

work done by the forces of combination, it certainly must have transformed itself finally into heat.

* Is it doing this at every step in the process?
I feel certain that the Clarendon Press would adopt such a work as I have mentioned.

By this time you must have got the first proof of my preface, & I hope that you consider Tallett's fraud discoveries adequately acknowledged.

Some one said that Williamson is writing a "Dynamier". Well, there may be room for such a work of the ordinary sort, but it is quite distinct from that which I propose, & could not compete with it.

* Happy thought: if this is so, a current should be called a "Fugitive Phantom". I think that you have some such notion of Friction - an unfortunate thing which, the very moment it is born, is transformed into something else, as if Nature was instantly ashamed of what she had produced, and with a perpetual blush was for ever hiding it away.

[N.B. This is a scientific play of fancy unrivalled in literature]

By the way, is it safe to go over to Ireland now? I hear some talk of an alliance offensive and defensive between the Irish and the Zulus - much to the disgrace of the latter. Does any one get paid over there now?

I am going to set up a Manufactory of Swords of Honour, but one such house will scarcely be able to meet the demand.



10/19
61, Tolerhill Street,
Bloane Square,
Nov. 25.
Φ,

Your truly great mind has not recently transferred any of its ideas to paper. I have met with one or two points in Fleming Jenkins's ^{book} to which I had desired to call your attention; but I have not brought the book here with me, & I must, therefore, deprive you of an increase of knowledge for a season.

I am almost determined to go over to Dublin on the 18th or 19th Dec. & see you about the long deferred work.

A more definite idea occurred to me within the last few days, & the time, apparently lost, is all the better spent in mature reflection. My idea is to produce a work on an entirely new

plan and to revolutionize the study of Dynamics. The title which best describes the treatise I have in view is "The Correlation of the Forms of Energy". After preliminary work of the usual sort, cut down to very moderate dimensions, there should come separate chapters with the following heads: —

The Thermal Equivalent, The Electro-Chemical Equivalent, The Magneto-Electric Equivalent, The Actinic Equivalent.

Under the first of these would come the principles of Heat and the dynamics of Heat Engines. Its basis is Joule's Equivalent.

The basis of the second should be the determination of either the heat evolved or the work done in the combination of a definite weight of Zinc with Sulphuric Acid.

The last would be a difficult determination. How should it be made? By measuring the amount of a silver salt reduced in an Actinic Cell by light?

Again, would it be advisable to define and adopt as the common type and basis of all forms of Energy a thermal form or a mechanical form (such as a foot-pound or

an erg)? This is a minor or merely logical matter, however. I am certain that this idea would be a great success, and I should not be at all surprised if Thomson & Fair had some such thing in view for their Vol II — if it even appears. They probably will go to work on a most ponderous scale.

I have lately got a book describing all the Dynamo Machines — "Electric Lighting", by Dr. Paget Higgs. It is useful, but clumsy, badly expressed, and unscientific. I shall take it over to Dublin. 10/19

A fundam^l. question: Take a Grove Cell, circuit closed, current flowing, zinc consumed, &c. Apply the Equation of Energy. Work done by internal forces of system = Energy generated. Is the current itself part of this energy? If so, the current must consist of motion of material particles. Part of the energy is, doubtless, to be found as heat, wh. goes out of the system (Cell), but is conserved. Consider the cell as used up. Current completely stopped. Hence if the current was ever a part of the energy equivalent of the