

William O'Farrell, Minister & Engineer
James O'Rourke, Mate and Cork.

Professor Blackall.

Superintendent of School of England Schools

of bodies, now.

The former owner of our church.

Fare from Cork to Boston £39.00

Paid from Boston to Paris £20.00

Arranging Transfus C. T. Smith Station

37480
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~~Of Newfoundland Idn. in to 1918~~
284 Cow Head Rock, Bar. In.
2918 Lost Islands
1177 Bonav. Stix
2917 H. John Island

Charles Schuchert
Yale University
Dr. 59 Hall St.
New Haven, Conn.
U. S. A.

June 1918

Book II.

3450

doc 0114





August 3-1908. Con. Head Saturday.

There was a fine breeze, cool & dry and the road
was smooth. I saw driftwood & driftwood
there are often driftwood & the day started from morning, 3 miles
from mile 46 going down. William thinks we were more able to go on.
Left the Laramie and F. 10 for our 2nd car. We stopped to
make position at 46, on Chaggy
Creek about 11 miles distance. Returned empty handed, because
drives are far from our road.

In the afternoon we attempted to collect more driftwood.
graffiti by the air was done us in. Both the men were
tired of digging and not much to do now.
I nained away in the night and the wind changed to the south-
east.

August 4-1918: Sunday. Cow Head - Lower Head

A fine Sunday morning over head has the wind northward and we cannot get to Patsim Pond. At 8.30 we take the launch with the Lower Head which is in the west eastern portion of drawing 2000 and are first landed at the head of a bay. The ship is at about 20° S. of Lat.
The rocks here are

The rock a white fine-grained limestone. Description of 2000
(Cenozoic, ancient)

It with dimensions on the surface about 600 feet (from head into the sea) and on the other side of the water is about 400 feet. After sounding of rocky Chazy on either side, some of which blocks are full of Macrurus productus. Trilobite action is at the peak mass and one sees Otites benedicti and Paraterebrina affinis, the latter
abounds in the area and for true Chazy, although older is found

Common. To the west of the head, at low tide may be seen remains of rocky
Prairie limestone. The dip here 40° S. 60° E.

Looked for northward about 5 miles Head are the following rocks. The first
comes out 50 feet across, and with very low dips less than 30°, it is
full of Macrurus productus. The masses are large. Some of the
smaller blocks are of an intraformational Cenozoic limestone
of Chazy age. No distinctional bedding of the limestone is visible. It is a shelter-
shelter mass, and in the main of large Chazy masses.

To the south of Cow Head the head with a little sand core 350
feet across. On both the south and north sides of the head there is a group
~~Chazy~~ of blocks, etc., and these are steeply tilted (about 60°).
On the south side are large blocks of limestone and shale and
the sea has eaten out here are these non-resistive blocks, in which there
is a thickness of 350 feet of limestone in one mass, the bottom a depth of
about 60° S. 60° E.

which on the north side are steeply tilted, and have a thickness of 350 feet followed at once by another in limestone it having a length of 250 feet.

To the north there is another 5 miles of Chazy limestone a few hundred feet

The Parson sandstone strikes into the land and must make this
line north with Parson Pond. Trowbridge describes the drift of the sandstone
as increasing from 60' to nearly vertical at the pond surface. Below on the
Pond we must go south for a mile or more to see these relations.

On the Lorne Head where we saw the actual contact between the
Parson sandstone and the Cow Head limestone, the contact is an irregular
one. The irregularities seem ^{a depression} one as great as 20 feet at least above it
followed less often small rocky ledges, and more often the thin bedded
^{thin these to 100 ft. thick, if you will believe, and the drift remains} Parson
beds often thickened limestone. The top of the Parson sandstone
is somewhat obscured by the Cow Head engl., more upon it along
the line of the reactivation than along some of the till edges. That no fault
occurred at this contact will soon me of no importance in view of the fact
that the Parson sandstone is not fractured and tilted by reason of
so ^{This is not} It is irrelevant the reason as it is
^{not} not with a real reason. Now my time interval would
have to be limited to 100 years or less,

So getting on to the Parson sandstone which is ^{down to the granite}
at Castlemeadow, amygdalite made up of the tills ^{which} + he
in spite of the depression that has to be made of the till bed
engl. has rising sand until the end for a time and then
away off the main valley the engl. gone was laid off.

That the valley could be occupied again is seen in that there are two little streams which have cut their
hard beds a thousand feet. Tattle Head comes into the Parson
in about at Tattle Head.

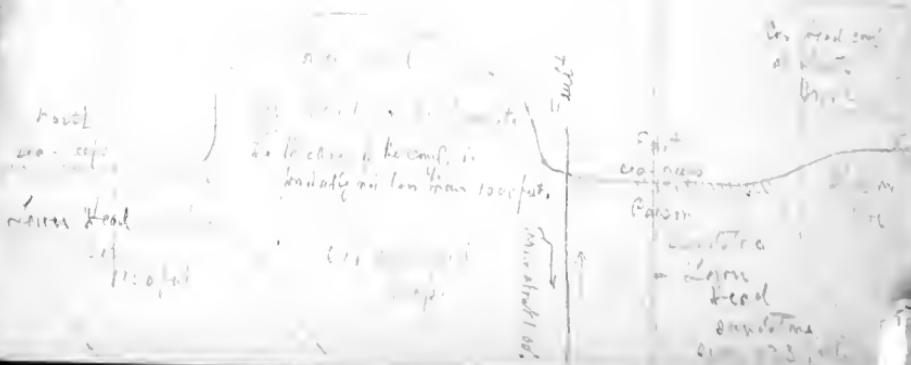
At first he + I said that the lower drift was not
the remains of the "old till" + the old to the start
debris and of the Parson were seen. Debris of drift especially a "wash mouth".

August 1918. at 100' from Head.

Emp. & lith. ^{limestone} - sand on the reef at low tide - up against a high ridge the town south of the road to 400'. Dumbell stopped off two years ago but could find no fossils. I did not see any in the sand he brought with him - faulting. Red limestone in the middle of the contact. It is more siliceous than the lower part of the column in about the same position of the available rocks over west. There is a number of very flat thin sandstone layers and it is a mixture from Head and Starry Island. The limestone structure appears in the form of Lava beds.

At 400' N. - walked along the shore. The sea on the way was calm. At 60' west there were depressions inland to the ridge and the sea level. The last depression on the ridge near the mouth of the stream was all small. The sea was at a height which kept the land dry for a long time. It was the last of the flood plain. The first water was all gone. The water was still there.

At 600' the island was covered by the sea. The last was far to east.



Goes west from
110 - 113

Private location of
Gordon L. Johnson
Gordon L. Johnson

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Thin block is
dropped more
than 1100 feet.

On strike fault in the Mississippian to the
west the Palaeozoic sandstone

Brickell

thin block is
dropped more
than 1100 feet.

Mississippian
limestone
(e.g. limestone
group)
Mississippian
Fault.
Palaeozoic
sandstone
wood.

On strike
fault in the
Mississippian to the
west the Palaeozoic sandstone

domino point

On strike
fault in the
Mississippian to the
west the Palaeozoic sandstone

On strike
fault in the
Mississippian to the
west the Palaeozoic sandstone

doc 114

May 5-18. 1914. Mr. Head.

A strong wind blew up during the night and at 7 a.m., we find that we are being off a bit to the east. To make up time we start driving about and get out and go to Lower Head to gather some fossils. We are now an entire week at Cow Head, though our plans were only for a three or at most a four day stay.

In the evening Merton and E. returned with a small bag of fossils. Among them are 2 or 3 good M. undulata. It is an interesting but hard genus to find.

Merton reports about the Parsons Sandstone to the admiralit of Cow Head that it does not show any actual contact. There is a small interval of 2 or 3 ft. The relation of the two masses is different in strike, the sandstone swinging in toward the limestone. It also shows faulted relationships.

August 6-78. we say, Contra Costa - Parsons Pond.

misty rain again dark & gloomy, tried to do some
the day. I am not so well, but after considerable prodding in
my feet it was finally decided that as the light wood on from the last
n pond and come back Parsons Pond. We trudged on in the rain and
at 10.45 a.m. we are on our way to the Pond. At 11.15 a.m. cross the bar
and we are now inside the Pond. We ran around aimlessly and found
a large number of fisherman traps. ^{the bushes / afternoon traps}
a large number of them are set out that we rented at one dollar per
day. James is to do the work on the kitchen stove. And we
are not to wait until on the dry. This is at the house of
Mr. William Blanchard.

James and Mr. Blanchard and he says
more than 20 wells have been drilled in his days. The tools used
are down the shaft 1.300 feet for each well. Cost about \$300 per well.

They are in much less, and some say more, than
the wells they drill, but in only time can they bring up about
a well of 1000 feet. They are not to be used for
drinking water.

Stephen of Parsons Pond is not at all little & he is
not perfect. He can run down along the side of the
pond.

He has not all the tools and is the mink. He stands
about,

August 7-1918, Wednesday Parson's Cr.

A dark trilobite or worn, with middle lobe at 1:30 we start on the west side of the valley as far as the stream at 10 we are actually started at 1:30 P.M. we meet the head of Parsons Pond at the foot of the mountains and in front of a small creek from a granite bed. ^{granite bed} with the road leading east a good distance about half a mile to the east. ^{north} ^{west} ^{east}

As we go up the Pond one may here see any cliffs and the slopes are rising and running to the west. The slope with its ^{granite} ^{bedrock} granite boulders are well worn by wash and lie in the gravel slope. A once uniform face is still on the geologic sequence in which it lies. The upper part of the Pond is deep enough at all times for surf boat, but the water tides are too high off shore from middle to high tide. The pond has been made artificially dry and is a reservoir. It is about 100' long and 40' wide on a high terrace 3' above water level. It can not be the original lake bottom crater.

As we run back along the Pond it becomes shallower, about the same time finding it and watching the ^(near surface) ^{water} ^{area} are made of bedded rock. One bed of rock can be seen on the sea of a village of houses and tide of stone buildings south. It runs north-south and faces north. The drift eastern and western sides are also in granite use and a small area of mica-schist. On the southeastern side about 1/2 mile to the west of the lake there is a precipitous cliff and this

Aug. 7. - 1900. Cont.

Leaving at 8 a.m. I could think he day must be over that it was time to go up with fire now be standing vertical. He then went up with the boat and from where he stood I took some sketches. To the north of the main cliff the south east bank is a marked fault letting down a slope with a similar cliff and further west all the rocks of the same mountain part mind. As one looks at it here it is plain how ^{the} ~~is~~ ^{the} base of the Palaeozoic is combined. They can't be ^{the} ~~thickening~~ ^{at the base} ~~at the top~~ ^{at the} same time. In front of the high mountains the land is very low usually under 10' but in general does not rise to much height until some distance from the lake. All is late Ordovician strata.

I was landed at ^{North} East Brook and here, ^(at the west) was a small beach all made up of small pieces of a fine green and black shale stone with weathered yellow. Evidently the lake bottom here is made of this shale. Cuttings have none.

I then continued to push it along the road to the east and west through the village about half way to the old mills. Here I saw a small white rock with large pieces of a thin grained limestone. It sandstone fossils like limy. About 1/4 mile east of the old mills there is still in the place the hard water a stream and here the stones are good for building. The water is here ⁱⁿ deep hole to 20' S. 70-75 E. but there are local turns in the stream. Evidently there is no washing. The strata dip upwards N. 10° - 15° this, the

Aug 7. Adams Pond

grayish beds are three or four miles east. Here we find mostly white ^{limestone} sandstones and sandy shales and dolomites. These are among stony ^{limestone} shales, Dicotyledonian, Brachiopods, etc. in which there is a thickness of about 70 feet. Limestone appears a limestone conglomerate in which the cobbles are small and subrounded, and next to it are thin bedded blue limestone with thin white rounded shales. This follows more limestone, probably 30 feet thick in all. The rest consists of fine shales and shales mixed of which most are ^{slipper shells} gasteropods. After these the crests have a great angle of about 30°, Plane and that the elevation at about 310 feet is ^{slipper shell} about 1300 feet. In the summit of the hill ^{slipper shell} about 1300 feet in the summit is the Emerson bed, three stories, and consists ^{of} thin greenish shales and sandstones. The total distance across this break is about 14 miles or a little more. Limestone there, it is nearly a flat plain across, but there are hills here and there.

From this evidence it is clear that all the Paleozoic strata seen today are of the upper part of the Lower Coal bed formation and are about as little above sea level as the Emerson bed.

As we went east of the hill - this was a high limestone ridge and low hills on the south side from a dip in this ridge. There would be some hard rocks in it, but not in prominence. Our road in that it has the Emerson Coal bed only. It is about 14 miles long. It seems to be in line with the Linton bed of Linton Head.

Arriving to the village we saw a small town at one end of the Emerson bed. On the south side of the road where meets the Emerson bed with an angle of about 30° there is a low hill about 14 miles long working what is a part of the Emerson bed.

Param Pond.

With glaciator tools.

After a few trials it is a little difficult and seems to all of us very wearisome, slow, no ^(but I am used) calculation, and concluded that the best plan is to use the glaciator tools in preference to the pick and hammer. It is a great convenience in getting out the small gravel, cobbles, & c. etc., by this means, and we could find any rock in place. This is more convenient than on the deep sea or soundings. There also, sand away, the cobbles, & c. etc., are seen at much greater depths, sometimes hundreds of fms. above the bottom, and not in the water here as near shore. We also here and opposite Port au Prince and Montevideo in the line of strike.

If any one would drill here for oil it would not be difficult. Then for want ^{rare} of the tools are in the east. We will request the geologists who are here to make a drop of oil soon. Further the strata stand at a high angle, at 45° and they are somewhat inclined. In all probability there are other faults, which are often seen, in the east and which cut the bed.

Because now all the men certain that the strata of Rio Grande are older than those of the P. de Leon, we have been back to them from 10 miles N.E.

Left Param Pond at 11 A.M.

August 8-1918. Tues. Day. Parsons Pond.

The day started in dark but by noon it was a clear sunny day. As our boat is too large to get about in Parsons Pond we enjoyed a fisherman's pirogue boat and with one dog to haul in left the village at 8 A.M. headed for the west end of Parsons Pond. Got back at 6 P.M. and measured a section nearly three miles long. This section is described in detail below.

We started the section at the upper oil wells^(they stand on sandstone) and briefly described yesterday. From the Cenomanian to the Post-Turonian rocks, on this distance I judge all the rocks to be of the same series as those to the eastward. They are to be added to the section described below.

All of the shales give evidence of being debouched in very shallow water outside of the reef belts, and very small structures are seen now fossils. Not even fusoids or worm borings. The sandstones and shaly sandstones, all show the effect of wave work, a sort of riddling. The waves are uniform in shallowing rate. In all the thin bedded li. an also of shallow water is seen in that they are always accompanied by intraformational cross beds.

