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Comparison of Marx's and Karp's philosophical views - What is technology?

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ABSTRACT

The essence of technology is at the same time the essence of man. Ernst Karp and Karl Marx are great philosophers in the same period, who successively formed a distinctive philosophy of technology and view of technology in their understanding of the concept of technology in terms of technological ontology, technological evolution and society, culture and state. On the basis of analyzing and comparing the differences between Karp's and Marx's views on technology in terms of technological ontology and technological epistemology, this paper follows the dialectical way of thinking and finds that Karp's view of technology is narrow in terms of the existence of isolation and mechanicity. Marx's view of technology, on the other hand, explains the relationship between society, technology, and productive forces in a discourse led by holistic thinking, and ultimately puts human beings in the link of purpose and power of technological development for dynamic examination.

1. Introduction

Karl Marx and Ernst Karp were outstanding German thinkers and philosophers during the same period, and their ideas were both very popular in their own fields of study and studied by multitudes. Marx's views on science and technology have been elaborated in detail in "Research and Revolution - China's Science and Technology Policies and Social Change", written by American scholar Richard P. Satmire; and "Ten Years of Reform: China's Science and Technology Policies", published by the International Development Research Center (IDRC) of Canada in cooperation with China's State Science and Technology Commission (SSTC).

The study of Ernst Karp has been discussed since the middle of the twentieth century: one view is that the framework Karp applies to the philosophy of technology is to a certain extent superior to other philosophical frameworks for the study of technology. But Karp, while rejecting Hegel's idealism abandoned the dialectic and simply projected philosophical ideas that viewed technology on a non-technological level. (Carl Mitcham, 1972).

One perspective suggests that in Karp's idea of organ projection, the link between organs and technology is straightforward, i.e. he "establishes a special connection between organs and technology." (Jean-Yves Goffi, 2012) as well as the equally groundbreaking perspective that Karp had studied certain similarities between external tools and human organs and developed this idea into a philosophical reflection. (VAN PEURSEN, 1970) Ernst Karp's projection of the human self as a template in his philosophical theory of technology in relation to real-life technology is in fact an externalized manifestation of an advancement of human consciousness in its understanding of itself, a perspective that does contribute to both anthropology and philosophy of culture. (Kirkwood Jeffrey West 2018)

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Although their ideas have been exhaustively studied, there is still no comparison between their philosophies of science and technology in the academic world.

Karl Heinrich Marx and Ernst Karp were both pioneers of the philosophy of technology in 19th century Germany, and their successive philosophical reflections on "technology" resulted in different views and philosophies of technology, which have had a profound impact on later generations. Both of them were influenced by Hegel in their youth, but subsequently put forward different understandings and interpretations of technology.

In this paper, we focus on their views on the philosophy of science and technology, adopt a qualitative research method to compare their representative views on the philosophy of science and technology, analyze their differences, and find out the reasons behind them.

2. Karp's and Marx's basic views on the philosophy of technology

Karp's simple view of technology: the hand is the prototype for instruments of the same kind of purpose. Karp's plain view: all tools or instruments with the same kind of purpose are modeled on the human hand as an instrument for orienting, touching, picking up, and moving. "For the hand is the instrument that is born and becomes the model for the machine." [1]For some of the activities that do not appear to be extensions of the human organ, such as in the instruments and devices of the arts and sciences, Karp, for his part, sees them as recreations that are extensions of the hand, adding that the mental artifacts burrowed out of the hands, the teeth, and so on. Fingers become hooks, hands become bowls. Knives, spears, shovels, rakes, plows and spades saw arms, hands and fingers in a variety of positions.[2]

On the other hand, people create tools in accordance with their bodies and organs, both consciously and unconsciously. This idea comes from Carruth and Hartmann's Philosophy of the Unconscious. Karp argues that the human body is seen in the world as an indicator of the real, and that people can learn about themselves through the techniques and instruments that are projected onto them, but these are more unconscious than conscious. Unsurprisingly, Karp draws on Darwin's theory of biological evolution: 'On the railroads and airline routes, ... is based on the circulation of blood within the organism'[3]

At the same level, Marx viewed technology as the essence of the productive forces. Technology, as part of the productive forces of society, progress in technology causes changes in social relations, which are manifested in the productivity revolution of the industrial revolution. Social revolution is essentially the contradictory movement of the productive forces and relations of production embodied in society. Marx's view of technology as the productive forces of society is the development and great changes in the system of machines and the great changes in the mode of production and productive forces based on it: "The bourgeoisie has created in its less than 100 years of class domination more and greater productive forces than all the productive forces created in all the past generations"[4]

On the other hand, social production is also a constraint on technological development. Because the "first prerequisite for all activities" is material production, which determines the prerequisites for the development of other aspects of production, it is also reflected in the technological dimension, that is, the necessary conditions for technological production and the driving force for progress. Technological production and progress is first of all stimulated by economic development and social production, demand for the emergence of machine technology to provide the most essential power. Marx, after examining the development of technology, believed that the biggest factor promoting the emergence of machines and machine labor was the expanding demand, which could no longer be met by manual labor.

