TRANS-HUMANITIES

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Author(s) : Iljoon PARK

Source : *Trans-Humanities*, Vol. 8 No. 1 (2015), pp. 111–130
Published by : Ewha Womans University Press
URL : http://eiheng.ewha.ac.kr/page.asp?pageid=book10&pagenum=060600
Online ISSN : 2383-9899

Rereading of the Whiteheadian Understanding of Organism in a Trans-Human Age: A Critical Review of the "Extended Mind Theory"[1]

Iljoon PARK (Methodist Theological University)

I. Introduction

The hybridization of humans and machines has become a symbol for a new phase of our civilization that will disclose a hidden aspect of being-human.[2] According to Lewis Mumford, the machine is not opposite to the human. Rather, one can find very human values in the machine, while the waste, loss and exploitation of energy by humans disclose the coldly mechanical actuality of human beings. This means that the boundary between human and machine can be drawn in a different way. For Mumford, the machine can be a mental being that interacts with human culture, because the machine is the society or the social habit in which the machine is used. Mumford argues that slaves who were exploited for building the ancient pyramids, those who were treated as a kind of human-machine to pull the oars in the Roman galleys, the soldiers in the Macedonian phalanx and so on witness the form of machine. With these examples, Mumford says that the machine does not only mean the modern mechanical things. Rather, human civilization has been based upon social organizations, in which human labor has turned into a form of machine by social institutions (75). While ancient civilization was based upon the "mechanization of human labor," modern civilization realized the "humanization of the machine itself" (217). The boundary between human and machine is ambiguous and murky. In this context, when Erik Brynjolfsson

1. This work was supported by National Research Foundation of Korea Grant funded by the Korean Government (NRF-2012S1A5A2A01021030) whose title is "A Hybrid Anthropology of Being-Human in an Age of Trans-Humanism."

2. Cf. Brynjolfsson and McAfee; Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Penguin Books, 2005).

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and Andrew McAfee say that our civilization is already in the Second Machine Age, in which the world is controlled by digital power and in which humans and machines are digitally connected and hybridized (13), the hybridization is not only a modern characteristic but also part of human culture itself.

This paper argues that this human-machine hybridization would be an unrecognized aspect of being-human,[3] which would be gradually disclosed in an age of trans-humanism. For that purpose, this paper tries to reread Alfred North Whitehead's idea of organism from the eyes of trans-humanism, which would be a new definition of being-human. Trans-human and post-human perspectives share "a common perception of the human as a non-fixed and mutable condition," although their interpretations of the prefix "trans-" or "post-" signify different horizons of thought (Ferrando 27). Defining a boundary between trans-humanism and post-humanism is not easy, but here in this paper, the terms will be used in a very general way. The expression "post-humanism" points to an idea of being-human *after* the traditional notion of human being has been questioned, while "trans-humanism" signifies a phase of hybridization of being-human with the non-human, the non-living and the inorganic media. However, the upshot of the post- and trans-humanism discourses is that human 'being' needs to be redefined in terms of our recent technological developments. This paper suggests more. Such a redefinition has to be based upon some appropriate philosophical grounds. However, the trans-humanism discourses still seem to contain a modern notorious legacy of anthropocentrism, which casts its shadow on the theory of the extended mind in cognitive science. This paper argues that Whitehead's philosophy of organism shows a way to overcome the unacceptable modern legacy under the dark clouds of ecological crises.

The same error of trans-humanism discourses also has been made in cognitive science. Cognitive science shows that cognition is a coupling of organism and environment or of the brain and the external surroundings. These days, any model for cognition acknowledges interaction between brain and the world. The models have been developed from computationism or cognitivism through a connectionism model to embodiment. The main development is the acknowledgement of interaction between organism and environment. The

3. The term, *being-human,* is to signify genuinely what is human after the conceptual foundations of human being have been deconstructed. Human being is impossible, but we are still human. Being-human marks such a moment.

