1912

Ontario

Book I,

3194 Ontario

doc. 0102

Charles Schuchert
Yale University
New Haven
Connecticut

July 21-1912
Manitoulins Trip.

Alice and Albert Schuckert, Okla.
3737 Regent Ave., Norman

Alice and Albert Schuchert
3937 Regent Ave, Norwood, Ohio.

Phil. Schuchert 758 Bells st.
Price Hill, Cincinnati, O

Simon Stutig 1057 Academy Ave
Price Hill. Cincinnati, O.

E A. Callahan, Mrs Wade
472 Orange st. New Haven, Conn.

Margaret Corcoran, 59 Hall

M. J. Williams
Manitowaning, Ontario
Telegram to Little Current,
Manitoulin Island and have
it forwarded by phone to Queens
Hotel.

E. J. Whittaker at Collingwood up to
July 6th.

Truro, July 21-1912, Sunday,

Left Belle and Truro at 10.05 A.M. for Montreal and Toronto on the Ocean Limited.

The Triassic extends from south Truro to East [illegible] at the crossing [illegible] of the [illegible] the Cobequids.

A loose thick conglomerate appears about [illegible] to [illegible] and [illegible] I think [illegible] Triassic. It dips to the [illegible] year [illegible] about 10°. The pieces are open coarse, angular and illy assorted but bedding is easily discernable. Evidently [illegible] Carbonic after their reelevation in later Pennsylvanic times. These conglomerate are not over 2 to 3 miles south of Londonderry.

[illegible] as at the southern foot of the Cobequids. From here [illegible] to be more rugged and is undoubtedly Paleozoic. Reddish [illegible] conglomerate dipping downward

again to the north, Londonderry and then [illegible] hidden rocks, that are more or less metamorphosed. The former are evidently of Carboniferous age laid down after the [illegible] of the Cobequids while the metamorphosed sedimentaries are of earlier [illegible]. I should rather think they are of pre Silurian age. They extend at least to the northern end of the [illegible] near Wentworth, a few miles further north the granitic core is at hand.

Immediately on the north side of the Cobequids, one sees the dip and shales of the [illegible] series, and I also thought that some of these rocks farther south in the mountain core had been metamorphosed by the igneous intrusions of the mountain core. In this event the [illegible] strata [illegible] the Cobequids [illegible] and converted to a semblance.

I should [illegible] think the Cobequids came into existence at the close of the

Acadian time or at the end of the Grand here? It is very probable that there are no Devonian strata other than the Lower Devonian (even of these) in the Cobequids. The Cobequids were again rejuvenated in the Pennsylvanic time and again formed the shore of this period. Probably again little after Triassic time.

What rocks occur near Rogersville and Harcourt, N.B.? Lie nearly horizontal. Are they Coal Measures? The rocks are still horizontal at Newcastle. [illegible] yellowish, mostly a sandstone, red.

Between [illegible] and Bathurst we seem to be upon granite. Look this up to see if an old core is in here, [illegible] [illegible] the Coal area comes up to this one. Ten miles south of Bathurst the [illegible] and [illegible] is very pronounced

As we go up the Matapedia beyond Matapedia river terraces of gravel are

cond [illegible] on both banks at about 25 to
30 feet above the present water level.
As we get up to the real water, of
Metapedia Curiously the valley widens
out and we see at least two terraces,
one about 100 above the river, the other
about 30 above the river. This is south of
Lac du Saumon. Farther north
the country seems to widen out still
more but it is [illegible] to
make out the topography. Could not see
how we get into the Saint Lawrence drainage.
This is a picturesque valley and it will
be worth the time to stop here some time at
either Campbellton or Metapedia and take
the train [illegible] Tarrant Lic and then
Saint Lawrence trains.

Montreal July 22-1912. Monday.

Arrived at Montreal at 7.45 A.M. and at 9 was off on my way to Toronto.

Leaving Montreal on the Grand Trunk we follow the Saint Lawrence and then the shore of Lake Ontario.

From Montreal west across the Ottawa and west for about 30 to 40 miles we pass over the very flat country seen so often to the south of Montreal. The land is as flat as a table and must have been under the glacial lake that united Lake Ontario and Champlain.

Before we get to Thousand islands and then all the way to Kingston we pass through a bumpy country, the low bumps being of Adirondack granite and the hollows in between being filled in with the ancient sands of the Saint Lawrence. It is the area of [illegible] Frontenac barrier.

From Kingston west we see below the lake [illegible] and [illegible] that is evidence of the former high levels of Lake Ontario.

Got to Toronto at 4.30 P.M. and left for Edinburgh at 5.45 after Dawson at 9.30. William is abroad and will see him in the morning.

Collingwood [illegible] 2-3-1912, Tuesday.

Started out with Williams to see the [illegible] Cuesta back of [illegible] Collingwood [illegible] drove south towards Crains Mills which is on the [illegible] of Collingwood and Heywell to about 5 miles south of Collingwood.

At the level of the water in the town of Collingwood are [illegible] shale very light grey limestone in which occur *Prasopora*, *Subulites*, a *[illegible]* and *[illegible]*. [illegible] many others [illegible] but not easily [illegible]. The horizon is Trenton and at nearly what [illegible]. The Prasopora [illegible] zone. I should estimate the horizon to be Middle Trenton.

We then drove over a low flat [illegible] the [illegible] about 20 [illegible] from Collingwood [illegible] a few hundred [illegible] directly [illegible] Richmond. [illegible] in the middle [illegible] *Tetradium*, [illegible] *[illegible]*, [illegible] *concentrica*, [illegible] *A. [illegible]* [illegible] *Cincinnati* [illegible]

[illegible]

The locality studied to-day on the [illegible] road is locally known as Blue [illegible] and is about 5 miles south of Collingwood. Mains Mill is on the same road and is about 2 1/2 miles south of Collingwood.

(?)

including "Hudson River"

The Richmond, Whittaker says is 390 feet thick and with the green and red shales above not measured. In a rough way we made out [illegible] the road at least 400 feet up where [illegible] come up to the Clinton-[illegible] horizon. About 200 feet are in the upper Richmondian green and red beds. The green shales have fossils in thin limestone bands.

(Blue shale Richmond (Whittaker) = 390 feet

Workman's Brook } Red-green " (Williams) = 128 "

Certainly thicker than this = 518 ")

[illegible] — [illegible] green [illegible] (Williams) = 128 [illegible]
[illegible] thicker than this = 518 [illegible])

[illegible] [illegible] [illegible] but the fossils are [illegible] distinctive. (See above) ①

[illegible] we [illegible] the Richmond the strata become more and more sandy, the [illegible] [illegible] the Brown [illegible] [illegible] [illegible] drift out fossils [illegible] the [illegible] [illegible] [illegible]. Finally [illegible] greenish sandy [illegible] [illegible] [illegible] limestone that have [illegible] [illegible], [illegible], [illegible] acuminata and Leperditia like caecigena. See my [illegible] [illegible].

[illegible] [illegible] is a considerable thickness of red-brick-red shales devoid of fossils.

All [illegible] [illegible] and [illegible] [illegible] [illegible] [illegible] Richmond age.

[illegible] [illegible] [illegible] [illegible] sandy shales without fossils [illegible] [illegible] [illegible] 15 of [illegible] [illegible] are [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] At the [illegible] the shales change [illegible] into [illegible] [illegible] and these [illegible] [illegible] [illegible] [illegible] [illegible], finely granular [illegible] [illegible]

[Later concluded to be [illegible] Richmond]

limestone that have a small and depauperate fauna that reminds me of the Trois fauna. It is probably of Silurian age as the fossils suggest and there is nothing here that is of Richmond character. They may well be called the [illegible] shales. Richmond: [illegible] The thickness along the road side is 10 to 11 feet [Foerste says are 28 feet thick] [illegible] exposed [illegible] road at [illegible] blue limestone (certainly an error), [illegible] writes that these shales are [illegible] feet thick, followed by [illegible] shales and then the massive dolomite or [illegible] limestone making the top of cuesta [illegible]. We made no attempt to see all of the Trois [illegible] and [illegible] of [illegible] shales.

In the [illegible] the Trois [illegible] a loose piece of [illegible] Hilderth [illegible] [illegible] and other fossils all [illegible] of the [illegible] fauna collected [illegible] of Hamilton, Ontario. This piece [illegible] the shale said [illegible] It could not have come [illegible] the Trois and probably not from [illegible]

the green shales at the base of the Niag. We
will probably see this formation again. I took
about one-half of the slate path. It must have
overlying the green Clinton shales seen so well at [illegible]
Left [illegible] in road at 9.25 P.M. [illegible]
Meaford to see the fine Richmondian
section 2 1/4 miles east of this town on
Workman's Creek.

Passing down the road Williams
[illegible] gave a thickness of at least 450
feet from the base of the [illegible]
Shales beds down to where the first Rich-
mondian seemed to be in place. However
the base cannot be seen here and there
is a great [illegible] in the [illegible] of the base
of the [illegible]. The [illegible] height from
the lake level up to the base of the
[illegible] is about 517 feet
[illegible] are [illegible]
[illegible] Collingwood, Utica
of [illegible] and all the [illegible] in
the [illegible].

Meaford, [illegible] Wednesday.

Started out with Williams to see the [illegible]. [illegible] about 2 1/4 miles [illegible] of Meaford (Paul's Hotel).

Just where the Railway crosses the [illegible] one has a fine view and good exposures of [illegible] with [illegible] of the [illegible]. Whittaker said these beds are Eden but we had no [illegible] than [illegible] [illegible] [illegible] [illegible] Modiolopsis [illegible] Pholadiformis, (It was loose, however.) The [illegible] are beautifully marked [illegible] and among them saw the [illegible] form but with an axis about 2 1/4 inches [illegible] [illegible] [illegible] [illegible]. Saw a splendid trilobite [illegible] which I gave to Williams.

We [illegible] up the [illegible] into [illegible] [illegible] continue on both [illegible] wagon [illegible]. Have a [illegible] and [illegible] [illegible] [illegible] 20 [illegible]. The only [illegible] or [illegible] seen are [illegible] and [illegible] Pleu. [illegible] (may be known Rafinesquina alternata) Ambonychia radiata and

Inoceramus concentrica ~~a [illegible]~~ are the commonest fossils. [This is probably the Fossaire]

At about 220 feet above the railway bridge we came upon the *Cotopaxi*[?] *leachi* zone [illegible] along with *Stephanoceras* [illegible] and [illegible] are the [illegible] fossils. We are still in the Blue shale [illegible] but [illegible] are [illegible] thin limestone layers than [illegible]. This must be [illegible] upper [illegible] zone.

[illegible] at 306 feet above the bridge [illegible] bedded limestone [illegible], [illegible] [illegible]. The [illegible] are beautifully [illegible]. *Stephanoceras*, *Perisphinctes* alternata, *Ambo-[illegible]* radiata with many [illegible] [illegible] here. The [illegible] is still blue. [illegible] [illegible] continues [illegible] to the next [illegible] about 30 feet [illegible]. [illegible] [illegible] [illegible]. Fossils are [illegible] [illegible] and brachiopods. Other than [illegible] [illegible] are [illegible].

[illegible] we got the [illegible] evidence [illegible] [illegible] beds interbedding with the blue shales and sandy limestone. Here the [illegible] beds are [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] and [illegible] with [illegible] [illegible] all [illegible] [illegible] [illegible] and [illegible] and practically [illegible]

of fossils. Williams went up the brook further and I [illegible] Upper Richmondian fossils. Casts of [illegible] also occur and a [illegible] impressions, [illegible].

