

New Connotation of Marx's Metabolism Concept under the Background of Information Age [†]

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Abstract: Marx looked at the word “metabolism” as the law which can be found in the natural science field, rather than as the thought of an individual. Marx used this word in three different contexts within three areas of study focused on the relations among nature, humans and society. With the development of science and technology, information transformation is a well-known concept and has receives considerable interest. Thus, in the information age, besides metabolism, information transformation plays an important role in the relations among nature, humans and society.

Keywords: metabolism; historical materialism; information transform

1. Introduction

“Metabolism” is a scientific term that appeared with the development of modern natural science. However, there are different views on the inheritance between the concept of metabolism used by Marx and Engels in their writings, and the concept of metabolism used in previous academic articles. Since Marx and Engels did not make a clear explanation of the historical origin of the concept of metabolism, later generations try to find the exact textual basis for the concept from their respective positions. Based on this, people tend to focus on the debate of tracing to the source, while ignoring the more important thing: to give new connotation to Marx's thought in the background of a new era. On the basis of clarifying the origin of Marx's metabolism, this paper puts forward the scientific terms of information transformation in the information age, and takes information transformation as a new element to interpret the relationship between man, society and nature.

2. Arguments about Marx's Concept of Metabolism

Schmidt, who was known as the “heirloom” of the Frankfurt school, was the first one to study Marx's concept of metabolism. He believed that Marx's older demonstration of the relationship between man and nature was more similar to natural science, and the use of the term “metabolism” provided evidence for this, as it was not speculative. Schmidt argues that Marx used the term because, like Engels, he sought both the advances and philosophical generalizations of the natural sciences of the 19th century and the further development of social theory. Schmidt believed that during the preparation of Marx's writing of “Capital”, he was influenced by the materialism of natural science represented by Bushner, Vogt and Moleschott, and used Moleschott's concept of metabolism. His early thoughts were influenced by Schelling, Hegel and Feuerbach [1], and he became more and more inclined to materialism with the color of natural science. This thought of Moleschott's was taken seriously by Feuerbach in his later years. Schmidt argues that Marx was also familiar with the underlying materialist elements of Schelling's ideas, and was greatly influenced by Feuerbach. Therefore, based on the background of the formation of Marx's thought and the inheritance relationship, Schmidt believes that Marx's concept of metabolism is more inherited from Moleschott's

thought. As for Liebig, who also used the concept of metabolism, Schmidt thought it was also influenced by Moleschott. 'Both Marx (e.g., in *Capital*, volume 1, pp. 552–553), and the chemist Liebig (Heidelberg, 1851, pp. 622–623), who could not help but accept the influence of his ideas, made comparisons between the transformation of matter and the state' [1].

Schmidt was questioned by Shiina Shigeaki who was an agronomist in Japan in 1970. His book, "Agronomy Thoughts—Marx and Liebig" described that it is hard to say that Marx's concept of metabolism comes from Moleschott. He insisted that Marx's concept of metabolism came from Liebig. In response to his dissatisfaction with Schmidt's argument, he used a large number of quotes from Marx himself and Marx's attitude towards Liebig to carry out the argument. The author quotes Marx praising Liebig in *Capital*. "One of Liebig's enduring achievements was to illuminate the negative aspects of modern agriculture from the standpoint of natural science. His view was echoed by many later eco-socialist theorists.

This paper argues that it is not important which famous writer's work is the source of Marx's concept of metabolism. If Marx used this concept according to any one individual's point of view, there would be a detailed explanation of Marx's rigorous academic attitude. Marx regarded metabolism more as an accepted fact of the existence of natural science at that time, and as a realistic law of natural science discovery. Of course, scholars put forward ideas from different perspectives regarding the origins of Marx's concept of metabolism, but this is ultimately beyond dispute. However, it is more important to recognize the way Marx used this concept and the meaning of the three aspects of metabolism given by Marx in different historical contexts.

3. Marx's Metabolism

Marx always took the knowledge of natural science as the basis of his research methods and insisted on the unity of natural history and human history. Marx endowed the concept of metabolism with three related and different meanings from three dimensions: metabolism in nature, metabolism between man and nature and metabolism in society.

Regarding metabolism in nature—the natural scientific interpretation of "metabolism"—Marx believed that "natural science is the foundation of all knowledge" [2]. First, Marx regarded metabolism as a realistic law of natural science. Marx once said, 'If a chemist does not study the real laws of material transformation and solves certain problems according to these laws, but wants to transform material according to the "eternal concepts" of "naturalness" and "affinity", then what should people think of such chemists?' [3]. As Marx quotes Petro Verri in "Capital", 'all phenomena of the universe, whether created by human hands or caused by the general laws of physics, are not really new creations, but mere morphological changes of matter. ... For example, the earth, air, and water are turned into grain in the field, or the secretions of insects are turned into silk by human hands, or pieces of metal are assembled into clocks' [3]. In fact, Marx once made an explanation of human history and natural history. He stated: "... natural history, the so-called natural science, we won't talk about here; what we need to study is human history ..." [4]. Therefore, Marx believed that history is the real natural history of man, and there must be metabolism between man and nature.

Marx discussed the concept of metabolism between man and nature from physiological and sociological perspectives. Therefore, the nature of human beings, 'just as the production of plants, is the consumption of elements and chemicals in nature', which determines that human beings 'produce their own bodies in the consumption form of food and drink' [5]. Marx believed that 'labor is firstly a process between man and nature, a process in which man causes, adjusts and controls metabolism between man and nature through his own activities. Man himself, as a natural force, is opposed to natural matter. In order to possess natural things in a form useful to his own life, man makes the forces of nature in him ... The arms and legs, the head and hands move, and when he acts upon the nature outside him and changes it, he changes its own nature at the same time. He brings into play the dormant potential of his own nature, and puts the movement of this power under his own control' [3].

