

ESSENTIAL CONCEPTS FOR CONSTRUCTING INFORMATION ECOLOGICAL ETHICS

Tianqi Wu, Jing Ren, Qian Jin, Xinmeng Bi

Abstract: *There are a lot of new problems about ecology and information. We urgently need a brand-new information ecology philosophical thought to guide and transform human cognition and behaviors. Philosophy of information and ecological ethics thus came to meet the demand. We urgently need to build a more universal and explanatory information ecological ethics. First of all, following the ideas of integrativism and emergentism in system information science, the ideas of information civilization and ecological civilization are integrated, and the concepts of life community and human community are integrated. The new thought is to enable human beings to truly enter the information ecological civilization as well as solve relevant social, educational, legal and other issues.*

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Introduction

The issue of ecology and information has been the most widely discussed topic today, involving many fields such as world politics, science, society and people's livelihood. With the rapid development of human civilization in the past century, we have entered a new era of ecological and information civilization. The simultaneous emergence of these two forms of civilization also brings a problem, that is, how do they learn from one another to integrate harmoniously.

However, it is a narrow understanding to regard information civilization as a mere application of information science. Thus, it is far from enough to introduce the achievements of information science and technology into ecological protection and transformation, or formulate relevant laws and regulations, which is the most superficial way of integration. We must integrate the advanced scientific thoughts and ideas in information civilization such as information complexity, ecological holography, system emergence into ethical cognition. Only by improving the cognitive level of all humanity we can reach a consensus about human destiny, and then the concept of information ecological ethics can be well implemented so that the whole mankind can truly step into the information ecological civilization.

The study of information ecological ethics requires to integrate the ideas of information civilization and ecological civilization. Before putting them together, we must first make corresponding transformation on the two kinds of civilization concepts.

1. The Integration of Information Civilization and Ecological Civilization

Since we call them “civilization” , they are something that is “a relatively high level of cultural and technological development” [1]. We can understand new mode of civilization from two aspects: material civilization and spiritual civilization. That is to say, it is one-sided to regard information civilization as the development of information science and technology and its achievements. Such narrow understanding lacks of the depth of philosophical thinking. Information science and technology can only be regarded as the improvement of productivity and cannot be promoted to the transcendence of people's ideological cognition; It is also superficial to understand ecological civilization only as protecting the environment for the interests of people, because the essence of ecological civilization is different from that of previous civilizations, and the rediscovery of the relationship between human and nature will be an ideological revolution. Science and technology can only be used as a means to protect the environment. The key is a revolution of human cognition of nature.

The establishing and maturing of human civilization models, including fishing and hunting civilization, nomadic civilization, agricultural civilization, and industrial and commercial civilization, can be divided into three main processes:

1. The promotion of productivity and the ability to explore nature enables mankind to acquire a large number of new understandings of the world;
2. Under the new mode of understanding, a number of new ideological, cultural and philosophical theoretical systems are proposed by some people;
3. Finally, the new theoretical system spreads to the public through the education system and information, thus brings new ideas and changes in lifestyles to all mankind. It achieves the consensus of all mankind in a new civilization.

Finally, the new civilization (mainly refers to new ideas) will bring about the general improvement in social productivity, people's understanding and living standards, which will breed the next new form of civilization. Therefore, the establishment of a new civilization requires the completion of these three civilization steps. The symbol of the real establishment and emergence of a civilization is the unified recognition of the ideology of the whole people.

The reason why these two civilizations appear at the same time is that there are a lot of new problems about ecology and information. In view of these unprecedented new problems of mankind, on the one hand, we need to formulate corresponding laws and regulations to draw the bottom line of people's behaviors; on the other hand, we urgently need a brand-new information ecological philosophy to guide and transform human cognition and behavior morally. Under this urgent need, philosophy of information and ecological ethics came into being. However, given the reason that the information theory and ecological ethics theory in western world are still developing, there are many basic problems and misunderstandings which are difficult to solve, we urgently need to build a more universal and explanatory information ecological ethics thought.

2. The Integration of Life Community and Human Community

The idea of life community and similar concepts appeared at the end of the 20th century. With the development of ecological ethics in western world, this concept began to be widely mentioned at the beginning of this century. Another corresponding concept is "human community". The concept of human community should be understood from the perspective of the integration of human species, which is to regard all mankind as a system rather than a simple group of individuals. The advanced concepts of interconnection, interdependence, mutual cooperation, seeking common ground while reserving differences, equality of relations, mutual benefit and so on, are essence of human community. Such a mode of thinking requires us to reconsider the definition of human beings.