mind and the world interact in terms of the bodily medium. However, they are still trapped in a "BRAINBOUND" (original emphasis) model, which regards the body just as "the sensor and effector system of the brain" and the world as "the arena in which adaptive problems get posed in which the brain-body system must sense and act" (Clark, *Supersizing the Mind* xxvii). The theme of this article is that our cognition extends beyond the biological boundary of the body and the skull. In fact, the body, the brain and the world are complementary to each other. For example, the bodily orientation of a dancer is "continuously affecting and being affected by her neural states, and whose movements are also influencing those of her partner, to whom she is continuously responding" (24). Indeed, cognition is none other than "structural coupling that brings forth a world" (Varela et al. 206). As a matter of fact, all our activities for living are "the coupling with an environment" (195). Due to this feature of structural coupling in cognition, the human hybridizes with the non-human to arise in a new world. However, this paper criticizes the theory of the extended mind in that a kind of modern humanism or anthropocentrism still lurks in Andy Clark's notion of human beings as natural-born cyborgs. It is because Clark sees the hybridization of the human and the machine as "supersizing the [human] mind." This is not a re/definition or new construction of being-human. Rather, it is the intensification of modern anthropocentrism with the prefix 'trans-,' under which all forms of hybrid beings have been suppressed (Latour 49–90). Almost all forms of trans-humanism discourses have made this violation. Trans-humanism can be a philosophical resolution to redefine being-human beyond the modern anthropocentrism, as Nietzsche already did with his notion of the Overman (*der Übermensch*), but post-humanism is still trapped in it. To overcome the modern anthropocentrism in cognitive science, especially in Clark's theory of the extended mind, this article argues that trans-humanism should be redefined by Whitehead's notion of organism, which will help the theory of the extended mind from falling back into the modern error again.

Ⅱ. Whitehead's Trans-Humanistic Notion of Organism

Whitehead's philosophy of organism contains a seed for a philosophy of trans-humanism, which means that human *being* crisscrosses the existing boundary between human and non-human, between living and non-living, and

thus goes beyond the conceptual boundary of being-human by hybridizing with non-human extensions. In fact, the commonsensical boundaries of human/non-human and living/non-living derive from the modern philosophical error of the "bifurcation of nature," in terms of which nature is thought of two unrelated substances of mind and matter (Whitehead, *The Concept of Nature* 30). Western philosophy has regarded them as different substances, each of which has to be dealt with by different principles. Thus, nature is divided into two different natures. This is the error of the substance philosophy that has dominated Western philosophy for the past two thousand years. Substance philosophy violates the principle of coherence because two substances require two explanations for two different systems. It means that the mind cannot explain matter, and vice versa. There is no way to explain coherently mind and matter, and this is the violation of the explanatory principle of coherence.

For philosophy to have its explanatory coherence, says Whitehead, nature cannot or should not be divided into two natures. In his famous statement, Whitehead says with regard to reality, "all our sense-perceptions are in the same boat, and must be treated on the same principle" (*The Concept of Nature* 44). This means that nature does not have two principles dealing with two different substances (mind and matter). To get out of the substance-based way of thinking, Whitehead seeks for "the sorts of relations which [the] entities of various kinds can bear to each other" (49). These relational features of things are termed "relata" (50). Nature and mind consist of relata. All things in the universe happen out of their relations. However, when one looks around the surrounding world, this relational feature steps back behind perception. Instead, one sees only so-called "objects." This is so because all events are "named after the prominent objects situated in them, and thus both in language and in thought the event sinks behind the object, and becomes the mere play of its relation" (135). The common difficulty of philosophies is their failure to recognize "the ultimate fact of multiple relations" (150). To recognize relation, one has to get out of the substantial way of thinking, because any attention to an object hides the relational features of being by making the subject focus more on the object and infer the relations of the object as derived from the attributes of the object. At the bottom of such a way of thinking, there lies the notion of the bifurcation of nature.

The fact of the relations derives from a general fact that everything is in process. The general fact refers to "the creative advance of nature," which consists of a series of events (Whitehead, *The Concept of Nature* 178). Things

we recognize as objects are in fact certain series of events related as a nexus. Thus, any fact in nature appears as an event, which is nothing other than "the relation of extension" (75). This extensional relation refers to "the things related by the relation of extension," and it witnesses the continuity of nature, which is none other than "the continuity of events" (75, 76). Everywhere in nature which is in process, there is event. The most elementary fact of the world is event, but this eventual feature does not get prominent attention because one perceives the world through object-centered cognition. We human beings are accustomed to seeing the world through objects, not in terms of events. The eventual feature of nature discloses the relational feature of things. Relation determines what things are and who we are. However, relatedness has been regarded as a product of the attributes of the substantial essence of things. This is the main failure of Western philosophy.