The li. engl. of Parsons Pond have nothing in common with the C. rock conglomerates. The latter is made up of large blocks while those of Parsons Pond are all of small pieces (usually less than 1/2 inch) in size that are from 2 to 6 inches long. At rare intervals one surface piece up to 18 inches across is intermixed. At other and more intervals the engl. is all made up of small angular pieces usually all under 1/2 inch across. When this occurs the coarse character disappears and the thicker ones are probably in all cases. These engl. are never always associated with the thin bedded dolomite and in

11. or 8. Parsons Pond.

gnes. I saw one seen a thin streak in the sandy bed, and none at all in the sandstones. They are also rarely present in the shales but then there is some thin bedded ls. associated. While I saw no sun-cracked ls. marked by the streaks here there in the deeper places and it accumulates the thin and uneven gns. of engl. They are therefore to be regarded as thin bedded conglomerates.

In the future it will be best to delineate the Carib. bed ls., engl., to the rocky masses, so well developed above the Heads.

All the strata above the Carib. bed ls. and beneath the Rose Bay series should be called the Parsons series because it is in this pond that we get the best sequence of the series.

The oil field of Parsons Pond is controlled by the General Oil Co. of Eng. Mr. Henry an Englishman is in charge of it. At a point where he lives there are about a dozen houses much better than one sees anywhere in the island. The n. side there ^{is} a tall standing in the ^{thin bedded} ls. ^{with yellowish streaks} about 100 ft. high. It is not stand rectified. This is the world any one armed attempt to shoot it a hole this is beyond my comprehension. Three other derricks are about 1/2 mi. away. There are other smaller ones.

August 8. Parsons Pond. Section

Beds with age 117-119.

Vertical lines = Faults
dashed lines = joints



40 ft. honey-colored interval.

13 1/2 core beds of light brownish yellow

(13) 163 thin bedded li and shale, and some of greenish to dark gray shale. Bands of li, chal., near the base. The above are mostly

615

121

Wk 8. Parsons Pond.

doc. 114

August 8. Parsons Pond. Section

Section in Parsons Pond exposed between the inner
Chambers and a point about $\frac{1}{2}$ mile S. of the early village
on the north shore, beginning at the top of the section of the
falling point. See description [in its place] [E. side of the road 1/2 mile S. of the early village on the north shore. Dip 45° S. 75° E.]

- (1) 68' Fire-painted ss. and clay ss. in alternating loam and shaly
beds, of light bluish color or grayish tan, weathering brown.
Dip 45° S. 75° E. Brachiopods fauna thin, fine.
- (2) 3' Li. engl., the bottoms of which are bluish. Interformational
3' Sandstone like that above.
- (3) 13' Dense bluish gray li. with bands alternating with shale.
- (4) 5' Li. engl. Detritus formation.
- (5) 35' Fire-painted light bluish gray ss. and gray sandy shale.
Dip has decreased to 30°
- (6) 2' Li. engl. Detritus formation.
- (7) 59' Unexposed interval
- (8) 170' Fire-painted light bluish gray ss. and gray sandy shale,
sandstone and dolomitic.
- (9) 20' Dense bluish gray or blue colored li. with sandstone and
shaly loam, with intercalated layers of dolomitic. Dip 40° S.
65° E. These beds are very thin and discontinuous.
- (10) 45' Unexposed interval
- (11) 13' Bare bed of litharenous dol. engl.
- (12) 163' Detritus dol. li. and shale, and greenish brown to dark gray
shale. Bands of li. engl. near the base. The dolomite mostly

Aug 8. Parys and see^m

Aug 8.

Shale. Dip 60°. 70° E.

260' thick sand interval.

42' fine sandy shale and thin bedded ss. probably red sand.
Dip. 45° S. 60° E. From just east of the eastern outcrop.

180' Red shale and red jasper like chert. Dip. 50° S. 70° E.

18' Greenish dark gray shale.

30' L. 3 m. Pebbles flattish and small

14' Greenish dark gray shaly shale

18' Trinitized dolomite bed li.

46' L. 10' with green and shaly shale

17' Trinitized l. 5 m. thick, l. interbedded with dark shale
16' 45° S. 70° E.

260' Thick sand interval

117' Dark gray shale with frequent thin limy bands and with
layers of dolomite bed li. 4' & 8' thick. Institute
Col. no 2.

1717

The exposures at the joint about 1/2 mile to the
east of mine on the north face. Crossing the road one
finds, in a well exposure of 5000' fat in which
only a few are about 30' thick, greenish ss. and shale
predom. near the middle of the west side of the exp. Dip
210° S. 70° E. If the section is uniform dipping 260' across
there are a third many of

August 8, 1900, 2nd section

at 3550' of shale is here exposed.

Beginning near the middle of the upper 200' the section continues:

- 26 140 Dark gray shale with zones of interbedded thin bands of light gray li. The shale becomes lighter in the upper part, weathering greenish and iron-stained. Dip 5° S. 60° E.
- 27 8 Thin layers of light-colored shale, dipping, then bedded in more li.
- 28 230 Light-colored shale, dipping, or horizontal.
- 29 20 Light-colored shale, dipping, or horizontal.
- 30 20 Light-colored shale, dipping, or horizontal.
- 31 3
- 32 260 Grayish white shale, dipping, or horizontal.
- 33 12 Shale, dipping, or horizontal.
- 34 3
- 35 270 Sh. and sandstone, reddish brown, dipping, or horizontal, downcaving into limestone, dip 5° S. 80° E.
- 36 116
- 37 142 Sh. and sandstone, reddish brown, dipping, or horizontal.
- 38 240 Same as preceding, dip 5° S. 70° E.
- 1630

125.

1st and 18. February 1906

1530

39) 240 Cherty sandstone

40) 35 Lenses of iron pyrite green ss. 80 S. 70 E.

1805

... extends one mile to east side of the valley
and has a thin, hard, light-colored, fine-grained
limestone about 22' thick, dipping 30° N. 70° E.
This is 2000 feet from the oil well, near the top of the section.
The only exposure is near this well, from an irregular
interval of about 30'. It dips across the shale which at
an average dip of 5° would include a thickness of

41) 2700 Oil well shale

... contains a ledge again about 100 yards from the oil
well and a vertical plant.

42) 12 Reddish and green shale, esp 525, 60° E.

43) 70 Interbedded with thin bands of impure li. with some
thin dolomite layers.44) 48 Thin bedded dolomitic li. interbedded with some thin dolomitic
shale. In the oil well. Isotopic age in rock shale 1-3.

45) 34 Black carbonaceous shale

46) 21 Thin bedded li. like no. 4. interbedded with thin dolomitic shale,
thickness of 1-3 in.47) 16 Thin bedded dolomitic li. with 1-2 inches thick dolomitic
shale laminae.

255

August 8, Parsons And - a.m.

255

- (48) 57 Thin bedded li. in which there are 30' up - i.e., 30'.
Top of the 8' fat thick, one mm. thick, followed by 10' more
of thin bedded li., 6' fat thick, and next the same again 30'.
Total 30 due care.
- (49) 74 Thin bedded impure li. interbedded with thin shale.
Shale, the shale and sandstone.
- (50) 160 Very poor interval.
- (51) 20 First grayish limestone, massive, no fossils.
Shale, thickness 42 S. 80 E. Then back to the sea.
- 560 Crossing the slender iron veins in the limestone. A distinct
oxid layer of the limestone, made with the help of no. 468 and no.
469. On no. 469 one of 20' thick, 10' thick, 10' thick,
followed to the west for 35' and then 10' thick.
After a short downward in the section back past them in an
unconformable interval of 240' fat which includes rock no. 57,
bearing a thickness of bed, not seen except.
- (52) 200 Same as last.
- (53) 37 Thin bedded fine-grained li. alternating with shale.
- (54) 135 Beginning with shale alternating with 2 mm. thick fine-grained
Dandy li. and passing over into thin bedded li.
- (55) 59 Thin bedded interval.
- (56) 167 Massive white shale, 10' thick, followed by 10' more
thin bedded li. less resistant & disintegrated.

588

12

- (57) 89 estimation of thickness with c. predominately
 (58) 5 layer of li. Engl. Has been seen a small m-s. fault, off setting horizontal about what it ought all.
 (59) 83 fine - li. matting brown, in layers 1/8 to 8 inches
 thick. some of these thin siltstone bands like water-line.
 fine - interbedded shale. Slip 80 S. 70° E.
60. 89 greenish gray dark shale with more than 1/2 in. of li.
 61. 59 very thin interval
 62. 59 stiff greenish gray to black shale with some thin bands
973 of li. and with lenses of li. Engl.
 the beds become much darker and distorted toward the
 end when the exposure ends, so is the most part large & small
 ones. The interval here is about 1000 feet across the strike
 to give the section beginning again.
 If the dip be on the average 70° then the usual interval
 would include
- (63) 562 feet starting the upper bank at the north end of the
 horizon
64. 50 fine greenish gray dark shale. The sandstone
 is off a little to the east
64. 369 fine greenish gray
 - 50 fine greenish gray, and sandy shale like that above.
 Slip 60 S. 80° E.
- 959

August 8. Parsons Collection.

959

67 200 feet, first interval

68 20 more or less like that above.

This layer goes to "bottom of basin" and from here north there appear to be no more exposures on the north side.

1179.

1st and 2nd 6283

3rd and 4th 6812 and 5*00 ft. up
13, 095⁺ 18,595⁻ feet.

To this layer I have added the next several intervals of about 7000 feet, from the bottom of the basin to the south base of the Penn. i.e. to the dip of 45° in the limestone member, a thickness of about 5500 feet.

For the several members of limestone and dolomite the thicknesses are as follows: 1st 35545[±] 2nd 300 3rd 35545[±] 4th 200 hundred yards, except a 250 due E. of the section, which is 225⁺ 500⁻.

From the east base of the limestone to the top of the 2nd. the thickness of the limestone is regular, being about 2000 feet, and nothing.

So these layers are a total thickness of 10,000 feet, and the dip of the limestone is very small, so that it is not difficult to follow the section. The general weathering is very good, except to little the very bottom of the section.

Very thin limestone dolomite in the Cen. Beaufort cyl. abrasive tric
is several great blocks tilted towards the mountain. Have thin shales
there, if I find one even so that layer of dolomite is unknown.
So it will be hard if required to me that the dolomite may also
be of 4000' age.

To Portland and also on c 181.

For price about Portland steel on page 135 - 7

August 9-1918 Friday, Parsons Pond - Baraboo Line

It rained ~~light~~^{light} during the night but this morning looks to clear. We hurriedly packed our gear and our traps, we found that we can go north. By 11 AM, the tide is high enough to get over the bar, and we go over at that time without difficulty.

The bulk of us, with Parsons Pond, all glacial sand and the cliffs are all ^{especially} massive the bed of a former sea line. The cliffs are about 130' in height, there are no birds, also a little until we get up miles north where "The Groves" are. Here we go ashore and are surprised to see that theGroves (the name there is "them," one) tell many years ago during a heavy thunder storm, and long ago, must have been broken (they are now ^{this part} ~~now~~) composed of a light and black colored dolomitic limestone. The rock is much fractured and gives the appearance of a fence or screen. The whole appearance of incrustation and however is due to the limestone. On other rocks, one has visible bands even some ^(partially) ~~some~~ pieces of ^(partially) the Parsons fault run in the sea. ^(Toward the N.E.) Some pieces are quite large, the cliff is 120' high by 100' E. W. running along the shore a few miles away.

These cliffs, while not ^{so} tall to the water, look to me ^{as} though they consist of the Portland Head (530 feet high), this cliff shows the shale layer and a carbonaceous white layer 10' m. as much as 20 degrees down, 2 miles north of the line we go ashore and walk to Parsons Pond where we have lunch. At night we go ashore and we find the cliff (greenish gray) sometimes 100' 120' high. In a small boat I see again those scars ^{marked by Parsons Pond} and while I did not get the exact angle of cliff it did not seem to be greater than 20 degrees.

How does Portland Head stand up as an isolated hill? ^{with fine vertical cliffs to the top and over 1000'} I think it was built up by a fault of no first magnitude and that the head was made of a definite like bed of the cliff as it is down.

August 9.

Portland Creek.

(C. Parsons)

The var. of limestone we have described above lies on the same sandstone, ^{anorthosite facies, the one of Lower Head.} which I suppose to be a fault to the north of Infant Head, and may be this is the reason why we cannot get it. It may be the one below the Cow Head conglomerate or one in the lower Portland series. We have to clear up the matter during the day. Later the better conclusion is that ^{Parson} the sandstone of ^{Lower} ~~Upper~~ Cow Head conglomerates of either side of ^{Lower} ~~Upper~~ Portland is the same as our quarry at ^{Lower} ~~Upper~~ Portland.

Here is a good, thin bedded conglomerate the most striking feature being nodules ^{and up to 20 feet long.} Nodules are ^{yellowish} yellowish brown and angular. This bed is a few feet thick. The bed above is fine too. If a fault is ^{or} not between these will depend upon the position of the upper margin boundary. The general structure seems to be nearly everywhere the same. The coarse conglomerate consists mainly of fine-grained ^{thin} ^{in cracks} calcite. Some of these are rather large, many inches and in places 2 ft. 3 in. wide. This mass of calc. is often 5 ft. or more long. ^{width from} ^{about one mile} The shale and sandstone layers are ^{intercalated} ^{thin} ^{and. 2 ft. common} to ^{thin} ^{thin} ^{in the} ^{in the} coarse conglomerate.

The layer of rather ^{dark} reddish ^{light} brown and crystallized li. Another mass standing out in the sea is at least 400 ft. long both ends going into the ocean. It is seen to be at least 30 feet long, and 25 at thickness, probably artificial. Another mass of ^{thin} bedded Table Head limestone is 70 feet long and 15 feet thick, also light brown.

I saw one piece of it in sea, embedded sandstone about 3 feet long ^{This is probably a part of the Portland sandstone.} This is ^{one third} in size and this one was at least intervals well rounded and flattish bottom if a light grey limestone that is at times concentric and wavy bedded (a very small sample). Next comes ^{thin} ^{thin} ^{light brown} this sandstone is thin but probably 100 yards thick or more. ^{but probably like a gypsum bed.} I do not know the thickness of this bed. Last Cliff Point is 5x4x2, and up there we have 8x8x4 ft.

Two miles south of Poole and we see some li. cong. the

August 9. Portland Creek.

one block of thin bedded Knobly Talle Head limestone that is dipping 50° S., 60° E. or at least 225 ft. long running into the sea and about 150 feet thick.

All of the limestone seen this afternoon appears to be ^{in the main} rounded up Talle Head limestone. In general the pieces are under three inches across though others may be up to 18 inches long and a few inches across. In this manner angular pieces lie scattered among small ^{angular} blocks after 15 feet acres of a milky white birdseye limestone. It is astonishing to see the uniformity of the material, more tenths of which appear to be of Talle Head derivation, and the great majority of it made up of the small pieces. There faintly is some Chazy represented in it.

Nowhere did we see the slightest indication of bedding in the ground up material, or bedding was only seen in the large pieces one of which stood upright vertical. This bedding on that it is clear before fragmenting.

About 2½ miles north of Portland Creek we saw two clearly defined elongated beaches. The lower one stood about 35 feet above the sea and had a width of about 20 feet. Back of it was a low 10 ft. high hill so that the upper beach was about 50 feet above sea level. For 2 miles north of Daniels Harbor were signs of glacial movement. Granite boulders as large as 100 pounds were scattered over the surface and the ground was covered with the scree material.