First of all, we need to dialectically understand the difference between integrativism and holism. Ludwig Von Bertalanffy believes that a general system theory was needed to integrate the knowledge system of dividing disciplines. [2] He calls it a new, systematic and interdisciplinary way of thinking: integrativism. Holism emphasizes the idea that individuals obey the whole and pursue uniformity; while integrativism emphasizes understanding the relationship between the whole and the elements from a systematic perspective. On the one hand, it is necessary to determine the whole's top-down guiding and inhibiting effect on the elements. On the other hand, it is also necessary to respect the relativity, independence, freedom, randomness and uncertainty of each element in the system. This is also the reason why a dynamic self-organizing system enables the occurrence of emergence. Combining integrativism and the emergence thought, Wolfgang Hofkirchner puts forward a new systematic interdisciplinary world picture: emergentism. [3] He further propose the idea of a unified theory of various disciplines, [4] and the logic of “the third.” [5] From this point of view, studying the life community, human community or information ecological civilization is not just due to a concern about simple concepts and slogans, but should be understood as the product of self-organization and emergence from complex information systems. We should study scientifically based on the ideas of integration and emergence.

For beings born and multiplied in the earth's ecosystem, the fate of each life group is generally linked and inseparable. Therefore, not only the fate of mankind is common, but also the fate of all life is. Community of human and community of life are closely linked. From the perspective of ecosystem, the ecosystem is actually the community of life. Human community is an important subsystem of ecosystem and an element of life community. At the same time, the human community is essentially different from other elements in the life community. It is the only subsystem which holds ethical responsibility and works as agents in life community; therefore, it can be said that the human community is the most important element in life community. To sum up, information ecological ethics is inseparable from the two most critical elements: life and human beings, which requires a new ethics theory with dual ontology, that is, to integrate human ontology (human community) and life ontology (life community) from the perspective of system. The value needs of these two elements are complex, relative and generally related, of which are overlapping or contradictory with one another. We should not go into humanistic extremism nor another natural extremism. Instead, we need to find the best ethical principle from the value demand game of the two elements.

There are two opposing interpretations of the concept of life community. The first view is that life community should not include inorganic environmental factors, [6] and the study of life community should be started from human beings. There are three main ideas to support this view:

1. In human ethics, ethical responsibility is the internal premise of ethical behaviors, and ethical responsibility and ethical behaviors are equal and mutual. The inorganic environment has no ability to perform an ethical behavior, so people should have no ethical responsibility for the inorganic environment.
2. The moral subject of both ecological ethics and human ethics is human beings, and it still needs to regulate the behavior of human beings who are the moral subjects, so the thought of life community should still start from human beings.

3. The traditional thoughts of ecological ethics was not logically established. it is impossible to deduce the "ought" of human beings' moral obligations to natural objects from the "is" of ecological objective laws.

Due to the above three reasons, this kind of view is still to understand the concept of life community from the perspective of anthropocentrism, which can be interpreted as a mild and extended version of anthropocentrism.

The second view is that life community should include human and nature, that is, the whole ecosystem. The idea of information ecological ethics we put forward is to demonstrate and clarify why human beings should bear inescapable ethical responsibility for the whole life community from the perspectives of philosophy of information and natural science.

3. The Ethical Responsibility of Human Community for Life Community

The three issues mentioned above involve two important concepts: ethical responsibility and ethical behavior.

Ethical responsibility refers to the obligation of any organization and individual to abide by ethical norms and consciously safeguard ethics; Ethical behavior refers to the activity that any organization and individual consciously abide by the ethical norms, and transform the ethical content into their own behavior, so as to achieve the ethics and morality. Ethical behavior is the most basic form of morality.

