup> <sup>it</sup> <sup>are</sup> <sup>many</sup> <sup>small</sup> <sup>conch</sup>.  
The <sup>bed</sup> <sup>is</sup> <sup>about</sup> <sup>10</sup> <sup>inches</sup> <sup>thick</sup> <sup>and</sup> <sup>is</sup> <sup>very</sup> <sup>thin</sup> <sup>than</sup>

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of <sup>this</sup> <sup>is</sup> <sup>a</sup> <sup>4</sup> <sup>inch</sup> <sup>bed</sup> <sup>of</sup> <sup>sandstone</sup>.  
of <sup>2</sup> <sup>or</sup> <sup>3</sup> <sup>feet</sup> <sup>thick</sup> <sup>with</sup> <sup>in</sup> <sup>it</sup> <sup>are</sup> <sup>many</sup> <sup>small</sup> <sup>conch</sup>.  
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2. In case of H. Jolly Post 1  
No. 1000 1000 1000 1000 1000







20 inches thick made of mud-balls that  
have rolled up during a storm.

Between the Medina sandstone and the  
Tockport there is here not a trace of the  
lower Artthropicus bearing Medina, none  
of the <sup>(16 feet)</sup> bedded Clinton <sup>(16 feet)</sup> shale, none of the thick  
Clinton limestone <sup>(4 feet)</sup> nor any of the Rochester  
shale (30 feet). In other parts <sup>at least</sup> of the  
Garan hills are seen outcrops of the Medina  
at least 16 feet thick while here at Hamil-  
ton it is only 2 feet thick.

Below the Medina at some places the  
formation, at the top are 5 feet of green shale  
and then follows a thin bed of sandstone  
sandstone that abounds in the hills. There  
are more red shales that are a part of  
sandstone in the hills. Below  
are more green shales with occasional  
a few thin layers of red sandstone  
and some thin layers of shale.

The uppermost beds are seen along

Hamilton section.

Lockport dolomite

57 feet

Break

Medina sandstone

8 "

Break.

Cataract shales and li. About

75 "

Basal sandstone

8 "

Break

Wenstonn

over

200 "

the well cut road and especially back  
of a two story building near the store  
house.

As we could nowhere else see the lower  
Cataract beds we walked still farther west  
or north to the Mountain View House at  
the foot of another hill. Here  
along the steps down the hill may be seen  
the lower part of the block, not resting on  
the Medina. At the level of the reservoir  
basin and at the base of the steps we saw  
the basal limestone and one  
ancient sandstone layer, but without  
seeing the basal sandstone in situ below.

As we were going to the Medina we made out  
the lower part of the block about  
70 feet.

Left the road at about  
P. M.

A very beautiful day. The Cataract  
formation is situated at the base of the  
Medina formation.



The red Queenston begins to show  
about 10 miles south of Toronto and extends  
across the lower part of the land towards the  
Niagara River all the way to Nia-  
gara Falls. In all this region there are  
no Richmondian fossils.

*Amphithea planicoma* occurs  
plentifully and in good condition at  
Hamilton. Some good specimens in the  
University of Toronto collection.

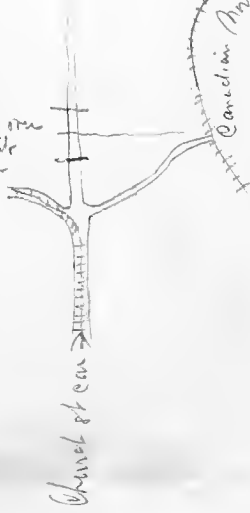
The red Queenston also occurs  
10 miles north of Toronto and at this point  
is 15 miles wide. The fossils are  
very minute. All of the Richmondian fossils  
which occur in the Queenston at this  
place are of the Queenston from Collingwood  
region and are very small.

Deep quarry  
in Edho.

High pass

Canadian Northern Railway

Bridge over  
high water  
Don



Toronto August 24-1912. Saturday.

Spent the morning at the Don <sup>Valley</sup> Brick yards in northeastern Toronto. One gets a street car - Church street line - opposite the Walker Hotel and goes to the end of the line. Then about half mile down into the valley of the Don.

At the top of the Don Brick Co quarry there is about 100 feet of glacial material - sands but mostly clays - and then about 80 feet of thin bedded limestones and shales of a dead blue color and pinkish red. The percentage is variable. Sometimes does not exceed 10% but here on all the beds containing fossils and especially one of them has been seen attached to plates of brachiopods. *Leptæna modesta*, *Plectambonites*, *Leptæna* and *Leptæna* *californiana* are some of the fossils they also get large *Costellus* *flavus* and *Leptæna* *trifurcata*. Took a small section in the quarry this morning and see fossils about the size of Upper Eden and possibly also basal Lorraine.

Mr. Jaxton, the fabric that sold me  
the Canadian fossils.



It began raining at noon and spoiled  
the rest of the day. In field work. Intended  
to go into the Humber Valley to see the  
Lorraine. To go to the locality in distant  
western Toronto we take a Huron  
trolley to end of line and transfer to a  
radial line to Lambton Station. Cross  
the bridge over Humber and proceed down  
stream along western side.

In the afternoon visited only parts  
of the city to see his quarters and  
the main building in a large building devoted  
to chemistry and physics. In two blocks  
to the west is the Parliament Buildings.

We did not see a lot of the work  
from the West (Manitowin). Both are  
now being used, but the latter is  
to be used for the purpose of a  
all of the work and some of the  
is being.

