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Death and Immortality: Biological and East Asian Religious Reflections on Transhumanism

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Abstract

The transhumanist notion of digital immortality (mind-uploading) is a misnomer and conceptually invalid, because it is based on a flawed presupposition of binary distinction between life and death. The multifaceted nature of death involving single cells, multicellular organisms, and human brains shows that the process of death plays a crucial role in sustaining life. Immortality without death pursued by transhumanists is an erroneous concept not supported by biological appraisal of death. East Asian religions and theology generally agree with this claim. Thus, we further postulate that death is not only an integral part of life but also a gracious gift that enables a life to grow

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into its higher domain; namely, mortality is the presupposition of an elevated life and so eventually immortality.

• Keywords

Biology, Christian Theology, Death, Immortality, Life, Neo-Confucianism, Transhumanism

To be blessed in death, one must learn to live.
To be blessed in life, one must learn to die.[1]

In March 2016, a historical Go match between AlphaGo, an updated Artificial Intelligence (AI) developed by Google's DeepMind unit, and Sedol Lee, a Korean Go grandmaster, took place in Seoul, and AlphaGo handily won by 4-1.[2] Most people in Korea and East Asia reacted to this AI's triumphant victory with fear and intimidation, rather than with joy and inspiration. This victory emphasizes the achievements made by human technologies and the subsequent possibilities of AI's conquest over humans and digitalization of humanity. Today, AI is on every corner of Korean society. For the past several decades, Korea has spearheaded the frontiers of information technology fields with conscious efforts to make information technology its national industrial base. Given this historical push, we predict that transhumanism will soon gain popularity and propagate quickly in Korea. Moreover, the appearance of a Transhumanist Party candidate in the US presidential election could encourage some attention to transhumanism. A provocative slogan of this candidate, "Let's make Ameri-

1 Philippe Ariès, *The Hour of Our Death* (Oxford: Oxford University Press, 1981), 300.

2 See Christof Koch, "How the Computer Beat the Go Master," *Scientific American*, March 19, 2016, accessed March 23, 2016, http://www.scientificamerican.com/article/how-the-computer-beat-the-go-master/?WT.mc_id=SA_WR_20160323. For an East Asian reflection on this event, see Heup Young Kim, "AlphaGo's Victory over Korean Go-master Showcases Western vs. Neo-Confucian Values," *Sightings* (the University of Chicago Divinity School Martin Marty Center), June 23, 2016, accessed June 25, 2016, https://divinity.uchicago.edu/sightings/alphagos-victory-over-korean-go-master-showcases-western-vs-neo-confucian-values. Go, a popular game in East Asia like Chess in the West, is "an abstract strategy board game for two players in which the aim is to surround more territory than the opponent." For more, see https://en.wikipedia.org/wiki/Go_(game).

cans immortal," would worry even more those who are convinced that transhumanism is one of "the most dangerous ideas" that the West has ever produced.[3]

This article will argue that the transhumanist notion of immortality is scientifically invalid, because immortality inherently requires a cyclic integration of life and death. Our day-to-day operating paradigm is predicated upon a dualistic distinction between life and death. However, contemporary life science knowledge does not adequately support this binary thinking. Life and death are two sides of the same coin. This article aims to shed new light on a biological notion of death and its implications for the concept of digital immortality, in dialogue with East Asian religious thought.

A Biological Appraisal of Death

Although immortality has been a prominent cultural and linguistic symbolic term, it is ambiguous and often causes confusion because of its semantic breadth. This article focuses on the general transhumanist goal to eliminate death. Digital immortality, technically termed "whole brain emulation," and commonly referred to as mind-uploading, is a key transhumanist hope. Digital immortality is the hypothetical concept of a person's mind living eternally in durable artificial hardware. It is one example of the transhumanist attempt to defeat death. Anders

3 Brett McGinness, "Zoltan Istvan 2016: Let's Make Americans Immortal," *Reno Gazette-Journal*, June 14, 2016, accessed June 15, 2016, http://www.rgj.com/story/news/politics/2016/06/15/zoltan-istvan-2016-lets-make-americans-immortal/85909236. Francis Fukuyama, "The World's Most Dangerous Ideas: Transhumanism," *Foreign Policy* 144 (2009): 42–43.