Williams [illegible] and [illegible] miles [illegible] of [illegible] and got to 128 feet higher than the rippled zone (includes the 30 feet of last statement) where the red beds continue. There are very [illegible] in their [illegible] he got [illegible] and small [illegible] (the same as all slabs). All these 128 feet are [illegible] with some green [illegible]. [illegible] the land [illegible] sea flat almost on the land side.

[illegible] the rippled beds the commonest fossils are [illegible] and Hebertella sinuata. I see no [illegible]ax, Strophomena [illegible] on the [illegible] [illegible] pieces [illegible]. Later on I found a single [illegible] [illegible]. [On my second visit saw but one more].

We then succeeded [illegible] the railroad bridge to [illegible] water level. Thickness [illegible] is 140 feet. It is a series of blue shales almost without hard limestone bands [illegible] there are occasional [illegible] and crinoid stems [illegible] that harden the shale in thin layers. These beds remind much of the Eden at Cincinnati but the fossils are in all probability Richmond though they may come down some into the Upper Lorraine. I see no typical Lorraine as found in Ohio and certainly no Eden as hitherto outlined [At my conclusion as will be seen later]

The Richmond [illegible] is one of the finest sections, [illegible] fossils, that I have seen in a long while. From the water level [illegible] up to the highest part of [illegible] a distance along the windings of the stream of at least 2½ miles, [illegible] according to [illegible]. Corrected the true thickness is about 510 feet with [illegible]

the top & bottom all seen. (Driving over 700 feet)

Beginning at the gate shore and all the way up to the railway bridge and beyond for more than one mile, through a thickness of not less than 400 feet one remains constantly in grey blue shales. In the lower 200 feet there are very few limestones and the fossils are accordingly scarce. I saw nothing that would establish the age of the lower beds, but at the railway bridge one gets an undoubted Medicottia faded fauna which proves these beds to be Richmondian. [illegible] the [illegible] are nearly the same. In the upper 200 feet more [illegible] limestones appear but the shales are [illegible] still dominant in these [illegible]. In these upper 200 feet fossils are more common, [illegible] and [illegible]. [illegible] and [illegible] are the common forms [illegible] always turns up but in reality [illegible] are [illegible]. There is ever a large Leperditia and [illegible] a rounded [illegible] (? Pentremites) (

that occurs by the thousands but not one of which shows the same character. Brachiopods are very scarce, an occasional Hebertella sinuata, more often Rafinesquina alternata and poor Strophomena sulcata, ~~and [illegible] [illegible]~~. Very rare Platystrophia laticostata. Calymene fragments are very common but always in fragments. Isotelus fragments are also often seen. An occasional but fairly good Ceraurus near C. dusei being [illegible] and exceeding rarely the [illegible] is a [illegible]. Cyclospira [illegible] [illegible] occurs commonly throughout but is only rarely seen in good specimens. Crinoids are even [illegible] throughout the whole series.

Whitaker got Cataryga erratica = C. bradleyi for the first time about [illegible] feet above the base of the series (i.e. above the lake) or about [illegible] feet above the railway bridge [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

At about 340 feet above the lake or about 200 feet above the railway bridge

we found the second zone of C. ornatica and about 2 feet higher a red with good gastropoda! The two Catazyga beds are according to [illegible] then 158 feet apart. [illegible] C. [illegible] fossils also becomes at least 10 feet higher for slabs with Catazyga were seen at least that much higher.

At about 400 feet above the lake the thin bedded limestones begin to be more common and may be one half of the material and continue to become more prominent throughout the zone of about 30 to 40 feet thick. All of these beds are [illegible] but becomes more and more marked higher up. The limestones are impure limestones and are of a lighter blue than the others [illegible] weathering yellowish. With the appearance of [illegible] the [illegible] begin to drop out and at the top [illegible] are [illegible] absent.

With the disappearance [illegible] Cincinnatian [illegible] appears [illegible] marked C. [illegible] the [illegible] bedded beds appear. In the first

[coll.]

red bed I got a small piece of *Tetradium fibratum* but it might have been drifted there at the time of deposition for it was the only fossil I saw and it was in a small fragment.

The Williamstown section closes with 128 feet of green and red shales with thin beds of impure limestone, but the red shales dominate. Fossils are practically absent except at the top [illegible] [illegible] [illegible]. This section is here incomplete and a more reliable top can be [illegible] not along the road side seen [illegible] [illegible] [illegible] [illegible],

There can be no doubt that all of the [illegible] section is Richmondian and [illegible] [illegible] all the guide fossils are absent. I saw none of them [illegible] [illegible] [illegible] and [illegible] we have not seen *R. capax*.

The Richmondian [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

700 feet thick [= Eden, Lorraine and Rich.]

Persistent collecting for one week along this birch [illegible] [illegible] produce 150 species [illegible] [illegible] fossils. This section is [illegible] [illegible] equal to the Richmondian of southwestern Ohio.

The section along [illegible] [illegible] Birch in a general way is a duplicate [illegible] [illegible] [illegible] of the Cincinnati area and [illegible] [illegible] [illegible] [illegible] [illegible] a little [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] far more [illegible] than in the [illegible] [illegible]. [illegible] [illegible] a [illegible] [illegible] [illegible] [illegible] [illegible] as I had expected.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] of the rise of the land. It is as follows.

Craigleith July 25th 1912. Thursday.

Left Meaford at 9.30 on a mixed train and got to Craigleith at 10.45. Stopping at a small farmers home run by an old lady.

Walked down from before lunch along the beach to see the Collingwood black shale. Found it interbedded with thick beds of somewhat dark (bituminous) fossiliferous grey limestone. The fauna is more Trenton than Utica in the general sense. The only [illegible] Asaphus canadensis seems dead [illegible] like Triarthrus becki. Calymene [illegible] is the most abundant fossil. Also noted Rafinesquina [illegible] [illegible] Illaenus, [illegible] and Prasopora.

After dinner went east 1/4 mile of the station where the Trenton tab appears to be. No Collingwood shale appears here at water level.

We then went west of the station a little more than 1/2 mile to a small brook up which we went. Here at the water level, or rather about 2 feet below the water level is the ^apparent^ top of the Trenton.

Over this follows: Black shale 14 inches

One bed of limestone about	12	"
Black shale	16	
One limestone	10	"
Black shale	36	"
One limestone	12	
Black shale	2	12 feet 10 inches
One limestone	6	"
Black shale	10	"
One limestone	10	"
Black shale	2	"
[illegible]	5	"
Black shale		
One black shaly limestone	12	"

(written vertically beside the list: All of these [illegible] [illegible] — Top of 55 [illegible] [illegible])

The above [illegible] the wagon road.

Black shale ^containing^ with O. canadensis up to 20 feet above lake level (anyway)

Railroad track here.

As we could not see other outcrops in [illegible] we [illegible] to another one about 1/4 miles south of [illegible]. Here at 74 feet above the lake we are still in the typical dark Cashmaqua shales like that [illegible] of the Utica, they are seen *Triarthrus spinosus*, *Endoceras proteiforme*, *Orthoceras proteiforme* and possibly a *Leptobolus*. A little higher up we get *Leptobolus*, *insinuata* and a diplo-graptid in abundance, below 3 or 4 specimens.

At 10 feet [illegible] the hill [illegible] in [illegible] green [illegible] shale, [illegible] *Calymene senaria* (*Triarthrus*) *Plec. sericeus*, [illegible] *testudinaria*, and *Trinucleus* [illegible], [illegible]. This is about 140 feet above the lake level. [illegible] the [illegible] the material at this [illegible] at least 20 [illegible] is unmistakably the [illegible] shale that we saw yesterday in the [illegible] Richmond, [illegible] that the Utica [illegible] about 180 to 215 [illegible] [illegible] [illegible] [illegible]. If we [illegible] between [illegible] and the [illegible]

[Later — there is no break in the Cincinnatian series.]

We then climbed up the brook to get to the Leptaena [illegible] beds but a heavy rain overtook us and we had to give it up.

Returning to Mrs Ransom's house where we got lodging we came across another small brook beside the road [illegible] and here we had a clear view of the transition from the dark Utica shale to the [illegible]. The Utica is a dark shale and in the brook breaks out in flakes so that the walls recede angularly. Then follows a zone about 10 ~~[illegible]~~ feet thick in which there is an alternation of [illegible] sandy shales with blue shales. Then higher [illegible] blue shale [illegible] a zone [illegible] and [illegible] [illegible]. Williams reached [illegible] [illegible] the Utica above the limestone at lake level about 80 feet thick. I will study these rocks again [illegible] with Williams [illegible] the total thickness of the "Hudson River" above the Utica.

Craigleith July 26-1912 Friday.

Started in at the little brook beside the private road-side about 1¼ miles west of Craigleith station. The transition from the darker black and lighter Utica shales to the crumbling blue shales is as described yesterday. In the dark shales Triarthrus spinosus is always present. In places one finds Leptobolus and the graptolites (always the small traces [illegible] that species) also occur at the top. In the blue shales I did not see any fossils but those [illegible] yesterday 40 feet above the black shale with a single [illegible] Triarthrus [illegible] show that they are [illegible] and that there is a complete transition from the dark Utica to the blue [illegible].

[illegible] fossils in the [illegible] black shales and the nodular limestone. All [illegible] comes from the little patch of lowest beds above the Trenton, in [illegible]

mnds, from the transition beds to the more typical Utica.

The most abundant fossil is undoubtedly Bassleroceras canadensis, sparingly in the limestones but wonderfully prolific but always fragmentary in the Utica shales. But one entire shell from specimen in the limestone.

The next most abundant fossil is Dalmanella testudinaria multisecta, and a highly convex Rafinesquina. The latter in the shale is always flat. Plectambonites sericeus is also found in the lowermost limestone but soon vanishes. One may say that are the brachiopods vanish with the limestones. Platystrophia also occurs but [illegible] as if a large [illegible]. [illegible] [illegible] the Kentucky Trenton form. [illegible] [illegible] is common in the basal shale. [illegible] [illegible] occur here and if so my material [illegible] it.

In the shales of [illegible] trilobite [illegible] [illegible] fairly common — and here one does not see [illegible] trace [illegible] [illegible] character-

teristic of the lower black beds. Calymene callicephala [illegible] numerous [illegible] and every now and then one sees a tail piece of Isotelus gigas [illegible]. Ostracoda are wonderfully prolific in the basal black shale. But in the limestones of these are present I did not see them.

Graptolites are very rare and occur only near the base in the black shales. Brachiopods are always present in about three species. Endoceras or Orthoceras are always present.

Williams returned at 2 P.M. having gone to the top of the mountain [illegible] all locality pointed out by Walcott. According to his barometer reading [illegible] distance [illegible] [illegible] the base of the [illegible] [illegible] is about 600 feet. This then is the thickness for the shale series of the Ordovicic between the Trenton and the [illegible] in the black [illegible] in Europe [illegible] [illegible] is about 670 feet

for the blue shales and the Richmondian.

Williams states that the green shales beneath the _Leptaena_ beds are here 15 feet thick and rest with sharp demarcation upon the gray shales of the Richmondian. The Leptaena limestones here are about the same thickness as made out 5 miles south of Collingwood, that is about 11 feet. The division over the Leptaena beds can no more be made out here than at Collingwood.

In the basal Clinton are arenaceous limestones, Williams saw fossils of several species, but nothing that to him suggested Clinton.

Left late in the afternoon for Collingwood.

Thedford, July 27-1912 Saturday.

Williams wanted me to show him over the Hamilton about Thedford - Arkona as he is to be the guide for the Geological Congress here next year.

We left Collingwood at 6.30 A.M. changed to the main line at Georgetown and arrived at Thedford at 3.45 P.M. Stopping at the Holland House the same hotel I was at in 1895 when I collected material for the U.S. National Museum.

