

Examining the Foundational Possibility of Ethics of Technology – Based on the Philosophically Ontological Turn

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Изучение фундаментальной возможности этики технологии – на основе философского онтологического поворота

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Abstract. With the several important turns of philosophical ontology, that is, from the “Being as what it is” and “Being as what it ought to be” based on the Monistic Ontology, to “Being as demystifying what it is” of the Existence Ontology, and then to the “Being as verifying what it is” based on Pragmatism’s Relational Ontology. The foundations of the contemporary Ethics of Technology transformations are in focus. “Being as what it is” and “Being as what it should be” emphasize good can regulate technological goodness. “Being as demystifying what it is” emphasizes the essence of technology is regarded as the revelation of the world and truth. “Being as verifying what it is” advocates a responsible technology manifests itself in the whole process of technological artifacts motivation, production and verification. However, from the perspective of naturalism, the previous ontology of technical ethics is confined to metaphysics or the category of anthropocentric knowledge, resulting in the gradual decline of the sense of awe of nature, the self-engaging of the subject, etc. From the natural history’s perspective, the Ethics of Technology should focus on the harmony of nature, science and technology and humanity, which can provide a new perspective for the generation of technical ethics.

Keywords: Technical Ethics; Monistic Ontology; Existence Ontology; Relational Ontology; Natural History

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Резюме. С несколькими важными поворотами философской онтологии, то есть от «бытия как сущего» и «бытия как должного быть», основанного на монистической онтологии – к «Бытию как демифологизации того, чем оно является» в онтологии существования; а затем и к «Бытию как к подтверждению того, чем оно является», основанной на реляционной онтологии прагматизма. В центре внимания – основания современных преобразований в области этики технологий. «Бытие как сущее» и «Бытие как должное быть» подчеркивают, что добро может регулировать технологическое совершенство. «Бытие как демифологизация того, чем оно является» подчеркивает сущность технологии, рассматривается как откровение мира и истины. «Бытие как подтверждение того, чем оно является» выступает за ответственную технологию, которая проявляется во всем процессе мотивации, производства и проверки технологических артефактов. Однако, с точки зрения натурализма : прежняя онтология технической этики ограничивается метафизикой или категорией антропоцентристского знания, что привело к постепенному угасанию чувства благоговения перед природой, самозабвению субъекта и т.д. С точки зрения естествознания, этика технологий должна быть сосредоточена на гармонии природы, науки и техники, и человечества : и что может зародить новую перспективу и генерировать новое поколение этики техники.

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Заключение

Introduction

At present, the research on technical ethics is taken mainly from the perspectives of Taoism, normative ethics, naturalistic responsibility theory, functionalism, post-phenomenology, hermeneutics and so on – to explore the path and method of the realization of technical ethics. The naturalism theory of Taoism contributes to the development of technological ethics. For example, Laozi and Zhuangzi both put forward naturalism and technical criticism [Wanqiu Chen, Zhi Yong, 2007]². Scholars represented by J. Heinrichs and M. Stake propose that normative ethics can provide effective moral norms for modern technology, especially artificial intelligence ethics [Heinrichs, 2019; Reijers, 2020; Vallor, 2016; Swierstra & Rip, 2007]³. H. Jonas, however, believes that traditional normative ethics standardizes technology from the perspective of human's purpose, character and technical consequences. This anthropocentrism tendency will accelerate the arrogation of humanized technology over nature and leave hidden dangers for the survival of the earth. Therefore, he proposes to provide an effective interpretation for the possibility of technical ethics from the perspective of naturalistic responsibility theory [Jonas, 1984]⁴. However, other scholars (among them P. Verbeek P.) proposed to suspend Jaspers and Heidegger's discussion on the ethics of technology; and instead make a functionalist evaluation of "what can technology do" in the human community [Verbeek, 2005; Fossa, 2018].⁵ Yoni Van Den Eede points out that post-phenomenology has paid attention to how technology regulates the relationship between people and the world, but more attention should be paid to how technology regulates the relationship between people, so as to reconcile the distance between the "micro" of individual technological practice and the "macro" of social structure [Van Den Eede, 2011].⁶

² Wanqiu Chen, Zhi Yong. Lead technology with Dao – Discussion on Taoist technical ethics [J]. *Journal of Jiangnan Universit*,2007(7,1), pp17–21.

