The 3rd

WORLD HUMANITIES FORUM 2014

Proceedings

CONTENTS

"Articles by Chang-Rae Lee, Reiko Kuroda, and Stefan L. Sorgner are not included in this PDF version due to copyright conflicts."

SESSION 3 75

Parallel Session 1-1. Human Life in Cyber Society

Parallel Session 1-2. 'Post-Human' Mind and Body

Parallel Session 1-3. Biologism and Humanism

CONTENTS

SESSION 5 353

Organizers' Session : MOE/NRF Session

Organizers' Session : Daejeon Metropolitan City Session

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

KEYNOTE LECTURE

The Urgency of Humanities in the Age of Techno-scientific Production

Peter Louis Galison (Harvard University)

The Urgency of Humanities in the Age of Techno-scientific Production

Peter Louis Galison
Harvard University

I am honored to be counted among your numbers in the humanities, though my training, oddly enough given the occasion, lies between theoretical particle physics and history of science. Perhaps it is just because I come from the social and physical sciences, that I am so deeply honored to be here as the World Humanities Forum contemplates the role of the humanities in an increasingly scientific and scientized world.

For some journalists, educators, and politicians, this rise of the sciences has thrown the humanities in a crisis. "Humanities fall from favor," declaimed the *Wall Street Journal* in June 2013. Twenty-five years ago, Stuart Hall argued that his best option facing the crisis of the late 1980s in the humanities was to turn away from the literary humanities and toward sociology and cultural studies. Others have accused the humanities of irrelevance in the battle for employment, or too quick to embrace MOOCs to swift to abandon Great Books, or too easily seduced by quantitative methods or, more recently, the digital humanities. As an outsider looking in, I am struck by the unstable and yet perennial nature of the crisis. It is a crisis that is unfolding now, or over the last five or ten or even fifty years. Or perhaps, as the *New Republic* had it, acerbically, in June 2014: "the humanities have been going down that drain since at least 1621, when Robert Burton blamed their decline for the rampant disease of melancholia attacking scholars of his generation." In my book, anything declining for four hundred years must be quite powerful.

Well, I am not the right person to adjudicate this nearly half millennium of declinist debate. Instead, I want to argue that we, the rest of society, *needs* the humanities, urgently, *precisely* in this moment of techno-scientific ascendancy. I think, roughly, speaking that the opposite is true. Just because we live in a

momentwhen coding and apps, predictive analytics, biometrics, cybercrime, and all-too watchful corporations and governments, agencies, have become so pervasive, that, we need the humanities more than ever.

Need them for what? Are the humanities important in the Age of Coding because they can carry on the culture that risks being left behind when our education becomes ever more technical? Should students study art history, literature or Confucian philosophy between classes in nanoscience and biochemistry? That is a line of response—the necessity of communicating culture—is one we hear often, and there is much to it. After all, our universities need to respond to students who want to spend their years of hard study doing more than problem sets, who need to be able to speak clearly, write persuasively, and read critically. One An Op Ed in the *New York Times* said: "Students remain grabbed by the questions we pose in humanities classrooms — about style and character, politics and perception, love and ethics — and by how we follow these lines of inquiry into the pages of a novel, or the composition of a painting, or the prose of a philosophical treatise."

In fact, you don't have to look far for responses to the enthusiastic burial of the humanities that some would have the universities conduct. You could, and people do, focus on the role that the arts and literature play in the continued identity of a culture. Generations of elite German students have learned their Goethe, Kleist, and Schiller as a way of learning about the world of literary virtues, but also as a way of learning what it meant to be German. Russians know their Pushkin, Dostoevsky and Tolstoy in part to learn about history, God, and humankind, but also what it is to be Russian, not just today, but in the long run of history. So it is in many nations across the world national, where history and national literature has a similar range of functions: to raise within its citizens a refinement of thinking, but also a sense of the social and spiritual value structures to which they belong, the struggles of those who had gone before, so that each new generation too could think beyond their individual needs and imagine something beyond the satisfaction of proximate needs.

From time to time, and perhaps more today in this epoch of mass migration and heterogeneous societies, we expand that canon to inspire a more international spirit. In ever more places, we declare the need for a *world* literature and *world* history. We need to understand the trade relations of the whole Pacific or Atlantic rims in order, really, to grasp how our modern world came into existence. All of these are good arguments, they are arguments for maintaining the humanities alongside the STEM subjects, arguments for not letting the humanities-abolitionists rub out the literary, historical, philosophical and artistic aspirations our

cultures have guarded and developed for centuries. Such arguments for the humanities move me as they do so many of us. They have nothing to do with the argument I want to make here.

Instead, I want to push for a more radical stance, the case for a different kind of urgency in the humanities that I could put in summary: We need the humanities in this technoscientific moment not as a laudable accompaniment to the serious business of the sciences. No, we need the humanities at the very heart of our technical disciplines because the scientific-technical world is in the midst of creating some of the most vexing, exciting, productive and dangerous configurations of knowledge that we humans have ever faced. And the problems produced are not solvable with heat transport equations, C++ code, or algebraic geometry. The toughest issues at the core of our techno-scientific world are not solvable entirely within the domain of the technical.

The Self and its Technologies

Take the issue of privacy, self, secrecy, and friendship that have so dominated the news these last few years. These are topics that are ones the humanities have dealt with forever—ok, at least since the pre-Socratics. Some of the most technically sophisticated companies in the world have driven into this arena with a mac truck, and gotten into trouble again and again, each time the shock seems to hit them hard. Facebook has ridden into controversy around data mining, around the manipulation of information feeds to test the pliability of emotions. They, like so many other companies have been shocked by the powerful back reaction by people (and governments around the world) at revelations about their cooperation with security agencies from the NSA on out over their counterparts in a myriad of other countries. These same companies have run into resistance about the provision of personal data to unchecked third parties, who could do with it what they would. Companies, governments, and criminal consortiums track virtual footsteps and real ones too—for a gamut of purposes. Sometimes it is to offer a helpful suggestion about a good film to watch or book to purchase. But it might also be to provide information to be leveraged, information to fake identity, information to reveal what an individual wants more than anything to remain private about her interests, discussions or relations.

The permanence of this (aspirationally) universal archive coupled with ever more sophisticated data mining tools put us in an unprecedented situation. Our gaits, our faces, our genes can be stored and pulled out later, at will. What does this do to us and where should the limits to such gathering be placed? Notions of

privacy and personhood, of deliberation and experimentation, of rights to property, these are concepts, even fields of inquiry that have a deeper grounding in philosophy, literature, and law than they do in the training we give to IT experts. We fingerprint people who are arrested—and for over a century we have grown used to this practice. We do the same with soldiers, for different reasons. Swiftly and with a minimum of discussion, around the world, governments have begun DNA sampling those arrested, a quiet, smooth-as-silk generalization from the inked thumb to mouth swab. But there are differences that have emerged, not to prominently that are staggering: the thumbprint marks you. That mouth swab puts data on your blood relatives and unborn descendants for generations to come. Does the government have the right to DNA fingerprint future generations? Do we as individuals have the right to give that information away should we want to? More than technical or even legal matters, these are ethical questions that depend on views about the limits of the self.

For quite some time, the self, its limits and its transformations have been central concerns across a range of the humanities. We see it in ethics, of course, we see it in history of psychoanalytic theory, we see it in the body of historical epistemology that Foucault and Deleuze bequeathed to us, we see it in a myriad set of studies of the evolution of subjectivities. We should use that knowledge. It matters.

True, in certain areas, we have created professional ethics boards—medical ethics being one of the best developed. But these questions: questions of risk, and knowledge, the limits of control over the disposition of our own DNA, the proper balance between shared and withheld information: these are questions that are not settled and cannot be settled by isolated groups of professionals. Not every individual, not every culture, not every family wants to be treated the same way. But if we are barely holding onto a system of assessing these questions in, say end of life decisions (do you want extreme measures used, are you an organ donor, for example), we are nowhere near that in the other regimes of individual decision making about our fate: no one is asking us if we prefer to have our faces or gaits scanned in public, no very deep public debate surrounds phone tracking as we walk around big stores, or the data group in many industries carefully joining data from "preferred customer status" with a myriad of other data bases. The combination of these data—the mining—heads in ways we can barely grasp now and have no way of assessing in the future. Once our data are out of our hands, how it will be used is no longer in our control. One thing is sure: that discount card at the supermarket will take your data places beyond the discount on tomatoes.

Nuclear Dump

During the last years, I have been struck again and again by the necessity of humanities reasoning in what might seem like the least likely of technical places: nuclear waste. What could possibly be humanistic in million gallon tanks of highly radioactive sludge left over from the fabrication of atomic weapons? What could be of any conceivable interest to ethicists or literary or anthropologically minded humanists about giant swimming pools stacked densely with hot radioactive fuel rods? In fact, radiological waste—like many other environmental questions are increasingly important within the humanities, and the concern of the humanists should be brought to bear on the wider technical field.

What is this waste? Well, you could take the nuclear industry and trace each process, from mining and milling ore through the fabrication and eventual testing and stockpiling of weapons—and each stage there would be a story of waste. Alternatively, we could narrate this account from the perspective of labor historical disputes circulating around work safety standards, whistleblowers, and the struggle between the atomic workers and their employers at the Atomic Energy Commission (later, the Department of Energy). This account would necessarily be complicated by the intervention of communities of civilians—who just happened to live around the many production plants and testing sites, where grassroots organizers ("downwinders") have been active for decades in getting information about their exposure, their fears, their children, and their property. But no matter how it is told, the production, management and politics of this empire of waste is a story of extraordinary magnitude that will, before it is done, dwarf the original, $20 billion (current dollars) WW Ⅱ nuclear weapons project many times over. Estimates of the cleanup continue to mount, but no one expects the process to be stabilized in less than thirty years or for less than several hundred billion dollars, in the United States alone. And that doesn't begin to address what it would cost to deal with testing sites in Algeria or Tibet, not to speak of Chernobyl, Fukshima or sites of nuclear production elsewhere.

In telling this tale, the history of science and the history of land intersect in politics, philosophy, and health. For example, plutonium has a half-life of 24,000 years. You need about ten half lives to "get rid" of nuclear waste, that is reduce it by a factor of about a thousand. So plutonium and some of its related material will be around, and hazardous for hundreds of thousands of years. The US government has set a period of 10,000 years for one of its waste sites to warn the future—10,000 years! This has meant bringing in not only

nuclear and materials experts but people, yes humanists, who might have some idea how to think about a civilizationally-distant future.

Back in the late 1980s, the Department of Energy brought in futurists, who had cut their teeth predicting weapons systems and economic forecasts ten, maybe twenty or thirty years ahead. Now they were given the daunting task of saying what things might look like as far in the future as the ice age is in our past. They were joined by semioticians, anthropologists, archaeologists, and linguists, even by a science fiction writer who was also an astrophysicist (a nebula prize winning writer, in fact). These and other specialists produced a set of scenarios about how future people, 400 generations from now) might inadvertently penetrate the site. The architects set to work to design monuments to warn them. Here is a real life instance in that hardboiled domain of nuclear weapons work, where technical systems alone quite simply did not suffice.

The debates were deep and quite tough. Should the markers be in linguistic form, a kind of Rosetta Stone? Or should they be pictographic? Should the site be left unmarked at all—in recognition that we have, for centuries, been digging into gravesites with dire warnings to find treasure. Should the site be marked so it can be seen from space, from underground? Would the future be literate, would climate change or nuclear war have so altered our weather systems that the geological protection of the site would be compromised?

Here, in the multi-year study by this DOE-sponsored interdisciplinary group is a real example of the humanities at work in the very center of a problem of extraordinary difficult and urgency.

If I could return to our topical mandate, I would say this. The knowledge you in the humanities produces is important to preserve for many reasons—a world that has forgotten its history, its creative interventions, its way of making meaning out of the world—is not a world most of us would want to inhabit. This is true now and has been. But we inhabit a particular moment, one where it is particularly easy to value computer coding above classical codices and calculation above concern. My hope in this talk is to convey my profound conviction that the kind of knowledge possessed and taught by the humanities is not ancillary but central to our handling of a world in technological transformation.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 1

Plenary Session 1
Human Identity in the Age of Transformative Science and Technology

Science, Technology and the Human Experience

Ellis Rubinstein (The New York Academy of Sciences)

–

Technology, Posthuman and Humanities

Tae-Soo Lee (Institute of Human Environment and Future, Inje Univeristy)

Science, Technology and the Human Experience

Ellis Rubinstein
The New York Academy of Sciences

I. Introduction

Spatially, physically, and existentially, the human sense of self is being transformed by science and technology at an unprecedented rate.

To historians and to paleoanthropologists, this is not a new phenomenon. From the dawn of modern humankind - about two hundred thousand years ago - the ability of the human brain to envision and develop tools and technologies has revolutionized not only human experience but the experience of self. Indeed, the exploration of technology precedes even modern humans by hundreds of thousands of years with tool making going back millions of years. And not only our most direct African and out-of Africa ancestors but also Neanderthals clearly evolved their culture based on discovered or acquired technology since there is evidence that early Neanderthal populations didn't initially control the use of fire but learned to do so about 400,000 years ago.

But while paleontologists can occasionally establish early evidence of evolutionary and revolutionary applications of science and technology - say, identifying ever earlier examples of modeled figures or of cave paintings - one thing we contemporary humans can't do is directly determine the level of self-awareness of Homo Sapiens, in general - or even pre-literate modern humans. Could they consciously evaluate the effect of their discoveries and insights on their own experience of self? We can't know.

But we can know, today, that the human brain doesn't merely employ science and technology in the service of self and tribe; it *recognizes* a transformational experience when it happens. And this exquisite firing of ensembles of neurons, which somehow assemble a mental construct that impels us to re-evaluate the fundamental assumptions about ourselves … this flash of profound insight is - I propose to you - happening ever more frequently in the human experience.

Which is why there is great appeal in the theme of this year's World Humanities Forum: "Human Identity in the Age of Transformative Science and Technology." In choosing this theme for their conference, the organizers have recognized not merely the relationship of science and technology to human experience, but they have implied an even more important notion: that human kind is now in an age that could be characterized as so scientifically transformational that human identity is literally changing before our eyes … and inside our heads … because of the exponential pace of new knowledge.

My task, as a former journalist, former Editor of Science, and now President of an academy of sciences is to return briefly to my roots as a reporter and to convey in hopefully meaningful terms the range and pace of transformation in our self-identification as humans. And I will do this in two segments: First, I will attempt to document the transformation taking place among the 2 billion people on our planet that have been most cut off from the benefits of science and technology. Then I will turn to the world as you and I know it: where we think we already know all there is to know about the relationship of new knowledge and our modern identity.

II. Where Are We? The Transformation of Spatial Understanding

To get started, I propose to focus first on the transformation of humanity's sense of spatial understanding. [see #3] But before I get to my first example, allow me to concede that many brilliant essays have been written on the changes in the human mindset emerging from our many experiences of an increasingly "globalized" world: a world where transportation systems can carry medicines and food to the forlorn in a matter of hours, but also, using the same technologies, guns and diseases are sweeping across continents and oceans wreaking havoc to a planet that has been described as ever smaller.

You and I take for granted that we can do business anywhere on the planet, meet our peers at conferences on a day's notice, and bypass all of that through videoconferencing using handheld phones … and, thanks to Samsung, probably soon our watches as predicted in comic books five decades ago. So it can be relatively rare when we are forcibly reminded of the pace of change in our daily human experience.

I received a tiny shock recently while reading a novel. On the eve of World War II, one of the characters boards a train from Paris to Berlin: the journey takes 18 hours! This was the pace of land travel into the early years of my own lifetime. In my youth, no one in America would have imagined attending a set of business events as I am this week that are taking place in New York, Muscat, Daejon and Doha. Indeed, my parents who were educated business executives would have never heard of 3 of those cities.

But in our daily lives, I suspect that most of us take our spatial transformation for granted. So I propose that we try to see the power and majesty of this shift through the eyes of two children.

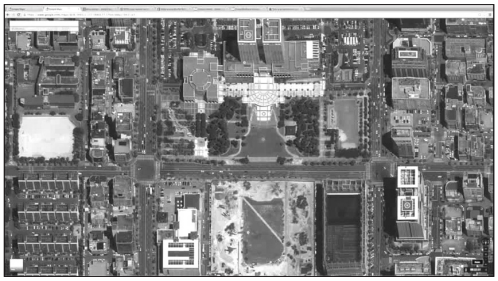
To meet the first child, I will take you on a quick trip from Daejon to the village of Dertu via Google Earth.

This is a rather typical sight in the village of Dertu in northeastern Kenya. Only about 140km from the border with the failed state of Somalia, Dertu is an endangered village of about 6000 pastoralists who, until recently, were effectively cut off for lack of roads from the provincial capital, a town called Garissa, which is 95 km to the south.

Even when war isn't spilling across the border from Somalia, Dertu is endangered. Had you visited the village 7 or 8 years ago, you would have seen a version of the catastrophe that we hear about in so many villages in Africa, India and other least developed regions. In the best of times, the villagers lived without electricity, lacked healthcare, and had no access to secondary education. In the best of times, its arid climate produced an average annual rainfall of only about 350 millimeters.

But that was in the best of times. Before the 2006 short rains, the area had not received sufficient rainfall for an entire decade! As the intensity of the drought increased, the goats, sheep and camels had to forage over hundreds of kilometers in search of water. When they found a reliable water source, they would overgraze, destroying the environment. When they failed to find reliable sources, they starved and then died: the animals and then the people.

So by 2008, when this picture [see #4; photo 1] of some of the most important residents of the community was taken, the village was characterized by extremely high poverty levels, pests, disease, malnutrition, high maternal and child mortality, and illiteracy. My wife shot the photo as something significant happened in Dertu. It had just become one of the first 10 sites of the United Nations Millennium Villages Program: a proof-of-concept effort designed by the Columbia University macroeconomist Dr. Jeffrey Sachs to show that integrated interventions - improved agriculture, nutrition, clean water, access to health care, universal primary and secondary education - could transform the world's poorest, most cut-off villages at an affordable price so that within 5-6 years the villagers themselves could begin to lift themselves out of poverty.



#4

This has proven true in most of those Millennium Villages. And much of the success has been based on science and technology - fertilizers, insecticide-impregnated bed nets, advanced hydrology, and so on. But even the most visionary experts in development assistance didn't foresee the transformational effect of one technology on human beings in circumstances throughout the developing world. And the reason for that is that this transformational technology wasn't even considered when the Millennium Goals were being drawn up in 2003 and 2004.

I now show you this photo [see #5; photo 1, the boys] of a few of the boys in that village only 6 years ago.

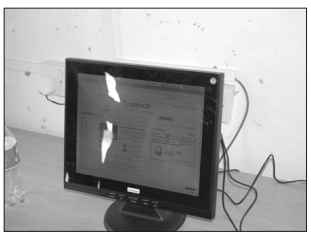
What they were looking at was this computer screen [see #5; photo 2, the computer]. It was the first anyone had ever seen. But the computer itself wasn't the unforeseen technology element. That was brought into play thanks to this man [see #5; photo 3, the man], Carl-Henric Svanberg, who was then the CEO of the multinational ICT company, Ericsson. Carl-Henric became so emotionally committed to making a difference for the poorest of the poor that he committed his company to connect all the Millennium Villages to the worldwide web by erecting cell towers[see #5; photo 4, the tower].

Carl-Henric committed to do this with no strategy for making back the investment and knowing none of the villages had power. But he knew he could solve the latter challenge by utilizing advanced solar cells. And he suspected he could address the former challenge by convincing the local telcom providers ? in this case, Zain - to offer way-below-cost connectivity for the first few computers and mobile phones ever seen in these villages on the promise that the technology would spur business and they would ultimately be repaid on their investment. And how that worked! I could provide wonderful stories but don't have the time to do so.

Rather, I want to concentrate on an unexpected byproduct of Carl-Henric's investment. He intended to show the villagers the kind of web pages that would tell them about the outside world - say, prices for goats at distant markets. But one of those boys said: "Wait, can you show us where we are in the world?" And with Google Maps, those villagers that day, children and elders alike, saw - for the first time in their lives - their place on our planet.

Many people, including the visitors there that day, were in tears at the faces of the villagers. Everyone knew a moment of profound transformation had taken place … and before their very eyes.


#5-1


#5-2


#5-3


#5-4

Now I propose to take you on a second journey - one that is quite a bit shorter than from Daejeon to Dertu. This is across the Kenya?Ethiopia border from Dertu to a town called Koraro [see #6: video].

This is Koraro [see #6: photo]. There is no place more beautiful on Earth. The landscape features extraordinary escarpments and rock formations and the colors of earth and rock are astonishing, from brown to red to gold. But the beauty of the landscape in the eyes of tourists hasn't been sufficient to nurture the people who live there.

For decades, the people in Koraro lived almost solely off the farming of teff and maize. Animals were also kept, but, by 2007 - two years before I visited this village - drought had killed most of the animals and had so decimated the crops, that, together with poor seeds, lack of fertilizer, and ignorance of the science of agriculture, there was wide-spread starvation, stunting of children, and unremitting poverty.

And that wasn't all: malaria decimated the village on a regular basis; unsanitary water triggered a plethora of water-borne diseases; women died in childbirth at very high levels. Lacking even a rudimentary road, it would take hours to walk to a clinic in the nearest town, Hawzen; and the provincial capital, Mek'ele, was another 4-hour drive away by vehicles that no villager would ever have owned.

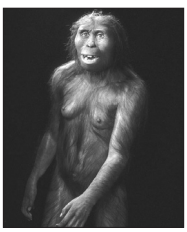
Now, just up there [see #7, photo 1: the wide landscape], looking down on Koraro is the high plateau of the Rift Valley that traverses East Africa. If you head south for a few hours, you will eventually arrive at a river valley[see #7, photo 2: the river photo,] the valley of the Awash. This is where the famous Lucy [#7, photo 3: Lucy] walked from watering hole to watering hole 3.2 million years ago. This is also where Modern Humans moved out of Africa heading toward Dertu and then Somalia and then out of Africa to the Middle East and eventually even to Korea.

So in 3 million years, how was life better for the "modern Modern Humans," the Homo Sapiens Sapiens of Koraro who had no share of - had barely a cursory knowledge of - the science and technology of the Industrial Age?


#6


#7-1


#7-2


#7-3

But then, thank goodness, as in Dertu, the UN Millennium Villages Project arrived. To touch on how much changed in the last 7 years, thanks to the intelligent, integrated application of science and technology … and good development practice … I can report that the Koraro village residents now have a health clinic they built themselves, clean water brought from a mountain source through pipes they put together themselves, a set of dams that would retain water during the dry season constructed by their own labor, and a school I will come to in a moment. There has been an enormous decrease in malaria; water-borne diseases have almost vanished and there has been a decrease in communicable diseases. Maternal mortality is dramatically down. The villagers have increased yields and diversified crops. And the livestock is healthy. The result: the villagers are actually emerging out of poverty. Such is the effect of the application of science and technology.

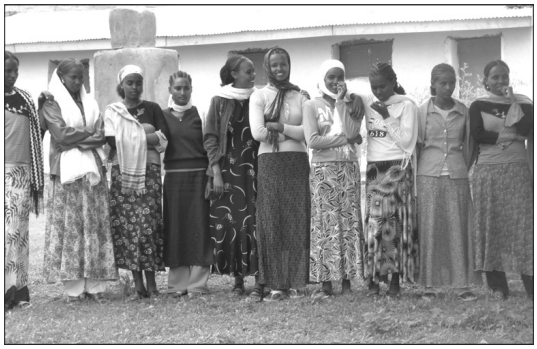
But one story crystallizes my theme for this meeting. Meet some of the girls [see #8, Photo 1, the girls] of the Koraro village in this 2009 photo that I took when I came to see the changes that had taken place in the first 2 years of Millennium Village transformation. These were the first ever girls of Koraro who were able to go to secondary school. Why? Because before that year, there was no secondary school beyond a one room hut for boys. And all girls were married off by their fathers by or before the age of 12!

But now, behind these girls, you see a real school with dorm facilities for this first class of girls who were described as "Koraro's Hope of the Future." And you may wonder what was that hope?

The village's first ever "education coordinator" told us clearly: That a few of these Koraro girls might make it to the technical school in the provincial capital of Mek'ele. That maybe one girl out of the first few classes of secondary school graduates might somehow make it to university and become a role model some years down the road.

But among these girls - at least some of them - there was a different vision. Because science and technology had transformed their actual image of themselves in ways that no one would have predicted.

I will never forget how when someone challenged them in the Tigray language to step forward and tell 50 or so assembled ministers, governors and aid experts what they might want to be in the future, at first, they were too shy to step forward. But then this girl, K'dan Gilmichael [see #8, photo 2, girl in the center], stepped forward and told us in perfect English: "I would like to be a *natural scientist*!"



#8-1

The onlookers were astonished. How did this girl come upon such a concept? Wasn't it endearing ... even inspiring ... but what were the chances of her aspirations coming true?

The truth is that K'dan's outlandish dream didn't quite come true: she doesn't appear to be headed toward being a scientist. But she did make it to university and, instead of science, she is studying engineering!

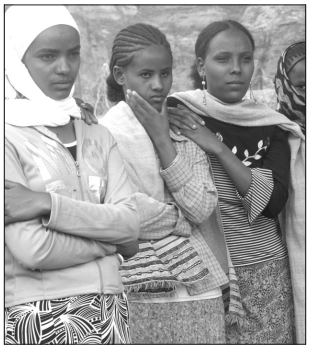
And if you think that is remarkable, imagine that, today, a mere 5 years after the opening of the first secondary school in Koraro, 100 girls from that and its surrounding villages are in university programs!

So let us consider how a village ... and a tribe ... and a district ... and an entire nation's people are changing their image of themselves through the application of science and technology to their lives.

III. Who Are We? The Physical Transformation of Humanity

By now, you will see that my strategy in this talk is to seek out anecdotal examples that will illuminate *fundamental* changes in the human experience that can be directly attributed to the application of science and technology to contemporary life. The first two examples take place in communities that had, until recently, been almost entirely cut off from the gifts of science and technology. So my next examples will attempt to demonstrate that even in our most highly developed cultures the fruits of basic and applied research are so breathtaking, they leave even the most educated humans in a state of wonder about where the human race is headed.

To convey this point, I turn to the advances in health science. And as before when I began my previous section, I wish to first acknowledge that there is an enormous literature in this area, much of it documenting the inspirational cascade of insights into, say, brain function and our immune system ... and much of it ensuring that we are realistic about the incredible and seemingly unending challenges to our health mounted by a mindboggling array of threats.



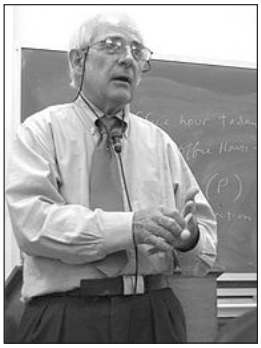
#8-2

So rather than attempting to choose isolated examples among a host of stunning developments ? for good or harm - in the life sciences, I will focus on an area that nicely connects to a basic philosophical debate about identity that I hope many humanities experts will appreciate. When I was an undergraduate a thousand years ago at UC Berkeley, I chose to take a course in philosophy from a young but already renowned philosopher who has only become more famous in the decades since … and who, remarkably, at age 82, continues to lecture to this day.

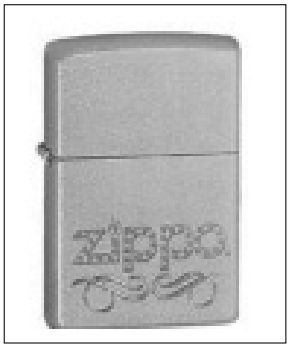
In 1965, Dr. John Searle [see PowerPoint #10, photos 1&2, John and the lighter] pulled out what was then the iconic cigarette lighter of the day - a Zippo - and showed our class that he could take out the wick because it was worn and replace it with a new one. Then he asked us if we would say that he was still holding the same Zippo lighter. We immediately agreed that he was. But then he changed the flint wheel. Still we agreed it was the same lighter. So then he methodically changed every part of the lighter including the case itself until we acknowledged that we no longer thought it was the same lighter, but we didn't know when it had changed its identity.

Now, all of us are familiar with - and excited by - the advances scientists and engineers have made in developing the artificial cochlea, bionic eyes, artificial hearts, stem-cell-grown organs, and there is even fascinating work going on to utilize a combination of pharmaceutical cocktails and electrical stimulation to regenerate neurons in the brain. Combine all this with artificial limbs and a reconstructed face, and what have we got?

Now add in a futuristic version of Google glasses - by then, implanted along with something even more eerie: a personal advisor composed of a "thinking" neural net like IBM's Watson. As many of you may know, the artificial intelligence supercomputer created by IBM first beat humans in chess, then in quiz games, and now can fool health professionals online by answering their questions so quickly and intelligently, the humans thought they were in contact online with a real doctor. And it isn't just a gimmick: Watson has proved better at diagnosis of some diseases than good doctors in top-rated hospitals.



#10-1



#10-2

Now, needless to say, the philosophical question posed by Dr. Searle isn't yet applicable to any human on our planet. But it will become increasingly significant as technology advances. And to prove that not all of what we can imagine is frightening ... indeed, to provide an *inspirational* perspective on these developments, I will show you a short video taken at a New York Academy of Sciences conference last September.

[see #11, video clip]

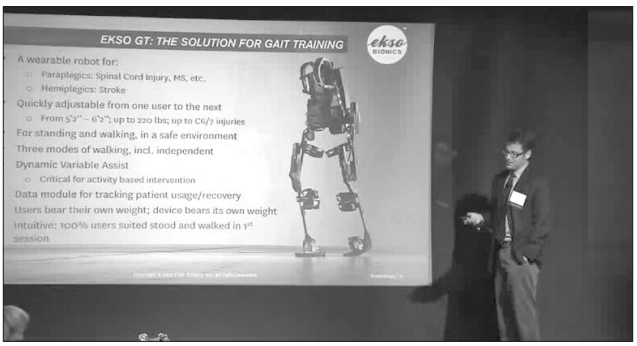
In this video, I haven't provided audio. Instead, I will tell you what you will see. The man on the right is Dr. Nathan Harding. He was a mechanical engineering professor at Carnegie-Mellon University when he co-founded and became CEO of a start-up company, Ekso Bionics. There, he invented what we call an exoskeleton, shown on the screen. As the film begins, you see a woman in a wheelchair appearing on stage. She is Amanda Boxtel, a woman from Colorado who, 22 years ago, went skiing, had an accident severely damaging her spinal cord and becoming paralyzed from the waist down with no hope of ever moving her legs again. After 2 decades confined to a wheel chair, science and technology have changed Amanda's life. As you see, she can now put on Dr. Harding's exoskeleton and the result is astonishing to see.

So let's just imagine what will be possible with nanomaterials of all kinds 2 decades from now...

IV. Who Are We Really & Are We Alone? The Existential Transformation of Humanity

Now, for my concluding remarks, I want to move from the notion of future cyborgs - part human; part machine - to touch briefly on several - at least to me - even more astonishing findings about our human-ness. And then I will close this talk with a brief speculation about our place in the universe. Consider this closing portion of my talk to be about what I will call "The Existential Transformation of Humanity." [see #12]

I begin by asking the question: Who Are We Really?
And then I'll end by asking are we alone.



#12

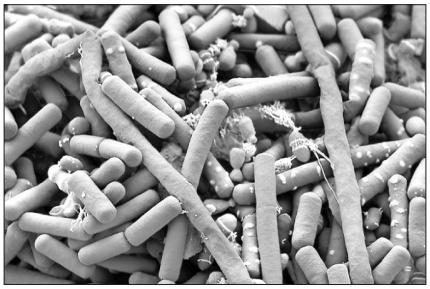
Until perhaps 5 years ago or less, nearly any non-scientist and even most scientists would have said that we humans are essentially a product of our genes. Especially in the early 21st century, in the wake of the excitement flowing from the decoding of the entire human genome, most conversations about who we are, what determines our health, what our cognitive capacities come from, and, barring accidents or other environmental insults, what our potential life span is … all of these major questions were considered tied to our genetic makeup.

But only an eye blink of time ago, all this began to change. A Nobel Laureate, now deceased, the great Dr. Joshua Lederberg, was among the very first to alert us to another way of thinking. But it wasn't until the 1990s that any serious attention was paid to the notion that our health might be inexplicably tied to a cloud of bacteria that live in and on our bodies. And, today, the new understanding of the role of these bacteria suggests that they effect - maybe even control - not just our propensity to obesity, diabetes, but some forms of cancer, multiple sclerosis, arthritis, and more. And they may even be able to affect our minds: to cause or ward off depression, anxiety and perhaps even autism!

Incredibly, while science for decades thought that a genetically-based immune system eliminates harmful pathogens purely through its own system of organs, tissues, cells and molecules, researchers are increasingly discovering that the microbes that live within us co-evolve with and exert direct control on our immune system - for good or ill.