At Terra Cotta which is about ten miles north of Georgetown the land is much eroded and gullied, there is a tile factory here using a red shale only here and there a thin green band. This red shale formation is at least 100 hundred feet thick and [illegible] the [illegible] This evidence is interesting [illegible] with the thick red shales at Hamilton underneath the so called Clinton - Greens in

fauna. In this event the _Leptaena rhomboidalis_ beds to the east come much farther east than the Collingwood area but the shales above contain the _Rhinopora verrucosa_ fauna in the one that was described in the brick red shales.

This [illegible] the [illegible] of the _L. rhomboidalis_ beds are present about Terra Cotta - Georgetown area as to the west of the latter and before getting to [illegible] which is considerable [illegible]. To the west of the railway station at Georgetown there is a collected [illegible] the [illegible] which I [illegible] then [illegible] limestones of the [illegible] series [illegible] one [illegible].

[illegible] Thorold [illegible] are collected in the railway cutting [illegible] mile west [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]. The cut at the original bridge, [illegible] 20 feet [illegible]. The lower 5 feet [illegible] red [illegible] [illegible]

Cronata. The next 8 feet [of more living than snakes] may be called the [illegible] Conus beds followed by 4 or more feet of a grey to yellowish brown sand [illegible] the [illegible] zone of *Athens vittata*. Very few of the species seem to tread a definite zone but in a general way the greatest abundance is as above indicated. See my small collection of fossils.

Called on Professor [illegible] the local school teacher who [illegible] me [illegible] on Mr. Fuller the [illegible] here.

Medford, July 28-1912. Sunday.

[illegible] going on geology today.

[illegible] Grand [illegible] of 1897, sheet no 125, 126 [illegible] Ann. Rep. Part I of vol. IX (new series) by R. Bell. His generalized section is as follows:- All dip [illegible]

? Huronian [illegible] end of [illegible] William Bl. and S-E. end of [illegible], Grass, [illegible] grey and buff dolomites. 100 feet.

[illegible] Then [illegible] and [illegible] and buff dol. [illegible] feet.

Clinton. [illegible] or [illegible] almost [illegible] at top but only 22 feet thick = "Iron Ore band" 177 feet.

[illegible]

[illegible] Blue-grey [illegible] and shales with [illegible] and [illegible] 30 [illegible] [illegible] 300 feet.

Utica. [illegible]

[illegible] and [illegible] 520 feet.

? [illegible] [illegible] 100 feet.

Total [illegible]

In walking around to the north of Reading this afternoon I was struck with the low relief of the country which is however decidedly unpleasing [illegible]. The high lands are ridges and the road that runs north and south [illegible] land [illegible] [illegible] by one of limestone [illegible] [illegible]. Between this limestone [illegible] the [illegible] shales and then the coal [illegible] by fine unfossiliferous shales and then by [illegible] limestone about [illegible] mile [illegible] are [illegible] than 30 feet. Below the [illegible] The [illegible] occur [illegible] limestone [illegible] shale used for brick and tile [illegible] =

The Lower Hamilton [illegible]

is a [illegible]

For record literature see

Whitcombe, Const. Canadian Cal. I, for 2, 1889.
" " " I " 5, 1898.
Munro, Rep. of Privy Council 1897, pp. 129-182
Chisholm, Dict. of Canada 1896.

Thedford July 29-1912, Monday.

Collected all morning in the brick and tile grounds about 3/4 mile northwest of Thedford railway station and [illegible] creek house. The section here combined with that of the railway cut [illegible] about [illegible] :-

"Ridge" at railway cut [illegible]

[illegible] weathering [illegible] concave [illegible] [illegible] [illegible] bred.
About 4 feet [illegible]

[illegible] shale with [illegible] [illegible] and [illegible] of [illegible] [illegible],
About 6 ft.

Blue shales [illegible] [illegible] [illegible] or [illegible]
About 8 ft.

(Railway cut.)

Blue shale.
Thickness not seen but [illegible] about 8 feet.

Lower [illegible] [illegible].
About 3 feet.

One or two feet [illegible] [illegible] [illegible]
About 2 feet

Black [illegible] [illegible] [illegible] [illegible] [illegible] inches [illegible]

Lower Hamilton [illegible]
Brick Clays.

(Brickyards.)

[illegible] [illegible] of [illegible] in [illegible] [illegible]
and [illegible] [illegible] [illegible].

In the afternoon left Ardmore on the mail stage. Left at 3.15 and got to Ardmore at 5.30 P.M. Stopping at the same hotel as at 17 years ago, the Cliff House Inn. Cliff proprietor.

Arkona, July 30-1912. Tuesday.
Spent the day Collecting at Bartletts Mills now called Marshalls Mills or better Hungry Hollow.

Here we have the continued section of the railway cut, and the [illegible] seen [illegible]

The height of the hills at the bridge over the Aux Sables River is according to barometer 38 feet to the [illegible]. Farther down stream about 1/2 mile away I seen higher cliffs of blue shale and limestone [illegible] up to the upper limestone [illegible] beds. These cliffs are about 50 feet [illegible] here.

The section at the bridge is as follows:-

Glacial tile

[illegible] blue shales weathering brown [illegible], the lower [illegible] brown, 12 feet. [illegible] here.

Ferruginous shale with [illegible] [illegible] 15 inches

Coral reef 3 feet. [illegible]

= The Encrinal limestone [illegible] — Limestone [illegible] 20 inches

Black oily shale with [illegible] 6 inches

[illegible] shale = Lower Hamilton

[illegible]

[illegible]

The bulk of the fossils and so far the greater number of species come from the upper Hamilton or the beds above the Encrinal limestone, and in fact essentially from the Coral zone. Outside of the corals and the Fenestellidae most of the species pass upward and yet many forms and most of the corals hold a rather restricted range.

Since the Kinney Hollow locality is still good collecting ground yet it is not as good as it was 17 years ago when I first saw the place.

I was surprised to see an abundance of Styliolina in the upper Hamilton just above the coral zone. Here it occurs with Chonetes scitula, Leiorhynchus limitare?, and Ostracoda.

It is probable that most of the Dolato-crinus came from the coral zone. Taxocrinus from the mucronatus beds while Arthroacantha occur in association

with the Microcyclus beds.
Spirifer granulosus occurs in the Encrinal limestone. Also at Kettle Point in what must be the same height as Hamilton for here occurs the black Huron shale.

Arkona, July 31-1912. Wednesday.

Spent the day in Rock Glen and Aux Sables river.

In the Rock Glen at 24 feet below the Encrinal limestone came upon a bed of spinose Platyceras that infest Arthracantha. The crinoids had all gone into debris but the gastropods were wonderfully in place. Associated I saw Spirifera hamiltonensis, [illegible] Ambocoelia umbonata and Schuchertella [illegible] chemungensis.

The section in Rock Glen is as follows:-

Upon level of water fall

A. vittata limestone

Fringe [illegible] of limestone above in the shale

Blue shale.

[illegible] umbonata zone.

← 22 feet →

Coral zone - 3 feet

Coral limestone. 20 inches

Blue soft shale or clay.

[illegible]

24 feet [illegible] the Platyceras [illegible] bed at water of Rock Glen.

Same shale down to Aux Sables at dam.

[illegible]

Left Arkona late in the afternoon preceding.

Acervularia marmini seems to come in only above the Athyris vittata zone. Saw several specimens today above the falls of Rock Glen.

[illegible], Principal of Public School and local collector. May sell his collection; not worth more than $ 75. Has few corals.

Ancyrocrinus bulbosus occurs very rarely in the Microcyclus zone and at Stony Point. Spirifer granulosus in the coral limestone and at Stony Point.

Stropheodonta demissa, Rhipidomella penelope also occur in the Microcyclus zone.

Found one Phillipsastraea verneuili and gave it to Williams.

Cryphaeus boothi occurs at Stony Point.

Thedford August 1st 1912. Thursday.

Started out in a buggy for Kettle Point and Stoney Point.

At Kettle Point we are in the Huron black shales with many "kettles" = concretions up to nearly four feet in diameter. There are many of these kettles and all exceed two feet in diameter and sometimes 3 can be seen in a square ten feet. As a rule however they are irregularly spaced. All that we saw lie in one general zone of from 6 to 8 feet thick but then this abundance than one has seen of an [illegible] name, a little city beside Lake Huron.

These concretions split on weathering through the center when one sees that the core is a yellowish [illegible] ways. From this center a cone-in-cone structure originates and then a fine radial structure to the outer periphery. It is a black crystalline growth [illegible] Outer is [illegible]. [illegible] some [illegible] periphery.

These concretions bend out the strata, and about as much downward as upward. Around the center [illegible] the black shales butt up horizontally against the concretions. Saw no

organisms in the center.

The black shales are replete with sporangia and when weathered give certain layers a slight amber tint. See the specimens. Also got two pieces of *Sigillaria*, and a *Lepidodendron*. See the specimens. We also saw stout pieces of wood that had been converted to coal = a hydrocarbon, very fatty. Of *Lepidodendron* there may be 3 species or more, the scars had an outline like this. These Williams has,

Along the beach large pieces of limestone with much chert are found among the crystalline erratics. These are of Hamilton age and have an abundance of *Chonetes vicina* (coarse but faint striae). The other fossils are small *Spirifer mucronatus*, *S. granulosus*, *Stropheodonta* [illegible], *O. erratica* small, *Cryphaeus boothi* and many other fossils.

At Ohio Camp about 2 miles north of Belle River one sees the Hamilton limestones

that immediately underlie the Strum. [illegible] far they underlie is difficult to tell because between these two places we saw another smaller point of [illegible] limestone in a dome (or anticlinal). At this place the limestone had chert and are the same beds we saw loose as blocks among the granite [illegible]. These I judge to immediately underlie the Strum. At other points we are [illegible] [illegible] that may be 10 [illegible] [illegible] the [illegible]. In some way, the [illegible] [illegible] of the [illegible] limestone at Ulfiva,

[illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible]

emcana, [illegible] [illegible] [illegible] [illegible] invahsi, Rh[illegible] fusslana, [illegible] [illegible] halli, [illegible] [illegible], [illegible] [illegible] and many [illegible], [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

Also [illegible] [illegible] iana, [illegible] tail,

A. Pilkey

S. [illegible]

Thealogical Cottage [illegible]

Collect, find [illegible]

Brought a lot [illegible]

Promised to collect for me, [illegible]

in detail [illegible] him up.

[illegible] Collingwood.

The question that we should be asked what is the character of the contact between the Hrum and Hamilton. While we did not see it today yet I rather suspect the contact is an abrupt one and that a land interval may have intervened between these two formations or that the Hrum change came in suddenly. The Stony Point Hamilton should be [illegible] with [illegible] to see if the [illegible] has a [illegible] time section. Comparison should also be made with Alabama. The fact that only a little Hamilton occurs in the [illegible] [illegible] [illegible] [illegible] is going on in this [illegible] northern [illegible] changing the [illegible] and bringing [illegible] [illegible] [illegible]

Georgetown Aug. 2-1912 Friday.
Left [illegible] at 6.59 a.m. for Junction where we change cars to go north again to Collingwood.

At Limehouse Station there are the bedded limestones interbedded with red shale. Are these Richmond or Medina?[2]
[Parks says Medina ss. below, Clinton above]

It rained so hard all the morning that we could do nothing at Georgetown and could not make use of the time to see the Niagara exposed along this place. Went on to Toronto and then to Collingwood.
Left [illegible] at 6 P.M. Again at the Globe Hotel.

Collingwood August 3-1912. Saturday.

