will have spread to a great distance – call it r. I admit that then the energy ~~of the universe~~ within the sphere radius r round you will not be exactly the same for + e as for – e – if e' were within that sphere I could not deny offhand the existence of the term ee'/r – But if e' be in Sirius or the sun I think I can

Therefore it seems to me that if energy travels with finite velocity the expression ///ee'/r requires some modification

1 Devonsquare
Lincolns Inn
July 16 1885

15/156

Dear Sir

Your letter lay a week at the New University before I happened to get there let that be my excuse for delaying the reply – they forward letters to me from here (Lincolns Inn).

I did not express myself I fear quite clearly, about the whole energy of the universe – I suppose the current e' in Sirius to have existed from time immemorial – and you suddenly create a current e in Hobart – I did not mean

to say (as you seem to have understood me) that the electrical energy of the universe was the same after you start that current as it was before - Surely not, because by starting the current you convert chemical energy into electrical - 15/156

But you can with equal facility (a A / b B) having four wires, connect them thus A a B b or thus A b B a creating in one case the current + u in the coil and in the other - u And what I meant was that the energy of the universe the instant after you do that is just the same whether you do the one or the other

If that be true there as an accurate expression it cannot contain the term uu' -

You will say that I am assuming instantaneous creation of a finite current which is physically impossible. Doubtless in the time within which you can by any known method create one ampere, the disturbances

"capable of accurate scientific
"interpolation" Mathematics
as you say must take
care of themselves and
adapt themselves to the
facts not the facts
to themselves

Yours very truly
H. H. Turbervy

15/156

Suppose disturbances
spreading from a centre
in the sun if you like -
You agree with me that
for any complete wave
from $+\pi$ to $-\pi$ the
effect on me is zero.

We do not by that mean
accurately get rid of the
fractional part of a wave
I make an assumption
like Helmholtz' - I say
~~that you may take as~~
~~values~~ R so great that
within any sphere of (say)
the suns radius ~~beyond~~
~~Mostly outside~~ of R, there
is always as much + as

you may take a radius r so great that within a sphere of radius r there shall be always as much + u as − u −

If then that sphere be removed to a distance from me infinitely great compared with r, it, and all the waves produced by it will always have zero effect on me − So that the effect on me of all the current in space beyond a certain distance may always be neglected − On that assumption $\frac{uu'}{r}$ can do no harm −.

It is as you say a question for experiment whether the effect of starting a current is to produce stationary waves or a single wave propagated outwards

You want to be able to measure the effect in space by some other means than by interposing a conductor & getting an induced current 15/156

I wish I could make any suggestion that would be of any use.

You are quite right to correct me for saying "experiment affording as "a basis for mathematical "reasoning" I ought to have said "equally