Ship out the night for today to

of the ... ..

dian Express collect. It has the material  
from Larchmont, Frito & Credit, Grimsby  
and Hamilton, and Toronto.



Toronto August 30-1912. Sunday.

A hot sultry Sunday morning.

Left Toronto on G.T.P. at 12:15 P.M.  
for Niagara Falls, New York.

At St. Catharines - <sup>(= Burlington)</sup> and the  
next station southward <sup>(= Richmond)</sup> -  
= Queenston - in all the streams show that  
the present layers have hard banks. These  
I should think would reveal fossils.

The Niagara *concretion* appears at  
Burlington when it is about 2 miles to  
the westward. This is 31 miles north of  
Toronto and 7 miles north of Hamilton.

To the north of Queenston which is 4  
miles north of Hamilton there is a large tele  
graph pole which is used by the Richmond and  
Queenston lines. Half to the north  
these poles to G.T.P. has cut through the  
Perrin and is now in the third position  
and is used.



At Merilton we begin to size up on the  
Cuesta which is not as high here as at  
Hamilton. The face of the Cuesta then lies  
to the south of the road.

Stopping at the Imperial Hotel opposite the  
railway station. At 5 P.M. started out to see  
the Falls and went over to the Canadian  
side.





Niagara Falls, N.Y. August 26 - Monday.

Will spend the day, at least I will, and break  
my own, to study the Niagara section as exposed  
along the line of the Lower Bank of the N.Y. Central  
to the east.

at the top rock is dolomite. In general this formation  
consists of thin bedded limestone (weathered surface)  
without shale partings, ranging in thickness from 2 to  
6 inches, about 20 feet or more. Below this  
is a zone of heavier bedded dolomite where  
the beds average 6 to 18 inches. All of these beds  
are dark in color - a blue - and in this agree  
with the well known as exposed about 1/2 mile on only  
where the color is almost black - a blue green  
green color - and there is more shale in the  
partings.

As I go on, I see that the tendency <sup>in</sup> <sup>for</sup> the main mass of the lower beds  
is <sup>bedded</sup> into <sup>between</sup> <sup>with</sup> <sup>of</sup> <sup>their</sup> <sup>beds</sup> <sup>and</sup>  
this is more <sup>in</sup> <sup>the</sup> <sup>lower</sup> <sup>part</sup> <sup>of</sup> <sup>the</sup> <sup>section</sup>.  
There are many cavities that originally were filled with



celestite and other minerals.

The beds at base of Escarpment are heavy with zones of thin beds. They are also more crystalline granular and of lighter color than those at the top <sup>all of</sup> or those at Hamilton.

Local transition. There is a sharp contact between this zone and the Escarpment dolomite although the character of the material is not very different. The dolomites are firm while the top of the transition breaks into small more or less cubical pieces. Very few fossils are seen here at the top. The basal 3 feet of the ~~zone~~ <sup>the masses of having been broken</sup> shows much pillow structure, is distinctly ~~bedded~~ <sup>bedded</sup> and ~~beds~~. The red is better added to the transition zone because it breaks down into small pieces, mainly about the size of the beds below. The ~~red~~ <sup>beds</sup> are seen to ~~gradually~~ <sup>spring down</sup> ~~merge~~ <sup>merge</sup> just west of the ~~hatchman~~ <sup>hatchman</sup> ~~to~~ <sup>the</sup> ~~thickness~~ <sup>thickness</sup> of Transition zone a mile or so.

Clinton conf. On the tip of the Clinton heavy bedded  
invertebrate at the second orated house, occurs a layer <sup>down the grade</sup>  
of about 12 feet long in - - - - - It begins about one  
foot below the top of the li., and continues 5 feet upwards,  
into the shale. Over it the Rochester shale distinctly  
appears. See my photo and theme by Sailer.

Rockester shale. The horizon at which the fossils  
 come in clay with the fine brown slats is about 20  
 feet below the <sup>heavy bedded</sup> ~~crinoidal~~ <sup>slat</sup> ~~limestone~~. This zone is about  
 3 feet thick, <sup>but in thickness and is also separated by</sup> and then lies <sup>above</sup> a ground. They occur  
 however all the way below to the Clinton limestone  
 so that the <sup>entire</sup> Rockester shale embraces all  
 of <sup>the zone</sup> <sup>from</sup> <sup>20 feet</sup> <sup>or</sup>.

Clinton limestone. The change from the Rockester  
 shale to the solid, hard and highly fossiliferous limestone  
<sup>usually</sup> occurs <sup>(begin 1/4 inch thick, the transition is 6 to 8 inches)</sup> <sup>occurs</sup> <sup>in</sup> <sup>1</sup> <sup>to</sup> <sup>2</sup> <sup>inches</sup> just as we  
 saw it at Spring. Here however the Clinton li.  
 is <sup>no longer</sup> <sup>with</sup> <sup>any</sup> <sup>of</sup> <sup>the</sup> <sup>character</sup> <sup>of</sup> <sup>the</sup> <sup>Rockester</sup> <sup>shale</sup> <sup>except</sup> <sup>that</sup> <sup>it</sup> <sup>did</sup> <sup>not</sup> <sup>see</sup> <sup>Jurijacanthus</sup>.  
 The <sup>limestone</sup> <sup>has</sup> <sup>a</sup> <sup>transition</sup> <sup>in</sup> <sup>the</sup> <sup>upper</sup> <sup>30</sup> <sup>inches</sup> <sup>of</sup> <sup>it</sup> <sup>into</sup> <sup>a</sup> <sup>thin</sup> <sup>bedded</sup> <sup>one</sup> <sup>in</sup> <sup>which</sup> <sup>do</sup> <sup>not</sup> <sup>occur</sup>  
<sup>any</sup> <sup>more</sup> <sup>of</sup> <sup>stylolites</sup> and small cavities.  
 Thickness about 8' to 10 feet.