[illegible] the morning [illegible] northeast Collingwood [illegible] minutes walk on the [illegible] [illegible]. Here are [illegible] [illegible] drab to greenish-yellow [illegible] that [illegible] are [illegible]. It is all [illegible] [illegible] and [illegible] [illegible]. The [illegible] are not abundant and [illegible] the commonest species are Calamagrostis [illegible] Plec. [illegible] Rosa [illegible] ; Phacopsis [illegible] [illegible] are [illegible] [illegible], Fuscidea [illegible] [illegible] are [illegible] [illegible] the Icmidium [illegible] are [illegible] [illegible] Fulcaltia [illegible] [illegible] Ilicarum arenarium [illegible] one [illegible] flat [illegible] [illegible] are [illegible] [illegible] [illegible] [illegible], and a cast of Pecilotrichum [illegible].

The [illegible] of these beds is Trenton = [illegible] or [illegible] Trenton, [illegible] [illegible] [illegible] of the [illegible] of [illegible] Trenton for the top is at [illegible] some 5 1/2 miles to the south. How much is above can be [illegible] calculated [illegible] [illegible] but [illegible] not know what the thickness is.

We then visited a small [illegible] along [illegible] [illegible] walking to the south [illegible] [illegible] [illegible] or [illegible] the south [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] and the intermediate one visited on [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] i.e. the [illegible] [illegible] [illegible] [illegible].

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

Left on Steamer Germanic for Manitoulin.

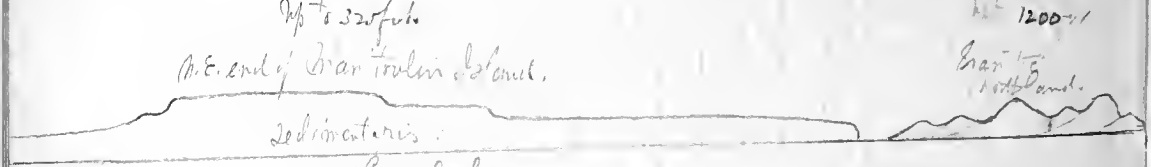
[illegible] [illegible] [illegible] [illegible] [illegible] are see in [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] town

we see what appears to be contact between the red P[illegible] and the "[illegible]" as the first [illegible] the [illegible].

The Steamer [illegible] landed at Green River ready at 8 A.M. and as there was still some [illegible] we walked to the [illegible] in the [illegible] one-half mile east [illegible]. The limestone above the red shales is a series of at least 20 feet [illegible] magnesian limestone that we take to be the [illegible]. Here they are [illegible] above the [illegible], while on the [illegible] track [illegible] they are nearly 400 feet above the [illegible], the distance is about 50 miles [illegible] this [illegible] is about 16 feet to the mile.

[illegible] with the red shales [illegible] the [illegible].

[See later [illegible] 16 and 17]


Up to 325 feet.
N.E. end of Boar Island.
Sedimentaris.
Lake level.
Alt 1200 ft
Granite
North Bank.

Lake Huron August 4 - 1912. Sunday.
On Georgian Bay.

At 7 A.M. we are opposite Cabot Head. All of the Manitoulins are flat topped islands with beds sinking in altitude southward and rising steeply northward in steps that are however not very marked.

At 11 A.M. we are approaching the "Sound" [illegible] north shore. To the south lie the [illegible] flat topped islands usually less than 100 feet [illegible] with [illegible] the [illegible] [illegible] and abut [illegible] against the [illegible] of the north. Line of [illegible] [illegible] [illegible] north [illegible] [illegible] rugged [illegible] [illegible] vegetation [illegible] [illegible] the conifers are very conspicuous. The mountains rise to nearly 1200 feet.

This north land and [illegible] the area of elevation, ~~[illegible]~~ of [illegible] [illegible] [illegible] but apparently flexed. All of the Manitoulin [illegible] must have extended across this elevated land but has since [illegible] been [illegible] away. [illegible] [illegible] [illegible] [illegible] [illegible] it seems [illegible] [illegible] [illegible] [illegible] a [illegible] [illegible] [illegible] [illegible] [illegible].

At [illegible] [illegible] Killarney and [illegible] [illegible] [illegible] [illegible] the [illegible]

For the geography and geology of the Killarney area and the eastern Manitoulin Island see map 12 Canadian Geol. Surv., J. Bell.

is but a few hundred feet wide.
[illegible] its way. Red granite on both sides. To the north rise mountains of to 1180 feet above the [illegible]. As we steam towards Little Current we see an island, Badgeley Island, the north side of which is rugged [illegible] while the south side is flat [illegible] and of [illegible]. The strata here appear to be deformed and to lie in domes [illegible] greater dip than farther southward.

Got to [illegible] at 3 P.M. Staying at Queen's Hotel.

Spent the rest of the afternoon [illegible] over the [illegible] in the [illegible] about one-half mile [illegible] of the hotel. About [illegible] with [illegible] are to be seen. All of them are marked by more or less [illegible] *Cladonia* [illegible] [illegible], *Calosoecia canadensis* [illegible], *C. sinuata* and [illegible] [illegible] [illegible], *Stylopora* [illegible]. Most [illegible] are abundant and [illegible] [illegible].

[illegible] and

green shales at the top of the Richmond so well developed on [illegible] and to the south east to Hamilton and Niagara Falls. It is probable that these shales were never developed in the Manitoulins or at least in but thin amount and since eroded away.

Bell states that the part of the red Richmondian is seen on Cabot Head. Here about 30 feet.

As we did not see contact between the Richmondian and Clinton the exact nature of these uppermost beds is not yet known to me [See Aug. 13 where this contact is described. No red beds here or on Manitoulins].

Grant Township, August 5 1912 Monday

Examined in the morning the small dry brook about [illegible] mile south of the village. Began to make the following downward going sec[tion] in [illegible] the way in grad[e] level.

Farm flat [illegible] until [illegible] first [illegible] once before [illegible] or impure [illegible] some green shales, [illegible] marked (1). [illegible] Tanstill[illegible] [illegible] are common and up to one [illegible] across. R. cabax of the [illegible] seen in 3 places.

Then [illegible] power [illegible] with [illegible] shale [illegible], and [illegible] farm [illegible]

Then [illegible] [illegible] [illegible] Bysiricea may occur here.

[illegible] Tanstill [illegible] R. Cabax [illegible] makes, a water fall and a sharp ascent of the farms.

Then a [illegible] shale [illegible] some [illegible] or impure limestone, the shale predominating. [illegible] few [illegible]. Saw R. cabax, [illegible]. [illegible] and [illegible] Richmond [illegible] thick.

Over [illegible] [illegible] [illegible] Richmond [illegible] [illegible] [illegible] [illegible] level. At the top are heavy bed about 12 feet [illegible] limestone [illegible] [illegible] [illegible]

There are [illegible] here and there seen

are hard to get. Mostly small Orthoceras.

From 13 1/2 feet of shaly limestone that weather into a nodular limestone. There are many fossils that show on weathering but few can be had that have any value. Zygospira Kentuckyensis is common and there are bivalves and gastropods. Saw no coral other than a single Stelliporella obstruta.

Then more regular bedded lis with shale partings down to lake level, 28 1/2 feet. Leptaena rhomboidalis and more proliferous. Those collected at the bottom are marked Zone (3), and those near the top are Zone (2). In zone (2) I also a single R. capax and Strophomena filitexta. In zone (3) Orthis insculpta, Stelliporella obstruta and Fainstella stellata are the most common fossils. Bryozoa are also common but all are on slabs.

The Richmond seen thus far measures 82 feet and is essentially a limestone - thin bedded - series with but little shale, the shale increases in amount towards the bottom and here the fossils are also more common. Orthis insculpta appears to be restricted to the lower 28 feet.

fossils are also more common. [illegible] [illegible] [illegible] [illegible] [illegible] 25 feet.

In the afternoon examined the basal Silurian at the back of Manitowaning for about 3/4 miles to the north and about the same distance to the south. Contact with the Richmond cannot be seen here. [illegible] there are about 20 feet more of Richmond above what we saw this morning before the Silurian begins.

The "Clinton" makes an escarpment-forming[?] [illegible] here [illegible] 25 to [illegible] 50 feet. It consists of thin bedded grey to yellowish fine grained dolomite without shale partings. All of the fossils are [illegible] pseudomorphs and as a rule are very [illegible]. [illegible] noticed are [illegible] Favosites with small corallites, Favosites [illegible], Eridophyllum, Heliolites, [illegible] [illegible] [illegible] [illegible] [illegible] (Bell), Dalmanella elegantula, [illegible] [illegible], Orthis [illegible], [illegible] [illegible], Rhipidomella[?] [illegible], Orthis [illegible], C. flabellulum, [illegible] [illegible].

[illegible] places the [illegible] added [illegible] [illegible] [illegible] [illegible] by reef [illegible] that have a [illegible] [illegible] [illegible]. One reef is made up

mainly of Klimatozoun, actinoy Tropora [illegible] the most conspicuous [illegible] [illegible] (gigantica), and a [illegible] [illegible] in [illegible] can the [illegible] be well made out for all are [illegible] [illegible] [illegible] and [illegible] on weather. These reefs make domes and are easily distinguished on the [illegible] farm land.

What is the age of these [illegible]? Bell says "Clinton" but there is little to [illegible] [illegible] Clinton. The [illegible] Pentamerus is suggestive of the "Clinton" [illegible] of Hamilton and Dundas. The corals however of the exposures seen today are of Silurian character and of [illegible] not to be [illegible] in the [illegible] and [illegible]. It is an early phase of Silurian – [illegible] an [illegible] early phase – of which but a very little is to be seen at Toronto – Hamilton – Niagara Falls. There is still much to be learned in regard to this [illegible] "Clinton".

Williams has the well records of 3 wells dug on Manitoulin for petroleum. Two of the wells are just to the northwest of Manitowaning, the other one is ten miles further northwest. These wells show the Collingwood black shale above the Trenton to be here only 20 to 22 feet thick, followed by the Hudson River of not less than 635 feet. All of the wells began in the Richmond just below the "Clinton".

Bell gives the Utica as 65 feet thick

Bell " " Hudson River as 250 feet.

Bell also states that overlying the "Clinton" there is always 20 feet of red marl. So far Williams has not found these red marls. They must occur somewhere as stated by Bell and as Williams has not found them [illegible] studied these contacts [illegible] in the section here. If this is proven it will be a point of much paleogeographic importance.

[2194 / 3]

Manitoulin Is. August 6 1912 Tuesday.

Spent the morning collecting Niagaran corals at Fossil Hill [illegible], 2 miles to the south of Manitowaning. The corals occur as pseudomorphs in snow white silica, the latter being [illegible] in the rock, they are quite [illegible], especially the compound forms. Eridophyllum occurs in colonies [illegible] several feet across. Favosites favosus [illegible] 16 inches across. Halysites are fairly common, in small and very large corallites. Syringopora is not common. Strombodes in two species are fairly common. Cup corals in at least half a dozen species are common but good ones impossible to get. Of brachiopods there are small Pentamerus oblongus (less than 2 inches long), Orthis flabellulum and Atrypa reticularis. Otherwise nothing but comminuted [illegible] material.

These corals occur in the [illegible] [illegible] of the Niagaran and weather out of a porous, crystalline dolomite.

In the afternoon tried to see contact between the Niagara and Clinton but failed to find the place where Williams had seen it. The Niagara at the supposed base [illegible] holes in a Pentamerus [illegible], but with a very [illegible] dark colour and [illegible] filled in [illegible]. These holes in the dolomite are very common. The [illegible] are in a heavy bedded grey dolomite, in places greenish, that weathers into thin beds. In general it is devoid of fossils.

