

**THE BADNALLS OF LEEK, STAFFORDSHIRE.**

Letter addressed to:

Robert Stephenson Esq. Civil Engineer  
Messrs Stephenson & Badnall  
Pendleton  
Manchester

Post marked Isle of Man

Douglas, 25<sup>th</sup> October 1833

My Dear Sir,

You will observe by the publication in the Mechanics Magazine (when it appears) of our experiments, that I have made a calculation of the velocities as determined by the Times occupied in ascending or descending with the various loads tried on Wednesday and Sunday last. I sent Mr. Jarrett, also, the calculations of the last experiments and I suppose he will condescend to make some allusion to them, though I confess I anticipate anything but a candid declaration on his part.

I shall be with you about the 3rd or 4th November, at which time I will determine upon my place of residence in England as it will be quite necessary I should leave Douglas before the meeting of Parliament and there must be no stone left unturned to procure our immediate appointment to some of the new lines - I wish you would prepare your bias as to the Oldford line, tracing down in a rough way the line of country through which you would carry it, as it would be desirable that we should, in proposing anything even to intimate acquaintances, show some grounds for recommending the adoption of any plan. Perhaps some other new lines of road may also occur to you.

It strikes me very forcibly that if you reside in Manchester, I ought to be in London or Birmingham and that at each place we should have an office -we could always meet as occasion might require, half way without much loss of time and as London will soon be the source from which most of the various roads will branch out, it is the best place of residence - at least such is my present decision. Much as I would like to be in your immediate neighbourhood, I think we should have a better chance of business by one of us being in Birmingham or London. This however is a point for consideration. I hope before this, you have seen or heard from your brother and that you can induce him to see that it is both for his interest and ours that he should go on with amicable feeling.

Mrs Badnall is much pleased at our having agreed to join, indeed, I have no doubt but that with good management we shall go on prospering - I anticipate we shall have two questions raised on the result of our last experiments, but each will fall to the ground.

1<sup>st</sup> -that had we been ascending another hill opposite to the one from where we descended we should have suffered a loss of velocity, which was not explained, at the foot of the plane in running from the descent to the level.

2<sup>nd</sup> -That (as before often proved) had the maximum velocity on a level with any load which the Engine could take, been continued, the advantage would not be so great as shown in the experiments from a state of rest to a maximum velocity.

The first position is groundless in as much as the descending part of the train can suffer no diminution? of velocity from an opposite part of the train ascending, which would not be counterbalanced by a proportionate advantage in the next declivity? for instance - in measuring up the hill we should have gone much higher, had the whole train been descending from an opposite bank, instead of our having to draw 150 tons, along a level until the whole were on the inclined plane -and the differences in the elevation attained would have enabled us to generate a velocity equal to any difference which there might be in the precise velocity the engine would be running at the foot of the plane had the carriages been going up a hill instead of running as they did on the level.

Now for the 2<sup>nd</sup> position — our object is to prove this - our experiment, fully proves it - that if we start on a course at a maximum velocity for the level, we can increase that velocity to any extent almost, or if the increase be not wanted we can carry a proportionate excess of Tonnage. I have not the slightest doubt but that the Firefly Engine will carry 250 Tons from Summit to Summit of a course 800 yards long and rising and falling 1 in 100 mean from a state of rest, and if so, it is that any velocity left assist in further .....

Give my best regards to Mr Derbyshire .....

...yours .....

Rich Badnall.

Do not on any account omit writing a note to the Manchester D.O begging any letters directed to S & B. to be put in your box - bye the bye, would not Mr Fitzgerald build us an office at or near the Collieries if we paid him Rent for it. It would be very convenient to you.