Sandberg and Nick Bostrom believe it would enable "back-up copies and digital immortality" by replicating the function of the human brain.[4] Many transhumanists easily accept that digital immortality can be realized in the near future partially through the development of a sophisticated AI like AlphaGo.

Digital immortality presents serious scientific and conceptual challenges. As noted in the ongoing debate about weak versus strong AI, there are a huge number of unresolved questions and problems. In addition, digital immortality entails an intellectual leap from the creation of artificial intelligence to the continuation of life and the defeat of death. A proper assessment of mind uploading, along with other transhumanist anti-death programs, necessitates a reflection on scientific theories in order to probe the notions of death and immortality.[5]

Definitions of Life and Death

Tibor Gánti, an unrecognized Hungarian biochemist during the communist regime, has suggested the following classifications of the world: 1) the living, 2) the potentially living but not dead (i.e., resting seeds), 3) the dead (it has lived earlier but has lost the capacity of liv-

4 Anders Sandberg and Nick Bostrom, *Whole Brain Emulation, A Road Map* (Oxford: Oxford University, 2008), accessed June 15, 2106, http://www.fhi.ox.ac.uk/wp-content/uploads/brain-emulation-roadmap-report1.pdf. Also see Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (Oxford University Press, 2014).

5 Calvin Mercer has provided some of the most thoroughgoing Christian theological assessments of whole brain emulation. See, e.g., "Whole Brain Emulation Requires Enhanced Theology, and a 'Handmaiden'," *Theology and Science* 13/2 (April 2015): 175-86, and "Bodies and Persons: Theological Reflections on Transhumanism," *Dialog: A Journal of Theology* 54/1 (March 2015): 27-33.

ing), and 4) the non-living (it does not live, never was alive, and is not going to live).[6] Discriminating the living from the non-living is a seemingly easy and familiar task. However, it is notoriously difficult to define life precisely. All entities are composed of the same atoms which are not themselves alive. But in what way do the living and the non-living differ?[7] What transforms the chemistry of the non-living to the biology of the living? Life can be defined by a long list of operational features, such as homeostasis, metabolism, growth, reproduction, adaptation, and evolution. There seems to be an enormous gap between our scientific knowledge and the unifying laws of life. Is life the extremely well-coordinated collective behavior of non-living matter driven by certain environmental conditions? Is there a continuum between the living and the non-living? How about the connection between cognition and life? These questions remain insufficiently answered.[8] It is almost embarrassing to realize our fundamental failure to grasp what exactly distinguishes life from death. The novel interdisciplinary approach of "systems biology," based on the anti-reductionistic approach of systems theory, addresses and investigates the properties of life from a holistic perspective.[9]

An alternative approach is to attempt a definition of death. Death is one of the most obvious and profound human experiences. Someday

6 Tibor Gánti, *The Principles of Life* (New York: Oxford University Press, 2003), 1-10.

7 See Rodney Brooks, "The Relationship between Matter and Life," *Nature* 409 (2001): 409-11; and Rasmussen Steenet, et al., "Transitions from Nonliving to Living Matter." *Science* 3 (2004): 963-65.

8 Mark Bedau, "Four Puzzles about Life," *Artificial Life* 4 (1998): 125.

9 See Fred C. Boogerd, et al., "Towards Philosophical Foundations of Systems Biology: Introduction," in *Systems Biology: Philosophical Foundation,* ed. Fred C. Boogerd et al. (Amsterdam: Elsevier, 2007), 3-19.

we will die. Despite our familiarity with death, however, death itself seldom has been the independent subject of scientific inquiry, largely because the phenomenon of death is regarded as an irreversible end-result of many different causes. Given the lack of scientific discourse on death, how can we derive a reasonable scientific understanding of death without personal biases? A scientific approach to death must address two different dimensions, namely, the death of physical existence and the death of conscious existence. The former denotes an objective approach, which can be pursued by examining the evolutionary history of life and death on earth. The latter signifies a subjective approach for which understanding the human brain is necessary, leading us to the seemingly intractable mind-body problem. The next section will first examine death from an evolutionary perspective and then touch upon the special property of the brain in relation to human subjective death.