Below are thinner bedded <sup>each</sup> <sup>thin</sup> <sup>limestone</sup> <sup>in</sup> <sup>beds</sup> <sup>2</sup> <sup>to</sup> <sup>4</sup> <sup>inches</sup> but in general 4 to 6 inches  
 thick above are derived of <sup>mass</sup> <sup>is</sup> <sup>nodular</sup> <sup>limestone</sup>.  
 Below are more thin bedded, <sup>or</sup> <sup>nodular</sup> <sup>limestone</sup>, about



They are regular limestone, crinoidal and of a blue color.  
3 feet thick. These beds have many fossils, but I could  
make out none, there are bygonia, crinoid, and  
Whitfieldella and Platystrophia and Cor of plecton  
in some.

Clinton shales. Sharply and almost without tran-  
sition ~~is~~ dark greenish ~~with~~ hard shales  
that split out vertically. About 4 1/2 feet thick. I saw  
no fossils. Partially is to be regarded as of Clinton  
age.

Medusa sandstone. Occurs beneath the above shales  
appears a red <sup>(white)</sup> <sup>at first</sup> <sup>8 inches thick</sup> <sup>then</sup> <sup>into</sup>  
a hard <sup>1 1/2 to 2 inches</sup> <sup>in thickness</sup> <sup>of</sup> <sup>crinoid</sup>  
sandstone. I can follow <sup>the</sup> <sup>crinoid</sup> <sup>stems</sup> <sup>into</sup> <sup>the</sup> <sup>mass</sup> <sup>of</sup> <sup>the</sup>  
Medusa sandstone. Whitfieldella <sup>is</sup> <sup>seen</sup> <sup>in</sup> <sup>the</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>green</sup> <sup>and</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>crinoid</sup>  
sandstone.

The top of the Medusa sandstone is channelled, with <sup>me.</sup>  
the top of the Medusa sandstone appears <sup>at</sup> <sup>the</sup> <sup>top</sup> <sup>of</sup> <sup>the</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>green</sup> <sup>and</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>crinoid</sup>  
sandstone. The top of the Medusa sandstone is channelled, with <sup>me.</sup>  
sandstone. The top of the Medusa sandstone is channelled, with <sup>me.</sup>  
all red. Whitfieldella is a predominant, then alternation  
of thin beds of sandstone with shales and <sup>is</sup> <sup>seen</sup> <sup>in</sup> <sup>the</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>green</sup> <sup>and</sup> <sup>red</sup> <sup>shales</sup> <sup>and</sup> <sup>in</sup> <sup>the</sup> <sup>crinoid</sup>  
occasional crinoid sandstone. Cor plecton

Ditto from the year that collected some  
year ago. Have a few back issues today  
from here, Philadelphias, also some Les,  
are not see our old collection.



two feet below the grey band.

The fossils of some years ago I believe were about 25 feet beneath the grey sand. I could not note here.

The Red Medina may be 40 feet thick and as I saw before the series comes from all sandstones at least to nearly a mile below, we cut out with the strata a distance of a half mile above an very thin shale, with shales just below, there are green shales. This is the same into small plates.

The lithology here is entirely different from any other formation in the small gulch. The upper part of all dark green shales is conglomerate with thin angular pieces of limestone scattered throughout the mass. On the east side of the tunnel the shales are thin and the limestone is in the form of small fragments scattered throughout the mass. The lithology is entirely different from any other formation in the small gulch.

① This zone of about 3 feet of limestone is decidedly an *avillicum* limestone trending in the *triglobus* type *Oriskany* or *domestic*. *avillicum* staly. is abundant in *triglobus* but in the *Oriskany* layers it is hard to make out the fossils. Fragments of *Triglobus* are common here but I saw no good ones.

② This difference of later included was not one of dip but in all probability is due to an irregular erosion surface. To all intents the beds of the entire section are horizontal.

follows. Medina sandstone <sup>above</sup> in distinct thin grey  
 beds resting somewhat in way upon the Cataracts.  
 Upper Cataract <sup>grey</sup> shales <sup>here</sup> about 4 feet instead of  
 10 as in the <sup>and magnesian</sup> lower <sup>is</sup> seen 3 feet of thin bedded  
limestone surrounding the Hellborn.  
 Later I saw that <sup>recurs</sup> not far from the mine and is one mile to  
 the west the green shales are seen at the well  
head of the mine and so that they are at the top of the  
section. There appears there is a little distance  
 in dis. between the two sets of strata, thus:-  
 Medina thin bedded sandstone.

4 ft. thin upper limestone	Tunnel base	① sandstone	Sulphur
10 feet of <u>middle</u> shales greyish <u>yellowish</u> limestone 2 feet of <u>stale</u> limestone			See ② above
Basal sandstone thin - 20 feet			

The tunnel is only one mile or two mile from the western line of the Cataracts.

Early in the afternoon I went  
to a little house to see the tunnel  
and to see the contact, and  
then back to the house situated about  
one mile from the Whirlpool Rapids  
Station.