Consider the following astonishing fact: more than 10,000 microbial species - entirely different species of bacteria! - live within our gut, mouth, on our skin and in our intestinal track. And for every cell in our body, there are 10 microbe cells in and on our body, which means that each of us are harboring 100 trillion living cells of alien organisms! [see #13]

Suddenly, doctors are concerned that the indiscriminate use of antibiotics, the advanced detergents we use to clean our hands - the so-called germ-killers, and some of the most unfortunate elements of our daily diets are effectively killing off the very "germs" we need to make us healthy or to fight off disease … or simply to protect or even build up our immune systems.



#13

In one of the most bizarre demonstrations of our dependence on a healthy diversity of alien microbes, doctors have proven that patients dying from colitis and for whom no antibiotic would work can be immediately saved by simply transplanting the feces of a healthy person. And recently, promising treatments of Parkinson's patients have been reported as well.

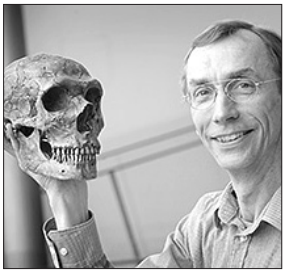
So where does this leave us relative to the question of this conference? I consider it revolutionary for the human psyche to have to accept that we are essentially symbionts with the bacteria that live in us. For centuries, humanity wanted to believe that we were "at the center of the earth." Then we wanted to believe that we were at the center of the solar system with the sun rotating around us along with the other planets and stars. Then we have wanted to have pride of place in the animal kingdom. Indeed, for centuries and to this day, a huge portion of our population doesn't want to concede that humans evolved from other mammals, much less from the simplest forms of life. The idea that the bacteria that live in us are crucial to our lives has to confound such thinking.

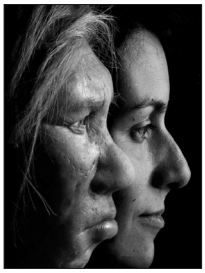
And so do the recent revelations of the great paleogeneticist, Svante Paabo, [see PowerPoint #14, photo 1, Svante and the skull] that modern humans intermarried with Neanderthals. Roughly 4% of European genes and 1.5% of Asian genes come from Neanderthals. [see PowerPoint #14, photo 2, Neanderthal & Human] And as if that isn't shocking enough for some, it now emerges that some of us on this planet - though mostly people in Papua New Guinea, the Philippines and Aboriginal Australians - share 1% or so of their genes with a long lost species called Denisovians, about whom we so far know nothing beyond their genetic makeup.

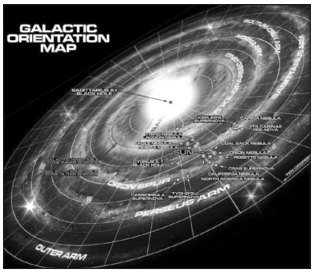
And as if that might not be shocking enough to the average human being, imagine if we explained to him or her - as we should in every school - that the mitochondria in every one of our cells… the organelles that are effectively our cellular power plants and that are deeply involved in both cell growth and cell death and can provide benefits or cause disease - these tiny cellular components began as alien invaders of our cells and then inhabitants of them and are now crucial, if occasionally deleterious, to our lives.

So we now know that we are not alone in our bodies, we were not alone on this planet, and science and technology are increasingly hinting that perhaps we are not alone in this universe.

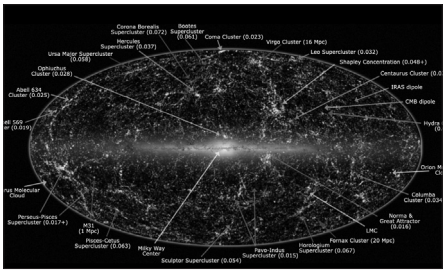
I close my talk by simply citing the latest numbers. Astrophysicists are confident at this point of two big numbers:


#14-1


#14-2



#15


#16

There are a hundred billion planets in a typical galaxy. This is our galaxy, the Milky Way. [see #15, Our Galaxy] It has between 100-400 billion stars. So maybe the estimate of 100 billion planets is conservative.

Now let's move up to what astrophysicists call the Local Universe. [see #16, the Local Universe] This approximates what we can see across a distance of 1 billion light years. You can see that the image was organized to show the Milky Way at the thin white line at the center. Around it are countless other clusters of galaxies.

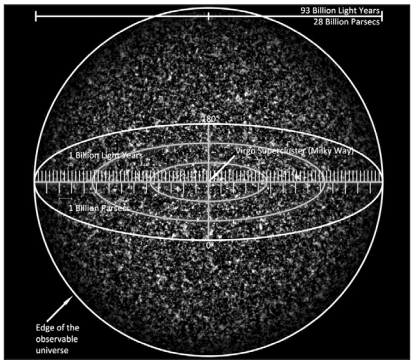
And now we come to the so-called "Observable Universe[see #17, the Observable Universe], which is, as you can see, 93 billion years across. This is everything we can see through our most advanced telescopes. And in this image there are ***hundreds*** of billions of galaxies.

So let's multiply 100 billion planets (the number in an average galaxy) times, say, 500 billion galaxies. I think you'll agree that the result is a pretty big number. So what are the chances that no life has emerged somewhere out there?

And if science and technology determine that there *is* life elsewhere - perhaps even lots of it - how does that change our image of ourselves?

Gamsa habnida

Thank you very much.



#17

Technology, Posthuman and Humanities

Tae-Soo Lee
Institute of Human Environment and Future, Inje Univeristy

Technology is the core characteristics of Homo Sapience. The term *Homo Sapience* highlights the fact that human beings are able to make use of their intelligence as the most effective device for adaptation to nature, and technology is the most representative product of human being's intelligence. Of course the level of intelligence first humans showed was far short of making technology. In early days when humans threw stones and swung sticks like chimpanzees, and cut stones into tools, humans did not come up with anything that could pass for technology.

Humans finally lived up to their name Homo Sapience when they began to farm about 10,000 years ago. Today, farming is described as depending on nature, or euphorically, togetherness with nature. In fact, growing grains and raising livestock is a technology of domesticating natural beings to our needs. Nurturing plants or animals is no longer a kind of mere adaptation to nature. It is a technological behavior, namely an artificial intervention that actively transforms nature. In the 21st century, how deep technology may intervene in nature is emerging as hot potato. However, we have to remind ourselves of the fact that that technological intervention in nature is not a recent trend, but dates back to the remote prehistoric past. Seemingly natural phenomena like rice growing from the seed, and dogs giving birth to puppies are actually containing lots of human elements.

It goes without saying that humans also are part of nature. Technology is a natural product as well, since it comes from intelligence that is provided by the Nature. Still, technology never stops at passively adapting to or supplementing nature. Technology intrinsically has the power of transforming nature. Indeed, technology has developed in the way that goes beyond the natural limits. Where it is headed became clearer than ever when the western science and technology swept the entire world. Humans still are part of nature, but that truth does not matter anymore; humans emboldened by the power of the

western science and technology have become accustomed to thinking of their position in the world as that of the master commanding over the natural surroundings. We are now quite confident that we humans already have conquered and enslaved the Nature.

Of course such self-confidence is occasionally challenged by events like volcanic eruption, tsunami or thinking of a possible asteroid crash. At such moments, humans come to wonder if they are only fooling themselves to claim they are master of nature. But such events are eventually understood as sporadic incidents like the sun being shadowed by clouds time to time. Humans believe such incidents cannot seriously affect the course of our destiny. This belief is based on hope rather than probability. And, anyway, no matter how much we prepare, we could not perfectly tackle natural disasters. To forget about it might be wiser than being anxious about uncertain possibilities. Thanks to this way of thinking, humans' self-confidence could continue to grow, - despite such moments of trial.

It is only a matter of time that humans become so confident that they believe they can be like god. In the wake of the 20th century, humans were increasingly fascinated by the future suggested by human engineering technology. Now, manipulating human beings is regarded as a technology more sophisticated than manipulating nature. To put this in conqueror's vocabulary, humans, after quelling everything on the surroundings, have turned to conquer what lies at the heart—themselves. The wave of conquest could not stop before conquering the last preserved part of nature, the humans. When this conquest sweeps the final destination, humans would become something that exists above humans: god. In other words, technology is poised to make humans like god. Technology has become so powerful thanks to its integration with science.

Technology and science were not connected to each other in their inception phase. Whereas technology began to develop as humans used tools for survival, scientific research originated from intellectual curiosity about natural phenomena in ancient Greece. According to Aristotle's systematic classification of disciplines, technological knowledge is clearly distinguished from contemplative theoretical study on natural laws of the cosmos. But in the modern era, when people in the western world succeeded the Greek civilization and resumed natural science research, science and technology became rapidly close to each other. Modern westerners were quite active in using the natural science knowledge to manipulate nature for their material benefit. They viewed learning how to manipulate nature (and humans) was as important as earning satisfaction through contemplative study. Bacon's quote "Knowledge is power," in the early modern era was the very *zeitgeist* of the modern western world. As the modern age progressed, the westerners-led global market economy was established, where businesses support research activities. As a result applied science linking systematically scientific knowledge with technology is exerting the biggest influence in today's human life, and the maxim 'Knowledge is power' has become the entire world's

zeitgeist.

Today it is difficult (or even meaningless to some people) to draw a line between pure science and applied science. A contemplative life dedicated to pursuit of truth is no longer the typical life of scientists. It might be hasty to actually say that pure and applied science are no longer distinguished, but what is clear is all scientific research is now closely related to technology. Pure passion for fine particles has resulted in nuclear technology while the technology of particle accelerator has allowed looking deeper into the particle world. In a nut shell, no matter how individual scientists see their research, their studies are somehow connected to practicality consisting in using technology.

Scientific research on humans, compared to that on nature, can more easily lead to technology. That is because knowledge about human is inseparably connected to normative value-judgment. In cases of research on nature, researchers are allowed or even encouraged to claim their research is value-free although it is on some level conducted for pragmatic utility. For instance, no physicist would try to determine whether the big bang 13.7 billion years ago was a good thing or not. However, a different story is knowledge on humans including the structure of brain and genetic information. Such findings push humans to go further than just the cognition of truth. They almost automatically lead to technology of improving human. Scientists who have knowledge on brain structure or genetic information find themselves in a position very similar to doctor's position; knowledge of medical truths normally leads to technology of treatment. If such findings are just contemplated with their practical significance ignored, that would be rather regarded problematic.

In fact, since long before the modern cutting-edge technology emerged, humans have studied themselves and utilized the findings to improve themselves. But not all of such knowledge was applied through technology. Mainly the knowledge on human body was linked with technology. Therefore medicine which took charge of scientifically studying human body became united immediately with medical technology. However humanities did not lead to applied science. They differed because the way humanities improve humans is not through technology-based manipulation, but through its impact on humans' way of thinking, views, personality and character. At least that has been so far the common belief.

This belief is being threatened as research on human body advances rapidly. To say figuratively, science is moving from the body's surface to the deep inside, and is about to unveil the long-hidden dark secrets. Among the secrets are the mechanism of thinking and emotions engraved in brain or DNA. Therefore one can say science has finally reached the border between the body and soul. When science enters the area of mind, almost all the properties that have been thought as mind-specific could be open for the technological manipulation. If this should occur, one might think science and technology could replace humanities to play humanities' traditional roles. Should we seriously consider the possibility that in near

future science and technology succeed in upgrading humans to such a level that they do not experience any more humanistic problems?

It might be too much burden for the existing medicine to play this role alone. Advocates of the possibility have high expectation for not only medical technology but for other advanced technologies, in particular, genetic engineering, information technology, robot engineering and nanotechnology. It is now inevitable for medicine to cooperate with these advanced technologies from various fields including physics, molecular biology, logic, numeric science, and information technology (Such cooperation in all these areas is a trend in recent time). The results such cooperation can bring would be really fantastic. Injecting nano robots to a patient's body to eliminate tumor would be rather a bland example. We can picture nano agents as super white blood cells which are stationed in blood vessels to perfectly block any invasion of disease germs. Not implausible is to replace our muscles or other major organs with products of cancer-proof, high-endurance new material which does not bear any trace of protein synthesis. Going further than individual level treatment, we could change our genes to make health and longevity universal characteristics of the human race.

Of course these imaginations can come true only in the future. But, no one can dismiss these as mere fantasy considering the pace of science and technology today. The success of human genome mapping project, in particular, made us feel the future of human gene manipulation is just around the corner. Genetic engineering naturally draws attention from parents-to-be as the technology allows designing their babies. Already in the early 20th century (in some part of the world) people showed strong interest in eugenics which aimed at having best possible future generation. But when Nazis demonstrated how eugenics can couple with dangerous ideologies, the support for the research froze. Medical students at least stopped proclaiming that their calling is to upgrade the human race. But that was not the end of story. Desire for a better offspring is only natural for humans, who are able to make value judgment. It would be rather inhumane to give birth to a baby sure to develop a genetic disease when there is a known genetic measure that can eliminate the cause of disease.

If a disease is an abnormal state of body, treating it would be to restore the normal state. But the standard of normal and abnormal is not unalterably fixed. One can say severe physical weakness, even without any sign of disease, is not normal. If a baby is to be born with this condition and if there is a way to fix it before birth, it would be right to take the measure. One step further, being born with rather abnormally ugly face is also a misfortune, so it must be right to fix it, too, if there is a way. But it does feel a little uneasy to allow designing the baby's appearance. If we allow parents to have their children as tall as they want, we wouldn't have any reason to ban esthetical design of babies. Whether and how one changes their look is basically the person's decision to make. Legally and ethically, getting a plastic

surgery poses no problem. Therefore there is no justification to stop parents' attempt to give their children the best look possible through gene-level adjustment. Being exceptionally friendly to plastic surgery, Korea would find it especially difficult to ban parents from having their children's genes manipulated so that they would not bear esthetical flaws the parents tried to fix through surgery. Considering that westerner-like appearance is regarded beautiful in Korea, the day might come when Koreans sport big eyes with western eyelids, prominent nose, and even blond hair and white complexion. This scenario is hardly plausible, but if it does happen, it shouldn't be dismissed as a light matter only to do with looks.

As seen above, seemingly harmless attempts at better looks can bring complicated consequences. But even more complicated would be the implications of attempting at enhancing intelligence. No parents would ignore the chances to make their children smarter, and there is no justification to stop them. The problem is that the standard of being smart is relative just like the standard of beauty. One should be taller than others to look tall, and smarter than others to be recognized as smart. If intelligence enhancement is allowed and left unchecked, no one knows where the competition would end up. Actually, we do not know for sure where the developing technology is headed and what human beings would look like in the end. Being healthy, good looking, and smart is a simple, rather humble wish normal people like today's parents can hope for. Those who speculate the future from a more expert point of view suggest pictures of future humans far beyond average people's imagination. It is so different from what we are now that a new name for those was proposed—*posthuman*—which is now well accepted and widely used.

What posthumans would look like would hardly matter. Whatever they look like, their inside would be totally different from humans. As suggested before, their bones and complexion might be of man-made high-quality materials. Intelligence might not matter, either. Adding several neurons to individual brains would not be necessary by then. In the posthumans' time, everyone's brain may be connected to the central artificial intelligence computer that far outperforms today's super computer so that all kinds of information and knowledge can be uploaded to it and downloaded from it. Such a collective intelligence maintained in one place would make it seem rather pointless to compare people's intelligence as we do today.

Of course, to most people of today, the posthumans are perceived as imaginative beings that might appear in bizarre cyborg movies. Most people would naturally think human evolution in that direction would be like bringing our own species to the end. However, there are early, early adopters who argue that this posthuman is not at all the wrong destination for humans' self-upgrade project. They uphold the concept *transhumanism* to back up their argument.

The prefix *trans* of *transhumanism* implies humans are in transition from humans to posthumans, and, at

the same time, it virtually declares the existing humanism based on today's ethics is not effective any more. This declaration can be interpreted in different ways as humanism itself means a variety of things, but what is certain is that transhumanism takes a certain stance toward humanities as humanism is related to the academic activities. Indeed Max More, one of the spokespersons of transhumnism, highlighted that transhumanism is different from humanism (and humanities) in that the former attempts to apply technology to overcome humans' biological, genetic limitations while the latter exclusively depends on educational and cultural measures to refine humans. (pg. 5, part 1. Roots and Core Themes 1, *The Philosophy of Transhumanism*, Transhumanism Readers, 2013). From a certain perspective, More does not seem to totally deny the raison d'être of humanities. But other advocates of transhumanism seem harsher than More. They express almost no interest in how humanities including literature, history and philosophy have dealt with human issues so far. And they have made themselves clear by making no remarks on humanities' role in the project of human enhancement.

Of course advocates of humanistic values take a different stance. But it is not easy for them to win the debate against transhumanists. As the topic is future humans, their chance of winning would differ depending on what kind of future humans, or what phase of future is being discussed in the debate. But in most cases, those who support posthumans have the upper ground in the debate. In cases where potential flaws of posthumans are pointed out, they can be easily countered by presenting another version of posthumans who have overcome the flaw in question. In doing so, transhumanists do not even need to prove how such upgrade would be possible. In today's posthuman debate, projections such as the one by renowned inventor R. Kurzweil that once the advent of IT reaches the singularity in several decades, cases of artificial intelligence far beyond our imagination will emerge seem to be free from the burden of proof. Instead, as it seems, those who try to challenge the projections should provide proofs why they are implausible.

Recently, M. Sandel pointed out that genetic engineering for enhanced humans can destroy the foundation of ethical rules that have been accepted in human society. ("The Case against Perfection", Harvard, 2009) He wrote enhanced humans who became what they are by themselves would no longer think they are gifts from nature, and hence, their sense of humility and solidarity that are based on such thought would seriously weaken. The problem is, without humility and solidarity, ethics cannot stand to hold the community together, he wrote. F. Fukuyama also proposed a future where enhanced humans despise, dis-empathize and oppress humans who maintain the given natural state for whatever reasons. ("Our Posthuman Future", New York, 2002) Like Sandel, Fukuyama also believed hasty human enhancement attempts with uncontrolled genetic engineering would deal a blow to ethical foundation of today's community.

Many believe the ethical foundation of human society lies in humans' several important mindsets that we call humanistic values. And they also agree the mindsets can be damaged by reckless human enhancement attempts by science and technology. However, transhumanism also has a counterargument for this. If empathy and sense of solidarity are that important, posthumans can be engineered to have those mindsets. In his writing "Why I Want to be a Posthuman When I Grow up," philosopher N. Bostrom presented a picture of posthumans that have a more matured mind than today's humans. (*The Transhumanist Reader,* ed. by M. More & N. Vita-More, Oxford, 2013) This seems fairly possible since our cognitive skills are connected to our other mental functions, and their collective improvement would be possible. He also expects to be able to understand Proust's novel better and capture the most subtle part of Mozart's music, once he becomes a posthuman. The same way, he will be able to better empathize with those different from himself. The all-mighty posthumans' lack of empathy could have been the soft spot of the transhumanist argument, but it was easily countered by arguing that posthumans will be more empathizing than today's humans.

From the transhumanist point of view, Sandel and Fukuyama's concerns only apply to enhanced humans, who are yet on the road to becoming posthumans. Transhumanism's answer is that such worries will be settled down as the enhancement technology advances. This can be the answer for all concerns regarding not only lack of empathy, but other deficiencies. But this seemingly invincible argument bears a critical flaw of transhumanist logic. That is technology is used only when what should be done is decided through value judgment. Apparently, Bostrom judged it is good to understand Proust's novel and Mozart's music, but on what basis did he make this judgment? Of course, the brain may show different neurophysiological reaction to Mozart's music and some mediocre music. But the reaction itself cannot be judged as good or bad. To better understand, recall why there is no point in judging whether the occurrence of big bang 13.8 billion years ago is better or worse than the event occurring 13.9 billion years ago. While we lead human race into the future, we will need to decide constantly what posthumans should be like. But technologies like genetic engineering, IT and nanotechnology do not help much in making the decision. Decisions concerning IQ or stature are relatively easy and simple cases; there are far more difficult cases which require much prudence as they carry huge implications. Humanities have contemplated on those complex matters for more than 3,000 years.

Posthumans might actually be our destiny, but what posthumans should be like, and what characteristics they should have are not yet decided. Since the decision making will occur starting from the present, it will be based on today's standard of what is good. But the decision should be constantly checked and contemplated to make sure it is leading the development and utilization of technology in the right direction. The transhumanism declaration issued in 2012 includes contents that well satisfy today's ethical standard. It says transhumanism supports happiness of not only human beings but all sentient beings

capable of feelings. There is no way of knowing through what kind of deep philosophical reflection the transhumanism declaration is corroborated, but the mindset of posthumans described in the declaration seems to be as matured and noble as that of Buddha. It seems no one would object this direction.

However, the day when humans reach the best ever decision, thus stop their humanistic contemplation, and unleash all their technological power to transform the entire human race at once will never come to life. The day when the final, perfect version of posthuman is launched will not and should not come to life. If it does, the history of humans will literally stop. The day should be viewed as the end of human race. It would mean a future where enlightenment does not come from years of painful meditation under Bodhi tree, but through brain engineering, or downloading and compiling a certain source code in the brain. Is it really bliss to be able to skip the hassle of meditation and get directly to the result? Humans have already developed contraception to take the pleasure of sexual intercourse without bearing offspring. If pleasure is the goal, the hassle of intercourse can be skipped as well. Thanks to science and technology, we will be able to get the sexual pleasure by giving the right spark to the right part of the brain. In the same way, we could give a person who never went through others' suffering a strong sense of empathy and sympathy by taking a neurophysiological step on the brain. Imagine a world of posthumans where nobody is unhappy but everybody gets a regular brain treatment to remain noble by empathizing with fictive image of suffering neighbors. Can we call them saints? It seems posthumans do not need to participate in reality. Instead, they could just lie on the bed to feel the fulfilling pleasure of doing noble deeds. In that case, would it be necessary to live long and healthy? If there is a medicine that can trick the brain to feel a moment like the eternity, the hassle of being could be skipped, too.

It seems the best state for human beings is to constantly working to seek and realize what is better. While continuing the effort, they will feel their life is fulfilling. Odysseus in *Odysseia* by Homer chose life over becoming a god and enjoying immortality and eternal happiness. Because, to him, being a god who need not and cannot seek goodness felt like being dead. Today, science and technology is once again offering a chance to become like Greek gods. But pursuing to be a god seems to be better than actually becoming a god. The best thing about having posthumans as our destination might be that it urges us to get on the track toward it. If science and technology do make humans godlike, making us stop our pursuit, that will be the end of human history and their life. But until that day comes, humans will continue their humanities contemplation seeking what is good. Scientific research will also continue until that day.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 2

Plenary Session 2
Past, Present and Future Interactions between the Humanities and Science/Technology

The Humanities in the "Era of Science and Technology"

Yung Sik Kim (Seoul National University)

–

The Age of Ecology : A New Enlightenment

Joachim Radkau (Bielefeld University)

–

A Planet-changing Species : Humans in the Anthropocene

David Christian (Macquarie University)

The Humanities in the "Era of Science and Technology"

Yung Sik Kim
Seoul National University

1. Social changes and the humanities

What we call the "humanities" today originates from Renaissance humanism, which brought on a new trend of learning in response to social changes of the day. It was primarily a reaction against the established academic trend of medieval Europe which had been centered on theology, metaphysics and natural philosophy. These subjects were not excluded from Renaissance humanism, but it tended to seek from them what were more humane and secular. Such tendency naturally diverted the interest of the humanists to history and literature, and more people tried to find these subjects from ancient Greece and Rome, going beyond the medieval framework of learning that was combined with Christian theology.

However, this movement of Renaissance humanism did not give a complete shape to the humanities of today. A similar academic movement that had taken place centuries later played some role in forming today's humanities, that is, the movement for the reform of secondary and college education in the late 19th century. This also was a movement to respond to social changes of the time by teaching modern languages and practical studies, departing from the exclusive devotion to classical studies and languages. To be sure, the movement influenced natural and social sciences more, but it also brought changes to the humanities, and contibuted to forming the humanities of today.

During the two significant periods that shaped today's humanities – the Renaissance period and the late 19th century – Western society was undergoing a huge change, and the humanities took a new shape in response to that change. When we look at the situation in East Asia also, most new intellectual and ideological changes took place in the periods in which society experienced great changes, e.g. the Spring and Autumn period and the Song dynasty. Today also, society is changing dramatically. and the humanities are facing another turning point: The humanities today are expected to change in response to the new changes in society.

Social changes in today's world show various different characteristics. The most important of them is 'scientification,' 'technicalization' and 'informatization' which is taking place on a great scale. Numerou s social and cultural phenomena associated with science, technology and information are appearing in today's society, and they are becoming more important day by day. Moreover, the changes are not confined to a particular area or class of society or culture, but are affecting everyone throughout the entire culture and society.

The first to consider is contributions made by technology through its convenience and effectiveness. For instance, science and technology have clearly made a great contribution not only to the development of telecommunications technology, various means of transportation and automatic machinery, but also to solving the food shortage problem and finding the cure for incurable diseases. On the other hand, today's science and technology are causing many problems to society: environmental pollution, ecosystem destruction, energy depletion, challenge against the dignity of life, and inequality between nations and classes, for example. At the same time, however, science and technology have played a pivotal role in coping with the harmful effects caused by these problems. They have contributed to removing environmental pollution and developing pollution prevention technologies, and also helped to prevent the depletion of fossil fuels by developing various alternative energy resources, and to restore the ecosystem. Due to such importance, science and technology - knowledge, types, methods and materials of science and technology– are occupying a greater and greater position in todays 'society and culture.

This phenomenon of 'scientification' and 'technicalization' of modern society and culture has become commonplace now. Or it can be said that the phenomenon has become the most important and characteric feature of modern society and culture. It is no longer limited to specific fields. No area in modern society and culture can be free from science and technology. In this respect, we may call the modern time we live in as the "era of science and technology".

Thus naturally, knowledge required by modern society is deeply involved with various elements of science and technology. Therefore, phenomena and problems of the society and culture that are primarily oriented to, and focused on, science and technology must be included in the areas of interest of general intellectuals; they must be included in anly list of subjects for studies on society and culture, and on man's life, value, and belief in them. Such social and cultural phenomena and problems, then, should certainly be included in the humanities. Perhaps it can even be said that they ought to be the most significant subjects in today's humanities.

However, the work to include new social and cultural phenomena in the humanities is only beginning now. Such work is yet to become part of the studies of the humanities in universities. This is somewhat similar to the situation in the Renaissance period when the new humanistic

movement began outside of universities, and universities reacted against it. Indeed, today's humanities have lost the openness and dynamism which were found in Renaissance humanism that stood up against the dominant Scholasticism, the shackle that had been stifling the academic learning of Europe till then.

2. The humanities: subject, object, method, spirit, and 'liberal arts'

Over the last decade, the issue of "the crisis of the humanities" ("人文學의 危機") has often been raised. This also reflects the tension between the adherence to the old academic framework and the new circumstances surrounding knowledge.[1] As this topic has been discussed by numerous people, I will focus my talk today on a particular point relevant to the theme of this forum. My point is that if, under today's circumstances, a solution to the crisis is to be presented in the form of an adherence to the traditional humanities, it would be inappropriate, and would only reflect a lack of understanding of the real nature of the crisis. That would also be a "non-humanistic" attitude, blindly holding on to the traditional humanities without paying proper attention to the reality surrounding man today.

Of course, the true humanistic approach – reflection, introspection and exploration regarding various problems in man's life and reality – should be maintained. But such humanistic exploration ought to be carried out on proper subjects. A question arises immediately: Are the issues being dealt with by the humanities today – life, problems and reality – really ours? The real problem may be that they are not, and this may have been what caused the 'crisis of the humanities'

A particularly serious problem is that, for the scholars working on the humnities, whom I will refer to as the "humanists" in this talk, the subjects of the humanities have remained fixed, unchanging from the traditional subjects and topics that had come down from the periods when the modern humanities were taking shape – the Renaissance period in the West and the Song dynasty in China, or at the latest the Age of Enlightenment in Europe or the so-called period of "opening ports" (開港) in Korea. Since then, man's life has changed greatly; the way of human life has been transformed enormously in the last several decades, particularly over the last 10 years or so. Thus, th e newly changed human life, problems and values should naturally be subject to humanistic reflection and exploration. The new humanities should encompass not only the traditional subjects and topics, but also the reality and the problems of today. It needs to be reminded in this connection that the traditional subjects and topics of the humanities themselves were once new--new

1) The "crisis of the humanities" became a frequently mentioned phrase relatively recently, but an awareness of the crisis has continued to exist in modern times. A book titled "*Crisis in the Humanities*" had been published 60 years ago. John. H. Plumb, ed., Crisis in the Humanities (Harmondsworth, 1964).

life, new value and new problems—when they first appeared, acompanying new intellectual trends of the new culture and society, during periods, such as the Renaissance and the Song dynasty. Today also, we are living in such a period in which new ideas and cultural trends are giving rise to new values and problems, and thus new humanities are required.

Therefore, the kind of approach the humanities should take in order to overcome the "crisis ofthe humanities" is obvious. Today's humanities cannot be satisfied with discovering, through the humanistic reflection and exploration on traditional subjects and topics, a humanistic value system and applying it to the changed human life and problems, though that is certainly important. It is necessary to establish new humanities that look for a new value system by looking into the changed life, values and problems of today. What is most important, science and technology, information and management, which account for a great part of today's human life and problems, should become the major subjects of the humanistic study--introspection, exploration, and reflection. All areas of the humanities, including literature, history and philosophy, should get out of the boundaries of the existing subjects or topics that have little to do with the present life, face these new cultural elements, and should carry out humanistic reflections and explorations on them. Otherwise, the humanities will not be able to respond properly to today's social needs.

Yet, this is not sufficient. The humanities cannot be taken merely as knowledge, subjects or topics. The humanities should also be considered as a method or a spirit. The humanities need to study, through the method and the spirit of the humanities, all subjects, knowledge and things, not only those that have been accepted to the humanities. In particular, new subjects, knowledge and things should be studied with the humanistic method and spirit. Of course, numerous areas outside the boundary of the humanities also need to be subject to the study, research and analysis of the humanities.

Thus, the "humanists" of today, who study the humanities that deal with such a variety of areas should have a wide range of interest and should study broadly. To be sure, because of the intense specialization of the academic disciplines and the consequent deepening of the gap between individual disciplines, it is difficult to maintain a wide interest and to study broadly. But as the negative effects of such specialization and segmentation of the academic disciplines are being recognized, a new movement in the opposite direction aiming for intellectual breadth is bound to appear, and has already begun. And in parallel with such specialization and segmentation, new content, theories, methods and systems, as well as the changes in the content of the existing disciplines, are coming into being, and are creating new fields, breaking up the boundary between the existing academic disciplines.

In this connection, the most daunting problem I believe is the situation in which the humanities are

separated from science and technology and the fact that in such a state of separation, the humanists are seriously prejudiced against, and ignorant of, science and technology, the most important element of today's society and culture.[2] The humanists should guard against falling into such a prejudice and should try to understand science and technology. Of course, understanding science and technology is difficult. But what is required of the humanists is not to acquire the specialized knowledge of science and technology that will qualify them to become specialists, but to understand the nature of science and technology—to understand the roles, significance and effects of the field and its activities in society and culture. Understanding at such a level is entirely possible if one does not avoid science and technology, but maintains some interest and exerts some effort.[3]

Of course, it is possible for the humanists to go on without doing so. Surrounded by the colleagues who are equally ignorant, they will not feel any inconvenience. If that continues, however, the loss they should bear will become enormous and their interest will be confined to a narrow scope that does not cover the large and important part of society and culture today. In fact, such humanists are victims of the separation of science from society and from the humanities. Many humanists today do not realize that they are in a very abnormal state in which they do not feel uncomfortable while not performing the proper role as humanists in their society and culture.

One thing I want to point out in this connection is that the humanities are not only for those who specialize in the humanities. The humanities are needed for people to be broadly cultured. Also, they form the basis for a variety of fields. Actually, a very small minority of college students who study the humanities later become scholars specializing in the humanities; most of them work in other fields. Many students enter "college of humanities" with hopes and plans to work in more practical fields outside the humanities. And that is not wrong but is something very natural. The nature of the humanities itself is meant to help people to realize such hopes and plans. Studying a broad range of the humanities will be helpful for those who plan to build their careers in the practical fields. The original structure of the university itself was like that when it emerged during the Middle Ages in Europe. All students were required to take basic subjects, such as philosophy, science, logic and rhetoric in the faculty of liberal arts, before moving on to the three higher faculties of law, medicine and divinity. I believe that universities today should find a key for solving the "crisis of the humanities" from this foresight embedded in the original structure of the university.

---

2) Of course, the prejudice and the ignorance in the opposite direction, namely the prejudice and ignorance of those working in science and technology about man and society, are also serious. On the seriousness of the division between science and technology and the humanities should in Korean society, see Kim Yŏng-sik, "The Problem of "Literary (mun)-Scientific(i)" Distinction in Korean Society", Science and Philosophy, 1993, 20-34.

3) Also, to understand the nature of science and technology, particularly to properly understand scientific activities and characters of scientists, it is necessary to actually encounter and experience science and technology. Although it is impossible to make all humanists experience every scientific field, ithey should learn at least one field to some extent. Even without full understanding of the difficult contents, and not remembering every thing learned, making an attempt itself is important.

the humanities" from this foresight embedded in the original structure of the university.