This leads to Marx's most fundamental point about technology, which is that the basic driving force of technological development is economic activity expressed in the need for production. The ever-expanding productive forces provide the needs and economic possibilities for the birth of technology, the material means and the prospects for its development.

At the same time, Marx also pointed out that the greatest difference between man and animals comes from labor. Labor begins with technical activity, i.e., the creation of tools. Tools are not only extensions of man's natural limbs, but also the embodiment of man's purpose and will, the organs of the human brain created by man, materialized knowledge.

In the broader realm, that of society and the state, Karp argues that the facsimile of machinery and society remains the human organ. In the course of their development, tools lose their congruence with the human organ in appearance. But in essence, the technical tools and all the artifacts that result from the technical outcome are projected according to the size and number of the human body.[5] Therefore, Karp continues to believe that tools are projections of organs, externalized forms of the human body, thus making them consistent with the human organ from a comparative point of view. "Machines that show an essential relation to the human body are projected to a higher degree, external shapes are less similar, and projections with spirituality are clearer." [6]

Beyond this, Karp broadened his vision, expanding the argument from industry and machinery to the new science of mechanical engineering. The prototypes of design activity were derived from the human skeletal structure, while the steam engine's conversion of fuel into heat was inspired by the human affective system, and even the electronic communication system, to which Karp referred to the hu-

man nervous system. Karp argues that all tools are inspired by human form and function, and that the human organ is the measure of the tool. Thus, at the level of the tool, the human being becomes "the measure of all things". "The intrinsic relationship between tools and organs ..... is more of an unconscious discovery - that is, man is constantly creating himself through tools. The utility of the tool comes from the control of the organ, so that the form of the tool can only originate in that organ" [7]

Karp argues that in addition to exploring the relationship between technology and human beings at the level of tangible technology, he also sees linguistic culture as a product created by technological culture. At the level of society, the state is not a material institution, but a system, but it is also mapped and reproduced from human organizational systems. He argues: if this is reflected in language ..... then the most obvious place to look would be the state system[8]

Marx's study of technology in society is more macroscopic: it shows that from the perspective of social change, it points out that technology is the basic driving force of social change.

Social ownership is a technological advance embodied in the social division of labor, and technology is equally fundamental to social consciousness. Spiritual activity is likewise intertwined with people's material activity. In the process of material production, people's spirituality guides technology, sets up plans for its utilization, and guides the development and improvement of evaluation systems.

In looking at the issue of capitalism, Marx argued that machines are an integral part of capital, and that the social relations entered into by producers as well as their interactions are different because of the differences in the means of production. As technology advances, the development of the means and relations of production inevitably leads to capitalism. In terms of how technology contributes to social change, Marx writes, "No social form can ever perish until the full productive forces it contains have been brought into play."[9] And the specific forms of change are varied from "material changes taking place in the economic conditions of production" to "material changes in the economic conditions of production." ..... change" and "the legal, political, and other ideologies that people use to overcome conflict" [10]

Marx emphasized at the level of social management that technology is the basis and prerequisite for social management.

Marx made an in-depth analysis of the problem of the relationship between the capitalist and the laboring worker in the capitalist mode of production, in which, in his view, the worker labors under the supervision of the capitalist and the output belongs to the capitalist. This capitalist management is dualistic, and this duality arises from the duality of production, where the technology of the workshop craftsmen is historically present, and on the other hand the one-sided activity of the workers acquires a narrow form of activity (independent production). That is to say, on the one hand, the craft industry has the division of labour as the basis of its socialized production, while on the other hand, the narrow localized production is growing.

