

# Logic Examination and Arrangement upon the Classical Mechanics and the Foundation of Natural Science

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## Explanation

In principle, this booklet is strictly restricted within a special discourse universe dealing with a series of most basic concepts about the foundation of natural science system, which had appeared before the relativity theory created by Einstein, or within the definite domain of the generally called classical mechanics. In this book, five propositions are discussed. And, completely opposite the ideological trend of axiomatism broken in 20<sup>th</sup> century, both the logic consistence principle and material first principle serve as the unique criterion to judge the true and false of every science statement. The propositions are as: to negate the principle of relative motion and reestablish the objective significance of material movement; to negate the illegal idea about initial system and resupply the second Newtonian law with a brand new definition or interpretation; to re-explain Lorentz's transformation and demonstrate why it obtains some empirical verification; to make the falsification on the universal significance of conservation laws and reveal their real origin in physics; to provide a rational interpretation for Michelson-Morley experiment; to change the customary idea that takes the light speed invariance principle as an axiomatic assumption so as presupposed ever by Einstein, point out that it is no more than a necessary inference of the universal principle of the speed of every material wave and supply the principle with a much more complete description [1].

This book may be read by researchers, teachers and undergraduates in the area of fundamental mathematics, theoretical physics and scientific philosophy.

*While research workers exert themselves to extend the boundary of science, other scientists are more anxious to ascertain whether the scaffolding is really solid, and whether their more and more daring and complex edifices do not risk giving way. Now the task of the later, which is neither less important nor less lofty than that of discovery, necessarily implies a return to the past. This critical works is essentially of an historical nature. While it helps to make the whole fabric of science more coherent and more rigorous, at the same time it brings to light all the accidental and conventional parts of it, and so it opens new horizons to discoverer's mind. If that work were not done, science would soon degenerate into a system of prejudices; its principle would become metaphysical axioms, dogmas, a new kind of revelation.*

*..... Alas, the exclusive worship of positive facts makes some scientists sink into the worst kind of metaphysics – scientific idolatry.*

*Fortunately, it happens at certain periods of evolution that resounding and paradoxical discoveries make an inventory and a thorough survey of our knowledge more obviously necessary to everybody. We are fortunate enough to be living at one of these critical and most interesting periods.*

## Steadfastly Adhering to Two Basic Scientific Principles: Logic Consistence Principle and Material First Principle

The author itself does not remember how many times in different cases to directly quote the same words said by Sarton, which is published in the title page in this book. It might be said that Sarton

was one of a very few researchers living in 20<sup>th</sup> century who could keep with a relatively clear head to still persist in a kind of belief of scientific idealism, while the whole human meeting an unprecedented shock or disaster that only originated from the ideological trend of axiomatism [2]. Once the axiomatic thinking orientation, namely a kind of new conventionalism that even was contemptuously disregarded by the medieval scholastics though is dressed with a modern language, universally accepted, it can only mean both the logic and empirical fact basis that originally are indispensable to every real scientific statement will completely vanish, while the what used to replace both of them would be the some highest subjective will that only originate from some researcher individual. In that case, all things appearing in the science activity could not but be as same as said by Kuhn, who was the creator of a so-called theory of scientific paradigm, the generally said science would be nothing but a set of ideas that were commonly held by a small group named as a scientific community [3]. Of course, if such a theory were really accepted by all of us, the uniquely things we permissibly do would lie in making an apparent distinction between a few great geniuses and the numerous living beings, where there would be no position for us to be allowed to make any discussion except the absolute obedience.

However, any theocracy and superstition will not last long. And, what the human science really needs would never be the storm for us to set off a revolution and another revolution in science but only lie in retaking the logic criticism and logic analysis weapon, which has been frankly abandoned by these scholars pursuing axiomatism, to make a historical and global clarification and arrangement on all the most elementary concepts that may appear since the birth of Newtonian mechanics [4,5].

Within all the propositions we will discuss in this book, it might be endowed with a primary and fundamental significance for us to reconfirm the objective connotation of any form of mater movement. Both the movement of material and the material in movement would be a dialectical unity. Since human always impossibly exhaust all the realities presented in the material world, it must be unavoidable for us to first complete an idealized construction on the material we want to know and describe, and, just based upon which, for a proper formal expression system to may further be successfully constructed, so as rightly said ever by Brouwer. We should know the idealized construction, which must be indispensable to any significant scientific

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Received May 10, 2017; Accepted May 30, 2017; Published June 05, 2017

Citation: Benluo Y (2017) Logic Examination and Arrangement upon the Classical Mechanics and the Foundation of Natural Science. J Phys Math 8: 231. doi: 10.4172/2090-0902.1000231

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statement and still need the necessary support of the relative empirical facts that only logically originate from the definite material object, to never mean the completely freely artificial fabrication only based upon some pure subjective idea, so as advocated noisily by D. Hilbert. Well known, in the great debate over the whole last century about the philosophical foundation of mathematics, as the leader of the intuitionism, Brouwer has been publically called as the deadly enemy of Hilbert, who was a leading figure of the axiomatism that has been all the rage and occupied the predominance up till now in the modern science world. Then, if a particular material object we discuss really exists in a kind of idealized meaning, the movement only logically belonging to the material object must be objective in same the level. Otherwise, so especially emphasized by the contemporary scientific mainstream society, material movement as well as all the kinematic quantities did not have any certain objective meaning, all the scientific statements would correspondingly loose their objective significances and existing values.

