

Dear Sir
I have been very busy with the
preparation of my great book, and
I have not had time to write to you
before. I am very glad to hear that
the book is well received.

As there will be nothing on the
subject of gypsum in the paper on the New Red Sand-
stone, to which you refer in your favour of Aug
17, I do not claim now to answer your questions.

The gypsum of Nova Scotia has attracted
considerable attention since Mr Lyell published his
reasons for believing it to be older than was previously
supposed; and you will find much matter re-
lating to your inquiries in papers by Mr Lyell Mr Brown
of Sydney and myself published since that time
by the Geological Society of London. I do not therefore
propose in this letter to give you much that is new
but merely to give a general view of the appearances
I have observed and the conclusions deducible
from them.

The great workable deposits of gypsum are all
contained in the Carboniferous system, and most
of them in its lower part. The New Red Sandstone
contains only small veins and thin layers of gypsum
of no economical importance. For proof of this
I may refer you to the papers above mentioned and
to that on the New Red Sandstone which I hope
will be published in the course of this year.

The great masses of gypsum constitute true
beds apparently as continuous as those of the

limestones associated with them. These beds are however often of very great thickness, and this together with the tendency of their surfaces to be worn into pits, their association with soft marls and sandstones can only be removed by denudation and the disturbances to which our Carboniferous strata have been subjected often present this arrangement more being distinctly seen. In the following cases however it is very evident.

At Oden's point near St. Nicholas the descending order seen in the coast section is as follows.

- 1 White Laminated Gypsum, fine grained and rather hard, with minute crystals of carbonate of lime. Estimated aggregate thickness, 100 feet
- 2 Reddish Gypsum large grained foliated
- 3 Alternations of thin beds of Gypsum and grey earthy limestone.
- 4 Grey Limestone Laminated & Brecciated a thick bed.
- 5 Reddish sandstones & shales.

The dip of these beds is S. 5° and the lamination or subordinate bedding of the upper bed of Gypsum is parallel to the dip. The beds can be traced inland for several miles the outcrop of the Gypsum remaining parallel to that of the other beds.

A section similar to the above occurs at West R but there the limestone which is fossiliferous does not alternate with the gypsum at their junction.

Two of the smaller beds near the mouth of

The Schenacastic. a good illustration of this point
The part is a bed of black gypsum on the West side of
the river. It is 12 feet thick and is included in
beds of reddish sandstone, a layer of which separates
the gypsum into two portions. In this case
the contrast of appearance between the red sand-
stone and the black gypsum apparently colored
by coats of bituminous matter is very striking. The near-
est instance is a bed of whitish anhydrite with
some common gypsum in its upper part regularly
interstratified with reddish sandstone.

Near Wallace harbor is a bed of gypsum whose
relations are as follow, in descending order

1 Reddish clay or shale not well seen

2 White granular gypsum

3 Grey limestone with fossil shells. The figures
and the cavities of the shells filled with
deliquescent gypsum.

4 White granular gypsum thickness about 12 ft

5 Reddish clay or shale

6 Grey sandstone with Calamites and trunks
of coniferous trees.

The above are the best illustrations which
I have seen of the gypsum. These are cir-
cumstances worth of notice in addition, as it
acts in generalizing from such facts. It is the
stratification or layering observed in many

masses of gypsum. This always coincides with the plane of stratification where the latter can be observed and is often caused by the presence of thin layers of clay marl or limestone. It frequently happens that in beds or masses whose associated rocks cannot be seen this layering is observable and affords indications of dip and strike which may be compared with those of neighboring rocks. In more instances this layering affords evidence of great disturbances. A remarkable illustration of this is afforded by the enormous bed of gypsum called Whytes or the Big plaster rock, on the west side of the Shubenacadie. In this case the indications of the contorted laminae are confirmed by the vertical position of some associated thin beds of marl and limestone.

Anhydrite very frequently accompanies the common gypsum. In some cases as at Whytes quarry and the Bend of the Shubenacadie it forms the lower parts of beds which above consist of hydrated gypsum. In other instances as at the estuary of the St. John and at the St. Croix R. it constitutes the mass of large beds, which are however in the immediate vicinity of beds of common gypsum. At the East R. of Pictou it occurs in large balls included in a thick bed of hydrous gypsum. The

Anhydrite has not been observed to be connected with any metamorphosed rocks; and in the only instance where I have seen gypsum contained in beds altered by heat the gypsum was hydrous.

The gypsum whether hydrous or anhydrous is nearly always crystalline. In the great beds it is foliated and granular; sometimes large grained and often almost compact. In one instance only have I found the gypsum of a bed to have a chalybeate uncrystalline appearance. In the small veins which traverse sandstones or the gypsum beds themselves the structure is fibrous.