8 Upper Hornsey Rise. N.
1897, April 19 –

13/8

Dear George –

~~I was disappointed~~ on studying Preston's paper in this month's Phil: Mag: to find that his promised analytical proof of my theorem (& of the lemma I had used to prove it) is what in College we used to call a 'bogus' proof: i.e. what on a cursory view seems a proof but on adequate examination turns out not to be such. I very much wish that an analytical proof could be discovered, because it would probably lead to the much wanted analytical expressions for the coefficients.

But there is not this make-weight, which I had hoped for, to be set against the ~~sneering~~ in every instance based upon a blunder of his own in the end ungentlemanly letters I received from Preston; and the extraordinary treatment administered to me by you, intrinsically unjust and in any case a course which it seems to me should not have been taken towards a gentleman. See on one point St. James's ~~Epistle~~ opinion in Chap: 2. of his Epistle.

I am sorry too – very sorry – because under the circumstances I am very reluctant to have the duty imposed upon me of pointing out Preston's mistake. I have endeavoured to do this in as gentlemanly a tone as I can command, pointing out as strongly as I can what in his paper may be commended. 13/8

The James O'Kinealy, whose uncommonly elegant proof of Fourier's Theorem Preston makes use of, was a graduate of the Queen's University & had been a pupil of mine. I had devoted part of an Honour Course of lectures which I gave him to the 'Separation of Symbols' as it was then called, and its applicability to dynamics. This at the time was a new subject though long since it has become one of the commonplaces of Mathematics. It is this method he makes use of. He was an extremely intelligent student whom it was a pleasure to teach, but like so many others was lost to science by the business of life.

By the way, in regard to the history of the lemma. I think I mentioned that I had heard of it about College before Jellett gave us a proof of it in his lectures. I am pretty sure the first I heard of it

1845–46

was in my Junior Soph: year, from Galbraith in Honour lectures on Optics. For I remember that he gave the enunciation of the ~~theorem~~ lemma and pointed out its utility, but left us to prove it for ourselves, which I and I suppose others did. It was in fact an immediate inference from the work he was then doing with us, on the lines which I point out at the bottom of p 335 of my paper in last Octr's Phil: Mag: — Jellett was the first College lecturer whom I remember to have heard giving a *proof* of it — much less elegant than Preston's 'bogus' proof, but with the advantage over it of being valid. 13/8

Your affectionate Uncle

G. Johnstone Stoney —

$$(a + b/v + c/v^2)\left(1+\beta t + \frac{\phi t}{v}\right) = (a_t + b_t/v + c_t/v^2)(1+\overline{\beta+\phi}\,t)$$

$$a(1+\beta t) = a_t(1+\overline{\beta+\phi}\,t) \qquad a = a_t\left(1+\frac{\phi t}{1+\beta t}\right)$$

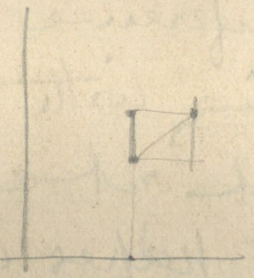
$$a\phi t + b(1+\beta t) = b_t(1+\overline{\beta+\phi}\,t)$$

$$b(1+\beta t) = b_t(1+\overline{\beta+\phi}\,t) - a_t\frac{\{1+\overline{\beta+\phi}\,t\}\phi t}{1+\beta t}$$

$$b = b_t\left(1+\frac{\phi t}{1+\beta t}\right) - a_t\left(1+\frac{\phi t}{1+\beta t}\right)\cdot\frac{\phi t}{1+\beta t}$$

$$= b_t + \{b_t - a_t\}$$

$$= b_t + \frac{\phi t}{1+\beta t}\left\{b_t - a_t\left(1+\frac{\phi t}{1+\beta t}\right)\right\}$$



Johnstone Stoney

$$\delta U + p\delta v + v\delta p = 0$$

$$\left(p+\frac{a}{v^2}\right)(v-b) = RT$$

$$pv$$

$$\frac{dp}{p}+\frac{dv}{v} = \frac{dp}{p-\alpha}+\frac{dp}{p-\beta}$$

$$\frac{dp}{p\,dv} = -\frac{1}{v}+\frac{1}{p-\alpha}\frac{dp}{dv}$$

$$\frac{p}{(p-\alpha)(p-\beta)} = \frac{1}{v}$$

$$\frac{dp}{p\beta} = dv$$

$$\beta = a + bp + cp^2$$

$$\frac{dp}{ap+bp^2+cp^3} = dv$$

$$\frac{dp}{p(p-\alpha)(p-\beta)} = dv$$

$$\log p^\lambda\cdot\overline{p-\alpha}^\mu\cdot\overline{p-\beta}^\nu = v$$

$$p^\lambda\cdot\overline{p-\beta}^\mu(p-\gamma)^\nu = p_0 e^{v/v_0}$$

$$\frac{dp}{p\,dv} = \beta \qquad p = \frac{k}{v}$$

$$\frac{dp}{p} = \beta\,dv$$

$$\log p/p_0 = \int\beta\,dv$$

$$p = p_0 e^{\int\beta\,dv}$$

$$pv = \text{const}$$

13/8

$$\frac{\lambda}{p}+\frac{\mu}{p-\alpha}+\frac{\nu}{p-\beta}$$

=