"The principle of division of labor, peculiar to the workshop crafts, isolates the different stages of production, which are independent of each other as the same number of partial labors of an artisanal nature" [11] Here Marx saw a refinement of the social division of labor under the development of technology, dividing production into a number of mutually independent and nested segments, separating human manual technology into separate and atomized segments, but at the same time laying the technological foundations for production in large factories. Marx saw it as the externalization of the factors of historical progress and development in the formation of the social economy and the evolution of the means of exploitation. [12]

Large-scale industrial production brought about an increase in the efficiency of production, but it also caused extensive changes in the relations of production, the original ties of the workshop craftsmen were severed, but "the capitalist mode of production at the same time created the material prerequisites for a new and higher synthesis, that is to say, for the union of agriculture and industry on the basis of their antagonistic development. "[13]

Interestingly Karp's Outline of a Philosophy of Technology opens with, "If the history of man is studied, he can be found to be the history of the improvement of tools. If the method of making tool-use-history is to be made more advantageous, it would be more profitable to compare it with Marx's class-war-history." Both theories Karp is talking about here are meta-theories, scientific systems that incorporate other disciplines, such as anthropology, political philosophy, economics & sociology. Marx's class-war-history theory, on the other hand, is essentially derived from the "theory of alienation" and the "laws of scientific history". Compared with Karp's tool-use-history, Marx's theory seems to be less direct, or rather, somewhat detached from reality. Karp's viewpoints are more derived from his personal experience of life and the needs of the challenges he faced, adopting more concepts of human nature and connective technologies, cultural processes, and cultivated environments.

From this point of view, in order to explore Karp's "organ projection theory", we should start from the purposefulness of Karp's question, which is to link the natural existence of human beings with the creation of artifacts, and to ask what makes the invention and technology come closer and closer to the function of the human mind and body. If we examine Karp's "organ projection" from this perspective, we can see the shadow of his anthropocentrism, and we can also arrive at his important point: the self-liberation and self-consciousness of human beings and human nature.

Even at the more macro level, where it seems impossible to find a direct counterpart in the human organism, such as the state apparatus, Karp still argues that the state is a machine until its despotism destroys the human being, and that attacks on despotism from the lower levels can enrage it, so that the state can be compared to the fragile nervous system. The more mechanically a state is controlled, the more despotic he is; the more organic a state is, the freer he is. Thus, "The machine is despotic, the organism is free." [14]and as articulated in the Outline of the Philosophy of Technology:

The State should function like an organism, although it cannot be machine-like in general. There are machines within it, and these machines are treated as different parts within the whole organism.[15]

It is easy to see that technology has a limited role to play in the emancipation of the human being, and in the case of machinery, maximizing its role is essentially a matter of increasing the precision and reducing the redundancy of parts in order to reach the "limit". Therefore, for the smooth functioning of a social organization or a state apparatus, it is necessary to reflect the structure of the human body (since the structure of the human body is the "optimal solution" to the limit).

In Marx's view, historically, since the transformation of man from a direct participant in the process of production to a simple motive force, all the work accomplished has been determined by the machine. As technology evolved from the level of serving man to that of controlling him, its development was not simply in a favorable direction. On the one hand, technological development is a process of self-improvement towards better control of nature and greater exploitation of natural resources, but on the other hand, it is also alienating the essential nature of the human being and diminishing his holistic, dynamic aspect.

Just as in the factory, the invention of new machines results in more efficient organization of production, but likewise makes forms of labor redundant and thus reduces the number of workers. "Machines have had a negative effect on the mode of production based on the division of labor, and on the specialization of labor on that basis"[16] In addition, the role of technology in the transformation of human culture, according to Marx, is to be examined in terms of the mode of production of the means of labor, as well as in terms of the transformation of the relations of production of the machines and tools.

In the age of capitalism, the input of large industrial machines, the rapid depreciation of the individual physical strength and skills possessed by workers, the lengthening of absolute working hours, the great increase in productivity and labour intensity, as well as extensive social collaboration, all lie in the enormous change in the way society is managed and organized, which is formally a double-edged sword brought about by technological development.

For Marx, the development of technology cannot be separated from the ontological status of man.

It was Marx's lifelong pursuit to pay attention to the reality of man's existence, to care for his future development, to pursue his fundamental emancipation, to promote the progress of human civilization, to eliminate exploitation and oppression, and to return to man himself all that belongs to him. The complete emancipation of man requires a thorough understanding of the source of his oppression. At the same time, all the doctrines of Marxism are premised on human beings therefore technology in him is more as a weapon of social criticism, and most of his ideas are the result of the social criticism of technology. His philosophical thought on technology ultimately serves the supreme goal of overcoming the alienation of man and liberating him.

