

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 $+u$ as for $-u$. If u'
were within that sphere
I could not deny offhand
the existence of the term
 uu' - But if u' be in
Sirius or the sun I
think I can

Therefore it seems to me
that if energy travels with
finite velocity, the
expression $\frac{uu'}{r}$ requires
some modification

1 New Square
Lincoln Inn
July 16 1885

15/156

Dear Sir

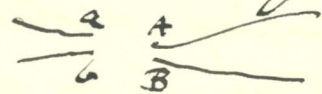
Your letter lay a
week at the New University
before I happened by there.
Let there be my excuse for
delaying the reply - They
forward letters to me from
here (Lincoln Inn).

I did not express myself
I fear quite clearly, about
the whole energy of the
universe - I am supposed
the current u' in Sirius
& have existed from time
immemorial - and you
suddenly create a current u
in Dublin - 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)



having four wires, connect them thus Aa Bb or thus Ab Ba

creating in one case the current + μ in the coil and in the other - μ

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 is an accurate expression ^{the energy} to current contain the term $\mu\mu$.

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 need take
care of themselves and
adapt themselves to the
facts not the facts
to themselves

Yours very truly
S. B. Burbury

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 means
accurately get rid of the
fractional part of a wave

I make an assumption
like Helmholtz' - I say
that ~~you may take as~~
~~radius R so great that~~
within any sphere of (say)
the suns radius lying
~~wholly outside of R~~, there
is always as much $+\pi$

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

If then that sphere be removed
to a distance from us
infinitely great compared
with r , it, and all the
waves produced by it will
always have zero effect on
us - So that the effect
on us of all the currents
in space beyond a certain
distance may always be
neglected - One that
assumption $\frac{u}{r}$ 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 interfering 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 box for mathematical
"reasoning" I ought to
have said "equally