

Baltimore 23^d Mar 1870

Prof J J Dawson

My Dear Sir

Your favor of the 21st Dec last was duly delivered to me by our friend Prof Carpenter, who gave us interesting lectures upon Ostrac & other mollusks. We thought we ought to ~~prepare~~ ^{examine} some of our Chesapeake systems, but as was the case with our friend Hawkins last year, we could not induce him even to taste them!

I consider the bed containing the eggs to be well defined, as I have pretty thoroughly investigated it. In order to assist you in understanding its relative position, I enclose you what I consider a mere sketch of the Geology of Md (not a Geological map) which I prepared some 11 years since.

At that time I had hoped that our Legislature would have made provision for a Survey & map. Two years later I informed them that I had completed my reconnaissance of the state, & could in two years finish the work if I could have the assistance of a Topographer, a Paleontologist & Chemist, but that there was no use in proceeding further without them. In the mean time we had war on our borders & in fact within them. This threw every thing into confusion in this

border state, so that the work was stopped,
& I have since been unwilling to trouble
myself with the legislature. They are worse
than we, & are spending the public money
lavishly for party politics, but nothing for
science.

on the map, the spaces (21) are
the prolongation of the Cretaceous of New
Jersey, beneath which are not less than
300ft of white clays (with a few thin red
bands) which Hy Rogers clasped with the
Cretaceous. It has been well established
however that these clays extend ~~into~~ through
the northern part of Delaware into & through
Maryland into Virginia. The upper or N.W.
edges pass near Elkton, Horse De Grace,
Baltimore & Washington, as may be noticed on
map no. 22. MTD B in the section

Resting upon these are what I have
provisionally called (Iron ore clays)

Perhaps it will be better to describe
the "section across the Meadon" given on the
map.

A indicates what we used to call metamorphic
but which I presume you will call "Lower
Lancasterian"

B Lower Meadon, without fossils (white clays)

C "Iron ore clays", slate colored & lead colored
containing the following fossils etc

1 Cypris. Of these I have two nearly perfect specimens
& numerous fragments. They are about 15 in high

and nearly as much in diameter, they are all silicified.

- 2 Silicified wood coniferous & abundant.
- 3 Lignite, coniferous, also abundant.
- 4 Three teeth & several vertebrae of a Dinosaur described & named by Lady Atraden Johnson see Smithsonian Contributions to Knowledge vol XIV page 102.
- 5 Fragment of rib of a whale
- 6 Impressions of fern like leaves have been found at one locality near Butte.

The clays C are very fine grained & free from sand. In color they vary from light slate color to red color. The color seems to be produced by an intimate mixture of comminuted lignite or the leaves of plants but I have been unable to detect the smallest fragment of a leaf of *Cypris*.

At several ^{places} within a distance 20 miles I have noticed that B & C are ~~separated~~ ^{very} separated by a band 4 to 6 in thick of hard red ferruginous sandstone, which probably constituted the bottom of the ~~ancient~~ ^{ancient} ~~marsh~~ ^{marsh}. Whether this parting is continuous throughout I am unable to say.

The maximum thickness of this bed is about 200 ft, & it contains numerous nodules of Carbonate of Iron weighing from a pound or two, to half a ton. They have been largely used for the production of iron during more than 100 years.

I have come to the conclusion that previous to the elevation of these Mountain formations, that C constituted a line of marsh at the head of a bay

I would be glad of an opportunity to show you some parts
of interest in this vicinity & hope to see you here again

or bight, the shores of which extended from a point
southward of Richmond & Fredericksburg to Washington
D.C. Baltimore & Elton Md. From near this
latter a long bar or shoal extended southward -
since elevated & ^{now} constitutes the extensive & some
recent formations which form the parts of Delaware
Maryland & Virginia lying between the Chesapeake
& Delaware bays. This bar defended the shores of
the "March" from the waves of the Atlantic
ocean.

During & subsequent to their ^{they were removed} elevation by the floods
from the elevated regions on the N.W. many deep
ravines were cut through them exposing the
subsequent White Clays; so that the upper
beds are not ^{now} continuous on their line of strike
(about N.E.) I know of but one point
where the clays extend below or near
the level of tide. This is at Sagarito point
near the S.E. limits of the city.

This Cyead has not been described, because
we are not fully supplied with books treating
of this class of fossils & we will be pleased
if you will investigate & describe ^{it} because there
is no one here so well qualified for such work.
We have supposed it Meadon but would
be glad of your opinion whether it belongs
to Meadon or Ortilge. I presume it certainly
belongs to one or the other.

The above imperfect account was written
during many interruptions, but I hope will
give you some idea of the position of the Cyeads &c
very truly your friend
Philip Tyson
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