Williams states that below these Pentamerus [illegible] with *Leptocoelia hanoverensis*, but did not see this rock still lower and [illegible] from the cliff we again saw the [illegible] [illegible] [illegible] yesterday. [illegible] in the Clinton [illegible] [illegible] the very [illegible] [illegible] here.

[illegible] Wednesday.

Rained all day and remained at Queens Hotel.

Left [illegible] Thursday, left at 6 P.M. on the small steamer [illegible] The land is flat and [illegible].

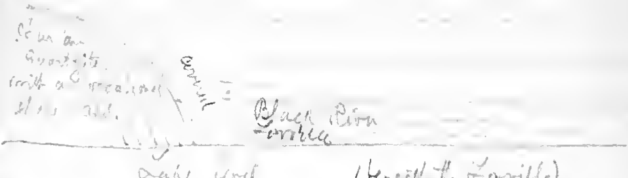
About 1½ miles [illegible] Little Current the top of the Trenton is exposed and one may find here the upper 10 feet. It is a thin bedded series of greenish more or less shaly limestones with [illegible]. The preservation however is not fair and much of the original calcite is replaced by crystalline calcite. The beds are marked with P. incrassatus, Cyrtodonta and an abundance of Lyzora.

The Collingwood shale overlies the Trenton in the same hill and about 10 feet of it occurs in the [illegible] hill-side. At intervals are the harder limy ones. The fauna is far less prolific here than at Collingwood and an occasional tail of Ogygites canadensis occurs. Graptolites are far more common and with these are associating Leptobolus lepis, (the large form), Lingula modesta, Orbiculoidea and Triarthrus becki. These shales are not so black and bituminous here, nor so fine

and Triarthrus beckii. These shales are [illegible] [illegible] and [illegible] here, [illegible]

gained. Here as at Collingwood the Coquite [illegible] deposit of the higher beds.

In the afternoon had [illegible] Turner [illegible] [illegible] [illegible] end [illegible] [illegible] Roche island. this is Mosquito bay [illegible] [illegible] [illegible] to the Trenton but no actual contact. It is as follows



In the lowest bed, [illegible] I saw [illegible] [illegible], Orthoceras tenuifilum, Columnaria [illegible], [illegible] and [illegible] [illegible]. [illegible] are [illegible] than 15 feet [illegible] that are Lorraine like [illegible] [illegible] [illegible] are Lorraine [illegible] the [illegible] [illegible]?

[illegible] island and saw the [illegible] [illegible] [illegible] are [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] of fossils. They are [illegible] [illegible] [illegible]

[illegible] [illegible] some.
[illegible] in [illegible]
[illegible] the [illegible] Black River
[illegible] series the top
[illegible] are at [illegible] Cement.
[illegible] The milk-white Trenton beds
[illegible] the other [illegible]
[illegible] of the same
deposits seen at Beloit Wisconsin. It
seems to me [illegible] series
in [illegible] only that here the limestones are
[illegible] and [illegible] colors.

The old Huronian floor was a very
uneven one and some of the higher places
[illegible] until Utica time. It is probably
due to [illegible] floor that the Ordovician
strata [illegible] in domes. [illegible] contacts
can be seen where the Ordovician strata
always dip away [illegible] in all directions.

[illegible] Toronto arrived at 5.30 P.M.
[illegible] Park and [illegible] at 9.30.
There are [illegible] to [illegible] for
the Geological Congress Excursion.

Stopping at Queens Hotel.

[illegible] Queens [illegible].

Little Current, August 9-1912. [illegible]

Stayed here last night to see the fine contact along the new railroad building here [illegible] the Canadian [illegible] Railway.

It rained [illegible] during the night and [illegible] [illegible]. All concluded not to go out. We are talking of the [illegible] trip for next year from Toronto around the lakes to Collingwood.

Talking with [illegible] about the succession at [illegible] and elsewhere I learned that [illegible] is no [illegible] here but the "? [illegible]" [illegible] in the introduction [illegible] to the Lorrain [illegible] [illegible] a formation [illegible] that is older than [illegible]. [illegible] the succession [illegible] the [illegible] into the [illegible] [illegible] like the [illegible] and are [illegible] [illegible] [illegible] here and [illegible] [illegible] the Collingwood [illegible]

[illegible] Hamiltonian age [illegible]

Tomwerd [illegible] [illegible] Trinity and Park, [illegible] a great [illegible]

[illegible]

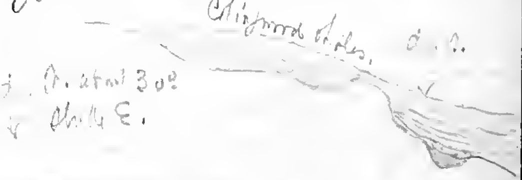
[illegible] [illegible] the [illegible] [illegible] Eden age [illegible] [illegible] the [illegible] in the valley of the [illegible]

[Then is the Lorraine of Clay Cliff and Wellman's Brook]

Toccste [illegible] is [illegible] in [illegible] the locality in the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] in [illegible] on an [illegible].

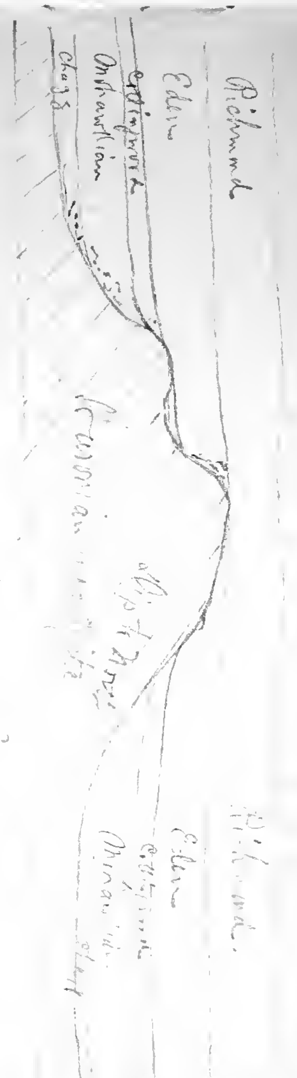
Near Sheguiandah, Manitoulin.



The [illegible] 112 feet above the lake and [illegible] the lake [illegible] not over 6' [illegible] this [illegible] over rides the Huronian due to the [illegible] in the sea. In one place the shales abut against the quartzite [illegible] of the latter. [illegible] of [illegible] loose [illegible] down the slope [illegible] of the sea. [illegible]

There is Collingwood shale to the north and to the south of the Huronian quartzite, [illegible] south one does not [illegible] more than the Collingwood but [illegible] the north the Eden [illegible] and [illegible] about one mile more the [illegible]. I would interpret the [illegible] as follows:-

Richmond. I would interpret the covering of the [illegible] as follows:



Spent the afternoon in visiting the [illegible] quartzite monadnock about 7 miles south of Little Current.

Going south after leaving the lake point we rose at once to the [illegible] and then there is a [illegible] for several miles over the Collingwood shales. Good [illegible] are [illegible] to be seen in the road cuttings.

[illegible] on the road [illegible] shales and [illegible] the road [illegible] [illegible] and [illegible] [illegible] [illegible]. The [illegible] is [illegible] about 100 feet above the [illegible] at [illegible].

The next rise of the land is through the upper Eden but got nothing here. Then we stopped [illegible] north of the place and beside it collected again at the [illegible] of the town Richmond. The beds are thin bedded limestone [illegible] and have Zygospira kentuckyensis, Streptelasma rusticum, small [illegible] [illegible] (rare) Strophomena sulcata, D. [illegible], Catazyga headi etc. See the list of fossils.

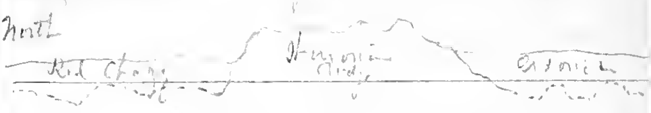
Little Current August 10 1912 Saturday.
Raining all night and up to 8.30 A.M. Did not go out the weather looking too bad.

In the afternoon Mr. Turner launched us across the water to south side of Great [illegible] island and we then walked about 2 1/2 miles north on the new railroad bed not yet tracked. The island is almost flat and practically without rock. There is therefore but a small [illegible] in most cases in the joints of the limestone. We began in about middle [illegible] limestone and finally got down into [illegible] [illegible]. [illegible] prominent fossil [illegible] all the bed [illegible] is Receptaculites oweni. In the higher bed we got [illegible] but [illegible] are wider apart. A little [illegible] as far as we [illegible] we got [illegible] [illegible] [illegible] [illegible] not [illegible] [illegible] corniculum [illegible] [illegible] a short mile distance [illegible] [illegible] [illegible] [illegible] stellata. [illegible] we passed [illegible]

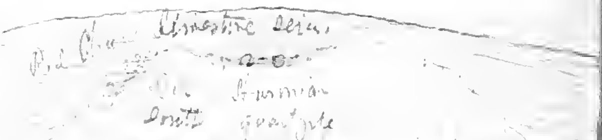
it is hard to say. According to Wells dip 1° 40 feet to the mile it would make 160 feet but somehow it does not seem to me more than 100 to 120 feet.

All in all the afternoon had little interest because we started out to see the contact of the Mt Carmel with the Hermosa. To see this we should have gone at least three miles further which would have made the afternoons walk of at least 14 miles.

Little Current, August, 11-1912. Sunday.
As the day is good we have taken the launch Lotus for the north-east side of Great Cloche Island. Left at 10.10 A.M. We arrived at the south end of Cloche Channel beside the railway at 12.30. [illegible] south [illegible] along the east side railway cutting the [illegible] so called Chazy red shales. To the south [illegible] Huronian quartzite, a [illegible] into the Ordovician strata. It is [illegible] over again



In a small borrow quarry for the railway dam across the channel we see the top of the Red Chazy [illegible] limestone [illegible]-dome like the Huronian. Then here a red shale series with [illegible] magnesian limestone. The contact is [illegible].
[illegible] from this locality.



(At Mission [illegible] we saw the same [illegible] on Aug 8 but there they are not red, nor sandy, but are heavy bedded [illegible] with Columnaria).

These limestones south of the Storm are
done on the introductory lime series [illegible] the
Black River series, and should not be added to the Cardshale series. [illegible] Corals
[illegible]
[illegible] the limestone between 10 and 20 feet.

Above come in 12 feet of Lowville
[illegible] the milky-white birdseye limestone.
Some of the beds are dense conchoidal frac-
turing limestone interbedded with often layers
which on weathering crack down into a shale.
Had no time to collect fossils but those collected
by Foerste yesterday are Black River-Trenton
forms. Just beneath these beds are often
[illegible] bryozoa and Rhynchotrema near
inaequivalvis. See my list. Saw some sun-cracks.

Without transition there rests on the Low-
ville a darker granular hard limestone 10-12 inches thick with
Columnaria, followed by a series of thinner bedded
crystalline limestones separated by shales with
the Black River fauna, of which Foerste
measured at least 43 feet in the cut
300 yds long where the strata dip at an
angle of 15 to 20 degrees (See photo).

aspect of these degrees (see photo).

Lower Black River

Below the red sandy magnesian limestones are brick-red sandy shales with zones of sandstones that below become more coarse and conglomeratic (see Williams statements of [illegible]). In places these brick red shales are [illegible]. Collected some fossils [illegible] a sandstone and Pach[illegible] (Pleurotomaria [illegible]).

The red beds, against the [illegible] show clear [illegible] contact as the [illegible] are here more and more sandy and [illegible] toward the [illegible].

