

East Asian Voices on Science and the Humanities

Editorial & Introduction

with Willem B. Drees, “*Zygon Goes Global: East Asian Voices*”; and Thomas John Hastings, “*Extending the Global Academic Table: An Introduction*.”

Where Are We?

with CHEN Na, “*Why Is Confucianism Not a Religion? The Impact of Orientalism*”; KAMATA Toji, “*Shinto Research and the Humanities in Japan*”; KIM Seung Chul, “*Religion and Science in Dialogue: An Asian Christian View*”; and LEE Yu-Ting, “*East Asia and Human Knowledge – A Personal Quest*.”

How Did We Get There?

with HSU Kuang-Tai, “*Science and Confucianism in Retrospect and Prospect*”; SI Jia Jane and DONG Shaoxin, “*Humanistic Approach of the Early Protestant Medical Missionaries in Nineteenth-Century China*”; and ZHAO Aidong, “*American Missionaries Transmitting Science in Early Twentieth-Century Eastern Tibet*.”

East Asian Engagements with Science

with Thomas John Hastings, “*Kagawa Toyohiko (1888–1960): Witness to the Cosmic Drama*”; INAGAKI Hisakazu, “*Kagawa’s Cosmic Purpose and Modernization in Japan*”; HYUN Woosik, “*An East Asian Mathematical Conceptualization of the Transhuman*”; KANG Shin Ik, “*Jumping Together: A Way from Sociobiology to Bio-Socio-Humanities*”; FUKUSHIMA Shintaro, “*Multilayered Sociocultural Phenomena: Associations between Subjective Well-Being and Economic Status*”; and SHIN Jaeshik, “*Mapping One World: Religion and Science from an East Asian Perspective*.”

AN EAST ASIAN MATHEMATICAL CONCEPTUALIZATION OF THE TRANSHUMAN

by Hyun Woosik

Abstract. This study explores the transhuman from an East Asian perspective. In terms of cognitive science, mathematics, and theology, we define the transhuman system as characterized by (1) transcendence, (2) extension by compactification, and (3) *samtaegeuk*. Compactification is conceptualized here in mathematical terms, as adding one or more elements so that a system becomes more complete—as one might join both ends of a line, and thereby create a circle. We assert that the East Asian transhuman could be defined as a three-point compactification: (1) as an extension of biophysical objects and events such as robots, cyborgs, and environments (Earth); (2) as an extension of culture, science, and art (Human); and (3) as an extension of

Hyun Woosik is Professor of Christian Studies, Hoseo University, Cheonan, Korea; e-mail: godel@hoseo.edu.

the interaction between the human and Cosmic Absolute such as in religions. Such a notion of the Transhuman might be associated with God, but any description of God, the Absolute Infinite, will apply to something less than God.

Keywords: absolute infinity; compactification; East Asia; God; *samtaegeuk*; singularity; transcendence; transhuman

Why does society need both the sciences and the humanities? Because we live in techno-scientific environments as well as in the natural world. To understand humans and these worlds that exist around humans, we require both instruments as a pair of overlapping lenses for the natural and artificial realms. In short, we are (1) biological beings, (2) cultural beings, and (3) technological beings (Drees 2015b). In terms of biology, the human as a species *sapiens* (wise) of the genus *homo* (man) simply emerges from the given environments. In terms of culture, the human is described as *homo scientificus* (of science), *homo religiosus* (of religion), *homo loquens* (of language), and so on. In terms of technology, the human as *techno sapiens* is evolving from the artificial environments.

We note that informational techno-sciences have the power to change the relationship between the human cognition system and the world around it. Information technology, for instance, is about building a so-called virtual society. In such a virtual society, will transhuman beings control information technology or information technology control transhuman beings? In this paper, the term *information* has at least two senses in modern science and the humanities:

- (1) A *mathematical* sense from digital communication theory or information theory. For instance, information is a set of *bits*, a sequence of binary states held in classical systems, whereas quantum information is a set of *qubits*, a sequence of ternary states held in a quantum system.
- (2) A *linguistic* sense from the meanings understood by members of a specific society and culture.

By definition, everything in the cosmos is a kind of information, although, like the human, information is a somewhat ill-defined notion. For instance, matter is defined as the union of energy and information. Each living organism has a structure determined by information encoded in its DNA, and culture is socially transmitted information from human culture to transhuman culture. When we can resolve the cosmos into digital bits or qubits, everything in the cosmos could be information. For example, whenever we speak to one another, the channel we are using is sound waves. Here, the sound wave is the medium for auditory information processing.

