

Sides of opening thro' wh. disc hangs.  
These points belong to two little  
wires passing & round by back of  
guard plate & completely insulated  
from it. They are connected one  
with one pole & other with other  
pole of a thermopile with galvan-  
ometer in circuit & when disc  
moves forward to flush position  
(& not till then) the circuit is  
completed, & needle deflected.  
When disc drops from flush  
position needle runs back; so we  
know exactly the flush position.  
The exact time of contact of micro-  
screw with guard plate wh. it is to  
move is also told by the completion  
of a current thro' screw & plate.  
I have calculated that I can  
easily measure EMF (absolute)  
of  $\frac{1}{5}$  of a Sigh Daniell!!



10/141

Saturday.

I, You contemptuous ass! My  
problem, although very easy, is not to  
be dismissed as you think; for  
your proof holds equally whether  
the tube contains mass or not, but  
in former case, the result is not true.  
It depends at once on fact that  
potential cannot have a max. or  
min. value in empty space.  
Observe the different way in wh.  
Maxwell regards a line of force  
from that in wh. Cunningham, Tenkin,  
& all others regard it. Maxwell  
~~finds it~~ makes it a tube (not a line)

and in this way gives some meaning (but a very inaccurate & bad one) to the ridiculous statement in books that the density of electrification on a portion of surface is prop<sup>t</sup> to the number (!! ) of lines of force intersecting it. Maxwell's statement of this is not true unless the electrical unit is infinitely small — which, as Carey Foster remarked when I pointed out this absurd method to him, is by no means to be taken as necessary, the electrostatic unit being well defined. I could enlarge on this measure of density wh. is so much vaunted, but I won't.

10/14/1

So you did not think much of my fine Electrometer! Well, it is being made, & all the minutest details

have been satisfactorily settled.

Then —

1. I can measure a deflection amounting to about half a second or even less, if I like !!!  
by using a micrometer screw whose pitch =  $\frac{1}{50}$  inch, & whose <sup>diameter</sup> circumference at its head = 3 inches, divided into 50<sup>ths</sup> — not by any means an excessively fine division as we have in the Lab. at Univ. College one like this, not with a large head, though.
2. I can measure the flush position to any degree of accuracy by a method of wh. I am very proud, & wh. I explained to Carey Foster with his approval. When disc is exactly flush, it abuts against two tiny wire points which are fixed flush with the plate at opposite



10(141)

Dr. Lodge also thinks that it must be a success, tho' I had not hit on this measurement of flush position when I saw him last. He thought this the great difficulty.

Please tell me whether Tallett is satisfied with my reference to him.

five Williamson 2? Copy with my compts.

I go to Cooper Hill on Tuesday. Send letter there.

Caray Foster is very nice &

an excellent mathematician.

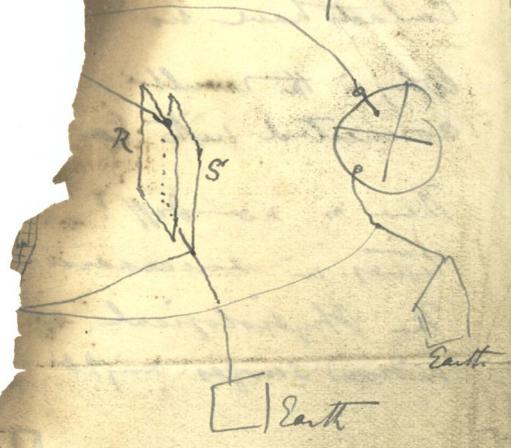
There is splendid work done  
in his lab., as all the men  
work the math. theory of  
Heat, light, Elect. & Magnetism,  
etc. at same time as experiments.  
I feel quite up to my neck  
sometimes when we have to  
discuss the math. of polarized  
light, ratings, & a hundred  
other things.

M. 10/141

27<sup>th</sup> Apr. 190.

plates! I conclude  
then the molecular state of  
of the sensitive surface,  
state taken up as  
at is what I have

10/142



(I think, necessary in dry atmosphere)

Poles A, B, also connected with two copper plates R, S,  
each about 6" square; S connects with the Earth; R, S are about  
 $\frac{1}{2}$  inch apart.

Now produce insens. state of cell; cut out & short-circuit  
the Elect.; work the Voss until a spark passes; then  
put back the Elect. & examine the cell. It has  
become sensitive!

I find that S must be to Earth, otherwise the result will  
scarcely be produced (if at all).

If a condenser is used instead of R, S, the cell may be  
sens. or insens. after spark. I suppose that the induced  
charges are too strong & that they alter & re-  
alter the molecular state many times.