Here, it is very important to note two facts, that every event "contains other events as part of itself" and, thus, that it is "a part of other events" (Whitehead, *The Concept of Nature* 76). In other words, every event in nature contains each other and becomes a part for each other. This co-belonging has not been much noticed because one sees the world through the erroneous perspective of simple location, which derives from the "fallacy of misplaced concreteness," thus "mistaking the abstract for the concrete" (Whitehead, *Science and the Modern World* 51). In other words, the fallacy of simple location refers to the modern philosophically erroneous belief that a thing simply exists here, not anywhere else. However, every actual entity in the universe is constituted by an event, in which actual occasions contain each other through their respective prehensions, which are the events. It means that one cannot say that a thing is simply here or there and not anywhere else. Then, where is it? It may be here and there. An actual entity or an event is both one and many. The prehension interlocks all actual entities, and things are everywhere in the interlocked relations of the prehensions. In this sense, "everything is everywhere at all times. For every location involves an aspect of itself in every other location. Thus every spatiotemporal standpoint mirrors the world" (91).

Then, how do we define a thing "without recurrence to the concept of matter in simple location" if an event is related to everything existing (102)? As a matter of fact, an event is "the grasping into a pattern of aspects" from the surrounding environment (119). Whitehead describes this as "the appropriation of the dead by the living," which means an "objective immortality" (*Process and Reality* xiii). In his words, "what is divested of its own living immediacy

becomes a real component in other living immediacies of becoming" (xiii–xiv). In a series of becoming, an antecedent event is passed on to the subsequent one, which objectively inherits the contents of the former.[4] This means that the following event inherits the relational features of the former. Because everything in the universe is related, the relatedness of an event can be extended over all throughout the universe. The only difference is the degree of relatedness. However, an event from its subjective perspective contains the universe through its extensional relatedness. Then, one can say that an event is a universe. This does not mean that the universe is just one event. Rather, every event in the present moment respectively realizes the universe within itself through its extensional relationality. In this sense, our universe is like "multiple space-time systems" (Whitehead, *Science and the Modern World* 122).

An event here is termed "*locus standi*," which is "the percipient event" (Whitehead, *The Concept of Nature* 107). This can be described as "the bodily life of the incarnate mind" (107), which means that the body is not merely a material aggregation of flesh and bones. Rather, the body is a plan of the whole constituting the bodily life, according to which electrons in the body behave differently from electrons outside the body. This means that the body is "a portion of the environment" for the electrons (Whitehead, *Science and the Modern World* 149). Our experience of the body is none other than "the modification of molecules in the body as the result of the total pattern" (149–50). In other words, the body is an in-between boundary of the mind and the environment. The body is not a substance but the harmonious realization of the events. From the eyes of an event, the inside and the outside of the body do not matter. However, as a higher society of events, the body has its own subjective plan, which regulates its subprocesses for the well-being of the whole. As this plan for the whole, the body shows its own subjectivity. Yet, in itself, the body does not have any substantial existence because it, after all, consists of events under its name. Into this part-whole relation, the term "organism" is introduced. The body discloses the mechanism of organism.

For Whitehead, "organism" is "a 'generic' notion" for "the complete expression of what takes place" (Stengers 128). Although the term "organism" has a biological connotation, the application of the notion in Whitehead is not

4. For Whitehead, this is "the creative advance of the world," and this is the irreducible stubborn fact consisting of "the becoming, the perishing and the objective immortalities" of things passing (*Process and Reality* xiv).

confined only to the biological dimension of being. For example, an electron is an organism in Whitehead's sense. It means that Whitehead goes beyond the modern boundary of the organic and the inorganic. For him, organism is "not an explanation of life but a characterization of the order of nature itself" (Stengers 129). Thus, the first reference to organism appears not with regard to biology but to physics or quantum theory. Nonetheless, organism is not a physical being or substance, but it rather appears "in the context of a factory, its workers, its stockholders, its executives, and its environment," each of which exhibits the cases for the term (140). The concept of organism works like an *interface* between the inner process of the organic society and the environment, and it is thus a temporary and fluid boundary between the inner and the outer.