Such an embodiment can imply certain limitations imposed by media. In the context of information media, *homo sapiens* may be described as *homo medialis* (Moon 2012).

In the age of techno-science, the human is artificially selecting himself or herself from synthetic environments. Thus, the human is beginning to break the laws of natural selection by bioengineering, cyborg engineering, and genetic engineering. *Homo sapiens* is transcending its biological limits. Would such an extension still imply *homo sapiens*? We may no longer be *homo sapiens*.

By *transhumanism* I mean all the transformation from the human as *homo sapiens* to the human beyond *homo sapiens*. For instance, Cruz (2013) assumes that posthumanism is a general outlook with many different incarnations, a term that is usually employed in cultural studies and marked by a postmodernistic mood. And then he posits transhumanism as a subset of posthumanism. For Cruz, transhumanists are trying to make the transition from healing to enhancement in order to overcome human limitations. We agree with Cruz in terms of posthumanism, but disagree with him in regard to transhumanism, since transhumanism is not merely a subset of posthumanism. For Tirosch-Samuels (2012), transhumanism is the transformation of the human species from the human to the posthuman. This is more convincing.

Here I propose that transhumanism is a transformation from posthumanism as a representation to more than that. Representation here is defined as a system for making explicit certain entities or patterns of information with a specification. Thus, transhumanism could be defined as a subset of posthumanism and beyond posthumanism. In other words, posthumanism is the domain and beyond posthumanism is the range for transhumanism. We assume that the transhuman is evolving from *homo sapiens* to *homo transcendentalis*, beyond Darwinian natural selection, which emerges to transcend naturally and artificially given conditions, whereas *homo transcendentalis* obviously includes *homo scientificus* and *homo religiosus*. We need to see that all interpretations of the transhuman are not only about the subject matter, but also about the transformation.

We assume religion as a symbolic system of human rules and values that is founded on a belief in a superhuman order and establishes powerful motivations in humans by formulating conceptions of a general order of existence (Geertz 1977; Harari 2011). According to Harari, a Jewish historian, this definition involves two distinct criteria: "(1) religion holds that there is a superhuman order, which is not the product of human whims or agreements, (2) based on this superhuman order, religion establishes norms and values that it considers binding." He asserts that "religion's emergence was one of the most important revolutions in history, and made a vital contribution to the unification of the human, much like the emergence of universal empires and universal money."

When we refer to an “East Asian perspective,” it means a way of thought reflecting a cognitive system in the contexts of East Asia, including diachronic and synchronic operations (Kim 2015). At the message level, we can think of information as having to do with sending and receiving messages, while at the understanding level we think of information as having to do with knowledge and understanding. More than anything else, the fundamental problem in human society is that one receiver’s information could be another receiver’s error, when we share some message containing a lot of information. For any message, there is meaning from the message and its contexts. It is possible that either the encoding process or decoding process of a message is not relevant to what the message means, since meaning is something outside techno-science.

This work is methodologically connected with aspects of cognitive science, mathematics, and theology, but chiefly involved in an exploration of the transhuman from an East Asian perspective. The next part begins with the transhuman as transcendence. The second part then investigates the transhuman as compactification. The last part discusses the East Asian transhuman in terms of *samtaegeuk* (the triune Absolute).

THE TRANSHUMAN AND TRANSCENDENCE

Let me start with director Wally Pfister’s film *Transcendence* (2014), written by Jack Paglen. *Transcendence* tells a significant story about a new artificial intelligence model, which could create a technological singularity—namely “transcendence”—by means of uploading a person’s consciousness into a quantum computer. In regard to self-consciousness, this film implies there would be no separation between *techno sapiens* and *homo sapiens*. Moreover, *transcendence* is asking what defines the human and specifically human values after certain artificial selections.

My first topic is the issue of the transhuman, whose definition requires the use of ideas from cognitive science and mathematics. The problem begins with the human mind in terms of a system called *cognition structure*. In Figure 1, “Action” in abstract terms refers to a mapping from one-dimensional times to n -dimensional spaces, and hence “Cognition” is defined as a mapping from one-dimensional times to some mental spaces in n -dimensional spaces. Recall that these notions arise from studying mathematics, computer science, and brain science. By human minds, we mean the mathematical product of human brains and artifacts such as computing machines. Here, mind system is logically construed as the relation between the brain system and the machine system.