3. Task of the humanities in the "era of science and technology"

Having dwelled on the humanities so much, let us move on to science and technology. In modern society, specialized knowledge of science and technology is clearly, at times severely, separated from general intellectuals' interest and understanding.[4] As such separation is found so clearly and extensively these days, people tend to assume that this kind of separation is a natural state that has existed all along. However, it is a relatively recent phenomenon, resulting from the specialization of science over the last two to three centuries.

The decisive event that gave rise to the separation of specialized science and technology from general learning, particularly from the humanities, was the revolutionary scientific changes called the "Scientific Revolution". As a result of the Scientific Revolution that occurred in Europe during the 16th and 17th centuries, "modern science", drastically different from the traditional science, was formed, and in the course of its subsequent development science became applicable to technology, grew to a big scale that costs immensely, became difficult to understand, and in particular, became "specialized". And with the progress of specialization, science became more and more separated, isolated and estranged from general culture and the humanities.

In the 19th century, such state of separation has intensified and has gradually become a fixed feature of science and technology. Along with this line of development, there arose something like a state of opposition between people engaged in science and those in the humanities. One example is that the humanities, or humanism, proclaimed moral superiority of the education of classics and liberal arts over the emerging science and technology which claimed its intellectual superiority and practical value. That was, after all, an expression of the traditional humanists' feeling of superiority over, and hostility against, science and technology. Of course, there were other humanists who showed a different, almost an opposite, attitude, namely those who respected the expertise and the authority of the scientists concerning the specialized scientific knowledge. Yet, such "respect" had the effect of leading the humanists to neglect the specialized scientific knowledge and exclude it from their intellectual concern, leaving it to the scientists and technical experts.

Before this separation between science and technology from the humanities occurred, study of the natural world and scientific knowledge had been part of the broad humanistic pursuit both in the West and in East Asia. For example, scientific knowledge was always an essential part of Western

4) For example, C. P. Snow used the expression, "two cultures", in referring to this state of separation in his famous book *The Two Cultures and the Scientific Revolution* (Cambridge: Cambridge University Press, 1959).

learning. From antient times to Renaissance period, scholars in the West did not rule out the natural world or science from the scope of their intellectual interest. In East Asia also, science and technology were never excluded from the humanistic study of texts. Confucian scholars in East Asia did not avoid, but diligently studied, the phrases in the classics and official histories that referred to the natural world and scientific knowledge. For them, that was part of the process to become a sage through the search for the "principle of heaven" (*tianli* 天理).[5)]

This situation of scientific knowledge in traditional society in the West and East Asia, in which scientific subjects were a natural part--though not the most important part--of learning, is of a great significance for people living today. For the task of today's humanities confronted with the problems caused by science and technology that dominate modern society and culture is not to avoid, separate, oppose, or overcome science and technology, but to embrace, understand and use them. Moreover, it reminds us that the present situation of separation of science from the humanistic subjects is not the natural situation for scienece to be in. It is a particular historical situation generated in the course of the development of modern science in the West. During most of the history such separation did not exist. It is clear, then, that the more natural state for the two is to co-exist, rather than to be separated from each other.

It should be noted that the situation of science and technology in society has changed enormously from the time when the separation of specialized scientific disciplines were in progress in the 19th century, when the separation did not cause much problem but helped the development of the individual disciplines. When the state of separation was taking shape, the scientific disciplines were at an infant stage, and there was a need to promote the specialization through focussed activities in the fields themselves. The importance of science and technology in society was not so great, either. Thus, the separation of science and technology from the humanities did not bring about great harmful effects In 19th century. But today, the circumstances have changed greatly both in academic learning and in society, and the problems of the separation have become extremely serious.

Science is profoundly important in modern society and culture. Science today has become a critical element in all areas of society and culture, affecting them deeply. Above all, science is playing such an important role through technology. Science, which had originally been included in the interest of the intellectuals due to the importance of the study of the natural world, has now become an essential part of the life and interest of the intellectuals. Yet, while the world is becoming full of science and technology, humanists today are ignoring and excluding science and technology, the symbol of modern culture. The "crisis of the humanities" can be seen as a result of the separation

5) Yung Sik Kim, "Confucian Scholars and Specialized Scientific and Technical Knowledge in Traditional China, 1000–1700: A Preliminary Overview," *East Asian Science,Technology and Society: an International Journal* 4 (2010), 207-228: reprinted in . Yung Sik Kim, *Questioning Science in East Asian Contexts: Essays on Science, Confucianism, and the Comparative History of Science*_(Leiden:Brill,2014), pp.131-157

of the humanities from the various specialized fields like science and technology. And the crisis appears more serious in Korea because the separation is more serious in Korean society.[6)]

Today, the fields of humanities themselves are becoming—and have already become—specialized. Many fields of humanities are becoming fields of specialized knowledge, just as the fields of natural science, and then social science earlier. This led most humanists to form specialist groups of specialized disciplines, in which they concentrate on specialized research, discussion and competition, confining themselves to their own traditional subjects wile excluding other subjects like science and technology. We find many humanists in such a situation still blame science and technology for making man's life desolate. But are those humanists not the very ones who are devastating the humanities? Is it not the real task of the humanists to save the fields of humanities from such devastation through an understanding and incorporation of science and technology.

An important aspect of the "crisis of the humanities" has to do with the fact that it is difficult to answer the question as to what the characteristics and purposes of the humanities are. Of course, it is not easy to answer this question with respect to natural science and social science also, but it is possible, at least to some degree. In the case of the humanities, however, it feels much more difficult to answer the question. It may be possible to say simply that the humanities are the fields of study that deal with man's life. But then, there is no justification to exclude biology or economics from the humanities. Should we then say that the humanities are the fields that are not "scientific"? One cause of the difficulty has something to do with the way in which the humanites were formed and defined. While the fields of natural science and social science were specialized and became separated from the general corpus of European academic learning that encompassed all areas, the remaining fields were named "humanities"--as fields of study for introspection and reflection on human life and reality. As the areas that we used to consider to belong to the humanities were specialized and left, the remaining part of the humanities (the field of introspection and reflection) increasingly showed the symptoms of deficiency. What we call the "crisis of the humanities" my be referring to these symptoms.

One function that the humanities have performed with respect to science and technology is to point out the harmful consequences of science and technology. it can indeed be said that this has so far been the main task performed by humanists concerning science and technology. For instance, many humanists have pointed out, analyzed and interpreted the fact that the development of science and technology led to many problems, including environmental pollution, ecosystem destruction, energy

6) Kim Yŏng-sik, "Reflection on the Characteristics of Korean Science", 『Science in Modern Korean Society』 (Changbi Publishers, 1998) compiled by Kim Yung-sik and Kim Geun-bae, pp.342 - 363.

depletion, inequality between nations and classes, and defiance against the dignity of life.[7)]

Of course, it is important to properly understand the real nature of these negative consequences of scientific and technical development and human dependency on it. It will help ease the consequences and the dependancy. But this is not all. As we have seen earlier, science and technology have performed positive functions and have bought benefits to man also. Sometimes, the development of science and technology in one field has enabled people to become aware of the negative ramifications of science and technology in other areas.[8)] Also, by providing a deeper understanding of nature and man, and the relation between them, science has allowed people to build a balanced view on many issues, such as the environment, ecosystem and resources. In fact, in recent times the situation of technology has changed, and people's ideas about technology have changed accordingly. Thus, the relation between man and technology has become so complicated th at it can no longer be reduced to that in which man "controls" or "utilizes" technology.

In such circumstances, the humanities cannot go on opposing or ignoring science and technology. The humanities need to be connected with science and technology, the most important and characteristic element of modern society and culture. And I am not arguing for the connection between the two fields because science and technology have become important in today's society and culture. What I am arguing is to undo the current "unnatural" state of separation, which began during the Scientific Revolution in Europe before spreading to the rest of the world, and to restore the original state, which was the "natural" state both in Europe and East Asia since the ancient times till only a few centuries ago.

4. Search for connection of the humanities with science and technology

How, then, are we to connect the humanities with science and technology? This is a task and a challenge facing the humanities today, the "era of science and technology".

I have no clear answer or solution to this question. After all, my main concern has been to stress that the situation of today's humanities, which is completely isolated from science and technology, is causing a serious problem and that such a situation cannot be justified either in view of the intrinsic

7) This, in fact, can be seen as a tradition that has passed down since Karl Marx (1818-1883) who talked about human dependancy on technology based on the idea that labor is subordinate to machinery. In modern times, Martin Heideger (1889-1976) and Lewis Mumford (1895-1990) joined, arguing that not only labor, but also morality and emotion are also subordinate to technology. Jacques Ellul, Technological Society (New York: Knopf, 1964) translated by Park Gwang-deok (Hanul, 1996).

8) For example, it was a scientific research that discovered the existence of the ozone layer and harmful effects of the ozone hole.

nature of the field of humanities or its historical development. And although I have no concrete solution to this situation, I may be able to say a few things.

To begin with, it needs to be pointed out that it is unrealistic, and impossible, to try to go back to the old days when the humanities and science were not separated from each other. Once the humanities and science have gone through the process of separation, they cannot simply go back to the past, without being affected by the changes that took place in that process and while still remaining in the surrounding circumstances that resulted from those changes. The humanities and science, which have already undergone those changes and acquired such new characteristics will have to be reconnected as they are today in the new circumstances and with the changed characteristics. Even if it were possible to go back to the earlier situation before the separation, the connection between the humanities and science would then lose its significance in such a situation, and thus there might not be any reason to try to connect them.

Some propose that a new "paradigm" for the relation of science and the humanities should be found, but such obvious and theoretical proposal cannot lead to a concrete method for the connection. In fact, most attempts for the connection so far have been centered on pointing to the general directions at a basic level rather than providing concrete methods. For example, as the negative aspects of the impact of technology on society is drawing more attention in recent times, many advocate the coexistence and reconciliation of technology (or science and technology) and man (the humanities) as a solution. However, there has been few suggestions of concrete ways to work out such coexistence and reconciliation.

What, then, needs to be done specifically? To begin with, we may consider the various kinds of con nection that can take place between the humanities and science.

For example, there are jobs that make science and technology easy and interesting by means of quizzes, games and cartoons involving science and technology. But they are not the real connection we seek for. Moeover, there is a clear limit in making science and technology easy and interesting in this way because of the inherent difficulties of science and technology that have already been specialized.

Thus, one should face science and technology head-on, however difficult they may be to understand. Given the importance of the role of science and technology in modern society and culture, they cannot be replaced by easy expedients, or laid aside and ignored. So it is important to acknowledge and accept the fact that science and technology--their content and activities—are difficult. And it will help if it is kept in mind that, fortunately, what are required of the general intellectuals, or humanists, in such efforts to understand science and technology, is not to become experts and to

compete with the specialists at a professional level.

There can be literally "meetings" between scientists and humanists, and between scientists and artists, taking place in gatherings with such names as "meeting of the humanities and science" and "meeting of science and art". But it cannot be expected that these meetings will bring about the kind of connection between science and technology and the humanities that we hope for. Of course, such meetings are in the direction towards communication and interaction between the humanities and science by getting rid of the barrier between them. But the "connection" resulting from these "meetings" is bound to be limited. We can discern in the mind of those who hold such meetings the idea that scientists and humanists who work separately within their own realms can come to the meetings and exchange what they need from each other, and even the notion that the scientists assume the task of making the scientific subjects in a form that can be digested in a "humanistic way," so that the humanists can simply "accept" the result. They even seem to feel that it is natural for the humanists to exclude scientific subjects from their concern and thus that it is a remarkable feat for the humanists just to come to contact with science and technology by coming to these "meetings". In this respect, these meetings which are being held in the name of "connection" and "integration" of the humanities and science have an effect of confirming and reinforcing the separation between the two.

Obviously, such meetings cannot be genuine meetings, because a proper connection cannot be made between the humanists and the scientists while the knowledge and studies of individual humanists and scientists remain separated from each other. The connection should take place within an individual. In particular, humanists should perform the entire work of connection for themselves. And the task should include the investigation and decision on such questions as how much scientific knowledge they should accept and understand, and what are the important aspects of science they need to consider. Once this has been done, the connection will be realized in the work of individual scholars, and at seminars or discussions on individual topics or fields, without having to arrange a venue for such "meetings".

Again, a question arises. How can the humanities accept science and technology? There can be various types and levels of "accepting".

To begin with, it is important to recognize that the humanities accepting science is a completely natural thing, although it may at first sound unusual, or even abnormal, out of the track. For the humanities to accept science is not to find something from outside the humanities and to incorporate it. It is to accept what should be a natural, proper part of the humanities that have been, and are being, improperly, and unnaturally, excluded,. Of course, there is no shortcut for doing so, and thus it is important to recognize that it will not be an easy work. Keeping that in mind, let

us move on to consider more concrete methods.

The most elementary way for the humanities to accept science and technology may be the use of computers or the Internet by humanists. This certainly is a connection between the humanities and science. But it is obvious that simply using the output of science and technology in this way is not the real connection. We can also think of writers and artists using science and technology as their subject matters. For example, scientists and machines appear in novels or art works, which thus use scientific and technological knowledge. The same goes for the cases where scientific techniques are used in the process of creating music and art. These are very obvious and familiar examples, and thus are the most conspicuous expressions of the humanities-science connection in modern society and often thought of as evidence of the connection no one can deny. However, I cannot but doubt that our attempts to connect the humanities and science can remain at this level.

Humanists applying, or appropriating, concepts or knowledge of science and technology show a different kind of connection at a level different from the above examples. But such connection is still not sufficient. In particular, simply using isolated knowledge, words or objects in isolation at a superficial level can hardly have any significance. Scientific and technical terms not clearly understood are frequently used by the humanists these days. Common examples include such terms as "entropy", "relativity", "quantum" and "uncertainty". Rather than using – mostly misusing – these abstruse and difficult terms of physics, it might be far more fruitful to broadly grasp the knowledge of biology or environmentology, which is relatively easy to understand, and incorporate into one's thinking.[10] Indeed, the content of molecular biology may at first feel unfamiliar and more difficult than the above-mentioned terms of physics . But they are easy enough even for high school students to understand if they exert some concentrated efforts..

The cases in which the humanists study science and technology academically, namely, the cases where the humanists work on science and technology as their research topics, may represent another form of connection, in some sense of a level higher than the examples mentioned earlier. Typical cases are the history of science and the philosophy of science. The two areas, the history and the philosophy studying science as their subject matters, are the areas that have developed through the 20th century and have become established academic disciplines.[11] There also are cases in which the humanities, owing to the needs generated by their subject matters, come to meet science and technology, and are connected with them, thereby creating new "interdisciplinary" fields: cognitive

10) C. P. Snow has argued that one should not simply use terms of science, but they should be "assimilated along with, as part and parcel of, the whole of our mental experience". The Two Cultures (Cambridge University Press, 1998), p.16.

11)Questions as to what impact science and technology have on society and culture and what impact the elements of society and culture have on science and technology, and what isthe nature of scientific knowledge and what are the reasons that it is accepted as knowledge are the typical subjects studied in these fields.

science, brain science and evolutionary biology, for example. These fields of study have successfully established themselves in the academic world. However, although it is true that they are examples of connection between the humanities and the fields of natural science, they are no more than meetings and connections of a few individual areas arising from the needs of particular subjects, areas and problems. Although their academic achievements are frequently mentioned and valued, this kind of connection cannot be enough.

In any case, attempts of the various kinds and levels discussed so far for connecting science and the humanities are all currently in progress, and they should continue. But as I have pointed out repeatedly, the connections resulting from such attempts cannot be fully satisfying. Regretably, I personally have no alternative to propose. But considering the seriousness of the extent of separation at present and the importance of science and technology in today's society and culture, I do believe that there need to be connections between the humanities and science at a deeper, more substantial, level than what we have looked at so far.

There is one thing to consider in this connection. The basic position common to all kinds of connections suggested so far sees the relations between science and the humanities as that of complementing, rather than opposing, each other. This is basically a right position. But it still has a problem. This position puts science and the humanities on the same level, while, in fact, the two are of different levels. It is not to say that either of them is superior to the other; what I am saying is that science and the humanities are of different nature, different levels, and different dimensions, and thus it is impossible to bring about a symmetrical combination or integration of the two by having them meet each other.

I am increasingly inclined to believe that what is needed between the humanities and science is "connection", and not "combination" or "integration". Sometimes, I have a suspicion that combination and integration may be impossible or unreasonable, may be even something that should not be attempted. I also feel that what is more important is to eliminate the division and the barrier between science and the humanities which resulted from the view that the two are symmetrical, rath er than to search for the method of connecting them. In actual history also, while science and the humanities conflicted, influenced, and formed relations with, each other, they were not standing on equal, symmetrical footings. Science used to be only a minor part of philosophy and theology, before it gradually became independent, separated, important, and eventually ended up being a model to emulate. Once this is clearly recognized, it will become obvious that what is needed is not the meeting, integration or convergence between science and the humanities. something different is needed, which might be called as just "connection". Or perhaps the expressions like "cohabitation" or "coexistence" will do.

5. Prospect

While discussing the goals the humanities need to seek--and the problems to solve--in this era of science and technology, I have not provided concrete solutions, or suggestions for the connection I have spoken about. Even while discussing the actual attempts aimed at connecting science and the humanities, what I have offered were mostly complaints or criticisms, merely saying that none of them are good enough to be a satisfactory solution. The truth is that I am pessimistic about this problem. Sometimes I even feel hopeless, at which moment I doubt if there will be a way at all out of the current situation of separation, isolation, and barrier between science and technology.

Yet, although I am pessimistic in that I see no clear method or way out, I do not believe that the connection will never come up. The basis of such a gleam of hope is so slight that it even appears pitiful: it is based on the mere belief that people – and society – of today have reached such a state in which they can no longer afford to be complacent about such separation and barrier and to go on without changes. I believe that, driven by such discontent, someone, somehow, will eventually come up with a workable connection.

I cannot predict at the moment what will be the method of the connection which will eventually provide the solution. Perhaps a completely new solution which has never been suggested will come up. On the other hand, one of the solutions that have been already proposed may end up serving as a key solution some time in the future. Examination of the major trends and changes of learning and ideas, especially the large-scale ones that occur once in centuries, will help us guess the types and the nature of the solution that we look for. And from such examinations we can predict that the solution will be of an altogether new, entirely different, kind, something that could not have been predicted to become a real solution when it was first proposed. It is entirely possible that an attempt, which was made without recognizing the above-mentioned problems, and which had nothing to do with the attempt to find the solution to them, may end up with providing real, substantial solutions to all those problems.

This means that the solutions will not be found through organized projects deliberately aimed at coming up with them. Of course thery will not come suddenly from nowhere, either. The solution will emerge in the course of making various attempts, including the ones I have mentioned. And wh at is important, a lot more so than the attempts made on purpose targeting the “meeting” and “connection” between science and the humanities, is to see clearly that the current state of separation between them as a problem.

In this respect, it is fortunate that the seriousnes of the problem is being recognized in recent years.

We can see this from the fact that there are more and more attempts for the "meeting" of science with the humanities, arts and culture, and more and more arguments for "integration" of them. However, a far more thorough recognition is needed. It is necessary to see how serious the current state of separation of science from the humanities and the general culture is and how important it is to address that problem. Above all, it is necessary to have the firm belief that the problem must, and will eventually be resolved despite the great difficulty of doing so.

No one can say that it will necessarily be the humanities which will provide the solution or that the humanities must provide the solution. Yet, if the humanities are to do so, or if we call what will provide the solution as the "humanities", one possible scenario is that the "humanities" will no longer exist as one field. In fact, what we call the "humanities" today are the aggregate of various humanistic fields, or merely a name that stands for the aggregate of the fields that belong to "colle ges of humanities," and it is doubtful whether the humanities really exist.[12] What should be sought, then, is not just the aggregate of the humanistic fields, but the "humanities" that encompass all fields of study (which have become specialized in modern times), in such a way that they can be meaningful and helpful to a variety of problems of human life, the humanities that do not stop at being specialized knowledge but go beyond that to embrace all these fields. Of course, questions about how to "encompass" and "embrace" will continue to be raised. But one thing is certain. It is unimaginable to exclude science and technology in the course of such "encompassing" and "embracing".

After all, the humanities we look for are more of "method" and "spirit" than "study". This is more congruent with the meaning of the singular word of "humanity" than the plural form, "humanities". And it feels as if the word "humanities" were functioning as an adjective rather than a noun. All the academic disciplines, including the ones falling under the category of humanities today, will become specialized. But the spirit and the method of the "humanities" (now as an adjective) that encompass all these fields, and the need and desire for such spirit and method, will remain. That will be what the "humanities" ultimately pursue, through which a new solution will come up. One thing to be noted in this connection is that in the past ethics, which belongs to the "humanities", was regarded as practical while science which explores the natural world was considered to be of no practical use. Today, the situation is exactly the opposite: while science is considered practical, the humanities including ethics are regarded as a field of no utility. In this situation, seeking the spirit and the method of the "humanities" may be the way to restore the practical utility which the humanities used to have in the past.

12) To be sure, "natural science" is also an aggregate of various fields of study, but it is hard to say that it has no substance. In that regard, it is worth noting that the word, "humanities", is in plural form. Of course, there are bothsingular and plural forms for the word, "science". But in the case of "humanities" the singular form, "humanity," has a completely different meaning from that of the plural form..

What I have said was not a clear or satisfying answer, but that was to be expected. After all, my aim was not to offer a definite answer or solution, but to raise problems, and in particular to point out that unless the separation and barrier between the humanities and science are removed, there will be no solution to the problem, and the problem will even deteriorate. If this point is understood, that will be enough for me.

Other than that, what I have talked about are more of complaints that may lead to problems rather than solutions to problems. Yet, I hoped that doing so might bring about further questions and criticisms, which will eventually help us think more about the problems. It may be expected that other solutions can be found through such questions and criticisms.

The Age of Ecology : A New Enlightenment

Joachim Radkau
Bielefeld University

Professor Radkau sent us his aftherthoughts regarding the issues discussed at the forum. Following his wish to share 3 points developed from the conversation with Professor David Christian, we decided to insert them before his speech paper.

(1) As to the traditional aversion of the humanities against natural sciences and technology, I would underline what Carl Amery (see "The Age of Ecology") emphasized: It is fundamentally wrong to equalize the criticism of certain technologies by environmentalists with the old aversion against the modern technical world of rightist philosophers like Heidegger or Oswald Spengler. This new criticism is a competent and specific criticism originating from an interest in technology and with a view on technological alternatives. It is best documented by the immense mass of literature on the nuclear controversy, but also by environmentalists like Amory Lovins.

(2) Charles P. Snow who was quoted on our congress attacked the gap between the "two cultures" (but in truth he himself widened this gap by his naive trust in technological progress and his discriminating and sometimes unjust remarks on the humanities); but environmentalism on the whole does not deepen this gap but is rather a way of overcoming this unhappy confrontation between humanities and natural sciences. (As I tried to demonstrate in my "Max Weber" also the later Weber tried to overcome this gap but has usually misunderstood by Weberian sociologists!)

(3) In Korea I often was shocked by the monotonous and unsensible modern architecture but at the same time moved by the rediscovery of old beauties of traditional art and architecture especially since the 1980ies. I think everywhere in the world, also in Europe and North America, there is an intimate connection between environmentalism and this rediscovery. By this way, environmentalism might help to overcome the deep split between old "right" and old "left" within South-Korean society.

The title of my paper might arouse the suspicion that I fell into the teleological trap of projecting a sublime sense and deep destination into my theme. But to be sure, I do not intend to present an uncritical, self-complacent success story; at present there is indeed no good reason to do this. It is not at all easy to define so-called environmentalism, the popular ecology of today: "ecology" in a comprehensive and political sense, not in the old sense of a biological sub-discipline. Over the years, I myself have often been hesitant and wavering at this point and have been several times criticized by reviewers because of this "meandering" of mine.

When I wrote my global history of the environment entitled "*Nature and Power*" in the late 1990s, I had just before published a history of German nervousness, and I had a special interest in emotional, even pathological roots of environmentalism. My chapter on the modern environmental movement started with the statement: "The strongest human impulses grow out of an interaction of love and fear. Environmental awareness, too, becomes an urgent passion when the love of nature – sensory and supersensory love – is united with fear. Anxiety about nature is most acute when it is also an anxiety about one's own welfare, and it becomes a public force when the objects of individual concern can be melded credibly into a great threat to the nation and humanity. This kind of interconnection of anxieties stands at the beginning of the modern environmental movement." But, please note: an interconnection of anxieties, not one single anxiety!

At that time in the 90s, I discovered an epoch-making change of fear of maladies, which had occured about 1960, as a root of environmentalism: the change from the old fears of infectious epidemics to the new *grande peur* of cancer. That would give an explanation for the rising fear of radiation and the dominant role of the anti-nuclear opposition in the environmental movement of diverse countries, from Germany to Korea. But this explanation alone was not sufficient. Regarded from a global and not only from a German perspective, environmentalism comprised a lot of elements which had nothing to do with cancer. More and more I perceived that there is no single master narrative of modern environmentalism.

I entitled the introduction of my new history of environmentalism "*The Age of Ecology*" which combines diverse narratives with a hint of humour: "*The Green Chameleon*". (My friend Frank Uekoetter, who wrote at the same time a history of German environmentalism with the somewhat ironic title "*The Greenest Nation?*", entitled one chapter "*The Green Enigma*".) Indeed, in the course of time environmentalism appears as a grassroots protest movement as well as an administrative top-down strategy and source of political legitimacy, as a lot of local initiatives as well as a base of global conferences, as a philosophy as well as an outburst of hysteria.

From my view, these inherent tensions are essential for environmentalism; they are the condition that this movement remains in motion and does not freeze too much in rigid structures. Therefore I think the chameleon-like character of political ecology is a proof of its vitality and of its adaptation to the jungle of environmental problems. If we look back to older movements – socialist, Communist, nationalist, fascist – we will realize how quickly the so-called movements did no longer really move but became tied down by a set of fixed ideas, and how great is the difference in this respect from the environmental movement.

I. Alternative interpretations.

According to the rules of critical rationalism if you present a thesis, you have to explain at the same time by which way your thesis might be disproved. Now, when I state that modern environmentalism is best understood as being a new enlightenment: what are possible alternative interpretations of environmentalism? I propose three alternatives: (1) Environmentalism belongs to the so-called "new social movements"; (2) far from being in its core a rational phenomenon, environmentalism has ideological, even a kind of religious or spiritual roots; (3) environmentalism springs from a state of anxiety; it belongs to the history of hysteria, of *the grand peurs*. About every point you could write a book. Let me give a short comment to each of the three alternative interpretations:

(1) When social scientists discovered the new environmentalism in the 1970s and 80s, they used to subsume it into the "new social movements", a fashionable concept of that time related to the concept of "post-materialist" age and "post-materialist society". But this definition is too narrow; it holds true for certain situations, but not for the phenomenon as a whole. Members of the Federal German Ministry of the Interior declared proudly (and somewhat reproachfully) to me: "In fact it is we who have founded the environmental movement!" And they were not totally wrong. The lasting force of environmentalism does not emerge merely from citizen initiatives (which often are short-lived and focused upon a single goal), but from a steady interaction between grassroots movements, NGOs, political and administrative bodies, scientists, mass media and, last but not least, courts of justice.

Helmut Weidner who compared Japanese and German environmentalism over a period forty years, explained to me that in Japan, too, there existed a lot of local anti-nuclear opposition, but this protest lacked the interaction with other forces of society that were necessary for a lasting political effect. He remarked in Federal Germany it has been the merit of pragmatic 68ers to effect this interaction. At the beginning of the German anti-nuclear protest, there stood the wealth of critical insights brought in from American scientists by Holger Strohm, founder of the German section of the *Friends of the Earth*. For no other great movement of history information was as essential as it has been for environmentalism.

(2) To be sure, there are many indications for ideological, religious, spiritual motives of environmentalism. I myself contributed an article "*Religion and Environmentalism*" to the "*Companion to Global Environmental Movement*" edited by John McNeill (2012). It is conspicuous how many origins of environmentalism are in the Protestant world; I must confess that for some time I had the hidden ambition to become a green Max Weber and write on "*Protestant ethics and the spirit of environmentalism*". But even in Protestant countries these roots were not always Protestant; for instance, new Buddhist trends seem to play an eminent role in the green scenery.

From my view, this is exactly the significant point: There are a lot of spiritual roots of environmentalism (but also the enlightenment of the 18th century had spiritual roots!), but these roots are diffuse. There have been many green leaders who would have liked to have had the charisma of prophets; but they lacked the mass of followers and are mostly forgotten today. The best example is Rudolf Bahro, one of the founding fathers of the German Green Party, who started as a Marxist and at the same time as an admirer of Martin Luther, then turned to Meister Eckhart, Spinoza, Buddha and others, until he turned to Bhagwan Shree Rajneesh with his tantric sexual practices. The founding mother of German Greens, Petra Kelly, though she was critical of Bahro's arbitrary religious eclecticism, moved from the Brazilian liberation theologist Helder

Camara to the Tibetan Dalai Lama. The unity of environmentalism is clearly not established by religion, nor is it by a certain ideology. Rather, a big curiosity in spiritual matters and not only here is characteristic for environmentalism.

(3) Does the Age of Ecology been best understood as an Age of Fear? I have already discussed this interpretation. I think here again we realize the specific insights into environmentalism which are produced by a global historical approach over several decades. Within a restricted scope limited to certain stories environmentalism may appear as an outburst of panic; watched over a *longue durée*, however, and with a global horizon, views of this kind turn out to be narrow-minded.

A certain point deserves special attention: The "ecological revolution" of 1970 spreading from California to Japan was in no way a reaction to a certain ecological catastrophe. To be sure, England had been shocked by the *Torrey Canyon* supertanker disaster of 18 March 1967 near the coast of Cornwall, the American Middle West by the imminent biological death of Lake Erie, Sweden by the acid rain, Japan by the Minamata disaster caused by mercury emissions; in many cities protests gathered against rude "redevelopment" projects – but the "environmental revolution" arose out of an intellectual combination of very diverse concerns; it was no one-point movement: therefore the lightning career of this abstract and artificially constructed term "environment"! And from the beginning onwards intellectual elites joined environmentalism, even if the mass media were mostly animated by aggressive demonstrations and clashes with the police.

II. Six arguments for "new enlightenment"

Now I shall present six positive arguments for my thesis that environmentalism is best understood as a new enlightenment:

(1) An "Enlightenment" needs a preceding darkness against which to fight and which is to illuminate. Indeed, the "ecological revolution" of 1970 was confronted with a darkness, since the 1960ies were not only the decade of the students' rebellion but even more a decade of technocratic megalomania connected with new dimensions of environmental pollution. In the first decade after the war it had hardly been possible (at least outside North America) to publish a world bestseller about the "limits to growth" since only a few people believed in unlimited growth; it was only in the 60s when the illusion of eternal growth reached its peak. At that time, "futurology" (later on, a more modest "future studies") became fashionable. It is remarkable that "future" was a magic word of the ecological turn, too: Here you may observe dialectics of futurology because you arrive at absolutely absurd consequences if you extrapolate growth consequently and excessively.

In former times, the awareness of the limits of natural resources had been a driving force of imperialism: of the race to the last resources of the world. At present, there is a tendency of a new race of this kind on the oceans and in the arctic regions. Maybe in the future the age of ecology will be recalled as an age of peaceful wisdom: of a reasonable common coping of mankind with the "limits to growth"!

By the way, if you go much further back into the past, one could state that the new enlightenment started at blind spots of the old enlightenment of the 18th century, which were inherent in the utilitarian

imagination at that time of a benign nature created for the use of mankind: an imagination which already had been shattered by the earthquake of Lisbon in 1755 when Voltaire mocked at Rousseau's naïve trust in nature. The idea of the "revenge of nature" arose at that time in order to give some sense to such catastrophes, but this idea – even accepted by Friedrich Engels – appears somewhat helpless because one did not really believe that "Nature" was a person. Strangely enough, Max Horkheimer in American exile sometimes called Nazism the "revolt of nature": revenge of wild nature against its domestication by the enlightenment of the 18th century. Behind this background one can say that the new enlightenment illuminated not the least a dark side of the old enlightenment, too.

(2) At the beginning of the ecological revolution there were not furious demonstrations; instead this great turn had a long intellectual prehistory dating back to the wake of the second world war, to the foundation of the UNESCO and the IUCN (International Union for the Conservation of Nature) with prominent persons like Julian Huxley in the center, as Anna Woebse pointed out in her pioneering book "*Weltnaturschutz: Umweltdiplomatie in Völkerbund und Vereinten Nationen 1920-1950*". I have already pointed to the crucial role of information for environmentalism. In his speech to the UN Environment Conference held in Stockholm in 1972, Gunnar Myrdal, a well-known member of this elite who believed in the power of science, took it for granted that concern for the earth's ecosystem should originate among scientists aware of their responsibility, not from a broad mass movement.