Things existing have their endurance, such that they are "limited, obstructive, intolerant, infecting its environment with its own aspects" (Whitehead, *Science and the Modern World* 94). Put in other words, things, such as organisms, "modify their environment" (205). It is due to the feature of an event "as drawing together into its own limitation the larger whole in which it finds itself" (94). This drawing together of the aspects of all things into their own affects the surrounding events, and they respond (or feed back) to the event. Here, the term "infection" is equal to "modification." It can be expressed as "the success constituted by all endurance in a changing world" (Stengers 158). However, this infectious drawing together is not a mere fusion but "a valorization, a determinate shaping, conferring a value—that is, a role—on what is prehended" (158). This can be termed a "coupling" of the inner events and the environment. According to Isabelle Stengers,

> Infection designates the way in which the modes of prehension are reflected for each other, and success implies a co-adaptation of values. When a being endures, what has succeeded is a co-production between this being and 'its' environment. This environment is nothing other than the totality of beings taken into account and valorized in a determinate way, and each of the valorized beings prehends the taking-into-account of which it has been the object, the role that has been assigned to it, in a way that is not incompatible with the maintenance of this mode of prehension, or of this role. (158)

Here infection is close to "the rather peculiar effect of communicating directly with the possibility that what is holding together may cease to hold together"

(163). Put differently, organism in Whitehead refers to the way to connect *ethos* and *oikos*. The term "ethos" means the way that an organism takes its environment into account. The term "oikos" points to "the vaster totality to which [the organism] belongs, and more precisely the many links, niches, and collectivities produced by the *ethos* that mutually imply one another, and on which each depends in one way or another" (Stengers 164).

What does this mutual inclusion of organism and environment mean? Here one should note again that this organism is not biological. Thus, the desk I am working at is prehending me prehending it. That is, Whitehead's organism is ambiguously between the living and the non-living, between the organic and the inorganic. In this ambiguous in-between space, the organism shows a possibility for a creative coupling of the inner processes in the body and its environment, making it possible to hybridize with the events outside. In this sense, Whitehead's notion of organism has a connotation for the trans-human world, in which human organism crisscrosses and hybridizes with the inorganic technological media. Whitehead's criticism of the modern notion of simple location is very relevant to our 21st smart century, in which people are wired and connected and thus exist multi-located, whether in the virtual or in the actual worlds. The boundary of an organism, that is, the body, is not a relatively independent wall of an agent, but is really fluid and ambiguous, prone to be hybridized with others. These features of fluidity, ambiguity and hybridity can have some messages for this smart world, in which human and machine are entering the second stage of hybridization. This may be the modern unconscious dream the moderns never achieved due to the erroneous notion of the bifurcation of nature (Latour 140–41). However, Whitehead's theory of organism is never an attempt to extend the image of the human mind over nature. Rather it is to de/construct any human-centered systems of thought in that his basic unit of being, that is, an actual entity, is never a human. It is a very small process of becoming, which is prehension, in comparison to that of a human being. It may be as small as an electron, but it contains the whole of the universe in its prehension. Due to this feature of prehension, in which every other actual entity co-belongs to each other, the hybridization of beings takes place. Thus, the hybridization of humans and machines derives from the fundamental feature of nature, not from unique 'mental' feature of humans. Further, the most profound feature of being-human is not mental but natural. The process of nature embraces mental process, but the mind does not supersize over nature, which is always

the hybridization of the mental and the physical.

Ⅲ. Clark's Theory of the Extended Mind

The theory of the extended mind argues that brain and environment form a couple and that this coupling makes the mind extend over the outer world. In other words, the physical environment can be "parts of the mind" (Clark, *Supersizing the Mind* x). This thesis implies that the boundary between mind and world is "far more flexible than one might have thought" (x). How can we define a boundary between the mind and the world? In other words, "where does the mind stop and the rest of the world begin?" (220). On the one hand, according to our commonsensical understanding, there is clearly a division between the mind and the world. It means that the mind is within the skin and the skull, that is, in the body. The world is outside the body, outside the mind. This is called the internalism of the mind. On the other hand, the meanings of our language do not only stay in our head. They are externally communicated. That is, they are externalizing the mind. This is a kind of externalism. However, Clark and David Chalmers take a third position: "an active externalism," "a very different sort of externalism" (220). When playing a Tetris game, one physically rotates falling geometrical shapes on the screen or mentally rotates the image to check the fit. Here, the physical rotation of the shapes on the screen is equal to the mental rotation of the images in the brain. The screen functions as part of the cognition processes. In this process, a "part of the world" is "part of the cognitive process" (222). That is, the cognitive process is not just in the head or the brain.