Yet, mathematical modeling of the real world is not straightforward. Following Figure 1, we begin with a Real World problem. Then we need to represent the original problem by a mathematical notion. The final step is to interpret the mathematical solution in terms of the original problem.

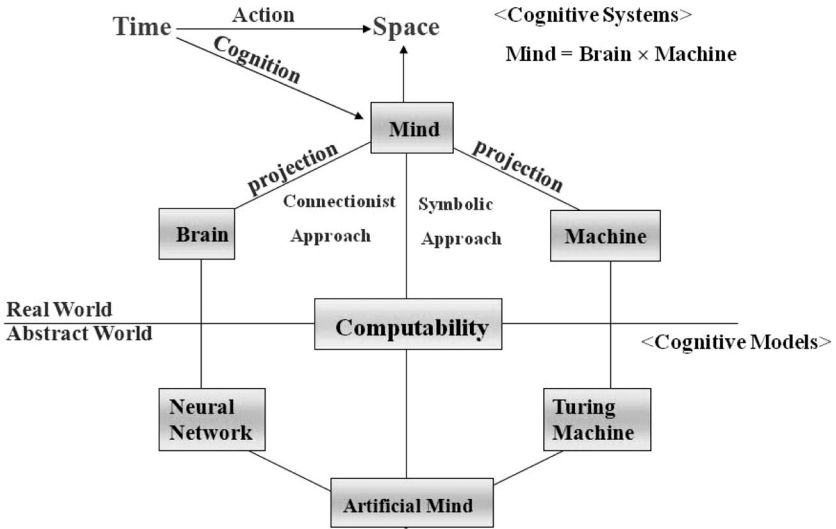


Figure 1. Cognitive Science Approach to Minds (Hyun 2013).

From this assumption, we arrive at two basic models, called *natural* and *artificial* minds, meaning the mind in Real World and in Abstract World, respectively. The current mathematical models in cognitive science imply that the human mind is regarded as a product of the human brain and the computing machine. Here, Mind (the system of minds) can be defined in terms of the formal product of Brain (the system of brains) and Machine (the system of machines). In other words, the product of Brain and Machine is the relation such that a state of Mind implies a state of both Brain and Machine. And hence, we can obtain two mathematical projections and one physical projection:

- (1) *Symbolic Approach* as Projection from Mind to Machine. This symbolic modeling is concerned with mind as if it is treated as a computing machine. The *symbolism* is used for studies that model human thought and behavior in terms of symbolic manipulation of sequential automaton-like units. The symbolic school views the mind as a serially symbolic manipulating system.
- (2) *Connectionist Approach* as Projection from Mind to Brain. This connectionist modeling is concerned with mind as a computing network, the brain. Many properties of the human mind involve parallel processing. Connectionism is used for studies that model human thought and behavior in terms of networks of neuron-like units working parallel and in a distributed manner. This connectionist school views cognitive systems as a parallel distributed

processing system. This brain-style theory of processing takes its inspiration from neural networks, which execute all operations simultaneously in a parallel manner.

- (3) *Quantum Approach as a New Projection.* If we offer a new projection from all the classical computation models to the mind at the quantum level, then we may propose a quantum cognitive science. A hypothesized quantum approach is also intended as the systems of mind. For instance, Roger Penrose and Stuart Hameroff (2011) assert that consciousness in human brains plays an intrinsic role in the universe with respect to a particular form of “objective reduction” of the quantum state.

For instance, artificial intelligence (AI) and its various embodiments, such as Turing machine models and artificial neural network models, obviously belong to the artificial mind. Stimulated by consideration in AI, strong AI-thesis proponents who assert the equivalence of human mind and computer raise the question: When can we get an isomorphism between two specified systems of minds? The *technological singularity* might be an answer. The singularity here is said to be a unique event if the pace of technological change is so rapid that human life is irreversibly transformed (Kurzweil 2005). In terms of mathematics, the singularity is a value that transcends any finite limitation.

