

24/24

ST JOHN'S COLLEGE,  
CAMBRIDGE.

26.ii.95.

Dear FitzGerald

I prefer not yet to  
contemplate the contingency of  
my tensor not being found to  
exist. The conclusion would be that  
a physical element of a conduction  
current does not exist: - that it is  
not conveyed by ions: - however  
all kinds of discrepancies as well

By the formula on p 817, an  
ion  $e$  moving with velocity  $V$  is  
acted on by a force

$$-eV \left( \frac{d}{dx}, \frac{d}{dy}, \frac{d}{dz} \right) F'$$

where  $F'$  is the component vector  
 potential along its direction of  
 motion. Thus if it describe  
 a circle, <sup>radius  $a$</sup>  ~~is~~ the axis of a  
 symmetrical, <sup>magnetic</sup> field, and  $N$   
 is the total magnetic induction  
 through that circuit, so that

$$F' = \frac{N \dot{a}}{2\pi a}, \text{ ~~to } \frac{N \dot{a}}{2\pi a}~~$$

the force on it will be radial  
 and equal to

$$eV \frac{d}{da} \left( \frac{N}{2\pi a} \right)$$

with the proper sign attached.  
 [This is in fact Ampere's force.]  
 Next vacation I hope these  
 matters will be put in a good  
 demonstration dress, with exact

indication of where the uncertainty  
 about the inertia etc. of matter  
 to which the electrons are now  
 be attached intrinsically, hypothesis.

Indeed there is very little  
 hypothesis except ~~going on to~~  
 the action theory <sup>the fact</sup> that fact  
 that matter holds itself together  
 in the ordinary ways open to  
 observation, - without  
 attempting to explain how it does

Yours  
 Thomson

24/24