ble conditions subject to the smallest number of variations, and hence the steady states of these atoms and the matter composed of them are obviously the first to be treated."

One of the chief of those phenomena in the thought of the writer of the preceding paragraph is gravitation. No phenomenon is more constantly and forcibly impressed upon all creatures that inhabit the earth than gravitation. They are aware of this force at every step, sometimes painfully so. The law of gravitation, first used by astronomers, is the simplest of the known laws of nature. It seems for this very reason that the force of gravity should be the very first to receive a theoretical explanation, because its law is the simplest, and because the inverse second power of the distance only (no higher powers) is required for its enunciation.

And yet, in spite of this, attempts at that time to bring gravitation into the realm of electrodynamics were abject failures, so much so that the able physicist, Sir A. S. Eddington, in 1918 wrote as his opinion, "gravitation is outside the electromagnetic scheme." The common opinion was that gravitation was a thing apart having no connection with electrical phenomena.

Another motive for the study of the Lorentz theory was to test its accuracy by comparing deductions from it with observation.

The Lorentz Theory Untenable

Three important deductions were brought to light in that paper, any one of which makes the equation and theory untenable.

First point. Suppose the first electron e_1 is still moving when the second electron e_2 is brought to a standstill, that is, when both the velocity beta sub-two and the acceleration f_2 are made equal to zero. This substitution in the magnetic vector H (3) reduces it to zero, and reduces the electric vector E to $e_2 R^{-2}$. With these values of E and H the force (1) becomes merely the electrostatic force

$$F = e_1 e_2 R^{-2}$$

and yet the first electron e_1 may be moving in any prescribed manner. This prediction from his theory cannot be the prediction of a truth. The force upon an electron is always a function of its own velocity as well as of the velocity of the second electron.

This analysis points to error in the original force-equation (1). Because the velocity q_1 does not appear in the expressions for E and H (equations (2) and (3)) its only opportunity for entering the force-equation is through the term

$$q_1 \times H$$

but in the case supposed H = 0, so F is independent of the velocity of the first charge upon which the force is expressed.