There would be two alternatives on the relation of natural intelligence and artificial intelligence. Theoretically, all the classical, not quantum, computing systems such as a Turing machine cannot be free from Gödel’s incompleteness theorems that any not-weak consistent formal system (in particular, any reasonable formalization of number theory) cannot prove everything that is true; that is, such a formal system is incomplete. In 1951, Kurt Gödel, a mathematical logician, delivered the 25th Gibbs Lecture, entitled “Some Basic Theorems on the Foundations of Mathematics and their Implications.” In this talk, he addressed the significance of his incompleteness theorems with respect to the nature of mathematics and the limitations of human cognition. Gödel himself would assert the disjunction as a new way of alternatives, in spite of some so-called Gödelean arguments (see Hyun 2013):

Alternative 1. (either) The human mind infinitely surpasses the powers of any finite machine (*intuitionist’s AI-thesis*).

Alternative 2. (or else) There exist absolutely unsolvable mathematical problems (*finitist’s AI-thesis*).

Alternative 3. Alternative 1 or Alternative 2 (*Gödel’s AI-thesis*).

I would call the third alternative to the above disjunction *Gödel’s AI-thesis*. So-called “intuitionists” assert only the first alternative but deny the second one. Alternative 1 requires that the natural intelligence system is

superior to the artificial one, whereas Alternative 2 claims that there is no natural intelligence system beyond the artificial one. So-called “finitists” would insist on the second alternative only. According to a finitist AI-thesis, the existence of a technological singularity is valid. So, the convergence between the natural intelligence system and the artificial intelligence system could allow a more comprehensive articulation of any exchangeable intelligence. Consequently, Gödel’s AI-thesis—that is, his own disjunctive conclusion that allows the truth of both alternatives—could disclose a new window rather than a specified alternative. Thus, Gödel’s AI-thesis and technological singularity are compatible.

THE TRANSHUMAN AND COMPACTIFICATION

Now we are modeling the transhuman as an extension of the human system in terms of *compactifications*. We use the term “model” here when we capture some properties of a system in order to explain the known properties of the original system and guess new properties.

In mathematics, for instance, by the completion of the rational line, we get the real line, that is, the complete metric field of real numbers endowed with order. We note that such an extension has richer properties than those of the subsystem, where the subsystem somehow determines the underlying set and the richer system of the extension. Obviously, each subsystem has a set of certain deficiencies, whereas the extension modifies it. Thus, new properties could be settled by the deficiencies themselves. Here, the real problem would be how to connect deficiencies to the original state. What about a transhuman system as an extension of the human system?

It is well known that the behavior of finite sets and the behavior of infinite sets could be rather different. We can endow our objects with an additional system, such as a topology. Then, it is provable that some objects show properties similar to those of finite sets, even though they are infinite sets. From the infinite objects, we can obtain “almost-finite” objects called *compact spaces*. The definition of compactness tells us that all open covers have finite subcovers. For example, the real line is not compact. However, we can get compactness by adding one or more points to the space. This method is known as *compactification*. By definition, we can compactify the real line by adding one point at each end: plus infinite point and minus infinite point. Then the extended real line is compact, that is, mathematically closed and bound. If we insert just one missing point into the real line and join the ends, we can make it into a circle; we thereby realize a one-point-compactification of that real line. These results imply that a noncompact space can have many different compactifications.

Moreover, we can show that a transhuman infinite system is defined as an extension of the human finite system. For a non-compact space *HUMAN*, let a property *omega* be not in *HUMAN* and let *TRANSHUMAN* be the

union of *HUMAN* and *omega*. Then *TRANSHUMAN* is a *compactification* of *HUMAN*. In other words, when the given event realizes completely the deficiency, that is, a new event, and belongs to it, then we can approach and understand it. If we identify all new points as new properties, then the new space can be obtained by adding just one more point to the original space and all the deficiencies can be addressed by the addition of one more point. For me, metaphorically, if *omega* may be thought of as one God, then the *TRANSHUMAN* forms a Christian theology.

The *Transhuman* is defined as an extension of the human finite system, by adding deficiencies to the original subsystem. And *transhumanization* is thought of as a compactification of the given human system containing many deficiencies. The transhuman system can compactify the human system by adding certain deficiencies as new properties. Hence, we assert that the pattern of compactification can define the pattern of transhumanity.