³ Heinrichs J., Stake M. Human Enhancement: Arguments from Virtue Ethics [J]. *ZEMO*,2019(2), pp. 355–373. Reijers W., Coeckelbergh M. *Narrative and Technology Ethics* [M]. Palgrave Macmillan: Cham, 2020, pp. 12-13. Vallor S. *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting* [M]. Oxford: Oxford University Press, 2016, p31. Swierstra T., Rip A. Nano-ethics as NEST-ethics: Patterns of Moral Argumentation About New and Emerging Science and Technology [J]. *Nanoethics*,2007(1), pp. 3–20.

⁴ Jonas H. *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* [M]. Chicago: University of Chicago Press,1984.

⁵ Verbeek P. *De daadkracht der Dingen: Over Techniek, Filosofie En Vormgeving* [M]. Amsterdam: Boom. Translated as *What Things Do: Philosophical Reflections on Technology, Agency, and Design* [M]; by Robert P. Crease. University Park, PA: Penn State University Press, 2005. Fossa F. Artificial moral agents: moral mentors or sensible tools [J]. *Ethics and Information Technology*,2018(20), pp. 115–126.

⁶ Van Den Eede Y. In between Us: On the Transparency and Opacity of Technological Mediation [J]. *Foundations of Science*, 2011(16), pp. 139–159.

W. Reijers and other scholars, however, have proposed technical ethics towards hermeneutics. Reijers argued that the words people use and the stories they tell constitute the basis for understanding technology [Reijers & Coeckelbergh, 2020]⁷. However, with the development of artificial intelligence and biotechnology, the natural breeding mode of human beings has gradually been changed. Human beings from a natural person born from nature to a technical person produced by the intervention of biological technology. How to deal with these emerging technical ethical dilemmas, such as normative ethics, post-phenomenology, responsibility theory or hermeneutics from a single perspective – all this cannot give a complete solution. As P. Boddington puts it that : We can use virtue ethics, but we need to pay attention to whether the virtues of the old world are suitable for the new world we are creating. Consequentialism, which takes avoiding pain and increasing happiness as the criteria for ethical decisions, raises the question of whether technology can produce happiness [Boddington, 2017]⁸. The extension, enhancement and substitution of artificial intelligence for human initiative, reasoning and computing power have brought challenges to moral motives, moral choices and moral judgments advocated by consequentialism, deontology and virtue theory [Boddington, 2017]⁹. In order to explore the best way for the sustainable existence and development of human beings, the research of technology ethics should also investigate the original state of the generation of technology and the way to realize the good of technology from the perspective of Ontology and Natural History.

1. “Being as what it is”

“Being as what it is” emphasizes common good which can regulate technological goodness. If we ask about the Ontology of technology ethics, we need to give a brief explanation of the Ontology. In the context of western philosophy, Ontology is the study of the existence of all beings. At first, Aristotle started the ontological inquiry of technological goodness based on Monistic Ontology.

Aristotle thinks that technology starts with people, but it wants to show the world as an object that can be controlled by a man. The problem is that the world does not start with people. It is impossible for people to control things whose origin is not in himself. Aristotle argued that technological good should be subordinated to the highest purpose good, mainly from his different understanding of technology (*techne*; Greek: τέχνη), practice (praxis) and theory, and that technology tends to overstep

⁷ Reijers W., Coeckelbergh M. *Narrative and Technology Ethics* [M]. Palgrave Macmillan: Cham, 2020, pp. 13–19.

⁸ Boddington P. *Towards a Code of Ethics for Artificial Intelligence* [M]. Switzerland: Springer International Publishing AG, 2017, pp. 67-68.

⁹ *Ibid.*, pp. 29-30.

human beings, which will lead to human self-destruction. Although Aristotle's τέχνη is different from technology in the modern sense, but both deal with things that can be changed and generated. Their purpose is to seek some external products based on production, creation, labor, etc. Because their activities depend on external things, tools or materials – they are not independent and their free activity is at a low level [Bartlett & Collins, 2011]¹⁰.

Practice deals with the activities of communication (ethical or political) affairs, which has intrinsic purpose and guides people to realize harmonious order relations. Theoretical activities are people's contemplation of the natural world, human beings and society (out of hobbies and interests). Theoretical activities are activities carried out within reason, independent of external things and with internal good purpose. Compared with theory, technology and practice have more in common, that is, the subject matter they deal with is variable, and their activities cannot be independent of external things, which makes a precursor explanation that the good of technology is subordinated to the good of purpose.

