

1. Andrews

Lancaster P., July 2, 1879.

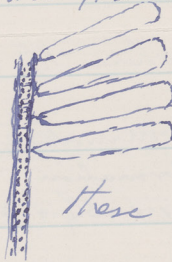
Principal J. W. Dawson L.L.D. -
Montreal, Canada -

My dear Sir:

Please accept my thanks
for your Address on the Quebec Group of Sir
William Logan. I have read it with great
interest. If we have so much trouble in the West
with our undisturbed & un-metamorphic rocks
it is not to be wondered at that the old rocks of Canada
should be matters of great perplexity. The last count of
appeal is super-position, but, as you well say, this
is not always to be ascertained where the rocks are folded.
I have little confidence in determinations from litholog-
ical characters. These ^{in the same formation} change greatly & rapidly in our
undisturbed regions of the West & would be none the
less ranging & unreliable when the rocks are metamorphic.
I admire Prof. Dana's quiet way of working out
the formations along the border of Mass., Conn. & N.Y. The
most laborious & painstaking field work can alone
settle our difficulties, & this work too many of our
geologists will not do & consequently their speculations
are almost worthless.

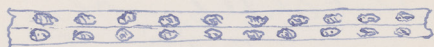
I suppose before this you have looked over the Atlas

of Am. Coal Flora by Lesquereux, it is beautifully
engraved & printed & a valuable addition to Palaeobotanical
Botany, I have recently given Mr. L. some plants from
one Ohio Waverly, which will help to clear up some
difficulties with a class of plants allied to your by copalites
vanuxemii. I found some of these feathery forms in
concretions in the upper Waverly several years ago.

Lately I have obtained from concretions in the same geol.
horizon large forms of the same general type in the leaves are
inch long & from $\frac{1}{16}$ to $\frac{1}{8}$ wide. The fig. below gives roughly
an outline of some of the leaves. The stalk is regularly
pitted with a series of  depression rather than dots. I have
these from the large form down to the
fine feathery form, all in the same concretions. I have

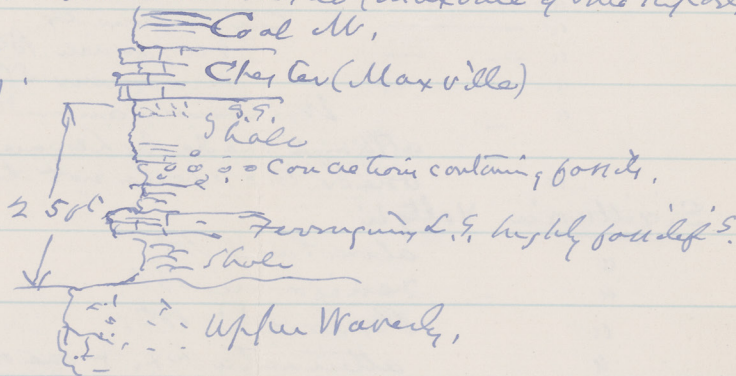
called Mr. Lesquereux attention to my suite of specimens & he
wishes to call attention to the matter in his Vol. 4 Dext. & will
from the larger & cylindrical form, perhaps make a new genus
He's Trochophyllum Pl. III Atlas, he thinks of the same group
to include the whole group. I have a curious little
new fern from Mr. Rushville plant bed which afforded
me so many new things some years ago. It is a narrow
bladed leaf like that of a Leptodendron - but has joint scars
up & down on each side of medial line. It is much

like a narrow ~~lycopodium~~ Polypteris Hookeri
from the Sandwich Islands.



I have quite a number of ^{other} new things from the same bed,
which I hope to publish ^{at} some time.