(3) Over the years and decades, environmentalism developed enormous intellectual dynamics transcending boundaries of scientific disciplines, ideologies and cultures. Robert Poujade, the first French environment minister, pointed out that the simple term "environment", as it was then understood, had an "imperialist", expansionist quality. Comparable with the old enlightenment environmentalism led to a new discovery of the whole world. To be sure, some of these discoveries might have been more or less constructions of the mind; but there were indeed new kinds of environmental risks to be revealed, whether you look at John McNeill's "*Something New Under the Sun*", or at Christian Pfister's "syndrome of the fifties" or at Ulrich Beck's "*Risk Society*" or even further back to Rachel Carson's "*Silent Spring*" of 1962 and Karl Polanyi's "*Great Transformation*" of 1944. The atomic bomb was a warning sign not only with regard to nuclear technology.

(4) Already in the 19th century there was a lot of protest against obvious harmful pollution caused by the Industrial Revolution; this wave of protest has been rediscovered by the first generation of environmental historians. But Frank Uekoetter's great work "*The Age of Smoke*" ends exactly in 1970, the year of the ecological revolution. At that time, at least in the old industrial countries the classical types of industrial pollution provoking the human senses were more or less in decline, in part by the advance of electricity. The typical new quality of the age of ecology was the intensified attention to *hypothetical* risks, foremost the risk of radioactivity, of new pesticides, of genetic engineering and of climate change. The evaluation of these risks was foremost an intellectual challenge; it could not be achieved by spontaneous sensual perception. Wolf Haefele, the German "Fast Breeder Pope" of the 1960s, after retiring from the fast breeder development published in 1973 an article "*Hypotheticality and the New Challenges: The Pathfinder Role of Nuclear Energy*". To be sure, he wanted to divert the opposition from his breeder and point out that nuclear technology was not the only new hypothetical risk; but he was a sagacious man, and his article defined the new quality of the new environmentalism in an appropriate way.

(5) Regarded from a wide horizon over decades and in different countries, environmentalism was not obsessed by one single fear, one single ideological construction, but had very diverse allies. One of the most striking examples is to be found in the history of German environmentalism during the transition from the 1970s to the 80s. In the late 70ies the environmental movement was passionately focused on the risks of nuclear energy; but since 1981, the eco scenery was dominated by the alarm about the "*Waldsterben*", the "death of the forest". In 1985 Carl Amery even wrote: "The death of the forest was the first violent ecological shock to affect the whole nation" (in the time before, the nuclear controversy had rather split the nation).

Frank Uekoetter concluded: "Without the debate on the death of the forest, it is doubtful whether the Greens would have entered the Bundestag for the first time in March 1983 with 5.6 per cent of the vote." That is an irony of history as the dying forest distracted attention from the nuclear issue that had been central to the formation of the Greens. The same holds true for the climate alarm of the following years (no wonder that this alarm aroused the enthusiasm of the nuclear lobby!). All in all, in the course of time, intellectual curiosity was much stronger than monomaniac convictions and communities in the development of environmentalism. In the long run, there were no stable frontlines.

(6) As I have said, environmentalism from its first beginnings until the present time is characterized by deep inherent tensions; these tensions are the base of the structure of my "*Age of Ecology*": the base of the diverse dramatic narratives. Keeping to the number six for this sixth positive argument that environmentalism is best understood as a new enlightenment, one may distinguish the following six tensions:

(6.1) For Barry Commoner, one of the founding fathers of American environmentalism, the fundamental insight of political ecology consists in the sentence: "*Everything is connected with everything else*." For effective political action, however, you need to concentrate yourself upon a certain target. You can write the whole history of environmentalism as a drama caused by this tension!

(6.2) David Brower, the other founding father of American environmentalism, invented the slogan: "*Think globally – act locally*." But if you follow this slogan too obsessively, you get schizophrenic by loosing any link between thought and action. Grassroots movements are mostly local; but about 1970 environmentalism got its new dynamics not the least by the new worldwide horizon. Also this tension is until now a hidden dramatic element in environmentalism!

(6.3) Characteristic for the new environmentalism was its capability for conflict; but at the same time, it searched to establish a common interest of mankind towards overcoming the Cold War; "*Greenpeace*" became the name of the most famous and (peacefully) fighting international green NGO. The tension between strategies of struggle and strategies of consensus belongs to the sources of motion within the environmental movement.

(6.4) One of the origins of environmentalism is toxicology in connection with occupational medicine: Manual workers were the first who suffered from toxic emissions which later on evoked environmentalist protest. When Rachel Carson discovered the toxic effects of DDT, she was influenced by Wilhelm Hueper, an occupational physician of German origin, then director at the National Cancer Institute. Care for human

health was always a powerful driving force of environmentalism – but at the same time fear, other driving forces have been fear of the "population bomb", a longing to be alone in the virgin nature, and a love for animals sometimes much stronger than the love for humans.

When Paul Watson, captain of "*Sea Shepherd*", was fighting against Japanese fishing boats which hunted dolphins a fishermen complained that there were "over 300 000 dolphins" out there that ate the fish and deprived fishing families of food, Watson replied with brutal candour that his duty was to save the dolphin, not to rescue fishermen. By internet I ordered a second-hand copy of the book "*Ecology Wars*" written by Ron Arnold, one of the most militant American anti-environmentalist hardliners. When I received the book, to my great perplexity I found within a personal dedication inside: "*to Captain Paul Watson – who understands what the war is about. Salute from an admiring opponent – best wishes, Ron Arnold.*" "What the war is about": What? Apparently Arnold would say: "Captain Watson is a sincere man who frankly says that environmentalism is a war against humans." But apparently Watson did not appreciate this dedication and threw the book away so that I could buy it for few dollars! He would not concede that the environmental movement is anti-human. Again and again we realize a deep tension within environmentalism between an anthropocentric and a biocentric attitude.

(6.5) If we approach environmentalism with concepts of Max Weber, we discover many charismatic leaders, charismatic communities, and charismatic moments, but in the long run also processes of organization, bureaucratization, rationalization, and transformation into every-day routine, that are frequently disappointing for the enthusiastic activists of the first hour. It seems that environmentalism has to cope with this inner tension, too. As environmentalism has rational impulses, processes of rationalization have their logic and cannot be merely regarded as processes of decline.

(6.6) Characteristic for environmentalism is a strong orientation towards the future: "Future" was from the beginning, from the ecological revolution of 1970 onwards, a magic word, followed since the environmental summit of Rio 1992 by "sustainability", "sustainable development" characterized by the "precautionary principle", by provision for future generations. But on the other hand, peculiarly the grassroots protest movements were driven by a provoking present, by topical problems here and now. Here we realize a deep tension with regard to perspectives of time.

At this point, please let me make an interjection about my old historical hobby of wood; my book "Wood" has been published this year in Korean. The principle of sustainability was first formulated in German forestry of the 18th century. After Rio 1992, from forestry it spread all over the world, over diverse branches of economy. The whole history of forestry is characterized by deep tensions between short-term and long-term calculations. I think environmental politics might learn a lot from the history of forestry. Volker Hauff, the German delegate to the Brundtland commission which pronounced the principle of sustainability as a general maxim, told me with regret that this commission had only a little knowledge of forest history. That may be one cause of the problem that sustainability during the last decades remains too often an abstract principle, a mere *mantra* without practical significance in concrete situations.

Now the critical question: What do all these six tensions prove? From my view, they all together are the striking proof that environmentalism does not originate out of certain emotions alone, from certain

ideologies and group interests alone, but out of a combination of very diverse impulses – a combination which can only achieved by intellectual operations. But will this complicated combination remain stable in the future, too?

III. Finally: The dialectics of green enlightenment.

Theodor W. Adorno and Max Horkheimer published a book in 1947 which became a Holy Scripture for many intellectuals: "*Eclipse of Reason*" by its American title, "Dialektik der Aufklärung", "Dialectics of Enlightenment" in German. It was a kind of intellectual self-criticism after the terrible Nazi experience: They described how the enlightenment with its increasing influence became entangled in the mechanisms of power, producing its own kind of intolerance and mythology and turning its highest ideal, reason, into an instrument of domination. In a country like Germany, where environmentalism has become influential since more than forty years (but also in a country like Costa Rica which presents itself since three decades as being the ecotopia, the "green republic" of the Americas) we may study disturbing dialectics of green enlightenment, too.

Again I think one should observe three different points:

(1) Also the green enlightenment when it acquires political influence is not free from the seductions of power. There are tendencies for creating a new orthodoxy. I remind Robert Poujade who called "environment" an "imperialist term"; Frank Uekoetter points out in his new book on the rise of German environmentalism "*The Greenest Nation*?" the enormous attraction environmentalism has for an ambitious administration. There is the danger that an effective protection of environment is drowned in an ocean of regulations. A manager of a German nuclear power station complained to me: "There are ten thousand nuclear safety regulations; nobody is able to have them always in mind and to observe them." Another manager joked: "German nuclear power stations have so many safety mechanisms that they only work if you turn off these mechanisms."

(2) Therefore I sometimes am anxious that somebody will write in twenty years or so a continuation of my "*Age of Ecology*" with the title: "*The Age of Eco-Bluff*". Consequently, from my view eco-revisionism is also part of the green enlightenment: It would be not wise to dismiss as a heretic anyone who professes scepticism about a particular eco-alarm. (Frank Uekoetter complains to me that he is treated by orthodox greens as a heretic since he has co-edited a book on false eco-alarms!) A lasting global success of environmental protection will probably hinge on whether it achieves a limited number of clear and simple regulations that any rational person is able to understand; that was the case with the smoking ban in public places (a remarkable success hardly analyzed until today!), which the eco-age saw enforced more and more around the world. If the human right to clean water, pure air, healthy food and restful sleep is enforced with all its consequences, a large percentage of environmental problems will be already covered. Man's relationship with nature can be made harmonious only if it is in harmony with human nature.

(3) Exactly because environmentalism does not originate from one single ideology, the rise of green orthodoxy leads inevitably to a clash between different orthodoxies as we experience today in Germany

after the "Energiewende", the turn of energy politics after the Fukushima disaster in spring 2011: enforcement of renewable energies versus the protest of landscape protectors against wind power parcs and biofuel monocultures. There is the danger that environmentalism breaks into pieces exactly due to its success, and that its inner tensions and heterogeneous elements lead to dissipation. Here may be a peculiar mission for an historian who is able to play an intermediating role by pointing out the force of the intellectual combination of these diverse motives during the past decades. A final statement of my "*Age of Ecology*" has been quoted several times:

"The ability to cope sensibly with internal tensions and competing objectives has probably never been as decisive as it is today for the future of the environmental movement. To place a doubter of the iconic hockey stick climate curve on a par with a Holocaust denier is to strain the cohesion of the movement as much as if one were to treat as enemies all those who still hesitate in unconditionally denouncing all forms of nuclear technology, or to accept as members only those for whom the undisturbed mating of toads is more important than a new express train line. Jeremy Bentham, who loved his cats but also the mice in his study, did not fail to realize that there can be clashes between objectives in one's love for nature. But the amatory conflict between cat and mouse is nothing in comparison with the clash of objectives over the environmental future of today."

At present we do not know whether the history of environmentalism will turn out in the end to be a success story, a comedy or a tragedy (therefore it is good for the historian to combine all these possibilities in a Shakespearian way!). In 1988 Jacob von Uexkuell (whose father invented the modern term "environment") said at the awarding of the Alternative Nobel Prize to the courageous Brazilian environmental activist José Lutzenberger: "He is not an optimist, he is not a pessimist; he is a possibilist." I believe that possibilism in this sense is the best base not only for the writing of environmental history but also for getting something moving. Thank you!

A Planet-changing Species : Humans in the Anthropocene

David Christian
Macquarie University

Main Theme

Cosmos, Humanity, and Civilization – The Future of Humankind Through a Vision of the Universe

In spite of the scientific and technological advancements made in the last few decades, the global community has not taken similar strides in its movement toward prosperity for all. Famine, disease, and climate change – only some of the issues that continue to plague our community – are often ignored in the buzz of social and mass media. Clearly, new frameworks are needed to inspire a vision that pursues the betterment of humanity.

Intellectual discourse that seeks to inspire such a vision must be grounded in an understanding of the origins of life and the universe in which we live. By answering the question of how we came to be, we can gain insight into the question of what we can become, not only as individuals but also a species that is united in a common history.

To understand our future we must study human history at the appropriate scale:

The scale on which you study something really matters. If you study something at the wrong scale you won't understand it. If the subject is unimportant, of course, this doesn't matter. But what we are talking about in this conference is something very important: the future of our species. So we must make sure we discuss the question at the appropriate scale.

Unfortunately, in the modern world, educators and scholars and scientists and politicians around the world study human society at the wrong scales. I will argue, in line with the main theme of this conference that "new frameworks are needed" to understand this moment in human history, and in the history of our planet, the only home we know.

So what is the proper scale at which we should study the history and future of our own species? I

believe the proper scale is that of Big History. Big History studies the history of the entire Universe. It links insights from cosmology, physics, chemistry, geology, biology, history, economics into a coherent understanding of the history of our Universe and of the place of human beings in the Universe. Currently, several schools and Universities in Korea are teaching courses on big history and the Big History Project is creating a free on-line course in big history in English.

What can we learn about modern human society from studying big history? Big History can tell a coherent, and interesting story about the history of the Universe, that helps us understand better the strange and remarkable role of our own species. That story is based on the best of modern science.

The Big History Story:

Most big history courses tell a simple but powerful story. The Universe began about 13.8 billion years ago, in the Big Bang. It began as a tiny, incredibly hot ball of energy that was expanding very fast. At first, that ball of energy and matter was very simple. We have direct evidence of what the Universe was like because we can describe the energy flows in the Universe by mapping what astronomers call the Cosmic Background Radiation. Such maps show that all parts of the Universe existed at almost exactly the same temperature and pressure; temperatures differed by no more than $1/1000^{th}$ of a degree C. We also know that atomic matter consisted of only Hydrogen and Helium atoms (with a tiny admixture of Lithium); there was also dark matter, which we don't understand. There were no stars, no galaxies, no planets, and no living organisms. There were certainly no human beings.

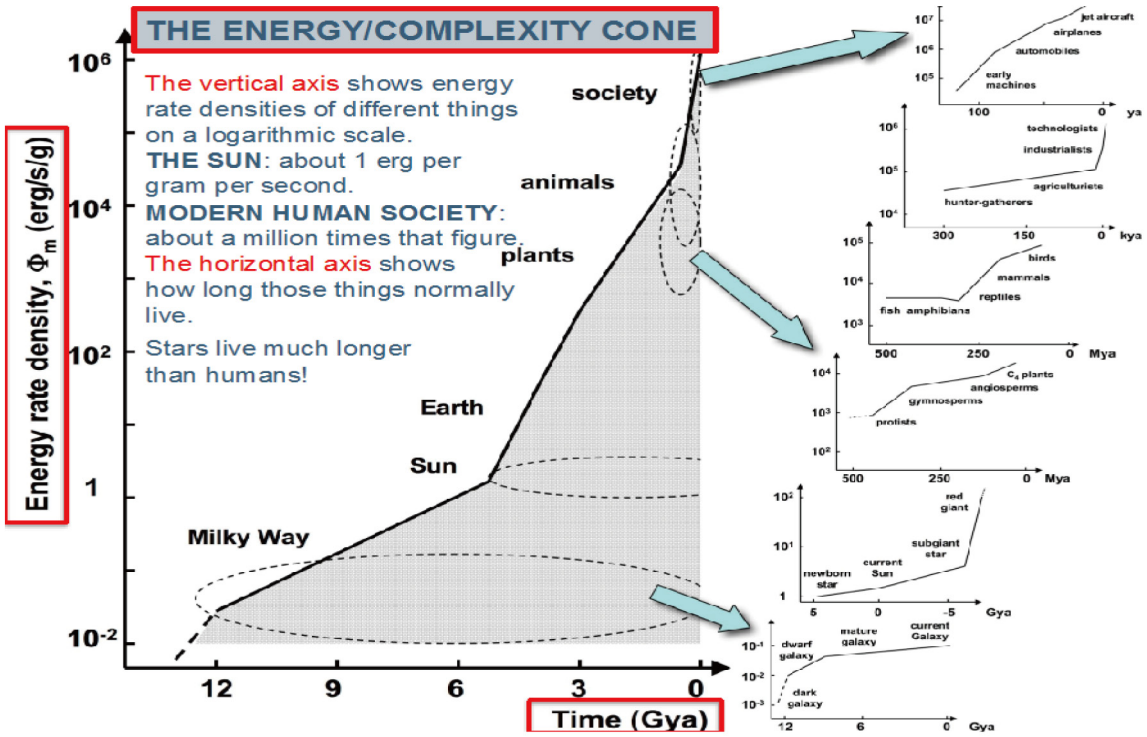
Then, over the course of 13.8 billion years, new and more complex things appeared, but they only appeared in pockets in the Universe where the right 'goldilocks' conditions existed. The process begins with Stars. Then dying stars created new chemical elements, so parts of the Universe, inside galaxies, became more complex chemically. In regions of chemical complexity it was possible to make more complex chemicals, such as water and silicates, so gradually dust grains and ice grains appeared, and around young stars these gathered to form asteroids, comets, moons and planets. Rocky planets like our earth were particularly complex because most of the Hydrogen and Helium had been driven away so that they were dominated by most of the other elements of the Periodic Table. On our earth, and probably on billions of other planets and moons in the Universe, chemical complexity increased, particularly where they was liquid water, and gentle energy flows from nearby stars or the interior of planets. Increasing chemical complexity gave way to life. Life had an inbuilt mechanism for creating more complexity: natural selection, because gradually more and more information could accumulate in DNA, which was a sort of template for building new types of living organisms. On our earth, life consisted mainly of bacteria for 3 billion years, then larger, multi-celled organisms appeared, and eventually our own species appeared, just 200,000 years ago.

Over 13.8 billion years, we see complex things appearing, and from them even more complex things are created, so that the highest level of complexity slowly increases. But there's a problem. How can

complexity increase if the natural tendency of the Universe is towards simplicity? This is what the Second Law of Thermodynamics, the law of entropy, seems to imply. The answer is not that hard. As long as the universe is not perfectly homogenous, there will be tiny flows of energy from region to region, and it is those flows of energy that can help build and sustain complex things. This means there is a close link between complexity and energy flows. Every complex entity manages energy in some way. Stars do it through fusion in the cores; supernovae generate the high temperatures needed to create new elements through colossal explosions; rocky planets drive plate tectonics using the heat at their core; and living organisms mobilize energy using what biologists call 'metabolism'.

The astronomer, Chaisson, has argued that, very roughly, the size of these energy flows seems to increase as things get more complex. Here's a chart from one of his articles. It tracks the 'energy rate density', or the amount of energy that flows through a given amount of mass (say a gram) in a single unit of time (say a second).

If you're a human being, this graph is remarkable. It shows that the energy rate density of a star seems to be about 1 erg per gram per second, but that of modern human society seems to be about 1 million times greater than that. That suggests that human societies are extraordinarily complex. Today's global society seems to constitute one of the most complex phenonemena we know in the Universe. That suggests that we live at a remarkable time and place.



How does human history fit into this story?

How do humans fit into this story? As this graph suggests, humans begin to look extraordinarily interesting with the story of big history. Indeed, this moment that we live in, early in the twenty first century, looks interesting, and possibly dangerous, not just on human scales, but on planetary scales of several billion years.

Humans mobilize energy in entirely new ways. The best way of explaining this is through the idea of 'collective learning'. Many animals can communicate, but most animals communicate so inefficiently (so much information is lost) that information does not accumulate from generation to generation. We can be sure this is true because if any other species had developed the ability to accumulate information from generation to generation, we would almost certainly see the results in the paleontological record. Over time, as the species accumulated new ways of extracting energy from its environment, it would enter new niches, its populations would grow and it would start manipulating its environment in more and more powerful ways. And we know of no limits to such processes once they start, so eventually, it is likely that such a species would end up dominating the planet. Behaviour this extreme would almost certainly show up in the paleontological record on scales of several hundred million years. But we have no evidence for the existence of such a species. That suggests that no other species in the history of the planet has been able to share information efficiently enough for it to accumulate from generation to generation.

We are the first species that can do this. And the result is so significant that it marks a major turning point in the history of the planet and the biosphere. Some time in the last 200,000 years, our ancestors acquired the ability to share information with such precision and in such volume that information began to accumulate from generation to generation. We don't yet understand exactly how this happened. Perhaps there was some slight rearrangement of human brains that gave us grammar and a richer form of language. But we can see the results. Even in the Paleolithic we can watch as our ancestors learnt new ways of managing their environments so that they could enter new environments and migrate from region to region. By 10,000 years ago, our ancestors had settled every continent on earth apart from Antarctica; they lived in tropical forests, in deserts, along coasts and in the Arctic tundra. No large species had spread into such a wide variety of niches before. By ten thousand years ago, our ancestors were extracting energy and resources from most environments on earth.

Collective learning implies a constant steady trickle of new information, new ways of were trivial; they learnt new jokes or developed interesting new fashions. But occasionally our ancestors stumbled on innovations that had breathtaking power. The two great complexes of technologies that magnified our control of energy most spectacularly were agriculture and control of fossil fuels.

Agriculture emerged and began to spread from the end of the last ice ages, about ten thousand years ago. Farmers learnt how to manipulate their environments, the rivers plants and animals around them, so as to increase the number of species they could exploit, and reduce the number of species they could

not exploit. As a result, our species got more of the energy flowing through a given amount of land. We began to control more of the biosphere's energy flows, all of which ultimately derived from the sun and were captured through photosynthesis. With a sudden increase in available energy, human populations increased, communities became larger and more complex and we see the large, ramified communities we commonly described as civilizations.

The second crucial turning point in human history came when humans learnt how to tap the colossal stores of energy locked up in fossil fuels. This, too, was like striking gold. Humans stumbled on technologies that gave them access not just to recent photosynthetic energy, but to sunlight fossilized over 300 million years. Instead of just using energy captured over say 50 years (burn a piece of wood and you are probably using energy generated 50 years ago), coal gave humans access to energy stored over 300 million years. Today's modern society has been made possible by this remarkable energy bonanza. Fossil fuel energy has helped us grow more food, transport more people and goods, make new things, and it has encouraged the development of entirely new technologies. It has generated so much wealth that for the first time in human history, wealth has spread to large numbers of people rather than to just a tiny elite.

A moment of planetary significance: The Anthropocene:

The scale of energy flows through modern society mean that this is an astonishing moment in planetary history. Paul Crutzen suggested we call this era the 'Anthropocene', because, for the first time in 4 billion years, a single species dominated change in the biosphere. But like all gold rushes, the Anthropocene is also a time of danger. We do not really understand what we are doing as we throw energy around us. Yet many scientists are beginning to suspect that these huge energy flows are disrupting important processes that have maintained the earth's environment and kept it safe for us. We move more earth than all the world's rivers, we are turning the oceans to acid, we are reducing biodiversity fast, and we are transforming the earth's climates. We have even developed weapons that, if we were foolish enough to use them, could destroy much of the biosphere in just a few hours. No species has ever had this power. You cannot burn up 300 million years worth of accumulated energy from sunlight in just a century without consequences.

Understanding this is very important because our power carries responsibilities to future generations (whose lives will be degraded if we misuse our power), but also to the biosphere as a whole. That's why it's so important to understand the significance and scale of this moment in planetary history.

Why haven't we noticed?

If I am right, why is this not obvious to everyone? Why is this not something that everyone understands, that is taught in every school in the world? I think the reason is clear. To see this, you need to see human history as part of the larger history of the biosphere over 4 billion years. And very few scientists,

politicians or teachers look at the past on these scales. Most historians, for example, look at the past on a scale of a few hundred years. On that scale, you cannot see these large trends and you cannot appreciate the full meaning of human history.

This is why we need the large lens of big history. We need it in our research institutes and in our schools so that the next generation understands the significance of this moment in the planet's history, and the importance of trying to avoid the many dangers we face.

What can this tell us about humanity and our future?

It may be that we need to explore these issues on even larger scales. As astronomers discover more and more planets around other stars, the likelihood is increasing that other star systems have also generated life. And that increases the likelihood that some of them have generated life forms similar to us. By that, I mean life forms capable of collective learning. If this is true it means that there may have been many Anthropocenes in the history of the Universe because once a species is capable of collective learning, you can bet that sooner or later it will dominate its planet.

That idea raises an interesting question. If humanoid species have appeared many times in our Universe, and perhaps many times even in our galaxy, why have we not seen them? This is known as the Fermi paradox, because the great physicist, Enrico Fermi, once asked: "Where are they?" If other species like this existed, it is likely for purely statistical reasons that most of them would have existed for much longer than us, in which case, they would have developed technologies way in advance of ours. Such technologies should be detectable. But despite searching for almost 50 years, we have seen no sign of them

One possible explanation is suggested in a wonderful science fiction novel called "A Canticle for Leibowicz". It is set in a world after a nuclear war, which people in the novel describe as 'the flame deluge'. The world is severely degraded, a bit like the world 3,000 years ago. Some monks are preserving ancient manuscripts that turn out to be tracts on science. Then the novel moves forwards hundreds of years and we watch as society slowly re-creates the science of the past, until eventually, they learn once more how to build nuclear weapons. And … they use them again. So is it possible that all humanoid species face a sort of bottleneck? That all of us will be destroyed by the technologies we develop?

This presents a challenge to the next generation. Can we perhaps be the first humanoid planet that finds ways of living sustainability within our biosphere? That is the challenge for the next generation. But you can only understand the challenge if you look at the past on a large enough scale, the scale of big history.

For more information about big history please go to:

Big History Project: https://www.bighistoryproject.com/home

The International Big History Association: http://ibhanet.org/

The Big History Institute, Macquarie University: http://mq.edu.au/research/centres_and_groups/big_history_institute/

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 3

Parallel Session 1–1
Human Life in Cyber Society

Rethinking the Traditional Paradigm of Communication in the Era of Digital Culture

Youngjeen Choe (Chung–Ang University)

–

'Diamigration': An Integrated Emergence of Transnational Migration and Diaspora in the Digital Age

Hong–Jae Park (The University of Auckland)

–

The Theory of Storytelling Evolution

Chul Gun Lyou (Ewha Womans Univeristy)

Rethinking the Traditional Paradigm of Communication in the Era of Digital Culture

Youngjeen Choe
Chung-Ang University

1. Digital Culture and Communication

Digital technology has been radically transforming our ordinary ways of communication since the advent of the Internet, World Wide Web and the Big Data. Print-based media gradually shinks to a less powerful platform, and they are converting their commuincation paradigm to fit for the digital culture. With the emergence of a new digital communication paradigm, information is spreading out so rapidly that we can get all kinds of news around the world inmediately by checking them in personal digital gadgets such like the personal computer and smartphone. Various platforms of Social Network Service(SNS) are also driving us to reorganize our social time and space by their immediacy and ubiquity. Indeed, we are beginning to inhabit "a fundamentally new historical epoch with its own image of power, conceptualization of force, and sense of history"(Rodiwick 206).

A new communication paradigm on the basis of rapidly growing and expanding digital technology is often discussed in comparison with the paradigm of what Walter Benjamin called "the age of mechanical reproduction"(217). J. Hillis Miller configures the notion of cultural studies by analogizing its technological assimilation to Benjamin's insightful discourse on photography and film whose prophetic effects "could be fully obtained only with a changed technical standard, that is to say, in a new art form"(32-34). D.N. Rodowick also discusses the political implication of new technological developments by referring to Benjamin's speculation on "reification or liberation"(75). Both arguments are taking a similar standpoint that a significant change in communication platform essentially involves new political choices to either reappropriate or subvert the meanings of communication in the previous platform. This issue of political choice is closely related to

how any communicative message can be understood and distributed amid the influence or force of the new communication platform.

In the current epoch of digital culture, a message connotes ambivalent aspects with regard to its communication platform. On the one hand, it seems to be guaranted for the freedom of individual expression. Anyone can express their own opinions or feelings on their personal online blogs. They can upload pictures and videos on Youtube. They can exchange and disseminate useful information links on SNS. Even the act of clicking "Like" on Facebook becomes a routine gesture to express their opinion in a silent message. Democracy seems to be realized perfectly on the cyber space because anybody can raise their voice in a cybernetic agora. On the other hand, the cybernetic communication quite inevitably tends to make the actions and practices of individuals withdraw from physical space and render them visible only on a virtual space. By this way, individuals "feel less and less accountable for their actions and speech acts, since they confront one another less and less in relations of reciprocity unified in both space and time"(209). In other words, the new communication platform can exert its force of surveilling and controlling each individual's actions in an invisible quarantine of mega-database.

Considering this ambivalence in how digital communication platform operates in our current society, we need to speculate on the dominant value of communication in our everyday life by looking back some significant philosophical reflections on how the notion of communication has been discussed. The focus of my argument on this issue will direct toward Jacque Derrida's critique of J.L. Austin's speech act theory and turn to how the nature of communication is changing with respect to the digital manipulation and distribution of signs.

2. Traditional Concepts of Communication: Condillac and Austin

Any communication is mediated in order to articulate and deliver an addresser's message to its specific recipient. It is characterized "by the same conditions – the necessity of interpretive work, the unavoidability of perspective, and the construction by acts of interpretation of that which supposedly grounds interpretation, intentions, characters, and pieces of the world"(Fish 700). Here, the act of interpretation and its various conditions raises an important issue of performativity by the question of whether the original meaning or intention articulated by the communicating subject can be equally performative on any level of communication. In the traditional sense, speech and writing as two main categories of communication were considered as two different means to communicate the same meaning. They were different only in that speech takes its elements from phonemes and writing consists of its basic units from graphemes. Beyond this

modal difference of communication, they were the same means to convey the meaning which was assumed to exist identically within the consciousness of a speaking or writing subject. The notion of writing as a means of articulating and delivering the same content of meaning as in spoken communication leads to the presumption that the articulator's intention would be immanent within the structure of writing.

Jacque Derrida puts into question this traditional notion of communication as a vehicle for conveying "proper meaning"(309). In his essay "Signature Event Context," his argument on the notion of writing begins with Condillac's analysis of the origin and function of writing. In Condillac's view, speech is a direct means of communicating proper meaning by articulating sounds. It is made possible by the presence of addresser and addressee, and thereby, by the presence of proper meaning. In other words, Condillac sees writing as a secondary stage to supplement the absence of addressers to communicate their thoughts to absent addressees. What is present in both means of communication is the proper meaning articulated by the sender or the addresser. By this presence of proper meaning, he emphasizes the representative character of written communication. In Coldillac's view, writing is seen as a pure representation of its content which is assumed to be immanent regardless of the different possibilities to express it. Condillac sees representation as the essential condition to make writing possible. For him, writing becomes a means to represent and communicate what is determined by the addresser. In this process of writing, the addresser and the addressee seem to be temporarily absent, but they are immediately restored in any moment of reading by the very presence of proper meaning. Writing is never cut off from the addresser, neither does it continue to produce any other effect "beyond his presence and beyond the present actuality of his meaning."(313) As Derrida argues, Condillac's notion of absence beomes a modification of presence: "The absence of which Condillac speaks is determined in the most classical fashion as a continuous modification, a progressive extenuation of presence. Representation regularly *supplements* presence"(313). In this sense, Condillac sees communication as a vehicle for what is represented, or the proper meaning, and thus, writing becomes a core part of this communication.

The notion of a proper meaning as a substantial reality for writing can be also found in Austin's analysis of speech act theory. There are two types of utterances in Austin's speech act theory: the constative and the performative. Constative utterances are used for describing a state of affairs, and they carry the alternative values – true or false. Unlike the constative, performative utterances do not carry true or false values. They perform the action to which they refer. Between these two kinds of utterances, Austin imposes his emphasis on the performative. Viewed from the traditional semantics, constative utterances should have the central position in their values because the religious or philosophical hierarchy on language sets up true or false statements as the norm of language and treats other utterances as flawed or supplementary forms.

Accordingly, performative utterances are put hierarchically in the marginal position within that semantic system. Austin's investigation of the qualities of performative utterances, however, tries to subvert this hierarchy. He proposes that the performative is not a flawed constative, but inversely, that the constative is a special case of the performative. This is the way Austin offers "a pertinent critique on logocentric premises"(Culler 16).

According to Austin's argument, every utterance is bound to a certain context, and in order to become performative, it should satisfy the articulator's intention as well as the circumstance and persons surrounding it:

> There must exist an accepted conventional procedure having a certain conventional effect, that procedure to include the uttering of certain words by certain persons in certain circumstances, and further, the particular persons and circumstances in a given case must be appropriate for the invocation of the particular procedure invoked. The procedure must be executed by all participants both correctly and completely. (Austin 14-15)

Viewed from this point, a speaking subject takes a central position in a procedure of utterance, and all conditions of possibility of felicity follow that authorized subject to perform the utterance. To make the utterance successfully performative, the speaking subject must specify the necessary features of the context. This is one crucial point by which Derrida criticizes "the conscious presence of the speakers or receivers, the conscious presence of the intention of the speaking subject for the totality of his locutory act" in Austin's speech act theory. Accordingly, Austin performs a teleological reappropriation of the traditional perspective on the presence of the speaking subject in order to get the felicity of utterance, even though he tries to defy traditional logocentric premises on the predetermined structure of meaning beyond context. Thus Austin argues that every performative utterance should never occur but once because the uttering of certain words by a certain person in a certain circumstance cannot be repeated. In this sense, Austin denies iterability or citationality of utterance, because there would be no remainder outside "the total situation"(147) once a performative utterance is made.

