

Short demonstration of the energy concept $E = (mv)c$ as a desideratum of microphysics.*

By Ed Dellian, Berlin. E.Mail: e.Dellian@t-online.de

Since interpretational questions in quantum mechanics (QM) mostly arise from its presupposed formalism, an attempt to eliminate some contradictions of QM is started on a critical reinterpretation of its basic principles and concepts (as has been strongly claimed by Sir Karl R. Popper since 1983), concerning the notion of energy and its relation to momentum. Taking up an early hint of Erwin Schrödinger (letter to Max Planck, May 31, 1926), the inadequacy of the classical concept of kinetic energy with the $E = hv$ of QM is shown by demonstrating that QM tacitly implicates and requires an energy concept of motion expressed by $E = (mv)c$. Though it has already appeared in Albert Einstein's nonrelativistic proof of $E = mc^2$, the properties of this notion have not yet been investigated. The most elucidating one seems to be due to the obvious *proportionality* of energy and momentum (connected by the factor c), an analogy that can easily be revealed as the substructure not only of the current photon theory, but also of the Heisenberg indeterminacy relations. Turning over to a philosophical interpretation, the concept $E = (mv)c$ is proved to be the mathematical expression of the law of cause and effect. From its connection with most recent developments of research on Isaac Newton's natural philosophy that have proved an identical quantification of Newton's *force of inertia* ("materiae vis insita"), it is inferred that the concept presented here should express the energy of matter waves as identical with the Newtonian innate force of matter that accompanies uniform straight-lined material motion as its immaterial cause of physical reality, thus corroborating the realistic view of QM held by for instance Planck, Einstein, Schrödinger and deBroglie.

(*Copies of the 1987 poster can be ordered from the author).
