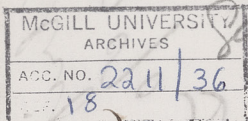


McBreen

New York

Sep: 4<sup>th</sup> / 71



My Dear Dr. Dawson,  
The other day I was in Ringgold, Penn: which <sup>is</sup> in the centre of the Southern mining district & while there I collected some details of the mining for anthracite which I thought might possibly be of interest to you. I had no chance to go down into one of the mines as I had some experiments in making steel from

from

the magnetic field of  
Iron tree, but had the  
Chance to converse with  
one of the mining Bosses,  
as they are called & he  
gave me the details.

In Schuylkill Co. there  
are 278 Collieries which  
produce 4,500,000 Tons  
yearly. This at the mine  
is worth some \$3 per Ton.  
They employ a man & boy  
on an average for every  
three Tons of coal produced,  
which with the royalty  
&c. cost the operator about  
\$1.81 p. T.  
Dead work (running in

drifts &c;) & incidental amount to about  
370 on this cost.

The shale between the seams of  
coal average about 90 ft.

The work is done almost entirely  
by the pits with the exception of those  
who attend to the machinery.

The most curious fact connected  
with the district is that almost  
invariably the Southern dip in the  
veins is the east. In the hickory

District in a distance  
of one & a half miles -  
there are no less than  
three coaling basins.

These seem to consist  
of the same veins fold-  
ed & subjected the ac-  
tion of Denudation.

Now in each of these  
cases, the rule dedu-  
ced from Experience is  
that when the veins  
of a mine have a sou-  
therly dip, the mine is  
a good one; when nor-  
therly, poor. The poor  
veins are more interstrati-  
fied with small  
<sup>strata</sup> of shale & the  
coal contains quite a

a large quantity of Sulphur.

This fact struck me as so very curious that I determined to write to you about it as I did not know whether the same peculiarity of one direction of slip being better than another existed any where else.

To prevent making any mistake I questioned another old miner on the subject & he confirmed what I had heard.

In the experiments with the steel, we had taken the pure iron and 100 lbs

So this was added 19 3/4 %

of Carbon in the shape of  
finely powdered anthracite  
Coal & wood tar, & the product  
made into bricks which  
were pressed as hard as pos-  
sible & then ~~and~~ heated in  
a furnace until dry.

A puddling furnace was  
floored with sand & the  
floor baked, when the fur-  
nace was opened & the  
bricks charged in. Broken  
glass was then thrown on  
the top & the door closed.

The glass melted very  
soon & as soon as this  
was done the oxygen in the  
iron commenced to form  
Carbonic ~~acid~~ <sup>oxide</sup> gas & come

At the top of the melted mass, but being through  
it, where it burnt off. As soon as the  
gas had all gone, the iron combined with  
the carbon & according to the proportion  
formed malleable <sup>or cast</sup> iron, high or low  
steel. I have a specimen of this ~~sort~~  
before me of the malleable iron. It has  
crystallized on cooling & the crystals are  
the most beautiful I have ever seen in  
this metal, although whether it is also  
entirely pure iron I do not know as I do

not recollect what the cry-  
tals of pure iron looked  
like. The blacksmiths  
& iron workers of the  
declared it to be the purest  
iron they had ever seen.  
I have never seen such  
a perfect crucible or  
a large scale as that  
furnace was.

I hope you credit that  
I have not bothered you  
with this long letter or  
taken up your time with  
details entirely uninter-  
esting to you.

Pray remember me  
to ~~my~~ Dawson & his  
daughter.