XXIII. Note to "Electrical vibrations and the constitution of the atom"

Lord Rayleigh

To cite this article: Lord Rayleigh (1906) XXIII. Note to "Electrical vibrations and the constitution of the atom", *Philosophical Magazine Series 6*, 11:62, 292-292, DOI: [10.1080/14786440609463445](https://doi.org/10.1080/14786440609463445)

To link to this article: <http://dx.doi.org/10.1080/14786440609463445>

Published online: 16 Apr 2009.

Submit your article to this journal [↗](#)

Article views: 4

View related articles [↗](#)

XXIII. *Note to "Electrical Vibrations and the Constitution of the Atom."* By Lord RAYLEIGH*.

I FIND that the remark (p. 121) that solutions such as (12), (15), (19), involving a factor e^{+r} "cannot apply to a problem where the disturbance is supposed to originate in the neighbourhood of the sphere" needs qualification. That the solutions *as they stand* cannot be so applied may be admitted; but Profs. Lamb† and Love‡ have shown how by limiting them suitably they may be made to express the advance of waves into a region previously undisturbed. This is a matter of some importance, and I regret that I overlooked the memoirs just cited, in which clear explanations are given.

XXIV. *The Heating Effects produced by Röntgen Rays in different Metals, and their Relation to the Question of Change in the Atom.* By H. A. BUMSTEAD, Ph.D., Asst. Professor of Physics, Yale University§.

THE study of the phenomena of radioactivity during the past five or six years, and, in particular, the brilliant series of experiments and deductions which we owe to Rutherford, have left little room for doubt that a certain proportion of the atoms of radioactive elements are continually breaking up, and that the constant emission of energy by these bodies is a result of this atomic disintegration. This process in any given radioactive body appears to be going on at a fixed and definite rate which is characteristic of the particular substance studied and which is quite uninfluenced by any external circumstances whatever. Although radioactive substances have been subjected to the greatest extremes of temperature available in the laboratory, and to great variations in other physical and chemical conditions, no certain results have been obtained (so far as the writer is aware) which point to any corresponding change in the rate of decay of the substance. In fact the process of atomic disintegration has appeared to be quite beyond human control||.

* Communicated by the Author.

† Proc. Lond. Math. Soc. vol. xxxii. p. 208 (1900).

‡ Proc. Lond. Math. Soc. vol. ii. p. 88 (1904)

§ Communicated by Prof. J. J. Thomson, F.R.S.

|| The apparent change (due to high temperature) in the rate of decay of radium-excited activity, discovered by Curie and Danne, has been shown to be due to the fact that the successive products of radium volatilize at different temperatures. Cf. Bronson, Am. Jour. Sci. July 1905.