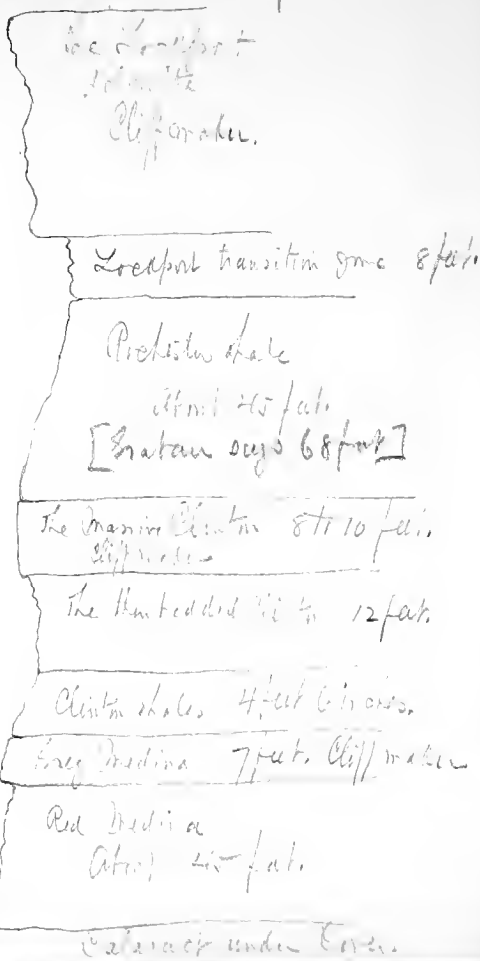
① I could not get at this zone in the  
precipitous cliff but from the down fallen  
material it looked to me like the thin  
bedded Medina sandstone. All of the  
lighter Cataract rocks are here cut out.

Basal sandstone of Calacaris heavy bedded

white somewhat coarse grained, even bedded  
sandstone. Rests on a fairly regular line  
upon the surface but there are some <sup>dist</sup> irregularities,  
the most <sup>obvious</sup> being a low <sup>irregular</sup> <sup>bed</sup> <sup>of</sup> <sup>fine</sup> <sup>grained</sup> <sup>sandstone</sup>  
about 20 feet thick, all in heavy beds except  
the lower 5 feet thick. This is <sup>with</sup>  
some <sup>small</sup> <sup>faint</sup> <sup>bedding</sup>. Can be seen to be a  
continuation of <sup>the</sup> <sup>same</sup> <sup>bedding</sup> <sup>at</sup> <sup>about</sup> <sup>20</sup> <sup>miles</sup> <sup>west</sup> <sup>of</sup> <sup>the</sup> <sup>station</sup>.  
<sup>above</sup> <sup>the</sup> <sup>base</sup> <sup>of</sup> <sup>the</sup> <sup>basal</sup> <sup>sandstone</sup>  
<sup>is</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>the</sup> <sup>Calacaris</sup> <sup>is</sup> <sup>also</sup> <sup>seen</sup>  
at <sup>the</sup> <sup>station</sup> <sup>at</sup> <sup>the</sup> <sup>base</sup> <sup>of</sup> <sup>the</sup> <sup>basal</sup> <sup>sandstone</sup>  
and it appears <sup>to</sup> <sup>be</sup> <sup>the</sup> <sup>same</sup> <sup>as</sup> <sup>the</sup> <sup>expressions</sup> <sup>now</sup>  
an <sup>error</sup> <sup>about</sup> <sup>the</sup> <sup>distance</sup> <sup>of</sup> <sup>about</sup> <sup>two</sup> <sup>miles</sup>  
up to <sup>the</sup> <sup>station</sup> <sup>at</sup> <sup>the</sup> <sup>base</sup> <sup>of</sup> <sup>the</sup> <sup>basal</sup> <sup>sandstone</sup> <sup>at</sup> <sup>that</sup>  
nothing of these <sup>now</sup> <sup>is</sup> <sup>seen</sup> <sup>at</sup> <sup>the</sup> <sup>station</sup>. Because  
the <sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>is</sup> <sup>so</sup> <sup>great</sup> <sup>and</sup> <sup>because</sup> <sup>they</sup>  
<sup>cannot</sup> <sup>be</sup> <sup>smaller</sup> <sup>than</sup> <sup>the</sup> <sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>are</sup>  
<sup>you</sup> <sup>are</sup> <sup>sure</sup> <sup>to</sup> <sup>find</sup> <sup>the</sup> <sup>same</sup> <sup>bedding</sup> <sup>at</sup> <sup>the</sup> <sup>station</sup>, the  
<sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>is</sup> <sup>so</sup> <sup>great</sup> <sup>and</sup> <sup>because</sup> <sup>they</sup>  
<sup>cannot</sup> <sup>be</sup> <sup>smaller</sup> <sup>than</sup> <sup>the</sup> <sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>are</sup>  
<sup>you</sup> <sup>are</sup> <sup>sure</sup> <sup>to</sup> <sup>find</sup> <sup>the</sup> <sup>same</sup> <sup>bedding</sup> <sup>at</sup> <sup>the</sup> <sup>station</sup>, the  
<sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>is</sup> <sup>so</sup> <sup>great</sup> <sup>and</sup> <sup>because</sup> <sup>they</sup>  
<sup>cannot</sup> <sup>be</sup> <sup>smaller</sup> <sup>than</sup> <sup>the</sup> <sup>distance</sup> <sup>between</sup> <sup>the</sup> <sup>stations</sup> <sup>are</sup>



At the Whirlpool station there is a magnificent exposure of the entire gorge or all from the base to the top. It is as follows:-



[see doc. 101]

Copied from last years mts. 1911.



Niagara Falls, Aug 8 - 1911.

At the Whirlpool Rapids <sup>station</sup> in the Lower  
Niagara may be seen good examples of  
bottom scouring and sitting up of the bottom  
muds by the storm waves. extend for a few feet.

