The Triple Dialectical Relation of Engels' Theory of Motion

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Abstract: As the core category of Engels' Dialectics of Nature, motion runs through the whole research process in Dialectics of Nature. Engles criticized the view of mechanical motion theory in research of natural science, studied and discussed the dialectical relationship between motion and matter, the dialectical relation between attraction and exclusion of the basic form of motion, and the dialectical relationship between motion and equilibrium. In the study of the triple dialectical relationship of motion, Engels systematically interpreted that motion is the way of existence and the inherent attribute of matter, and neither matter without motion nor motion without matter exists, the basic forms of all motion are attraction and repulsion, and it is impossible to attract without repulsion or repulsion without attraction, and all equilibrium is only relative and temporary, and equilibrium and motion are inseparable. Therefore, Engels elaborated the dialectics of materialism motion view, and further demonstrated the importance of dialectical thinking to natural science research, which has important theoretical guiding significance to today's natural science and social science research.

1. Introduction

"Together with Marx, Engels is a great craftsman of dialectics of materialism and one of the founders of dialectics of materialism". In the process of motion research, Engels based on two central purposes: one is materialism and the other is dialectics. Engels first put forward the basic idea of dialectics of nature in his letter to Marx on May 30, 1873, "The object of natural science is the matter in motion.…Therefore, the discussion of these different forms of motion is the main content of natural science." Engels studied the motion systematically and formed the dialectical materialism motion view. In Dialectics of Nature, Engels summarized the basic forms of motion by studying various forms of motion in natural science. He scientifically explained that motion is the existence and inherent attribute of matter,all motion is the interaction of attraction and exclusion, equilibrium and motion are inseparable,and deeply revealed the triple dialectical between motion and matter, attraction and exclusion, motion and equilibrium.The dialectical materialism motion view has been proved in a series of studies.

2. The Dialectical Relationship between Motion and Matter: Motion is the Existing Form and the Inherent Attribute of Matter, and the Interaction of Matter is Motion

For Engels, Hegel was a thinker with 'the greatest genius'. "What Engels wants to do is to establish a comprehensive and systematic materialism like Hegel's system".His Dialectics of Nature emphasizes that the research object of natural science is material, and dialectically explains the relationship between matter and motion. Firstly, he clarified: "Dialectics of Natural Science: the object is moving matter." The object position of matter in motion in Dialectics of nature is determined. Secondly, he scientifically explained the dialectical relationship between motion and matter: the properties of matter are revealed through motion, "Without motion, matter is unimaginable." Thirdly, various forms of motion studied by the properties of matter can draw an important conclusion: "The properties of moving matter are derived from the forms of motion."

The object of Engels' research is "The whole nature constitutes a system,that is,and the sum of all kinds of matter". Matter here refers to "The existence of all matter". These matter interacts, and the interaction is motion. Engels explained the definition of the concept of matter from the

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perspective of dialectics. He defined the concept of substance with motion, revealed the essence of substance, revealed the dialectical nature of substance, and defined the concept of matter from the material form of the matter attributes and the matter nature of the form of motion.Engels studied motion from the perspective of mechanics, physics and chemistry, proved that motion covers all transformations and processes in the universe, which was understood as the existence mode and inherent property of matter from the perspective of dialectics. Correspondingly,Engels defined the concept of matter from the perspective of dialectics, believing that "Motion is the form of matter existence and the inherent attribute of matter".

Matter is matter in motion, and motion is motion of matter.The central research task of Engels is to reveal the dialectics of nature and the dialectics of natural science. Matter and motion are inseparable, motion is the way of existence of matter. Matter without motion is as inconceivable as motion without matter. In the process of research, motion and matter may be separated temporarily.When we study the problem, we need to study the two aspects of matter (matter form) and motion (motion form), to select the necessary aspects, and to study them pertinently, conditionally and relatively.In the study of molecules, atoms, electrons, protons, neutrons, and other specific forms of matter,Engels didn't study from motion, but from matter under specific conditions. The separation of matter and motion is relative, but unity is absolute. That is to say, the relationship between the matter form and the motion form is exactly the concrete expression of the relationship between matter and motion. The separate investigation of matter and motion is only relative, and "motion and matter are an inseparable unity".

Matter itself can only be truly understood through motion, and the attributes of matter can only be displayed in motion. Only through motion can we truly understand the form and type of matter and the attributes of matter.To know motion and the form of motion is to know matter. "Motion, …, covers all the changes and processes in the universe, from simple position change to thinking." Engels defined the concept of matter from different concrete forms and forms of matter and motion, criticizing the motion view of mechanism. In order to fully study motion,the nature of the matter carrier can not be ignored.While simply studying the mechanical motion, matter can be regarded as a particle without considering the different attributes of the matter carrier. For example, when we study the fall of an object, we can regard it as the fall of a particle without considering the difference ofthe matter carriers of the object. But this kind of simple investigation is only the mechanical motion, which has conditions and scope. If we want to deeply study the causes caused by mechanical motion, we must consider the properties of the matter carrier. Engels studied the motion through the way, which combines a variety of motion forms with matter itself. He closely linked motion and matter and studied them together. Whether it is the relationship between matter and motion, or the relationship between matter form and motion form, whether it is the study of matter attributes through motion form, or the study of matter attributes through matter form, the conclusion is the same, thus it is the study of material properties through motion.