According to Aristotle, the technical good is subordinated to the supreme end good. Such a position is conducive to the realization of technical ethics. Scholars give different comments on this. Atkinson Paul believes that in the face of the rapid development of technology and its uncertainties, Aristotle's theory of virtue emphasizes that technical actors should have moral character, practical wisdom, and make moral judgments and choices, which are of great help to the realization of technological goodness [Atkinson P., 2009]¹¹. Aristotle regards technology (art, production, making) as a quality, related to production and in accordance with logos [Bartlett & Collins, 2011]¹². In this regard, Atkinson's understanding corresponds to the activity of technology that depends on the tools and materials it uses. It can only show some controllable objects; and it cannot presume the domination over the whole existing world, or the usurpation of human beings themselves. The realization of technical good depends on technical actors with moral character.

On the other hand, Boddington believes that the biggest problem of virtue theory is the teleological explanation of "human goodness" based on human "functions", while the unique functions of human

¹⁰ Robert C. Bartlett and Susan D. Collins. Translated. *Aristotle's Nicomachean ethics* [M]. The University of Chicago Press, Ltd., London, 2011, pp. 1–23.

¹¹ Atkinson P. Ethics and ethnography [J]. *Twenty-First Century Society*, 2009, 4(1), pp. 17–30.

¹² Robert C. Bartlett and Susan D. Collins. Translated. *Aristotle's Nicomachean ethics* [M]. London: The University of Chicago Press, 2011, pp. 119–120.

beings are fundamentally different from artificial intelligence [Boddington P., 2017]¹³. Nevertheless, Boddington affirms the value of virtue theory. Substantively, here, Aristotle argues that the right thing must be done for the right reason and in the right way. At the same time, it is difficult to transfer the ethical decision-making power to the machine – to produce the right reason. In this sense, the realization of technical goodness still depends on the subordination of human purpose goodness.

By contrast, Boddington's critique neglected one important fact that the essences of the real world are given by Nature. In addition, the naturalist essences are "hidden" within the things, in their inherent substances – ingenerate *Dunamis*-potencies [Khroutski & Tasić, 2021]¹⁴. According to Aristotle, the analysis of all the four major natural (physical – *material, formal, efficient, final*) causes is needed – for understanding an organ's function [Tasić, 2017]¹⁵. Essentially, the virtue theory of Aristotle is trying to pursue the harmony of nature. Some contemporary scholars do not pay attention in full to the neo-Aristotelian demonstration of Organicist natural cosmology, thus neglecting the positive impact of this view on technological ethics. We plan to develop this point of view in detail in the coming studies and articles.

2. "Being as what it ought to be"

"Being as what it ought to be" means that moral commands can regulate technological goodness. Kant's explanation of what technology should be is hidden in his explanation of the practical form of "what it should be". In the Kantian context, technical action (probabilistic practical principle), practical action (actual practical principle) and moral action (necessary practical principle) together constitute the different states of practice. According to Kant:

The volition in accordance with these three kinds of principles is also clearly distinguished by a difference in the necessitation of the will. Now in order to make this noticeable too, I believe that the most suitable terminology to use in ordering them is to say that they are either rules of skill, or counsels of prudence or commands (laws) of morality. For only law carries with it the concept of an unconditional and objective, hence universally valid necessity, and commands are laws that must be obeyed, i.e., followed even against inclination"¹⁶.

¹³ Boddington P. *Towards a Code of Ethics for Artificial Intelligence* [M]. Switzerland: Springer International Publishing AG, 2017, p. 102.

¹⁴ Khroutski K S, Tasić M. New Integralist Time: New (True–Organicist) interpreting, understanding and applying of Aristotle's OrganonKosmology–to bringing successes to the contemporary world science [J]. *Biocosmology – neo-Aristotelism*, 2021, 11(1,2), pp. 27–72.

¹⁵ Tasic M. On the classification of animals according to biological functions, after Aristotle [J]. *Biocosmology – neo-Aristotelism*, 2017, 7(3,4), pp. 513–523.

¹⁶ Allen W. Wood. Translated. *Groundwork for the Metaphysics of Moral / Immanuel Kant* [M]. New Haven and London: Yale University Press, 2002, p. 33.