Red shales

30" sandstone

6"

30"

a. Some of the shells down from the top was  
still soft and pressed into the shells before final  
embedding. These are included from  
8' to 12' of the top.



Local sandstone. To the east of the  
Whirlpool Rapids Station about 2 miles may  
be seen the contact of the white basal sand-  
stone upon the red shales of the Queen-  
ston. The contact is an abrupt one. As a  
rule the red shales contact is seen upon the  
face of a small channel  
cut by the sandstone into the red shales.



Niagara Falls, N.Y. July 9-1911.

Great Boyce Route. Wheelport Rocks.

The upper 10' of the Medina is mainly sandstone in beds from 8" to 18" with sandy shale partings. All are more or less cross-bedded. Near above a pair of very thin bedded sandy shales with thin local lenses (up to 2") of sandstone. This is in the lower part of the zone that occurs the bottom of the description described yesterday. Then follows below a sandstone from 8" to 12" thick gray rock. Below this is more of the thin bedded and sandy shales.

The Medina sedimentation is very irregular in nature within a few hundred feet all a variety of beds from sandstone to sandy shale. The thickness of sandstone in the shales are to be more variable.

Towards the top of the Medina is found all sandstone as if the lower part of a series.

etc.

Basal sandstone. At the base of the



Onedina occurs one bed of coarse, light-green sandstone that is more or less cross-bedded. It is about 10 feet thick. Upwards it passes into a bed of thin bedded sandstones of the same character as below but with shale partings.

The sandstone at the contact is a dirty sandy mud with some pyrite. In a half inch it changes into a cleaner sand and here the worm borings begin. In the basal one inch of the sandstone saw one piece of the lower bed shales included in the sandstone. Bearing an old land surface marked clearly by the invading sea.

The large bedded basal sandstone, with markings of the wind and waves in the lower part, is the basal sandstone. The thickness of one bed is about 400 feet. It is 2 miles before the contact. The contact is very broad and the sandstone is 18 inches deep. The contact is more or less



more small irregularities from 0 to 8" deep, averaging 4 to 3" deep. At the contact the old shales have been changed for from 1 to 4" into a green shale due to the "saccharine" nature of the sandstone. A good view of the underside of the sandstone shows a decided lumpy crescentic ridged character = the old pitted surface on which the beach spread. The lower part of the sandstone is much tried by horizontal erosion, especially in the lower part of the sandstone, where undulating cravine may be seen. The fossils are all scattered as they are in the ground.

At the contact the sandstone is a rather fine grained massive, blue gray color, the color being a sandstone shale. The 30 ft. thick mass which the sandstone has formed. This is the same as the shale at the contact seen. As a rule the sandstone is almost a uniform





about the minor irregularities.

Question. The red and shales are  
regularly bedded, in fact appear to be too  
regularly bedded to be of strictly continental  
origin. Only the sandy muds are not  
obviously normal yet the bedding is regular  
throughout of marine sedimentation.  
However I did not see a sign of bottom  
gravel or fine run shells sea de-  
posit. The fact that the shale is evidence  
of a marine deposit has not  
yet been observed in this region. On the  
other hand there are thin beds of fine  
sandstone which are not  
to be seen. The shale is  
usually of some 16 3' thick to  
a few feet. The same kind occurs  
along the coast.











## Film IX

- ✓ 1 Niagara escarpment near Jones Falls 4000' high
- ✓ 2 " " on Jones F. 20' high. Aug 17-
- ✓ 3 Local part dol. about middle to show heading. The contact  
rock just where the R.R. shows the gorge. Aug 26-1912
- ✓ 4. General views of the gorge from David Ford " "
- ✓ 5 Sharp contact: Lockport in transition zone to Rochester  
shale. Line 4 ft. above track. Later concluded to  
place the contact at the 14 ft. line also 3  
feet higher.
- 6 The local structure. Also at section at the top of the  
Lockport transition zone.

## Film X

### ~~Lepidodendron~~

- ✓ 2 Contact of Rochester sh. transition zone and Lockport  
sh. First decided on " " and the structure. Rochester  
shale at end of lower tree branches.
- ✓ 3 Bryozoa at top of the list on 12 x 2 feet.
- ✓ 4 More views in Medina about 30 feet below the gorge bands.
- ✓ 5 Contact of " " (Catawba) with some little tunnel.  
The contact is a little higher on the line. The  
" " the actual contact is a little lower than  
four feet higher.

✓ Contact between Queenston and Patawack sand  
sections. Looking east along highway line.





H. A. Parks

College 3028

69 Albany St.

52/30

doc. 101

doc. 103

Summer of 1911.

With my sisters.

Niagara portmanteau

in box in 1902

[d. 101]

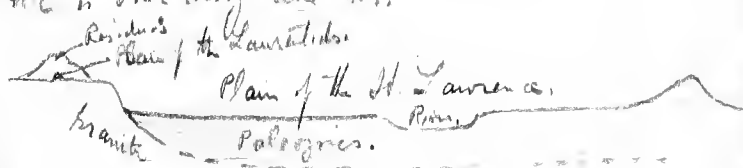
[placed in]

[transferred<sup>n</sup> to doc. 103 in  
1994 by C. MacC.]



Montreal, August Saturday 12th 1911.

This morning on the top of Mount Royal one is impressed with the great plain on all sides of the Mount and in the far north with the Laurentide plain. On it for the most part one sees low mountainous residuals. On the south side of the river St. Lawrence are other mountains with the trend of the Appalachianians. A section to the north of Mount Royal from S. to N.E. is some thing like this.