3. Analysis of Marx's view of technology and Karp's view of technology

On an epistemological level, in Karp, the technological product is a summation of the process of empirical production from the concrete to the abstract, and he recognizes, based on his own long history and experience with artifacts, that the tool or the machine is similarly related to the organs of the human being, as an extension or projection of one's own organs. This kind of man is is empirical and austere, with metaphysical implications. From the experience of the similarity between various objects and the arms or organs, Kaplan inductively analyzes and arrives at the "theory of organ projection". This is a kind of inductive analogy that rises from empirical sensibility to abstract rationality. On the cultural level, Karp also believes that it is technology that transforms nature and society under the impetus of human beings, forming culture and society.

In Marx, the analysis of technology is more in the analysis of the products of technology. Marx tends to break down the machine into its different parts, namely the engine, the transmission machine and the tool machine, but up to this point, Marx does not go any further in his analysis. But this structured vision brings benefits to Marx's examination of society and alienated man. According to Marx, the products of technology are the instruments that produce surplus value. Thus, Marx's philosophy of technology ultimately serves his theory of social philosophy. In time, Marx's philosophy of technology predates Karp's "projection of organs", but in the above sense, Marx did not place the philosophy of technology in a primary and important position.

Therefore, from the level of social impact, Karp likened tools and machines to human organs, took technology as an object of study, and made engineering, anthropology, and explanations to open up the basic direction for the philosophy of technology, so in this sense, Karp's philosophy of technology plays a pioneering and foundational role.

From the perspective of technological ontology, Karp only mechanized the simple viewpoint: to regard machinery as the projection of human organs in reality, to regard the generation and even the development of technology purely as the driving force brought about by human needs, and to regard human beings as the center of technology, which also led to the neglect of the important role of the natural world as well as the other species of the natural world. Naturally, Karp's view of technology has also become one that leads him to believe that technology is a tool and a necessity for the conquest of nature, to the neglect of the organic whole that is closely related to and unifies human society and the natural environment. The single-minded emphasis on the role of technology for human beings would also lead him to overlook the importance of diversity and harmony between the natural environment and human beings. Therefore, "organ projection" has the narrowness of over-centering on man himself and neglecting nature.

On the other hand, Karp's technological materialism is a mechanical materialism. Seeing society, technology, and tools as human organs, attaching thereby external objects to the cognitive subject, making technology subordinate to man, and ignoring technology itself and its natural laws of development, as well as isolating technology itself, failing to see its interconnectedness with the outside world, and naturally failing to see the role of external conditions in technological development.

In the capital theory and other political economy works, Marx has made certain judgments on technology, but scholars are divided on whether Marx has a systematic philosophy of technology, according to Marx's series of indirect assertions about technology, which can be called Marxist view of technology according to Wu Guolin's (2014)point of view. The Marxist view of technology, on the other hand, is based on system and connection, and Marx's technological essence is directly related to the human-like essence, so to grasp Marx's view of technology, we need to start from the perspective of human essence, and to understand human beings and their human-like essence first. Wu Guolin also points out that "Marx's or Marxism's view of the nature of technology directly relates technology to the nature of human beings, and thus this can also be seen as a substantive view of the nature of technology." [17] In Marx's view, the class essence of man is "free conscious activity", and the real essence of man is "the sum of social relations". Therefore, technology is essentially the product of people's free, conscious activity, and at the same time, conscious activity itself. With human beings, the free conscious activity of human beings is created, and technology itself is created unconsciously. The biggest difference between man and animals is labor, and from this point of view, technology is also the essential existence that distinguishes man from animals. At the level of the essence of technology, Marx's view of technology is already non-mechanical and non-independent.

Marx also viewed technology as both a product and a creator of human-society relations. On the one hand, the needs of society are the source and driving force of technological development, and on the other hand, the iteration of technology renews the relationship between man and society. Technology is both a reflection of the level of social productivity and a response to the existence of the human species. The essence of technology arises together with the essence of man, and then develops together with his productive activities and class essence. At the level of technological development, Marx adopted a systemic and holistic view, a progression under the Kappian mechanistic and isolationist view. Marx's view of technology involves the analysis of many social phenomena in addition to the study of technology itself, and these analytical reflections are not only organic but also processual, so that the objects of study in Marx's view of technology are not abstract essences but concrete, living, dynamic things.

