

9 Mad
Sept 27

Keswick
Sept 3. 1871

MCGILL UNIVERSITY	
ARCHIVES	
ACC. NO. 224	38
REF. 31	

Dear Papa

I was glad to hear
of last week's letters that you had
got safely back to Lacoua after all
your journey. We have been in
working in the vicinity of the celebrated
Barrondale ~~place~~ mine for the
last few days & so have had an
opportunity of seeing a little in connection
with it. It is not being worked
at present but is represented by
a number of small run cuts and
steep hillside, each having its heap
of debris sloping down. We examined
several of these heaps & the deposit
evidently occurs in ~~primary~~ ~~having~~
stratigraphical order to the ~~the~~ ~~passing~~

through traps & highly altered & cleaved ash beds which dip S at about 50° & form the mass of the hill. The Plumbago occurs in pebble like pieces dispersed through a matrix somewhat like the surrounding rock but not quite so compact. Quartz also occurs in some instances at least filling out Cavities in the mass. Plumbago is also found dispersed in places through the Venetian colouring it black, forming thin sheets & slickensided surfaces. It is so far as yet seen a most perplexing deposit. My theory is that the crack was formed before the rocks (ashes more especially) were so much, or at all metamorphosed. That hot water forced its way up carrying with it melted bituminous matter

That the vein became filled with
this, and the ~~stays~~ detached
from the ~~the~~ compartment of soft walls.
The whole being consolidated
infiltration of quartz, & the bitumen
changed first to anthracite & then
to graphite by the same process
which retained & preserved
the rocks surrounding & induced
slaty cleavage in the ash beds.
This would also account for the
fine homogeneous character of the
flint, & is favoured by the
circumstance that I observed one
of the little pellets of flint in a
cavity, & detached on all sides but
one.

Prof Ramsay in his lectures seemed to
say as you suppose that glaciers had a
very great influence in shaping the
mountains of Wales & Cumberland.
With regard to this district Mr Ward

seems to believe that their action
was only subordinate & limited in
effect. He should be able to judge after
having worked here so long. Sub-aerial
denudation & coast have been active
during ~~the same~~ period. Probably
with the exception of the Glacial Submergence,
~~the same~~ of the ~~mountain~~ ~~denudation~~
period. In reading over your ~~note~~ at
glacial pamphlet however I thought
you attached too little importance to
the erosive action of glaciers & their effects
in preparing sediment which may be
distributed by ocean currents & so
great forces to ocean currents which
so far as we see at present only
fill up when they transport matter
at all.

I enclose my acts of last Dec. I
must apologise for not having done so
sooner.

Your affectionate son
knows all details in regard to the

Sept 6

P.S. Yesterday we came down
by the Plumbago mine again &
examined several workings on
top of the hill which showed its
character much more clearly.
The Plumbago fills vesicles in
a Greenstone dyke which runs
along a fault in the Twp of Ash
Hts. The Cavities in the greenstone
are dispersed irregularly many often
coming together in one place. In
Some parts nearly all Cavities are
filled by Plumbago, in other places
nearly all with quartz. Some
Cavities part with Plumbago &
part with quartz. The greenstone
near the vesicular portions is
not so well crystallized as in
other parts of the Dyke & gives appearance

which made me imagine from
detached specimens that the vein stuff
was consolidated sand & debris.

The Plumbago has evidently come
up as bitumen in vesicles in the
Greenstone. just like the Trap at
Tar Point Siski, & some of the

Scottish traps I saw at Rurstedland.
At one or both sides of the Greenstone
dyke is a debris vein filled with
stones & often cemented by Calc & having
strings of Iron & Copper pyrites, but
only slightly coloured by plumbago.

Many of the levels have been driven
through this soft stuff lower &
side cuts made into the Dyke.

Gravel