In human ethics, for example, A has ethical responsibility to B, and B should also have corresponding ethical responsibility to A; Both sides should abide by the ethical norms. If either side's behavior violates the ethical norms, it will receive ethical and moral condemnation, just like the very popular phenomenon of "social death", which is caused by the ethical and moral condemnation one received from the public. At the beginning of human society, there was no law, only primitive ethics and moral rules. The law constructed by humans, on the one hand, was a tool to maintain national rule, and on the other hand, it was a bottom line of ethics and morality. Legal responsibility and law-abiding behavior are the minimum ethical requirements for a social individual or organization. Therefore, compared with the law, ethics and morality cover a wider range, and

the content of the norms is more detailed and complex. It is a core criterion to measure the degree of civilization, stability, prosperity and advancement of a society. Law needs corresponding law popularization to help people establish legal consciousness, while ethics and morality are more dependent on education. Because ethical condemnation needs to be carried out by the society, the members and organizations of an society act as ethical actors and ethical supervisors at the same time. At the same time, the popularization of ethics strengthens social members' participation of public opinion related to the law; it also enhances citizens' sense of ownership of the country and improves people's happiness index; At the same time, its constraint scope is more comprehensive with better effect and lower costs; People are more likely to accept and agree with it, and so on. Therefore, the establishment of a civilization is inseparable from the improvement of the corresponding laws and regulations, as well as the construction of the corresponding ethical and moral thoughts. The popularization of information ecological ethics is the basis for the establishment and improvement of information ecological civilization.

The generalized nature or natural system itself has no purpose and subjective intention, it just moves and evolves based on laws of nature. Therefore, discussing the ethical relationship between nature and humans, we cannot say that the natural law is its ethical responsibility, or that the movement of natural law is its ethical behavior to humans.

But ecosystem or life community has its purpose, that is, the benign maintenance and healthy development of ecology and the continuation and prosperity of life. If there is no life in life community, the whole system will be no longer a life community. The purpose of the life community is reflected in its fundamental need to maintain its essential attributes. Only in this sense can we talk about positive and negative values, good and evil, and other relevant concepts and issues that must be involved in value evaluation. So we need to establish ethics in the theoretical framework of the life community as the ontological being.

However, there are still many inorganic things in life community, which should not be regarded as a part of an individual. From the perspective of life community, these inorganic things and inorganic environment are an

indispensable part of the whole ecosystem. We can compare it to those special groups in human ethics who have no ability to conduct ethical behaviors: the newborn babies and the elderly, the disabled and the patients, such as autism, depression and other mental disorders, and so on. These groups in human society are also an indispensable part of the social system. In fact, everyone has to go through the period without the ability to conduct ethical behaviors in one's development. Such special groups basically do not have the ability to conduct ethical behavior towards others, so it is difficult to assert that they have ethical responsibility. However, human groups with ethical behavior ability still have ethical responsibility for these special groups.

With the development of ecological ethics and the evolution of human ecological civilization, most countries in the world have enacted corresponding animal protection laws and inorganic environmental protection laws. As mentioned above, law is the bottom line of ethics and morality. Protection laws have been enacted for animals and inorganic environment which do not have ethical responsibility and cannot conduct ethical behaviors. Thus, human beings should bear ethical responsibility for the life community in terms of ethics and morality.

Human beings and human society are part of the earth's ecosystem. Human behaviors and the movements and evolution of the ecosystem will mutually affect one another. They interact and cannot be separated. Therefore, there is no doubt that people have the ethical responsibility for life community.

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THE CONCEPT OF “LIFE COMMUNITY” IN INFORMATION ECOLOGICAL ETHICS

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Abstract: *Ecosystem is a life community composed of organisms and the natural environment they live in. Philosophy of information puts forward the ontological view of the dual existence of matter and information, and the evolution view of the dual forms of evolution in material and information. The process must be the evolution or degradation in material form and information form at the same time. The essence of life community is "life." A natural system that cannot sustain life should not be called a life community or an ecosystem. Thus, an ecosystem must be a natural system that can sustain life and its prosperity. Although we may talk about the concept of value from the perspectives of existence and universe, we can only talk about ethics, good and evil in the frame of life community. And we do not bear ethical responsibility for the entire universe.*

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Introduction

With the development of complexity science, human understanding of the world jumped out of the limitations of anthropocentrism and began to rediscover the world from the views of system and evolution. The term "ecology" was created by the German zoologist Haeckel Ernst in 1866. [1] He defined ecology as "the science of studying the relationship between organisms and the environment." The prefix “eco-” stems from ancient Greek translation of “home” or “our environment.” Combined with system thoughts, we often use “ecosystem”

to refer to it. Ecosystem is a life community composed of organisms and their natural environment.

