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The special and general relativity theories, mainly formulated by the famous physicist Albert Einstein and the quantum theory devised by Max Planck, Niels Bohr and others, have gained such prominence in modern physics that nobody dares challenge them. However, these theories must be challenged, if found incompatible with one another or inconsistent with observations. This is the task taken up by Engr. Musa Abdullahi in this book of nine chapters for which I readily write the foreword.

In physics, we now deal in three systems of electrodynamics. There is classical electrodynamics for electrically charged particles moving at very small speeds compared to that of light, relativistic electrodynamics for particles moving at speeds near that of light and quantum electrodynamics for atomic particles moving at very high speeds. The author is of the view that there should be one consistent system of electrodynamics applicable to all particles up to the speed of light.

The author introduced a new system of electrodynamics, which he called ***radiational electrodynamics***, where a charged particle, like an electron, moving in an electrostatic field, radiates energy. A moving electron is subjected to *aberration of electric field*, due to an electrostatic force being propagated at the speed of light. The author showed that the force exerted by an electrostatic field, on a moving electron, depends on the magnitude (speed) and direction of its velocity. The electron is accelerated to the speed of light as maximum. Using Newton's second law of motion and extending Coulomb's law of electrostatics to a moving charged particle, he showed that an electron could be accelerated to the speed light with constant mass, contrary to relativistic electrodynamics.

The author is also of the view that *aberration of electric field* is the missing link in classical and relativistic electrodynamics. He contended that Larmor formula was an erroneous expression for radiation power, which misled physics to the Bohr's quantum theory of the hydrogen atom.

The author rejected the idea of constancy of the speed of light and accepted the Galilean-Newtonian relativity where the speed of light is a constant relative to the source only but, relative to an observer, the speed depends on motions of the observer and the source. On this basis, he derived an expression for the speed of light in a moving medium and gave a non-relativistic explanation of the result of Fizeau's experiment.

The introduction of two stable models of the hydrogen atom, a non nuclear one for the gaseous state and a nuclear one for the solid or liquid state, without recourse to quantum mechanics, is very interesting. Both models give rise to emission of radiation of discrete frequencies, as given by the Balmer-Rydberg formula, in accordance with observations.

The author derived the formula, $E = ½m(c^2 + v^2)$, as the total energy of a body of mass m moving with speed v, where $m = m_o$ the rest mass, is independent of speed. The simplicity of derivation of this equation, from basic electrical principles, compared to the relativistic formula $E = mc^2$ (where mass increases with speed as $m = \gamma m_o$), is a significant result.

A notable result is found in the non-relativistic rationalization of the apparent increase of the mass of an electron with its speed. The author showed that the expression for the radius of circular revolution of an electron, round a positively charged nucleus is γr_o, the same in relativistic electrodynamics and in *radiational electrodynamics*. This is larger than the radius r_o obtained in accordance with classical electrodynamics. He suggested that the increase in radius with speed, becoming infinitely large at the speed of light, which has the same effect as apparent increase of mass with speed, was misconstrued as increase of mass with speed.

A remarkable development is the unification of Coulomb's law of electrostatics with Newton's universal law of gravitation. The electrostatic forces of repulsion and attraction between the masses of two bodies, each containing an equal number of positive and negative electric charges, cancel out exactly. The gravitational forces, being proportional to the product of square of the charges, remain positive and attractive.

If the author's formula for radiation power; the unification of electrostatic and gravitational forces; the non-relativistic explanations of the results of Fizeau's, Roger's and Bertozzi's experiments; the rationalization of apparent increase of mass of a particle with its speed and the clarification for the origin of inertia of a body are proved to be correct, it would amount to a great scientific breakthrough.

I am pleased with this book titled, *"Electrodynamics for a particle accelerated to the speed of light with constant mass"*. It makes stimulating reading and provides good materials for teaching physics. I commend the author for providing some food for thought and recommend the new electrodynamics for study, critiquing and testing by physicists.

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