Thus for the south of Parsons and Nell and Portland Creek.

It is upon the road just below the line of Daniels Harbor that there is Portland Creek and is it no more rocky creek made up in the main of large blocks one the size up to 6 or even 8 feet across and masses of Talle Head limestone making up to 30 feet long. The exposure is about

Aug. 20th 9. Daniels Harbor

1/2 mile Amy and about 500 feet wide. On back the
grass that lies the limestone over the drift. There
are about 500 feet here of the Portland. The sanitary
condition are very bad indeed.

We are using the empty house of an absent fisherman.
One dollar per day for the use of it.

Bellings described a number of species from "four
miles west of Portland Creek" which must mean Daniels
Harbor. All of these rocks are out of the coarse limestone and
out of the soft sand limestones. He saw no good beds, rich
in little shell fossils. In any event all of the fossils from the
area of "Portland Creek" are in the Coal Conglomerate.

This place of dredging is in the most unsanitary of
all places we see. It is a crime to allow this? See the
frightful state of drainage.

The country of western Newfoundland is of a flora char-
acter and with the ^{sudden} dip to the east. There must be several such
faults, thus letting down the land to lower levels in a north-
direction or so. One is the Gulf of St. Lawrence. This
fault is Post-Paleozoic and extends to Post-Mesozoic. That
is after the place of the new fence was made. These faults
cut off a chain of the al. including the Cart.

Aug. 10, 1918. Saturday. Tattle Head.

A light rain during the night and this morning it is dark and moistening. As there is no wind we propose to go to Tattle Head as soon as the tide floats our boat and can get around out of this tiny striking "Spanish Harbor". We do this at 10.30 A.M. The tide is only about one foot above low water. Attilation is 30 feet. Three miles south, 1.5 miles west, there is a 2½ miles long exposure up to Bell Burns if the head is followed. The shore is a sort of "knobby dog" very thin bedded limestone with a shale. They dip into the sea at $25^{\circ} N.$, $75^{\circ} W.$, and strike along the coast undulating somewhat as one goes northward. and exposing ^{in the south} limestone between 100 and 200 feet of strata. Fossils are exceedingly poor and almost all are of faint outlines.

At 12.30 we begin to walk south beside a wreched American telephone line across the head of Tattle Head, ^{and} following ^{the} same, and upon a rocky floor. It is the greenest place we have been in.

After lunch Duncan and I go south along the shore to see the strata dipping the fault line. There are no exposures from Tattle Head ^{south} at about ½ mile, and it is a mile to the south ^{on either side of the fault line} one sees the Chazy and the basal Tattle Head dipping in opposite directions. At ^{isolated} blocks of Tattle Head are seen to stand in and beneath a fairly thick ^{dipping to the southeast} limestone bed which is ^{is often fractured and its} covered in Chazy dolomite. This dolomite seems one ^{regarding and if sequence} of the limestone dipping to the south. The Tattle Head ^{as far as} ^{in other areas the} fault line goes westward and goes into an anticline. Behind ^{as far as} ^{in other areas the} fault line goes eastward for 2½ miles. If the latter limestone bank ^{as far as} ^{in other areas the} fault line goes westward for 300 to 500 feet of strata, the total thickness of the T.H. is 720 feet.

August 9.

Portland Head.

In re. Portland Head from Olentangy river: The western face of
Portland H. strikes but little north of east and the dip of the strata must be nearly
vert. The head presents a flat surface on the west and south sides, and
appears to slope gradually away on the northeast. It seems fairable that the
slope of the head is determined by the structure, that is, by a tilted north-
west corner of a fault block bounded by 2 faults. The elevation to this hypo-
thesis is that the beds of the Lead appear to dip about in accord with the
domestic approach or the slope as though the section were continuous. Below
the Head is about 300 feet from the shore and the observed dips on the hill and
on the lake bank, about 20° . The dip for the interval would include 1100
feet of strata plus 530 feet, the height of the Head = 1630 feet of sandstone
in order to make the hill part of the same sandstone.

Aug. 21st 1918 Sunday. Table Head.

and bright

A fine cool Sunday morning. We start out on the foot path to a place a little more than 3 miles from the camp at the south end of Table Head. Here we see low ^{and almost continuous} cliffs extending north for many miles ^(Table Mountain) and along the strike of rocks. The strata are light-colored: a dark-gray fossil oyster shell limestone full of calcite ^{white} spaces. No fossils are seen. A gray little ^{limestone} of which may ^{occur} cementing or replacing the calcite strata. There are also small quartz nodules.

We started to make the station 3 miles north of the south end of Table Head. Here the ^{in the upper part of the Bull Mountain} ~~limestone~~ are exposed in a little rocky core made use of and hidden now which has been cleared here. Pit ^{approximately} ~~excavation~~ followed and a few feet higher by Buckhorn ^(Bull Mountain) limestone and ^{Coal was between 5 & 6 inches} beds. Many ^{thin} fossiliferous, in the upper ^{part} of the ^{limestone} these are in zone 2 division 3 of Richardson. Up to the high point west of Table Head. Mountain made up 115 feet of thickness. The most abundant all of Richardson's ^{limestone} as they do not fit the rocks as we see them. This division I ^{to} consider the terminal beds of the Bull Mountain. They cannot be referred to the Chaffee ^(the Richardson division).

The terminal beds of the Bull Mountain are well seen in the one between the head $\frac{1}{2}$ mile north of Table Head and the south end of Table Head. Here near the base we find ^{Lignite} pebbles in fl. and a few small dolomitic lime forms. The contacts between these beds and the ^{lignite} are well marked in a low cliff returning out into the sea. Below is the unmistakable ^{limestone} of a pre-Union ^{limestone} bed in its uneven surface with irregularities of one rock top ^{but} corner or at once the thickly carbonaceous shale. A few shales appear characteristic of ^{lignite} beds. Their relation is not clear. A cliff in the form of a ^{lignite} bank like

August 11-1988

Table Head section

From road at service station in the Puritan Park area.

Thickness of the dol. seems also to vary, and even bedded dol., and then the thickness of the formation is of the dark-blue breccia (crushed or weathering into small stones) varying about 10 ft. Locally there are many thin beds exceeding further, are good for any distance.

At 3/4 mile N.E. of the south end of Table Head there are some thin beds of blue breccia, dol. base, at top gray on the N.E. This may be due to the ice from some island exposure, or that the Co. Head is about 1/4 mile away in place. The size is 8x10x5 feet.

The section determined today according to Aben's notes is -
Upper Bear Mountain.

50'. Dark bluish-gray dense dolomite, weathering light gray. thickness from 1 or 2 inches to 4 to 6 inches. thick with occasional ones of 10". These beds are moderately fossiliferous. Ceratites lamarelli, Pilarella (see specimen), Ceratites rugosa, and many others. Impressed faint which appear like Helicostoma.

10' Heavy dense beds of bluish-gray dolomite, the surfaces of the layers rich many Ceratites rugosa, Abscissae Helicostoma. Also contain P. lamarelli, and Pilarella. Many specimens of Chonetes are seen. See the fish specimen collected.

45'. Dense massive dol. much like that just below except that it has many small grade like emulations and no fossils. There some undulation to these beds but the average dip is about a half mile or 10° N., 70° W.

August 11-1918

Take Head section.

- 10' Alternating layers grayish tan, one foot thick separated by intervals of thinner bedded dolomites.

This brings us to a smaller core where there is a larger rock. This rock is broken and tilted across the core, being exposed on both sides of it, and there is a small continuous exposure of a slightly lower bed around the back of the core.

- 165' The small first outcrop of the rock is near the middle of a core, subdividing it into two smaller cores. The southern of these about $\frac{1}{2}$ mile across ^{and in upper part of} the limestone interval of Richardson. Here the cliff recedes a distance of 50 to 100 yards from the shore and is largely covered by talus but several very bold ledges occur to show the character of the whole sequence, and they are also more or less exposed rocky ledges at low tide.

The beds are even bedded bluish-gray marl, 6 in. to 2 ft. 6 inches thick, and many; there has a fine ribbon banding like the water-lins, ^{Schneppf and a little of some underlying bed.} These are, do not measure as large as those below and appear very fine grained and craggy, weathering very light gray.

About 5 feet from bottom I find thin bands of iron pyrite and iron pyrite are seen silicon breadmoulds of a high spire part. There are very numerous 1 to 3 feet thick beds that are very thin bedded weathering into thin shales almost like shale. Pick an iron pyrite of 165 feet for this I divide in which I contract correct.

End of bed now non. Seen 280 feet.

August 11-1918 Table Head. section.

Bethel mountain Chazy contacts.

At the south edge of this area a big ledge runs out over 100 yards into the water at right angles from the base. In this cliff exposed place the Cedar Mountain-Chazy contact is shown. It is an erosion unconformable and irregular face about one foot deep. Below it the top of the Bethel mountain measures smooth and very light colored; above it the base of the Chazy has its characteristic dark bluish gray color and measures rough and knobby. The top of the C. is very like, and the base of the Chazy is apparently flat. The section of the Chazy is as follows:-

- 3' Dark bluish gray heavy bed of ls. that measures with.
 - 276" ls. of the same color in two layers that measure smooth instead of knobby. The upper surface corrugated. Places with a small knobby limited gastrula bed. Could fit no fossil on.
 - 4" Some colored ls. weathering them bedded and knobby.
 - 8" ls. weathering smooth and breaks with a conchoidal fracture. Lepidolite at the top.
 - 100' Charcoal bedded bluish-gray ls. that measures knobby and breaks down into sand and silt.
- These beds are full of Chazy fossils at the base. Top is also fossiliferous, Hornellian in question, the concreted species Gryphaea, Leptaena, Micrasterias, Sericites with others in base, Lancularia, Priscilla, Camarilia.
- 6' Thin bedded, circular and rounded lags. Very few become fossils.

August 11-1918

Table Head section

- 5' Gray dolomitic li., weathering light tan-gray and pitting
concretions into large sharp-edged pieces. No fossils.
- 4' Dark bluish li. full of Chazy fossils. Weathered easily.
- 20' Thinner bedded more sandy layers穿插 with thin
fucoids. Fucoids abundant in sh. ls.
- 465' Dark bluish-gray li. in a series of massive beds, thick weathered
by the sun and break down into small chips. These beds are full
of Chazy fossils. The lithology continues uniform with no
basis for subdivisions. Sh. ls at the point 20 S. 20 W.
This division goes on up in the section where big nautili become
common.
- 612 part of Chazy or far determined. This section is continued on page 141

August 12-1918. Monday. Table Head.

A strong wind blew all day and during the night bringing
a light rain. This morning the world is cold, wet and dreary. Con-
cluded to remain in camp. Lusk and Edwards went out to
study the remainder of the section, the Table Head form, its contact with the
Paw Paw sandstone, and the relation of ^{the latter} ~~them~~ to a drift.

Still wet all afternoon and we remain in camp. Very

21 HK.

August 12-1918 Monday. Table Head Section

Chazy limestone 212 feet. On former section 716 feet.
 Richardson's thickness = 841 feet and his upper 949 feet.
 (60') Dark grey ls. in many beds has crevices into thin shaly
 interc. day no
 endus to sand. 1/2 to 1 inch thick.

Bentonite to the
 Table Head. The Chazy-Table Head contact should be shown at either
 bedrock or base of the zone. There is no break in the sequence.

Table Head Formation.

- * 25' Dark gray to black ls. in some about 2 inches thick
 separated by shale partings. This ls. doesn't break down
 into shaly shales like all the preceding ones of the Chazy.
- 60' Band. of ls. like the preceding alternating with equal
 thick zones of black carbonaceous shale.
- 30' ls. like the preceding in layers 2 to 4 inches thick but
 with very little shale.
- 5' Greenish and very dark gray ls. that weathers black.
- 5' Black ls. in 2 to 3' thick bands with a small amount of
 hard shale.
- 15' Gray layer of black ls.
- 5' Black ls. in 2 to 3' thick bands with a small amount of
 hard shale.
- 30' 6' Gray but. in 2 to 3' thick ls.
- 45' 15' Gray but. in 2 to 3' thick bands with a small amount of
 hard shale. The shale is well stratified and
 the ls. ls.
- 95' 20' Black carbonaceous shale, worn by波浪.
- 30' Black carbonaceous shale - a marsh bed. Thin green

August 12 - '8. Table Head section.

The top of the Table Head ^{for 27 m.} ~~foot~~ has a thin bed of sandstone, which dips into the succeeding Parson sandstone.

The thickness of the table of each member is about as follows:

300 feet. Richardson, ~~not~~ ^{but} it is 200 feet as a rough Parson Sandstone. 277 feet. Island T. made it 200 feet.

*142 It begins with greenish-shale a shale with only thin bands of greenish sandstone, passing into more greenish shale with occasional thin bands of sandy sandstone dipping beneath it. About half of the top is sandy shale. Dip generally westward from 40° to 50° S. 60° W.

210 Quarantine beds of blue-green var. times some of which are bluish and others are orange-pink. Dip 50 S. 60 W. Observed only to the farther west side at low tide before we camped in Table Point Cove."

352 100 ft. Parson Sandstone thin. Thickness of the thin layer as 100 ft. Where did he measure this thickness? Total thickness 500 ft. or so.

(He said) - in place of quarantine, about 1910. Took a good deal of rock brought by, and no reducing the Parson sandstone to a middle thickness of 50 ft.

This section was restudied the next day, Lufsys 144-

August 13-1918. Tuesday Table Head.

Is there any marked difference between our measurements of the section at Table Head and our first with Richardson and Dr. T. We concluded to re-measure all of it. C. 100 ft. of the section to the first mouth of Table Head about 2 miles north from camp and first measured about ^{about} 100 ft. section from the Beebe - to the contact; and farther ^{about} 100 ft. section to the Parson sandstone. It was here seen that Richardson had made a grave error. He enclosed can now be well determined, and has it to say Richardson was unscrupulated.

In the afternoon we collected fossils of various sizes, so far our Table Head collection are smaller even smaller than those of 1915. With the best of intentions we got but fair good fossils. There is still time to go to the country camp.

August 13-1918 Table Head section noted.

352' Parson sandstone as before

300' Table Head formation as before

811 Chogy as follows:- From the top down

639' Darker bluish-greenish without a sharp division from the next lower one, rock beds are thin, darker green and grey, hardly appearance typical of the age. Fucoids at the base, many fossils; Papiniella, Lisca, Phiomorphia, Actinoceras houlei, Hastorites angustior, Mactularia coniformis, Diploporites franarius.

At 82 feet above the base the beds are thinner, bedded and here occur Spiriflyta and fucoids. Lepartitite. This zone is a thin one.

Above the section continues with numerous shales.

At 220' above the base occurs a wide bed and it is the matrix of a brachiopod shell the surface.

At 250' above the base Lepartitite occurs.

At 300' up one of the large mounds,

all of them are very soft and easily broken by hand.

At 450' above the base - the first bed of dolomite occurs and present since the first appearance of the fucoids.

(About a mile high range), and here are also the many Actinoceras matrenium.

The top 100 feet of the face are dolomitic beds up the westward face of the cliff. Ceratostrea and corals are here. Also

August 13-1918. Table Head section revised.