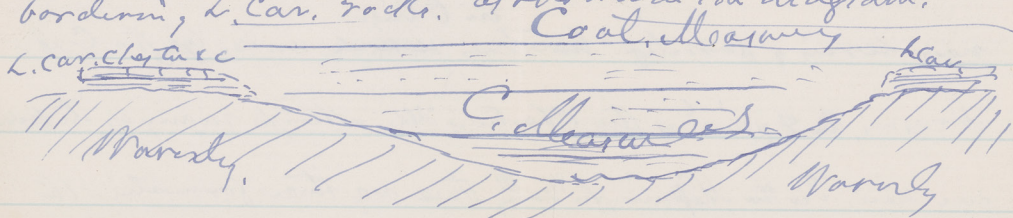
Just now I am much interested in the study of our
lower Carboniferous rocks. We had long known the
Waverly now generally admitted to be the lowest member of
the Carb in the West. Several years since I found a
new series of fossiliferous ^{in Ohio} limestone ~~underlying~~ ^{underlying} the Coal-
Measures, the Equival of the Chester of Ill. although many of its fossils
are new. In the Mississippi Valley these are three formations - the
Burlington qf., Keokuk qf., & St Louis qf., between the
Waverly & the Chester. Lately I have been searching for traces
of some of these groups, & have found in Perry Co. an inter-
val of 25 ft between the Chester (Maxville of this Report)
& the Waverly.



I have sent a few of the fossils to Whitfield - who finds them
mostly new - but more after Keokuk types. I have now
many more fossils to send him - but these are mostly
new & peculiar. But I shall be able to show probably
that the post-Waverly sea extended into Ohio &

in its shallow waters, lives an abundant fauna although ~~and~~ considerably unlike that of the deeper sea of the Interior. I shall, I hope, be able to establish for Ohio a claim to a fair record in her rocks of the L. Car. time; This also seems to show what is properly below the Ohio Ches-

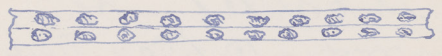
ter. Our Ohio C. Meas. were deposited upon an uneven floor. For there was evidently a long interval ^{of time} between the L. Carbonif. & the Coal M., during which the upper part of the L. Car. was in places removed by Erosion. In these eroded valleys the C. M. were first deposited & so we have seams of Coal on a lower absolute level than the older bordering L. Car. rocks, as shown in the diagram.



Singularly Dr W. claims that these coals below the Chert are in absolute level are L. Carboniferous coals, & claims this especially for the Jackson Coal of Jackson Co. & In my Cabinet I have the following plants from the shale on the Jackson Coal;

<u>Lepidodendron</u> -	obovatum SC.
" - - - -	radicans Lx.
" - - - -	Clypeatum Lx.
" - - - -	rugosum BC.
" - - - -	rimosum SC.
" -	Melchiorianum SC. (This identification although made by Lesquereux is doubtful)
"	one or two species not determined.
<u>Sigillaria</u> Voltzii	
"	alvolaris Bt.
" -	reniformis Bt.
"	Brardii Bt.
"	attenuata Lx. & one other not determined.
<u>Syringodendron</u>	pachyderma Bt.
"	cyclostigma Bt.
<u>Lepidophloion</u>	laricinum SC.
<u>Sphenopteris</u>	acuta Bt.
<u>Alethopteris</u>	Helena Lx.
"	louchitica Bt.

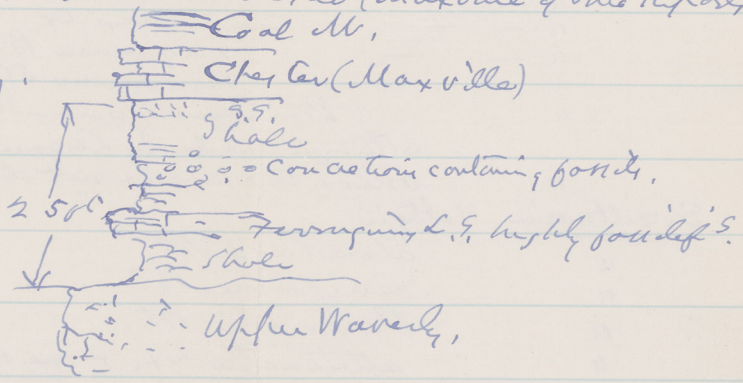
like a narrow *Hycofodina* *Polyfodina* *Hookeri*
from the Sandwich Islands.