EAST ASIAN TRANSHUMAN AND *SAMTAEGEUK*

At the conclusion of *Cosmic Purpose*, Kagawa Toyohiko (1888–1960), a Japanese Christian thinker, makes the following statement embracing the approaches of an Asian notion of emptiness, theism, and modern science, as follows:

From ancient times people have set out to explain salvation from cosmic evil in one of three ways. First is India's religious way, the idea of emptiness. Second is the theistic approach to salvation that developed in Western European thought. Third is the modern scientific attempt to banish cosmic evil.

I do not find these three to be incompatible. Each of them was bred in human consciousness. Nishida Kitarō recognized the conscious efficacy of the idea of “nothingness.” In the Middle Ages, Nicholas of Cusa acknowledged “zero” algebraically. The modern quantum mechanic physicist Herman Weyl has followed the same line of thought. We are right to eliminate the idea of a meaningless void, but I am speaking of opting for “zero” as a way to think of removing cosmic evil. Moreover, the third path of science's banishment of evil, in its modern meaning, also requires our utmost efforts.

There are, however, limits to human strength that leave us no other solution than to recognize the dependence of everything on an absolute cosmic will that has prepared, a priori, the strength for human beings to survive and for evolution to develop. (Kagawa 2015, 269)

It is remarkable to note that Kagawa's perspective of “seeing things whole” formulated a positive synthesis of Christian faith, Asian emptiness, European theism, and modern science (Hastings 2015). I agree with him in the sense that some East Asian logics are compatible with modern science and Western theism. For instance, when a set of three elements has zero as an exponential value, its value equals one—symbolically, $3^0 = 1$. In terms

of Christianity, *kenosis* (emptying) is equivalent to mathematical “zero” or Buddhist “nothingness.”

From an East Asian perspective, the transhuman is an extension of a ternary subsystem by means of a three-point compactification: heaven, earth, and human. In the standard logic based on the Western dichotomy, it does trivially hold that the transhuman system contains two subsystems such as the human and its complementary one. Yet, such division and separation cannot grasp the East Asian way of thinking. Let us examine the features of the logic systems in East Asia. First, the East Asian binary system, called *taegeuk* (in Korean, “the great ultimate” 太極) or *yin-yang* (陰陽), is a structure like Möbius bands in modern mathematics, one example of the manifolds. The band has a twist and is one-sided; that is, inside is not separated from outside, and hence, outside is not separated from inside in those bands.

In the first verse of his *Dao De Jing* (道德經), Lao Tse formulated the prime axiom of cognition: “the truth that may be cognized as truth is not the permanent truth” (道可道非常道). If we substitute “truth” with a variable X, we obtain that X to be cognized as X is not X over time. Thus, we figure out that the dynamics of affirmation and negation cannot be separated in the Daoist cognition system. Following a similar logic, Ryu Young Mo (1890–1981), a Korean Christian thinker, could investigate that Jesus is the One of “Being-in-Non-Being (*opshigyeshin nim* in Korean)” because the Resurrection delivers the Being and the Crucifixion delivers the Non-Being (Park 2002). In terms of quantum physics, “the observer” cannot be separated from “the observed” in the East Asian binary system. Quantum theory tells us that the *non-separable oneness* of the universe is the central theme of East Asian Daoism as well as the dominant theme of quantum physics.

Second, the East Asian ternary system, called *samtaegeuk* (in Korean) and referring to a triune Absolute as Heaven-Earth-Human, is a structure like Penrose’s three worlds—the mathematical, the physical, and the mental—and the profound mysteries (Penrose 2005). Likewise, for East Asian peoples, the three worlds of Heaven, Earth, and Human are all together without separation. *Samtaegeuk* is also a three-valued cosmology in East Asia. Since the beginning of their history, East Asians have believed in three realities of Heaven, Earth, and Human as a *continuum system*, and then have derived a ternary system in terms of the prime number “three” in order to build up a trialectic system. Thus, I would call *samtaegeuk* the East Asian trinity that includes the binary way of thought. We note that the *non-separable togetherness* of the universe is not only the central theme of East Asian cognition, but also one of the most important questions in current quantum theories.