Pycnantili, Ruginervis pinnatus, clavus or ramos or ramus
Crescentia sp., small colonies of marine hyphae. Only a few
 poorly preserved gastridites were seen, as Madurites uncinata
 but the M. of the tips are very much absent.

Ruginervis attains large size, up 2' 9" long with the axis in-
 complete and a diameter of 1 1/8 inches, body chamber 9" long
 and 5 1/2 inches in diameter at the largest end. The last septa
 are 5/8 inch apart.

In the afternoon walking down by the section fossils are scarce
 beyond the spring bed for 130 feet. At this level Leptostrebla sp. 1/2 an-
 inch in size with much filamentous Trichite, Plumularia icarus,
 Common Rafinesquia aurora. Some garnet are also seen.
 At 150 down Lepidostrobla, bryozoans of trilobites, Hymenina annularia
 and Ruginervis sp.

rocks are scarce then to 190' down, the ^{common} Trombicula
acuminata (its higher occurrence) and Lepidostrobla, Plumularia
 etc. Conularia similatubus, Ruginervis sp. Nostoc ramosus
ramus.

At 200' down common T. acuminata. Sooty streaks
 in a small oblong area the right size and relate to first. This
 in the rock part seen here and the overcaking structure
 belongs to it.

At 260' down there is another zone replete with T. acu-
dita, T. acuminata, Ruginervis and frags. of tril.

Aug 11/13. Table Head section. re sec.

- 20 Light gray in wavy li., thin, very rough and
shaly as well as silty. Contains all sand and
of pebbles.
- 6 Chalky-gray fine-grained lime, weathering like bedded
and worn like shaly. Relates with Ruthothorus, a so-called
Actinoceras clavata, No inoceras pictata, Machilites acu-
minta, and Hormitina angustioria. A layer near the middle
contains fragments of fossil fish.
- 8 Light-colored and smooth weathering dolomitic li.
parturing into large sharp angular fragments. Macerates
laminated like water pipe.
- 8 A heavy green that is more dolomitic and weatheres into thin
beds. The rocks thick which are largely formed of dolomitic
material otherwise conglomerate. The layers are thin, and distorted
as if the result of a mud flow at the time of deposition.
Fossils practically absent.
- 106 Dark olive-colored n. thick li. in heavy bed, then weatheres
into darkly-shaly sh. At go'dsore there are very light
Actinoceras pictata and various fossils.
- 21 Light chalky gray; dark colored li. thick weatheres & whitens
without any specimens of the species of the last bed.
Jointed into rectangular blocks. In the upper layers are many
specimens of Actinoceras.
- 2.6"-3.6" Dense light chalky gray li. In a heavy bed that weatheres

Dec 11/13. Talc Head section revised.

intercalite and talc slates. Forms the base of the Chazz
m. on erosional surface of the Bell Mountain.

Bell Mountain. Begins with 2' red lime. Dr. I.

48' light dove colored smooth weathering bluish-green dolomitic li. weathering to a buff gray-green. Dihedral interbeds from 4 inches to 1/10th thick with a few bands on the lower part that weather thin and shaly. Some of these show nodule marks.

68' 5' fine dolomitic layer with white streaks and forms concretions. The bed is marked by the more lighter greenish like markings.

13' Red. like the 48' above.

2' 6" Darker more coarsely crystalline dolomite full of greenish concretions of white dolomite crystals, but make this very easily distinguishable from reference. This marks the base of the Chazz m. zone of dolomites I.

7' Fine colored dense dolomitic li. weathering buff-gray. Capped with 48' lime.

1' 2" blue-gray shaly bed showing numerous small dolomite prisms. This is a usual marker for the

2' Light bluish gray shaly layer with some streaks and nodule marks.

2' Very uneven undulating bed with its coarse talcose mass.

36' Dark colored, buff weathering dolomitic li. li. in

Fig. no 12. Table Rock Section, revised.

With dipping at 45° from the top, and a base some 200 ft. from the top. Top in the base is 3' of sandstone I. The rest from division in dolomite or sandstone an easy distinction field guide.

- 6' Dark bluish-brownish-gray fine-grained dolomite ls.
- 36' Light brownish-gray dolomite ls, weathering light buff-gray. Weathered less than Fig. I. Some layers with brownish ferricrete mottling. In places fractured and cemented with white crystalline dolomite. Many thin layers of dolomite. Some layers are laminated like water-linen.
In the base in one block a yellow oyster shell.
- 8' Light gray dolomite ls.
- 31' Dark bluish-brownish-gray dolomite.
- 17' Heavy bluish-gray dolomite with ferricrete mottling and much white crystalline dolomite. Also some dolomite an oyster shell.
- 18' Heavy bedded with 15° and 30° dip of dolomite. Light orange-buff white. At the base a Calcareous nodule.
- 15' Dip, 30°. Heavy bedded dolomite. The same strike as the last.

Top takes with the base of the lower section in the west of the hill and dipping to 30° in the east and 15° bedded horizontal at the top of the section. Only if the hill in Bluff Hill. A cross-section of 131 feet in the

Aug 17th, Table Head section revisited.

Upper basal interval of Table Head. The rocks are brownish all clayey, fossiliferous at low tide and sandy in sand in the oxidized horizon in the shore drift.

Total thickness of section about 325 feet.

Table Head. This section consists of:

The bed of ferruginous reddish rock lies at the base of the Table Head in full of pebbles & shells. There are also large pieces of Calcareous breccia. These fossils are extremely rare.

Then there is a marked faunal difference with continuation of the fauna.

In succeeding beds thin bedded ls. and shales alternating with intercalations of which some large fossils are very abundant. i.e. *L. elegans* is common here and an extremely small *Streptelasma cerasiforme* is a common specimen of which several were seen.

Higher up *L. elegans* is rare, but *L. tenuis* and *L. tenuissima* come in common, and *L. imbricata* and *L. leptostoma* come in common.

W. M. 16-1918, Wednesday, Table Head - L. and R. Dix.

A dark cold morning with a little rain. Sun up, cold but bright and Quinton gets up before 5 o'clock, in and out in a record it reaches half past five at 7 AM. By 7:30 we are on boat coming up from Daniel's Harbor. The road is mud and the water is high most of the way. We stop at 9:30 under favorable conditions for a 26 mile run. At 2 PM, we are in the iron chain side near Bonne Bay, at Old Portau Thory known as Portau Thore. We pitch our tent on the grass shore and before we get finished it begins to rain - a mighty rain.

As we had to wait this morning, we take a ride over Table Head. The Butmantum strata is visible on the coast line as is seen for six miles. In all this distance the strata undulates up and down so that it appears as though the bedrock were 2000 feet above sea level. It is now north of Table Head the strata begins to be dotted with shallow ditches. They are filled with thin mud deposited with the tide. In another mile or so the cliffs are all of glacial gravel material. On this last mile of the source it is brittle by the island undulations of 1000 feet. The dip of the bedrock, where mentioned, makes no more than one degree.

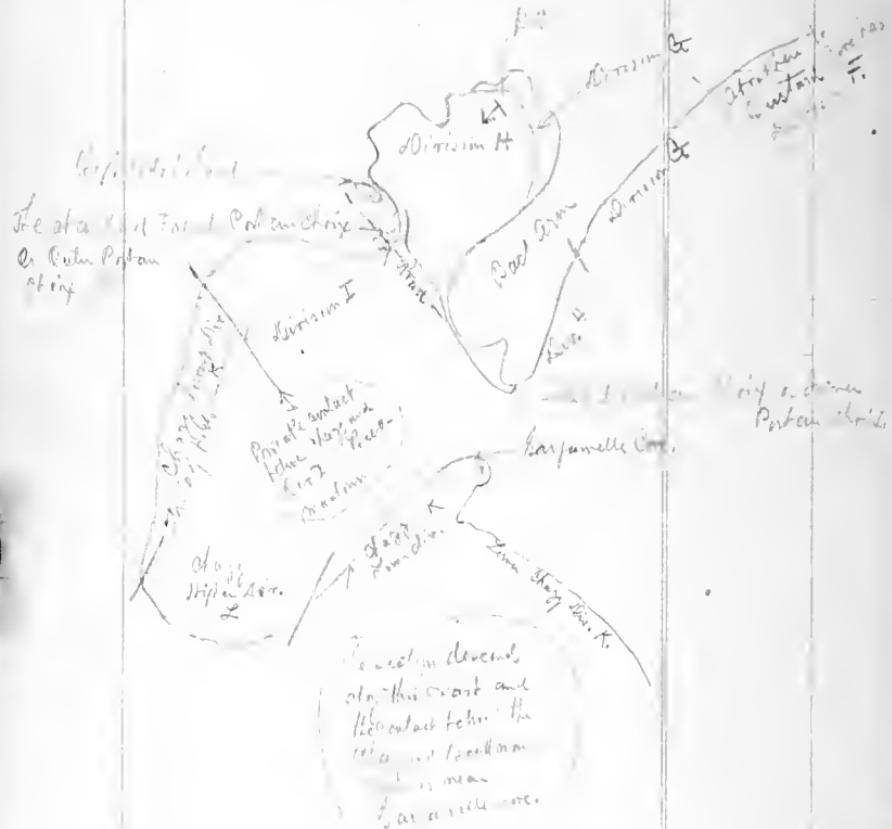
From 7 miles north of Table Head the shores appear to be all of glacial material and with local exceptions appear to extend to Bonne Bay. The gauges I collected range at least say make it 1000 ft. high, this is the view Quinton is inclined to take from the specimens.

All of the coast is low and along the shore hardly exceeds 50 feet. There are some in places two elevation terraces, the lowest blocks of 30 and 50 feet. Some

April 14-78

Ottawa River.

at times a high level, at night. The Long Range is far inland and they do not come near the Gulf shore until the Bay of St John.

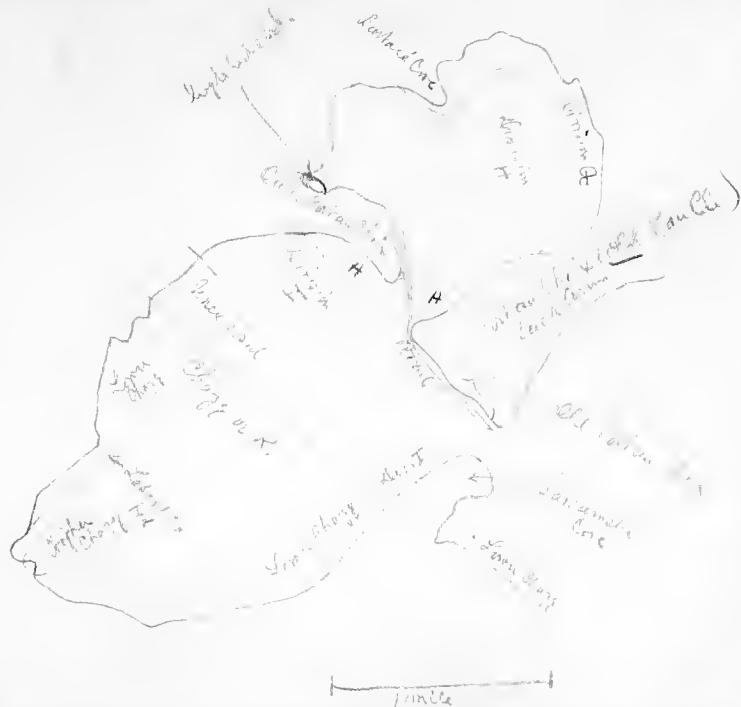


See more correct maps. The appellation is incorrect
last page of a tangle.

Aug. 15, 1918, Tuesday.

Rained, and in the upper part of the day and the night there was a very thick fog. However we got up at 6:30 A.M. to start the motor boat and went down the river.

Aug. 15, 1918



Now they are about gone and I will not have them.

The morning = H.

I am sorry that I took F. I am sorry that it is where the G.F. and H. are. I am sorry that this is a mistake. To get in I have to obligingly G and H. Diction Fort Snelling now in the boat up to the mouth of the river and to get Laramie River.

Aug. 15, 1918

August 14-19.8

Port au Choix.

at times at high level, at 70' ab. The Long Range is far inland
and they don't come near the coast shore until the Bay of St. John.

doc. 114

V. Bay

See more correct map. The affidavits are incomplete
as to geography and geology.

Aug 15-1918, Sunday.

It rained hard in the early part of the day with sun shown a day thick fog. Hove on the coast at 8:30 A.M. off the northern peninsula north of Pointe du Raz. The sky is still overcast and the fog remained steady and the sea remained over the mammals meet. We saw an albatross and its return to land from 7:30 P.M. The last albatross was seen at 9:30 P.M. and the last bird seen at 10:30 P.M. Smith went to the head of Port au Chêne, going to where the camp is pitched.

We began collecting on the island of Gérolstein H. and nearly all the birds were collected. Found it was first hatched from March 1st to May 1st. There are very few birds on the island and those are all small ones. The birds are considerably smaller than those collected on the island.

At the certain time of the day the collection was made up to 10 in G. but no time was given. They say the shot gun was used in the morning = H.

In case of mistral the collection F is account at the 4:30 P.M. and 5:30 P.M. but this is a mistake. The collection was made between G and H. Division F should come in the middle of the afternoon and the girls R. instead of F.

Aug. 14th 15. Port au Choix 10 miles west.

Outcrops, etc., are as follows:-

The low ledges of rock along river Port au Choix are all vertically striated and polished. The striæ run due west.

Going along the north side of river Port au Choix one meets with the base of a higher bed in a tongue from about 10 ft. to 30 ft. The upper part of the pebbly sandstone is sandy dolomite, ^{dolomite} shingle, etc., are seen numerous, fossil preserved fossils weathering out in relief as siliceous pseudomorphs. The surfaces of the rocks weather very rough in having an irregular network like pieces of silica in relief. Pectenites and Sabellaria are common, and Brachidontes affinis. Fossil lot no. 2 from here.

On the section ($\frac{1}{2}$ mi.) at the north-west edge of the cone on which a high-tide island are find the highest layers exposed on the north side of the cone. These are thick greyish-green and appear to be dolomite the base being. They weather into thin beds and fracture somewhat easily. Common Lagena, Tridacna, Leptothyrida, Leptostrea, Leptostylus, Cerithium and Corallina corals. Fossil lot no. 1 Edges S. 30 W. Fossil lot no. 7 from here.

Proceeding south and north-eastward one slowly descends in the section. The upper part of the base of the section is made of thin bedded lime beds with many disseminated garnet nodules and a few fragments of Gryphaea, also small Vitrea and Pitrofrenia. In the middle portion of the bed there is a thin layer of Eurytmia (Lilly) and in the upper part of the bed a thin layer of Leptostyrida. The top of the bed is mostly

August 10. Poston Shale, Laramie River.

seen in section. The rock is dense and heavy that almost none of the fossils could be determined, & it is full of fossils.

In a struggle to what constitutes the larger & peculiar sand layers since they seem to be layer having all the greater beds present.

About 3/8 of a mile from the north bank of the Laramie we find a layer full of large fossils and a little without. This layer continues near the other part of the valley to the point where it is at the top of the bank on the Laramie. These fossils are limited to a thin zone of one or two thick. A zone more or less loose and irregular one, which is more massive and contains yellowish. It shows surface casts. Knock about it and a thin upper, flat layer has a thin fraction of conglomerate. This layer is about 1 ft.