The active externalism appreciates that "the human organism is linked with an external entity in a two-way interaction, creating a coupled system that can be seen as a cognitive system in its own right" (Clark and Chalmers 222). The human cognitive processes include externally surrounding entities that are utilized for the purposes of the cognitive processes by forming a coupling of the cognitive processes and the external entities. For example, when one uses a calculator, one does not use brain energy for calculation, because the calculator does the job instead. According to Clark and Chalmers, the coupled process is literally equal to "a cognitive process" (222). In short, human cognition works in a way to form a couple between human organism and the external environment surrounding it. This means that the environment or the

world is not merely and passively recognized by human cognition. Rather, the environment (or world) plays an active role in human cognition. Thus, when there is a change in the environment even without any change of the internal cognitive process, human behavior may be completely changed. It does not simply mean that external change can affect the internal processes. Rather, any internal or external change already affects our way of living. Everything in nature is "in the same boat, to sink or swim together" (Whitehead, *The Concept of Nature* 148). Writing something on a paper is not simply an external behavior, reflecting the internal process of the mind, but is "part of thought" already "continuous with processes in the environment" (Clark and Chalmers 223).

To illustrate the points of the extended mind, Clark and Chalmers introduce a virtual case of patient Otto. Patient Otto has suffered from Alzheimer's disease and lost his capacity for long-term memory. In order to overcome his handicapped condition of memory, he utilizes his hand-written records in his notebook. Otto carries the notebook with him everywhere he goes. When he finds some things to remember, he opens the notebook and writes them down. For him, the notes that he writes take "the role usually played by a biological memory" (Clark and Chalmers 227). One day, Otto heard about the exhibition at the Museum of Modern Art and decided to go there. According to the information he wrote down in his notebook, the location of the Museum is on 53rd Street. Naturally, he believed that the Museum is on 53rd Street because his notebook showed that it is there. In this case, the written information in the notebook works "just like the information constituting an ordinary non-occurrent[5] belief" (227). That is, the information in the brain and that in the notebook work in the same way. The only difference is the location of the information: in the brain or in the notebook. Of course, some might say that Otto's belief would disappear if he lost his notebook. However, it would be the same case if we lose our memory about things; things that we should not forget. When one does not remember the thing, it is like something non-existent. The difference between Otto and normal people with a standard capacity of memory is that Otto's memory capacity relies on his notebook, which is outside his brain, while normal people's memories are in their brains. What matters is the role the information plays for the agent. For

5. Ordinary belief does not occur or take place but it is rather given to us through culture or learning. In this sense, Clark expresses ordinary beliefs as "non-occurrent."

Clark and Chalmers, there is no reason to give priority to the information in the brain over that in the notebook.

The point about Otto's case is that his internal brain process and his notebook "constitute a single cognitive system" (Clark and Chalmers 230). In other words, the brain and the notebook are structurally coupled, and the notebook functions as Otto's extended memory. However, the external media do not simply work to serve the brain. They are structurally parts of the mental process. To give another example, Clark introduces Richard Feynman's case, in which he is mentally working, writing down on paper with his pen. Here the paper is "not simply a record or representation of his inner work, but really his working" (Clark, *Supersizing the Mind* xxv). Clark actually regards the paper as Feynman's "thinking on the paper" (xxv). By saying "thinking on the paper" instead of working on the paper, Clark wants to point to the inseparable functionality of the cognitive circuitry between the paper and the brain of Feynman. The circularity discloses "the outward loop as a functional part of an extended cognitive machine" (xxvi). This tool-using activity of the mind literally extends "the machinery of mind out into the world—as building extended cognitive circuits that are themselves the minimal material bases for important aspects of human thought and reason" (xxvi). Also, writing can be "a medium" to couple the thinking and the world together (126). This loop of tool-the-body-and-the-world indeed "*supersize*[*s*] the mind" (xxvi). The bodily gesture also exemplifies this. When one explains or thinks about something that does not easily come out, one often uses some bodily gestures. Here, the act of gesturing is "not simply a motor act expressive of some fully neutrally realized process of thoughts" but "part and parcel of a coupled neural-bodily unfolding that is itself usefully seen as an organismically extended process of thought" (125–26). That is, the bodily gestures are not the expressions of the inner thinking, but the thinking process itself. Gesture is "both a means by which thought is accomplished and an aspect of mind—an aspect of the thinking itself" (129). In this sense, gesture is "both a systemic output and a self-generated input that plays an important role in an extended neural-bodily cognitive economy" (131). In this sense, human minds hybridize with the world, and it is on the same train of thought "structured and informed by our body-based interactions with the world around us" (xxvi).