Thereby, Kant abandons the influence of natural emotions on the will; and emphasizes the principle of reason accepted by all.

To prove that technical commands are possible (as it follows from the translation of Allen W. Wood), Kant points out that “How an imperative of skill is to be possible probably needs no particular discussion. Whoever wills the end, also wills (insofar as reason has decisive influence on his actions) the means that are indispensably necessary to it that are in his control”¹⁷. In the *Groundwork of the Metaphysics of Moral*, Kant believes that it is not necessary to explain how a technical command is possible, because reason has a decisive influence on behavior. He who desires an end, will demand, within his means, also the means necessary to achieve it.

According to Kant, “These can therefore in general be called imperatives of skill. Whether the end is rational and good is not the question here, but only what one has to do in order to achieve them”¹⁸. We also find, in this line, Kant’s two other substantive utterings:

1) There is one end, however, that one can presuppose as actual for all rational beings (insofar as imperatives apply to them, namely as dependent beings) and thus one aim that they not merely can have, but of which one can safely presuppose that without exception they do have it in accordance with a natural necessity, and that is the aim at happiness. The hypothetical imperative that represents the practical necessity of the action as a means to furthering happiness is assertoric”¹⁹.

2) there is one imperative that, without being grounded on any other aim to be achieved through a certain course of conduct as its condition, commands this conduct immediately. This imperative is categorical. It has to do not with the matter of the action and what is to result from it, but with the form and the principle from which it results; and what is essentially good about it consists in the disposition, whatever the result may be. This imperative may be called that of morality²⁰.

When a technical action is subject to a “Being as what it ought to be” rule, it eliminates the influence of feeling on the will, excludes the individual's emotional inclination and subjective will, and emphasizes the principle of reason accepted by all.

Boddington argues that Kant had a simplistic understanding of what technology should be [Boddington, 2017]²¹. He points out that Kant was concerned with the responsibility of rational agents, but this does not apply to complex *artificial intelligence* (AI). AI ethics involves transparency,

¹⁷ Ibid., p. 34.

¹⁸ Ibid., p. 32.

¹⁹ Ibid., p. 32.

²⁰ Allen W. Wood. Translated. *Groundwork for the Metaphysics of Moral / Immanuel Kant* [M]. New Haven and London: Yale University Press, 2002, p. 33.

²¹ Paula Boddington. *Towards a Code of Ethics for Artificial Intelligence*. © Springer International Publishing AG ,2017, pp. 13-14.

visibility, and understandability of information, and AI creators have the responsibility to predict and inform relevant risks. If information is not transparent or too abstract, it will violate the ethical code. The realization of technical ethics becomes very difficult.

Bryson and Kime also oppose Kant's abandonment of experiential purposes and guidance of technology from "what it ought to be". They believe that technological products, as specially manufactured artifacts, exist in the target environment set by human beings. If this is ignored, it is difficult to assess or avoid the risks implied by technological products [Bryson & Kime, 2011]²².

3. "Being as demystifying what it is"

According to Heidegger's understanding, the characteristic of his Monistic Ontology is to inquire both into enabling the environment of the being and to forgetting the being. Therefore, Heidegger's Ontology has turned from the Monistic Ontology of Aristotle and Kant to the *Ontology of existence*. Technology is no longer defined by theoretical reason, transcendental or the collection of external materials, nor is it an external system or entity completely separated from human existence.

In Heidegger believing:

...technology is not equivalent to the essence of technology. When we are seeking the essence of "tree," we have to become aware that That which pervades every tree, as tree, is not itself a tree that can be encountered among all the other trees. Likewise, the essence of technology is by no means anything technological. Thus, we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it [Heidegger, 1977]²³.

So, Heidegger criticizes modern technology from the perspective of "Being as demystifying what it is". He regards the essence of technology as the revelation of the world and truth [Heidegger, 1986]²⁴. In the pre-modern period, the relationship between man, nature and technology was placed on the level of existentialism. From trees being my home to trees being used to build houses, when the understanding of trees shifts from survival to tool dimension, trees as resources become an abstract existence. When trees are no longer related to human beings in existentialism but become tool objects, the usefulness of technology dissolves the essence of technology. In the context of modern technology, people pay more attention to the usefulness of technology.

²² Bryson, J. J., & Kime, P. (2011). Just an artifact: Why machines are perceived as moral agents. <https://www.cs.bath.ac.uk/~jjb/ftp/BrysonKime-IJCAI11.pdf>. Accessed 22 Aug 2017.

