

According to the promise which I made
you last summer I ^{have} spent a few days on
the banks of the E. River - and have
seen much at least new to me
I send you the notes which I made
with some figures of the fossils which
may give you at least enough for to know what
you already have specimens of them
If not I can send you duplicates if
you require them - I have seen in the
a great deposit of black red sandstone
let's characterize ^{it} I hope than any other
reports which I have - I may mention
that the great deposit of red brown eye sandstone
I shall on the N. side of Buck's Harbor cliffs
in several respects from this on the E.B. It is much
less consolidated - contains no shell limestone
but abundance of concretions of soft limestone -
abundant in coal plants but has no marine
shells. It is probably a more recent part of
the coal series. I have already found many
parts of it and my next morning send
you an account of it if you think it would be of
any interest.

I find the Sharkstone of the Sherburne series
to be Ankylosaur system - do not the maps
of it there indicate the action of near concentrated
sulphuric acid at the time of its formation -
I have later

I have a full day at the water of

Wishing to commence at a new starting point I went to a point 8 miles distant from the mines where the Silurian rocks reach the bank of the East or principal branch of the river. At this place they consist of grey slates traversed by quartz veins. From the want of good sections and the confusion caused by joints and slaty structure I could get no accurate dip. Among other fossils I found fragments of *Trilobites* & of large *encrin* and an impression of the body of a small *Crinoid* enclosed by Pentagonal plates (probably *Actinocrinus*). Although the Silurian rocks reach the river at this distance from the mines their boundary extends from this place in a direction nearly 10° E - for some miles.

Owing to the swollen state of the river, I could find no section in its bed of any rocks immediately succeeding the Silurians, I therefore commenced my examination with some limestones and other rocks about $\frac{3}{4}$ of a mile eastward of the river. Here, at the north side of a hill composed of slate, I was shown pits resembling those of the gypsum and ascertained that good gypsum had been dug from the bank of a neighbouring brook, I saw none however but can scarcely doubt the truth of the information. $\frac{1}{4}$ of a mile N. of the gypsum is a thick bed of light grey coloured limestone resting upon dark red sandstone and dipping to W S W at an angle of 20° . In this limestone I found joints of *Encrin*, a few small brachiozoa apparently *terebatula* and two *matrefores* of which I have given a wide representation in Fig. 12 & 13.

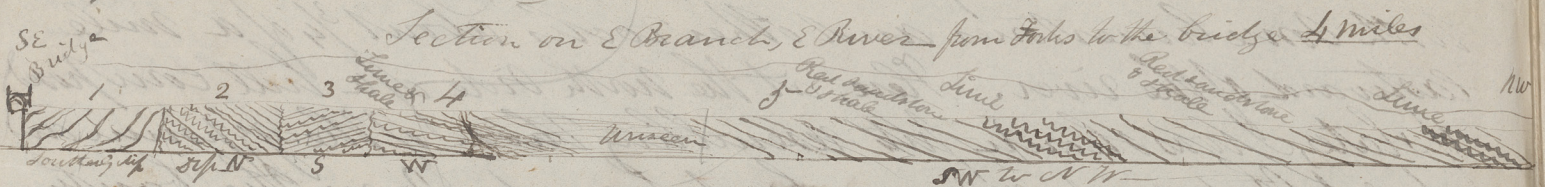
Returning to the river I found near a bridge* a high bank consisting of hard red and grey sandstones & grey slates or indurated shales, with veins of crystallized limestone and traces of copper ore. These rocks are much disturbed but dip to the Southward, they contain no fossils.

* The same to which we were brought by R. Smell,

2 Proceeding to the NW along the river side, these rocks are succeeded by black carbonaceous thin-layered limestone overlaid by a thick bed of hard grey shale, dip at an angle of 30° . These beds are traversed by small quartz veins and contain abundance of fragments of *Encrinurus*.

3 These beds are met by limestones & shales of similar character in one place however, dipping S. at an angle of 30° . These also contain fragments of *Encrinurus*. These rocks terminate at the mouth of a brook somewhat less than a mile from the bridge. Ascending this brook flaggy deep red sandstones are seen dipping WSW and with numerous imprints of irregular branching stems.

4 Passing this brook a quarter of a mile is occupied by grey shales and shaly & compact limestones, ^{dipping nearly W at angle of 20°} and containing many numerous bivalve shells. The large *Producta* Fig 1 is most abundant - I also found the bivalve Fig 2 & one similar to it but with 13 ribs, No 5 & No 6, also the brachio in Fig 3 & 4 & joints of *Encrinurus* & a smooth bivalve with a straight hinge of which there were no perfect specimens ~~among these~~.