3. On the Dialectical Relationship of the Basic Forms of Motion:the Motion is That Attraction and Repulsion Interact and the Sum of Attraction Equals the Sum of Repulsion.

Engels affirmed Hegel's assertions about attraction and repulsion.He criticized the mechanical theory of gravity,arguing that "Wherever there is attraction,it must be supplemented by repulsion." Hegel's assertion that "The essence of matter is attraction and repulsion"was absolutely correct. In the process of studying motion, Engels reached the scientific conclusion that "All motion lies in the interaction of attraction and repulsion." The simple forms of motion are attraction and repulsion, which belong to the dialectics, the fundamental aspect of the unity of opposites. Different from Hegel, Engels studied the attributes and nature of motion through the basic form of motion, and the basic form of motion is attraction and repulsion. Attraction and repulsion are dialectical unity, which are fully proving the dialecticals view of motion. First, he proved that both attraction and repulsion are dialectically unified in the matter itself from the perspective of materialism. Secondly, it is proved that attraction and repulsion exist in all motion from the perspective of the essence of

motion. Thirdly, he proved the conservation law in natural science from the perspective of dialectics that the sum of all attraction in the universe is equal to the sum of all repulsion.

Engels understood the essence of matter from the dialectics. The essence of matter is attraction and repulsion, and the essence of matter is the unity of opposites, which is the dialectical essence of matter. In the process of further studying the nature of motion, Engels closely combined the basic form of motion, the essence of matter and the meaning of attraction and repulsion, then proved materialistic dialectics from the methodology. Engels' dalectics of nature takes revealing the dialectical development of nature as the primary task of his research, and studies various forms of motion through the achievements of natural science. To further understand motion by studying motion forms. To define the nature of motion by studying motion. By studying the motion forms of mechanics, physics and chemistry, it is concluded that "The basic forms of all motion are approach and separation, contraction and expansion -- in a word, the ancient polar opposites of attraction and repulsion". By studying the motion forms of mechanics, physics and chemistry, it is concluded that "The basic forms of all motion are approach and separation, contraction and expansion -- in a word, the ancient polar opposites of attraction and repulsion". The basic forms of motion -- attraction and repulsion illustrate the nature of matter as attraction and repulsion . Finally, the conclusion is drawn that the essence of matter is attraction and repulsion, and motion is the existence mode and inherent attributes of matter.

Motion itself is the interaction of two objects, attraction or repulsion, then all motion is the nature of motion --interaction between attraction and repulsion, that is, all motion exists in the interaction of attraction and repulsion. Matter dialectics' characteristics and the root of matter attributes -- motion,are unified, especially for the essence of motion itself is dialectical, the interaction of attraction and repulsion of the matter essence and the essence of dialectics -- the unity of opposites are the same. Besides, as two basic motion forms revealing the matter performance of attraction and repulsion of the essence: in essence, there is a unity of opposites between the forms of attraction and repulsion. As Engels pointed out, the contradiction between attraction and repulsion "Is almost all that the *Course of Philosophy* says about dialectics". Engels regarded attraction and repulsion as a pair of contradictions. Since motion is the way of existence of matter, all motion is the interaction of attraction and repulsion, and the essence of motion is the interaction of opposition and unity, then the essence of matter is attraction and repulsion, and essentially the essence of matter is the unity of opposites. Therefore, the essence of matter, the essence of motion and the essence of dialectics -- the unity of opposites is identical. The concrete representation of motion in the interaction of attraction and repulsion is realized through different forms of motion. Although there are many other forms of motion, they are all different manifestations or dependencies of basic motion of attraction and repulsion.

Engels criticized Helmholtz's mechanistic view that the 'energy' is regarded as repulsion, the 'force' is as regarded as attraction. No matter what kind of motion form, which is from one form into another form, can be regarded as the basic form of motion, which is attraction and repulsion. Attraction and repulsion must exist at the same time, and they must be equal in total. The lower form of motion can be transformed into the higher form of motion, which at the same time produces other forms of motion, and different forms of the same motion are transformed into each other, and the amount of motion in the transformation process is constant. Motion can take place only when each attractive motion is offset by an equivalent repulsive motion in another place, or the gradual overtaking of the motion of one side over the motion of the other will lead to the final cessation of motion. There are two possibilities about motion cessation: repulsion and attraction offset each other, all repulsion occupies one part of matter, all attraction occupies the other part of matter. From the point of view of dialectics these two possibilities do not exist. First, with regard to the question of repulsion and attraction cancelling each other out, the opposite poles must be conditioned on their interaction. The interdependence and connection of the two and their separation and opposition exist at the same time. Therefore, from the view of dialectical, attraction and repulsion can not cancel each other out. Second, it is equally impossible for a form of motion to exist in one part of matter and the other form of motion to exist in the other part of the matter. It is as if a magnet was

split in the middle, so that instead of one block having one pattern of motion and the other having the other pattern of motion, each of the separate magnets would still have two poles.