Evolutionary History of Death

Is death inevitable? Quite contrary to the common-sense human experience, biology tells us that death is not the universal fate of all living organisms. The smallest unit of life is a single cell, which provides life and can be studied scientifically. Unicellular (single-celled) organisms, like bacteria and amoebae, can divide into two newborn cells without resulting in the death of either entity. Genes, molecules, and various structures are replicated into two new organisms, and this process can continue indefinitely as long as energy and an adequate environment are provided. Single-celled bacteria were the major form of life for the

first two billion years of life history on earth. What is the secret of the biological immortality of cells? Surprisingly, the answer to this question is simple. It is the cell's capacity to divide. Any cell, including human germ cells and cancer cells, that is capable of division and proliferation, is potentially immortal.[10]

A major jump in the evolution of life occurred one billion years ago when multicellular organisms arose from unicellular organisms. Multicellular organisms are not a mere collection of identical cells; instead, they consist of many different cells, tissues, organs, and parts of the body. A multicellular organism has to undergo the processes of development, cell differentiation, morphogenesis, and growth. During the entire life of a multicellular organism, each cell must shift its main mission from vigorous multiplication to a cooperative orchestration in order to build the whole organism. The ability to proliferate must be tightly controlled and regulated by genes inside the cells.

At this point, death appears for the first time on the stage of evolutionary history and starts to play a leading role in the history of life. During early development, cell death is particularly important in shaping the body and forming organs. For example, before birth, a human fetus has webbed or paddle-like hands with connective tissues between fingers. As development proceeds, these unnecessary connective tissues disappear as their cells undergo the process of death, freeing the individual fingers. This process of cell death is called "apoptosis," meaning that cells die in a programmed manner executed by active gene operation, not by accident or trauma.[11] The apoptotic

10 Herman Denis and Jean-Claude Lacroix, "The Dichotomy between Germ Line and Somatic Line, and the Origin of Cell Mortality," *Trends in Genetics* 9(1) (1993): 7-11.

11 Cinthya Assuncao Guimaraes and Rafael Linden, "Programmed Cell Death: Apoptosis and Al-

cell death is a crucial component in normal development.

By adulthood, multicellular organisms contain two fundamentally different cell types, germ cells and somatic cells. Germ cells are considered to be immortal because they create generation after generation through sexual reproduction. Somatic cells are the remaining cells that form all the tissues, organs, and other body parts. Somatic cells are categorized into two groups: fully differentiated somatic cells that cannot divide and stem cells that divide. The stem cells in a differentiated tissue allow it to renew damaged somatic cells, repair local function, and regenerate tissue. However, unlike unicellular organisms, these stem cells cannot divide indefinitely.[12] They have a limited capacity to proliferate, and they lose the ability for cell division after a certain number of divisions. For example, a fibroblast can only reach a maximum of fifty cell divisions, even in an ideal culture medium. This phenomenon is called "cellular senescence."[13] Cellular senescence is believed to have intended purposes and consequences. If stems cells had an unlimited capacity for division, the overproduction of cells may well disrupt the fine integration of the tissue circuitry. It is also now clear that cellular senescence is a crucial anticancer mechanism. In multicellular organisms, a dark flip side of cellular immortality is the development of uncontrollable cell proliferation, e.g., cancer.[14]

Since aging is by far the leading cause of death in modern society,

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ternative Death Styles," *European Journal of Biochemistry* 271 (2004): 1638-50.

12 Michael B. Schultz and David A. Sinclair, "When Stem Cells Grow Old: Phenotypes and Mechanisms of Stem Cell Aging," *Development* 143 (2016): 3-14.