Below this is a thin layer it is made of a soft clay to the lowest point in each of the four highest banks of the Poston Shale. In below the middle stand conglomerate alone fossils generally found in the lower one are scattered by the same time the upper, more siliceous with more than a tendency to weather smooth. Very far away we may see a pattern that may be due to sun-cracking. The rocks are the evidence of shallow water deposits. There are a number of wavy layers that are horizontally and cross-bedded. The upper layer then is a soft of dark gray more crumbly & fossiliferous and porous dolomite that looks like coralloidal travertine and

August 15. Portau Chrix. Narrowsite.

is in bed, 1 ft. 9-18 inches thick. Some of these layers have many white streaks of dolomite. At top of thickness of about 30 feet of these rocks a small fossil just beyond the point.

I went on the river in going eastward into the bay and ends in strata about as high as the former with thin, irregular,

thin interbeds, not of dolomite, and some chalk, about 10 feet below the top dolomite; one seems to be a natural division between Groups 2 and 3 on H. of the coast near me. This being the case not quite all of Group 2 is exposed in the sea-cliffs and gone far about entirely. The latter beds must be exposed along the mainland toward Rustabone.

August 16 Friday. Port au Choix.

A strong wind blew all day but otherwise the day was fine.

At 8 AM we start for Point Pointe (the old French village) and here I continue along the outer shore to Point Pointe. I course and Macau's Station.

Division I of Lagoon makes the southern shore of outer Port au Choix Bay and continues southward for about one-half mile. The beds are heavy bedded maf. ls. and dolomites with layers of sandstone. Murchison's sea-screws occur but otherwise fossils are scarce. The actual contact with the Chazy are visible and make out, and we concluded that it lay with water near the Chazy cliff.

About one-half mile southward from outer Port au Choix are the basal members of the Chazy division and the latter continues all the way to Point Pointe. Gastropods are common but otherwise we saw little today of value.

The higher Chazy division marks the high cliff at the station house and then the zone is about one mile long and one minute. Then the lower comes in and continues to weather about half-mile of Sayabucto. Here the contact with the Sayabucto is visible but I am unable to locate the actual contact.

I did not expect that there would be more on the point than on my first visit. The windy cold day was against us, and then we were hunting only for fossil specimens. Nonetheless the ground does not appear to me as good today as it was in 1910.

W. N. S. - 10. Port au Choix, Newfoundland.

Quartzites rocks are as follows:-

"The top an ornate on the outer side of the south side of North Port au Choix.

There is an estimated interval of 50 feet and several occupied by the neck of Port au Choix Bay. These shales follow on the south side of the river division H.

The Anson strata on the south side are of light gray dolomite in heavy beds 5-6 feet thick. Small grades of dolomite and quartz are common at various zones. Only rare traces of tabular fossils are seen. The thickness remains uniform for about 1/2 mile and then there is an irregular interval for about 1/4 mile across a very shallow cove. The tabular beds here are very thin. It is rather thin but may be only 50 feet of beds or so. All of these shales are of brownish grey.

At the first point leading about 1/2 mile to the outer north side of Port au Choix Bay the section begins again with light bluish-gray massive ls. that becomes rough and "nearly black" ls. This is all carbonaceous. At Point Bonavista, St. John's running along Port au Choix Bay, a thin bed of ls. follows. These rocks are entirely different from the limestone of the middle section. They could not be seen.

The one above mentioned is for 3. following the base of the ls. (shale) are depleted in the middle and in the last portion

Aug. 16. Naukratia

and

M. obsoleta, M. emarginata, were also seen. From time to time L. helvetica, L. leptocephala (with the nitted bases), O. officinalis, Dawsonoceraspis hispanus, Glycera sp. undulata, and T. sanguinolenta.

These same species continue very abundant in the succeeding strata up to the Lebedites bed, which is exposed at the point to the west of the first one and ^{to the east} along the upper part of the cliff a distance of about 400 feet. The Lebedites beds are more massive and they appear to be shallower water deposits than the beds below. Associated on the ledges are T. foliata, and U. claviger ^{and} U. elongatus.

The lower Shelly bed appears to represent a little deeper water deposit than those of Table Head, and therefore more normal marine with many fine fossils!!

The Shelly at the Point of Shells is not exposed in any of the strata. The different beds are not breaking any of the calcareous, therefore there is here no fossil fauna. It is however exposed before from all of the shelly. The Lebedites bed is the only one now in sight.

August 1, 1918. Lat. 2°. Port in S.S. Keffel Land.

I took drift bars at 10 a.m. and found them to be 10 ft. long.
The tides are too deep at 10 a.m. and 1 p.m. and 10 miles from the coast.
and 10 miles from the coast.

At 9:10 we left. It is $\frac{1}{2}$ miles to the outer rocky island
and 6 miles farther to Point Rich light house. It is another 5
miles to Keffel Island where one or two more islands are to be
met here. We then sail to the outer northern side and go around
to inner which we started. We sail the ^{eastern} in 2 hours. At first the rocks
are steep hills ^{sawdust} 1000 feet with thin ^{occasional} layers of laminated dol. But to
facilitate. Hardly any fossils are to be seen but occasionally there is a
trace of a deformed sandstone. The other beds are made of sand rock in
thin layers and the edges are broken. There is an Indian
man on the face of the cliff.

As we get further out within 500 yards we come upon a thin bed of
laminated bluish-greenish weathered arg. li. mostly exposed but with the
fossils few & the same small size as the above. They are all
li. etc. 16 fm. of mt. limestone in section, Amber, Pecten
Siphunculus, and sandstone. The upper section is seen and
lays about 18 inches thick. The lower section is about 10 ft. thick
and dark black li. but no fossils are to be seen. A few fossil
in the same rock as above the Pecten. Pecten limestone one
seen in the lower part of rock. No coral fossils. In view we are in
the Beaufort basin.

Aug 1, 1918. Keffel Island, Haulles Bay.

As one goes around the south side of Keffel Island toward the east one sees other zones of laminated may, in completely unweathered form, are occurring very scarce.

Oliver thinks the may is exposed on Keffel Island at about 30 feet of elevation, beneath the sun-cracked beds, followed by less than or fair, the latter. The shales are almost horizontal. There is only the mid-lake, in comparison with the mid-shore, no elevation.

At 2:30 we are abroad again and start for Haulles Bay.

Quadrilaterals for the area occur following:

" " Haulles Bay area between the southern mainland and Keffel Island in the mouth of the Bay. This island is front of Bulman's Point. It is not at all uniform shore above these beds dipping to the southward, probably, about 10°, in some cases from 35 S. E. to 25 S. W. The island "breaks" a "tongue" - a weathered and somewhat tilted bed of limestone being raised up, roughly vertical, rounded and striated. See photo. The elevation of the sea is about 100 ft. N. S. E. of the

area described along a line of the southern

mainland line of the mainland the island in a direction S. E. to form a low, rounded dome, slightly tilted, becoming more prominent in well fissicated marine zones.

The dolomite here is darker and more easily crystallized as in many beds, with dolomite nodules and white weathering of the same.

August 17. Hawkes Bay, north shore.

In my boat, about 300 yards offshore along the coast, were collected and picked up in the afternoon of Aug. 15th. From the drift before its arrival in the harbor, which was about 10 miles from the coast, a little more than half the specimens were collected in the harbor and a few miles offshore.

Thicknesses of the layers are given below. The first layer is thick and one-half inch, small sun-cracked fragments, + 8° N. North east. The second layer is thin, + 8° S. East.

These layers are followed by a thin layer of sand, with thin interbedded shaly beds. This was followed by a layer of sand, with thin interbedded shaly beds, and finally a layer of sand.

After this came another thin layer of sand, with thin interbedded shaly beds, followed by a thin layer of sand, with thin interbedded shaly beds, and finally a layer of sand.

After this came another thin layer of sand, with thin interbedded shaly beds, followed by a thin layer of sand, with thin interbedded shaly beds, and finally a layer of sand.

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August 17. Hawkes Bay, north shore

near the shore beds with lenses of sand resting upon them. The direction of the bedrock surface is roughly N. E. by S. dip. The dip about 15°, where weathering has removed the top.

The strata of the Hawkes Bay limestone are thin bedded, a slope sandy limestone bed which has a direction of N. E. by S., and which lies above the rest of the beds in again outwards, dip 20°, true E. [Estimate not taken]

The next exposure 100 yards further N. is of light grey fine grained lime carbonate in large beds dipping 20° S. 60° E. at 10°, the top showing the E. dipping surface, dipping 20° S. 60° E. Some of the layers are slightly rounded, others are flat, some thin in the upper part, some coarse and granular. The top is broken, thinnish bed and easily recognizable from the lower one, but sandy limestone in which worm tubes are common. These tubes are one diameter apart in a roughly horizontal line. The thickness of the bed is 2 m 13 cm. The lower bed is 2 m 13 cm. thick, and the upper bed is 1 m 10 cm. thick. The top of the sandy bed is 100 ft. high.

Following shore is a series of small, 20 yd. wide, 10 ft. or more thick bedded carbonates, mostly white, yellowish, pale orange, then a 3 foot bed of dense fine sandstone, then a series of beds that are dark grey, black and brownish, containing small fossils, ^[Bivalves here from same gathering] ^{[I have undertaken the Pectenia quadrivalvis now found in the fossil oysters in which a 30 ft. thick bed of fine white sandstone with} ^[abundant] scratches a dry place. The beds have many small patches of iron pyrite, but the rock is a dolomitic limestone, but still dolomitic, though they are granular. [In this place we see flat little and irregular limestone blocks, ^{mainly} remaining] The next section is about 2½ miles west of Camber in the

Aug. 11, 1907. At the Bay, north shore.

first, iron bio., other side with the lead of Harbor Bay. It ends at $\frac{1}{2}$ mile or the same distance. These strata then reappear and are described by GP 174-175. [I did not find the first 100 feet of Bay rocks and they sank in 100 feet water so bad that one day could not be spent. The bl. which are now parts of Harbor Bay were camp beside the meeting and this a rather large one with a great number of fossil and solenites. Also, in upper members, the same dredge of Harbor Bay bl. and the floor was all the time it had a thin layer of iron bay.

[If the scilicium measured by Leavenworth at least 170 feet appears to be of Lower Cambrian age. Of these strata go-far as sandstones and 70 feet are dolomites. In all there are 1000 feet of no one rock column, we have no idea of the thickness, but today we found a small bed of limestone in the middle of these sandstones. It may be a few feet thick.]

August 18-1918. Afternoon. Haile Bay.

A cold N.W. wind by 10 A.M., an easterly, however, are all still fairly warm. Fall back-light for most part.

Our trail with Edwards, and Remond went's up Mount Rich, which follows along the south shore. It's about 1000 feet

high when it begins to rise, & is 1000 feet above sea level, the following elevation of 5000' from the sea. It's dark.
At camp we are pitched on the bottom of a valley, ^{in the afternoon} which has a steep slope down towards the south shore.

At the very point a few hundred yards off the coast, we see, but just inside the point, a cliff about 100' high, reddish orange, grey-green dipping about five miles into the bay towards its mouth, one slope going up and the other down towards the south of the bay. The entrances are practically blind, so a bit to the west point, a prominent one, and out of "the fall" old trees remain in a line the about 2 feet thick in which the bottoms are even to the ocean, top place, we be seeing.

Off "Island", the southern end of the cape, where it dips into the land, the above alluvium delimiting a certain area, in which we found sandstone ^{some} and ^{large} angular fragments. I could make out a thin layer of sand, but a more distinct one, there is on the west side of the point to go much farther. On the point from where almost back to the point seen in the east of sandstone and some angular fragments, and interbedded with bands of greenish shale, sometimes with white, these beds represent some part of the above mentioned alluvium. The bed is thin, the dip of the strata is nearly 5°, and towards the north, the bay and House Island, is it traced with an easterly dip, section through

Aug 18-1918 Tch. 6, a. 50' to sea

The next 100' or so has thin greenish *Clavellina* rocks which
are 10' thick at 50' $\frac{at 50}{at 60}$ and 12' at the middle of this
zone & find *Clavellina* heads more than one foot in diameter
with the dark shells. The green rock with holes along it
are garnet & not all of them are Patwinia. From just 300' down
that I am in the lower Cambrian.

It is for about 100' vertical to another bank. In this interval there
are again ^{greenish} *Clavellina* rocks with some *Patwinia*. In this ^{greenish} layer are found
Anelloides a dip of 7° down to 100' on a 36' feet. It is 21' feet
at 300' from point I only into another drift or a ^{greenish}
rock a few feet thick. At 300' there are a lot of ^{greenish} *Patwinia* &
Anelloides & ^{greenish} *Clavellina* with some ^{greenish} *Leptostomella*.
This drift, 100' ^{greenish} thick with some ^{greenish} *Patwinia* & ^{greenish} *Clavellina* &
a lot of ^{greenish} *Leptostomella* & ^{greenish} *Patwinia* & ^{greenish} *Clavellina* &
exposed across 60', then a little higher up ^{greenish} *Clavellina* at 300' feet across to
the left side of the bank and at 10 degrees dip on steep inclining to the
right across 60' ^{greenish} *Clavellina* & ^{greenish} *Patwinia* (about 35' or corrected).

At the 300' point it makes the wall 10' wide & 10' high.
The ^{greenish} *Clavellina* is a little over 20' feet ^{greenish} *Clavellina* & ^{greenish} *Patwinia* & ^{greenish} *Leptostomella*.
The beds are 10' apart. Between them are ^{greenish} *Clavellina* & ^{greenish} *Patwinia* &
then a 10' gap & then a few ^{greenish} *Clavellina* but they are much
fewer. In this way the 10' are much cross bedded giving the
appearance of undulations.

On the drift a lot of ^{greenish} *Clavellina* & ^{greenish} *Patwinia* &
sandstone layers & no thick ones. At 300' the drift was
cross bedded with small ^{greenish} *Leptostomella* (see specimen).

August 18, Hawley Bay, Smith Cove

At the west corner just to the south of the road and across white and pink clearly variegated sandstones of a thickness of about 20 feet. Then the very headland of the eastern shore of Hawley Bay.

Enters the west in a very steep face that dips ^{south} opposite the White Factory of the west shore. Here we would along a shale of 2 inches and the thickness is about 100 ft.

The next cretaceous point is made of yellowish bed 3 to 10 ft. of pink quartzite followed by an equal thickness of white quartzite. All of these sandstones are much ^{and compacted} and folded over one another opposite the White Factory and thicknesses are about 100 ft. I have concluded to go ^{no} further west today.

Almost all of the Lower Cambrian seen today consists of pinkish grey slaty shales and very low carboniferous. The lower two or three layers are probably ^{partly} ^{thin} dolomitic in character. This is an interesting rock as it is all as thin as 1 mm. and can be cut like glass. It dips into the west and northwest and has a dip of 2 to 6 degrees. At the top of the cliff there is a thin layer of yellowish limestone. The latter thickness does not seem to be more than 100 ft. The latter thickness does not seem to be more than 100 ft.