²³ Martin Heidegger. *The question concerning technology and other essays*[M]. William Lovitt, translated. New York/London: Garland Publishing, INC,1977, p. 4.

²⁴ Martin Heidegger. *Seminare* [M]. Frankfurt am Main: Klostermann,1986, p. 433.

If we examine Heidegger's interpretation of the silver plate, we can find that he proposed that technology has important value for the uncovering of goodness. To make a silver plate, we need silver as material, the idea as form, the silversmith as the driving agent, and the purpose as the goal. The process by which the silver disk is created is the process by which all beings are demystified. Technology can make something exist that does not exist. Technological goodness is no longer defined by a single element, but is accompanied by the whole process of technological demystifying. Heidegger emphasizes:

...modern technology too is a means to an end. That is why the instrumental conception of technology conditions every attempt to bring man into the right relation to technology. Everything depends on our manipulating technology in the proper manner as a means. We will, as we say, 'get' technology 'spiritually in hand.' We will master it. The will to mastery becomes all the more urgent the more technology threatens to slip from human control"
[Heidegger, 1977]²⁵.

A general conclusion can be drawn that the essence of technology in this way lies in *demystifying*, and that technical ethics exercises in the manifestation of "demystifying what it is".

Fabio Fossa believes that Heidegger's interpretation of technology is of great value [Fossa, 2018]²⁶. Although, technology as a tool determines the style of human existence, no matter how complex and advanced it is – it is a tool created by human beings. Technology and technical products are artifacts that can only exist within a framework which presupposition or meaning depends on the purpose set by human beings. It is reasonable to regard technology and even artificial intelligence as the object of moral consideration; while technological products are not moral agents, because they reflect the intention and moral emotion of a designer; and convey the value tendency of the designer.

D.G. Johnson likewise points out that the right way is to view the generation of technological products from the perspective of morality, but it is wrong to think that artificial intelligence is the same as human beings [Johnson, 2011]²⁷. Human beings are the actors who set goals and values, while ARTIFICIAL intelligence is the actor who performs related functions. Although learning machines can be regarded as self-determined entities, it is still an artifact set by human beings, and the

²⁵ Martin Heidegger. *The question concerning technology and other essays* [M]. William Lovitt, translated. New York/London: Garland Publishing, INC, 1977, p. 5.

²⁶ Fabio Fossa. Artificial moral agents: moral mentors or sensible tools [J]. *Ethics and Information Technology*, 2018(20), pp. 115–126.

²⁷ Johnson, D. G. *Computer systems. Moral entities, but not moral agents*. In M. Anderson & S. L. Anderson (Eds.), *Machine ethics*. Cambridge: Cambridge University Press, 2011, pp. 168–183.

embedding of its “self-determination” is different from the self-conscious initiative of human beings. How to deal with this non-identity is not discussed in Heidegger’s works.

4. “Being as verifying what it is”

Faced with the influence of modern physics, Monistic Ontology suffers from the impact of relational functional paradigm. If Monistic Ontology has something in common with traditional physics, that is, they both advocate that “existence precedes evolution, but when physics probes into the existence world into particles... Everything is reversed, evolution precedes existence... Since evolution constitutes the essence of existence, the unchangeable entity in traditional physics is replaced by the relationship and function in modern physics”²⁸. When the relationship and function are regarded as the proof of the existence of beings, the Ontology has a turn from the Monistic Ontology and the Existence Ontology to the Relational Ontology.

Under this influence, Dewey breaks the traditional philosophy’s understanding of theoretical certainty and technical uncertainty, and takes technology as “explorations of techniques, tools and artifacts” [Dewey, 1931]²⁹. Summing up what has been said, Ontology is not an entity external to human beings, but is the “source” of life, history, experience, culture and technology. The result that “verifying what it is” places technological goodness in the production, manufacture and verification of technological artifacts, which overturns the traditional philosophy’s ranking of technology, practice and theory. According to Dewey, both Aristotle and Plato built their idealized theories according to the true and practical skills, but they despised the value of the practice of skills.

John Dewey proposed that “separation of technology and theory is the source and proof of the unbreakable difference between the good of ideas and the good of matter [Dewey,1920]”³⁰. For real, the advancements of technology (technosphere) constantly influences human beings since its appearance in society. The succession of technological generations leads to a change in human body and to transmutation of human cognition. Concurrently, as long as people produce and verify new entities according to their own needs, the idea of “verifying what it is” will have a tendency of anthropocentrism.

