60/13

11th November, 1896.

Φ,

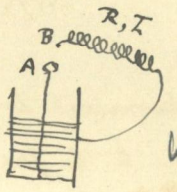
1. I promised to write to you to call your attention to the fact that you have among your students a young connection of mine, Mr. Bertie Tate, who will go to the Medical Profession. He has a scientific turn, and a word of advice, &c., would be very gratefully received.

2. Let me hear the result (if any) of your recent Davanona experiments on the arc.

3. I wonder how or where I could hear of the Quadrant Electrom.r described in the Sept.r number of the Proceedings of the Physical Society (Abstracts). Wilson called my attention to it, and it seems excellent. I have not got the "Zeitschrift für" &c. here, but perhaps you can look at it. If so, you might find out the town in which the inventors live, and to that I might write.

Fancy a deflection of 60 mm
from .01 of a volt!
No star could escape this.

4. I want to have your opinion on the
following point:
we everywhere find the
$= 0$.



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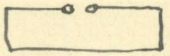
$$CI\frac{d^2V}{dt^2} + CR\frac{dV}{dt} + V = 0$$

for the diff. of pot. of the ends of a circuit
of resistance R, capacity C, self-induction I,
which is being rapidly discharged. This is
applied to a Leyden jar, in all gravity, as if
the two poles, A, B, of the machine are brought
into contact when the oscillations begin.
I maintain that since the discharge takes place
long before B is brought into contact with A,
our circuit is not the jar and the wire, but
jar, wire, and air-gap AB; and that R
is resistance wire + resistance of air-gap;
and that therefore all conclusions about the
oscillatory or continuous nature of the discharge
(not depending on whether $R \gtrless 2\sqrt{\frac{I}{C}}$)
are utterly vain, since the resistance of the
air-gap is at once very great (enormous) and unknown.
All writers calmly ignore this fact, but it is a difficulty
with me.

M. Poincaré strikes me as singularly inaccurate.
See his Oscillations Electriques, p. 35, where in the values of
β and γ he turns things upside down. He, too, says nothing
about the air-gap part of the resistance and the air-gap
part of the energy of the discharge.
See also his page 45, where he gives a most extraordinary
expression for the coeffᵗ of self-induction of
a rectangular circuit,  depending on its
total length alone, and not on the breadth, b, of
the rectangle. This is repeated throughout the book.
Can it possibly be right?
The coeffᵗ of self-indᵒⁿ of a rectangular current
can be very easily found with absolute accuracy.

I hope to see you at Christmas. That Gorman
Electrometer would be a treasure at Daramona.
I suppose that you will be over on the 30th?

Much love.

M.

It occurs to me that we may say with regard to the Leyden Jar
that the above equation applies merely to the surgings that take
place in the circuit (not including air-gap) after the first spark
has passed; but this is not very satisfactory.