

the fact that it seems
in contradiction with the
equally clear dynamical
conclusion that a vortex
ring can persist in a
perfect incompressible fluid
although the n^o of degrees of
freedom in the fluid is
infinite, & evenly distributed
everywhere throughout it.

Can this be reconciled
with the law?

b. The other alternative
is that nature is not ~~throughout~~
its whole extent, a dynamical
system.

8 Upper Hornsey Rise. N.
1895, May 21 -

Dear George 13/31
I am very much
obliged to you for your
criticisms, especially as
they were written when
you had so little leisure.

Is not however, what
you deal with in your
notes different from what
I am dealing with?

The alleged law of the
distribution of energy is a

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Limit law : what I try to deal with is the stages that precede that limit, the stages that intervene between the introduction of energy from outside & the subsiding of the disarrangement of the law which it occasions, i.e. the period I am considering is a period during which the true limit law, whatever it is, does not yet prevail.

But besides, if the alleged law is 1° true, and 2° applicable, I see no

escape from the inference that a monatomic molecule is either an uncompounded point or a smooth rigid sphere - yet all Chemistry & much of Physics seem to disprove this.

Is there any escape from this inference?

The alternatives seem to me to be

a. That the law is not universally true. And I do not know that this may not be the case, having regard to

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Even under the Boltzmann
Maxwell suppositions
^{smooth rigid} two hard spheres when they
impinge on one another, may
run together like drops
of water - & so become a
diatomic molecule with only
three degrees of freedom!

This is quite as likely a
supposition as that they stick to
one another at a point, and
become a rigid solid of revolution,
with five degrees of freedom. Both
in fact border on being absurd.

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right in thinking it to
be a known exception.

Also if you wd tell
me whether I am right in
supposing that rotational
& inrotational motions cannot
exchange energy with one
another.

What should I do, if
I had not you to set
me right!

Your aff^{ate} - Uncle

G. Johnston & Tracy.

Have you any idea when you
may be coming to London?

Turn
over

exciting a swarm of
hornets. If the law is
However, ^{both} true & applicable
the law may be, nature
nevertheless has no occasion
to obey it 'in carrying on
much of her work, since
much, perhaps most, of her
work is carried on in stages
that are not the final stages.

Can the continued
existence of a vortex ring
be reconciled with the
law? I sh^d. be very much
obliged to you if you wd
let me know whether I am
right in

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system. And I hardly
think anyone can be
quite sure that it is,
having regard to some
biological facts & having
regard to the indissoluble
connection between human
thought and its physical
adjunct going on in the
brain. Possibly to these
we ought to add the case
of chemical atoms.

But however this may
be, what I wished to
point out was that stages

earlier than the final distribution of energy, are what we often, and indeed I think most commonly, come across in ~~de~~ dealing with nature.

By events being 'more or less isolated' I meant more or less sluggish in imparting their surplus energy, when they have any, to events about them — more isolated when the time they take in doing

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so seems considerable to man, less isolated when it seems short to us, though still long when measured by the rapidity of molecular changes. I suppose rotational motion in a perfect fluid to be absolutely isolated.

Am I right in supposing so?

I hoped by confining myself to facts and inferences from facts, and by not mentioning the Boltzmann-Maxwell law, to avoid