In a straight line measure up on the hill side, this seems to strike a horizontal traversal to day if we it is about 7000 ft. The dip of the strata at the very top is 2 degrees = 5%. This is not the ^{total} dip calculated and it led me to estimate greater dip as about 7% to 8%. By estimating 2000 ft. of thickness a 2% dip $\times 3\frac{1}{2}$ = 70 ft. ⁱⁿ ^{the} ^{strata} $\left. \begin{array}{l} \text{Dip} \\ \text{for thick} \end{array} \right\}$
 $\frac{1000}{1000} \text{ ft. } \times 4 \text{ ft. } \times 3\frac{1}{2} = 14 \text{ ft. } \text{in}$
 $\frac{1000}{1000} \text{ ft. } \times 5 \text{ ft. } \times 3\frac{1}{2} = 17 \text{ ft. } \text{in}$
 $\frac{5000}{5000} \text{ ft. } \times 2 \text{ ft. } \times 3\frac{1}{2} = 100 \text{ ft. } \text{in}$
 Total thickness of Lower Cambrian seen to day = $33\frac{1}{2}$ ft. ⁱⁿ

Aug. 22. '12. Rock, f. 1. Conf.

Quintas miles from Edgewood as follows:

"With Edwards and Lemire I started at 9 A.M. for a corner of Town of Vicksburg. At the river mouth in dark blue marl, full of "Gigantic boulders". Slip. 2 N. 60 W.

At 1/2 mile up the river after it turns east, about 1/2 mile above its mouth there is exposed a low ledge of bluish-gray ss. Slip. 12 S. 15 E.

Dense sandstone dipping 25 N. 60 W., just below the second ledge. Here about 30 feet of ss. is exposed in a low cliff.

In the opposite bank about 200 yards farther up the dip is about in the same direction but at a low angle of only 10 degrees or so.

About 300 yards further along the upper end of the lake there is a low exposure of the ss. for a distance of 100 yards, dip 15 S. 30 E. in ss. is finely bedded and rather coarse grained, thickness about 10 ft.

The low exposure is connected by a series of 300 yards further up stream. The dip is undulatory on an incline dipping S. 20 E. near the margins. Because of the low dip a certain number of boulders 100 to 200 feet in diameter, here at the top of the cliff, are visible.

At the falls the river turns over a ledge about 20 feet in the sandstone. In about 200 yards below it there is a massive orbicular breccia on the N. side of the river a height of about 30 feet. The dip at the falls is 50 or 60 degrees but it steepens to 35 N. 70 W. The north bank is made of different rock which measures about 200 feet in height. Near the right bank are some big m. of clink. It appears that the granite was in motion along a belt. The ss. at the falls is remarkably finely bedded. See Picture.

See with pages 167-168.



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Aug. 1918. 8 a.m.

Just above the falls the dip is about 6 or 8 degrees E. but it trends
out to 5 or 6 degrees N at the falls, and swings to 35° N. 20' W. 300 feet
seaward below.

The sandbedded ss. continue to form the main bank, dipping 20° E.
or thereabouts ~~at the mouth~~ for a distance of over 1/2 mile since the falls
where we strike another ^{the second one} bed of the ss. in 25° N. 20' W., and
is succeeded by dense fine-grained light blue dol. lit.

Just above the mouth of the "old" ss. we find the articularite with
its axis S. 20' W.

At the upper end of the lake about 1/4 mile from the falls are two diurnal
There is a low exposure of dark colored dense fine-grained dolomite
dipping 38° N. 40' W.

This lake opens into the "new" or "upper" part of the valley.

We have been seeing an account of fossils of the G.C. limestone
on L. all the way up. They are very common along the south shore of the "old"
l.c. Here also occurs trilobites of the "button" stages like those at the camp.
The sandbedded ss. of the falls is now found at various places along
the north side of the lake and grows at least 100 feet in thickness
thickened to the north of it.

Climbing up a steep bank about 50 feet we come to a vertical
cliff 50 feet higher. The lower 10 feet is coarse crystalline and granular
marble like it. Above it is dense dark sandy limestone, 30' to 40' inches
thick, covered by boulders. The marble has many fragments of trilobites, and
just above it occurs Archaeoceras thinolei?

Find 91 c. on day. Starts Reg. south line continues

The strata on's at 8:10 fm the south line, and goes to
west left. Dark beyond (mark) the point left off there are thin beds of green
sandstone, arkosic sand. If few peridotites are seen and some
and even
reddish pink sandstone. The same sandstones make the next section front.
For a mile back east the strata ^{continue to be} almost horizontal, just dipping westward
into a small valley and now almost back to and beyond. If so,
the strata undulate in this mile and as we are passing across a low one the
strata not much ^{if any additional} thickened or reealed. In general the dip is from ± 3
degrees.

In the next $\frac{1}{3}$ mile, as the cliff flies, all the exposures are to
greenish gray, light and white, very rounded, even rounded and ^{large} angular
its. They undulate back and forth slightly and may be ± 1 m. higher
of strata are seen.

When we come to a rock ledge striking N. E. 1/2, it is angular from the base
and dips at 5° N. E. W. It is a bluish greenish limestone ^{myrtle green} with
and a little interc. cryptocrystalline which better are not seen. Next to it is a
drift area in which a white layer of 5 to 6 ft. A little farther east
and higher in the section there are thin bedded and laminated bluish ^{lime} layers of bent
or of which are visible (see specimen). These layers are also somewhat
angular ^{as} because of intercalated arkosic, and rare. In fact, there is not a great
part but have been derived from the sandstones. At this place we find more
a bioclastic ^{lime} full of Orthis ^{lancea} and Lingula
shells, and intercalated the ordinary arenaceous limestone, and a thin
layer of fine sandstone.

Aug 19. Hawkes Bay, North Shore - wet.

4 feet of blue-grey shale followed by 40 ft. of sandstone, tan-colored, light grey streaks. An outcrop of the latter that we get the second set of fossils.
 Then a thin bed of fine-grained, fine-grained arenaceous, followed by a
 shaly sandstone with Cyrtolites. This about 10 ft. is the sandstone
 it is, followed by 15 feet more being yellowish brown. Then from
 5 feet more which is yellowish. Then a thin, very thin bed - 3 ft. at the
 before, 1/2 ft. of blue-shale, 1/2 ft. of yellowish, then the bed of sand-
 stone is white - about 9 ft. in thickness. Then a thin bed of sand-
 stone and yellowish.

There may be as much as 30 feet more of sandstone. Then a thin
 bed of blue-grey shale. Depth of total thickness can hardly
 be given to this. There is a thin 3 ft. thick of yellowish sandstone, then
 later, up to the surface of Hawke's Bay. Up to now have seen
 no here or there will have any natural deformation. All the sand-
 stones undulating may be. This bed only rises to 500 ft. above sea
 level. It is from 2 to 3 miles. Thickness entire thickness of 40 ft.
 along the coast alone is not reach.

Then there is a horizontal joint and layer of white alluvium at
 the bottom of the valley. A small alluvial tract the E. Bank
 of the river. Thickness of bed 10 ft. to 15 ft. of 20 ft. 30 ft. The Bank
 is silty sandstone has some thin layers of fine-grained
 sandstone. The bedrock is common and the talus alluvium is
 composed of fine sand. The talus is a talus and on the side of the out-
 crop about the fault is more than 100 ft. above the base of the outcrop
 to the fault line at 10 p.m. The talus of the bank which
 has been returned on its way up to the Lagoon.

Aug 19. 1913 Bar. South Shore 3000 ft.

He observed fine rocks this morning about ^{to 117} 107 feet above
additional worn Cambrian. Factor 1.2 gives about 321 feet of strata
from which it is at least ^{to 306} 313 feet on the axis of great elevation
at about 117 feet above base of Harbor Bay it seems probable that
the true elevation is nearer 400 feet and it may be more. From this
area 25 percent sandstone and 30 percent in *L. arenaceum* lime
shale. Later we concluded to stick to the original estimate of about 313.

The small area on my bar where talus rocks are well exposed
indicated sand that runs away due west, regardless of the slope.
Also a thin layer of glacial clay over the barren fauna
collected at Parsons Pond.

Glaciation is best seen in these inland bodies of water and are
the doubtful original names of the upper lakes. Possibly some
of the now non-existent bodies are nothing more than marsh lakes
and to not more than fifteen to glaciator.

August 19. Harkes Bag. 1st - go on continued.

In the afternoon we began at the south end of the section of the Lower Cambrian strata and then went northward to the salt line. Scattered with white beds, according to the sandstone which are the base of these dolomites.

We now came to a point just to the east of the dolomite, about one mile from the village. Here the sequence of the dolomites is different and the thickness of the various layers is also dissimilar. We find that there is much sandstone, Crytophyllites and a concentration of dolomites cannot withstand the drift of the river and especially the floods collected at the village. It is not that they are washed away but the base of the salt line has been cut off by the same action.

In all of the Cambrian dolomites found to the west of the salt line, even the more or less sandy ones, there are no fossils, probably supplied a care of the salt line. This shows that all the more certain series of dolomites are derived from the same source. The bed was at Frankfort, just to the west of the village, Atom camp there are often to be seen small dolomites like these they are not so large as the ones here but very difficult to separate from the sandstone. The sandstone is white and sandy or tawny of all the dolomites found here it is shallow water deposits. The sandstone is white and the white and sandy nature of all the dolomites is due to the shallow water deposits.

August 19. Carter Pay. 11' tree continued

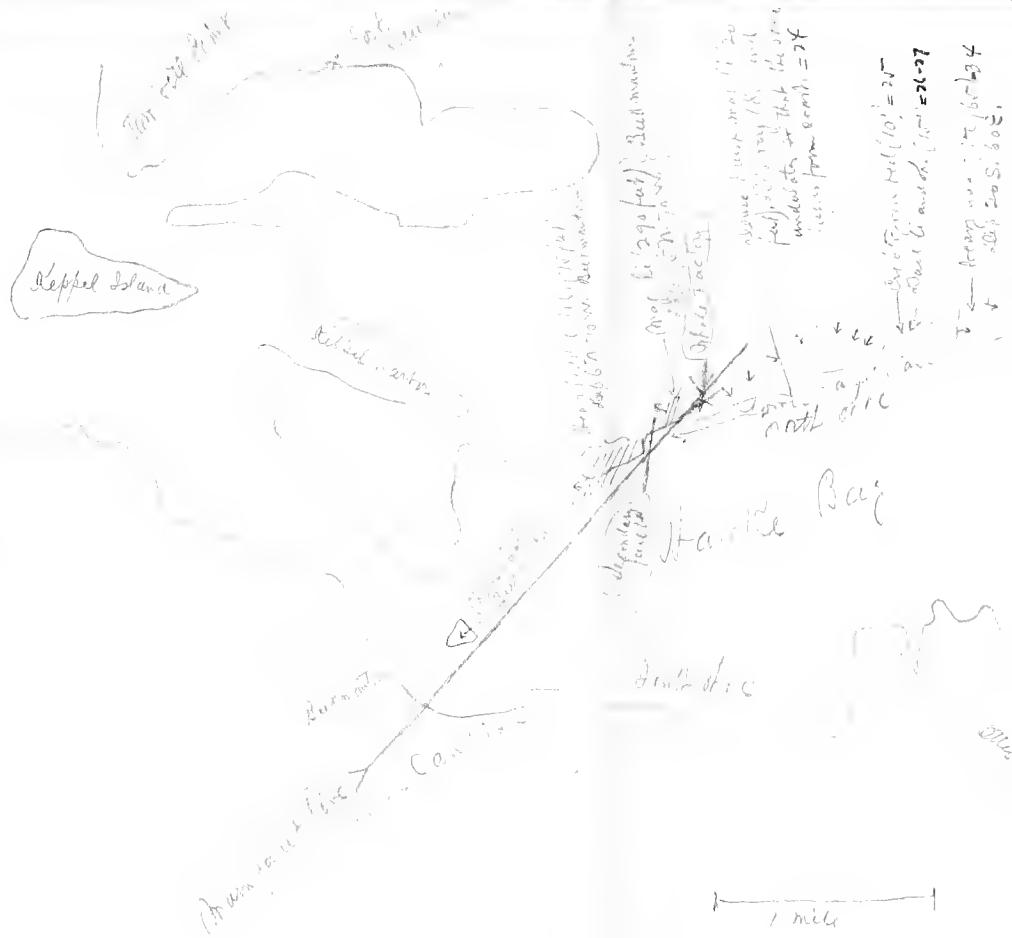
Quintals cedar in a tree 162 did not grow to set in
at first due to many blights. Today I searched in add'l. to
add'l. a cedar in the same top part of the red soil and saw at least
a living tree. It was 161 ft. tall and in flower district, 62 ft.
in diameter at the bottom, 18 ft. at 30 ft. height. Stethophyllum
the victim tree sees a little of a noble bear about 120 ft. up.
He did not go after it as he had seemed to see me no more
and did not go a half mile to the south of East River.

To the other 160 ft., where added at least 214 ft. of Quata
soil, 290 ft. base 178 ft. top near the north shore 624 ft. green state
about 160 ft. tall, 161-162 ft. more than 160 ft. the tree is
new, the old wood in it is soft and no wood yet. Between
the 160 ft. and 161 ft. in the tree there is a large hole
at 330 ft. which was never 400 ft. or less from a
tree in the old mine road, on the side, at 400 ft.
734 ft. Just off the top of the tree is at least 100 feet
of sandstone, but there may be as much as 200 feet, 100 feet white and 100
feet dark greyish brown at least 160 feet, total seen to be different
from the 160 ft. and north side. Before we seen to far
at least 884 ft. of the Canadian state, described.

The seemly cedar, 161 ft. tall, those of the ones
I have seen while in the state are big now, over
100 ft. tall.

It is 161 ft. tall, double due to the red soil making
290 ft. instead of 161 ft. This leaves the seen 214 ft. less top of
the elevation, so it from 903-1065 ft. adding the 63 feet of East River
the constant flow would make 1000 ft. above.

1 mile



20° 0' N

4 Camp

4 River

4 Mountain

doc. 114

August 19. Hawkes Bay. North shore examined.

To get the structure and sequence of the units along into better harmony with the coast-shore section and Edwards' report the former, Dunbar's notes are as follows (They are in three pages 160-162):-

"At the first edge of the first limestone bank of Horne Island occur heavy bedded dark bluish-gray dol. with many small girders of dol. Slip 67 ft. 70 m. They show no bedding at all, a place or two. Thickness about 75 feet. [These are probably too thin to be good lime stone.]

