Sloane Street S.W.

26/44

June 1st

My dear Fitzgerald

Many, many thanks for all your letters which have lain on my table staring, imploring, demanding an answer.

When at Boulogne the whole explanation of the action of contact electricity was trying to shape itself in my head; the jelly is now ready & I will turn it out of the mould, hoping it may not break while being dished.

Maxwell may be quite right about

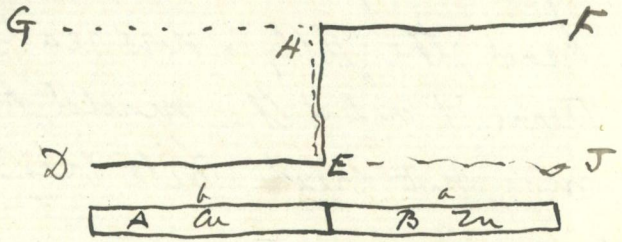
for points inside the plates due to contact action is G H J. A point inside the zinc is then really at the potential of a point inside the copper. Hence no heat is generated when a current flows across the junction since the potential of the electricity in crossing the junction is neither raised ~~now~~ nor lowered. (I have of course intentionally here disregarded the very small real Peltier effect).

There is then an E.M.F of contact between Zn & Cu of 0·75 Volts but the particles in the zinc are at the same potential as the particles in the copper.

We have succeeded in measuring the index of refraction of ebonite with the eye only, using a bright electric light result same as before about.

Sincerely yours W. E. Ayrton

the Peltier effect in his Elect. &
May and yet his letter in the Elect-
rician is wrong & at any rate has
been wrongly interpreted. It has been
assumed that because practically
no heat is developed when a current
flows across Zn & Cu there can be
no E.M.F of contact such as 0.75 Volts
now this is wrong for this reason
Let A and B be the Cu and Zn



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then inductive experiments, Volta's
Thermo couple, ours &c. shows that the
plates behave as if Zn had a super-
-ficial + charge and Cu a superfici-
-al − charge ~~equal~~ of such a kind
that the diff. of pot. between a point
a and a point b was 0.75 Volts.
That they have such charges I be-
-lieve to be a fact. But why do these
charges exist? — to neutralise of
course the E.M.F of contact between
Zn and Cu which tends to drive +
electricity from Cu to Zn. The dis-
-tribution of potential then ~~due~~
due to the surface charges is DEF,
but the distribution of potential