Let me mention a Korean famous anecdote about Hwang Hui (1363–1452), a great prime minister who served four kings in the early years of

the Joseon Dynasty. One day two of his maidservants had a violent quarrel. (a) On his return home from the office one of the quarreling maidservants came to him accusing the other of all the wrongs and defending her own uprightness. At the end of the presentation of her case, the prime minister agreed that she was right. The girl returned to her work happy and content. (b) Thereupon the other maid came to him to present her side of the dispute. After hearing out the second girl's accusation and defenses, the prime minister again agreed that she was right. The second disputant returned to her work joyful and vindicated. (c) Having overheard the whole proceeding, the wife of the good minister protested to her husband that after all it could not be that both girls were right. When the wife finished her assertion, the minister agreed that she too was indeed right. In all, the minister's logic follows the liberating system from Boolean logic. In terms of quantum logic, the measurement of the observer's mind associated with each term may also be described as "the minister's global mental state."

East Asia is known as a cultural area of Chinese characters. In Japan and Korea, as in China, some Chinese characters have survived even after they already had their own phonetic characters: *kana* for the Japanese, and *hangul* for the Korean. Chinese characters were derived from the earliest bone inscriptions used almost 3,500 years ago, that is, as pictograms narrating an event in an enriched two-dimensional trichotomic space (Han 2003a). A single pictogram could reflect the quantification by adding signs: (1) x (that means one thing), (2) xx (something), (3) xxx (everything), where x is a variable.

Hangul is the ternary linguistic system for Korean phonetic characters. In 1443, Korea's King Sejong designed and invented the vowel system in terms of three geometric symbols such as (1) point "." (Heaven), (2) horizontal line "-" (Earth), and (3) vertical line "|" (Human). The consonant system was devised from the trichotomic quantification of five geometric symbols such as velar, coronal, bilabial, sibilant, and dorsal shapes depicting anatomical features to pronounce that letter (Han 2003b). Consequently, one geometrical letter as a complete single syllable was formed by the combination of three components such as (1) the initial consonant, (2) the middle vowel, and (3) the final consonant. It is remarkable that *Hangul* has been described as one of the most scientific systems of writing (Diamond 1994).

Such a ternary way of thinking is still an efficient and primary method of cognition systems in Korea. Let us look at some tricolored symbols, called *samtaegeuk* from ancient shamanism. Figure 2 shows the official logo of the Seoul Olympiad in 1988, Figure 3 the traditional door symbol, and Figure 4 the fan symbol in Korea. All the *samtaegeuk* symbols tell us that the yellow [lightest shade of grey] wave represents Human, with the red and blue [darkest shade of grey] waves representing Heaven and Earth, respectively. For any *samtaegeuk* symbol, the structure always implies the



Figure 2. The Official Logo of 1988 Seoul Olympiad.

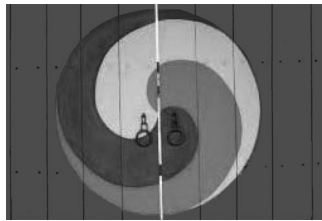


Figure 3. *Sam-tae-geuk* door.

non-separable togetherness of Heaven-Earth-Human. *Samtaegeuk* as sacred symbols could function to synthesize a people's worldview—their most comprehensive ideas of order (Geertz 1977). For instance, in the Korean shaman's tricolored topcoat worn in rituals, the red color indicates a medium for listening to the message of heavenly god, the blue color for interpreting, and the yellow color for accepting. Note that the shamanistic worldview remains a foundation of the Korean worldview (Hahm 1986). Although Daoism, Buddhism, Confucianism, and Christianity were already accepted as essential components of sophisticated religions, we can find huge amounts of indigenous Korean shamanism (Cox 1995).

Where is the proper space for the Absolute or God in the *samtaegeuk* symbols? It would be the center of the three waves. At first glance, the symbol seems to be flat, but it is complex like a tetrahedron. So, that mystic point can be interpreted as (1) the unique singularity point of three waves, (2) the cluster point of three sequences, limit point, and (3) the Absolute Infinity of three infinities. God is defined as the convergent point



Figure 4. *Samtaegeuk* fan.

of *samtaegeuk*. Consequently, *samtaegeuk* represents that three is one, and hence in East Asian ternary quantification, all is one.

The center of *samtaegeuk* could be described as a type of *inward way*. According to Rudolf Otto (1960), the inward way, that is, centering, corresponds to moving towards a consciousness of *Nothing* in Eastern mysticism. Here, we note that the Korean name of God is *Hanunim* after the term *hanul* (Heaven). Although Koreans sometimes personify Heaven, in principle they call the Absolute *Hanunim*. In daily conversations, for instance, the term *dolaganda* (to die) means to go back to Heaven as the Absolute origin. Thus, in terms of Nicholas of Cusa, *Hanunim* unites nothing and everything in the *samtaegeuk* geometrical model. For instance, maximum and minimum are one in actual infinity. Theologically, *Hanunim* is not the coincidence of opposites. Rather, opposites coincide in *Hanunim*. Human cognition is open toward the infinite. However, the Absolute Infinite cannot and will not be comprehended. We can only represent God as the Absolute Infinity in symbols (Weyl 2009).