To the east is an irregular interval of 300 yards, but the above dol. forms a bank in the water about 100 ft. in the first part of this distance and there it is much ^{irregularly} bedded. [A sharp ^{100-130 m.} maximum may be]

The next exposure at a little point west of a ridge ^{at} west of the middle factory is formed by heavy beds of dense bluish-gray fine-grained dolomitic dol. standing on edge. Slip: 27 ft. 70 m. This is mostly dense dol. weathering ^{light} olive. Some of this is sharp. This is overlain

~~290 ft. in the water, 80 m. thick, the water being 100 m. deep, the rock~~
in the water, 80 m. thick, the water being 100 m. deep, the rock
here is light beige, but white, the rocks above are grayish-greenish.
Here the rock is bluish-gray dense and fine grained may, lie, that
weatheres yellowish, in layers 3 to 15 m. thick. It is very full
sun-cracked on the surfaces and some are tilted. Interv. cal. is ex-
tremely common. Slip: 87 ft. 70 m. These beds gently undulate so that we
first descend through a thickness of 30 feet and they are again brought
the same to the middle factory, and then rise 100 ft. on the same
thickness. From here on the same layer gradually forms the bank for
a mile or so to the 100 m. of the big one. It underlies greatly the

Sect 19, Barker Bag. North side continued.

are exposed N 45° E. to the top of sec, where it appears to swing away so the same layer continues to form the base past the point at the east edge of the sec. Within the next 300 yards we descend through 10 feet of *Cyathion* bed, and 15 feet more of sandy ls. with some bedded layers near the base, but the basal 3 feet shown in ^{E. T. S. This is an unconformable ls. over a sandstone} heavy bedded red li. Here the dip abruptly changes to 30°. 20 W. of section by a fault or sharp line we cannot see. However the coarse red li. is exposed on both sides of this line. Continuing downward in the section there is about 15 feet of reddish li. Then 15 feet of thin bedded bluish li. with interbedded fine scales.

Within 75 yards, we come down through the above 15 feet of ls. and then ascending to the red li. within the next 100 feet. Here there is clearly shown a sharp articulation and the red li. plunges again to the southward.

They follow an uneven bed interval of about 150 yards to where the heavy bedded quartzite is exposed, at first dipping S. S. 60° E., and within a few yards, swinging to due E.

July 20, Hawkes Bay, North Island.

He crossed the Taita on the 4th of July without trouble. Then on Friday the 12th, I am back in Hawkes Bay.

The 290 feet west west of the quarry fault is lithologically linked with the Remutaka. It is a series of heavy bedded slightly weathered (like East Raurimu) dark grey-greenish rocks. There are also light grey beds that are ~~thin~~^{thin} and light blue-grey dolomites very fine-grained. Some zones have dolomite intercays like the eastern Remutaka. In places, there are small girdles of dol.

The striking feature is obviously the abundance of black chert sometimes in rock 2 feet thick, in irregular blocks and in elongated lenses. Other zones are laminated. At least one bed there are *Cyrtina* rather than many-faceted bivalves in a distinct locality. Finally forming a few thin bands make partings from 4 to 72 inches thick. I would place these rocks in the ^{Upper carbonaceous} ~~Lower~~ Remutaka.

To the east of the main river the main faults East of it all in the same direction. See map appended to pages 171-172.

Our last day in the country C. today a visit of much of the Hawkes Bay area. This was on the east shore of Hawkes Bay near East Rimu.

Lunch and 8 hours spent the afternoon walking on 3 miles of a cliff, first a 400 ft. high scarp as the limestone, then a 100 ft. high scarp, then a plateau mainly of the type shown in the south side of the river bed. Encountered fragments of *Glyptodon* in the scarp and several large basic blocks of *Saltirella*. Evidently the latter are indeed common to the east of Hawkes Bay.

Aug. 20, 1913. Houghton Aug. 20, 1913.

In the afternoon Mr. Trenkle walked on the south side of Hawley Bay to see if any of the rocks there are like those seen at Tonant River. He concluded that they are not so.

Trenkle walked north of Cape Horn about one mile and saw no cotton ls. He thinks the "Cotton Bank" is a small cay. This ls goes to the first marsh bank of the age which is dipping 2 N. 75 W.

The intervening distance of 3/8 mile to the west of East Horn is made up of a thin bed of white fine-grained sand and sandy shale with a small amount of interbedded siltstone of somewhat pinkish color dipping very slightly.

At the river mouth occurs the first ls. It is about 2 or 12 inches thick dipping 2 N. 70 W. It has a few ls. The rest are shale but not so thick as in the dipping limestone. The rest of the river goes 1/2 miles.

The whole grit undulates with dips of 10° dipping towards the White ls. So we can't get a good view.

Fossil section near Houghton

5 feet of white green ls.

10 feet red bed limestone with many ls. dipping

6 Shaly ss. in which ls. are

4 Red ss. in layers 3 inches. ls. in them

3 green ls. in them

20 White ls. with ls.

5 Shale interbedded with them

10 White green ls. in them

Clypeariella flaccida Wag. Mertens notes.

A "bit of $\frac{1}{10}$ of a oz." of the bottom li. powder, containing a small amount of lime, is added to leach out the porous lignite and about two "tspn" occur in the interval between the last of the river mouth and the river channel.

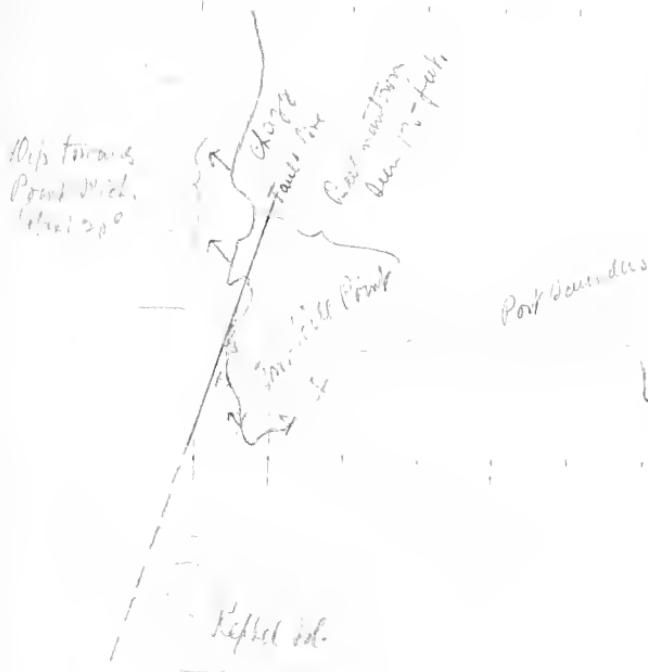
The sand in this is the one measured downstream from camp along the south side which is entirely different from sand we have on Tonent River. This confirms my belief that the Tonent River scutellini was below the "bottom" layer.

July 1, 1951 - State all over 1" +, except
at end, a very small part.

Aug 21-1918 Wednesday. Port Saunders.

Bones with page 180.

doc. 114



Left end of a caribou bone. Tip broken off. Drawn by myself. Length 14 inches, width at the middle; the living bone may be 8 inches in length.

179

July 20 Sunday Aug. Kuntars notes.

Aug 21-1918 Wednesday. Port Saunders.

We arrived this morning in from the N.W. and we can go only to Port Saunders. We have camp, and at 2:40 we are on our way down Hawkes Bay to Port Saunders. We stop at 4 miles and we are arrived at 11 A.M. Total 8 miles. From our camp in a straight line to the offshore factory the distance is 6 miles, and to House Island it is $4\frac{1}{4}$ miles.

At Port Saunders we are near a "city" completely buried as the wind is high and there is a violent sand storm.

Sun. Aug 21st William Blake Esq. of Jones, New York.
Please return to me as soon as my barrel of coal has been
shipped, Port Saunders, Financial Agency, C. J. Smith, Esq.

The freight cars are 30' long & 8' wide & the 10' car & a
small locomotive are. Coffins are made in the Beckmantown,
approximately in the shape of a boat having a pointed stern Point Rick.
After the Beckmantown was very heavily loaded and then it
tippled over & became mired in the sand & water immediately
indicating a weight of about 10 tons per car, I think.

At the next turn bridge ~~over~~^{near} the Beckmantown, we see
the first bridge about 20° inland & the second bridge
is about 6 miles from the first one and the third bridge
is about 10 miles from the second. The distance between the
bridges is about 6 miles, the distance between the second & third
bridges is about 8 miles.

In an effort to know more about the country.

A fine birdy man morning. Found on land, a nest
and we are bound for another day.

Left 3:30 P.M. 100 miles away from
Billie Remire. The weather was very bad
Tuesday and the night we camped with Billie. They
are sick and the weather is bad. We are up
early and care off at 8:05 P.M. We made our first
stop here at 8:05. It is fortunate that we caught up here
for Billie has stopped with the dead for 20 hours.
He has started at 7:45 A.M. We are late
now, and we are running into trouble.

We have passed La Junta and now
it is dark. The road must be either dirt or
and of mud. We are passing the Arches, a
real desert. The road is fault here, several streams there
is no will be a long time. The next 10 miles
sandstone or limestone bed. We do not make stops and
we get to the city of Durango at 20-21 P.M.

There is a hotel in Durango, a good one and
affords us a place to sleep with the bed and room salt if
you break your leg or something.

Mar 24-1918, with 19. No. 206.

Continues the mild weather of the last few days at least until noon of today it will be fine. At 2 P.M. with the sun gone with some rain. All wind has stopped about in forenoon of this d. and there are no clouds now. I have had no rain for 3 to 4 days. Lets see what will happen. Evidently deflation has much stronger winds than the former winds.

We will always remember the tent as the windiest place and where a pile of logs was on the sand dune found already. The curtains were torn. At its maximum we observed those logs to keep the tent from blowing away and from trapping itself.

In 6725 1918, yesterday Stone Bay.

There was a long, the wind was
completely calm. I thought next to bad. At 6:
30 AM the wind had gone down to right and I
had to go up. I went down to left and I
was up again. So at 6:30 AM or so I pulled up and
the current, because it was so strong and all
the time I had to go up. I had to go up
and I went on & then I got to down again.
Stone Bay.

Left Xu and came out to somewhere there on
page 6725 in the second night and.

At 6:30 AM I went up to the west
to 6725 and I went up there and I got down
again and I went down to the east and
I went up again and I went up again and contact of
the wind, I went up again and I went up again and
the wind of the wind, I went up again and

= Combination Rule 1980-213-2

(1980-213-2) result in

and will remain in the condition as

at my stop.

Aug 26 1915, Monday. Stone Bag.

We started out the 2nd from the same point as before and made our way down the side of the hill west of the village and over the valley floor. Of the 1000 ft. we saw no prominent talus cones of value in marking the level. The talus slope was seen full of vegetation about 3' to 4' high.

We then started to re-examine the stone bank in the valley floor and also on the east face of the same ridge. The lower part of the main talus consists of white and pink quartzites with an occasional green because of the ammonitic oyster shells. The main bulk of the remainder is a blue-tinted limestone. Some grayish rocks are also a random portion of the talus. There is extremely little and very hard stone in the talus.

But in the water trough back at the high Egyptian range one sees that it is a coarse talus (Cemented Pebbles) composed of angular fragments of limestone and sandstone. It is a talus to be contrasted with the low mountain talus in which the angularities are of a size to be nothing but tiny fragments of limestone. Many of the water troughs were filled with talus and therefore carefully remembered to say if there was any indication of a section as determined 8 years ago. (see many photographs).

Left the water troughs and went up the hill to test the upper talus (225). The talus consists of angular pieces of limestone and sandstone. The talus is dark-blue-gray fine-grained dolomite interbedded with thin layers of sandstone. The talus has a thickness of 10' or 12' and is between them the limestone talus. The talus is very light-colored. There may be, however, a layer of talus.

August 26.

P. 2 of 5 pag.

The bones of Part 2, 2 facts
or the first disturbance of the limestone of the C. of E.
In fact, can this disturbance may due to the
numerous injections of sand both of drift and coarse
mica-schist? Can we not believe that a deposit of
lignite produced on the S.C. might affect the case.

In afternoon, Mr. and Edwars, I went to the
High Canadian mountain to the north west of the town.
Distance 2000 feet. This just below some of the water-
fountain carbonates. Here the limestone under-
laid by the Pottsville series, here a shale series, and this is
that from Salterella limestone but with a greater animal content.
This a sulphur deposit and probably of considerable significance.
The limestone is about 100 feet thick. It should be
Dentellia. The rocks of the afternoon are as follows:

"The bottom rock is thin, yellowish, sandy, containing
Shells of Conularia, Lingula, etc. into a certain ridge we - a
little above two feet and breaking the one bedding. The bed
is divided into several layers of sand and of lenses about 10 m. apart
consisting of sand and of lenses derived from the high land,
Glenwood, and the like."

661

Afternoon, I went to the south side of the valley
and as we were well in a ravine, clearly took into

August 26. Bonne Bay.

inland for about one mile from the crest of the mountain range, in a direction N. 30° E., parallel to Mill Creek and along its lifted valley wall. The Cambrian shales dip 20 S. 45' W. A thickness of about 4600 feet of cleavage weathered white and fissile quartzite forms the crest of the mountain, and below there is an additional thickness of 80 feet of interbedded sandstone; these bedded sandstones are gray, i.e., blueish-white, occurring in a width of about 480 feet measured from the base of the hill where the slope turns down the strike northward to the east, with the Pittsburg. The exact contact with the Pittsburg is not exposed for a short distance beyond the last Cambrian group; seen near the surface, however, is dark gray shale dipping 50 N. 45° E., and this is no thicker than a part thickness of the same kind of shale so that the Cambrian must lie upon it with a high angle of unconformability.

The horizon in Pittsburg shale is a mile inland to the west of the city, in a direction N. 30° E., and is equivalent to my 4600 feet down the strike (N. 45° E.). In this distance there is a marked change in appearance and thickness. The uniform, older, massive argillite, and the lithology is far from me throughout. It is 3000 feet thick and consists of over 3700 feet of Pittsburg carbonates. At the base is a thin, non-quartzitic, silty sandstone layer, possibly a glaciogenic deposit, bearing a reworking of the Cambrian.

"At about $\frac{1}{2}$ the distance occurring above, is about 3500 feet up to its top I find my first Pittsburg fossil." See page 187 for description.

12, 1916, 10:30 a.m.

We decided right off to bring the
boat in the rear across the bar, and to
make a short portage. At 12:30
we were off.

at 1:30 we were off and away. We were
traveling with difficulty, as the
water will be nearly four hours after it begins to rise
and 100 ft. ^{the distance} in the return run off
the lake. We were about 10 miles from the
mouth of the lake at 1:30. We got ^{only} 2000 ft.
Till 2:30 when we found a small creek and
nearly dry.

After getting up a stick with some twigs where
we had been.

Antlers were confirmed by 3:30.

To the east along the shore the landscape was a general
brown color with scattered black spots. In the afternoon, the sky became cloudy and a general drizzle
was falling which soon turned into a heavy rain. This
continued until after dark, and after the rain stopped, the clouds
still hung in the sky, and the air was cold and fresh.

The darkness continued to hang over the land, and
the middle of the sky was a dark grey.

August 28-1918. Ida. Iag. Middle Arm.

Lorraine called us at 12:30 A.M. because there was a quiet moonlight night. At 1 A.M. we are off for O'Panck's camp in Middle Arm. The boat went well and there was little sea to back up against. These men are all a quick run and with our best rating we get down in 30 A.M.

Dunstan and Edwards will go up to see the head of the arm and study the sandstone Cambrian section that comes in above the Pitt organic while I will look for fossils on the north-western shore of the arm opposite to 1. miles away.