Our thinking and cognition significantly depend "upon the ongoing work of the body, and/or the extraorganistic environment" (Clark, *Supersizing the Mind* xxviii). In this sense, Clarks calls this model of cognition "extended,"

according to which cognition "include[s] inextricable tangles of feedback, feedforward, and feed-around loops: loops that promiscuously criss-cross the boundaries of brain, body, and the world" (xxviii). This means that the local works of the mind are "not all in the head" (xxviii). Indeed, cognition "leaks out into body and world" (xxviii). In other words, "individual human thought and reason are not activities that occur solely in the brain or even solely within the organismic skin-bag" (xxviii).

Can the body be the source of identity when the mind leaks out, such that it disrupts the normal boundary of identity? Our sense of embodiment is also negotiable, given that "the use of simple tools can lead to alterations in that local sense of embodiment" (Clark, *Supersizing the Mind* 31). When the blind use a stick to figure out the surrounding environment, they report, "we feel as if we are touching the world at the end of the stick, not […] as if we are touching the stick with our hand" (31). Here the stick can be said to be "incorporated" into "a temporary whole new-agent-world circuit" rather than an aiding prop or tool (31). This "stick-augmented perception" creates "whole new agent-world circuits," and, in this sense, the stick becomes part of "an extended or enhanced agent confronting the (wider) world" (31). In another experiment, blind subjects were fitted with head-mounted cameras whose outputs were connected to the grid on the skins of the backs of the subjects. At first, the subjects just felt some "tingling sensation" under the gird (35). After spending some time with the equipment, the subject started to "report rough, quasi-visual experiences of looming objects and so forth" (35). With the head-mounted and the grid-connected camera, the blind subjects were able to 'see' the world with "over 95% accuracy" in perceiving human faces and rolling balls (35). It reveals that the boundary of the body can be negotiable and even extended by incorporating new bodily and sensory equipment. With this, Clark suggests that we human beings are "not just bodily and sensorily but also *cognitively* permeable agents" (40). These cases witness that nonbiological tools and structures can "become sufficiently well integrated into our problem-solving activity as to yield new agent-constituting wholes" (40). These also anticipate a great possibility of "wearable computing and ubiquitous information access" (41).

In this sense, the theory of extended minds argues that the mind can be "realized, in part, by structures and processes located outside the human head" (Clark, *Supersizing the Mind* 76). In fact, the extended mind theory witnesses "hybrid systems displaying novel cognitive profiles that supervene on

more than the biological components alone" (99). This perspective enables us to use the world as a form of the "extended" capacity of the brain. In this way, the human cognitive process "loop[s] into the environment surrounding the organism" (111). Thus, the brain, the body and the world are the participants in each other.

Ⅳ. The Hybridization of Beings or the Hybridized Humans?

Clark indeed extends his theory of the extended mind over the image of being-human and boldly describes contemporary human beings as "natural-born cyborgs." A cyborg has been thought of as "combining flesh and wires," that is, of the human mind with nonbiologically enhanced bodily structures (Clark, *Natural-Born Cyborgs* 5). The cyborg was a cultural icon of "human-machine hybrid" in the 20th century (5). However, Clark boldly suggests that human beings are already symbionts of "human-technology" and that we are already cyborgs (3). This means that the thinking and reasoning systems of human minds are "spread across biological brain and nonbiological circuitry" (3). Thus, our understanding of human nature is in transition. Human beings are from the beginning "natural-born cyborgs." The "hybridization" of the biological brains and the nonbiological circuitries is not merely a modern development but "an aspect of humanity, which is as basic and ancient as the use of speech and which has been extending its territory ever since" (4). Speech and written texts, and recently digitally encoded media texts and contents and so on, all these constitute "a cascade of 'mindware upgrades': cognitive upheavals in which the effective architecture of the human mind is altered and transformed" (4).

The difference between human beings and other animals does not lie much in their neural and bodily resources. Rather, the instruments human beings use function like some external extension of the human mind and body. For example, one can feel something like brain damage when work files stored in one's computer are lost even without any physical damage to the brain. All of one's notes were made in the files, without which one does not even remember exactly what was done. What if his computer breaks down all of sudden and all of his records are lost? This loss functions like brain damage for contemporary humans. This is so because the human brain extends its ability over the bodily boundary and utilizes external nonbiological media as extensions of the brain.

For Clark, the distinctiveness of the human brain lies in its "ability to enter into deep and complex relationships with nonbiological constructs, props, and aids" (*Natural-Born Cyborgs* 5). This marks a stage beyond "*homo faber*," or human being the toolmaker. When one multiplies large numbers, one often uses pen and paper to store the intermediate results *outside the brain*. When this happens, the brain seems to "dovetail its operation to the external symbolic resource" (6).