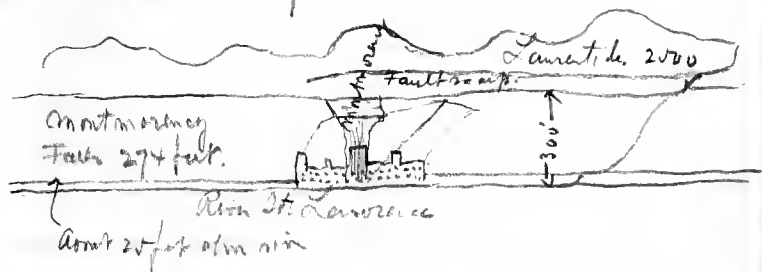
At several places up to Louiseville one sees to the north low terraces. I wonder if they are really such. For in the distance one sees the Laurentian hills.

Just before arriving at Three Rivers one sees a fine terrace, the bank of a former lake in the St. Lawrence. The bottom is as flat as can be and covered with a fine sand that drifts in places when one crowd of vegetation.

As we came down from Chateau de Fontenac this morning we had a good view of the conglomerates. The evidence is unmistakable that much of it and especially the large blocks are due to rolling and heating up of the limestone. Two large blocks were seen 5 to 6 feet across. However there are beds also of nodular limestone in which the nodules are interstratified conglomerates as laid down in the beds from 1 to 2 inches thick. The Lewis conglomerates are however true conglomerates of foreign erratic limestone as is proven by the fossils.

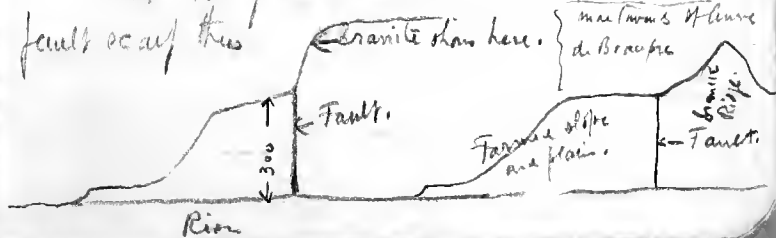
# Saguenay Trip. Monday Aug. 14 1911.

As one steams down the St. Lawrence north of the island of Orleans the Ordovician plain of about 300 feet above the river is plainly to be seen for back of Quebec all the way to beyond St. Ann de Beaupre. From the boat it looks quite level <sup>but</sup> in long swells between 200 and 300 feet.



At the Falls of Mountmorncy at the top occurs the thin bedded Trenton resting directly on the Laurentian crystallines. In front of the Falls occurs the dome faulted or called Hudson River shales. The dome throw to the west must be considerably over 300 feet.

North west of the Falls one seems to see the fault scarp thus





The Laurentides are of either late Cretaceous or later age. They are too much eroded to be of late Tertiary age. It was the shield that was elevated and not the Acadian mass.

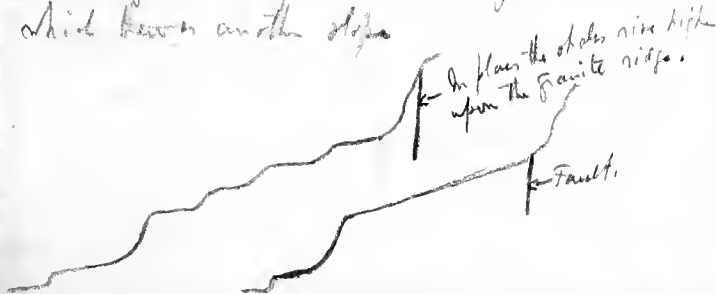
The water of the St. Lawrence is muddy in part of Quebec and all the way to north of the island of Orleans. It keeps up farther north but the more pure salt water get to Orleans. At about 200 miles N.E. of Quebec the water is practically free of mud and is more transparent. In other words practically all of the St. Lawrence mud is deposited in less than 400 miles due to the influence of the salt water.

In looking at the geology and structure of the region this morning it is evident that the Ordovician <sup>are</sup> originally extended, as to the north. It is now preserved, to some faulting over which the Acadian mass has arisen. This structure was probably made during the Taconic Disturbance and the old line reaccentuated again in Tertiary or later times.

As we go toward St Anne de Beauport the fault scarp is more marked. To the south are the fine farms and to the north the conifer wooded jagged ridge. Far back of the latter are the Laurentide.

(21 miles from Quebec)

At about more or less one rises at once up to the upper river terrace at 300 feet but farther to the east, this rise is broken up into a number of smaller terraces. Some of these are beautifully shown on the farms, little steep ascents of about 50 feet. In other cases it is all one graded slope to some major terrace beneath which lies another slope.



The fault line is precipitous and comes out to the shore at Cape Turmanate. It can be seen here for 5 miles down the river. In part of it most of the Ordovician has been removed but 3 miles up from the shore there is much low fertile land.

At Les Emboulements Boucher (p. 61) states earthquakes occur and the shore has gone beneath the river. The town was moved to the top of the mountain. This place is 61 miles east of Quebec.

About half way between Montmorency and St. Anne de  
Beaupre is the fine exposure of the Trenton limestone with  
the Hudson shales in place above. In other words the  
down faulted mass is rising as we proceed to the N.E.

~~Hudson R.~~

~~NTA-91~~

St. Anne de  
Beaupre  
Riv. Tanker.

Further east at Beauport the Trenton is again seen. There  
fore the down thrown mass lies as a syncline with the  
lowest part above near Montmorency.