1. Analysis of Ecology and Life Community from the Perspective of Evolution

If ecology is about the study of life community, then life community is the core object in the study of information ecological ethics. Nowadays, it is generally believed in ecological research that the interaction among various elements in the ecosystem has laid the foundation for the occurrence of biological evolution, which makes ecology the core part of biology. Theodosius Dobzhansky once said, "Nothing in biology makes sense except in the light of evolution." [2]

While Leigh maiorana van Valen mentioned that "evolution is the control of development by ecology." [3] Philosophy of information puts forward the ontological view of dual existence of matter and information, and the evolution view of the dual forms of evolution in material and information. Philosophy of information believes that the evolution of system is accompanied by both evolution and degradation. When an object changes in interaction, that is, in the process of evolution, its material structure and information content will change at the same time. That makes the evolution of things and world caused by this change dual. The process of either evolutionary evolution or degenerative evolution must be in both material form and information form. [4]

The information ecological ethics we established is based on Chinese Philosophy of information, ecology and ecological ethics in western. Firstly, we need to define the concept of "life community" in information ecological ethics. Life community refers to the whole ecosystem.

First of all, although life community is a part of nature, we cannot simply equate life community with nature in a broad sense. The scope of life community is much limited, compared with nature in a broad sense. Nature in a broad sense can refer to the whole universe, and even can be equivalent to the concept of the world of existence. While life community refers to the whole ecosystem on our earth (there may be other ecosystems on other planets, but we do not know about them yet), which is a unified whole composed of organisms and

environment. The essence of life community is "life." A natural system that cannot sustain life should not be called a life community or an ecosystem. Thus, an ecosystem must be a natural system that can sustain life and its prosperity.

Secondly, the life community we are talking about now refers to the current ecosystem. If we look at the life community from the perspective of evolution, we will figure out that the earth's ecosystem had been evolving into the current ecosystem step by step, and the life community has been changing with the influence of various factors such as climate, solar illumination intensity and so on. Life has existed on earth long ago, while human is a species that appeared in the late stage of evolution. Therefore, ecosystem or life community should appear before human beings and be above human beings. It is the basis for human birth and survival.

Not all ecosystems in the process of evolution can meet human survival need, while the current ecosystem is just suitable for our human. So our hope for certain is that it will not change too much. Excessive development will only bring disaster to us and other lives. So the life community specifically refers to the whole ecosystem on the earth.

Think about that: "does the idea of life community still start from human beings?"

First of all, it is impossible for us to conceive a life community without people. There is no real “wilderness” which can escape from human influence in the earth's ecosystem. Not to mention the destruction of the ozone layer, the pollution of various refractory garbage and synthetic chemicals ---- the consequence of today's global warming declares that it has global ecological impact. According to the World Meteorological Organization (WMO) global climate report in 2020, 2020 will be warmer than years from 1850 to 1900 by $(1.2 \pm 0.1) \text{ }^\circ\text{C}$, which is one of the three warmest years in its observation records (the other two are 2016 and 2019). Due to the use of massive fossil fuels since the human industrial revolution, the concentration of carbon dioxide in the atmosphere in 2020 will exceed 410×10^{-6} , which is 148% of that in 1750. [5] The impact caused by human beings is global, and it is the impact on

the whole life community. Any element in life community cannot escape from that.

Secondly, it is meaningless to talk about the ethical issues of information ecology in life community without consideration of human beings. If there are no people, all ethical theories will lose the significance of existence. As mentioned above, only human beings have the ability of conducting ethical behaviors. We cannot ask other elements in the life community to have ethical responsibility and ethical behavior. Without human beings, there is no need for ethical thoughts. Therefore, there must be people in life community as ethical actors. Information ecological ethics is thus designed to regulate the behaviors of people as moral subjects.

But we cannot say that the idea of life community must start from human beings. The previous part mentions that we should jump out of the confinement of traditional anthropocentrism, look at the relationship and interaction between human and life community with thoughts of complexity, system and information, and rethink what is life or human from the perspective of life community. Only in this way can we truly build new ethical thoughts for the common prosperity of human and life communities. In the past, the western ecological ethics thought did not really jump out of the limitations of anthropocentrism. Or it went too far so that completely abandoned the key position of human in ethics and the conclusion appeared extremely weak. Therefore, we need to find the corresponding theoretical basis or principles for the information ecological ethics based on the idea of life community.