Now we show that an East Asian transhuman system is regarded as an extension of the human subsystem. For a noncompact subsystem

HUMAN, let three points *Hanul* (Heaven), *Ttang* (Earth), *Saram* (Human) be not in *HUMAN* and let *EAST ASIAN TRANSHUMAN* be the union of *HUMAN* and the three points. Then *EAST ASIAN TRANSHUMAN* is a *three-point compactification* of *HUMAN*. If we identify all new points as new properties, then the new extension system can be obtained by adding three points to the original subsystem, and all deficiencies can be dealt with by the added three points. In all, *HUMAN* has a set of certain deficiencies and *EAST ASIAN TRANSHUMAN* rectifies this by three-points compactification. Metaphorically, if the added three points are thought of as gods, then *EAST ASIAN TRANSHUMAN* forms an East Asian theological trinity as *samtaegeuk*.

We could define East Asian transhuman as a three-point compactification of *samtaegeuk* (Heaven-Earth-Human) system that underlies all East Asian cognitive patterns:

- (1) *East Asian Transhuman of Earth-Point Compactification*: the extension of biophysical objects and events such as robot, cyborg, and environment.
- (2) *East Asian Transhuman of Human-Point Compactification*: the extension of the cultural products of the natural and artificial cognition such as techno-science and art.
- (3) *East Asian Transhuman of Heaven-Point Compactification*: the extension of interaction between the human and the Cosmic Absolute such as religions.

With respect to this interconnected and interrelated network, (1) East Asian Transhuman is defined at the biophysical dimension, that is, the realm from evolution and the interaction of many beings and events; (2) East Asian Transhuman is defined at the cultural dimension that seeks to understand how transhuman beings and their interactions may be worked in the realm of humanities and the sciences; and (3) East Asian Transhuman is defined at the cosmic dimension that seeks to understand how the collective transhuman beings could play an effective role in the cosmos. This proposition does actually imply a reverse anthropic principle. Since East Asian Transhuman as *samtaegeuk* extension system should form a whole and show all the properties of the whole, the East Asian Transhuman is not just the extended sphere of human beings but also a self-transforming system through required compactifications.

REMARKS

Will the Transhuman as thus conceptualized in East Asian and mathematical terms become God? Regarding technological singularity and compactification, our results do not imply a positive answer. On the contrary, God

as the Absolute Infinity cannot be cognizable. Once East Asian Transhuman has an infinite Absolute, East Asian Transhuman must also have many cognizable infinities as well. Like St. Gregory the Great, *Homilies on Ezekiel* (c. 593) (*quantumcumque mens nostra in contemplatione Dei profecerit, non ad illud quod ipse est, sed ad illud quod sub ipso est attingit*), we can say that no matter how far our cognition may have transformed in the contemplation of God as the Absolute Infinity, it does not attain to what God is, but to what is beneath God. The reflection principle in set theory repeats the same thing: Any description of Absolute Infinity will apply to some ordinal less than Absolute Infinity. In other words, “whenever we think we are talking about the Absolute Infinity, it turns out that we are really talking about some much smaller size level” (Rucker 1995). Let God be the Absolute Infinity. Then God implies that God is greater than anything we can cognize. Epistemologically, God is incognizable. Similarly, in his *Proslogion* (1078 CE), St. Anselm defined God as “something than which nothing greater can be cognized” (*aliquid quo maius nihil cogitari potest*).

Contrary to the epistemological approach, how about the ontological implications? We cannot prove the existence of God as an Absolute Infinity. That is a matter of assumption. However, in set-theoretical terms of the maximal, that is, not a maximum within the cognizance, the existence of God as the maximal reality is proved by Kurt Gödel. Mathematically, by the axiom of choice and the compactness theorem, God having all the positive properties is defined as the intersection of ultrafilters (Hyun 2014).