13 Francis Rodier and Judith Campisi, "Four Faces of Cellular Senescence," *Journal of Cell Biology* 192 (2011): 547-56.

14 Sui Huang, "On the Intrinsic Inevitability of Cancer: From Foetal to Fatal Attraction," *Seminars in Cancer Biology* 21 (2011): 183-99.

the most relevant scientific inquiry into death can be framed as a question of aging. Why do we age?[15] We usually take aging for granted. Aging is easily regarded as "wear and tear" occurring in our body after many years of usage. This is the "cumulative damage theory of aging."[16] There are many ways in which the natural process of living damages our cells and body. One example is the production of reactive oxygen species (ROS). ROS is an inevitable consequence of inhalation of oxygen during respiration. ROS causes damage and mutation in DNA, and dysfunction of energy generation. Another example is the accumulation of by-products of cellular metabolism. Alzheimer's dementia is most likely due to the deposition of non-degradable abnormal beta-amyloid protein, resulting in neuronal death and brain atrophy. However, this "wear and tear" theory of aging is being discredited as the sole cause of death.[17] The modern "programmed theory of aging"[18] argues that aging is not a result of a random and stochastic process occurring over a long period of time, but rather is driven by genetically regulated processes. The fact that all multicellular species have their own fixed lifespans supports this notion that there are ge-

15 Thomas B. L. Kirkwood and Steven N. Austad, "Why Do We Age?," *Nature* 408 (2000): 233-38.

16 Dazhong Yin and Keji Chen, "The Essential Mechanisms of Aging: Irreparable Damage Accumulation of Biochemical Side-reactions," *Experimental Gerontology* 40 (2005): 455-65.

17 Some extreme proponents such as Aubrey de Grey assert that ageing is entirely explained by the accumulated damage theory and therefore aging can be totally reversible and human lifespan can be extended indefinitely by biomedical technology. However, this notion is not endorsed by the mainstream academic community. See Warner, et al., "Science Fact and the SENS Agenda: What can We Reasonably Expect from Ageing Research?," *EMBO Reports* 6 (2005): 1006-1008.

18 Lucas S. Trindade et al., "A Novel Classification System for Evolutionary Aging Theories," *Frontiers in Genetics* 4 (2013): 1-8.

netic programs that determine when an organism will age and die.

Programmed aging and subsequent death, at the organism level, makes sense. A way to bypass the accumulation of damaged DNA and toxic products in multicellular organisms is to make a new organism through reproduction so that it can start fresh again with new cells. Reproduction is a much more efficient and robust way of sustaining life than repair and maintenance of a pre-existing old organism that has accumulated many errors and troubles. In some species, reproduction facilitates death. For example, salmons die quickly after they finish spawning. One could argue that death is a necessary component in the cycle of multicellular lives. Programmed aging theories argue that aging is ultimately a pre-programmed process that purposely causes deterioration and death in order to obtain an evolutionary benefit achieved by life-span limitation.

Brain Death

The death of homo-sapiens in the twenty first century is much more complicated than is the death of more simple organisms and warrants the reconceptualization of death. From a strictly biological point of view, we humans die because our cells die. With the advent of multicellular organisms, the nature of an organism, especially a human, can no longer be defined in terms of cellular function alone. As the human body consists of many different cells and various organs with different vulnerabilities, the definition of human death is a very important practical and legal issue. Until the late 1960's, human death was defined and accepted only when the cardinal signs of human life--heartbeat

and respiration--completely ceased to function. However, advances in medical sciences and technologies have made life support for cardio-respiratory function in patients with severe irreversible brain damage possible. Thus, the irreversible loss of entire brain functions has become accepted as the legal definition of death throughout the world.[19]

What makes the brain so special? How can we position the human brain in a scientific understanding of death? The human brain is a hugely complex system.[20] It is estimated that the human brain has at least 100 billion neurons and 100 trillion synapses. The mystery of the brain lies in its collective mode of operation, not in the features of individual nerve cells. Complex systems are typically made up of a very large number of constituent entities that interact with each other and also with their environment. Some complex systems are categorized as "complex adaptive systems" exhibiting behaviors like self-organization, emergence, learning, adaptive behavior, and even evolution.[21] It is now believed that the brain is this sort of system, in which mental states, such as consciousness, emotion, and memory, emerge from the interaction among multiple physical and functional levels.[22] The irreversible loss of emergence in the brain is regarded as the death of personhood.