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the *Car* ^{in the West}. Several years since I found a
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Measures, the *Equival* of the *Chester* of Ill. although many of its fossils
are new. In the *Mipimiffi* Valley there are three formations - the
Burlington gr., *Kookkuk* gr., & *St. Louis* gr., between the
Waverly & the *Chester*. Lately I have been searching for traces
of some of these groups, & have found in Perry Co. an inter-
val of 25 ft between the *Chester* (*Maxville* of this Report)

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new species. But I shall be able to show probably
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List of Plants continued,
Pseudo-pecopteris speciosa Lx. ?
Erenopteris artemesiæifolia St.
Sphenophyllum Schlotheimii Bt.
Carpolites platimarginata Lx.
Trigonocarpus amygdaloides Forme.

As you have given special attention to the L. Car.
 Flora, I wish your opinion in regard to the
 above list. Lesquerer agrees with me that it
 is clearly a group of Coal Measure plants. The Sphenoph-
teris acuta Bt. Mr Lesquerer finds in the Chert in Ind.
 but Brongniart finds it in the C. M. of Europe, & its range is
 probably considerable. The L. Wettsteinianum has also
 a wide range, but it is often found in the C. M. (I doubt whether
 my plant is L. Wettsteinianum, it is totally unlike Lesquerer's
 fig. in his new Atlas & does not correspond to Schimper's
 description.) It should be said that probably Dr W.
 has never visited Jackson & has never seen a collection of the
 Coal-plants.

I have recently found here in blue boulder clay
 striated boulders ~~with~~ ^{with} covered, parasitic tubes, formed
 by some Caddis worm or other agent, after the
 boulders were dropped in the run. I sent the specimen to
 Prof. Dana - but neither Verrill nor Smith knew the
 animal forming the tubes on the boulders. The existence
 of such a parasitic coating, on Blue Clay boulders,
 certainly militates against the theory that the boulders
 were thrust from the foot of a vast glacier & c.

In Vol III. Geology, of Ohio Reports, p. 31, Dr W. refers
 to some former observations of mine in Vol I. p. 447 &

Our Geol. Survey Report in 1874. but Report
Vol. 11 Ohio Report, some of the
name has been printed out
has not furnished you with
of R. D. Newberry

adds that these words "hardly have been written & his (my) district had not been outside of the Drift area". In every Report I have alluded to the Drift in my district. Dr W. could travel 80 miles on drift in my district. He would find (1) the Blue Boulders clay, containing striated boulders (2) sand & gravel of the drift on high as well as low lands (3) Boulders of granite, quartzite &c. dropped by the million almost over hill & valley. The largest boulders of the State, so far as I know, are in my district. There are so many boulders of Palaeozoic limestone that lime kilns have been erected to burn it. In Perry Co. within the limits of the Coal Measure - a friend has made a collection of Palaeozoic fossils from the limestone boulders & has compared between 60 & 70 fossils from Corvifera, Niagara, Upper & Lower Silurian. (4) Striated rock surfaces, as distinctly striated as I ever saw in New England or along the lake. I am sorry to be obliged to say that Dr W. has a very limited knowledge of the geology of Ohio. He in the last Vol. practically limits his inter-glacial forest bed to Southern Ohio. I don't only doubt whether there is anything more in Southern Ohio than a pre-glacial forest bed. Of such pre-glacial vegetation we have proofs almost every where in the West.

Pardon so long a letter. I seldom see a scientific man & hence my few runs on, or perhaps my tongue would if I were to meet you. By the way, I was mortified to find not long ago a letter - written & directed to your son in acknowledgment of his fine Report on the Geol. of the Bond - it was mislaid & I suppose please tell him my story & say that I will send him any or our Ohio Vols he wishes. I will send him the whole set, if he will try to pick up some of the Canada Reports for me. I have only one Vol. He may find odd vols. These would help me.

I have a little Elementary Geology for Western boys - which will I think prove useful. A second Ed. is in press a copy of which I will send when I receive one.

I am my cordially yours
C. B. Andrews

P.S. Please say to your son that I have read & studied his Report with great interest & profit & prize it highly.