From this impossibility of repeating the performative utterance, Austin tries to make a distinction between the ordinary use of language and the parasitic one(21-22). He excludes non-serious utterances – such like dramatic dialogues by an actor on the stage or poetic narrations – from the ordinary use of language which he thinks should be considered performative. In his opinion, the non-ordinary or parasitic use of language

mainly occurs by the repetitive citationality of any performative utterance, which the ordinary use of language must avoid.

In Austin's view, the act of citing utterances is lacking in a proper meaning, because the speaking subject as an original articulator of utterances is no longer present within the newly formed context. From this relationship between the speaking subject and the articulation of the utterance, Austin sets up two modes of the presence of the speaking subject: in verbal utterances, the speaking subject is referred to "by his being the person who does the uttering," while in written utterances, "by his appending his signature"(Derrida 328). And thereby, Austin argues that the presence of the speaking subject designates the singularity of an event, and at the same time, the written signature implies "the pure reproducibility of a pure event"(328).

3. Iterability: Derrida's Critique of Singularity in Communication

Derrida interrogates this singularity of an event in any type of communication. For him, it is doubtful whether the situation can become dangerous when speech or writing loses contact with its originating source and is no longer subordinated to a substantial reality, or "a proper meaning." Derrida's critique of Austin's notion of singularity configures the importance of iterability. Iterability, which etymologically implies the logic of linking repetition to alterity, "structures the mark of writing itself"(315).

This notion of iterability derives from Derrida's critique of traditional notion of writing as a modification of presence. Here, two steps are needed to develop the argument on iterability in writing. First, writing must be cut off from the presence of the addressee. If any idealized or empirical addressee were a necessary condition of writing, then, writing would be a modification of presence. Derrida does not agree with this presupposition because writing implies the "proper" meaning when it assumes the "proper" addressee. Writing can not be confined to a fixed meaning. On the contrary, it can be repeatable to contextual possibilities, and can produce different meanings for different addressees. In this sense, the notion of non-presence or absence of the addressee in writing paradoxically connotes that writing has every possibility of sliding into any addressee who is bound to temporal conditions. Thus he argues that writing "must be repeatable – iterable – in the absolute absence of the addressee or of the empirically determinable set of addressees"(315). Secondly, writing must be cut off from the presence of the writer, the sender, or the addresser. This argument does not mean that writing must have its autonomous structure deprived of the addresser as well as the addressee. Instead, it means that writing can slide into inexhaustible possibilities of different contexts which can produce meanings aside from the addresser's intention.

It is clear that every meaning is context-bound, but context itself is boundless. Viewed from this notion, writing becomes repeatable within the contextual possibilities. Once writing has slidden into one particular context, it can produce a certain meaning suitable for that context. But writing itself always has the possibility of moving to another context, and can produce a different meaning from a different context. In other words, in writing, there can be neither the determined addressee nor the proper meaning pertinent to the writing subject. In this sense, writing must be iterable, that is, both repeatable and alterable. It must be repeatable since it can be grafted upon a new context. Furthermore, it must be alterable since it is framed by a new context and receives a new performative force within that context. By this feature of iterability, writing can speak for itself, constantly sliding from one context to another. It becomes the moment of "the happening of otherness"(Silverman 214), and its position is indecidable between the effects of difference.

To question the subject of communication is to question the meaning articulated by the subject. The new concept of writing as iterability detaches itself from this present and singular intention of the subject. It offers a deconstructive way of communication in a field of writing. Writing as communication is "not the means of transport of sense, the exchange of intentions and meanings." (Derrida 329) Instead, writing intervenes the presence of consciousness of the speaking subject and exceeds – or disseminates – the meaning which the subject is supposed to impose on communication.

4. Communication in the Context of Digital Humanities

Derrida's understanding of writing (and communication in general) as a process of iterability provides a useful clue to how the communicative signs are created, manipulated and distributed in a newly expanding digital platform. While the traditional communicative signs, such as writing and speech, set up their own autonomous acts of discourse (i.e., separate acts of reading and speaking), the discursive acts of digital signs lead us to a variety of hybrid forms which are comprised of visual, verbal, written, musical, and sonic elements. The fundamental premise of this hybridization is that all the elements are intermixed on the cybernetic space rather than the physical space. And since the cybernetic space operates only on the virtual level without depending on the physical property which was quintessential to traditional representation, it becomes free of authenticating the traditional principle of mimesis. In other words, digital signs are not necessarily bound to the representational subordination of copy to original. D.N. Rodowick explains this logic of digital semiosis by borrowing Foucault's distinction between resemblance and similitude as follows.

> In resemblance, meaning derives from the authority of the original, an authenticating model that orders and ranks all the copies that can be derived from it. Alternatively, Foucault defines similitude as an ordering of signs where designation or reference has lost it centrality. In digital culture, the distinction between original and copy has lost its relavance. (211)

Foucault's idea of resemblance and similitude was positively introduced to explain the epistemological change in Rene Magritte's experimental paintings by which he argues for the dissociation of similitude from resemblance.[1] This idea can also apply to explain how the discursive act of digital culture makes the fundamental change in its logic of communication. First of all, the digital signs are functioning as a floating signifier which is deprived of its "proper" meaning. They are constantly sliding from one context to another as they unravel spatial coherence by recomposing and decomposing themselves on a virtual space of communication. Second of all, since the mechanism of digital communication is rooted on the algorithmic manipulation of binary code, each digital sign becomes modular. It is sorted as an independent unit, so it can be modified at any time during the programming process. This notion of modularity is what Lev Manovich calls "fractal structure of new media"(30). A typical example of this modularity in digital media is the World Wide Web. It consists of a series of Web pages, each of which exists as an independent unit with its source information tagged in a rhizomic network of internet database. One exemplifying case of this digital communication at its early stage of development can be found in Maciej Wisniewski's art project called "Netomat"(1999). Netomat is a web browser which retrieves "text, images, and audio" and flows "them simultaneously onto the screen without regard to the display design of the data source" when the user types some words or phrases on the computer screen. In this way, this web browser "reveals how the ever-expanding network interprets and reinterprets cultural concepts and themes"(Whitney Artport Webpage).

What is noticeable in Netomat project is the unpredictability of its algorithmic manipulation of internet data. The software search engine immediately responds to words or phrases of the user's choice by displaying a series of multimedia information including still images, text, animation, voices, and music on the screen. This process shows how a sign (in this case, a keyword to be input to the search engine) slides into a vast network of internet database, rearranges some available sources by the algorithmic manipulation of software, and visualize them in multimedia format on the screen. By this way, the original sign gets replaced by the objects

[1] In his essay on Magritte, Klee and Kandinsky, Foucault explains the difference between resemblance and similitude as follows: "Resemblance presupposes a primary reference that prescribes and classes. The similar develops in series that have neither beginning nor end, that can be followed in one direction as easily as in another, that obey no hierarchy, but propagate

of its similitude, and thereby, it can augment more than one interface by the machinic arrangement(*agencement* in the Deleuzean term) of internet database.

The interface in digital communication can be understood in terms of the Derridian sense of iterability in commuincation. The interface functions basically as a transmutable platform where a digital sign performs its reciprocal acts of sending and receiving. In this discursive event, the initial interface between user and computing system proceeds by its concatenation to another interface between software's search engine and the network of database, and subsquently to a chain of interfaces between the networks. The user's interface constantly transmutes its dimension once the inserted keyword (or a sign) begins its voyage of surfing the sea of internet database for its maximized output. During this process, the search engine navigates the vast network and brings up a thread of optimized results by deorganizing and reorganizing the database at each different interface.

In conclusion, this iterable mechanism of digital communication can provide a useful clue to pinpoint the epoch-making meaning of the Digital Humanities in our time. Since the late nineties when the Internet and World Wide Web became a dominant platform of digital culture, Digital Humanities has been an important interdisciplinary field to combine computing techlonology with various methodologies of traditional humanities disciplines. Its tasks include the digitization of analog texts and images of the arts, the development of big database search engines for humanities texts, and the creation and distribution of effective digital tools and platforms for teaching various humanities courses. The most fundamental task among them would be how to make the best use of database search engines and how to *montage* the databases effectively for the humanities research and education. One prominent example of this is corpus linguistics which would not have been fully developed without database technology. Another example would be the Google Ngram Viewer[2], an online phrase-usage graphing tool which shows the yearly based graphic data for any combination of words or phrases processed and extracted from over 5.2 million books digitized by Google Inc. In both cases, databases are not a mere compilation of neutral or value-free information. Instead, they are "different kinds of cultural forms, embodying different cognitive, technical, psychological, and artistic modalities and offering different ways to instantiate concepts, structure experience, and embody values" (Hayles 40). Each of them functions as a single modular unit which can be *montaged* on any level of algorithmic arrangement. And through the complex compilation and abstraction of data from a wide variety of diachronic and synchronic acts of search, we can reach what Foucault called "episteme" of a certain epoch of our research. Digital communication makes possible this type of epistemological mapping by intersecting

---

themselves from small differences among small differences. Rememblance serves representation, which rules over it; similitude serves repetition, which ranges across it"(44).

[2] books.google.com/ngrams

various layers of virtual time and space. And in the era of digital culture, the traditional humanities discipline can find its intuitive and flexible expansion and development by the intersections between time and space, between the virtual and the actual, and between technology and imagination.

Works Cited

Austin J.L. *How to Do Things with Words*. Cambridge: Harvard Univ. Press, 1975.

Benjamin, Walter. *Illuminations*. Tr. Harry Zohn. New York: Schocken Books, 1968.

Culler, Jonathan. "Convention and Meaning: Derrida and Austin", *New Literary History*. Vol. 13 (1981-1982), pp. 15-30.

Derrida Jacques. *Margins of Philosophy*. Tr. Alan Bass. Chicago: The Univ. of Chicago Press, 1982.

Fish, Stanley E. "With the Compliments of the Author: Reflections on Austin and Derrida." *Critical Inquiry.* 8 (Summer 1982). pp. 693-721.

Foucault, Michel. *This Is Not A Pipe*. Tr. James Harkness. Berkeley: Univ. of California Press, 1983.

Hayles, N. Katherine. *How We Think: Digital Media and Contemporary Technogenesis*. Chicago: The Univ. of Chicago Press, 2012.

Manovich, Lev. *The Language of New Media*. Cambridge: The MIT Press, 2001.

Miller, J. Hillis. *Illustration*. Cambridge: Harvard Univ. Press, 1992.

Rodowick, D.N. *Reading the Figural, or Philosophy after the New Media*. Durham: Duke Univ. Press, 2001.

Silverman, Hugh J. *Textualities*. New York: Routledge, 1994.

Whitney Artport Link for "Netomat":

http://artport.whitney.org/exhibitions/datadynamics/netomat.shtml

'Diamigration': An Integrated Emergence of Transnational Migration and Diaspora in the Digital Age

Hong-Jae Park
The University of Auckland

Abstract

Arguably, human migration has been a form of human need throughout history. As global connectivity continues to rise, this human movement is becoming less constrained by geographical distance, language barriers, and cultural differences. New migration in the digital age raises critical questions about how traditional understandings of human migration are applicable to the reality the world experiences today.

This paper presents an in-depth analysis of the findings from three research studies on Korean migration and diaspora in New Zealand. As an insider researcher, the author has conducted those serial studies with more than 150 young Koreans and adults from the Korean community. Based on such empirical evidence, this paper highlights emerging aspects of present-day migration and diaspora, and the impacts of such changes on populations and societies in the digital age.

Today's diaspora and migrant communities are more diverse, flexible, mobile, and inherently associated with advanced technologies physically and virtually. The supranational development of information technologies and social media has facilitated the growing mobility of people, reshaping traditional routines and offering new path for migration across borders. The main features of this 'diamigration' (the combination of diaspora and migration) include soft-landing relocation, a sense of double presence or belonging, fluid acculturation, and virtual identity formation. Present-day migrant and diaspora individuals are unlikely to consider moving to another country as a 'crossing of the Rubicon' (i.e., there is no going back), while most likely harboring thoughts of return migration and potential re-migration to a third nation.

The emergence of 'diamigration' is a significant social, economic and political issue as it generates different patterns of social capital or problems to both sending and receiving countries. This human movement can also create new forms of social needs that affect people's determination of migration and their resettlement across home and host societies.

Key words

Anomie, diaspora, Korean, migration, New Zeala

'Diamigration': An integrated emergence of transnational migration and diaspora in the digital age

Introduction

Human migration is, arguably, a form of human need associated with quality of life, better opportunities and security (see Crawford & Campbell, 2012). The movement of human beings from one place to another is an enduring phenomenon throughout human history. People around the world are in a continuous process of relocation, resettlement, and remigration; some are moving from the East to the West, while others are crossing borders from the South to the North. Accordingly, '[the] population of almost *every* country is nowadays *a collection of diasporas*' (Bauman, 2011, p. 428, emphasis in the original). Especially, the world is currently experiencing an 'age of migration' where the impact of globalisation on people's values, perspectives and behaviour provides fertile ground, physically and psychologically, for an increase in human migration (Castles & Miller, 2009).

Nowadays migration experience differs markedly from that of the past. As global connectivity continues to rise, human migration is becoming less constrained by geographical distance, and language and cultural differences than ever before (see Schmidt & Cohen, 2013). The supranational development of information and communication technologies, coupled with advances in transportation, has led to an unprecedented increase in transnational movement of people, information, and products across borders and shores (Oiarzabal & Reips, 2012). Those technological innovations facilitate a growing mobility around the world, reshaping traditional routines and offering new path for migration and diaspora. As a result, some of present-day migrants are unlikely to consider moving to another country as a 'crossing of the Rubicon' (i.e., there is no going back), and are likely to become flexible towards their cross-national migration. The following fragment of a newspaper article shows an aspect of such changes in present-day migration:

> 'No, I am not Kiwi [New Zealander], I am still Korean,' says 39-year-old Devonport cafe owner Denny Kim, who came here five years ago so his children could have a better education. 'At the moment, I am happy to live in New Zealand, but when my son and daughter go to university I will go back to Korea.' (*The New Zealand Herald*, 2012)

Migration (or diaspora) is constantly changing and the pace of change accelerates. Uncertainty appears to be growing in the age of migration (Cohen, 1997). The experience of new migration is becoming more

diverse as societies become more complex. In this vein, the emergence of new migration raises critical questions around how traditional understandings of human migration are consistently applicable to the reality that present-day migrants experience. The traditional modes of the roles of migrants and sojourners in society may no longer be relevant, and therefore, new models and images of migration have to be created. Suffice it to say, however, no theories are sufficiently competent enough to explain the complexity and flexibility of today's migration, or to foresee what this will look like in the future (see Bauman, 2011).

Regarding current migration issues, therefore, Putnam (2009, p. 5) once wrote: 'We live in interesting times. Let us learn from all that is interesting out there on issues of racial and ethnic solidarity, and chart a new course.' Motivated by Putnam's call, I reflect on my observations through research studies with Korean residents (including immigrants and diaspora members) in New Zealand. I focus my discussion on exploring major characteristics of the Korean migration in New Zealand, particularly aided by advanced communication technologies and social media. Firstly, an overview of the conceptions of human movement is eclectically presented to review critical debates on migration and diaspora in the modern age. In the main section of this paper, I shed light on major issues associated with present-day migration and diaspora, using the data collected from three sociological studies (between 2006 and 2013) within the Korean community in New Zealand. The concept of 'contact zone' (Pratt, 1991) is critically adopted to explain how the Korean population experiences present-day migration in New Zealand, virtually and physically.

Then, this paper discusses the issue of anomie in a migratory context, highlighting the problems and needs which are particularly pertinent to present-day Internet-mediated transnational migration. This discussion is based on an holistic approach to 'transnational' social innovation regarding migration, diaspora, technology and mobility across national borders. Finally, a compound word "diamigration" (diaspora and migration) is suggested to highlight the interdependent nature of both migrant and diaspora populations in this 'integrated' digital age.

Conceptions of Migration and Diaspora

As an age-old phenomenon, human migration has evolved with diverse patterns across languages, cultures and regions. Consequently, migrants are full of diversity, so are diaspora individuals and groups (Cohen, 1997). Traditionally, diaspora is a form of migration that creates a consequence of human movement to one or another particular territory, and diaspora individuals are those who move to another territory with a wish to come back to their homeland. Sheffer (1986, p. 3) defines modern diasporas as

"ethnic minority groups of migrant origins residing and acting in host countries but maintaining strong sentimental and material links with their countries of origin – their homelands". The main difference between diaspora and migration lies in the level of people's legal or psychological engagement with the host society. In a simple explanation, for instance, if a person wants to keep his or her legal and/or psychological identity as a member of the country of origin and retains his or her dream to return to the homeland (therefore, having at least two destinations), he or she can be seen as a diaspora individual during his or her stay in the receiving country. If a person gains a legal status to stay permanently and perceives himself or herself as a part of the adoptive society, he or she is regarded as a member of the migrant community which belongs to the host country.

Recently, the term *diaspora* has extremely proliferated and differentiated in migration studies (Brubaker, 2005). Consequently, one of the ongoing challenges in this field is how to clarify the concepts of "migration" and "diaspora" which have been used in the span of a few centuries. Although diaspora has a significantly different historical origin, ideas and debates associated with this phenomenon have been developed largely in relation to what migrant populations have experienced. In fact, moving to another country is likely to, but not necessarily, involvement in being a subject of two distinctive sociological features – simultaneously 'being a migrant' (from the point of view of the host land) and 'belonging to a diaspora group' (from the point of view of the homeland). In this sense, the term diaspora encompasses a range of migrant groups including immigrants, work-permit visa holders, foreign students, migrant workers, and relatively long-term sojourners (see Shuval, 2000).

Migration and diaspora can be categorised into two different forms of spatial and geographical changes according to a persons' cultural background: 'In-cultural migration' and 'intercultural migration' (from here, the term migration is used as a wider concept that includes both immigration and diaspora in the receiving society). Language is the key factor that defines cultural differences in this classification. In-cultural migration can be seen as human movement between the different nations (regions) that share the same language and cultural heritage. On the other hand, intercultural migration refers to "placement in an unfamiliar cultural context in which old habits and contingencies no longer apply" (Boekestijn, 1988, p. 84). This culture-based classification is possibly too simplified, but it is still important to understand how individual migrants and diaspora members from different backgrounds deal with their daily lives in the adoptive society. In this paper, the term of migrants is used to refer to people who are in a situation of intercultural migration alone unless particular definitions are made for those in in-cultural migration.

As 'external' migration crossing borders involves a place of origin and a destination, it requires migrant individuals to engage in intercultural relations and to adapt to the culture and lifestyles of the host

society. Traditionally, cross-cultural migrants are expected to trade most aspects of their cultural heritages for the ways that are accepted and 'normal' in the receiving nation (Berry, 1997). For example, those people who move into the adoptive country used to be assumed to 'give up' their own cultural identity, and 'have to adapt' to the new systems (including language) in the host society. Gudykunst and Kim (2003) argue that acculturation involves the disintegration and reintegration of the individual migrant in behavioural, cognitive and affective dimensions. This means that, to be functionally fit, the migrant must think in similar ways and have similar expressions of emotions as an indigenous local. However, integration of both original and adopted cultures is viewed as the most favourable strategy for migrants' acculturation, rather than choosing an either-or strategy (see Ward, 2008).

Although migration provides those people moving to another nation with opportunities for new life experiences, there are challenges related to resettlement in the receiving society. Cross-cultural adaptation and adjustment can create on-going difficulties for migrants who are not familiar with the language and culture of their adoptive society (Lum, 2011). Especially, language barriers are interrelated with migrants' unemployment and poverty, and as a result, some of them 'are vulnerable to all types of sub-standard living conditions and abuses' (Martinez-Brawley & Zorita, 2011, p. 18). Family dissolution and relationship problems are commonly cited issues among these migrant populations across the nations receiving intercultural migrants. Discrimination against those populations is another issue that affects their resettlement and wellbeing in their new environment (Clifford & Burke, 2009). Such problems often cause a lack of social participation and integration among migrants and diaspora members in the host society.

Migrants tend to form a variety of ethnic groups and communities themselves on a voluntary and informal basis within their communities (Hughey & Vidich, 1992). In fact, ethnic communities are flourishing in most migrant destinations. Those migrant communities have considerable diversity in their spatial locations, in the interests of their subgroups and in their degrees of population density. Some migrant and diaspora groups may establish ghetto concentrations, or urban residential districts for a segregated ethnic group (Pacione, 2005). Others may prefer to build up 'ethnic enclaves', referred to by Jaret (1991) as the social, economic and cultural complexes operated by members of an ethnic or cultural group. According to Li (2006), some ethnic enclaves are likely to form 'ethnoburbs', as a "multiracial, multi-ethnic, and multicultural community in which one ethnic minority group has a significant concentration but does not necessarily comprise a majority of the total population" (Li, 2006, p. 12). These multi-ethnic suburbs of residential or business clusters are particularly common among Asian migrant communities in the United States. Regardless of such diversity in shape and size, internal cohesion and trust among members are the dominant features of these migrant populations and diaspora communities.

Modern migration patterns lead to different and evolving types of ethnic populations and their associated functioning in globalised contexts. The concept of 'transnational migration' (based on the paradigm of *transnationalism*—a way of thinking about interconnectivity across national borders) suggests that new migrants and their communities are likely to maintain high levels of ethnic consciousness and ongoing interactions across national boundaries (Levitt, 2002; Rodriguez, 1996). Those transnational migrants and communities play an important role in increasing the movement of people and goods between nations, creating 'migrant social capital' which refers to 'resources of information or assistance that individuals obtain through their social ties to prior migrants' (Garip, 2008, p. 591). Such migrant social capital or ethnic social capital can facilitate individuals' migration, assist in their resettlement after arrival, and promote their community life in the receiving society (Levanon, 2011). As modern migrants are likely to live in/between two settings (the adoptive society and the homeland), the differences between migration and diaspora become greatly blurry and less distinctive.

The characteristics of a migrant community often depend on how community-based groups or organisations function and how diaspora and migrant members maintain relationships within those networks. Ethnic-based community groups are perceived as the organisations or groups which are formed and developed by migrants themselves on a voluntary basis in the host society (Schrover & Vermeulen, 2005). Some groups become formalised and well-established, while others remain on an informal and ad hoc level. These ethnic-based groups and organisations extremely vary in size, function and character (Cordero-Guzman, 2005). The roles of these grassroots groups are significant in fulfilling the needs of migrants and diaspora members who may feel isolated and marginalised by linguistic and cultural barriers in their new environment (Owusu, 2000). Some researchers have argued, however, that in the long term, such ethnic-based organisations often prevent migrants from being fully integrated into the host society, thereby effectively confining them to their ethnic enclaves (e.g., Kim, 2001).

Overall, ideas and debates on migrant and diasporic issues tend to focus on migrants' social and economic participation, their geographical clustering, and social cohesion and integration in 'mainstream' societies. The majority of migrant studies have, of necessity, focused on the issues associated with migrants' acculturation problems, their linguistic and cultural isolation, and racial discrimination against them within the receiving society. Social policy and practice with migrants tend to be underpinned by the 'traditional' assumption that migrant populations are likely to be poor, vulnerable and isolated, and therefore, become an obstacle of burden of the receiving country (Shier, Engstrom, & Graham, 2011). The impacts of current changes in present-day migration and diaspora, especially generated by a range of new technologies, have yet to be fully incorporated into debates in migrant studies and practice. Such

limited efforts are obvious in research on Korean diaspora communities that have established their domicile around the world.

Methodological Background

In understanding the complexity of present-day migration, migrant research is rather a 'dialogue' of human interchange, than a mere performance of scientific ways to select samples, collect information, analyse data, and interpret findings. Doing migrant research is an 'active' activity of social construction about the phenomenon studied within the current cultural, political, ethical and administrative contexts (see Rubin & Babbie, 2010). As such, the studies discussed in this paper have been conducted through embracing the Asian yin-yang principle, a long-lasting doctrine that has had a pervasive influence on Koreans and their culture. Acknowledging a mutual, genuine dialogue in the reciprocal relationship, this research philosophy provided a framework to enhance 'harmonised connectedness' as a way of forming connection with research participants in the community and wider society. Based on this philosophical and intellectual principle, the author has met more than 150 Korean adults residing in New Zealand to undertake three serial studies on the current issues facing them in a migratory context. In this paper, the term 'Korean residents'(rather than 'Korean immigrants') is preferred because it includes not only Korean immigrants but also other types of Korean residents such as international students and work-permit holders in New Zealand.

The first study was undertaken between 2006 and 2010 within the Korean community in New Zealand. This research was a mixed methods project in which unstructured interviews and face-to-face surveys were carried out with 80 participants across the country. The issues associated with acculturation and resettlement were explored, even though the research question was focused on intergenerational relationships among Korean migrant families. The participants in this study consisted of community leaders, religious leaders, health professionals, social workers, lawyers, and other key actors. More than 50 elderly migrants who moved to New Zealand in their old age also took part in either interviews or surveys throughout the research project. The main findings from this migrant study include identifying '*anomic abuse*', referred to as a type of elder mistreatment occurring when people are in a situation where social norms and values cannot regulate people's attitudes and behaviour towards older adults (Park & Taylor, 2011).

The second study (between 2010 and 2011) involved collecting data from a quantitative study on financial literacy among Korean migrants. The issue of financial remittance was examined in this face-to-face survey of 60 Korean adults in the Auckland region, where they were recruited from several Korean

ethnic-based churches. All the participants were restricted to first-generation migrants who were assumed to be responsible for their own financial and economic needs. The issues associated with financial remittances between the host and home nations were mainly examined, while participants' background characteristics were also obtained and analysed in this study. The results from this study show that most Korean migrants were not willing to, or were not able to, send money back to their families or relatives in Korea. The conclusion of this survey confirms the claim that Korean immigration to New Zealand is unlikely to be motivated by economic success or material gains, while financial safety is still necessary for them to manage daily lives in their host society.

The third research project was conducted using in-depth interviews with 14 community leaders and key informants within the Korean community between 2012 and 2013 in the Auckland and Christchurch areas. The main purpose of this study was to identify the roles of ethnic-based groups and organisations in transnational activities and connections between the host and home nations. The research participants were those people who had long been involved in various social groups within the Korean community, including five leaders of formal organisations or associations, two mass media owners, and four leaders of informal groups. Three religious leaders were also recruited for the reason that ethnic churches are strongly associated with social and civic participation in the Korean community. Among them, 12 participants were first-generation migrants who had moved to New Zealand as adults, and two were 1.5 generation migrants immigrating to the country when they were in adolescence. The findings from the study show that ethnic-based groups provided Korean residents with an opportunity to actively engage in social and civic practices in both home and host communities (Park & Kang, 2014).

In addition, documentary sources were collected and analysed from ethnic-based newspapers, magazines, and websites produced between 1995 and 2013 in the Korean community. In keeping with the method of documentary research, this ethnographic analysis focused on reviewing the relevant documents that contain information about the history of Korean immigration to New Zealand and a range of issues around Korean residents' resettlement and adaptation in this country. There were particular efforts to explore the interface of past and present Korean migration, and make connections between multiple types of documentary sources, virtually and physically. By combining such various sources of data, several different perspectives were pursued to trace how Korean migrants and sojourners managed their daily realities in New Zealand. As an insider researcher in the study population, the author has been 'naturally' able to, not only achieve what the research projects explicitly aimed at, but also capture publicly unknown stories and nuanced meanings embedded in different languages and contexts.

Empirical considerations: Korean community in New Zealand

This section looks closely at what goes on in the Korean community in aspects of how Korean migrants managed everyday lives in the New Zealand context. It presents the empirical evidence collected from three different research projects within the community. There is a special focus on migration experience and cross-cultural adaptation processes whereby people who were the subjects of research have shared social ideas and constructed a form of reality in this current digital world. Through critically synthesising these three sources of evidence, the author highlights the way in which Korean migrants established their own community based on their individual and collective experiences in local, national and transnational engagements. To provide contextual information for this discussion, the section starts with a brief description about migrants and diaspora members (including temporary visitors) in the Korean community in New Zealand.

Korean Migrant and Diaspora Individuals

The Korean population is recognised as one of the largest Asian ethnic groups in Aotearoa New Zealand, following the Chinese, Indian and Filipino populations. According to Statistics New Zealand (2007), Koreans have established the fastest growing ethnic minority community in the country during recent decades. The number of Korean residents in New Zealand has increased more than 30 times from 930 in 1991 to 30,792 in 2006. The Korean community consists of a range of people in terms of their legal status, including immigrants, international students and other diaspora members. Although the population contains people who were born in New Zealand, called the second generation of Korean migrants, it is made up mainly of those people who were overseas-born (The 2006 census data show that only six per cent of Korean descendants were born in New Zealand). As a result, they are likely to retain much of their native language, culture and lifestyles in their adopted society. About 70 per cent of Korean migrants have settled in the Auckland region, followed by 17 per cent in the Canterbury area. Although the Korean community makes up less than one per cent of the New Zealand population, it plays an important role in the development of the relationship between New Zealand and Korea.

The new immigration policy that came into effect from 2003 has significantly impacted on both the inflows of Korean applications and the characteristics of the Korean community. The numbers of people who gained permanent residence have dramatically decreased from 1,574 in 2006 to 942 in 2007 (Statistics Korea, 2007), and as a result, the number of Korean residents has been slightly reduced to 30,171 in 2013 (Statistics New Zealand, 2014a). Until 2003, the majority of Korean migrants were mainly those who could afford to bring the required sum of money for resettlement into the country, and therefore, they were likely

to be seen as "well-educated, middle or upper-middle class, and thus relatively affluent (or, at least, they were so prior to immigration)" (Epstein, 2006, p. 149). Under the current laws, however, residence applicants are those relatively young people who are able to work with good English skills before obtaining permanent residence status. This change in New Zealand's immigration regulations contributes to, not only reshaping the community's profile, but also reducing the number of Korean newcomers and potential members in the community.

Like many voluntary ethnic migrants from other countries, Koreans move to New Zealand in search of a better quality of life in a clean, green environment, rather than economic betterment and success. (Kim & Yoon, 2003). Especially, Korean immigration to New Zealand is partially a product of people's cultural practices, where family-oriented values are deeply entrenched, and children's education is persistently considered the most important investment for the future (mostly social or educational migration, rather than economic migration). Opportunities for children's education in an English-speaking environment attract many Korean parents to choose this country as a place to live, while they have a relatively low level of expectation or commitment to economic achievements (Morris, Vokes & Chang, 2007). In other words, the choice of many Korean adults to uproot themselves from their home country is so that they can equip their children with fluent English skills, as this is seen as a necessary investment for their children's future (Yoon, 2000).

Placing children's education first in the settlement process produces a range of issues that the Korean population identifies itself in the host society. Among those issues, English is the major challenge facing Korean migrants to settle in New Zealand (therefore, English is a 'full-and-push' factor, not only attracting Koreans to this country, but also getting them in a difficult situation in their host society). Kim and Yoon (2003) confirm that English proficiency is one of the major challenges facing Korean migrants in their host society.

> New Korean immigrants often consider New Zealand a sort of "paradise" in terms of its environmental quality and educational opportunities for their children. However, soon after their arrival they learn that New Zealand is in fact not a perfect paradise, but has some shortcomings as well. ... in "the foreign country" that they encounter with poor English and daunting cultural barriers. (p.87)

Many Korean migrants have difficulties associated with the resettlement process because they were born and grew up in a uniquely homogeneous Korean culture. As almost all Korean residents were overseas-born, the Korean community is mainly made up of those who are likely to maintain their native language, food

and cultural practices. For example, the Korean language is still widely spoken in Korean families and nearly one in three Koreans living in New Zealand indicates that they do not speak English in their everyday life (Statistics New Zealand, 2007). They have maintained their cultural identities and a sense of belonging, by residing in close proximity in a general area and sharing their similar cultural heritage. As stated above, some Korean adults, focusing on a better life for their children, have a low level of acculturation motivation for themselves in learning English, and face a range of issues associated with seeking a job or embarking on a second career in the new county. Consequently, their financial stability becomes threatened soon after their arrival.