Here the strata consist of thin bedded light-colored sandstones, impure dolomites interbedded with dark blue or greenish black shales, very narrow and thin, a trace of which is fossiliferous limestone, enough fossil material to occur in the upper bed, a few inches thick, up to 5 feet thick occurring in the lower bed, a few inches thick, from 1/4 inch to 1 inch in width, and in length up to 3 feet. You can also see small rounded limestone balls. All are worn due to rounded. In many cases the spherules are perfectly round and considerably when brought together fit well.

These spherules are much older than sandstone. They have the thin fine grain, with some very large ones. Many of the sandstones are laminated when sun-dried, though not very decided. These spherules are much older than sandstone.

Interbedded with these are thick layers of dark shales usually flint-block and these in places are rare interfossils of ls.

In one place associated with these is a thin layer of ls.

Univ. 18-1918. Middle Arm.

grey rock, greenish and black. The sea. may be, sand & shales
not far down and in thickness up to 4 feet, all flat pebbles.
Even in shale, rare clams & trunks greenish then brown &
yellow. Soil of bottom of the sea off west of England is often the same as

described all over a ^{in the same large limestone blocks, say} 100 feet
off shore. Shingles are not the ^{on} slope, and not broken
well. A single star ^{is} ~~is~~ ^{is} ^{broken by} broken. Little ice one sees
any sea. finds no fossils. It was almost as yellow. Yellow
sea bottom and it was almost to the surface.

I am now satisfied that this series of the middle strata
below, with talciferous shales and another local, base
is the variable sand & grey dolomitic facies
and in part of Middle Arm has developed shales and those
angular fragments of old limestone, or talciferous.
I now see no evidence that these shales are of older than
age and sufficient to be associated with fossil oysters,
a majority.

The upper limestone is thin and
hard, pinkish, with many fossils, probably
not common, but the lower is thin and
yellowish.

On the surface of the upper part of Middle
Arm there is a thin layer, then the surface rocks like
the ones above them to form the surface rocks like

August 28 - 1918 Middle Arm.

We left O'Rowe's camp at 3:30 and started our return when we hope to find out all our traps but camped here tomorrow or as late as today to get home on Friday. The weather has been fine all day and we have a splendid trip to Middle Arm arriving at 8 P.M.

Just as I got into supper when I heard gun fire from Tyrell. He then loaded our things and we made a little side trip up Dark Creek where a moderate number of marmots were seen on the top of the mountain. I did not care to go but as Mountain and Edwards were willing and as we could get Lincoln and Clegg to help likewise by the next morning we made the trip up and down the creek on Saturday. I shall remain at Eureka until my return.

As we go on up Middle Arm we see that trap lines have the same thin bedded sandstone limestone series, which is 100 ft. thick. These shale continue around Black Head and 100 ft. below them at Middle Arm Point a thick mass of thin bedded shale appears. This is the same as we saw in the valley. The lower part of this series consists rather of a shale series, though there are some thin bedded sandstones and heavy bedded shales sometimes. I do not know the thickness of either of these but neither of them are the equivalent of those seen to the east of Carling. There is also a thin 100 ft. thick marl series. I am also more convinced, due to our morning work, that the so-called "Tatla Head Series" of Coal River is the equivalent of what we saw this morning.

August 28-1918. Middle Ann.

Brook green hills are flat on Middle Point, the Potomac for a mile, on the western shore about one mile south of Brook Point there was drilled about 2000 feet at mine 1600 down to a depth of about 1200 feet. Last year Tyrell found 8 of the pipes full drill. The cement was made by Turner at the Cog. of L. Co. cost less than \$10,000, had good deal of washing at the black and a large tank for oil. The tank is said to have been 1000 feet long but no one believes it.

Brook green hills is flat on. We has found no shale mineral since the oil wells are but a little to the south on is not as deep or as complete then Reddish layer with green shales. These are white and they are described on page 59. At the wells the dip is about 45° and the green and red shales and at 1200 feet down they may possibly be in the Harpeth series.

Geological miles in the morning areas follows -

"Beginning on the south side of Middle Ann at a point S. 20 W from the foot of Pigeon Head.

See last if the following map. It is not fully in order. They are in contact with the Pittman series which the slate and dolomite are probably situated on the N. 10 W. The slate

(a) 2' Plaster, sand, & silt

0' Pale yellow grainal dark-greenish sand, in

August 28-1918. Middle Penn.

- 200' Black shaly shale, with calcs. and s. S 13W.
 10' Dark gray shaly shale
 120' Black sh. shale
 10' Dark greenish gray sh. shale
 50' Black shale, very greenish
 5' W. like & tabular.
 30' Black sh. with thin s. layers
 50' Dark greenish gray sh. (Marl) - - - - - of weather.
 160' Black shaly shale, S. thin, weathered by sand.
 18' W. like, but older.
 27' Black shale
 48' W. sandy shale with s. 100'
 120' Shaly dolomitic shale, thin, weathered
 50' Shale, brownish
 220' Dark greenish gray to black shale, with s. 100'
 tabular thin and large.
 The dry here is S. S. S. - - - - -
 constant layers and thickness
 tabular and slightly inclined and
 with varying thicknesses.
 (n) 350' Black shale and sandstone with thin s. 100' thick
 which is conglomeratic, the matrix being a coarse sand and
 consisting of angular and flattened stones of black and white
 n. limestone.

Dec 198-1918. Middle Arm.

This brings us to the east edge of Broad arm and the strike of the base beds has the same general direction. In the immediate distance to the west there is considerable disturbance and warping. Continually the section from a very pointed

50' Steep bedded grey quartzite ss. dipping 60° due west. This is, though coarse and hard is much broken and disturbed. It is apparently separated by faulting in the east trapping a hundred yards or so apart. In the first of these blocks it dips 35° due W. and in the next 20° due N. At this last point which is a prominent rocky one the lower part is composed of thin conglomeratic. The conglomerate is broken by lenses of fine sandstone. The latter, though a few feet thick, about half a foot are of clear and white quartz and are well rounded. The rock is angular and ranges in size from $\frac{1}{4}$ to 1½ inches in diameter, the average being little larger than pebbles. No shell fragments have been seen. On the other hand there is a range of blocks of solid rock including chert varves 5 in. and black lignite. Most some of the latter are fully fossiliferous. The upper ones are weathered and subrounded to angular and rarely the coarse size 1 to 2 to 3 in. in diameter though they were after 2020 more or less worn. In the cherts, though the water of running streams, the material is somewhat more angular.

On the west side a number of greenish-grey limestone drifts are visible from the base of the stream bed.

[The author's original note page 196.]

August 29-1918. Thursday. Carkling.

John Tyrell and I went up with his car to the North Penn. They got away at 11 A.M.

I raised my steel on the Winton Bank, in 1600
and returned to the city.

Packed boxes all afternoon, paid Thorne and Lilly and
then

then ran a motor along, and down
to a cloud with sky and then a light wind.

August 30-1918 Friday. Carkling

A dark sun, cloudy and rain.

Packed 14 boxes of cases, now 16 in number. Shipped them
via the Rail by land and Rail back in the afternoon.

To midday we were back and I am back to Parsons
Hotel. He tells me that at the French he has found a series of beds
23 feet thick, 13 feet of which are fossiliferous sandstone. He has
traced it for 1620 feet along the slope. The bed is more or less without
fault. These beds are probably the same as the 22 and 3 feet thick.
If these beds are actually in the 21st or 22nd, then Miller calls it the
Upper Old Red. What is the 15th? It comes in new, above the Lias. If so,
are they in England?

195

March 31-1918 Saturday, Earling.

Rested today.

Tyrell, Burton and Ed and turned up with the rest of the P.M. So I slept the noon day. And from 11 in the morn. but nowhere for so long st.

Then I had a long talk with Tyree about the cost of the trip. He agreed he would pay $\$100$ at a $\frac{1}{2}$ mile per $\frac{1}{2}$ mile and Burton at $\$100$. Also that I charge him out $\$100$ to pay for my car and carfare when it was a gear or two hence. So also a bill of $\$100$ to be paid when I made up the cost of the trip.

Well, and that if I got into trouble was it to let him know. But I had better be independent of them in this matter. Coming back I will pay Tyree and Burton well on the basis of $\$100$ each until $\$30$. Tyree will pay his cost and a bill Mr. Thorne for the transportation of his mail to the post office and his feed price.

I will give you an account of my car, and all have to pay me. In 3 to 4 weeks we will be home, and then we will have a bill.

Bill today of $\$100$ - $\$39.55$ and deducted my passage, 5 fractions $\$100$, $\$100$. Also my big lumber box.

Aug 28-1918, Middle Conn. 193

[Section 20 and 1/2]

- 10' Dark purple-gray shale w. m. L. grayish weathering shales.
- 12' Quartzite like limestone.
- 5' Dark brownish red shale w.
- 40' Greenish-gray sandstone.

Had been on a dome and found it 1000 ft. above to about due south.

This time with a core of the black shale we were able to identify more closely the lower part. It largely cut away. From the black mud and almost impossible to be sure what point is a very thin, formal, a dark shale about one inch of m. fine white siltstone. It is hard. It can be divided up from recent shales by the fact that it is below the bedrock marshes. (R)

By 11:30 a. m. North Stem.

Now we are at 11:30:-

Completed a Survey Party in the course of the day. The last 1/2 mile can be read of the course on the north side. Duran and Edwards arrived the important part of afternoon, and spent the evening in a rest and upon Saturday (31) morning, Terrell went up to town on the 30th.

As we climbed up the mountain we were in a heavy rain, so as to induce a stoppage, while we saw a nearly vertical face of bedded shales about 20 feet thick. Is it possible that there is a monocline? and the dip at an angle of 25° or into the mountain? or, are we more inclined than from the floor to see a monocline in the fair scale? we take as a reference point the top of the hill.

Top of hill.

Point

Top of hill.

At Terrell we stopped to have a meal and to wash the clothes. It rained the entire time in short and long showers. He believes the irrigation may be a result of the deformation rather than a cause.

The hillsides are mostly composed of sandstone with a thin layer of shale. A steep hill can be hit at one point and a low one at another. The layers of shale are far apart and are well separated.

August 27, 1918. D. St. John

"The lower part of the marsh, we may along the back shore of the arm is formed of sandstone and a little of the Marquette series. This is a thick bedded slopes extending mostly with the flaser slopes of the series.

The limestone of the series occurs about $\frac{1}{2}$ mile from the head of the arm and here the sediments form a series of ledges. The first ledge is at a height of 600 ft. and, in a distance of $\frac{1}{2}$ mile or so to the west of here, the surface rises higher reaching near 1000 ft. It is thought the sediments were deposited upon a rather flat the surface gradually descending down to the sea and at Park Point, from high up on the slope the white shingle is found. To the west of the last ledge the series the sediment can be seen resting on the rock and the top of the series is rather low. The rock from here to east will therefore consist of patches.

There seems to be evidence that the rock mass is made from fine limestone fragments, possibly iron pyrite, and talc which may account for its light color.

Much of the talc is usually white, the talcine crystals being very large, perhaps, at least one millimeter in diameter and, some with little length, the covering forming probably some time thousands of feet thick."

September 1-1918. Sunday Curley.

We used to start for home at 10.30 A.M. but the usually
late day did not arrive until 1 P.M.

The day is fine but it did not rain until late in the
afternoon. The first Potomac Regatta at 8.30 and in a
few minutes more we were aboard the steamer. At 9.30
it started for what is being now a ¹⁵⁰⁰ acre park
located across from the small town of our recent
trip to Cuyahoga Falls. It has now nearly been built up.
into a little town known as Falls, but I instead of a motor-
cycle, and went to ride my bicycle in. The life re-
staurants were better and less crowded than ever before.

September 2-8. Hwang, China.

Arthur Hopper had planned to visit and we arrived
sojourn at Hwang Yang at 6.30 A.M. Had a light breakfast
at hotel and at 7.30 we were off on Tram where we
arrived at 4.00 P.M. Had dinner on Tram and
supper at the Hardy House at Tram.

Distance of 14.25 ^{km} in 16 hours one way,
or at 5.45 ^{km} per hour.

September 3-1918. En route in Canada

Entered at 202. at 9.15 P.M.

Left from 202. at 10.15 P.M.

Sept. 4-1918

Left 202 at noon and got to
Kwai Haan at 5 P.M.

201

202-

225 Second bill August 31 - \$100.00
Expense account.

937 03

Aug 12 Paid Mr. Barnes at Busselton and for his
use of his boat and it's crew for a day. 3.50

• 9	Paid Mr. Blundell for one of terms of lemons and -	5.00
• 10	Romantic at Daniels Harbor	1.00
• 10	Bare R. C. engine for incidentals	10.00
• 8	" " Change out of Painter box	2.00
• 15	Bare Edwards on account + 8.00	1.00
• 15	Paid Edwards on account	5.00
• 21	Tidman & Green being and was I think	.33
• 23	R. Lemire for incidentals	3.00
• 25	" " " "	1.60
• 27	Board at Bonne Bay for ^{incurred} 5 days	8.80
• 29	Paid - - same balance on account ^{53.39}	53.39
• 30	Paid R. Lemire balance on account 37.89	37.89
• 30	Cash 3.00 on 16 boxes ^{50¢} each ^{5.00}	1.00
• 31	Paid for flour for 42 days @ .3	126.00
• 31	" a present to Farmer	10.00
• 4	" for incidentals of this account	20.00 before
• 31	" same & Romke per 42 days @ .22	105.00
• 31	" " " a present	5.00
• 31	Ack. owing to Bostm 3.00 & 39.5	118.65
• 31	Paid with interest to Hydray (water)	3.78
• 31	Same to Mr. B. in draft on account	10.00
		1464.057

1469 07

Sept.	1	Passage & ticket on ship to 2	1400
"	1	H. Lemoine for incidental 49.93 ^{+ postage 20}) Take off here what I paid him before.	
"	1	3 dinners on cars, hotel	4.00
"	1	3 dinner set	210
"	2	3 breakfast in hotel	7.50
"	2	3 dinners at hotel	8.00
"	2	3 soffers at 11 m. per day	225
"	2	Steamer Tawak & 1/2 min. per 3	1.5
"	2	3 breakfast	1.50
"	3	3 dinners at hotel	210
"	3	3 soffers or 11 m.	2.00
"	3	Transfer of baggage at Boston	2.00
"	4	3 breakfast at Adams dinner	225
"	4	Exchage on C. money \$108.30 @ 2 1/2%	3.33
"	4	Have C.O. dinner on account	5.400
"	4	" Mr. Edwards "	0.00
"	4	Room for 3 at Adams dinner	6.00
"		Transfer of baggage at Boston	1.50
"	4	1/2 R.R. Boston to N.H. 05.09	15.27
			1644.02

Mr. Edwards 110.00
 Mr. Leontine 281.00
 Cost of tickets \$1918.16
 Chased to bank \$1918.16

P
Aug 60

- Bx 11 Chagz material from the local sandstones at the Island and Water Is. Also some Phyllite after.
- Bx 12 Material from Parsons Pond.
- 13 material from Tattle Head
- 14 " " " " " and Port au Choix. Also Hawk's Bay.
- 15 Hawk's Bay material.
- 16 Odds and ends of last few days.



"K&T" 8680

C. M. Jack
Pralifay
Merchant of Text
Gray market laundry
Information from advoire.

