

(G.P.C.)

Monday, April 11, 1876.

~~William~~
William

My dear Father,

We gave in our diagrams & calculations with respect to our iron arched rib on Monday morning, & we now have a culvert to design for Prof. Baron, which is to be finished by Saturday. We went to the Workshop on Saturday & again on Monday (yesterday). It consists of a couple of buildings, one of which is a shed in one part of which there is a small collection of pieces of beton, samples of plaster, etc. Together with a few specimens of wood. The other building contains a vertical steam engine which ^{was} ~~is~~ used exclusively in for raising

a slight pressure of water, for the hydraulic experiments we were shown. For this object it was made to work a centrifugal pump, which raised the water from a tank in the yard, into which it eventually returned.

~~The rest~~ In the same building there was a forge, & in a wing attached to it a series of planing turning & drilling machines turned by a small gas-engine of one horse power. This was a very neat affair & extremely convenient as not requiring any boiler nor any delay in starting it. It looked exactly like a small horizontal steam engine, with a slide-valve which admitted the gas, and at the same time by its motion allowed the gas to be ignited in the cylinder from two little jets which remained constantly lit beside the cylinder. The machine worked very smoothly; but is, I believe, expensive and necessitates a good deal of repair

There is also a stream of water which circulates around the cylinder to keep it from getting excessively heated.

We were shown a divers dress, & saw it put on a man who was there, & also saw the pumps for the supply of air. Also a machine in which some beton was manufactured; a workman who put the slates on a piece of extemporized roof in a most dextrous manner; a carpenter adjusting a roof-frame, & cutting the mortises; together with a few minor experiments. We also visited Prof: Allungos observatory which is above the shed I spoke of. He has some ingenious self-registering apparatus worked electrically.

Yesterday the centrifugal pumps were explained to us, & we were shown some hydraulic experiments. There were first a couple of instruments for measuring the velocity of water. The water was made to flow in a sheet-iron canal about 18 inches square, in which variously shaped obstructions & dams were placed

made of pieces of board, & which illustrated
very well the flowing of water under the
various conditions. It was also made
to flow from ^{a tank through} square & rectangular
orifices to show the forms it took under
those circumstances. There were also some
agricultural machines, a machine for
making small drainage pipes, & hollow
bricks; we were also shown examples
of welding casting moulding & tempering
at the forge. There were also some ex-
periments on the strength of materials
for which a little hydraulic press was
employed. There was also a large & power-
ful hydraulic press, and a steel-yard
apparatus for testing tensile strength.

You ask about gratuities. The only ones
I know of were at Christmas when we each
gave 5 francs to be distributed among the
gargons.

I have decided to leave on the 25th May.
I will get a return ticket which can be had
for £ 25. It is good for a year, & for either
Quebec or Portland.

With love, believe me your affectionate
son

William