As a consequence of 'external' migration crossing borders, all Korean families are trans-nationally functioning in various aspects of family relations. Most family units or groups in New Zealand have extended, or even immediate, family members in their home nation. Some transnational families bring their family members including siblings and aged parents to New Zealand under the current immigration legislation system. On the other hand, a considerable proportion of migrant families per se choose to live separated from each other so that one of family members (mostly fathers) works in their homeland to support the rest of the family members living in New Zealand (Pio, 2010; This type of transnational families is often described as 'astronaut families' or 'goose families' because family members are separated from each other and rarely meet together in person (likewise how geese are seen to do so). Other individuals or family units may return to Korea and/or move to a third country such as Australia, Canada or the United States for their work or children's further education. Yoon (2000) states, therefore, that "it is difficult to find an accurate estimate of the number of Koreans who have departed from New Zealand, but it is certain that a considerable number of Koreans have either returned to Korea or have re-emigrated to a third country" (p. 66). The report published by Statistics New Zealand (2014b) also indicates this demographic mobility of the Korean population, showing that there were 1,672 permanent and long-term arrivals from Korea in 2013 but, during the same period, 1,605 Korean migrants left the country for an intended period of a year or more (or permanently).

Temporary diaspora members (including short-term visitors, work-permit holders and international students) play an important role in the Korean community as well. Their relationship with Korean permanent residents is inextricably interwoven, like having a 'symbiotic' relationship. There are more than 50,000 Korean visitors coming to stay in New Zealand for less than 12 months every year (see Statistics New Zealand, 2014b; Recently, the number of visitors was rapidly decreased from 111,979 in 2007 to 51,072 in 2013). Although the numbers of students are gradually decreasing, there are more than 10,000 Korean students attending New Zealand educational institutions from primary school to university. According to Korean government, there were 1,833 primary or high school students who study in New Zealand, while the

number of Korean students studying in tertiary institutions was 8,707 (Ministry of Education, Science and Technology, 2007). These temporary visitors and international students, needless to say, play a vital role in economic activities within the community, as well as making a substantial contribution to New Zealand's economy (Department of Labour, 2007). To serve them, the majority of Korean migrants in business run small-scale family businesses such as dairy shops, ethnic food restaurants, educational services, health product stores or travel agencies (Morris, Vokes & Chang, 2007). It is common, therefore, that fluctuations in the number of temporary diaspora members have a significant impact on social and economic dynamics within the Korean community in New Zealand.

Korean Community as a Contact Zone

The Korean community is in the midst of establishing itself as one of the newest ethnic communities in New Zealand society. On the surface, the community plays a vital role as a bridge institution in supporting its members and representing its cultural traditions. In other words, it is the ethnic community that plays crucial roles in a range of areas associated with social and community life of the Korean population resettling in New Zealand. Both attachment and interaction among community members exist where the ethnic concentration is located relatively independently in the host society. The boundaries of the migrant community are not only geographical but also represent a clutter of ethnic-based interest groups. That is, characteristics of the Korean community tend to be swayed by both place-based geographical factors like locality, and sociological or functional elements such as interest-based congregation and 'virtual (online)' communities without face-to-face interpersonal interaction. There are a range of subgroups and gatherings in different sectors within the community. The roles and functions of these community groups significantly impact upon the degree of structural assimilation of migrant and diaspora individuals at the community level.

One can argue that the Korean community in New Zealand forms an ethnoburb, involving a multicultural community with other ethnic minority groups (Li, 2006). In fact, the Korean community tends to serve as a multi-ethnic suburb that has extensive spatial boundaries within an 'economic enclave' and religious conformity. Its ethnic socio-economic structure has been strengthened by the increasing numbers of temporary migrants and permanent residents. By establishing ethnic-owned businesses and religious groups, the ethnoburb where Korean migrants live has attracted newcomers and 'potential' migrants to concentrate inside the community. Not only does the ethnoburb itself rely on economic, social and political conditions in the host society, but it also creates structural, functional and spatial diversity within wider communities. The ethnoburb incessantly interacts with the outside world by distributing 'frontline' migrants who have host language fluency into public and private sectors of society. Although there are often tensions between

migrants and local residents, such conflicts per se may not be a dominant reason for the formation of the ethnic concentration. In these social, economic and political circumstances, Korean migrants are likely to retain their identity and cultural heritage, while they may also have partially merged with New Zealand society. This further suggests that, for many migrants and diaspora members, cross-cultural adaptation may not always occur as long as they remain inside their ethnoburb in the new country.

The nature of the Korean community is more complex than what the notion of ethnoburb represents. It is in general influenced by three major factors: external push factors such as discrimination by the host society, internal pull factors such as ethnic solidarity, and historical immigration policies (Li, 2006). For instance, unfamiliarity with, or the prejudice of, the host society may encourage Korean immigrants to group themselves together and, as a result, develop an ethnoburb in a safe spatial location. For internal pull factors, the cultural tendencies which are in favour of collectivism may escalate motivations to establish stronger ethnic solidarity or unity than those of other groups (Laux & Thieme, 2006). New Zealand immigration policies also have a crucial impact on the characteristics of the population and its ability to develop community cohesion. For example, under the current immigration system, young adults who lean towards Western culture seem to be advantaged in obtaining permanent residence, while the business migrant schemes repealed from 2005 allowed middle-aged Koreans who had adequate funds for business and settlement to come into the country. These two populations are different from each other in terms of culture, economic independence and language skills, and such differing characteristics can influence the nature of the community which they are established in.

In addition to the above factors, the level of the relationship with the home country is another important element that influences the nature of the ethnic community. For Korean migrants in New Zealand, connecting with the native country is one of the key factors in establishing and developing the Korean ethnic community. 'Real time' connections between the community and the homeland have been enhanced by advanced media technologies, including the widespread use of the Internet, and Korean-language newspapers, radio and television outlets (Epstein, 2006). The flexible combination of all the above factors enables the Korean community to form and develop as an ethnic concentration allowing its cultural identity to emerge in the New Zealand culture. The formation of the Korean community creates opportunities for its members to generate an ethnic-based 'localised' culture, and, in turn, the culture produced by the community dictates how individual migrants maintain their cultural traditions, including familism or filial piety, in their new cultural environment.

The Korean ethnic community is not simply about ethnicity, economy or culture; it inherently has its own power and dynamics. There are always human interactions across power differences and an intersection of

oppositional interests within the ethnic unit. The community does not function as a homogeneous one but does work as a kind of '*contact zone*', referred to as a place where "cultures meet, clash, and grapple with each other, often in contexts of highly asymmetrical relations of power, such as colonialism, slavery, or their aftermaths as they are lived out in many parts of the world today" (Pratt, 1991, p. 34). The characteristics of the contact zone associated with Korean migrants are underpinned by two major cultures: the native Korean culture as the subordinated one, and the dominant host culture. The host culture is also made up of not only a dominant majority, but also includes indigenous or ethno-cultural minorities. When the contact zone works properly, 'transculturation' occurs among members of the community, instead of being entirely acculturated or assimilated into the dominant society. Korean migrants can determine partially what they accept or reject from a set of cultures, values and behaviours transmitted by the host society, while they may not be able to control "what emanates from the dominant culture" (Pratt, 1991, p. 9). They can also govern the extent of their integration into the New Zealand society. In light of this, the contact zone is not necessarily relevant to the notion that the "Korean community is as much a product of *exclusion* by the mainstream society" (Morris, Vokes & Chang, 2007, p. 12). Rather, the contact zone exists as the process of the negotiations among subjects outside (and inside) the ethnic community, despite the fact that "de jure and de facto discrimination forced racial minorities and immigrants to live in segregated, isolated communities" (Li, 2006, p. 12).

There is a wider range of ethnic-based organisations and media established in New Zealand by Korean migrants who hold different backgrounds from their home country. These community groups include Korean societies, sports clubs, business groups, alumni associations and Korean language schools. They provide the vehicle through which migrants and diaspora members can associate themselves with other people and build some meaningful relationships in their new environment. Events and activities offered by such 'insider' groups and organisations help Korean migrant and diaspora members share social and community issues and promote their cultural identity both within and outside the ethnic enclave. Such ethnic-based groups and institutions also play a role as 'gatekeepers' or 'cultural brokers' (Kim, 2001) between the ethnic community and the mainstream society in cultural, economic, social and political areas.

Ethnic-based media (community-based media, rather than mass media on a nationwide scale) have become powerful institutions that enforce community cohesion among Korean migrant and diaspora members. The Korean-based media directed towards the ethnic community provide both permanent residents and temporary visitors with an opportunity to connect them with New Zealand society. Coupled with the prevalent use of the Korean-language websites and Internet-mediated social media, ethnic newspapers and magazines are largely circulated in the Auckland and Christchurch areas. According to the Korea Press Foundation (2007), there were 30 media companies or organizations for Korean immigrants in

2007 in New Zealand, compared with 25 organisations in Australia. Those media include regional newspapers, monthly magazines, radio broadcasting, and online newspapers. Not only do ethnic-based media convey messages and information about things happening in New Zealand, but they also allow Koreans to keep up to date with what is going on at present in their home country. Such supportive functions of ethnic media serve as vital lifelines especially for such less settled groups as new arrivals, older people and temporary visitors, who are seeking ethnic support systems before they enter the host systems. Some products or services provided by ethnic media are sources for local business groups or community organisations to reach Korean migrant families through the use of the Korean language.

In order to help migrants settle, the contact zone needs to create 'safer houses' which are defined as "social and intellectual spaces where groups can constitute themselves as horizontal, homogenous, sovereign communities with high degrees of trust, shared understandings, temporary protection from legacies of oppression" (Pratt, 1991, p. 40). Religious institutions in the contact zone occupy a good position to bring people of a similar background together and form a safe house for the members gathered. Faith organisations help Korean migrants and diaspora members to fit into the 'Christian-based' western culture. A hundred Korean churches are used for worshipping by Korean families around the country (This is estimated from personal communication with some church pastors and community leaders). The majority of Koreans are affiliated to Christianity. Results from the 2006 New Zealand census show that more than 70 per cent of Koreans identified themselves as Christian, while only five per cent were affiliated to the Buddhist faith. These data are comparable with those in Korea where 29.2 per cent of its population in 2011 belonged to either Catholic or Protestant churches, and 22 per cent identified an affiliation to Buddhism (Ministry of Culture, Sports and Tourism, 2012). That Christianity is strongly established in the Korean community in New Zealand is in line with similar tendencies among Korean communities in other countries including Australia and the United States (Han, 1994; Laux & Thieme, 2006; Son & Kim, 2006). Morris, Vokes and Chang (2007) point out that newcomers are likely to become church-goers because immigrant churches function as a major agency for social networks, providing practical, economic and emotional support for new arrivals beyond spiritual benefits:

> Church, then, plays an important role in settling in New Zealand for a majority of Korean migrants. While Korean churches provide considerable practical assistance to migrants, and are a site of homeliness and security in a new and unfamiliar environment, participation also means potential separation from wider society, which can lead to a predominantly 'Korean life' in New Zealand. Korean church networks make it easier for migrants to make a living and to develop social networks, but participation in Korean

> churches also results in individuals being less likely to develop their own networks in the wider society. (p. 18)

Several Korean churches, for example, run senior clubs, called '*Noin Daehak*' in Korean, for older migrants to provide a range of activities such as education, socialising, entertainment, exercise and hot meals for lunch. These senior clubs, operated by ethnic religious groups, appear to be the 'safe houses' that become the largest support structures in the daily lives of migrant older people. The natural tendency to depend on such ethnic resources often leads to positive benefits for less-assimilated newcomers in relation to sharing common cultural values and close relationships without language barriers (Kim, 2001). In the longer term, however, ethnic-based groups and organisations also create barriers for those people to enter the host society, trapping them within ethnic boundaries (Thomas, 2003). Such a negative effect may result in a cycle of lower-level adaptation, a lack of relationships and networks, and a high level of social isolation (Lee, 2007). Regardless of whether living in an ethnoburb is advantageous or unfavourable, securing 'safe houses' becomes a major issue for less-settled migrants because of the dynamics of power and control that affect their social lives and their community in the new country.

Knowledge is power, and the relation between the two is not separable (Foucault, 1980). In the same context, *English* is power within the contact zone. It is not just a host language but an instrument of power that affects the life of most migrants directly or indirectly. People who have a good command of the English language are likely to act as key players in almost all sectors, while roles of 'traditional' leaders are compromised by a relatively low level of functional proficiency in the local culture. Interactions among community members become vastly complicated and multifaceted. Socio-economic inequalities exist between earlier migrants (or advantaged individuals) and later arrivals, and result in increasingly complex relations of power. Not surprisingly, "highly asymmetrical relations of power" (Pratt, 1991, p. 34) often occur among co-ethnic migrants within the contact zone. Some migrants are vulnerable to basic human rights violations and mental and physical health problems, due to language and cultural barriers and inexperience with the New Zealand systems. A considerable proportion of migrant families seem to face issues such as family conflict, divorce or domestic violence. These happen during their settlement processes. For example, older migrants who are unfamiliar with local knowledge tend not to assume their traditional authoritative roles, as they are likely to depend on younger generations in their daily lives. The impact of such a role reversal on the family can isolate older people from power relations and force them into a marginalised situation (Chou, 2007; Thomas, 2003).

In the contact zone, furthermore, not only do different cultures meet and clash between the dominant and minority parties, but conflict is also triggered within the subordinated culture which is under the

pressure of adjusting to the wider host society. As such, changes in culture, values and norms rapidly take place within the Korean community, so does the confusion of cultural identity among migrants and diaspora individuals. For some members, moving from their familiar environment causes them to be disconnected from their moral roots, such as heritage norms and values (Lee, 2007). In these circumstances, *anomie*, as an abnormal social condition where norms are confused, unclear, or absent because of the extraordinary pace of social change (Durkheim, 1952), can occur within the contact zone. In other words, a mismatch between social norms and personal standards causes an anomic situation for migrants and diaspora members who find it difficult to integrate into the host society. According to Bourhis et al. (1997), such anomie is commonly operative across generations in the migrant population.

> It is those individuals who reject both their heritage culture and that of the host society who are most likely to experience the cultural alienation known as anomie. Thus, it is immigrants with the marginalization orientation who are most likely to experience problematic identification with both the group of origin and with the host majority. Along with problematic ethno-cultural identification and acculturative stress, anomie can also adversely affect self-esteem and may hinder the adaptation of immigrants within the host society. (p. 378)

Anomie also germinates when migrant and diaspora individuals deliberately or unconsciously ignore new social norms (normative standards) due to the resettlement challenges and difficulties facing them in the adoptive country (Orru, 1990). Migrants' emphasis on economic (material) success, which can be named as '*New Zealand Dream*', often contributes to the weakening of traditional moral regulation and the generation of deviant behaviour in the new cultural environment (see Messner & Rosenfeld, 2007). Under conditions of individualistic competitions, migrants and diaspora members can experience a strain between aspiration and the lack of opportunities in the new country, while there is a lack of force to impose clear standards to guide their behaviour in the contact zone. The stress or strain toward anomie may also be facilitated by such hostility or discrimination as 'anti-Asian prejudice' (King, 2003, p. 506) existing in the host society.

Discussion: Migration and Diaspora in the Digital Age

The results from the three studies indicate that the nature of the present-day Korean migration to New Zealand is complex, diverse yet flexible. This migrant community inherently has its own evolving culture and traditions within the context where migrant and diaspora individuals are embedded. The concept of 'diamigration' is suggested to explain the combined phenomenon of migration and diaspora in the Korean community in New Zealand. The discussion in this section also includes major characteristics of

present-day migration in relation to the development of social care and service for current migrant and diaspora members.

Diamigration: Characteristics of Present-day Migration and Diaspora

The present-day migration that Korean migrants encounter in New Zealand can be seen as a more 'soften' and connected experience than traditional migration and diaspora. This particular phenomenon can be termed 'diamigration' (combination of diaspora and migration), which means cross-, or between- (dia, διά) migration. Diamigration, therefore, can refer to the human movement of ethnic individuals and groups who have left, but maintain virtual and physical ties with their homelands regardless of their legal status and citizenship in the adoptive society. This type of migration is more diverse, flexible, mobile and liberal than usual, and inherently associated with advanced technologies. The main features of diamigration include making non-economic choice and 'soft-landing' relocation, choosing a sense of liberal belonging, selecting 'fluid' acculturation and identity formation, and likely harbouring thoughts of re-migration.

Non-economic choice: Migration decisions are affected by a range of '(full) factors associated with the area of destination' and '(push) factors associated with the area of origin' (Lee, 1966). It has been understood that the dominant motive for migration is related to economic reasons, such as better economic opportunities, more secure jobs and, consequently, the possibility of remittance to non-migrant families back home. Present-day migration, however, has a growing diversity in its motives and methods. In the New Zealand context, the most common reason that current migrants chose this country was 'the relaxed pace of life or lifestyle', followed by 'the climate or clean, green environment', and 'a better future for their children' (Department of Labour, 2009). Such non-economic factors, along with taking advantage of the English-based education (for example, *education migration*), become important for present-day migrants in their migration decision-making and choice of destination (Park & Anglem, 2012). As a result, the legal status of these migrants remarkably varies; some obtain citizenship, while others remain as permanent residents without full citizenship. There are a number of 'intending' immigrants who hold a work permit or visa to obtain legal residence in the future. Other sorts of migrants (literally, diaspora members) include international students who stay for the designated period in the country. Accordingly, 'transnational families' (e.g., astronaut families or goose families), whose relationships are scattered across two or more nations, are not an uncommon phenomenon among present-day migrants (see Cha & Kim, 2013).

Soft-landing: Successful resettlement is obviously a crucial issue when migrants enter a new country.

Intercultural migrants who have different linguistic and cultural backgrounds face a range of challenges during their resettlement processes (see Boekestijn, 1988). Some present-day migrants, however, become capable of making 'soft-landing' relocations in their adopted nation, utilising the full range of physical and online resources available before and after their movement. Migrant communities provide new arrivals with internal support to adapt to, and settle in, the host society in a relatively feasible way (see Chen & Choi, 2011). Migrant social capital, roughly defined as the information and resources that prior migrants have accumulated, allows newcomers to broaden their survival strategies and use various resettlement assistance (Garip, 2008; Sanders, 2002). Significantly, ethnic-based media, online and off-line, serve as a resource pool of local knowledge and practical support for newcomers (Park & Kim, 2013). Migrant churches and faith-based groups provide their members with, not only safe and trustworthy sites for spiritual purposes, but also social, emotional and cultural support for soft-landing relocations (e.g., Morris, Vokes & Chang, 2007). It is noticeable, however, that the roles played by immigrant religious groups become less dominant after migrants have been settled, while non-religious or non-political gatherings, such as leisure and sports clubs, become more flourishing (Park & Anglem, 2012).

Double presence: Traditionally, it has been viewed that migrants tend to experience 'double absence—not here, nor there' between their receiving and sending societies (Sayad, cited in Nedelcu, 2012, p. 1340). This notion, however, may be no longer true for many present-day migrant and diaspora members. Their social ties are proliferating, and such connections foster their social involvement, not only within their ethnic communities (Oiarzabal and Reips 2012), but also with their home communities (see Schmidt & Cohen, 2013). Utilising the Internet, mobile phones, smart devices and social media (such as KakaoTalk, Facebook and Skype), new migrants are likely to seek out gatherings or groups to maintain their social lives in the virtual and physical worlds. Migrant communities sustain a variety of informal gatherings, small clubs, support groups, organisations and institutions within ethnic boundaries in both geographical and virtual spaces (see Brettell, 2005). The flourishing of such internal networks encourages people to belong to the ethnic-based groups in which they feel comfortable, experience enjoyment and are empowered without language difficulties or cultural barriers (Park & Anglem, 2012). Furthermore, present-day migrants are likely to retain strong links with their homeland communities via online and offline channels, and participate in the social, political and economic issues in the country of origin (see Hung, Xiao & Yang, 2013). This means that those migrants are ubiquitously able to involve themselves in various matters in both host and home countries, and 'live "dual," even "multiple," lives spanning national borders connected to social networks' across two different settings (Banerjee & German, 2010, p. 23).

Weakened acculturation and 'fluid' identification: In migrant studies, it has been believed that migration requires people to engage in intercultural relations and adapt to the culture and lifestyles of the host

society. Particularly, intercultural migrants have been expected to trade most aspects of their cultural heritages for the ways that are accepted and 'normal' in the receiving nation (see Berry, 1997; Gudykunst & Kim, 2003). These acculturation issues of present-day migrants, however, become a less prescribed formulation since those people are able to simultaneously maintain, to a large extent, their historical and cultural roots. The issues of identity and acculturation among present-day migrants become exponentially complex as people have more diversity in migrant status, reasons for, and length of, migration (Simon, Reichert & Grabow, 2013). Bauman (2011) argues that nowadays people experience 'identity formation', which is a lifelong process of readjustment, instead of having to hold to a 'fixed' identity. From this perspective, present-day migrants are likely to be those people who develop a 'fluid' (changeable or flexible) identity' between the places to which they previously belonged, and where they currently live. Due to increasing use of information technologies, their 'online identity' in the virtual world also affects the flexibility of their physical identity (see Schmidt & Cohen, 2013). As a result, those migrants may be capable of maintaining high levels of ethnic consciousness, and governing the extent of their integration into the host society (Park & Anglem, 2012).

Feasible returning: As Bauman (2005) asserted, people today are part of a liquid and rapidly changing society. The fluid movement of people, information and capital facilitates an increase in less fixed migration or more generally, migrants' mobility around the world. Return migration among present-day migrants is increasing as they often choose to move back to the homeland as part of a journey of flexible living arrangements rather than engaging in the more permanent one-way migrations of the past. This form of migration exemplifies the liberal movement of people where crossing borders is unlikely to be permanent or immutable (see Cohen, 1997). The spread of connectivity between the sending and receiving communities helps migrants choose to return to their country of origin (Park & Anglem, 2012). Less people considered moving to another country as a 'one-way trip' with no intention of returning home. As shown earlier, for example, while there are a number of new Korean arrivals every year, similar numbers of people continue to leave New Zealand to return to their homeland or move on to a third nation (Statistics New Zealand, 2014b). Accordingly, a 'brain drain' of migrant youth and young adults leaving the host nation is an emerging issue in today's migration patterns (see Stolz & Baten, 2012).

The enduring inclination towards diamigration is likely to continue to grow in the next decades as information and communication technologies continue to promote this tendency. In other words, technology is driving people's moving out into the virtual and physical worlds, and therefore, there will be a continuing influx of people and products across borders. Such technological developments help today's migrants and diaspora members keep connected with their peers and relatives, local people and the

people in the homeland on a real-time basis. For example, Oiarzabal and Reips (2012) argue that the influence of technology is "undeniable" because:

> It technology facilitates the flow of people across the planet and the formation, growth and maintenance of diaspora communities and family ties. In particular, the personal computer, the cell [Smart] phone and access to the Internet have become quotidian resources among migrants who use them to develop, maintain and recreate informal and formal transnational networks in both the physical and the digital worlds, while reinforcing and shaping their sense of individual and collective identity. (p. 1334)

These new migrant and diaspora populations often play a role as frontline actors with digital skills and competencies to generate global flows of economic, cultural and social capital in transnational contexts. These new migrants and diaspora members are capable of creating new communicative spaces utilising advanced technologies, and connecting both sending and receiving communities. Existing paradigms and approaches to traditional migration, therefore, will have to adapt and evolve to new migration and diaspora in the digital world. The traditional concepts, such as immigration, acculturation and ethnic minority groups, might not be always pragmatic as a way of understanding what goes on inside of new human migration across cultures and regions. Under these circumstances, the idea of diamigration, as an integrated human movement, can contribute to capturing the emerging reality of transnational individuals and communities.

Social Issues Associated with Diamigration

In this unpredictable context, the emergence of 'diamigration' poses a range of challenges which involve concerns about who constitute migrant or diaspora communities, what issues these individuals and groups face, and how they are associated with local people in the host society. Diamigration can create different patterns of social issues or problems to both sending and receiving communities, which will have an impact upon policies and professional practice in social services. It can also contribute to the creation of the social needs that affect new migrants' lives and their interpersonal relationships across transnational borders. The following issues are particularly pertinent to the provision of social care and welfare services in the receiving and sending countries.

Firstly, diamigration per se involves a certain degree of risk and has some shortcomings, mainly by the development of internal ethnic solidarity within migrant communities. Reliance on ethnic-based resources (migrant social capital) may cause some migrants to be associated with a cycle of lower-level adaptation,

a lack of social participation, and an increase in social isolation outside of the ethnic community (Kim, 2001). This 'narrow' adaptation strategy of new migrants and diaspora members can limit their participation and representation in main social and political structures in the adoptive society. Consequently, promoting the social cohesion and integration of those populations can be an ongoing issue at individual, community and societal levels in the host society.

The law of the jungle still operates in present-day migrant communities. There is often intense competition among community members to secure a share of the limited resources that are offered either by the host society or from the homeland. Although empowering migrants is an effective strategy to help them adapt to the host society, it should be noted that such empowerment may not always extend to their wider community or networks. Payne (2005) points out that 'empowered [migrant] individuals may be taking power and resources from others in their oppressed environment, to their disadvantage, rather than taking it from wider society' (p. 314). This competitive and exploitative situation can continue to exist even though new migrants may be capable of gaining a range of resources from the host nation and the homeland.

On the other hand, empowerment can be reinforced by the development of digital technologies and social media beyond national boundaries. Digital empowerment is emerging among migrant individuals and groups who are able to use digital technologies effectively for developing their life skills and competencies in the information society (Mäkinen, 2006). As migrants and diaspora members become more connected virtually and physically across national borders, their civil participation can increase in both their adopted and native countries. Consequently, those individuals can have their own voices heard and their issues taken seriously in host and home communities. However, new forms of inequality can be created against migrant and diaspora members within the diamigration community because some people possess more digital skills and competencies than others do. Nedelcu (2012), therefore, asserts that:

> Today, the Internet facilitates the co-presence of mobile actors in multiple locations and allows the emergence of a new transnational habitus. It also enhances new, connected ways of mobilisation and cohesion at a distance, although there are still many (unskilled) migrants who cannot benefit yet, on a large scale, from the digital revolution. (p. 1340)

Migrant populations are full of diversity and individual circumstances vary considerably among them in different countries. Acknowledging diversity in modern migration, the features associated with the diamigration phenomenon may not be consistent with all ethnic migrant groups and communities across

the globe. It remains important, therefore, for policy-makers, practitioners and researchers to address the issues that traditional migration poses. These existing migration issues include, but not limited to, psychological distress, language barriers, social isolation, discrimination and oppression, and possibly lower levels of socio-economic status among ethnic minority populations (see Dominelli, 2008; Hayes & Humphries, 2004; Lum, 2011).

Future Directions

Arguably, uncertainty appears to be growing, and change is enduring in the age of migration. The underpinning principle of this paper is that, although we live in unpredictable times concerning issues of racial and ethnic solidarity, learning from current trends and changes would help us become more able to predict and become more competent in our practice in the digital age. Firstly, it should be considered that diamigration does not exist in isolation. Rather, it occurs in the context in which migrants and diaspora members are embedded across transnational spaces. This means that working with migrants requires not only understanding of the issues associated with individuals' adaptation and resettlement, but also making sense of the context within which they are located (Payne & Askeland, 2008). The nature of diamigration importantly defines both client-hood and social services for today's migrants and diaspora members. Social problems facing them should be understood as both local and global in nature, including the sending and receiving communities. An ecological perspective would encourage researchers, practitioners and policy-makers to be aware of the environmental factors that surround the lives of present-day migrants, and how those external variables interact with personal and interpersonal factors within the context of current migration (see Bronfenbrenner, 2005).

A 'good' community requires a core of values to frame its identity, history and culture (Etzioni, 1996). Community members should share the moral commitment based on a set of core values. Within the contact zone of diamigration, however, social norms and values are likely to be modified and negotiated with local knowledge and power, rather than being handed over from generation to generation. Migrants' traditional values are less likely to be cherished and, as a result, have been substituted by what has been established in the host society. The sociocultural norms of migrants and diaspora members have become weakened by the emphasis on 'value-free' economic or material success in the new country. Anomie can occur for some migrant individuals and groups who do not anchor to new values in the host society but deviate from traditional norms as a result of migration (Bourhis et al., 1997; Orru, 1990). Such deviation from the established norms may impede the strength of traditional ideals about family and community among migrants and diaspora individuals who need to immerse into an unfamiliar atmosphere of the host culture.

In this vein, the traditional concept of community may need to be reconceptualised through infusing the nature of diamigration in the digital age.

Present-day migrants experience diamigration in a fluid way that increases the transnational flexibility and mobility of resources and networks between the home and host countries. This experience may not be a new phenomenon which is uniquely distinctive from that of earlier migrant populations around the world. The nature of transnational connections has been the core component of migration involving two or more geographical settings for many decades. Whilst using the term 'diamigration', this research reflection does not intend to conceptualise current migration and migrant identity in a one-size-fits-all approach. As many prior waves of migrants have also maintained ties with their origin country, diamigration may be seen as another way of describing 'transnationalism' (e.g. Vertovec, 2007), 'multiculturalism', or 'diaspora' (e.g. Oiarzabal & Reips, 2012). Despite this, the value of using 'diamigration' lies in emphasising emerging characteristics of contemporary migration in order to recognise a wider spectrum that encompasses various phenomena in human migration.

Conclusion

As global connectivity grows virtually and physically, migration is constantly changing and the pace of such change accelerates daily. Present-day migration is noticeably different from that of the past in many ways. Technological and informational developments have revolutionised communication systems and those advanced technologies and social media help new migrants and diaspora members keep connected with their peers, local people and the homeland on a real-time basis. In the case of Korean migration in New Zealand, present-day migrants retain high levels of ethnic consciousness and keep themselves up with real-time information across transnational borders. The distinction between migration and diaspora becomes blurry and less meaningful in the virtual and physical worlds. In this paper, therefore, the term 'diamigration' was used to shed light on the mixed nature of modern diaspora and migration in the digital age. The main features of diamigration include soft-landing relocation, a sense of double presence or belonging, fluid acculturation, and virtual identity formation. Consequently, present-day migrant and diaspora individuals are likely harbouring thoughts of return migration and potential re-migration to a third nation.

Beyond what has been presented in this paper, many questions still remain to be answered empirically and theoretically. For example, is diamigration the pure sum of the values and meanings of diaspora and migration? Is it a new form of migration or a different type of transnational movement particularly applicable to Korean migrants in New Zealand? Is the distinction between migration and diaspora no

longer useful for naming people crossing physical or virtual borders? Nevertheless, the emergence of diamigration appears as a significant social, economic and political issue as it generates different patterns of social capital or problems to both sending and receiving countries. This human movement can also create new forms of social needs that affect people's determination of migration and their resettlement processes across home and host societies. Existing paradigms and worldviews about migration and diaspora will have to adapt and evolve to new diamigration in the digital age as we chart a new course in the globalising world.

References

Banerjee, P., & German, M. (2010). Migration and transculturation in the digital age: a framework for studying the "space between". *Journal of International and Global Studies, 2*(1), 22-36.

Bauman, Z. (2005). *Liquid life*. Cambridge, UK; Malden, MA: Polity.

Bauman, Z. (2011). Migration and identities in the globalized world. *Philosophy & Social Criticism*, *37*(4), 425–435.

Berry, J. (1997). Immigration, acculturation, and adaptation. *Applied Psychology*, *46*(1), 5–34.

Boekestijn, C. (1988). Intercultural migration and the development of personal identity: The dilemma between identity maintenance and cultural adaption. *International Journal of Intercultural Relations, 12*(2), 83–105.

Bourhis, R.Y., Moise, L.C., Perreault, S. & Sacha, S. (1997). Towards an Interactive Acculturation Model: A Social Psychological Approach. *International Journal of Psychology*, *32*(6), 369-386.

Brettell, C. (2005). Voluntary Organizations, Social Capital, and the Social Incorporation of Asian Indian Immigrants in the Dallas-Fort Worth Metroplex. *Anthropological Quarterly, 78*(4), 853-882.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage Publications.

Brubaker, R. (2005). The 'diaspora' diaspora. *Ethnic and Racial Studies, 28*(1), 1-19.

Castles, S., & Miller, M. (2009). *The Age of Migration: International Population Movements in the Modern World* (4th ed.). Basingstoke, UK: Palgrave Macmillan.

Cha, C., & Kim, E. (2013). Assessing the role of culture in Korean goose mothers' lives. *Journal of Transcultural Nursing, 24*(1), 86–93.

Chen, W., & Choi, A. (2011). Internet and social support among Chinese migrants in Singapore. *New Media & Society, 13*(7), 1067–1084.

Chou, K. (2007). Psychological distress in migrants in Australia over 50 years old: A longitudinal investigation. *Journal of Affective Disorders, 98*, 99-108.

Clifford, D., & Burke, B. (2009). *Anti-oppressive ethics and values in social work*. New York, NY: Palgrave Macmillan.

Cohen, R. (1997). *Global Diasporas: An Introduction*. London, UK: UCL Press.

Cordero-Guzman, H. (2005). Community based organizations and migration in New York City. *Journal of Ethnic and Migration Studies, 31*(5), 889-909.

Crawford, M. H., & Campbell, B. C. (2012). *Causes and consequences of human migration: An evolutionary perspective*. Cambridge, UK: Cambridge University Press.

Department of Labour. (2007). *International students: Studying and staying on in New Zealand.* Wellington, New Zealand: Department of Labour.

Department of Labour. (2009). *New Faces, New Futures: New Zealand*. Wellington, New Zealand: Department of Labour.