Indeed, human beings have always been "adept at dovetailing our minds and skills to the shape of our current tools and aids" (Clark, *Natural-Born Cyborgs* 7). Further, these external tools and aids start dovetailing back to human beings, then the tools and aids become "more like part of the mental apparatus of the person" (7). When the brain and the world form a couple via external (digital) apparatus, it would become extremely difficult "to say where the world stops and the person begins" (7). These days, "the line between biological self and technological world" is fluid and ambiguous (8). Clark gives a description of such an example:

> Everywhere I turn there are people with phone to ear, or punching in text messages using the fluent two-thumbed touch typing that is the badge of the younger users. Some, with fancier handsets, are using the phone to surf the web. This town is wired.
>
> Not only is it wired. Half the people aren't entirely where they seem to be. I spent last Christmas in the company of a young professional whose phone was hardly ever out of his hands. He wasn't using the phone to speak but was constantly sending or receiving small text messages from his lover. Those thumbs were flying. Here was someone living a divided life: here in the room with us, but with a significant part of him strung out in almost constant, low-bandwidth (but apparently highly satisfying) contact with his distant friend. (9)

In this wired town, the "I" is connected to everywhere via the digital network. The "I" is not simply located here or there. The "I" may be everywhere, that is, wherever I am connected through the network. The notion of simple location totally breaks down. Moreover, the connectedness creates another virtual reality for the extended mind. In this wired world, the boundary between beings is ever more fluid. Over the fluid and amorphous sense of identity boundary, embodiment offers a sense of the subject. Our sense of embodiment

is dependent upon the boundary that the so-called "I" can control. That is, the direct experience of control and responsiveness is "a major factor in the creation of our sense of bodily presence" (131). Who we are is "in large part a function of the webs of surrounding structure in which the conscious mind exercises at best a kind of gentle, indirect control" (174). Traditionally, human beings have known two pathways of power: action at a distance and action by contact. As the modern history witnesses, the modern period totally ignores the former, action at a distance, although Isaac Newton proved this to be a gravitational force, and in this way, he implicitly argued that the universe is the organ of God. However, in this wired town, the old notion of action at a distance is revived in a form of virtual network. A smartphone user can send a decision to a colleague on the opposite side of the globe through text messages or messenger apps. Given that the boundary of a subject arises with the perimeter of the subjective influence on other(s), this global network generates the global "I," and the sense of embodiment becomes global but cloudy and murky, because it may be really hard to pin down the location of the "I" within this global network. The sense of the "I" leaks out through the global network, and the "I" exists everywhere in the network. In this way, the "I" hybridizes itself with the digital networks. In this sense of the "I," any dyad of human and non-human, of human and nature, of human and artificial does not work. We are hybridized beings. The boundary simply marks the arena of the "I's" control.

> We must recognize that, in a very deep sense, we were always hybrid beings, joint products of our biological nature and multilayered linguistic, cultural, and technological webs. Only then can we confront, without fear or prejudice, the specific demons in our cyborg closets. Only then can we actively structure the kinds of world, technology, and culture that will build the kinds of *people* we choose to be. (195)

What a Whiteheadian world of organism! Is it really? Clark's "natural-born cyborg" just looks like Whitehead's organism in its hybridization with non-living. However, there is a fundamental abyss beyond which Clark must pass: humanism. All the examples of hybridization Clark presents are about human beings with non-humans via the extended mind. The kind of humanism or anthropocentrism hidden in Clark's natural-born cyborg can be at once disclosed by asking: Can the animal mind hybridize with the non-

living? Here, Whitehead's philosophy of organism can show a path beyond humanism. Although "everything is everywhere" in Whitehead's philosophy (*Science and the Modern World* 91), prehension is never a human mind, but an actual entity in terms of its prehension of all other entities in the universe. The supersizing mind in Clark is also everywhere in terms of networks and hybridization. However, it is always 'mega-sizing' the human mind in that the animal mind never does that. The organism Whitehead shows presents its co-belonging with other beings in the universe. It does not necessarily mean a human organism, not even to say a biological one. Clark never explains why the human mind's ability to extend is possible at all. He just says that the human mind is inherently extending and hybridizing with the nonliving. Although he emphasizes the hybridization of the mind with physical beings, citing Martin Heidegger's *Zuhandenheit*, Clark could not explain why the human mind, not the minds of other animals, can be extended and hybridized. In this context, Whitehead's philosophy of organism offers the explanation Clark needs by the fundamental feature of organism as co-belonging in its own event of being. Further, Whitehead's philosophy anticipates that living beings including human beings can be prehended by nonliving beings, for his organism comprises all the levels of beings from quantum-mechanic beings to the highly spiritual organism, God. This is the missing part in Clark's natural-born cyborg. In this sense, Clark's natural-born cyborg needs Whitehead's organism to be a philosophy for this trans-human world, because the trans-humanism should mean any effort to go beyond anthropocentrism, which has been the mistake of the modern arrogant human self to bifurcate nature and thus to suppress any hybridized beings.

