

33 Wall St. New York, Jan 22/68

Prof. Dana;

My Dear Sir:

I am considering

whether the formations of Mass. Ct. & R.I. may not be classed chronologically somewhat as follows - and would be much pleased for any hints from yourself on the subject. The conclusions I propose to incorporate into an atlas of geol. maps of all our states & territories, with British provinces, wh I am editing, to be published by H. F. Walling. He proposes to have every map prepared by the best authority, provided such person does not decline. In addition to the published maps, we have new maps with the latest improvements promised as follows - N. J. Cook. Pa. J. P. Ledy. N. Car. G. Kerr. O. Ind, Ky, Ariz. N. Mex etc Newberry - Tenn & Ala Safford. Minn. Eames. Ia. White. Mo, Kan & Mont. Swallow. Wash I. Gibbs - New England I intend to compile. I have published maps of Br. Provinces, N. Y. (to be improved) Md. Ala. Miss.

Mich. Min. part Ia, & the general publications
about the terranes. Have applied without
receiving answers to Emmons for N. Can, Worthen
for Ill., Lesqueray for Ark (or declining for want
of time) Buckley for Tex., Hayden for northern
territories & Neb. Whitney for Cal., State
Min. Swada. I shall write to W.B. Rogers
for Va, Logan for E. N.Y., Mitchell for Mich.,
Holmes for S. Can (Is Lister living?) & Dr. F. Hubbard

Doye know of any important missions?

My scheme for S. New Eng. is this -
using 24 colors -

Eozoic -

1. Laurentian - D, E. & K (W.Pr) of Percival.

A & B. (E.Pr) Percival. Most of R.I. Extension of
Kunits Mass. Probably granite & gneiss near New
Bedford Mass. gneiss S. of Humb. schist - Worcester Co. - east part.
All these formations contain very
little free silica -

2. C & F (E.Pr) Conn, H (W.Pr) Ct. [H W.Pr = F E.Pr on
account of limestone beds] C. E.Pr. extended through
Mass to N.H., F (E.Pr) extended to embrace gneiss
of Mass holding Bolton limestones,

Can this = Labrador series of Logan?

3. Ferruginous gneiss - F. W.Pr, D. E.Pr -
The latter extended through Mass, following
towns where iron ore is very abundant -

I. W.Pr extended to N end of K. 2 in Mass

4. E. E.Pr Ct. & north part of Mass where a
synclinal structure apparent between 2 & 3 -
as in Winchendon, Ashburnham etc. These two
seem to lie at the top of the others.

The terrane is undoubtedly Erie
but being unstratified is colored litho-
logically. The terrane with the gneiss en-
closing it makes a great V enclosing in
the angle the Paradoxides formation &
overlying Paleozoic strata of the Boston
basin.

1. 2. 3. & 4 appear to be the natural order
from below upward - judging from their
relations, in Ct. to A & B of E.Pr. also to
K W.Pr.

E & B W.Pr = Quebec Int.?, traced down
from Canada continuously - B contains ser-
pentine. A. W.Pr also is Quebec -

B WPr = Bernhardt's Slate = U. Silurian
C WPr = Calif. mica schist Vt & Mass = U. Silurian

Mica schist of Worcester running down the
minerals - may be Silurian & the enclosed
clay slate is lithologically like Paradoxides
slates of Braintree - although it holds the
Worcester plumbago -

A quartz range seems to extend from R. I to
Sutton Mass, thence to bend & connect with the
quartz ranges of A. EPr Et. Solitude is
known of R I geology, that of the gray
ing all the quartz, limestones, & slates of NE
part of R I as Quebec without specifying dis-
tinctions. Quartz rock of Berkshire Co etc =
to Potsdam Limestones = Lewis - upper schists
= Lanza gr - Muscovite schistons can
be divided into 3 pts. throughout as in Mass

Can you put me in the way of any notes on New
Hampshire, better than Jackson?

Any hints you may make in reference to the
Atlas or my general classification of N. Eng. rocks
will be thankfully received.

Respectfully yours

L. H. Hitchcock

Scheme of Colors

Unstratified Rocks.