Dominelli, L. (2008). *Anti-racist social work* (3rd ed.). Basingstoke, UK: Palgrave Macmillan.

Durkheim, É. (1952). *Suicide, a study in sociology. translated [from the French] by John A. Spaulding and George Simpson*. London, UK: Routledge.

Epstein, S. (2006). Imaging the community: Newspapers, cyberspace and the [non-]construction of Korea-New Zealand identity. In H. Johnson & B. Moloughney (Eds.), *Asia in the making of New Zealand* (pp. 147-162). Auckland, New Zealand: Auckland University Press.

Etzioni, A. (1996). *The new golden rule: Community and morality in a democratic society*. New York, NY: BasicBooks.

Foucault, M. (1980). *Power/knowledge: selected interviews and other writings; translated by Colin Gordon*. [et al.]. Brighton, England: Harvester Press.

Garip, F. (2008). Social capital and migration: How do similar resources lead to divergent outcomes? *Demography*, *45*(3), 591–617.

Gudykunst, W., & Kim, Y. Y. (2003). *Communicating with strangers: An approach to intercultural communication* (4th ed.). New York, NY: McGraw Hill.

Han, G.S. (1994). An overview of the life of Koreans in Sydney and their religious activities. *Korea Journal, 1994,* 67-76.

Hayes, D., & Humphries, B. (2004). *Social work, immigration and asylum: Debates, dilemmas and ethical issues for social work and social care practice*. London, UK: Jessica Kingsley Publishers.

Hughey, M. W., & Vidich, A. J. (1992). The new American pluralism: Racial and ethnic sodalities and their sociological implications. *International Journal of Politics, Culture, and Society*, *6*(2), 159-180.

Hung, K., Xiao, H., & Yang, X. (2013). Why immigrants travel to their home places: Social capital and acculturation perspective. *Tourism Management, 36*, 304–313.

Jaret, C. (1991). Recent structural change and U.S. urban ethnic minorities. *Journal of Urban Affairs*, *13*(3), 307–336.

Kim, Y. Y. (2001). *Becoming intercultural: An integrative theory of communication and cross-cultural adaptation*. Thousand Oaks, CA: Sage Publications.

Kim, D., & Yoon, H. (2003). Reality in paradise: A pilot study of Korean immigrants in New Zealand using the 1996 census. *The new geography of human mobility-inequality trends, 2003,* 85-102.

King, M. (2003). *The penguin history of New Zealand*. Auckland, N.Z.: Penguin Books.

Korea Press Foundation. (2007). *Korea Journalism Review* (Korean). Seoul, Korea: Korea Press Foundation.

Laux, H. D. & Thieme, K. (2006). Koreans in Greater Los Angeles: Socioeconomic Polarization, Ethnic Attachment and Residential Patterns. In W. Li, *From Urban Enclave to Ethnic Suburb: New Asian Communities in Pacific Rim Countries* (pp. 95-118). Honolulu, HI: University of Hawaii Press.

Lee, E. (1966). A theory of migration. *Demography, 3*(1), 47–57.

Lee, Y. (2007). The immigration experience among elderly Korean immigrants. *Journal of Psychiatric and Mental Health Nursing*, *14*(4), 403-410.

Levanon, A. (2011). Ethnic social capital: Individual and group level sources and their economic consequences. *Social Science Research, 40*(1), 77-86.

Levitt, P. (2002). Keeping Feet in Both Worlds: Transnational Practices and Immigrant Incorporation in the United States. In C. Joppke & E. T. Morawska (Eds.). *Toward assimilation and citizenship: Immigrants in liberal nation-states* (pp. 177-194). New York, NY: Palgrave Macmillan.

Li, W. (2006). *From urban enclave to ethnic suburb: New Asian communities in Pacific Rim countries*. Honolulu, HI: University of Hawaii Press.

Lum, D. (2011). *Culturally competent practice: A framework for understanding diverse groups and justice issues* (4th ed.). Belmont, CA: Brooks/Cole.

Mäkinen, M. (2006). Digital empowerment as a process for enhancing citizens' participation. *E-Learning and Digital Media, 3*(3), 381-395.

Martinez-Brawley, E., & Zorita, M. B. (2011). Immigration and social work: Contrasting practice and education. *Social Work Education, 30*(1), 17-28.

Messner, S. F., & Rosenfeld, R. (2007). *Crime and the American Dream* (4th ed.). Belmont, CA: Thomson Wadsworth.

Ministry of Culture, Sports and Tourism. (2012). *Religions of Korea in Practice* (in Korean). Seoul, Korea: Ministry of Culture, Sports and Tourism.

Ministry of Education, Science and Technology. (2007). *Numbers of students studying overseas 2007* (Korean). Retrieved from http://www.mest.go.kr.

Morris, C., Vokes, R., & Chang, S. (2007). Social exclusion and church in the experiences of Korean migrant families in Christchurch. *Journal of Social Anthropology and Cultural Studies*, *4*(2), 11–31.

Nedelcu, M. (2012). Migrants' new transnational habitus: Rethinking migration through a cosmopolitan lens in the digital age. *Journal of Ethnic and Migration Studies, 38*(9), 1339–1356.

Oiarzabal, P., & Reips, U. (2012). Migration and diaspora in the age of information and communication technologies. *Journal of Ethnic and Migration Studies*, *38*(9), 1333–1338.

Orru, M. (1990). Merton's instrumental theory of anomie. In J.Clark, C.Modgil and S.Modgil (Eds.), *Robert K. Merton: Consensus and controversy* (pp. 231–240). New York, NY: Falmer Press.

Owusu, T. Y. (2000). The role of Ghanaian immigrant association in Toronto, *Canada. International Migration Review, 34*(4), 1115-1181.

Pacione, M. (2005). *Urban geography: A global perspective* (2nd ed.). New York, NY: Routledge

Park, H., & Anglem, J. (2012). The 'transnationality' of Koreans, Korean families and Korean communities in Aotearoa New Zealand – Implications for social work practice. *Social Work Review*. *24*(1), 31-40.

Park, H., & Kang, W. (2014). Social participation and transnational engagement among Korean residents in New Zealand – Issues and implications for social work practice. *Asia Pacific Journal of Social Work and Development*. Published online: 19 Jun 2014, DOI:10.1080/02185385.2014.925818.

Park, H., & Kim, C. G. (2013). Ageing in an inconvenient paradise: The immigrant experiences of Korean older people in Aotearoa New Zealand. *Australasian Journal on Ageing, 32*(3), 158–162.

Park, H., & Taylor, A. (2011). Anomic abuse: An invisible form of elder abuse and neglect in transnational family settings. *Te Awatea Review, 9*(1-2), 10-14.

Payne, M. (2005). *Modern social work theory* (3rd ed.). Basingstoke, UK: Palgrave Macmillan.

Payne, M., & Askeland, G.A. (2008). *Globalization and international social work postmodern change and challenge*. Aldershot, England; Burlington, VT: Ashgate.

Pio, E. (2010). *Longing & Belonging: Asian, Middle Eastern, Latin America and African peoples in New Zealand*. Wellington, New Zealand: Dunmore Publishing Ltd.

Pratt, M. (1991). Arts of the Contact Zone. *Profession, 91*, 33-40.

Putnam, R. (2009). Diversity, social capital, and immigrant integration: introductory remarks, *National Civic Review*, *98*(1), 3–5.

Rodriguez, N. (1996). The battle for the border: notes on autonomous migration, transnational communities, and the state. *Social Justice*, *23*(3), 21-37.

Rubin, A. & Babbie, E. R. (2010). *Research methods for social work* (7th ed.). Belmont, CA: Thomson/Brooks/Cole.

Sanders, J. (2002). Ethnic boundaries and identity in plural societies. *Annual Review of Sociology*, *28,* 327–357.

Schmidt, E., & Cohen, J. (2013). *The new digital age: Reshaping the future of people, nations and business*. New York, NY: Alfred A. Knopf.

Schrover, M., & Vermeulen, F. (2005). Immigrant organisations. *Journal of Ethnic and Migration Studies, 31*(5), 823-832.

Sheffer, G. (1986). *Modern diasporas in international politics*. London, UK: Croom Helm.

Shier, M., Engstrom, S., & Graham, J. (2011). International migration and social work: A review of the literature. *Journal of Immigrant & Refugee Studies, 9*(1), 38–56.

Shuval, J. T. (2000). Diaspora migration: Definitional ambiguities and a theoretical paradigm. *International Migration, 38*(5), 41-56.

Simon, B., Reichert, F., & Grabow, O. (2013). When dual identity becomes a liability. *Psychological Science. 24*(3), 251–257.

Son, G. & Kim, H. (2006). Culturally familiar environment among immigrant Korean elders. *Research and Theory for Nursing Practice, 20*(2), 159-171.

Statistics New Zealand. (2007). *Profile of New Zealander responses, ethnicity question, 2006 Census*. Wellington, New Zealand: Statistics New Zealand.

Statistics New Zealand. (2014a). *2013 Census QuickStats about culture and identity*. Wellington, New Zealand: Statistics New Zealand.

Statistics New Zealand. (2014b). *International Travel and Migration: April 2014*. Wellington, New Zealand: Statistics New Zealand.

Stolz, Y., & Baten, J. (2012). Brain drain in the age of mass migration: Does relative inequality explain migrant selectivity? *Explorations in Economic History, 49*(2), 205-220.

The New Zealand Herald. (13 September 2012). *Being Kiwi: Migrants torn in mobile age*. Retrieved from http://www.nzherald.co.nz/

Thomas, T. (2003). Older migrants and their families, *Family Matters*, *66*, 40-44.

Vertovec, S. (2007). Introduction: New directions in the anthropology of migration and multiculturalism, *Ethnic and Racial Studies, 30*(6), 961–978.

Ward, C. (2008). Thinking outside the Berry boxes: New perspectives on identity, acculturation and intercultural relations. *International Journal of Intercultural Relations, 32*(2), 105-114.

Yoon, H. (2000). Searching for Korean Identity in New Zealand. In D. Ball & I. Pool (Eds.), *The building blocks of national identity: Population in New Zealand's history* (pp. 63-76). Hamilton, New Zealand: University of Waikato.

The Theory of Storytelling Evolution

Chul Gun Lyou
Ewha Womans Univeristy

1. Principles of Storytelling

Among the four states of a narrative - possibility, probability, potential and necessity, potential dwindles over time, turning into probability, and at a point where the story ends, the only possible conclusion of necessity is left, completing a narrative.

Narrative creation, however, is not intended to make a perfect work from the outset, but is a process of "weaving texts" from sources as best as possible. An ill-structured and incomplete first narrative (text) continues to be recreated and dramatized towards the first part of the four areas of narrative creation which realizes the clearest interaction with consumers and the most beautiful recreation.

Traditional researches on creation deemed creation as experiences that entail a representamen that replaces an event of creation after it vanishes, namely intended omissions and inevitable oblivion, the most important research material, thereby having a possibility of easily distorting the substance of creation.

New creation researches discovered that narrative creation is a play that gives rise to constant reminding between a writer and a reader. A writer is a writer and a reader. A narrative input into the head of the reader (input narrative) extracts the indices pertinent to his/her memory, and they are placed over the storage narrative of the reader through the process of memory mapping. Over this course, anomalies, parts that are not in perfect accord with the storage narrative, occur, and the anomalies that are not easily understood or anticipated by the reader create new indices, which is the moment when a new narrative is created.

An independent reader accepts a narrative in four different forms: "immersive" type of readers who experience catharsis by identifying themselves with the character, "empathic" and "tracing" types of readers who feel compassion or pity for the character of a story based on conscious awareness that the character is just a stranger, and lastly, "introspective" type of readers who objectively understand and judge the character contemplatively without being affected emotionally.

Readers with the four personae observe two extremes, one of which is a classical design that corresponds to the initial situation, complication, climax and conclusion of a story, and the other is a experimental structure that suggests irrationality and meaninglessness of life without evoking emotion of readers.
Most creation, unlike a very few cases, is hard to apply the traditional stage model, which is composed of the processes of data research, writing and revision by the skills of a writer. Victor Hugo's "Les Miserables" that has been popular for more than five decades and cognitive science of the 1980s found that creation is a process of seeking the goal of a writer over a successive circulation of long-term memory, writing process and working environment. Also, a narrative completed through such process is not a new creation that reverts to the single origin of a writer. A motif, which is an element of situations, characters and acts that are repetitive in many different works over a long period of time, is repeated, and each motif creates a completely independent artistic discourse through rhetorical, logical and historical transformations.

2. Digital Storytelling

In the year 330 B.C., Aristotelis said in his book "De Arte Poetica Liber" that a narrative is composed of three acts of beginning, middle and end, and for each stage, a problem occurs in the beginning, and in the middle, the problem grows, and the problem is solved in the end, and such logical model is called problem-based storytelling. This is a structure widely used in Hollywood and is applied to "Tailspin", the very first program for creating stories.
After that time, digital storytelling saw a meaningful progress through variables of characters with Universe, Minstrel and Story Mind, adding various properties and schema related to the goal of a writer, and the internal and external segmentation of a problem, but it still seemed far-off to create profound stories.
To overcome the limitations of the problem-based storytelling, Selmer Bringsjord unveiled a storytelling program, called "BRUTUS", which applied the concept of motif, but that also committed a mistake of overlooking the fact that motifs of small and large transformations take place in a multistoried structure.

3. Creation Tool for Digital Storytelling

A story helper, unlike the existing tools for creation, is a tool for writing, and in part, for extraction. It helps understand the flow of acts where acts of a character and scenes in each part of a scenario are connected by setting Motif Transformation which allows motif change founding a motif, the core of Similarity Analysis subject that measures and provides similarity with the existing scenario in the database modularized through Fast Prototyping, a phase to find a past model that is linked to the idea of a writer with an objective case-based reasoning, a methodology to solve a new problem at present through an

analogy based on the solutions to similar past problems, and also setting structural verbs which show the acts of a main character that bring about changes in status in each of 110 scenes. Moreover, story helper can be used in the order of Structuring Guide, a phase that can improve the structure of each part of a story as a subunit of the law of causality, a bundle of event, emotion and action, to form an episode. Also, story helper continues studies with the aim of creating complex and sophisticated stories by doing researches on more delicate algorithm than case-based reasoning based on the current database.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 3

Parallel Session 1–2
'Post–Human' Mind and Body

Helicopters, Sonograms, Road-kill and Interference: the Recent Poetry of Irish Poets Ciaran Carson and Paul Muldoon

Matthew Campbell (University of York)

–

Emergence of Transhuman and Position of Human in the History of Being

Jong Kwan Lee (Sungkyunkwan University)

–

Posthuman Imagination of Korean Literature: Science Fiction Since 2000

Dae–won Noh (Kongju National University)

–

Umwelt: Ecosystem of Posthuman Distributed Cognition

Mijung Kang (Seoul National University)

Helicopters, Sonograms, Road-kill and Interference: the Recent Poetry of Irish Poets Ciaran Carson and Paul Muldoon

Matthew Campbell
University of York

Abstract

The Irish poets Ciaran Carson and Paul Muldoon have long written about literary territories at the edges of the human. As poets whose first work was published through the 1970s from Northern Ireland, and thus parallel with, though in oblique relation to, the 'Troubles' (1969-1997), they have emerged as poets of elegy drawn to political fear under surveillance. Their work is absorbed in the quotidian, in which subjectivity can be overwhelmed by an immense learning, over which is scattered the given of the technology which supports bur also watches modern life. When such technology impinges on the human – in the medical as well as the political sense, where watching and investigation is both the surveillance of the state and the empirical investigation of the human by the machines of medicine—both poets test the limits of that empiricism, investigating long histories of scepticism. They write poetry filled full of 'stuff' – some everyday, some utterly arcane. When they write about death and disease, as they have been doing in their maturity (both poets are now over sixty), that rubbing of the human subject and the forces arraigned against its knowledge (and indeed survival) create examples of two poetic achievements which rewrite the genres related to elegy for modern poetry in English. This paper will look at a small number of their recent poems about disease and death and relate them to ongoing concerns with technology and the human.

The elegy 'A Hare at Aldergove' was published first in Plan B, Paul Muldoon's 2009 collaboration with Scottish photographer Norman McBeath. It is a signature poem, traversing a number of issues familiar to his readers. Given its airport location it suggests what John Kerrigan has termed one of 'Muldoon's transits', a concept that involves travel, internationalism and various migratory identities. The poem also conveys the turn since the early 1990s to an obliquely politicised naturalism or ecologism, imagining a 'great

/ assembly of hares' migrating in 1963 from the old Belfast airport at Nutt's Corner to the newly-constructed Belfast International airport at Aldergrove. That supplanted assembly is now shown dicing with death near a runway in the middle of the province of Ulster and inevitably evokes a longer-term local colonisation, as well as short-term post-Good-Friday-Agreement assemblies shifting ground 'in the face of what might well have looked like defeat'.

With typical facility, the poem takes a Muldoonian quick dive away from genetics to culture: the poet tells us his own DNA is '87% European and East Asian 13%'. He further refers to his own flight as a 'Newark-bound 757' suggesting on the one hand a naturalised attachment based in the pseudo-science of genetic Celticism and on the other his own inevitably diasporic identity. All of these are played through a migrating assembly of hares. The Muldoonian image-metamorphoses proliferate further – for no other reason than that they both happened in 1963, and possibly suggesting the sort of pre-pubescent fun Muldoon has had with such things in the past, the date of the establishment of Aldergrove as an international airport and the release of Marilyn Monroe's *Something's Got to Give*, with its nude bathing scene, are salaciously run together.

This seems also to be an exercising of the Muldoonian control, playing together various elements which if we can't quite call them post-human, exist at the edges of the human, the animal and the technological, where a humanity tangles with technology, medicine and geography, offering various human and animal migrations. But this cannot remain entirely under control. If there has always been a danger that Muldoon's facility can be tempted into the facile, the reader has come to expect his usual corrective shocks. The associative shape-shifting can take on the indiscriminate quality of the unwanted, both in the organic and in the cultural and historic. Thus this big 26-line sentence from the poet looking at the hare, presumably from the window of his transatlantic (or transnational?) airplane:

> Clapper-lugged, cleft-lipped, he looks for all the world
> as if he might never again put up his mitts
> despite the fact that he shares a Y chromosome
> with Niall of the Nine Hostages,
> never again allow his Om
> to widen and deepen by such easy stages,
> never relaunch his campaign as melanoma has relaunched its campaign
> on a friend I once dated,
> her pain rising above the collective pain
> with which we've been inundated
> as this one or that has launched an attack
> to the slogan of 'Brits Out' or ' Not an Inch'
> or a dull ack-ack
> starting up in the vicinity of Ballynahinch,
> looking for all the world as if he might never again get into a fluster
> over his own entrails
> never again meet luster with luster

in the eye of my dying friend, never establish what ails
another woman with a flesh wound
found limping where a hare has only just been shot, never again bewitch
the milk in the churn, never swoon as we swooned
when Marilyn's white halter-dress blew up in The Seven Year Itch,
in a flap now only as to whether
we should continue to tough it out till
something better comes along or settle for this salad of blaeberry and heather
and a hint of common tormentil.

(*from* 'A Hare at Aldergrove', *Plan B*, 2009)

There are many extraordinary things in this vast sentence, not the least of which is the sustaining of a fairly rare thing for Muldoon, rime riche, across the entire 52 lines of the poem of 4 sentences. (From the end here: tormentil / till, heather / weather, itch / bewitch, swooned / wound' etc.). But such virtuosity aside, the odd thing around which this last sentence turns is that syllable, possibly a word, 'Om'. In Hinduism the Sanskrit syllable or sound, 'Om' or 'Aum', was the first and original vibration of sound. 'Om', is the sound, but not the sense, of meditation and prayer. To borrow a term used by Seamus Heaney, it is a 'vocable', a syllable before it is a word. If the hare is allowed to sound the syllable, the widening and deepening of the path of meditation may be refused given his precarious location as planes fly by, catching wildlife up in 'wheeled blades', scattering the victims of inaccurate blood sports or even the Fenian story of the changeling hare-woman wounded in the hunt. Marilyn returns, *The Seven Year Itch*, rhyming with 'witch' and in close proximity to hares and stolen milk, perhaps away with the fairies or the beasts or whoever. (In the Fenian cycle of Irish myth, there is a tale of Oisin hunting a hare he has wounded. He tracks it to a door and through a great hall, where he finds a beautiful woman tending her bleeding leg.)

The syllable 'Om' is also placed in a rhyming position, first appearing to provide full rhyme for all this submerged play with the pathology of the word 'chromosome', in which the syllable actually appears twice. This is the Muldoon facility, extravagant and fanciful, giving serendipitous welcome to the chances of rhyme. But it is as if the syllable 'Om' is allowed to work a sorcery on the language of the poem: after 'chromosome', the next occurrence is hidden, and sets off a chain of assonantal rhyme and sight rhyme in associations which might be slightly less welcome. 'Om' appears in the middle of the word 'melanoma'. It occurs four times later in this vast sentence, most notably in the words 'woman' and 'common'. It can be heard sounding through the final phrase 'common tormentil', where the reference is both to the sort of common Ulster wild flower which might grow round an airport built on heathland, the potentilla or common tormentil (the English derivation is from 'torment'; its herbal use is to cure the gripes, according to the OED; the Irish word for the flower is 'néalfartach'; néal: depression; fartach: hurt or injury). The common torment is something akin to the 'collective pain' over which only the pain of the cancer-stricken ex-lover will rise; that is, hers will be worse than the collective pain.

'A Hare at Aldergrove' touches down in the place that a number of Muldoon elegies have landed in the last two decades, most recently the turkey buzzards in the 2006 poem of the same name, which tear at

the entrails of road-kill like the cancer which afflicts his sister. The cancer-stricken subject of another poem for a dead lover, the 1994 elegy 'Incantata', is forbidden both aesthetic and religious solutions, given her own useless Thomist resignation and the equally useless ecology of the herbal remedies she insisted on. But given the inability to abandon ever-elaborate aesthetic structures, an ethical issue remains for Muldoon, where consolations are rejected. Along with the Thomist and the Hindu, these include the stoic, dismissed in 'Turkey Buzzards' as

> Marcus Aurelius humbug
>
> about what springs
>
> from earth succumbing to the tug
>
> of its heartstrings,
>
> ('Turkey Buzzards', 2006)

Heartstrings are also animal innards, torn from road-kill by carrion, and also, the poem goes on to say, 'whatever tears / at your vitals', both the capacity for sympathy and the pain of cancer. 'Om', like stoicism (or the ecologist passive acceptance of 'what springs / from earth') is dismissed as 'humbug'. The dividing and replicating cancer cell is an organic form. In the best essay written on the challenge to the consoling patterns of elegy in Muldoon's cancer poetry, Iain Twiddy says, with respect to the stanza forms of 'Incantata', that Muldoon's forms are monstrous mimics of dying organic structures. The cell replicates, as life and as that which deals death.

So what do we do with this monstrosity, played as it is through the poet's bestiary, where not only animal, but human suffering, is viewed as road-kill or even car crash? (Muldoon's 'Wayside Shrines' sequence from 2010 follows a series of car crashes, the elegist-poet like an angel of death happening late on the traffic accidents as well as the bedside of the cancer-victim.) What do we do when the machine as much as the animal cavort with human suffering in such destructive ways? In many ways, the ethical dilemma of an elegy which refuses consolation may be at odds with Muldoon's increasingly direct condemnation of human atrocity—not just the memory of war which might not have gone away in 'A Hare at Aldergrove', but also his positioning against 'the war on terror', and the global politics of the neo-conservatism of his adopted country, the USA: the title poem of the Plan B collection features waterboarding and the electric chair; the next poem is called 'Extreme Rendition': all this from a poet who has his daughter's Latin class declining '*Guantánamo, amas, amat*' ('Hedge School' in Horse *Latitudes*, 2006). That might be fun of a sort, though the joke is a guilty if not monstrous one.

Staring in the face of the cancer-sufferer, and knowing you will 'never again meet luster with luster in the face of a dying friend' may be a giving up on the unifying and healing consolations of symbolism, as in Walter Benjamin's notion of the priority of allegory over symbolism when looking into the face of the dying or the dead:

> Whereas in the symbol destruction is idealized and the transfigured face of nature is fleetingly revealed in the light of redemption, in allegory the observer is confronted with the *facies hippocratica* of history as a petrified, primordial landscape. Everything about history that, from the very beginning, has been untimely, sorrowful, unsuccessful, is expressed in a face—or rather in a death's head. And

> though such a thing lacks all 'symbolic' freedom of expression, all classical proportion, all humanity—nevertheless, this is the form in which man's subjection to nature is most obvious and it significantly gives rise not only to the enigmatic question of the nature of human existence as such, but also of the biographical historicity of the individual.
>
> (Walter Benjamin, 'Allegory and Trauerspiel', *On the Origins of German Tragic Drama*, 1928)

I think I want to go on to say that neither Muldoon nor his contemporary Ciaran Carson fully give in to that Benjaminian 'petrified, primordial landscape' and slippery though the concept might be in the work of these slippery poets, much of the effect –indeed affect—of their recent writing about suffering is dependent on at least a sympathetic fiction of 'the biographical historicity of the individual'. Both poets are also aware of a human intimacy with the machine – as death-dealer but also as medical friend, on the one hand as the bringer of knowledge of the dangers which afflict the human organism and on the other as an ally of those political powers whose surveillance may not be as benign as that of the doctor. This is an ethical problem about elegy which is also an aesthetic one – such as offered by Benjamin, who for one would not have wanted to separate out the ethical and the aesthetic, to say nothing of the historical and the political. Given the recent intervention of the machine into this genre, the human or even the post-human is intimate with these matters of human tissue and its destruction or healing.

To take two examples from these poets of human surveillance and the machine. The first is Paul Muldoon's 1994 poem 'Sonogram', through which the poet is shown the foetus of his soon-to-be daughter:

> The Sonogram
>
> Only a few weeks ago, the sonogram of Jean's womb
> resembled nothing so much
> as a satellite map of Ireland:
>
> now the image
> is so well-defined we can make out not only a hand
> but a thumb;
>
> on the road to Spiddal, a woman hitching a ride;
> a gladiator in his net, passing judgement on the crowd.

This has become a much-loved poem about parenthood, and Muldoon can be a moving reporter back from its wonders. But the poem does deal quite directly with the technological transformation of the human process of pregnancy as it passes through the machinery of the medical profession. The satellite view, is a relatively new experience for humans, and offers its view from a great height. The sonogram sketch of the map of Ireland is fun, I suppose. But the child's thumb, and that of the gladiator at the end, give an ominous conclusion to a poem which should be full of hope, for all that the netted gladiator of the foetus swaps both observing and judging position with the bloodthirsty crowd.

For the view from the sonogram-turned-satellite, we might think about that from a helicopter, the sort of machine used by the British army to survey a violent population, rioting in Belfast in the 1970s, or in Paris in 1968. So my second example is one of two poems called 'Revolution' in Ciaran Carson's 2008 narrative

poem *For All We Know*:

> Revolution
>
> Then I would try to separate the grain from the chaff of
> helicopter noise as it hovered above on my house.
>
> This was back in the late Sixties. I didn't know you then.
> Later I'd picture you in an apartment in Paris.
>
> You'd be watching riot police and students on TV,
> banners and barbed wire unfurling across the boulevards
>
> And the air thick with stones. The helicopters came later
> within earshot grinding the sound bites into vocables.
>
> I felt I had a malfunctioning cochlear implant,
> that someone I didn't know was watching me from on high.
>
> The picture would break up into unreadable pixels.
> I'd imagine putting my lips to the door of your ear
>
> as I held the conch you brought back from Ithaca to mine,
> listening to shells becoming shingle, and shingle sand.

Carson has long been a poet of the helicopter – as here in his prose poem 'Intelligence' from his classic 1989 collection *Belfast Confetti*:

> We are all being watched through peep-holes, one-way mirrors, security cameras, talked about on walkie-talkies, car phones, Pye Pocketphones; and as this helicopter chainsaws overhead I pull back the curtains down here in the terraces to watch its pencil-beam of light flick through the card-index – I see the moon and the moon sees me, this 30,000,000 candle power gimbal-mounted Nitesun by which the operator can observe undetected with his infra-red goggles and an IR filter on the light-source. Everyone is watching someone, everyone wants to know what's coming next….We track shadows, echoes, scents, prints; and in the interface the information is decoded, coded back again and stored in bits and bytes and indirect addressing: but the glitches and gremlins and bugs keep fouling-up, seething out from the hardware, the dense entangled circuitry of backstreets, backplanes, while the tape is spooling and drooling over alphanumeric strings and random-riot situations; it seems the real-time clock is ticking away in the memory-dump, so look, let's get the relocating loader, since contrary to expectations water-cannon proved only marginally successful; few rioters seemed unduly convinced by a heavy soaking, especially in summer;…
>
> (From Carson, 'Intelligence', *Belfast Confetti,* 1989)

This is a vision of the watching CCTV and computer and all of the strange, branded argot of the geek-operator going wrong just as it attempts to track down the enemies of peaceful streets, the language of the

riotous modern city and the machine-management of civil unrest. This might have been trialled in Belfast, but is still subject to glitches and gremlins of its failure in Bagdad, Cairo, London and Ferguson. This might be ripe for the analysis of Michel Foucault, except Carson goes on to give us a long passage from Bentham on the Panopticon, an earlier, utterly unrealisable tool of the myth of utter surveillance.

In the first 'Revolution' poem, Carson fixes us in the spinning of the helicopter blade. There are two poems by that title and in the second revolution, or turning round, the second poem also features security cameras and a helicopter. The two mirrored sections of the whole volume are in their way revolving the mysterious spy narrative of the poem, between liberated Paris, the fall of the Berlin wall and the outbreak of the Troubles in Northern Ireland. The book as a whole, published after the 'peace' in Northern Ireland has about it an uncertain ceasefire theme. Its narrative ends with a car crash. So, the revolutions are about the managing of 'revolution', the defeat of the rioters of Paris 1968, the transmuting of the Northern Irish civil rights movement into a long period in which violence engendered itself with infinite repetitions, and all to the soundtrack of the helicopter overhead. If helicopters grind sound-bites on to 'vocables', those are punned as 'bit and bytes' in 'Intelligence', computer words, the vocable turned to a computer, or virtual reality which never quite works: 'glitches and gremlins and bugs … the tape is spooling and drooling over alphanumeric strings and random-riot situations'. 'Vocable' was a word used by Seamus Heaney early in his writing about the troubles, a unit of pronounceable sound as much as sense, 'My hope', he wrote in 1972, 'is that the poems will be vocables adequate to my whole experience.' ('Belfast', 1972 and in Preoccupations). In Heaney the word functions in a noble apology for poetry in the face of atrocity. In Carson's re-use of it, it is a grinding mechanical sound, and leads him on to the technological invasion of the body by interference, both by ear – 'cochlear implants'—and in the data before vision—'The picture would break up into unreadable pixels'.

This is as much about interference as invasion, a confusion which is visited upon the human and will be familiar to readers of the 'postmodern' as much as the 'post-human'. But this writing is neither of those contemporary prescriptions. In both Muldoon and Carson, the touchability of the human by fear and loss stands in some way against the dissolution of death. These are not life lessons in the face of technological overload – though we must remember Muldoon's repudiation of the consolations of stoicism, all that 'Marcus Aurelius humbug'.

So, to finish briefly with Carson's two recent sequences about family illness and elegy. *On the Night Watch* (2009) and *Until Before After* (2010) both engage in experiences of family suffering and bereavement from a position which is sometimes sufferer, sometimes elegist. Death hovers over every lyric as a sort of imageless abstraction, and is an affront to the poet of things and objects that Carson has long been (even if shape and time in his poetry are always matched with a scepticism over what can be known and what can be said). But it is also the content of the kind of elaborate formal structures in Carson's contemporary Muldoon.

These two volumes seem to deal with more personal matters, unavoidably asking to be read together as a plot, the main characters of which may be the poet's family: family funerals, a dying father, a mother suffering forgetfulness and dementia, the illness and recovery of a musician partner. Until Before After is constructed in 3 sections each split into 17 groups of 3 lyrics. The last section has the loved one returning from hospital, being brought up the seventeen steps of the stairs of the family home. In what might be an arbitrary mathematical framework, the calculus, abacus, calculation (all words which appear in the sequence)

of human risk also look like a framework which structures healing and continuation. Of course it might not be risk at all: in Muldoon's terms, the need for meditative calm, 'om', resides in the genetic determinant, the 'chromosome'. This is the sort of thing Muldoon reserves for his own family poems in which genetic codes of continuance match the destructive potential of the illness which may lurk in those same genetic codes.