~~Trent~~ Montmorency

Hudson R. Trenton li.  
Riv. level Hudson Riv. Trenton li.

South of St. Francis Xavier <sup>about</sup> 38 miles  
from Quebec one sees elevated tracts at about  
60 feet. In filled sand from the Laurentides.  
Some of this material seems to lie in part of a fault  
scarp.

(80 miles E. of Quebec)  
At Murray Bay on each side of the river  
elevated terraces are again well seen. Here they ex-  
tend quite high probably to 300 or over 400 feet.

White whales go of the U. Lawrence at least  
as far N. Lincoln. They are often caught here.

The entire river valley was filled in with sand into which Murray river has carved its way down to sea level.

A game view here of the Laurentides.

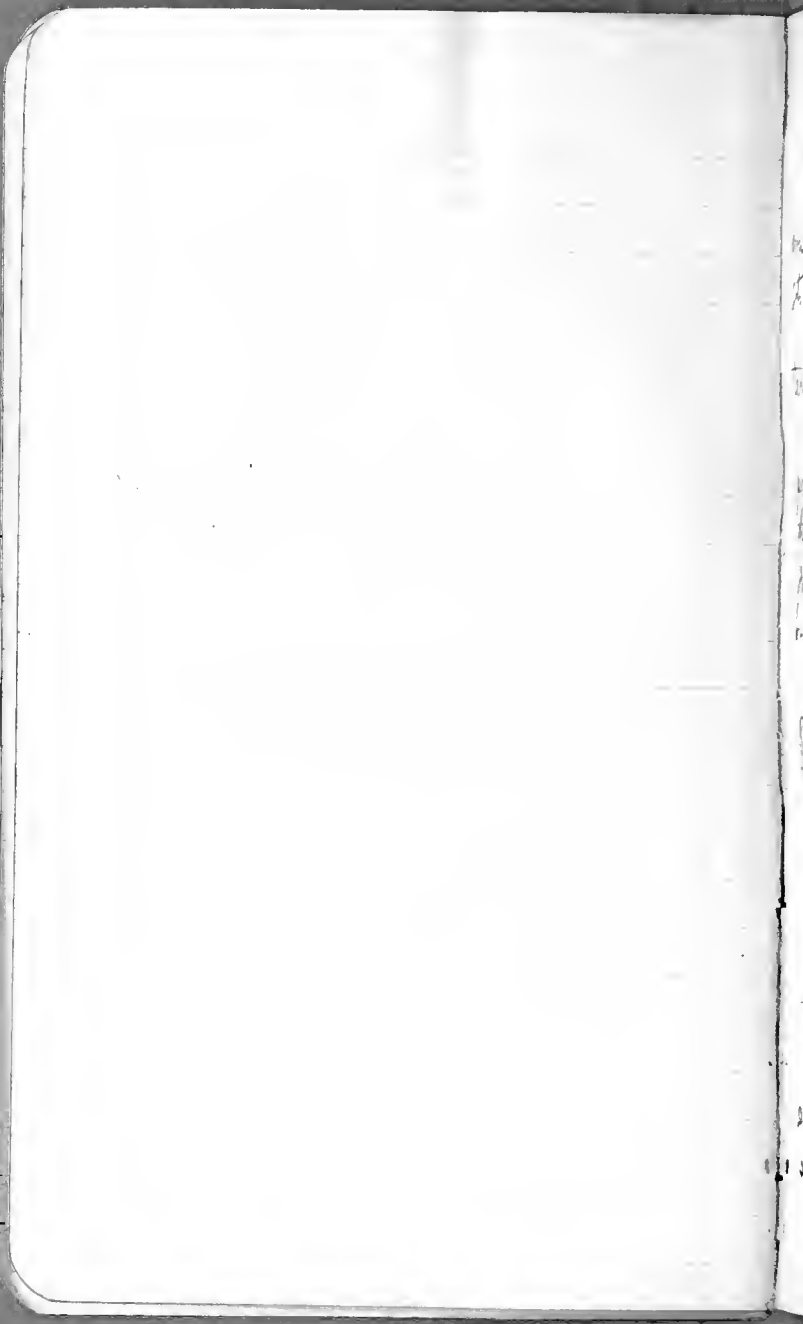
At the N.E. horn of Murray Bay (Cape l'Asile) one again sees five elevated beaches. The highest pronounced one looks as if of 400 feet. It is some 2 miles long.

At St. Simons again one is to see five elevated terraces. Up to about 400 feet. All sand.

(132 miles E. of Quebec)

At Tadoussac, maybe seen more elevated beaches or deltas of sand. I could see none higher than 100 to 150 feet.

In all places where there are streams entering the St. Lawrence there are seen the very best elevated beaches. Here also they occur at higher levels. But in none of the granites are cut benches. In other words the Gulf waves have done no cutting. The beaches are due to the infilling of the sands brought in by the lateral streams.



Saguenay Tuesday Aug. 15-1911.

The land is low about Chicoutoumi, not as a rule over 200 feet high and flat topped. Eastward the land gets higher.

About 7 miles east on the north shore 5 fine terraces may be seen rising to about 300 feet or more.

As one looks back to Chicoutoumi the old peneplain is well seen as a plateau. Here and there upon it are higher but also flat topped masses. Into the Saguenay bay the plain is also well seen but on higher bases.

Far to the north of the Saguenay one sees high granitic mountains standing some thousands of feet above the rest of the lands.

All of the crystallines are very much gneissed. To be seen everywhere and especially fine at Cape Trinity, 1700 feet high. Some gneiss are tabular but the masses are outcrop. This appears to be the highest part of the Saguenay.