1. Granite
2. Syenite
3. Porphyry
4. Trappean rocks.

Stratified Rocks

5. 6. 7. 8. (1) (2) (3) (4) of Eozoic -
Paleozoic -
9. Paradoxides beds on St. John's Group & perhaps the
slate with pleurobryas in Worcester
10. Potsdam ~~group~~ group - (Quartz rock Berkshire
& part of N. W. Pr. Et.)
11. Lumber gr. undetermined specially - talc-
schist of Mass., E. & W. Pr. Et., N. pt. R. I.
12. Lewis gr. (Stokely's limestone)
13. Lauron gr. Emmons magn. slate
14. ~~Paleozoic~~ ~~undetermined~~ Calcif. mica schist
(Niagara) - & C. W. Pr. Et.
15. Clay slate - of Bernardston Mass. & B. W. Pr.
probably = Upper gaspe series Canada
16. Paleozoic rocks of unknown age. - mica schist
of Merrimack R. Boston basin - some in Norfolk Co.,
17. Devonian of Bernardston.
18. Coal ~~the~~ Formation of Mass. R. I. mostly
as in my father's report of 1855 - barring the
Devonian - or Old Red

- 681
- 19, Lower 20 Middle 21 Upper parts of
Cannonville sandstone
22 Tertiary -
23 Drift -
24 Alluvium } as on Mans. geol. map

Dear Prof. Frank

The enclosed

Cannonville Sand

price list - very

just read before

today - I read

it for your

enlightenment.

Prof. H. Knowlton

about 1870. See the
about 1870. See the

any one has a right to present -

to know - (Prof. H. Knowlton)

33 Wall St. New York Feb 24th 68

Prof Dana:

My Dear Sir:

Your note of the 5th inst.

has been received.

Enclosed please find \$6., the amount of my subscription for the Journal of Science, for 1868.

The order of the succession of the different rocks, suggested in my last, was not made to depend upon their chemical characters, but upon their supposed stratigraphy. I relied upon the observations of Percival, and do not know how much reliance can be placed on them. There appears to be a very decided unconformability, for instance, between his formations H & I (W. Pr), although they are on the same line of trend. H is full of beds of limestone, but in I there are none. Such a change, contrasted with that of a mineral character, appears to me to denote unconformability. It reminds me of the way in which Logan first detected the un-

conformability between the Laurentian and Labrador - The lower limestone was transversely at right angles to the Labradorite bands & disappeared - We lack here, however, the difference in direction -

It seems to me that the pre-silurian age of these rocks is now well established - for

(1) The mineral character of the Laurentian and many of the Ct. & Mass rocks agree (2) The Laurentian comes into N. Eng. from Pa., N.J. & N.Y.

(3) It is in Vt. an anticlinal flanked on both flanks by the Potsdam & Lewis groups, the former hugging the gneiss on the two flanks. (4) The Paradoxides beds contain in a conglomerate patches of two older groups, the porphyritic & gneissic rocks, whose arrangement agrees perfectly with your view of their stratification - The gneiss is the oldest, overlain first by the porphyry, then by Paradox., slates, then by still newer rocks, all in the Boston basin. With the two ends of the field of spastic rocks clearly pre-silurian, it is difficult not to include them all. But (5) the Dubuq & Gaspe series to which the New England

rocks have been referred can be traced by their mineral character through the whole of New England to Long Island Sound, in synclinal troughs involving these gneissic rocks.

I adopt the sense given to Eozoic by Hochstetter rather than European, to include everything below Silurian, making the base of the Silurian the Paradoxides.

I agree with you as to the origin of granite & gneiss, but think it expedient to distinguish them on the map at present -

Your generalization as to the origin of the triangular form of the continent can be applied just as well upon the supposition of Eozoic rocks along the Appalachians & Rocky Mts., as if rocks of this age did not extend south of the Great Corner, area.

I am exceedingly interested in this subject, and think a careful study of the New England rocks will give greater perfection to our theories -

Your note gave the first intimation to me that you had even proposed ^{to publish} any map

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[4]

of the country - had a map, would
 issued now wd not interfere with my
 atlas - I have the promise of several new
 maps in addition to the ones mentioned to
 you, as of Cal. by Whitney, & probably Oregon
 & Nevada by the same, also Texas by Buckley
 etc.

Truly Yours

C. H. Hitchcock

C. H. Hitchcock on Map

Mr. Mark

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A. R. BREWER, Sec'y, }

Date Amherst Mass 1876

Received at 3:10 Aug 7

To O. C. Marsh

Dr Hitchcock
is out of town

Mrs Hitchcock

Call

#

[concerning Huxley dinner]