5 I recommenced my examination about a mile NW of the point last mentioned. Here the river is bounded by high banks of red sandstone and shale frequently alternating considerably disturbed & varying in dip from SW to NW. - usually at an angle of more than 40° . At the distance of more than a mile from the "fork" of the river these sandstones include a considerable deposit of dark colored limestone consisting of several compact & shaly beds and one with oolitic structure. One of these beds contains in its upper parts numerous shells, mostly compressed and distorted, but the same ^{with those in} figs 2, 5, 6, 7 also a thin *Platystrophia* (or *Strophomena*) represented in fig 9. Beyond this limestone the river banks display a fine section of red sandstones and shales usually in thin

[Faint handwritten notes, possibly bleed-through from the reverse side.]

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but further out it is still of a gray color
applying to black but is extremely fine
this becoming a small gray of sand -
then it becomes hard and after a light
ashy color - The reddish sediment. The color
some of the second has the color changed to
and this I think perhaps from the decay of
the broken blue green sediment in the flat
great part of the sea ice is the same as this in
and worked up the same and still more - is
present in the lower surface of the ice in some
is floated away & torn up. But little of it
for each its roots remain in the flat - with the aid
of the water molecules of the ice so it is here and
of making a cloudy part of itself - light - solid me-
of plants in fact but almost to
the the heavily covered a perhaps great if per me and
which also occurs in the heavily per the both
in that the great decay is going on. The great
kind of the 8th this decay is disturbed & the
the & perhaps seems to prefer mud perhaps
in the of the same - the change on the other
is perhaps & perhaps is this sets for the loss of mud.
but remains its red tins in cases to red heat - and the
from is found in the state of 9 parts - are notes of the
that of which of mud light in this way you will find in Ed Phil's
Vol 30 P , explains no position - rock from Ozark & the
thinks other things

chert's mode of decay of ice - is seen in great masses where
the act of fresh water on very old melting water probably - ends at
dried. The & says it is the best deposit as they are in the one
lots of the trunks being the sand & clay which is colored -

grey limestone with Massifines seen in two
places eastward of the Miller part of this section
also in all probably should be placed with the
others - although differing in one of its fossils -
At the point where this formation occurs
near the first fault I could not ascertain
whether the grey sandstones and shales
by which it is succeeded are superimposed
upon or separated from it by one of those
dislocations so common here. I was informed
that Logan spent some time at this
junction perhaps his notes may perhaps
find more important information -

The shells in the limestone of this point
consist of but few species yet the number
of there are certainly numerous in
some of the beds and almost every bed
contains the greater part of the species -
After a careful comparison I find that
none of these shells is identical with any of
those which I have found in the Symples
formation - and only one one The 13 ribbed
mentioned as found in note on Fig 11 appears to
be the same with a fossil of the Alurian rocks -
I have little doubt that these rocks belong
to the lower part of the Carboniferous system
and that as was long ago supposed by McCrory
these limestones may be representative of
the English Carboniferous limestone -

The Sandstones and shales with westerly dip are met at a short distance below the Forks by others of similar appearance dipping SE. at a high angle. In these another bed of limestone* similar to those before described occurs. It is not rich in fossils but has one layer which affords many individuals. These are those represented in Figs 1, 2, 6, 7, 11. Sandstones & shales again succeed this limestone, & a little beyond it they are arched with Northerly and South-
erly dips and beyond this they are much disturbed. At the Forks about $\frac{3}{4}$ of a mile from McHenry's they contain another bed of dark limestone in which I could find no fossils; and near this bed is a mass of vertical sandstone in which are some regularly striated stems of plants without joints.

A short distance beyond these vertical rocks strata of upturned and cracked sandstone conglomerate and dark shale occupy the river section. They dip SSE. *. Beyond these there is a portion in which I could see no section.

About a mile from the mines the dark brown sandstones & shales forming the lower part of the Coal-measures are seen in the bank & bed of the river dipping SE.

It thus appears that between the Carboniferous measures and the Alluvial strata - a considerable deposit intervenes differing in many respects from both. The mass of this deposit consists of hard usually fine grained reddish brown sandstones and shales, including at intervals considerable beds of dark coloured limestone and a few sand with masses of shells and more rare grey & brown sandstones & shales with remains of plants resembling those of the coal formation. To this deposit belong all the rocks seen in the river section between the bridge on the E Branch and the first Fork more than 2 miles as well as the dark coloured limestone and shales which appear in different places downstream of this part of the river and also extend to some distance westward. The light grey

* McHenry's - dated by you * Callon's -

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The relations of the gypum occur in this clay
are still a mystery to me. It may either be
a member of the red sandstone formation
or a remnant of some newer incursions
from the west which has been removed & denuded.
The absence of gypum in the river section
which shows it may be limestone is in favor
of the former supposition. On the other hand
I could find no trace of any newer formations
Low Clay veins, however, or some of that kind
which appears in the bed of the river. What
I will examine if I can along the river
in summer when the water is low. I hope also
to be able to examine more particularly the gypum
deposits in this river three or four miles below
High Point the heart of good sections in their
neighborhood gives little prospect of much success.

Carl Sandstone
River 1842