V. Conclusion

The humanism of the modern period never catches an idea of genuine being-human. A human being is not an object or a substance consisting of elementary matter, but event(s). The boundary of being-human has been altered and ever expanded along with the development of civilizations. Thus, Bruno Latour says that we have to take the human out of the injustice of humanism and "relocate the human" (136), for the boundary between the human and the non-human is "belated" to designate the emergence of a new human "in the pass, in the sending, in the continuous exchange of forms" (137,

138). This emergence marks the event, in which the genuine side of being-human discloses itself: trans-humanism. Human being is human only in its trans-human en-act-ing. This paper argues that hybridization is one of the important characteristic of trans-humanism.

> As identity becomes fluid, embodiment multiple, and presence negotiable, it is the perfect time to take a new look at who, what, and where we are. New kinds of human-machine symbiosis will, without a doubt, alter the way we see ourselves, our machines and the world. (179)

The denial of the notion of simple location does not imply a multiple location of being. Rather, our form of being in this wired world can be overlayered and overlapped. In other words, our embodiment can be multiple (194), and this multiple embodiment may generate the social complexity of the related networks. Does this mean "socially extended cognition" (Clark and Chalmers 231)? There is no reason to deny this. The only caution is that socially extended cognition should not be confined to human and living entities. This kind of error is still hidden in Clark's theory of the extended mind and his fresh notion of the human being as a natural-born cyborg. This is where Whitehead's thought of organism can help us to prevent being trapped in the hidden humanism in the guise of trans-humanism. His organism is not confined to the human or living being. Even an electron is an organism prehending the universe in terms of its own event. The thought of trans-humanism is not the evolution of human beings into a new stage, but a way to disclose the genuine aspect of being-human as one of many organismal beings in the universe. Through the organismic mode of being, we humans and nonhumans, living and nonliving, can feel each other, recognize each other and dream of each other. This is the real trans-human world, in which all beings harmoniously exist.

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Abstract

We live in a wired town, in which humans and machines mutually generate new forms of 'beings.' This is called a transhuman age, in which humans and machines are hybridized as digitally connected to each other. In fact, we humans entered into this transhuman realm a long time ago. Humans are the beings to use tools, with which humans extended bodily capacities and overcame predators. The paper traces the idea of transhumanism back to the notions of philosopher Alfred North Whitehead, who showed that being or all beings living and non-living are organisms. In his philosophy, the paper senses a scent of transhumanism. The mutual prehension is like a mutual hybridization. The theory of extended mind by Andy Clark and David Chalmers witnesses this hybridization of human and machine. The future orientation of this hybridized world is totally up to us in the present, depending on how we understand and take steps to prepare for the future. However, our commonsensical and dyadic understandings of nature/culture, human/nonhuman and living/nonliving become significant stumbling blocks on the road. This paper just tries to show how we, humans and machines together, are after all one, to sink or swim together. However, Clark's idea of human beings as natural-born cyborgs still contains a modern error of anthropocentrism. Thus, a trans-human philosophy for new beings needs to be a philosophy in which all beings, living and nonliving, are equally prehended. This article argues that this is Whitehead philosophy of organism.

Keywords: trans-humanism, A. N. Whitehead, organism, A. Clark, the theory of the extended mind, hybridization

Iljoon PARK is a Researcher/Lecturer at Methodist Theological University, Seoul. His research interests have focused upon the subjects of being-human in contemporary philosophies, cognitive science, evolutionary theories, evolutionary psychology, artificial life and so on. His main publications include: "An Ontology of the Between in Evolutionary Theories: The Ontology of Event in a Post-Human Age" in Korean (2014); "Evolutionary Theory and the Ontology of Event: Post-Human Implications of Evolutionary Theories" in Korean (2014). He also co-authored *A Philosophy of Scared Nature:*

Prospects for Ecstatic Naturalism (2014).
Iljoon85@gmail.com

Received: 14 January 2015
Reviewed: 23 January 2015
Accepted: 25 January 2015