The metabolism of society refers to commodity exchange. Marx criticized the physiography for 'transforming the production of capitalist into an eternal production of nature'. He believed that such

a society was by no means a “solid crystal, but an organism capable of change and often in the process of change”. Capitalist societies must also sustain themselves through material change. Marx started from analyzing the medium of social material transformation—commodity exchange—to investigate the metabolism of capitalist society. In a capitalist society, it is production that determines everything. Therefore, Marx believed that the process of commodity exchange is “metabolism in society”. Marx made a profound analysis of the role of the simplest commodity form in the further development of another commodity form—monetary form to capital form. Marx criticized the classical political economy. From the perspective of material content, commodity exchange ‘is a W–W, a commodity for commodity, and metabolism of social labor’ [3]. If we only exchange the material contents of commodities, the metabolism of society is the repetition of the simple exchange process. However, when commodities develop to a certain height, they obtain the form of money. Money becomes the medium of metabolism, and the velocity of currency indicates the velocity of metabolism in society [3]. As Marx said, ‘the emergence of capital marks a new era in the social production process’, ‘this historical condition contains a world history’ [3]. That is to say, once capital, as a form of commodity, becomes the medium of social metabolism, we will get a ‘definite and at first sight extremely mysterious social form’ [6].

4. From Metabolism to Information Transformation

Some scholars believe that Marx’s theory of matter is neither a theory of physical materialism nor has it anything to do with Newton’s mechanical determinism. Therefore, Marx’s thought should not be influenced by new physics and micro-physics, which is undoubtedly one-sided. Through the above analysis, nature science played an important role in Marx’s thoughts of the relations among nature, human and society. With the continuous development of natural science, its interpretation of nature also underwent the transformation from matter to energy or information. With the rise of information science and technology, information concepts, principles and methods have increasingly penetrated economy, culture and the life of mankind. We must keep up with the pace of the times, closely combine Marx’s thoughts with the development of contemporary science, technology, economy, society, ideas and life, and examine the relationship between man, nature and society from the dual dimensions of metabolism and information transformation. Along with the development of modern information science, we discovered a new world—the world of information: ‘The discovery of a new world radically changed our view of the world.’ ‘The rise of information system science and information technology revolution continues to advance, information science, information economy, and information society, information has been and is rewriting the human comprehensive scientific system, economic system, political system and way of military, culture, life style and concept’ [7]. More importantly, ‘information and information systems have the most general and universal character and have the same broad meaning and scope as matter and matter systems’ [7]. “Information transformation” will become “a rising star” after metabolism [8]. We can explain the significance and value of information transformation in science, technology, the economy and society in three aspects, and explain the necessity of information dimensions in analyzing natural, human and social relations. The concept of material transformation in ancient and modern times mainly refers to the transformation between materials and entities. With the development of electromagnetic theory, relativistic quantum mechanics, and modern cosmology, energy thinking has been established, breaking away from the theory that physical entities with static mass are the fundamental reality to form the world. This kind of energetic thinking breaks through the limitation of physical thinking and is no longer limited to the transformation of matter between entities. However, the speed of natural science development is very fast. Under the background of the extensive development of modern information systems, we should also examine the process of information transformation. Science not only reveals a contemporary information system different from traditional science and philosophy on how the material world of a new field, but also puts forward the scientific explanation of many programs with a fresh perspective, revealing a whole new world as a place of complex information systems with comprehensive pictures of the world, and subsequently producing new ways of thinking in information. In this context, the information

transformation is mainly in the form of changes in the structure, relations, procedures, and the evolution of multiple perspectives in the investigation of things. Information thinking emphasizes the historical dimension of things, as well as the dissipation, condensation, accumulation and generation of information content contained in its material transformation.

The information economy is a new economic system that develops synchronously with information technology. In the information era, mode of production and communication seem to be extremely convenient. With the rise of the information economy, human society is also undergoing a multifaceted and comprehensive change. Western scholars put forward different concepts such as “postindustrial society”, “superindustrial society”, “knowledge society”, “knowledge value society”, “third wave”, “information society”, “information age”, “information civilization” and “network society”. No matter which kind of expression is adopted, it indicates that the living state and communication mode of human beings have undergone profound changes. Many Western scholars on the characteristics of the information society put forward several theories, such as Bell’s “the coming of postindustrial society”, or “information society” of Manuel Castells. The arrival of the information society will pose a threat to Marx’s social theory, and whether the definition of the information society is beyond our material world is a matter that requires thought. In other words, what is the relationship between the information society which is mediated by information symbols and Marx’s society which was mediated by material goods? In the face of the advent of the information society, it is also necessary to answer whether Marx’s analytical approach is still effective or outdated. With the development of information science and technology, information transformation has been universally recognized as a “law of truth” discovered by science. As a new mode of production, the information economy has affected the whole way humans exist and has changed the civilization system of human society. In the face of these profound changes in human technology, economy and society, the element of information transformation is unavoidable in the study of the relationship between nature, human and society. Capital logic is the rule of the material transformation in capitalist society, but is information transformation still limited by the logic of capital formation, or has it gone beyond the logic of capital and now follows its own logic? Information transformation has become an indispensable aspect in the study of humans, society and nature. Only by exploring the relationship between material transformation and information transformation can we make a comprehensive and contemporary interpretation of the relationship among humans, nature and society. At the same time, the application method of Marx’s concept of metabolism also provides some enlightenment in regard to comprehensively investigating the complex relationship among man, nature and society in the concept of information transformation.

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