possible.

Tell me the day & hour when you will arrive at Egham. You are due this term. Name the train at once. I shall surely go to Dublin at Easter to fish & play racquets with the Kakopugal II.

Write.

M.

I have some notions for improved Dynamo-Machine. Shall expose them another time

---

10/8

Φ,

I hear from Clark that you want me to write. Very well.

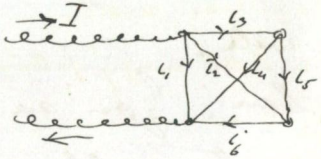
To business, then. You are lecturing. Give your men the problem (see Jenkin's Elect.ty & Magnetism, p. 151, Chap. IX) to find E.M.F in a ⊙r. wire rotating round an axis ⊥r. to lines of magnetic force.

I say that Jenkin is quite wrong in saying, from rule of thumb considerations, that E M F is a max. when (see end of p. 152) circle is crossing the lines of force at right-angles. He leaves out of consideration the factor $ds.\sin\omega$ in the expression

$dE = Hvds.\sin\omega$, where dE = diff. of pot

of extremities of the element ds, H = intensity of magnetic field, ω = angle between ds and direction of H, v = vel. of ds ⊥r to plane of it & H. Of course v is a max. in T's position; but ds/dω is not. I worked it once only (& rapidly) taking any azimuth of wire, and I find that ∫E will require Elliptic fns of 2d. kind.

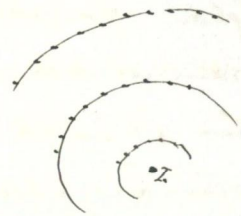
Give Jenn mem this simple problem in Kirchoff's Laws:



Current I from battery meets vertex of a square formed of 4 wires; there are diagonal wires. Find current in each part. I find $i_3 = i_6 = \frac{I}{4}$; the other i's involve $\sqrt{2}$.

Yesterday I tried 16 actinic cells made of blue glass, chloride of silver emulsion & measured both the current (by Galv.) & EMF (with Elect.) Latter unsatisfactory: I found that the cells were not properly insulated. Shall make some more very carefully insulated. The result appeared to be that $EMF = \frac{\text{Daniell}}{300}$; but it is of this, on account of defective insulation.

I then used Galv. & arranged the cells first on a circle of 7 inches radius & measured deflection. Then on a ⊙ of 14 inches, & then on one of 21 inches, radius. The deflection ought to be inversely as the distance from the centre (L) where there is a light (magnesium). So it was, nearly.



Thus, let I_1 = light energy falling on cells at unit distance ∴ $\frac{I_1}{r^2}$ = " " —— —— dist = r.

Now the energy of the current = RI^2 $\left(= \frac{E^2}{R}\right)$

$$\therefore RI^2 = \frac{I_1}{r^2}$$

$$\therefore I \propto \frac{1}{r}.$$

The results agreed fairly well. They will be better with better cells & a flame of bisulphide of carbon. If 2 lights are used $I \propto \frac{\sqrt{2}}{r}$, &c.

Elect. is getting made by a first class man — Groves, who made most of Wheatstone's instruments.

For measurements with Elect. the cells evidently require to be mounted in paraffin boxes & all very carefully insulated. This shall be done as soon as