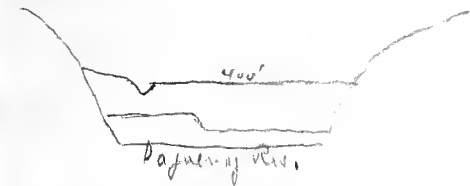
The water of the Saguenay is dark and is swamp water. At the head of the river one saw slabs, and porphyries.



The Trenton on the top of the Saguenay cliffs  
discovered by LePlanne indicates that the  
Laurentides are of recent elevation, for if these  
horizontals had been since the Tertiary  
disturbance at their present elevation they  
would long since have been removed.

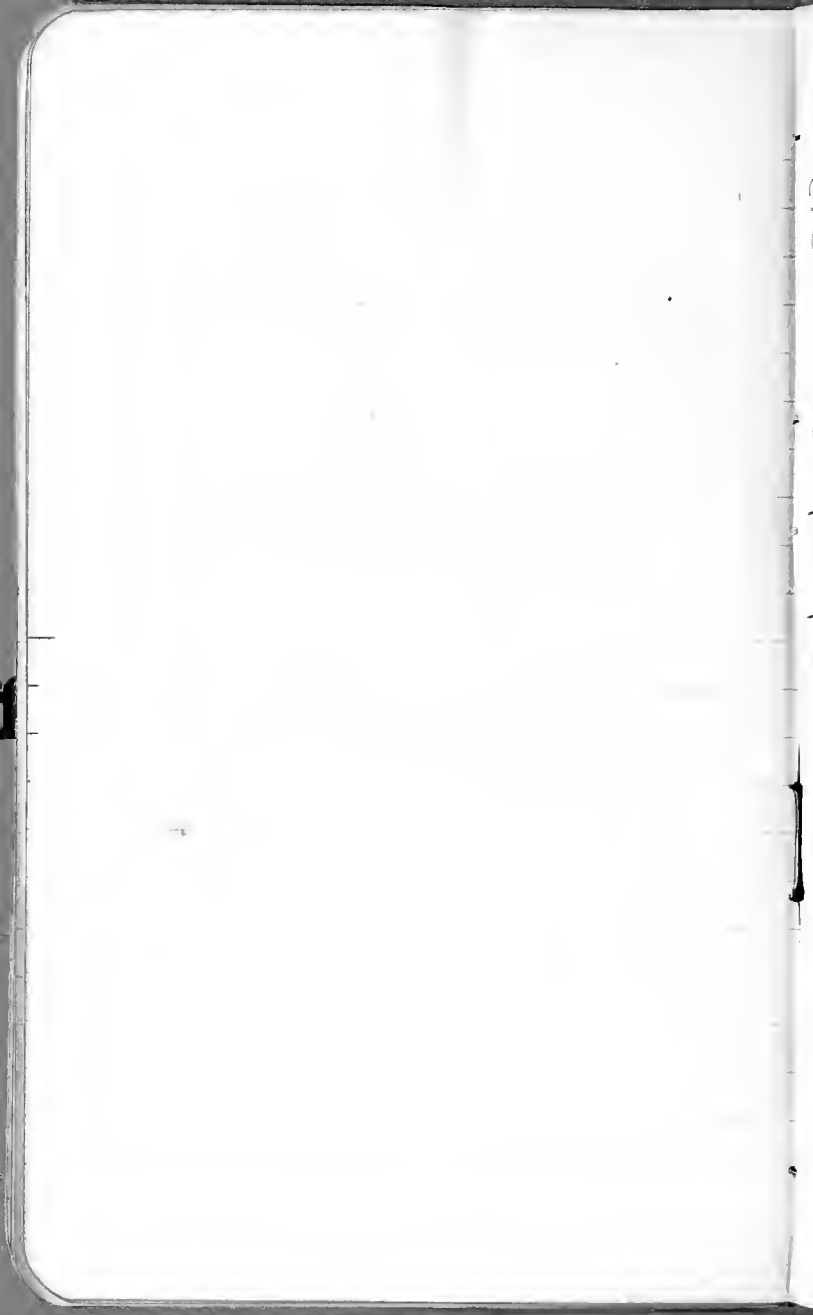
St. Johns Bay has a large river and in the past has filled of the bottom to about 250 feet. Multiple terraces may be seen here. Two are prominent, the lower one at 150 feet, the other at 250 feet. In the stream valley one can see terraces up to about 400 feet.

At the mouth of St. Marguerite river again are seen the terraced deltas. Here they again appear to go up to 400 feet. The broad valley is all sand filled.



Opposite St. Etienne bay occur badly dissected terraces for here the sand is piled upon the granite higher than 400 feet. This sand occurs on the outer side of the Saguenay bend. See map of Saguenay.

Finally at Tadoussac facing the St. Lawrence occur the same elevated terraces of cleanly marked angular sands of a light yellowish color. They are as high here as elsewhere. They thickly cover the granite and are now being washed away but appear mostly steady.



Along the beach at Tadousac saw Ostrea virginica, Mytilus edulis, Mya arenaria, Echinus droestackensis, Macla and Tusus. The Littorina littorea are very small here. Sea weed is not prolific. Saw no barnacles.

The Saguenay has a pinnal aspect. No water falls come over its sides.

As we get out of the Saguenay we see two immense terraces several miles long to the mouth of the river. One seems to be about 200 and the other 400 feet above the sea. To the south of the Saguenay there is another tremendous flat delta below of the lower level.