Through comparison, the following insights can be gained: first, Karp's philosophy of technology is based on human beings, reflecting the humanistic ideology advocated in the era. Technology is not some other object independent of man, but a projection of the subject in the real world. Projection, in turn, implies connection, the guidance and constraint of man on technology, but at the same time Karp is equally caught up in the isolationist viewpoint, rejecting the influence of other objective things on technology. Secondly, Karp's philosophy of technology is not dialectical but intuitive, mechanistic projection of man as a paradigm of technology shackles his deeper analysis of social development, while at the same time he recognizes the role of technology on culture and avoids the prison of mechanism. Thirdly, Karp's view of the nature of technology lacks a priori knowledge, believing that technology is spawned by human needs and imitates the human body in the process of production, while ignoring the process of spontaneous formation and development of technology in natural practice and social production.

4. An Exploration of the Reasons for the Existence of Narrowness in Karp's Philosophy of Technology

At that time, people's attention to philosophy was more on revering theoretical knowledge and devaluing practical technical labor. In addition, people engaged in specific technical operations or practical activities did not have sophisticated theoretical knowledge, leading to the segregation of scholars and craftsmen. The difference between the scholars' pursuit of discernment and the craftsmen's practical and experiential approach led the scholars to ignore the problems posed by technical practice, while the craftsmen ignored the search for theoretical knowledge. Scholars saw "man as a rational animal" and neglected the fact that man

is a "laboring man" and a "practical man." Marx, in his Syllabus on Feuerbach, directly pointed out that philosophers are always trying to explain the world in different ways, but the real problem is how to transform the world[18] . Karp's theory comes from his practice of productive life, Karp utilizes an anthropological approach to analyze technology, using the experience gained in Texas to mechanically and empirically combine tools with human and human cultural influences.

Technology is inextricably linked to social production and productivity, and Karp, influenced by environmental determinism, finds it difficult to distinguish the relationship between the social roots of technology and its ability to solve practical problems. Secondly, technology is a kind of systematic knowledge, which requires analysis between ontology, epistemology and methodology, and technology also has a purposeful action, which is a problem-solving oriented mode of action, and the combination of the two directly leads to the fact that the analysis of the philosophy of technology requires deductive reasoning and sociological factors, and ultimately needs to face the actual goals and specific actions, making it impossible to generalize its various aspects.

Karp lived in the 19th century, when the influence of physics on the world of thought was increasing day by day and mechanism was prevalent, causing many scholars to fall into the prison of mechanism, even in the study of anthropology. People tend to see the appearance of mechanical, social, and physical movements and combine them with mechanistic theories, but it is difficult to deeply analyze the essence behind them. On the other hand, Karp was limited by his time and did not correctly understand the organization of the human body, especially the fallacy of the mental system which led to his mistake of mapping the nervous system simply as a telegraph. So Karp's understanding always remained superficially intuitive and empirical.

In general, although Kapp as a philosopher many of his ideas are forward-looking, laying the foundation for the research of later scholars, and even having a certain inspirational effect. However, he was limited by his time and experience life, resulting in his philosophy of technology with a strong simplicity and empirical thought. Although Karp's philosophical view of technology embodies human creativity and humanistic features to a certain extent, it actually reflects the demands of the rising capitalist society at that time: he simplifies and isolates the relationship between technological development and social progress, instead of adopting the view of connection as Marx and Engels did, which puts technology, an instrumental object, into the productive forces and relations of production, and naturally, he cannot see the relationship between the development of technology and the alienation of man. connection between technological development and human alienation.

5. Summary

Through the comparison between the two it is not difficult to realize that the difference between Ernst Karp's and Marx's views on science and technology comes from the environment in which they work; Marx constructed a philosophical study of technology at different levels, from the economic base to the superstructure, through a three-dimensional and comprehensive understanding of society. Karp, on the other hand, was prompted to think about the philosophy of science and technology through the tools of observation because of the environment in which he worked. On the other hand, they both emphasized the importance of human beings in the philosophy of science and technology to varying degrees, but the depth of discussion was different. Marx, starting from technology, emphasized the role of technological alienation and technological development in the confinement and emancipation of human beings, whereas Karp's study of human beings in technology stops at the mere fact that technology facilitates the development of human beings, while ignoring the antithesis of technological development.

Based on analyzing the philosophical views of technology of the two, this paper hopes to provide some insights and help to later scholars and scientists of science and technology.While focusing on technological development, it is important not to forget the essential power of human beings as owners of technology and of technology, and not to use technological development to alienate human beings.

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