

Graham
Nov 1/75



West Virginia University

Morgantown, Nov^r 29th 1875

FALL TERM begins first Wednesday of September.
WINTER TERM begins first Tuesday of December.
SPRING TERM begins first Tuesday of March.
COMMENCEMENT on third Thursday of June.

Principal J. W. Dawson,

Dear Sir,

Many thanks for the note on the foss

I have for a year or two devoted a portion of my spare time to a study of the strata associated with the Richmond coal, & ^{found} have many peculiar features exhibited in them. Thinking that it might interest you, I send you a few notes on them. The strata containing the workable coal, extending N. & S. between the Appomattox & James Rivers, were evidently formed in a landlocked synclinal basin. The lower strata containing the coal are I think considerably older than the upper barren strata. Only the lower strata contain fossil plants. I have not yet collected enough of these to have a fair representation of the flora. Most writers assume the age to be Triassic, & Schimper in his *Trilite*, erroneously makes the same strata, lower "Mannes visées," & Oolitic. As far as my plants go many are of upper Keuper, or Rhetigian type, while others are Oolitic. The Oolitic type of *Althopteris*, Schimper's "*Cladophlebis*," is well represented by certainly 3 species, ^{the 1st of} which are found abundantly, & widely diffused. There are *Althopteris* *occidentalis*, Phill; *A. lobifolia* Phill; & *Cladophlebis* *costata*, Schimper. (*Pecopteris* *costata* Phill.) This last may be the *Pecopteris* *Whitbyensis* of Rogers. I have never seen his specimens. Other plants also seem to show that while the strata began to form before Rhetigian forms had passed away, they continued until Oolitic plants appeared. This trough with productive coal is interrupted about 8 miles N. of the James, & expanded by about 4 miles of primary strata from a second area of Mesozoic strata, which extends N. in the prolongation of the direction of the coal basin, up to North Branch river in Caroline Co. This latter area shows only monoclinical strata, with N. W. &

N. H. W. dipping strata. This has only carbonaceous shales, thin coal strings, & ~~these~~
contains the leaf coal cut 22 on. After these beds were formed the E. border of
the tract was depressed, & communication opened with the sea. We find over
lapping this area on the E. a most remarkable system of E. dipping beds which
extend under the Escarpment to an unknown distance eastward, they have been
seen 10-12 miles E. of Richmond, & throughout their entire extent, show the
marks of the most powerful eroding & transporting agencies. The materials
composing them are quartz & kaolin from granite & gneiss unsorted, masses
of shale from the shales above mentioned, & most remarkable of all, ren-
dentured stones, up to a foot in size, from the Potsdam sandstone on the W.
base of the Blue Ridge, more than ¹⁰⁰ miles distant. Many pebbles in these
beds show glacial action. These are the strata which contain the wood
cut 22 on. It plainly grew on the Gneiss areas W. of this place. Besides
the silicified wood, great mass of logs, & branches are scattered through
these beds, now changed to a laminated lignite. So you see the age
of the wood must be younger than that of the Richmond coal.

I was much interested in your paper on the Prob. Permian age of the
upper Canadian coal strata. We have near Morgantown, the greatest devel-
opment known, of the coals above the Pittsburg bed. I think that the plants
of this upper series show decided Permian affinities, there are no
Lepidodendron, Sigillaria & Stigmaria ^{in this field}, but a predominance of Pecopteris of
the section Cyathes, small species of Sphenopteris, many Sphenophyllum,
annularia, & astrophylloids, &c. I have a plant closely resembling it
not identical with, ~~Anatopteris~~ distant Schimper. About 400' over the Pitts-
burg beds, I got well marked Callipteris conferta, & 200' above ^{it} a plant
with a flabellate frond closely resembling Pteris phyllon cuneifolium
Brought.

Yours truly

X In Washington Co Pa
Lepidodendron & Sigillaria occur on
our horizon.

Wm. Doucaine