19 Michael A. de Georgia, "History of Brain Death as Death: 1968 to the Present," *Journal of Critical Care* 29 (2014): 673-78.

20 Wolf Singer, "Understanding the Brain," *EMBO Reports* 8 (2007): 516-19.

21 Roy J. Eidelson, "Complex Adaptive Systems in the Behavioral and Social Sciences," *Review of General Psychology* 1 (1997): 42-71; and Gerard Weisbuch, "The Complex Adaptive Systems Approach to Biology," *Evolution and Cognition* 5 (1999): 1-11.

22 Daniells S. Bassett and Michael S.Gazzaniga, "Understanding Complexity in the Human Brain," *Trends in Cognitive Sciences* 15 (2011): 200-209.

The complexity of the human organism means that physicians confront very difficult situations at the hospital bedside.[23] For example, what would you do with a brain-dead pregnant woman whose uterus is functioning perfectly to gestate a fetus? How would you persuade the parents to agree to remove a respirator from a brain dead child who otherwise is growing and developing? These questions clearly reveal that the definition of human death as brain death is a cultural construct and formed by general social agreement, rather than biological fact. The brain, understood narrowly as one body organ, is not the sole determinant of human life. The human mind is not only connected to the brain but also to the body in general. It seems that many transhumanists hold to an outdated notion that mind and body are separable entities. However, this simplistic notion ignores the complex relation between the brain and the body. On a scale of complexity, the brain would be at a higher level than the rest of the body. But that does not mean that information at the level of the brain completely vanishes after brain death.

David Keirsey, a complexity scientist, insightfully said that "the process of death is not as complete as it implies. Even in "death," something remains of the original entity. Some parts of the entity still remain and those remaining parts will interact with the surrounding environment at a lower level of complexity. The potential diversity of the lower level of complexity increases with the death. Thus, death is a form of information feedback between levels of complexity."[24] This

23 Samuel H. LiPuma and Joseph P. DeMarco, "Reviving Brain Death: A Functionalist View," *Bioethical Inquiry* 10 (2013): 383-92.

24 David M. Keirsey, "Toward the Physics of 'Death'," in *Unifying Themes in Complex Systems*, ed. Yaneer Bar-Yam (Cambridge: Perseus Books, 2000), 306.

information feedback system between different levels of complexities could be applied to the relation between the brain and the body. The brain is intertwined organically with the rest of the body, and there is constant information exchange between brain and body throughout life; even after death, the information at the level of brain does not vanish but transforms into a lower level of life and gets integrated back with the rest of the system. In other words, with regard to the human brain and its relationship to the rest of the body, interpenetrating levels of complexity cannot be explained by a dualistic distinction between mind and body, and between death and life.

Interim Summary

Our examination of the hierarchical levels of single- and multicellular organisms and the brain has demonstrated that death cannot be separated from life. Rather, death must be understood as interpenetrating multilayered and multifaceted phenomena. Death is far more subtle and profound than common conceptualizations allow. Mortality is not an inescapable fate of cells. Death was designed during the later phase of evolution to produce complex multicellular organisms, including homo-sapiens. The limitation of human life-span is a trade-off between aging and cancer. Death is a crucial component for the uninterrupted flourishing of life on earth. However, this conclusion does not address the entire problem of death. Brain death, as the death of personhood and cessation of subjective conscious experiences, poses an existential challenge. We do not know the ultimate fate of our consciousness following the brain death, in part because we do

not know what consciousness is and how it is related to the material brain.

Despite this qualification, our scientific reflection reveals that death is a dynamic evolutionary process rather than an irreversible perishment. While death remains elusive, it clearly plays a crucial role in shaping the larger picture of the universe. Death is not the process of destroying life, but rather it is "directly linked to the process of emergence of meaningful information."[25] So death and immortality co-exist in our cells, body, brain, eco-system, and even in the entire universe. Thus, the transhumanist pursuit for digital immortality, or any program bypassing death, is flawed, since death and life are an integrated whole.