It is still not clear how to characterize situations in which the transhuman is required. Evidently, they are open-ended. There are many problems in formalizing the transhuman in our “glocal” context (Drees 2015a), and many approaches to solving the transhuman await exploration. In my view, the proper discussion of these problems is unavoidably mostly interdisciplinary. The study of the transhuman in the context of East Asia can lead to a glocal metastudy of science and religion – a study of the transformation between a transhuman’s rules and a world in which he is embedded. I guess this possibility will eventually revolutionize the sciences and humanities for our coming society.

ACKNOWLEDGMENTS

This article is based on a presentation at the conference “The Presence and Future of Humanity in the Cosmos: Why Society Needs Both the Sciences and the Humanities” held at the International Christian University in Tokyo, March 18–23, 2015.

REFERENCES

- Cox, Harvey. 1995. *Fire from Heaven: The Rise of Pentecostal Spirituality and the Reshaping of Religion in the Twenty-First Century*. Cambridge, MA: Addison-Wesley.
- Cruz, Eduardo R. 2013. "Transhumanism and the Fate of Natality: An Introduction." *Zygon: Journal of Religion and Science* 48:916–35.
- Diamond, Jared. 1994. "Writing Right." *Discover* 15: 107–14.
- Drees, Willem B. 2015a. "Glocalization: Religion and Science around the World." *Zygon: Journal of Religion and Science* 50:151–54.
- . 2015b. *Naked Ape or Techno Sapiens? The Relevance of Human Humanities*. Inaugural address at Tilburg University, January 30.
- Geertz, Clifford. 1977. *The Interpretation of Cultures*. New York: Basic Books.
- Hahm Pyong Choon. 1986. "Shamanism: Foundation of the Korean World-View." In *Korean Jurisprudence, Politics and Culture*. Seoul: Yonsei University Press.
- Han Taidong. 2003a. "The Role of Architects in Asia." *Essays on Cognition Structures*. Seoul: Yonsei University Press.
- . 2003b. *A Study on Sound Structure as Understood of King Sejong's Period*. Seoul: Yonsei University Press.
- Harari, Yuval Noah. 2011. *Sapiens: A Brief History of Humankind*. London: Vintage.
- Hastings, Thomas John. 2015. *Seeing All Things Whole: The Scientific Mysticism and Art of Kagawa Toyohiko (1888–1960)*. Eugene, OR: Pickwick.
- Hyun Woosik. 2013. *Gödel and Cognitive Science*. Seoul: Dong Yeon Press.
- . 2014. "Gödel's Maximal Ontology." *Journal for History of Mathematics* 27: 403–08.
- Kagawa, Toyohiko. 2015. *Cosmic Purpose*. Translated by James W. Heisig and edited by Thomas, John Hastings. Eugene, OR: Cascade.
- Kim Seung Chul. 2015. "*Shūnyatā* and *Kokoro*: Science-Religion Dialogue in the Japanese Context." *Zygon: Journal of Religion and Science* 50:155–71.
- Kurzweil, Ray. 2005. *The Singularity Is Near: When Humans Transcend Biology*. New York: Penguin Books.
- Moon Young Bin. 2012. "The Mediatized Co-Mediatizer: Anthropology in Niklas Luhmann's World." *Zygon: Journal of Religion and Science* 47:438–66.
- Otto, Rudolf. 1960. *Mysticism East and West*. New York: Macmillan.
- Park Young Ho, ed. 2002. *Dasuk Ryu Young Mo Urok [The Words of Ryu Young Mo]*. Seoul: Durac.
- Penrose, Roger. 2005. *The Road to Reality: A Complete Guide to the Laws of the Universe*. New York: Alfred A. Knopf.
- Penrose, Roger, and Stuart Hameroff. 2011. "Consciousness in the Universe: Neuroscience, Quantum Space-Time Geometry and 'Orch OR' Theory." *Journal of Cosmology* 14:3–42.
- Rucker, Rudy. 1995. *Infinity and the Mind: The Science and Philosophy of the Infinite*. Princeton, NJ: Princeton University Press.
- Tirosh-Samuelson, Hava. 2012. "Transhumanism as a Secular Faith." *Zygon: Journal of Religion and Science* 47:710–34.
- Weyl, Hermann. 2009. "The Open World: Three Lectures on Metaphysical Implications of Science (1932)." In *Mind and Nature: Selected Writings on Philosophy, Mathematics, and Physics*. Princeton, NJ: Princeton University Press.