The development of natural science as well as all the useful knowledge systems must present the character to connect link between the preceding and following. Then, though the irrational and stupid negation against the objectivity of material movement was the thing that only took place in the initial of 20<sup>th</sup> century, the root of all the troubles met by all the successive researchers was just planted in the beginning of the birth of the classical Newtonian mechanics. In that very year, as the strongest competitor of Newton for the first right to create infinitesimal calculus, Leibniz ever was keen to challenge the concept about the absolute space supposed by Newton and pointed out that it must be irrational in philosophy to construct a space without any support from some special material. One and half centuries later, Mach once more launched the impact against the Newtonian mechanics, while which just being very influential on the occasion, and eloquently revealed the contradictions caused by the abnormal existence of infinite inertial systems. And, until nowadays, in the Physical Encyclopedia published by McGraw-Hill Press, a relative item clearly and exactly told us that Newton seemed not to know own second law wrong while that was defined as a law in logic. All these criticisms are without doubt reasonable, even though all the critics still impossibly reasonably answered the enquiries supposed by themselves. Nevertheless, provided these enquiries really exist, we must squarely face up to and successfully solve all of these most elementary propositions. And, it is the context of the second part in this book.

In this part, the generally called Newton's second law is firstly modified as a positive formal definition about a force acted on a certain mass point. It might be regarded as an effective definition human first supply for the imagined force and just coincide with the relative comment in the above-mentioned Physical Encyclopedia. However, in logic, it is unnecessary and even impermissible for the definition to only be strictly restricted within the inertial system fabricated initially by Newton. Or, just when defined in a positive physical expression space that is only extended from another certain material reality called as the body supplying the formally described force, the reconstructed formal definition will possibly be complete in logic. And, just for such a necessary modification, the formal definition of force will be independent of the kinematic state of the called reference system. Consequently, the famous d'Alembert's principle, which wishes to be used to arrange the problems presented in the non-inertial reference system at accelerating and, in essential, could not but be regarded as a pure metaphysics and certainly full of contradictions, will naturally

disappear and be replaced by the successfully modified Newton's second law.

A concept about the relative movement might be natural, ingrained or easier accepted in the public observation and intuition. But, the thing for the countless observational representations about relative movements, which must vary along with the change of the infinite reference systems we can choose, to be risen as a kind of universal basic principle only happened in the initial of the last century. If the words were real, the movement made by a certain subject mater would loose the objective significance necessary to every effective science statement. Further speaking, the so-called classical relativity principle, which was initially supposed only as a scenario description by Galileo, would not be right, and all the phenomena described by the description are only as some qualified physical realities. Then, if the necessary primary conditions disregarded, these old and interesting descriptions will become as fallacies. As for the formal transformation constructed by Lorentz, the finish of which benefited from the help of Poincare, is no more than a general and approximate description under some primary restrictions so as said by both the creators themselves. Why must we make an only finitely real and conditionally exiting empirical statement to be intentionally degenerated as another a rigid and too rough metaphysics according to the guide of a superficial and stupid axiomatism? The method to try to avoid the real existence of a series of contradictions, which people maybe cannot overcome for the time being, just by through any axiomatic assumptions must be a pure self-deception. All the problems about the so-called relativity principle are discussed in the third part.

In the fourth part, as a natural subsequence, the proposition dealing with conservation laws are discussed. Well known, from the initial of 20<sup>th</sup> century, forms of conservation laws as well as the corresponding symmetry laws, which might be regarded some type of development of the above-mentioned relativity principle, so as pointed or emphasized by the so-called Noether's lemma in 1915, began to suddenly appear before people. However, so as openly announced by Tsung-Dao Lee in a large public gathering hold in Beijing in the initial of this century, the forms of asymmetry appearing in the exiting-in-itself material world are absolute and perpetual while the symmetries presented in physics books just relative and conditionally existing. Besides, the familiar momentum conservation can only exist in the bodies that have own masses and space positions while the momentum moment conservation can only exist in the bodies that have own masses and certain geometry configurations. Mass point or set constructed by discrete mass points does not have own configuration and, consequently, is far from talking about their momentum moments. According to the same reason, it must be irrational in logic to discuss momentum and momentum moment of an electromagnetic field so as usually did by us. But, greatly differing from these conservation laws, the energy conservation law would be endowed with a special meaning. Or, than the energy conservation law is called as a universal empirical result, rather we more reasonably regard it as an unite artificial identification that is only used to logically connect all the different forms of physical quantities belonging to different material existing. And, just for it, we might reasonably say the energy conservation law to must be universal.

In the last part, namely the fifth part, the proposition about Michelson-Morley experiment, which ever excited the birth of the relativity theory that could only be regarded as an axiomatic system, will be systematically restudied. In appearance, the proposition should be closed into the domain of electromagnetic theory. But, the

discussion does not deal with any detailed calculation about either the electromagnetic field or any wave presented in the field, but only logically rely on how we can choose a proper kinematic reference system. So, in essential, the proposition how to rationally recognize Michelson-Morley experiment should be regarded as a most basic task we cannot avoid and may be subsumed into the domain of classical mechanics or the foundation of whole natural science system.

And, in the final, a point worth emphasizing would lie in such a basic idea about the science view throughout the whole book that is: the generally called material first principle is never as an empty slogan but only as a necessary conversion of the logic consistence principle, so as had been wisely pointed out by Aristotle as early as two thousand and five hundred years ago.

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**Citation:** Benluo Y (2017) Logic Examination and Arrangement upon the Classical Mechanics and the Foundation of Natural Science. J Phys Math 8: 231. doi: [10.4172/2090-0902.1000231](https://doi.org/10.4172/2090-0902.1000231)

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