An East Asian Religious Reflection[26]

A leading transhumanist, Simon Young, declared, "Bio-fatalism will increasingly be replaced by techno-can-do-ism—the belief in the power of the new technology to free us from the limitations of our bodies and minds…. In the twenty-first century, the belief in the Fall of Man will be replaced by the belief in his inevitable transcendence—through Superbiology."[27] He also boldly proclaimed, "Let us cast aside

25 Luc Jaeger, "A Biochemical Perspectives on the Origin of Life and Death," in *The Role of Death in Life*, ed. John Behr and Conor Cunningham (Eugene, OR: Wipf and Stock Publisher, 2015), 28.

26 East Asian religions consist of diverse traditions and each tradition has a complex history of development and interrelation with others. Nevertheless, this paper focuses on Neo-Confucianism and East Asian Buddhism based on Korean experiences.

27 Simon Young, Designer Evolution: *A Transhumanist Manifesto* (Amherst, NY: Prometheus

cowardice and seize the torch of Prometheus with both hands."[28] As we have seen, however, recent developments in biology and brain science refute the logic of transhumanist prometheanism. These developments demonstrate that this transhumanist reasoning is not well grounded in science. "Systems Biology" seems to be more convincing than Young's "Superbiology." Furthermore, transhumanists do not appreciate the value of death and mortality, treating them as "enemies to be conquered or as brute objects ranged over and against us—as aliens, monsters, as victims."[29] Ray Kurzweil, the present director of Google's DeepMind Program, once announced, "Our mortality will be in our hands."[30] However, East Asian religious thought basically refutes this transhumanist attitude toward death, while supporting the biological appraisal with some strikingly converging points.

Life and Death Co-exist as Part of the Whole

East Asian religions in general reject the transhumanist conception of death as an enemy or a monster (like a tyrant dragon)[31] and endorse the biological observation that assumes death is a part of life. They resist the division between life and death. Buddhism strongly rejects this

Books, 2006), 20.

28 Ibid., 40.

29 Mary Midgle, Science as Salvation: *A Modern Myth and Its Meaning* (London, UK: Routledge, 1992), 74.

30 Ray Kurzweil, *The Singularity Is Now* (New York: Viking Press, 2005), 9.

31 See Nick Bostrom, "The Fate of the Dragon Tyrant," Journal of Medical Ethics 31 (2005): 273-77. Unlike its popular maleficent images in the West, East Asians traditionally view the dragon as an auspicious and benevolent symbolic being that brings happiness and fortune.

dualism, arguing that both life and death are ontologically unreal and illusory. Both life and death are unreal; thus, there need be no distinction between the two. There is no death if there is no life. Life and death are dependently co-arising (*pratītyasamutpāda*). The problem occurs when one thinks about them as divided and contradictory. Ultimately, there is neither death nor life, and practically they are not different (生死一如), as they are two indivisible aspects of one co-arising reality. In Buddhism, therefore, "death does not signify an abandonment of life but aims its completion."[32]

Neo-Confucianism, too, conceives of death as a part of life. More precisely, life and death exist as a whole in complementary opposition as in the relationship of yin and yang in the Great Ultimate (*Taiji*).[33] As we have noted earlier, biologically life and death are two sides of the same coin (yin and yang) that comprise the integrated whole (*Taiji*). We live by breathing, continually repeating the processes of exhalation and inhalation. Breathing, as key to sustaining life, analogically denotes the fact that life itself is continuity (inspiration, life) in discontinuity (expiration, death). It is interesting that exhalation comes before inhalation in the Chinese character for breathing (呼吸). *Yijing* (i.e., Book of Changes), a foundational text for Confucianism and Daoism, states that one yin and one yang form the dao of life (一陰一陽謂之道).[34] So, in congruence with the biological observation, East Asian re-

32 Jin-hong Chung, "Our Traditional Understanding of Death and Today's Tasks," in *Sarmgwa Jukeumeui Inmunhak* , ed. Jae-gap Park (Seoul: Seoktap Publications, 2012), 68.