4. On the Dialectical Relation between Motion and Equilibrium: Motion is Absolute, Equilibrium is Relative, and Equilibrium is Inseparable from Motion

Engels criticized the view of mechanical motion in his study of motion in *Dialectics of Nature*. "His efforts are quite focused on freeing many rigid ideas from the bondage of academic pedanticism". Engels drew the view of matter and the view of motion of dialectical materialism. Engels first determined that "Equilibrium and motion are inseparable", and proved that the motion in equilibrium and the equilibrium in motion (relative). Secondly, he expounded that motion "Can neither be created nor eliminated", while "All equilibriums are only relative and temporary", and proved eternal motion and relative equilibrium by examples. Thirdly, the unifying relationship between motion and equilibrium is demonstrated through the study of the organism. "In the expansion of the significance of dialectics, he increasingly used interdisciplinary scientific methods to replace the critical revolutionary method of human knowledge", Engels uesd a large number of natural science phenomena to explain problems, to proved his viewpoint.

In proving equilibrium and motion are inseparable, it is the first start from the study of simple position changes of celestial bodies. Force uses force to measure the limit by its performance, and causes uses results to measure the limit. One of two subjects can be used as a unit of measure to measure the motion of the other subject, and the measurability of motion gives force its value. When the forces applied to a subject are equal, the subject is in relative equilibrium and its motion stops relatively, but the motion itself does not disappear. While studying the simple process of position change, Engels criticized the theory of mechanical motion. He criticized Wie Grove's view that "Strong inclination to believe that the other attributes of matter are forms of motion or will eventually come down to forms of motion" in *The Interrelations of Physical Forces*. For 'motion,' Wie Grove meant only mechanical motion, that is, motion of position. Engels, on the other hand, believed that mechanical motion was only a lower form of motion. Engels effectively proved the absoluteness of motion and relativity of equilibrium from natural science.

As for the question of equilibrium being relative and temporary, Engles pointed out that the relative equilibrium and the stillness of matter are the essential conditions of matter differentiation. Engels used the motion of molecules in physics to further study motion and equilibrium. In natural science, mechanical motion can be translat into the form of molecular motion .The transformation of motion is completely free due to the motion of the molecule. It seems to be superficially stationary, but, in fact, it is moving in another form. Like heat is converted into electricity in the thermopile and mechanical motion is generated again, this transformation of motion form follows a certain relationship of measurement. A known quantity of one form of motion can be expressed by units of measurement of other forms, and each unit of measurement can be converted to any other kind of measurement. Engels studied and investigated heat, electricity, magnetism, force, energy and work in the fields of astronomy, mechanics, physics and chemistry, and criticized Helmholtz's mechanical motion theory, and then reached the conclusion that motion is immortal and static is only relative. A certain quantity of motion in one form always matches a quantity precisely prescribed of motion in another form. Engels believed that"motion itself, as the essential activity of matter, as the existence form of matter, is immortal, including the aspect of quantity."

Finally, Engels studied motion in living organisms, "such motion results from the continuous equilibrium of the whole organism in the normal period of existence, yet is always in motion, which is the living unity of motion and equilibrium." In the study of the organism, Engels extended the concept of motion and matter to content and form, and the dialectical relationship between matter and motion can also be seen as "The inseparability and unity between content (matter) and form (in this case, motion)". The whole organism is constantly proving the identity of form and content. Every progress in the development of organics is at the same time, a retrogress, which guarantees the development of one aspect, in other words, excludes the possibility of the development of others. Engels put the dialectical relationship between motion and equilibrium into the organism, and

expounded the dialectical view of life, “life means death”. He put this dialectical method into the social history. Motion is absolute, labor also, labor creates the human itself. “Labor is source of all wealth”, it formed the historical concept of materialistic dialectics.

To sum up, Engels from mathematics, mechanics, astronomy, physics, chemistry and biology, in view of criticism of the mechanism and theory of gravity, in close connection with motion and the actual development of nature science, studied the essence of motion through the attributes of motion, and profoundly revealed the triple dialectical relations of motion and equilibrium, attraction and repulsion, and motion and matter, and besides further expounded the view of matter and view of motion of dialectical materialism. This thinking way and research method still have important theoretical significance and practical guiding value today.

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