[illegible] sandstones are [illegible] down [illegible] the [illegible] bottom [illegible] [illegible] [illegible]

[illegible] above the [illegible] [illegible] [illegible]

[illegible]

Left Little Current at [illegible] P.M. on Manitou [illegible] [illegible] at about 11 P.M.

Manitoulin Is. Oct. 2-1902, Sunday.

Spent the [illegible] with Messrs Foerste and Williams at the Clay Cliffs near [illegible] on the eastern side of Manitoulin Island.

The lowest rocks shown here are the upper beds of the [illegible] Eden and the greater part of the [illegible] but not the uppermost Richmond. The height of Clay Cliffs is about 170 (? 290) feet and I should judge that at least 120 (? 150) feet of this is Richmond. Williams states that the thickness of all the rocks at Clay Cliffs from lake level to the base of the "Clinton" is about 195 feet. On the basis of the above figures this would give the Richmond a thickness of at least 145 - 175 feet.

Collected a few slabs and some bryozoa from the Upper Eden beds. Besides those taken saw Orthis occidentalis, Modiolopsis concentrica and M. philadiformis. These beds are blue clays with some thin limestones and although there are [illegible] in these zones there are fewer ones here than at [illegible] Brook

[illegible] though there are [illegible] these zones there are far more here than [illegible]

near Meaford. Saw also large *R. sericeum*.
From this evidence it would appear that the Eden fauna persists longer here and that some of the Richmond fauna appears earlier. In other words, that the typical "Eden" is mainly a Lorraine zone.

The lower Richmond is also covered by [illegible] material. The Lorraine beds here near the top of the [illegible] [illegible] is the Ohio Saluda fauna. What [illegible] may be regarded as a Saluda in time. The lowest [illegible] here Foerste [illegible] and is mainly in the [illegible] in time [illegible] in the Saluda zone.

The [illegible] has a great deal more [illegible] here than at [illegible]. Saw no C. [illegible] and [illegible] in the [illegible].

The [illegible] Richmond - Queenston a[illegible]. Hardly [illegible] in position and [illegible] [illegible] [illegible].

Manitoulin I. Au[g] 13-1912, Tuesday.

Examined the Richmond-"Clinton" contact on the [illegible] [illegible] about 1/2 mile east of Manitowaning on the east side of Mi.bay. On a [illegible] beside the roadway are shown about 15 feet of the highest Richmond - a series of thin bedded sandy and shaly somewhat magnesian limestones with many bryozoa and these are especially [illegible] in the top two feet. Lower in one of the lower [illegible] there are ostracoda. Thought I could make out Lep. capsifera. Saw no brachiopods. There are some crinoid columnals. The only bivalves that I could make out where Ambonychia, nearest to radiata, and an undet. Ctenodonta.

The 12 feet above the Richmond is more or less covered and I could not clearly make out the character of the beds. From what I could see it seemed to be greenish (weathering yellowish) clays jointly belonging to the "Clinton" series, just as one saw on the mountain back of Collingwood.

Then come in magnesian grey limestone with just a little of the finest sand, and a fossil of anything is to be seen. These are clearly the "Clinton" beds.

[illegible] a little of [illegible] [illegible] ... [illegible] have been. There are clearly the "Clinton" [illegible].

About the afternoon collecting at the "Rocks" [illegible] [illegible] of [illegible]. All come from the [illegible] in the [illegible] of the Clinton [illegible] which is [illegible] [illegible] above the base of the [illegible]. The small [illegible] [illegible] [illegible] [illegible] [illegible], the one near [illegible] [illegible] is [illegible] rare. [illegible] is also rare but the [illegible] [illegible] are [illegible] [illegible]. [illegible] [illegible] is also very common but one almost [illegible] never [illegible] [illegible] one. Rhipidomella [illegible] is [illegible] [illegible] [illegible] [illegible] [illegible] like [illegible] is [illegible] rare. [illegible] [illegible] an [illegible] [illegible] [illegible] large [illegible] that are [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] and not one [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] fauna [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] and possibly [illegible] [illegible].
These 3 feet are blue shales with occasional beds of argillaceous limestones that are

[These] are in thickness from 2 to 6 inches
rippled and bear bivalves. Other thinner
lying shales are replete with delicate bryozoa
and bivalves.

I cannot see how these beds can be
Eden or higher Utica and they are certainly
not Richmond. Probably they will turn out to
be a northern phase of the Lorraine.

By barometer we made out that it is at
least 212 feet from the lake to the uppermost
stop from which the "Clinton" city [illegible]. In
going up the trail at 46 feet above the lake come
in a great abundance of large R. alternata and
no Richmond fossils occur here. At 70 feet
above the lake we get the first [illegible]
[illegible] and [illegible] [illegible]
[illegible] [illegible] Richmond. At 126 feet
above the lake [illegible] [illegible] and
[illegible] [illegible] in abundance, and
[illegible] feet above the lake we are
[illegible] [illegible] [illegible]
not far from the "Clinton" [illegible] beneath the
"Clinton" limestone.

It would seem that the Eden beds are
shales without conspicuous limestone bands, the

Sericite, etc. with ... lenses ... limestones of a light green ... dolomite ... a ... with ... of Gale ... and ... at the ...

... deposits ... before ... altered.

Parks said after we came here from ... that it was the ... Rainbow ... again.

Manitowaning August 15-1912 Thursday.
Got up at 6 A.M. and packed 4 boxes of rocks and shipped them to Portland ... Hotel ...

Left on Germanic at 10 A.M. with Parks and Walker. Got to Owen Sound at 11.30. Stay at Seldon Hotel.

[illegible] ... at 11.30.
Staying at Seldon Hotel.

Owen Sound August 16-1912 Friday.

Spent the morning with Parks collecting in a series of small quarries about one mile East of the Seldon Hotel in the Clinton on the flat top of the escarpment. The quarries are but 3 blocks away from the Race Track or Fair Grounds.

The section is [illegible] the top 10 feet of the "Clinton" as it runs down into the flat land and south of the escarpment seen on August 13-1912. It is a series of magnesian (greenish-yellow to gray) sand in part dolomite thin bedded limestone with thin zones of chert. Fossils are very abundant in the upper chert zone. Anoplotheca planoconvexa is the commonest and the guide fossil. Others Stropheodonta, Schuchertella pecten, Leptaena rhomboidalis, Dal. elegantula, Rhynchonella are also common. Platystrophia biforata and the corals are [illegible]. Callocystites vesiculosum is very rare. The remains of Medina bryozoa of Hamilton Ontario are also here but the Arthrophycus do not show out so abundantly here as there.

[illegible] I see that the equivalence of the "Clinton" of Owen Sound and Collingwood, Parks says it is the same [illegible] as at the Forks of the Credit. At Limehouse the "Medina" is beneath this "Clinton"

S[illegible] walked north-east along the river road about 1 2 miles to the cement mills. Just opposite the mills there is a small brook [illegible] and fine exposure of the brick-red shales (Queenston) and a sharp contact of the "Clinton" stone.

The red shales or Queenston is exposed up to about 50 ft above the river or lake level and in this section consists of brick red sandy shales distinctly bedded with but very few harder more sandy beds about one-inch thick in the uppermost [illegible] feet. These red shales at irregular intervals have zones one inch or more thick of green shales which become more abundant towards the top of the formation while the terminal 5 to 7 feet are entirely green shales. These [illegible] owe their green color [illegible] to [illegible] waters and originally were brick-red also. In places near the top the shales are seen to be distinctly sun cracked, the cracks being small and the cracks rarely over 3/8 inch wide. [illegible] no fossils of any kind.

The "Clinton limestone" rests sharply and without transition beds upon the Queenston. When unweathered a heavy bedded argillaceous light green limestone

[illegible] of chert and fossils other than [illegible] also [illegible]

The Clinton limestones of the [illegible] sharply and without transition lies upon the Queenstown. When unweathered are heavy bedded argillaceous light green limestone

devoid of chert and fossils other than an abundance of Buthotrephis markings. When weathered are platy thin bedded yellowish limestones that upward become purer magnesian limestones with a tendency in beds to be dolomites. At the cement mills may be seen about 7 feet of the basal beds of the Clinton.

Forty feet beneath "Clinton" contact get C. sinuata, Ostracoda (L. caecigena etc) and bryozoa. The same bed is exposed 1/2 mile farther east where the Cement Mills dig red clay to mix with fresh water shell marl. They use about 3/4 marl to 1/4 of the Queenstown.

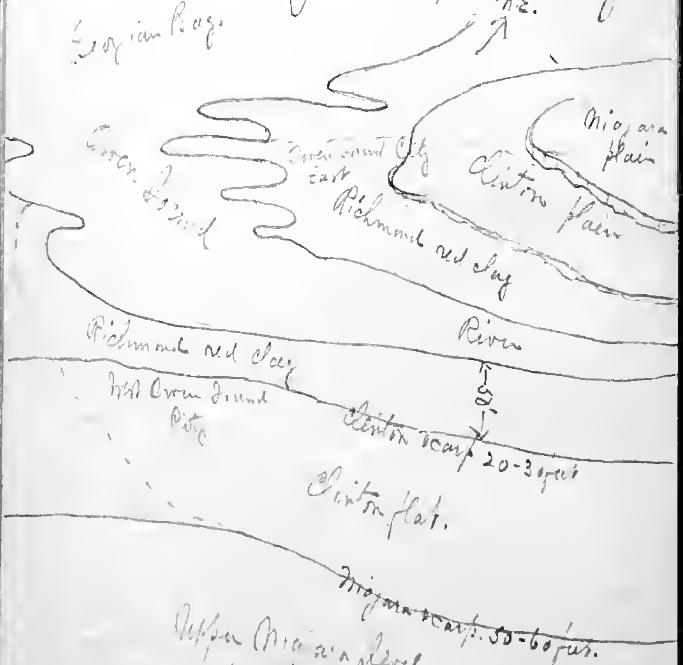
Along a level about 10 feet higher than the fossil zone occur lumps of secondary impure gypsum.

I now see that the green shales beneath the "Clinton" are changed Richmond red shales and must be added to the Richmond and not to the Clinton as I formerly supposed.

Where the cement mill digs red clay there occurs no Clinton covering. Here there is not more than 35 feet of Queenston showing due to the dip in this direction.

Collected late in the afternoon again in the Clinton quarries. In the beds just over the Richmond there are practically no fossils. Saw a poor Orthoceras and a few Dal. elegantula. The most fossiliferous layers occur from 25 to 30 feet above the Richmond.

Owen Sound August 17 1912, Saturday.



The Niagara escarpment around Owen Sound exposes not more than 50 to 70 feet and consists of heavy bedded fine-grained dolomite of a light grey color. It is the "white rock" of local quarry men while the Clinton is known to them as the "blue rock". It has but few recognizable fossils and the cavities are very small. Of fossils

I saw, favosites, [illegible] (small and medium

[illegible] the Clinton is [illegible]
to them as the blue beds. It has but few recognizable
fossils and the cavities are very small. Of fossils

I saw Favosites, [illegible] (small and medium corallites), Atrypa reticularis, Schuchertella [illegible] and a Stropheodonta suggesting S. [illegible]. There is also considerable Crinoidal matter.

[Wright's] At Wright's Stone mill one sees a small exposure of the blue shales in the banks of the small river I saw earlier in the morning at Jones Fall mill, [illegible] about 1½ miles west of the Seldon Hotel. Wright's mill is a few hundred feet east of the turnpike about 1 mile west of the hotel. Fossils are [illegible] here but the exposures very small. What I saw is mainly thin bedded, nodular blue argillaceous limestones separated by shale all of which weathers down into shale. The thin slabs of limestone are replete with brachiopods and bryozoa and of the same species that occur in the Clinton limestone, only that here Anoplotheca hemispherica appears to be absent, the other brachiopods are more abundant. Exceedingly common is [illegible]. Streptelasma is also common but the [illegible].