2. Life Community and the Axiology of Information

Luciano Floridi proposes a set of ethics ideas based on "information," the is, the macro information ethics. He tries to interpret the whole natural physical world and all things in it as "information," and hopes to explore the essence of the universe from the perspective of information. He believes that the mission of philosophy of information is to explore whether the universe is fundamentally formed by information, and whether the evolution of the universe itself can be explained by information dynamics. [6]

Floridi's attempt to extend ethics to the whole nature is worth to be supported, but this idea is open to discussion. First of all, ethics is based on the core concepts of value, good and evil. How can we define and understand these three concepts at the level of the whole generalized nature and universe?

Floridi directly applied the concept of intrinsic value in western ecological ethics to all information bodies. He believes that the information body can be regarded as a moral actor, and the information body can have intrinsic moral value so that should be respected. [7] Therefore, about the concept of value, Floridi merely changes the natural subject in the intrinsic value theory into the information body.

Floridi further puts forward the concept of "infosphere," which can be understood as the external environment of the information body or information system. [8] Describing the four basic ethical principles of the information circle, he follows the traditional idea that "information is negative entropy." [9] He believed that the information circle should eliminate the existing entropy and prevent the generation of new entropy. Unnecessary entropy increase is evil because entropy increase will lead to the disorder of the system; On the contrary, any act of maintaining and promoting the increase of information is good because the increase of information contributes to the stability of the system and makes the system more orderly. [9]

Combining information (as negative entropy) with order, Floridi directly unifies entropy, entropy increase, disorder and disorderliness with evil, and unifies information, entropy decrease, order and orderliness with good, so as to build the foundation of his information ethics.

According to the theory of good and evil in Floridi's information ethics, the degree of good or evil of the living or inanimate can be directly reflected by the degree of its structure (the degree of order); On the dynamic side, the degree of its transformation to evil or good can be directly reflected by the degree of its entropy increase or decrease. [10] Therefore, according to this theory, it can be concluded that the entropy increase of the universe is evil, and the environment with local entropy decrease is good. A strong idea of natural teleology emanates from this definition of good and evil. And it can be deduced that

nature, the universe or the existence have evil essence and the tendency of self destruction.

Wu Kun criticizes Floridi's thought of good and evil. He believes that a reasonable ethical principle should allow seemingly opposing factors to be compatible with one another and maintain a reasonable tension between these opposing factors, such as information and entropy, order and disorder, integrity and reducibility, certainty and uncertainty, determinism and non-determinism, purposiveness and randomness, inevitability and contingency. [11]

There are three main misunderstandings in his ethical theory. Firstly, the concept of information is simply reduced to negative entropy, and it is one-sided to explain information only by the concept of entropy; Secondly, it is one-sided and arbitrary to describe the concepts of good and evil only by entropy decrease and entropy increase; finally, his attempt to impose the concepts of good and evil on nature in a broad sense is a restoration of natural teleology.

Wu Kun's philosophy of information solved the problem of natural value. On the basis of the dual existence and evolution of information and matter, Wu Kun puts forward a theory of nature value and redefines the concept of value: "value is the effect achieved by things (matter, information, including the subjective form of information consciousness) through internal or external interactions." This philosophical definition of value really extends the concept of value to the field of existence, that is, the whole world. Such a definition of value can completely get rid of the debate to distinguish between the so-called intrinsic value and instrumental value in the western world. And it also gets rid of subjective value evaluation and endows existence with value. It can be used as the theoretical basis of the axiology of information ecology. [12]

However, the concept of nature in the axiology of philosophy of information is similar to the concept of existence as well as the concept of nature mentioned by Floridi. It is a broad definition of nature. Information ecological ethics is based on the ecological self-organization system, which is an ethical theory starting from the life community. Therefore, we can not directly use the natural ontology in the philosophy of information and should avoid falling into the misunderstanding like Floridi. The nature mentioned in the information

ecological ethics is a kind of nature in a narrow sense, which only refers to the natural environment in the earth ecosystem, that is, the life community itself.

Conclusion

In the information ecological ethics, we understand the universe the earth ecosystem staying in as the external environment of life community. Life community is an open and relatively independent self-organizing complex system. Although we may talk about the concept of value from the perspectives of existence and universe, we can only talk about ethics, good and evil in the frame of life community. In essence, there is no purpose and good and evil in the universe and existence; at the same time, we do not need to bear ethical responsibility for the whole universe. In fact, we do not have such ability.

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