²⁸ Wujin Liu. The Revival and Trend of Ontology Research [J]. *Zhejiang Academic Journal*,2002(1), pp46-52.

²⁹ John Dewey, *Art as Experience* (1931) [M]. LW, Vol.10. Carbondale and Edwardsville: Southern Illinois University Press, 1981, p53.

³⁰ John Dewey. *Reconstruction in Philosophy* (1920) [M]. In the Middle Works of John Dewey (1899–1924)], Vol.12. Carbondale and Edwardsville: Southern Illinois University Press, 1982, p. 177.

Dewey regarded technology as an intellectual inquiry into tools or techniques. In traditional philosophy, the emergence of technology means the absence and lack of human ability. Technical raw materials are valued because they can be transformed into useful forms. Because of their variability, raw materials, like technologies, are treated as imperfect “beings”. However, in Dewey’s opinion, technology has the potential or the characteristics of tools, not just because they do not yet exist, but because they can transform the form of existence, can direct the natural and even human forces to the satisfaction of human needs.

5 The turn of natural history

Natural history theory advocates a harmonious coexistence of organic view of nature. It pays attention to the harmony between man and nature, science technology and humanity, and the theory originating from modern natural history. Different from the traditional ontology of the rationalism or anthropocentric dimension, Natural history theory provides the metaphysical support for the industrial technology civilization. Unlike mathematical science, it does not provide formal support for the expansion or enhancement of technology from the computational dimension. It does not interfere with natural order and organic ecological evolution with excessive artificial technology. It goes out of the previous metaphysics, anthropocentric or computation's category of technical ethics ontology, and combines “Being as what it is”, “Being as what it ought to be”, “Being as demystifying what it is” and “Being as verifying what it is”, instead of regulating and criticizing technology from one single perspective.

Every country has its own natural history. After thousands of years’ development, Chinese scholars want to make natural history better serving the survival of human beings. Based on the above idea, Chinese Professor Huajie Liu proposed that natural history is an ancient tradition parallel to natural science. The value of natural history is not entirely judged by science [Huajie Liu, 2017]³¹. In turn, Professor Guosheng Wu from China believes that “Natural History” has two elements [Guosheng Wu, 2016]³². The first element is “History”, which is different from “Philosophy” that investigates the causes and roots of rational knowledge. This is a type of “history” knowledge that focuses on the phenomenological description, naming, and classification of existing things. The second element is “Nature” – the study of natural things, different from Civil History, which is the study of human affairs.

³¹ Huajie Liu. On the Renaissance of Natural History and Future Ecological Civilization [J]. *Academic Frontiers*, 2017(3), pp. 76–84.

³² Guosheng Wu. Natural history: Science of Traditional China [J]. *Academic Monthly*, 2016(4), pp. 11–19.

Professor Xiaoting Liu of China advances the significance of natural history as a principle or program [Xiaoting Liu, Bo Shi, 2014]³³. He pointed out that “the knowledge of natural history comes from the intimate knowledge of individual life, the labor cooperation of the collective or ethnic group, the inheritance of the experience of the ancestors and the classification of knowledge”. Therefore, it has the characteristics of naturalness, nearness, personal involvement, individuality, concreteness and locality, which is different from the artificial experiential characteristics of mathematical science.

A lot of Chinese scholars advocate that people should pay attention to natural history in the future, which is to remind people that if they continue to focus on the utility and function of technology and regard the nature and the universe as objects to be transformed, technology will gradually evolve into a set of economic and political tools. As technology is used to enable human enhancement, humans are constantly adapting technology and changing the world to their own needs. When people begin to worship the modern technology, it will produce the spiritual and cultural disease of the technological age. Technology development cannot solve the ethical dilemma and the sense of spiritual meaninglessness. Based on the theory of natural history, it is particularly important for people to have a sense of nature in awe.

First : science and technology affect people’s cognition and behavior by means of digitization, symbolization and codability. Natural history is not limited to these, but it also respects the natural order from the *internal* connection of organisms. It pays attention to scientific cognition and knowledge accumulation, and focuses on informing people about their living environment through diversified ways in life, culture and history, so as to enhance their sense of awe towards nature. In addition to scientific cognition, objective reasoning, knowledge accumulation and other attributes, natural history also enables people to understand their own living environment and the sense of awe of nature in a variety of ways in life, culture and history.