[illegible] blue shales and limestones of the Clinton are [illegible] not more than 20 feet thick [2] on [illegible] but they [illegible] from the [illegible].

The Clinton limestones are probably not more than 30 feet thick.

[illegible] bumped on the stage at 2 P.M. [illegible] Richmond where I got at 6.15 P.M.
Eight miles [illegible] round the [illegible] in the Clinton shales and then [illegible] to [illegible] a fair chance of [illegible] some fossils, although the shales were [illegible] with glacial material. [illegible] ten miles [illegible] O.S. it [illegible] as of the Niagara [illegible] on the Richmond. I could not get out to see the limestone which [illegible] [illegible] bedded [illegible] the Clinton. Of course it may [illegible] been the Clinton after all. The Richmond was here again the [illegible] shales. It is all Clinton and Niagara in ten miles east of Owen Sound, [illegible] 10 miles into Meaford is all on the Richmond a [illegible] Cincinnati.

Meaford August 18-1912 Sunday
It rained hard all last night and was in a drizzle all this morning. Laid low and was lazy.

In the afternoon walked out along the railway to Mahogany Creek. Below the railway bridge and on five feet higher, i.e. 140 feet of thickness down to [illegible] level all is blue shale, with almost no limestone. These may be regarded for the present as Eden shales.

From five feet above the base of the creek up to some undetermined distance continue quiet sedimentary beds which may be regarded as the Lorraine shales. There there is a gradual introduction of argillaceous limestones that gradually become thicker and more abundant the higher one goes. Probably 40 feet above the base of the Lorraine the limestones have Ambonychia radiata, Modiolopsis [illegible] and rarely M. [illegible]. In physical characters these beds are very like those at Clay Cliff only there are here fewer limestones and the fossils are less abundant. [illegible] middle Lorraine and about the same [illegible] as collected in at Clay Cliff. It must be in these beds that Whitaker got "[illegible] erratica"

[illegible] Sunday, rest and [illegible] more rain [illegible] to work out the [illegible] [illegible].

Meaford Ont. 19-1912.

weather dark and drizzling ... but started out at 7.30 in the mud for Workman's Brook.

About ½ mile up the brook from the wagon-road bridge, and about 150 feet above the lake, occurs the first Pettigrew zone. From about 145 feet above the lake and upwards, occurs the Lorraine division of blue shales introducing more and more thin argillaceous limestones but in no place do the smooth bedded and slightly ... limestones make up more than 5% of the thickness. These beds in the limestones have M. [illegible]ularis, M. concentrica and M. pholadiformis. Also Ambonychia radiata and Pyrgia (see the fossils).

Without break but at once appears at 160 feet above the lake a crystalline roughened limestone filled with very small R. squamula, Lep. sericea (very large) and D. occidentalis and Catazyga. ~~From this point upwards in the section fossiliferous limestones become more abundant.~~ The last species is common in the Catazyga limestone 
There are 3 limestones in about 4 feet and then it is again all blue shales for about 10 feet when another crystalline limestone is filled with large R. alternata. In the next five feet are 2 or 3 argillaceous l., and then

are shales for about 10 feet more. ... [illegible]

next five feet are 203 argillaceous li. and then

all shales for about 10 feet more. Here one sees the same fossils that occur below the Cataggza bed.

Then come in shales with many thin limestones for 10 feet and then again the blue shales with almost no limestones. As it goes on upward, the shales predominating by far, and the argillaceous li. never many.

One sees no diagnostic Richmond brachiopods until the second Cataggza zone and here only in this layer. I did not go higher up in the section today. See July 24 for remainder.

The lower Cataggza zone and the strata below are the same fauna collected at the Clay Cliff. Here as here the R. alternata come in higher and then continue upward. In [illegible] or as far as I can make out there is no sharp introduction of the Richmond fauna and hardly any of this fauna [illegible] until one gets to the second [illegible] zone, and most of it is above this bed. Even then the Richmond fauna is never striking, I suppose because nearly all the strata are blue muds. The shore line must be to the north [illegible] the Clay Cliff [illegible].

On the basis of the barometer measurement of Collingwood mountain which is about 810 feet from the lake level to the base of the

[At Craigleith it is 700 feet from the top of the Trenton to the Silurian. As there are 50 feet of Li. at Coll. we get about the same thickness = 800 feet]

Silurian I make out the following measurements.

These are 435 ft more than in Manitoulin

Trenton (Collingwood to Craigleith)	Est. at		50 feet.
Collingwood black shales (Craigleith)			80 "
Eden estimated at		(680)	215 "
Lorraine (Woodmans brook) measured			190 "
Richmond estimated (Mr. B. & Colling)			275 "
			810 "

In the Woodmans Brook I begin the Lorraine above the first decided Li. appear and with these Mo. cincinnatiensis, and M. pholadiformis. This is about 5 feet above the base of the brook at the railway bridge. Thirty-five above this line occur Catazyga erratica and it is about 155 feet to the C. headi bed. In all this distance blue shales occupy 95% of the space and about all the fossils occur in or in close connection with the limestones. Bivalves are the commonest fossils, then the Bryozoa, Brachiopoda, Gastropoda and Cephalopoda. Of trilobites one always sees Calymene and Isotelus fragments. This Lorraine is the New York one and not the Cincinnati Maysvillian. Nearly all the limestones are argillaceous, smooth surfaced, more or less rippled and variable in thickness — thinning and thickening once

in thickness – thinning and thickening and pinching out horizontally.

Of the Eden in Brookmans Brook one sees not more than about 110 feet from the railway bridge to the lake shore. The thickness of 215 feet is based on the height of the Collingwood Mountain less the known thickness of the other formations. It consists 99% of blue shales and but rarely does one see here an argillaceous li. Fossils are very scarce and all most all are bryozoa.

There is no break between the Eden and the Cincinnatian and the latter and the Richmond.

The Richmond between Arnprior and Collingwood is also a shale formation and about one-half of it (at least 130 feet) is red as previously noted in Ont. Usually not more than 1% of it is argillaceous or crystalline limestone. The chief fossils are bryozoa and brachiopods while the trackiopods are comparatively rare. Corals are almost absent and mostly those where seen on Collingwood Mountain. Just beneath the red beds the li. predominate for 30 feet or more.

Why are there more typical Richmond soils at Collingwood than at Meaford? At Clay Cliff they fairly swarm. Does this mean Valid for the South – in southern Ontario and Lake Erie?

Film IV

1-8 in other book.

~~9 The fiesta on the [illegible] looking [illegible] July 23~~

√ 10 Same from grass [illegible] head on "

~~11 [illegible]~~

~~The so called [illegible]~~

√ 12 The [illegible] [illegible] looking north

Film 5

√ Aug 23 - (1) [illegible] at [illegible] bridge [illegible] work, July 24
from base of Richardson.

√ 30 2 24 [illegible]
[illegible]
[illegible] limestone [illegible]

√ 31, 5 [illegible] Coral [illegible] centre.
[illegible]

√ [illegible]

~~[illegible]~~

~~Film [illegible]~~

Film VI. 1-6 August 4-1912

[illegible] county [illegible] of the [illegible] About Killarney. 1 [illegible] of Killarney
✓ 2 looking north, 3 looking west through the narrow channel.
4 looking [illegible] -6 [illegible] of [illegible] shore.

Film VII.

✓1 [illegible] on [illegible] 9. Sequin da Aug 9-12
✓2 Huron in black [illegible] of Clocke Isl. Aug 11-12
✓3-4 Huronian & Chazy contact " " "
✓5 Lowville beds above Chazy. Interbedded with shales Aug 11.
✓6 Black River cliff [illegible] in a cut of 300 feet 43 feet shows.

Film VIII.

✓1-6. Views of Killarney channel going east through it. One a view of Indians in boat on shore.

Film IX.

✓1 Niagara escarpment near Jones' Falls. 40-50 feet high Aug 17
✓2 " over Jones Falls 20 feet cliff " 17

Book 1

doc. 102

Jul 23 Collingwood Blue Hth

24 Meaford

Workmans Bush

25 Craigleith

26 "

27 Thedford

28 "

29 " Brick & Tile

30 Arkona Barth Hts Mills Marshville Mills Hungry Hollow

31 "

Aug. 1 Thedford - Little Pt Stony Pt

2. Georgetown [about 30 mi W of Toronto]

3 Collingwood Quarry

4 Lake Huron (Manitoulin Island)

5 Manitowaning

6 " Fossil Hill

7 "

8 Little Current [Town]

9 "

10 Great Cloches [Great La Cloche Is] (not Manitoulin Is)

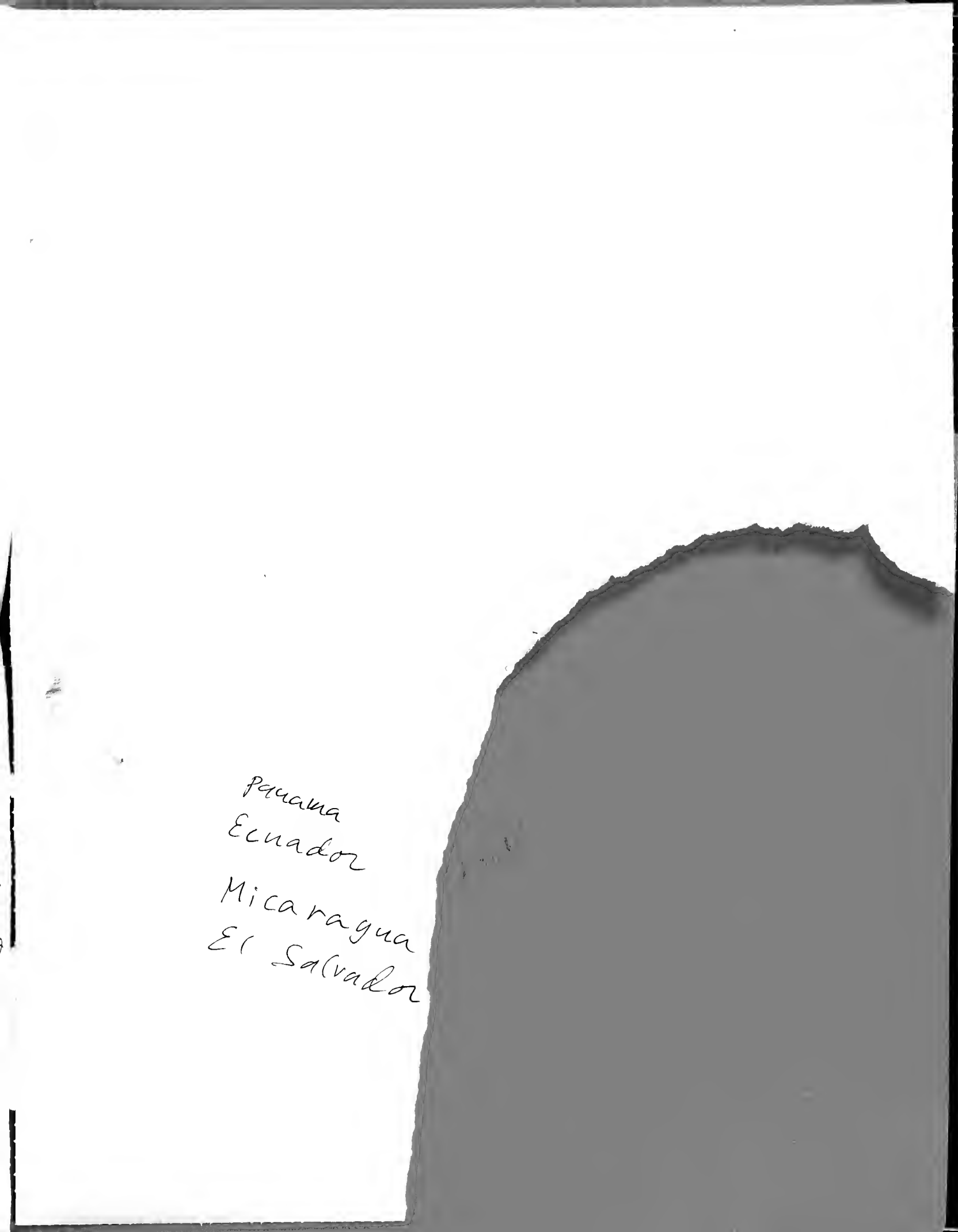
11 "

12 Cape Smyth (Manitowaning) Clay Cliffs

13 Manitowaning Indian Res. - "Rocks"

14 CapeSmith [Cape Smyth] Clay cliffs

15 Owen Sound (city) [not Manitoulin Is]
1 mi E of Selbon Hotel


Panama
Ecuador
Nicaragua
El Salvador

flowers

16 Owen Sound. city — Wright's Mill

19 Owen Sound city

18 Meaford

19 " Workmans Brook

end doc. 102

---

begin doc. 103 Book 2

Aug. 20 Collingwood.