33 For this discussion, see Heup Young Kim, "The Tao in Confucianism and Taoism; Trinity in East Asian Perspective," in *The Cambridge Companion to the Trinity*, ed. Peter C. Phan, (Cambridge, UK: Cambridge University Press, 2011), 296-98.

34 See Richard Wilhelm trans., *The I Ching or Book of Changes*, rendered into English by Cary F. Baynes (Princeton, NJ: Princeton University Press, 1967), 297-98.

ligious thought in general denies the transhumanist dualistic assumption that life and death are two different entities, events, or realities.

Death is Critical to Our Transformation to Attain True Humanity

In accord with the biological observation that death is a dynamic evolutionary process, East Asian religions view death as an opportunity to grow into a higher stage of life, sometimes understood as returning to the original state of life. The present human existential situation is not the goal of true humanity; death is the way to purify one's self to attain true humanity through self-transformation. Through the emphasis on self-cultivation, Neo-Confucianism underscores the discontinuity of habits polluted with selfish human desires and cultivating selfhood for the recovery of the original benevolent humanity.[35] Through its notion of samsara (the cycle of birth and death), Buddhism strongly encourages the perception of death as an opportunity for one's transformation into an elevated being.

East Asian religions often illustrate this process with the imagery of transformation from cocoon to butterfly. A cocoon must cast off its shell in order to be transformed into a butterfly. Death is like this natural process. To attain true selfhood (大我 the great person), one must rid oneself of concupiscence, sin, karma, and human desires (私慾) that contaminate the existential self (小我). This process of purification, albeit with different names (e.g., justification, sanctification, self-culti-

35 At this point, Christian sanctification and Neo-Confucian self-cultivation show thick resemblances. For this subject, see Heup Young Kim, *Wang Yang-ming and Karl Barth: A Confucian-Christian Dialogue* (Lanham, MD: University Press of America, 1996).

vation, awakening, or nirvana), is found in many religions.

Present existential humanity is far from perfect, indeed, it is troublesome, and so it must be subject to rigorous scrutiny and self-examinations through various practices of self-cultivation and sanctification, such as self-denial (無我), meditation, and prayer.[36] Thus, from an East Asian religious perspective, it is dangerous for an uncultivated, imperfect person or group of people to perpetuate life without the necessary self-examination and self-transformation. From this vantage point, the transhumanist proposal for immortality is one of the most dangerous ideas ever generated. The transhumanist goal can be seen as the immortalization of selfish desire and the will to power and hegemony, which is similar to the way that cancer cells analogically function at the cellular level (cf., the biological anti-cancer mechanisms of apoptosis and cellular senescence).

Death Contributes to Our Role in Stories Larger than Ourselves

East Asian religions agree with the biological approach that the locus of human evolution, advancement, or emergence is not limited to an individual person living at a specific time and space, but rather is expanded to wider spatio-temporal horizons and relationships of species, family, clan, group, nation, and world. In this regard, Brent Waters made an important criticism based on "natality," a term coined

36 For the Christian-Confucian way of humanization in comparison with transhumanism, see Heup Young Kim, "Cyborg, Sage, and Saint: Transhumanism seen from an East Asian Theological Setting," in *Religion and Transhumanism: the Unknown Future of Human Enhancement*, eds. Calvin Mercer and Tracy J. Trothen (Santa Barbara, CA: Praeger, 2015), 97-114.

by Hannah Arendt.[37] Clearly, birth and death are two distinguishable aspects of the human condition. The biological sciences show that reproduction is an efficient mechanism in the larger picture of human evolution, but it requires death. Transhumanists, however, do not speak about offspring, but, rather, focus on personal immortality. Waters rightly wrote:

> This disdain for generational interdependency discloses both the lynchpin of the posthuman project and the reason why it is a perilous enterprise…. Through its futuristic rhetoric, post-human discourse amplifies, exemplifies, and justifies one of the most pervasive late modern illusions—namely, that of an impervious individual autonomy and its resulting narcissism…. Despite their futuristic rhetoric, posthumanists are merely attempting to impose a tyranny of the present over the future.[38]