Second : Natural history helps to diminish individualism. The instrumentalism of technology is a reflection of the “individualism” from the perspective of Monistic Ontology, which means that the viewpoint or behavior taken by a person lacks care for other beings. If my world lacks respect and care for the other, there will be a lack of awareness of co-existence with the other. The misfortune of this ontology is to regard technology and even the other as a tool or means to achieve self-end. From

³³ Xiaoting Liu, Bo Shi. The theory of Natural History – the Program of Natural History and its Value [J]. *Jianghai Academic Journal*, 2014(5), pp. 5–11.

the perspective of natural history, the “subject” is manifested in the contrast of diverse species. In the face of artificial intelligence imitating or even surpassing human intelligence, human beings should not only be aware of their own limits, but also reflect on the parts of human intelligence that can be copied or replaced, and look for the parts that cannot be replaced. Such risks include algorithmic bias, disproportionate harms to vulnerable populations, failures of accountability and transparency, technological unemployment – and even the possibility of existential threats from “superintelligence.” [Schiff, Biddle, Borenstein, & Laas, 2020]³⁴ Looking at the symbiosis between self and all things from the perspective of natural history is helpful to dispel the usurpation of each other caused by the egoism of a subject.

Third : explaining technical ethics based on traditional ontology is useful but limited. For example, the development of new technologies follows utilitarian logic largely which emphasizes the increase of the greatest amount of happiness for the greatest number of people. However, whether technology can produce happiness is questionable. When one is able to decide whether this technology exists or that technology does not, the premise of technical ethics is to ask questions about ‘ought to be’ rather than ‘to be’ or ‘being’. People should realize that they are the members of the natural biological chain. The first prerequisite for the possibility of technical ethics is to ask the question of *ought to be*, rather than the question of *to be* or *being*. If we still believe traditional ontology that human reason can regulate the world and man is the subject or the center of the world, man will be covered by his own hubris.

Last : from the perspective of the integrity of individual life, the realization of humans’ happy life cannot be completely relying on the emerging technologies such as mathematical science and artificial intelligence. It is more useful to draw on the knowledge and experience of “nature and history” than to ask for digital deduction. The development of emerging technologies, especially artificial intelligence, mainly follows a utilitarian logic, emphasizing the increase of the greatest net balance of happiness for the greatest number of people. Instead of caring for the richness, diversity and sustainability of human life from the dimension of coexistence of all things as natural history theory does. The development of new technologies surmounts national and cultural boundaries, which also draws people’s attention to natural history. From the perspective of *natural history*, it is more advantageous to treat human, nature and all things in the world with “harmony and symbiosis”, and

³⁴ Schiff, D., Biddle, J., Borenstein, J. & Laas, K. What’s next for ai ethics, policy, and governance? A global overview. [J] *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society*, 2020: pp. 153-158.

to emphasize individual intimate knowledge, collective cognition and moral sense than to use monism to rule technology.

Conclusion

Technology is not only a means of human existence, but also a part of human self-formation and self-regulation. The development of technology is related to people's perception of technology and the related elements, which makes the mind and technology intrinsically correlative. When technology manifests the connection between man and the world, people's reverence for nature and the integrity of individual life will become the object of perception and care. The discussion of how technology ethics is possible from the perspective of *natural history* – such a discussion can provide a new perspective for addressing the ethical dilemmas of emerging technologies, such as artificial intelligence.

The last : we need to recognize that Aristotle originated cosmology (*Organon*Kosmology, as it is named in the Biocosmological Association), and which is essentially a Biological cosmology [Georges Chapouthier, 2013] . Aristotle's theory of *Four causes* (aetiology), organic Functionalism –*Organicism*, organic Teleology, Bio(cosmo)logical anthropology, social culturology, virtual ethics, biological science and Biological metaphysics (in the vein of neo-Aristotelism), Biocosmology as a comprehensive knowledge (contemporary Organicism and Integralism, that are referentially interconnected with Aristotle's *Organon*Kosmology) have evolved on this basis – all this could (and should) become the major direction for future research [Khroutski, 2015]. Biocosmology (relating to neo-Aristotelism) is ready to realize important contributions to the study of technological ethics, including the artificial intelligence ethics.

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