21 Limehouse Georgetown Terra Cotta [all about 30 mi W of Toronto

22 Cataract (18 mi NW of Toronto)

Falls of [the] Credit [River] perhaps ppl

Inglewood

[23 Grimsby Cut S of Toronto

Village Inn

23] Hamilton Mill + Wall Quarries.

Jolls Cut "

24 Toronto Don Valley Brick Yards

↓ Valley of The Don River

25 Niagara Falls city - NY

26 " RR cuts cell

Tunnel

whirlpool station

cabot Head.

Bowan Sound

Meaford

Owen Sound [city]

Waubaushene

craigleith

Sheguiandah

1880
145
12
35

STRATIGRAPHIC INVENTORY

Tier/Drawer 2. 18 Room 2

Age: __Tri __Cre __Cen __Ter __Pag __Neo __Pal __Eoc

__Oli __Mio __Pli __Pls __Rec

Rock Unit _____

Geography _____ Country _____

_____Number of Lots (est) _____Number of Specimens (est)

Information Level (A-E)_____

Accno(s) with material _____

_____New Locno with material (0-4)

_____Old Locno with material (0-4)

_____Priv Locno with material (0-4)

_____YPM Catno (0-4)

_____Private Catno (0-4)

_____Identification to Genus (0-4)

_____Document Present in Drawer

_____Loan Slip(s)

Preparation Level (A-E)_____

____Trimming Needed (0-4)

____Etching Needed (0-4)

____Est drs needed after prep

Conservation

____Pyrite (0-4)

____Shale & Shell (0-4)

____Glue & Thin Sec (0-4)

INFORMATION LEVEL
A. Nos on or contained with specs
B. Nos w/ but not on or contan w/ specs
C. No nos, but good loc info with specs
D. No nos, and scant info with specs
E. No nos, and no loc info with specs

(0-4) = quarter drawers

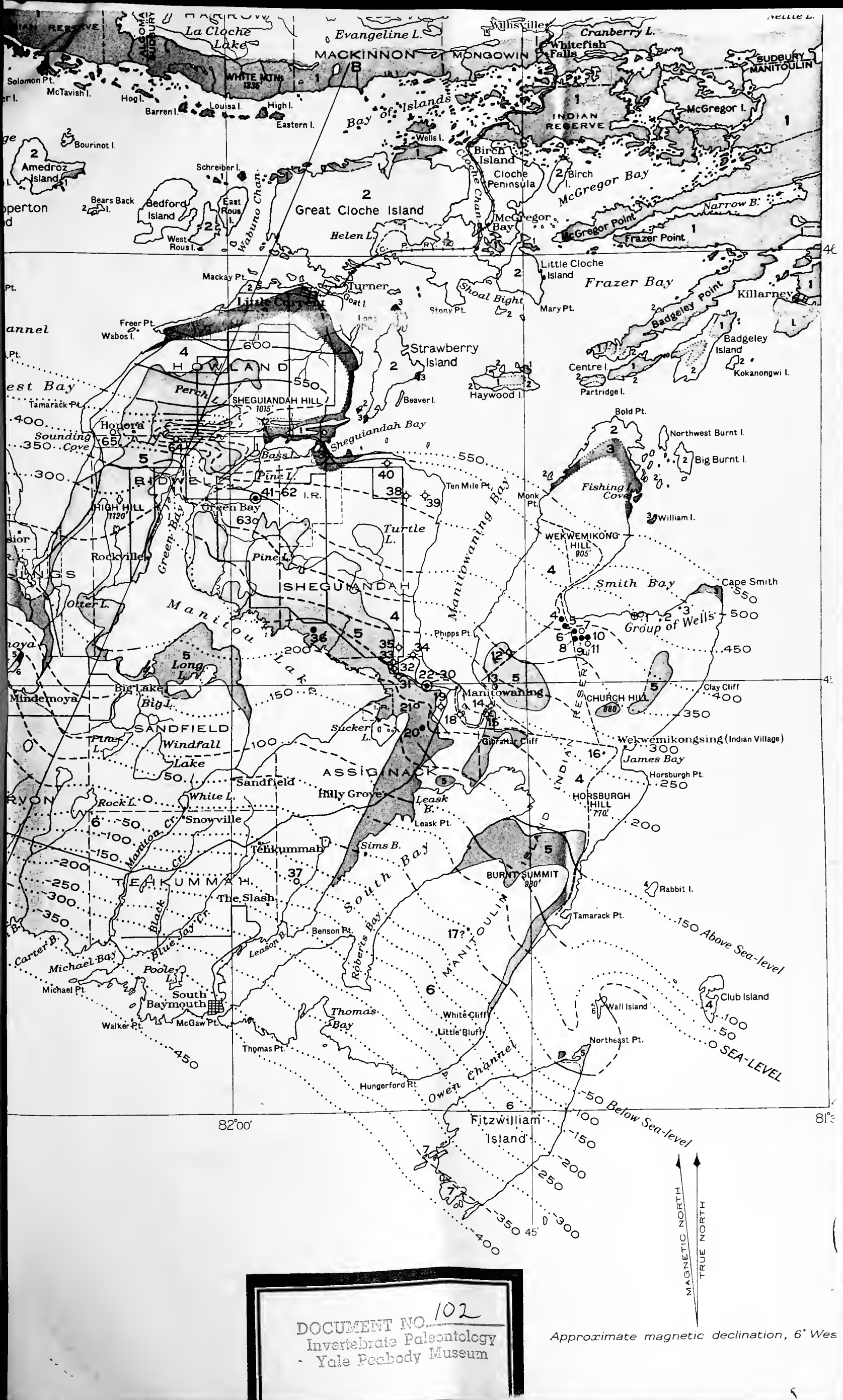
In taxonomy quantity = tenths of drs

PREPARATION LEVEL
A. Mostly 100% prepared from matrix
B. Partly 100% prepared from matrix
C. Mostly prep from mtrx but cud be trmd
D. Bulk - no prep, but little waste mtrx
E. Bulk - no prep, and much waste mtrx

Taxonomy (.1-1)

____Annel An
____Ammon Am
____Aster As
____Bival Bi
____Brach Br
____Bryoz By
____Coleo Co
____Hydroz Hy
____Crino Cr
____Crust*3 Ct
____Echin Ec
____Euryp*2 Eu
____Gastr Ga
____Inser*4 In
____Monop*1 Mo
____Nauti Na
____Ostra Os
____Porif Po
____Scler Sc
____Trace Tc
____Forams Fo
____Radiol. Ra
____Plant Pl
____Verte Ve
____Lith Li
_____ other
____Bulk Bu
_____Empty Em
____Document only Do

*1 Mono, Poly, Scap *2 Eury, Xiph, Arac *3 other arth *4 Conul, Cdts, Tent, Hy, Slt, Vol



MAP 351A

MANITOULIN ISLAND

MANITOULIN DISTRICT

ONTARIO

Scale, $\frac{1}{253440}$ or 1 Inch to 4 Miles

Miles 4 0 4 8 12

Kilometres 5 0 5 10 15 20

LEGEND

SILURIAN

7	*GUELPH FORMATION: dolomite*
6	*LOCKPORT FORMATION: dolomite*
5	*MANITOULIN FORMATION: dolomite.* *WINGFIELD FORMATION: shale.* *DYER BAY FORMATION: dolomite.* *CABOT HEAD FORMATION: shale*

ORDOVICIAN

4	*KAGAWONG FORMATION: dolomitic limestone.* *WEKWEMIKONGSING FORMATION: shale with limestone interbeds*
3	*SHEGUIANDAH FORMATION: shale.* *COLLINGWOOD FORMATION: shale*
2	*TRENTON GROUP: limestone.* *BLACK RIVER GROUP: limestone, shale, sandstone*

PALAEOZOIC

PRECAMBRIAN

1	*Not subdivided*

Gravel

Road

Geological boundary (defined, approximate, assumed)

Structure contour on top of Trenton Group (interval 50 feet above and below sea-level)

Well (location only)

Well (show of oil)

Well (show of gas)

Well (location uncertain)

Group of wells

Well number, referred to in Memoir 72

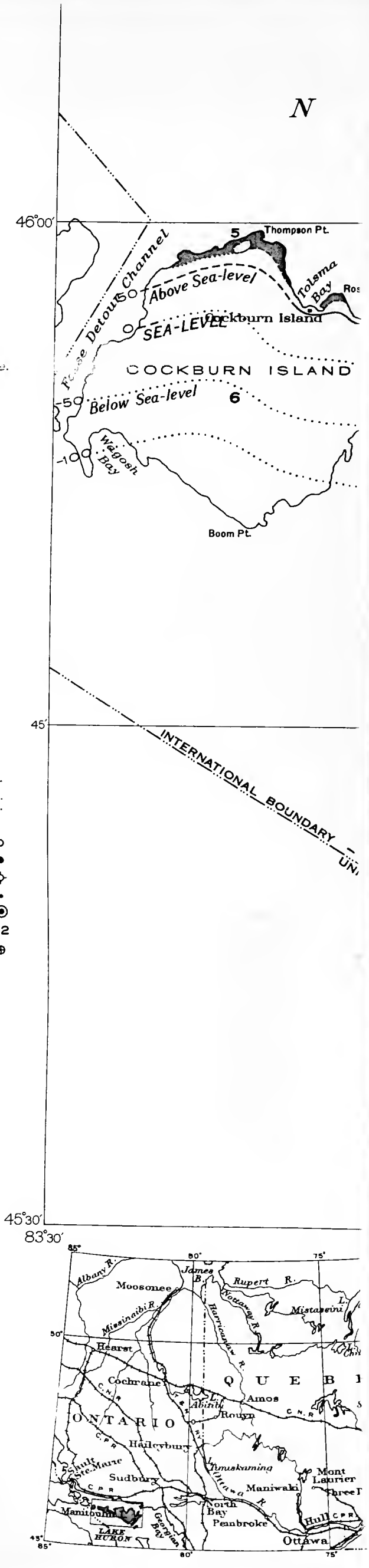
Oil spring

SOURCES OF INFORMATION

Areal geology and structure contours by M. Y. Williams, 1935.

Base-map prepared from published maps of the Department of Mines and Resources.

Printed at the office of the Surveyor General and Chief, Hydrographic Service, Ottawa 1938



Scale, 1 Inch to 200 Miles