From an East Asian perspective, Waters' brilliant evaluation can be supported by the important domain of intergenerational relationship, namely, ancestry. In fact, posthumanists are imposing "a tyranny of the present" not only on the future but also on the past. Neo-Confucianism, in particular, emphasizes this dimension and profoundly incorporates it in the ritual of ancestor veneration or worship. In ancestor veneration rituals the dead meet the living. Through these rituals, the dead return to and participate in the communal life of the living, and at the same time the living share in the life of the dead. In this way, ancestors become immortal in the life of their descendants. Ancestor veneration entails rituals where East Asians create space to transcend

37 Brent Waters, "Flesh Made Data: The Posthuman Project in Light of the Incarnation," in *Religion and Transhumanism*, 292.

38 Ibid., 297-301.

their personal mortality and establish a collective immortality of their familial community and lineage. Whereas transhumanists strive for a personal immortality, East Asians pursue a communal immortality by means of revitalizing the intergenerational relatedness among the dead, the living, and the unborn. Resisting the propensity of human hubris to impose a tyranny of the present over the future or the past, East Asians pursue a transtemporal unity and a harmonious and holistic co-existence of the past, the present, and the future in the community. We see this notion of immortality, for example, in Neo-Confucianism. In Confucianism, the very definition of humanity is not an autonomous individual or an isolated ego, but, rather, a being-in-togetherness or being-in-relationship as the Chinese character of its cardinal virtue, benevolence (仁), literally means "two people."

Conclusion

Digital and other versions of transhumanist immortality are misnamed and scientifically invalid, because immortality paradoxically requires the very process of death to be integrated in life if life is to be sustained. The biological sciences show that death plays a critical role in the life of single cells, multicellular organisms, and human brains. Life and death cannot be separated; they are two sides of the same coin. Viewed holistically, life is the process of a complex system, sustaining its status by means of self-organization and emergence.[39] Life moves through a constant cycle of birth, development, regeneration,

39 Fulvio Mazzocchi, "Complexity in Biology. Exceeding the Limits of Reductionism and Determinism Using Complexity Theory," *EMBO Reports* 9 (2008): 10-14.

and death. Overall, ranging from single cells to entire biological systems, the scientific appraisal of death suggests that the process of death is pivotal in producing novelty, creativity, and life in the universe.

East Asian religious thought and Christian theology are basically consistent with this scientific observation. First of all, they agree that death is not an enemy to conquer but, rather, an essential part of authentic life. Life and death are not two different entities, events, or realities, but, rather, compose an integrated whole in the same manner as yin and yang function in *Taiji*. Further, death is an opportunity to grow into a higher stage of life. The present human condition is not true humanity; death is the ultimate way to purify one's self to accomplish or recover true humanity. The transhumanist goal of immortality is dangerous, because that goal can be the expression of a technological hubris in the service of an imperfect human will to power and hegemony, analogically the same as cancer cells at the cellular level. Furthermore, the locus of human evolution, advancement, or emergence is not limited to an individual person, but is enlarged in the ever-expanding horizons of spatial-temporal and communal relatedness. A critical error in the transhumanist vision for immortality lies in the tyranny of the present over the past and the future by denying linkage to wider and bigger ancestral, evolutionary, planetary, and cosmic stories.

Death is an integral part of life, but it is also a gracious gift that enables a life to grow into its higher reaches. Mortality is the presupposition of an elevated life and eventual immortality. We need to celebrate what Dowd and Barlow call "the gifts of death:"

> Without the death of stars, there would be no planets and no life.
>
> Without the death of creatures, there would be no evolution…

Without the death of neurons, wisdom and creativity would not blossom… Without the death of old ways of thinking, there would be no room for the new. Without death, there would be no ancestors. Without death, time would not be precious.[40]

40 Michael Dowd and Connie Barlow, "A Scientific Honoring of Death," *Metanexus*, July 15, 2012, accessed July 17, 2012, http://metanexus.net/blog/scientific-honoring-death?utm_source=2012.07.17+Honoring+Death&utm_campaign=2012.07.17&utm_medium=email.

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