So, to take an early dip into the 153 poems along with the 70 sonnet-length poems of On the Night Watch, we can see that Carson allows himself an indulgence in wish-fulfilment matched with terror when he raises these issues, of predetermination, disease and the inevitable. It is preoccupied with watching, with surveillance, and with the fear of what the doctor's investigation might show:

On Looking Through

a speculum
at what

we fear to name
considering

the hereafter
of division

subdivisions
mortally bereft

as all change
must for life

we close our eyes
for fear

of seeing
the immortal cell
(Ciaran Carson, *On the Night Watch*, 2009)

Cancer is biologically an immortal cell, which will continue to replicate until the animal host dies. But of course, peering through a speculum into the body might suggest another immortal thing, the feared location of the soul, and its exchange of the mortal for unwished for versions of immortality, as in hell (*On the Night Watch* remembers its author's childhood Catholicism and has at least two sections set in the confessional).

The immortal cell returns in the most recent sequence.

They said

it was a shadow
quite of what

they did not know
as yet but might

for all they knew
have been there

all along before
whatever turn you
took took you
into what had been

unlooked for until
then so then

they took a knife
to it and took it out

This is terrifying experience played through the capacities of language and art to represent it. 'You' is not the poet, but possibly a close family member. Here the art is the sonnet and an at least fourfold play on the word 'turn': as a diversion or change of direction; a sudden illness or incapacity; in Irish music, the second part of the jig or reel; the volta or turn of the sonnet. The poems on the odd-numbered pages, like the 70 poems in the previous volume, have sonnet shape, like this one. They are not afraid to court the monstrosity of massive numerological structure and the facility of rhyme and verbal mood: 'took' runs from passive into active, across the internal rhyme on 'unlooked for' and out to the double active mood: 'they took a knife / to it and took it out'.

So the turn shows this way, as music, in these linked lyrics, where the little word 'it' –part-pronoun, part-unmentionable, part abstract syllable 'it', always vocable—starts off as an Irish traditional tune played by the musician poet, and then seems to become the life-force itself:

Five bars

in it takes
a turn into
a darker cadence
that alters how it

began so blithely
before it stumbled

on this scythe in
a field we knew

after all had been
there for all time

What is it

is it the it in
electricity

the pulses of

the oscilloscope

monitoring
the heartbeat

as in a spell of
hours

leaving
an after-image

brief as
of

a lightning-flash
switched off

Like 'Om' in Muldoon's poem, 'it' becomes abstract sound and an intense concentration of meaning, the life force as something mon-it-ored, measured and charged, until its final extinguishing in that ghastly phrase in which it is still contained: just when we think that lightning might expand the it that is contained, 'switched off' makes it return. The 'it' is also the surveillance of the body, like all of those poems of civil surveillance that Carson has been writing for decades, through the Troubles and after. His omnipresent helicopter, sometimes a curse of insomnia, reappears a number of times in these poems. Except here, sleeplessness is partly nursing and the surveillance of speculum or oscilloscope which might reveal things we need to know – even if we don't want to.

In the Book of Nod

is written
that two ones

were in league
with one another

cleaving each
to each in the bed

of their language
before they split

cursing each other
incommunicably

So is

the brain two
hemispheres

what's in between
I cannot fit

which thought
behind to which

before like beads
upon an abacus

dismantled from
their bearings

an incalculable
scattering

of aftermath
before me

That play with aftermath and before, a confounding of time and space is an orientation to a future calculated and incalculable, chance and 'mutability' forged into some sort of mathematical structure. The structure is observed and statistical perhaps, although the probabilities are mysteriously hidden in the future, or aftermath. The poem has to hover always around the unsayable, which is both Benjamin's 'form in which man's subjection to nature is most obvious' and an actuality in rhyme and experience, in mathematical form and biomedical content.

At death's door

is but
a frame

of words and not
the thing

itself if thing
it be

and if
so whatsoever

utters it
until it

swings to
has not yet

gone into beyond
the words

(Ciaran Carson, Until, *Before, After*, 2010)

We remember Wallace Stevens' 'Ordinary evening in New Hampshire', that 'The poem is the cry of its occasion / Part of the res itself and not about it / The poet speaks the poem as it is // Not as it was, part of the reverberation / Of a windy night...' At the end of the sequence, Carson celebrates the duet, the joint performance of musicians in time as it seems to emerge into the healing of the shared, where elegy becomes a love poem, a family poem. It may be more even than vocable, 'beyond / the words'. But this is also like a continuity of culture before death and the machine, a continuity of dialogue expanding from duet to polyphony in the Irish family poem.

Emergence of Transhuman and Position of Human in the History of Being

Jong Kwan Lee
Sungkyunkwan University

1. Introduction

Contemporary technologies are the apogee of modern technological development and are expected to become the future capital of humanity. All nations on earth are attempting to advance them successfully. But ironically, the closer humanity approaches to the age of extremely rapid technological advancement, the clearer it becomes that humanity faces the danger of expulsion from the future. Since the end of the 20th century it has been prophesied that transhumanity might come into being in the near future. Invented by sophisticated technologies and based on material substrates other than flesh, the transhuman is a human-like, but technologically augmented being which would exceed the ordinary human being in all aspects of performance.

It is well-known that such a prediction is a favorite theme of Hollywood SF films, but just by reflecting on the rapid development of cutting edge technologies, we already have enough reason to speak of the emergence of the transhuman. If recent advances in nanotechnology, biotechnology, information technology, and cognitive science successfully converge, then the birth of the transhuman is inevitable. As a matter of fact the transhumanistic longing for the emergence of transhumanity is closely related to the so-called converging NBIC technologies. The year 2002 should be recorded as the significant departure point when the cooperation between transhumanism and NBIC technologies was officially launched and

approved. In that year the report *"Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Technology and Cognitive Science"* was published by the US National Science Foundation. Since then transhumanism has dominated the future vision of the world. The first field affected by this transhumanistic vision of the future is that of an economy driven by businesses depending on cutting edge technologies. The work of Ray Kurzweil is especially instructive in this respect. Kurzweil is a well-known cognitive scientist who has been involved in the development of AI since 1960. In his 2005 book *"The Singularity Is Near"* Kurzweil dared to predict that the age of humanity must be eclipsed by the emergence of transhumanity just as the age of the anthropoid was eclipsed by the emergence of humanity.[1)] Kurzweil now acts as the president of Singularity University (sponsored by, among others, Google) and at the same time working as the CTO of the company. The CEO of Google, Eric Schmidt declared, when he visited Japan in 2010, that Google strives to bring augmented humanity into being by means of cutting edge technologies, which are growing at an exponential speed. Amongst such technologies the converging technology between IT and BT – i.e. Artificial Life Technology – deserves special attention in that it plays the role of the critical technological and theoretical basis upon which the transhumanistic vision of the future rests.

Encouraged by ALT, in the first Humanities Forum organized by UNESCO in 2011, one transhumanist from Singularity University predicts the future of human beings thus:

"*Homo sapiens* is the first species in our planet which is conscious of its own evolution and limitations, and humans will eventually transcend these constraints to become enhanced humans, transhumans and posthumans. It might be a rapid process like caterpillars becoming butterflies, as opposed to the slow evolutionary passage from apes to humans. Future intelligent life forms might not even resemble human beings at all, and carbon-based organisms will mix with a plethora of other organisms. These posthumans will depend not only on carbon-based systems but also on silicon and other "platforms" which might be more convenient for different environments, like traveling in outer space." (The Boundaries of the Human: From Humanism to Transhumanism, José Cordeiro, the 1st World Humanities Forum Proceedings, 396)

2. What is AL

Since the end of the 20th century failures in the field of AI led to an attempt to shift the paradigm of such research from a rationalistic to a bottom up approach. During this paradigm shift, the achievements of bio-engineering were accepted and translated into computer language, which led to the attempt to design an evolutionary development of life by means of computer simulation. This gave rise to Artificial Life.

The points of departure to the design of AL were the following characteristics of life maintained by the established positive biology.

1. Growth 2. Population 3. Self sustaining 4. Self control 5.adaptation to environment

These characteristics are translated into the language of biology combined with informatics

1. Life has the ability to evolve 2. Life is a complex of information controlling the form and the function of life, information which is transmitted and then replicated. 3. Life is self organising.

AL has succeeded in modelling these characteristics of life into a Cellular Automaton, the basic idea of which is formulated as follows.

> "A cellular automaton is a discrete dynamical system. Each point in a regular spatial lattice, called a cell, can have any one of a finite number of states. The states in the cells of a lattice are updated according to a local rule. That is, the state of the cell at a given time depends only on its own state one time step previously, and the states of its nearby neighbors at the previous time step. All cells in the lattice are updated synchronously. The state of the lattice advances in discrete time steps."(Richard Cochinos, Introduction to the Theory of Cellular Automata and One-Dimensional Traffic Simulation, http:// theory.org/complexity/traffic)

> "In this way the grid of cells goes through one generation after another, in a succession of states that (on a computer) can easily stretch to hundreds of thousands of generation. Extremely complex patterns build up, emerging spontaneously from the interactions between cells. Programmed into a computer and displayed on the screen, CAs gives uncanny impression of being alive."(N. Catherine Hayles, 1999, 240)

From the fact that the CA can simulate the process of evolution described by mainstream biology, AL theorists dare to assert that the essential principle of evolution can be optimally implemented by being converted into digital form with a material basis of silicon.

3. Philosophical Implications of AL

The CA implementing the "life" phenomenon in this manner has triggered an unprecedented intellectual innovation in theoretical biology and related areas. What current biology has determined as the essential characteristics of life as we know it, is able to be implemented on the basis of another physical medium or material. Seen only from the viewpoint of physics, life as we know it is carbon based protein life. But the CA demonstrates that the carbon based protein life is not the only possible form of life, and that the

characteristics of life can be better realized in silicon rather than carbon. This means that the very essence of life is not the material of which that life is composed, but the principles which enable its evolution. And the principles of life's evolution can be implemented far more efficiently, rapidly, and less defectively if it is based on silicon than on carbon. In other words: in carbon based evolution there are some cases in which the principles of evolution are so hindered that the process of life is disturbed and delayed, whereas in silicon-based digital evolution the principles of evolution are implemented optimally, efficiently and much more rapidly. According to the AL practitioner this relation between carbon based life and silicon based life can be compared to the relation between crystal and carbon based protein life. Crystal showed elementary traits of life in that unlike other purely physical bodies it happens to grow. "Before protein replication developed, a primitive form of life existed in certain crystal that has ability to replicate. But protein replication was so far superior that it soon left the replicating crystals in dust."(N. Katherine Hayles, 235). Since carbon based protein life came into being, the principle of evolution has been implemented better.

So if carbon based protein life should deserve the status of being more genuinely life than crystal because the latter shows noticeably inferior evolutionary ability, then silicon based life which shows better ability to evolve than carbon based life should deserve the status of being more genuinely life. From this point of view, the history of evolution seems to the transhumanist to have evolved from crystal life through carbon based life like us into silicon based life. For this reason the renowned cognitive scientist and transhumanist", Moravec asserts "that the age of carbon based life is drawing to close. Human are about to be replaced by intelligent machines as the dominant life-form on the planet."

And here emerges the new idea which overthrows conventional metaphysics. Digital life is not virtual life merely simulating real life in a computer, but this seemingly virtual life is rather real life living the principle of life in a far more optimal manner than we do.

So the life is then classified into two categories. One is "life as we know it", the other is "life as it could be". "Life as we know it" can be called 'wet life' in that it requires water and flesh, whereas "life as it could be" can be called 'dry life' in that it is based on silicon and has no need of water. This indicates that evolution is now entering another stage. Evolution up until now has been within the circle of wet life, whereas evolution from now on is the evolution from wet life toward dry life. The history of Being seems to succeed the principle of life from wet life to dry life. And if the evolution from wet life to dry life is successfully completed, then the evolution of dry life will begin, which means that the capacity of evolution to evolve will be augmented to a degree incomparable to that of wet life, and which will lead to the birth of the transhuman whose capacity is also augmented to an incomparable degree when compared to current human beings.

Here humanity faces an existential agony; whether it should retreat from the arena of evolutionary history, acknowledging the emergence of digital life as the emergence of genuine life because it realises the principle of life in a more genuine manner. Should we human beings welcome the emergence of a real, genuine life? It appears certain that it is an ethical duty for the less genuine being to make way for the more genuine being. So are we human beings not obliged to drive the NBIC technology at an exponentially advancing speed in order for AL to eventually transcend humanity?

4. Ontology of Life

Regrettably, however, this line of argument presupposes a premise in this future vision of transhumanism that requires fundamental examination. It is the premise that the human being belongs in the same category as life does, sharing the same mode of being with life. Life being said to have developed into the higher level of living being called human being through the process of evolution.

This fundamental question was raised by Martin Heidegger. However, unfortunately for us, Heidegger died before the technology of artificial life was developed. Nevertheless, through his ontological reflection on life he provided us with the opportunity to examine problems arising from the development of AL.

Heidegger's discussion of life concentrates on clarifying the ontologically different mode of being of the human being from that of life. The discussion is carried out through two steps: 1) Distinguishing the mode of being of animal life from the mode of being of physical bodies and then of tools; and 2) from the result of first step, then clarifying the distinct mode of being human from that of life, which leads to destructing the understanding of the human being as the one species of life which has emerged as the product of evolution.

Needless to say, Heidegger said little more than a few words about life in *Sein und Zeit,* the work which won him philosophical renown. But with these few words he pioneered the way in which to reflect on the problem of life in relation to the problem of world. In fact, three years after publishing *Sein und Zeit*, he discussed the problem of life with considerable intensity in his *Introduction to the Fundamental Problems of Metaphysics*. The uniqueness of Heidegger's ontological reflection on life lies in the fact that it dissolves the established framework for discussing the problem of life, namely, the confrontation between vitalism and mechanism. Instead he approaches the problem of life by way of distinguishing modes of being; the way of phenomenological reflection paved by the publication of *Sein und Zeit*. So in his *Fundamental Problems* he endeavors to reveal life in its unique mode of being just as life. Already in *Sein und Zeit* he had stressed that the starting point for discussing the problem of life must be the attempt to overcome the metaphysical error of confusing the mode of being of life with another ontological mode or of reducing life to the other ontological mode. (Heidegger, SuZ 50)

Here Heidegger strongly indicates that the mode of being of life is distinct from that of the present at hand as well as from that of human being. And three years later he began to discuss the unique mode of being of life in detail as follows.

How is the mode of being of life distinguished from the mode of being of present at hand. What is the present at hand? As is well known, it is the mode of being of the physical body extended in 3 dimensional space, to put it in the words of Descartes. How is the mode of being of the physical body distinguished from that of life? The ontological difference between them will be exposed to some degree if we compare the mode of being of a rock upon the earth to the mode of being of a lizard upon the rock. This comparison shows that the mode of touching between the rock and the earth is radically different from the mode of touching between the rock and the lizard sticking to it. The rock does not need to and is not able to move in order to be located on that position of the earth, whereas the lizard is not able to be located on the rock without its behavior. The rock is moved from one position to another only if an external force is exerted on it, and remains stopped in that position forever if no external force is imposed on it. In this sense the mode of being of rock is governed by the mechanistic rules, namely, by the law of causation. Moreover, the location of the rock is arbitrary to the existence of the rock. On the contrary, the lizard is not able to be located anywhere, but to survive only in a certain particular environment. Outside of this environment the lizard is able to be located in space only in the mode of being characteristic of dead physical bodies, and not that of living beings. So the "being located" of the lizard in that position is not arbitrary, but essential to its being as a living being. In the case that the lizard sticks to the rock that is warmed by sunlight, it has come to the rock by itself. The lizard is sticking to the rock in its own way of sticking to the rock, which is the way only possible to a lizard as a living being. In contrast, in order for physical body to stick to the rock, there is required some other measure than itself, e.g. the chemical bond.

Furthermore, by comparing the movement of physical bodies with that of living things, their different modes of being will be clearer. The movement of physical bodies is only possible through an external cause according to the principle of mechanism, i.e. causality, whereas that of life is possible through drives. In the case of movement of physical body, it is moved due to an external force, whereas in the case of the movement of the living being it is self-moved in order to preserve itself. Chased by a predator, the living being moves away from the position where it has been. But even in this case life comes to itself, sustaining its life. For example, in the case that an earthworm moves to get away from a mole, the earthworm is not pushed away from its current position by the physical force radiated from the mole, which would be the case were it a Newtonian physical body. To the earthworm the mole is a signal threatening the life of the earthworm, such that the earthworm is driven by its instinct of self preservation to move away from the mole. By engaging in this behavior, the earthworm comes to a position where it

can sustain its being. (M. Heidegger 1983, 347).

In this way the mode of being of living things is radically different from that of physical bodies at least in terms of mode of location and movement. Thus, in order to reveal the mode of being of life, we require a completely different language from a scientific language composed of the principle of causation and related categories.

Needless to say, in the history of science, there has been another type of biology which has approached the phenomenon of life from a different perspective than the physical-mechanistic: this is the theory of organism. However, Heidegger also detects a critical error in this theory. It is pervaded by an ontological prejudice which understands life as the unity of tools or functions. The theory of organism defines life in terms of "organ" which originally means "tool". But we may wonder whether the function which is implemented by tools is the same as the function which is implemented by the organs of living beings? Have living eyes and glass identical modes of being in that both are tools for seeing? Is the eye a tool for seeing, the leg for walking, the ear for listening, such that the behavior of living things must be understood as the mode of tool functioning?

Let's take a look at the concept of a "tool". A tool requires a user. A tool unproblematically fulfils its function as a tool even if it is separated from its original user, and is used by another user who is familiar with it's mode of employment and it's function in connction with other tools. On the contrary, the organ of a living being cannot function if it is separated from that living being. Unlike a tool it is not used by another user. A tool can be used for a certain purpose, but cannot use itself by itself, whereas the organ of living being is the activities of the living being itself in terms of role and function. So it is impossible and meaningless for the function of the organ to be separated from the living being. Furthermore, in the case of the living being the ability to see and to move is prior, and not the organ that implements these abilities. As Heidegger says, it is thanks to the ability to see and to hear that the living being can see and hear, and not on account of having eyes and ears. (M. Heidegger, 1983, 332) The representative example which Heidegger introduces is the protoplasm. In the case of protoplasm it is not determined beforehand which organ is to perform which specified function, but the organization of abilities into specific organs varies with changing circumstances.

In this way Heidegger clarifies that the mode of being of living beings should not be confused with other modes of being. This is of course a relatively modest investigation that only distinguishes the mode of being of the living being from the modes of physical things or of tools. But from this relatively modest investigation we clarify the way in which the original mode of being of living being as living being is revealed. It illuminates the mode of being of the living being especially with regard to the relation of the

living being to its world. To a living being the world in which it lives is built like an enclosed circuit in which the inhibition and disinhibition of its drives and the transfer of one drive to another circulate. Because it is captured in this circuit, the living being behaves only in the ways which the circuit makes possible.

In order to exemplify the unique mode of relation of the living being to the world in which it lives, Heidegger introduces an experiment conducted by Uexkuehl. It is an experiment in which we observe the behavior of a bee placed before a bowl with plenty of honey but with its abdomen cut away. According to the experimental report, the bee does not stop sucking honey, even in the case that the honey leaks out continually from the abdomen. Why is this? The bee cannot be aware of the fact that the current amount of honey is less than it just was, because it is driven to this behavior for the sake of satiation. Here is noticed the fact that the bee does not relate itself to the honey by identifying the honey as honey, or by being aware of its quantity. Heidegger says, "This shows conclusively that the bee by no means recognizes the presence of too much honey."

The unique mode of being of living being could be more clearly illustrated, if we observe the behavior of a mother hen. In the case of a chick facing danger and crying loudly, the mother hen comes to aid it immediately and behaves aggressively, even in the case that there is no visible enemy. However, in cases where the chick is placed in a bottle where its cries are muffled, even if it cries because it is near to death from suffocation, the mother hen takes no action even in the case that she observes its distressed behavior. Such behavior demonstrates that the world in which the mother hen and the chick are related and exist to each other, is not a visual space. They are captivated in the environment as accessed acoustically. In this environment the mother hen and chick behave as chickens do when driven by the necessity of survival. The living being behaves in reacting to the acoustic, visual, tactual signals, reacting to the signals only in the case of disinhibition or inhibition of the drives necessary for its survival. Otherwise the living being never reacts to the signals as though they were nothing. (Heidegger 1983, 370)

The case of mountain goats living on the steep and rough cliffs of the Terra canyon on the Balkan Peninsula demonstrates the mode of being of living beings as captivated in their environment clearer. Climbing up and down the cliff, the goats seek food, taking rest between the steep rocks of the cliff. The goats live there through a kind of acrobatics which would be impossible for human beings to mimic. But this is a very dangerous environment. According to statistics the probability of death due to a fall is higher than the probability of death due to predation. Nevertheless, the mountain goats never leave the cliff for some other, safer environment, and take no measures to avoid or reduce the risk. The mountain goats run a risk in what is a very risky place. Why is this? It's because to the goat the cliff is not a

dangerous place. Rather it is the original and optimal environment in which the goat lives optimally as a member of its species. The risk of falling is one original mode of being of survival of the goat as a goat. In this respect its mode of living by cliff climbing is fundamentally different from that of the human being who happens to be cliff climbing. In seeking a dangerous cliff, the cliff climber decides to climb the cliff in order to run the risk of a fall and to overcome that risk. Sometimes climbers fall with fatal consequences, but to the goat, the fall from the cliff which is a fatal accident for a human being is not an unfortunate accident, but the normal mode of living. The goats do not live there by decision. They do not live there after noticing that the cliff is dangerous and deciding it would make a good home. The goat is captivated in its environment.

From these cases the original mode of being of the living being is revealed as follows: in the mode of being of the living being, the world in which the living being lives is characterized by encirclement. The behavior of living being occurs by allowing itself be encircled by the environment. So according to Heidegger it is impossible to separate the living being from its environment. (Heidegger 1983, 292)

This demonstrates that the objective world which is identical to all living beings makes no sense in the relation of the living being to the world. The world is not so objective as to encompass all kind of living beings as though it were one infinitely extended space, which each living being occupies one part of it as its environment. As Uekkuehl once described, the world of living beings as a whole looks rather like a cluster of soap bubbles in that each living being is encircled by its own chain of drives enabling its survival, and is so driven to behave in its encircled world. But this bubble metaphor should be understood quite carefully, because the relation of the living being to its own environment is not literal containment. The fact that the living being lives means that in the process of surviving the living being is ceaselessly encircling itself by the chain of drives enabling its survival which is a kind of struggle for the sustaining of its own environment in which it lives. So Heidegger called this ability of living being to encircle itself "the very fundamental ability, in which all other abilities of animal are engaged and from which they are enveloped."(Heidegger 1983, 401-2)

5. AL and ek-sistential being of Human

What does Heidegger's reflection on the living being mean for the transhumanist who predicts the exponential increase of digital evolution toward the highly developed digital living being, in short, the transhuman?

As we have seen above, transhumanism is based on the CA modelling AL. From the fact that the CA can simulate the process of evolution, AL practitioners assert that the essential principle of evolution can be optimally implemented by being converted into a digital format on a silicon material substrate. But the transhumanists are also fascinated by the fact that the evolution digitally materialized on silicon implements the principle of evolution perfectly and rapidly without any unnecessary time delay due to physical obstacles. And it is for this reason that they go so far as to assert that the silicon based evolution is the authentic evolution. This leads to the ambitious project of developing AL not as a 2D image displayed on a computer screen, but as a real, material, 3-dimensional living being by means of nano technology. In fact, the project to bring to being AL as real living beings in the real world, and not as a simulated image in the virtual world, has been recently launched. It is the attempt to produce AL simulated in the computer not as 'dry life' but as 'wet life' materialized by means of artificial biological material. The technological tool by which this project is to be realized is the 3D bio printer with bio ink, the advancement of which is currently being driven by NBIC converging technologies. In the meantime an unprecedented onto-historical revolution is taking place. It is the future vision of transhumanism that the history of nature and culture will turn into a mega digital evolution which brings the so called metaverse into being.

But in this magnificient revolution expected by the transhumanists there is something unchanged. Despite transhumanism predicting that the future evolution on a different material basis would occur at incomparably greater speed and to incomparably greater extent than natural evolution, it has never raised objection to the fundamental mode of natural evolution. In the AL research area the classical Darwinian mode of evolution is simply repeated as it were.

According to Darwin all living beings live in one and the same objective world, being adapted to the conditions of that world in order to survive, so that in this process of surviving the direction of evolution is led to select the superior living being which is more adapted to the conditions of the world. In short Darwinian evolution is a world innate process taking place in the objective world, in which all living beings respectively occupy some part of it as their particular environment. But how about the evolution of AL? At first sight it seems to differ from the Darwinian in that it does not presuppose the objective world. According to AL evolution theory rooted in complexity theory, the environment in which living beings can survive emerges only in the process of interaction between living beings and this environment brings a kind of quantum leap according to the mode of interaction of the living beings surviving in the environment, which enables the living being to evolve to become a more complex and higher level of living being. In short, the difference between Darwinian and AL seems to lie in the fact that AL evolution is grasped as no linear emergent process without presupposing the same objective world.

Despite of the difference, however, the basic premise of natural evolution is repeated for AL in a more radical form. It is the premise of the hierarchical structure of evolution that evolution proceeds up into higher and more complex stages of life. Exposing the premise as it pervades the technical language in the field of AL research, it may be expressed as follows.

"Life has exhibited a remarkable growth in complexity over its evolutionary history. Simple prokaryotic one-celled life led to more complex eukaryotic one-celled life, which led to multicellular life, then to large-bodied vertebrate creatures with complex sensory processing capacities, and ultimately to highly intelligent creatures that use language and develop sophisticated technology — those creatures at the central focus of cognitive science. Although some forms of life remain evolutionary stable for millions of years (e.g., coelacanths and sharks), the apparently open-ended growth in complexity of the most complex organisms is intriguing and enigmatic. Much effort in artificial life is directed toward creating a system that shows how this kind of open-ended evolutionary progress is possible, even in principle."

Almost every attempt at AL tries to realize the open evolution which brings into being the highly intelligent living being far beyond human intelligence by means of program algorithms based on silicon or on totally new synthetic materials created by nanotechnology.

But examined in light of the Heideggerian theory of life, the hierarchical structure of living being which AL accepts uncritically from the biology of so-called wet life, appears very problematic. As has been shown already, the world of living beings is not homogeneously objective, but consists of diversely differentiated environments by which each living being struggles to be encircled and to be driven toward survival. And it is furthermore impossible to evaluate the relation between the respective environments of respective living beings in terms of superiority and inferiority. For example, compared with mammals, the environment and the physiological structure of ticks who suck the blood of mammals seems to be very simple and inferior. As a matter of fact the environment of tick is so simple and poor that there comes into being no complex biological being like a mammal, but only the very specific simple matter disinhibiting the behavior of the tick, which is, chemically put, referred to as butyric acid. But the tick can survive as a tick successfully and perfectly rather thanks to this simplicity of its environment and the simplicity of its behavior in it. So the simplicity of the physiological structure and the poverty of its environment are not inferior to those of mammal. In order to make this point more clearly, I shall compare the lion with the mosquito.

The lion is regarded to be the apex predator in the jungle – the biter of other animals. Nevertheless, the lion itself is helpless to avoid being bitten by the mosquito. The mosquito can be killed by even the slightest impact. However, in its environment, the mosquito can bite the lion. Whereas the lion survives as

the apex predator in the environment in which it can implement its ability to eat every living being necessary for its survival, the mosquito survives in the optimal environment in which it can implement the ability to bite the lion. In the environment in which the mosquito actualizes its ability to bite, the lion is no more than a living being incapacitated with respect to actualising any aggression against the mosquito. On the one hand, the lion as the highest predator which reigns over the jungle as its environment, is not able to enter into the environment of the mosquito. On the other hand, the mosquito is not able to enter into the lion's environment to become its prey. In this respect the environment of mosquito is not inferior to that of the lion. To the mosquito the mode being of the lion does not consist in being the apex predator, but in being prey for the mosquito. Here it becomes clear that when Heidegger speaks of the poverty of the world of a living being, "poverty" does not mean axiological incompleteness or imperfection. Rather it means the completeness of the respective environment in which each living being survives just as that living being.

Neglecting this fact, AL inherits a kind of hierarchical ontology from evolutionary theory which maintains that the world of living beings has a ranked structure from the lowest living being to the highest. This heritage is witnessed in AL's position that CA which display the emergent change toward higher dimensions must be regarded as simulating the process of evolution toward higher living beings and that the algorithm of CA program must be regarded as identical to the principle of evolution, but which can be implemented digitally in artificial materials. This heritage is in fact dramatized in the future vision of transhumanists like Ray Kurzweil and José Cordeiro as cited in the introduction of this paper. Let me repeat the citation again.

"*Homo sapiens* is the first species in our planet which is conscious of its own evolution and limitations, and humans will eventually transcend these constraints to become enhanced humans, transhumans and posthumans. It might be a rapid process like caterpillars becoming butterflies, as opposed to the slow evolutionary passage from apes to humans. Future intelligent life forms might not even resemble human beings at all, and carbon-based organisms will mix with a plethora of other organisms. These posthumans will depend not only on carbon-based systems but also on silicon and other "platforms" which might be more convenient for different environments, like traveling in outer space." (The Boundaries of the Human:From Humanism to Transhumanism, José Cordeiro, The 1st World Humanities Forum Proceedings, 396)

But the relation between the respective environments in which each living being survives, is not a vertical mode ascending from the lowest material layer towards the highest intelligence. (Heidegger 1983, 403)

No matter how dynamic and rapid the emergent process toward higher level may proceed in CA while the digital cells interact with each other, the process is not the phenomenon of life. The relation between each environment, in which the respective living being is driven to behave for survival, is neither that of "side by side"(nebeneinander) nor of "bottom to up"(untereinander). Rather the relation between environments could be better understood in the model of the process of enmeshing (interlocking) of the respective environments into each other.(Heidegger 1983, 401)

What deserves more important attention in the Heideggerian reflection on living beings is that his reflection clearly shows that the human mode of being cannot be implemented by CA. It does so by elucidating the difference in ontological mode between the human being and the living being. In order to reveal this fundamental ontological distinction between the human being and the living being, it is worth remembering the mode of being of the living being once again. Encircled by the environment, the living being such as an animal is captivated by the environment which consists of the things disinhibiting the drives of the living being to the specified behavior for the sake of its survival (M. Heidegger 1983, 292)

Going back to the example of the lizard, the rock to which the lizard sticks is not related to the lizard as rock. The fact that the lizard is related to the rock in the mode of being stuck to it is closed to the lizard itself. It is not revealed to any other living being whatever it may be. The fact that the lizard is related to the rock in the mode of sticking to it is revealed only to the human being who is observing that fact, and is described so only by the human being. Here comes clearly to light the distinct mode of being of the human being from that of the living being. Being captivated in its environment, the living being is not able to exist by relating itself to the things in the various changing ways while revealing them as this or that. The living being is able to survive rather by being captivated in the environment. Being captivated by encircling itself with the disinhibiters enabling its survival is the necessary and sufficient condition for the survival of the living being as that living being. So the behavior of the living being is carried out by circling the chain of drives for survival in an unchanged way. The behavior of the living being is related only to the stimuli or the signal disinhibiting its drives toward survival. So to the flies the spider web exists as nothing. This is the reason why the flies repeat the tragedy of being eaten to death by the spider without correction even in the case of being captured by the spider web hundreds of times.

This kind of thing does not happen only to simple insects like flies. Animals which seems to have of far more complex biological structure and greater intelligence suffer similar fates. For example, according to surveys almost 40% of the mountain goats fall to their deaths. Nevertheless, the goats do not move away from the cliff and do not take any measure to avoid death by falling, which entails that the cliff on which the goat lives is not a cliff to the goat, and that the death from a fall is not a death from a fall to the goat. The death from falling which is a fatal misfortune for a human being is not a misfortune at all to

the goats, but rather a routine and usual event. The mountain goat survives in the mode of being captivated in its environment while living in danger of death by falling as the original mode of its being.

On the contrary, in case where a human being were to reside on the cliff, he would see it as a dangerous place and decide to leave or take some measures to avoid the danger. Or like the mountain climber, he may decide to dare to climb the cliff, whilst running the risk of death from falling, in order to let his life be opened to the unusual meaning from the world in which he lives. In Heidegger's work "Fundamental Problem of Metaphysics" the distinctive mode of being of the human being that is clarified by this case is called opening and building the world in contrast to the living being captivated in the environment encircled around the living being for which the living being is struggling. In addition to that, the human being lives in the world by using tools. Human beings cannot live with the bare body, but must live while using tools. In the case of the goat, it lives on the cliff with its bare body, and, being captivated by the environment of the cliff, suffers the fall from the cliff as the natural mode of its being, whereas the human being climbs the cliff while revealing the cliff as dangerous and comporting to the cliff in the manner of reducing or challenging the danger by using tools which are respectively appropriate to the various ways of the comportment. (For this reason the world of human being is first and foremost open as the unnoticeable context of functions of tools which is neither the environment of the living being nor a space of physical bodies.) In this world the human being comports to the things mediated through tools, the functional context of which has been already understood in the mode of coping with the tools.

6. Conclusion

The Heideggerian reflection on the ontological distinction between the human being and the living being will be more detailed and more persuasive if his other works are taken into consideration. However, the most clear text in which this ontological distinction comes to light is his later work "letters on humanism'". Here Heidegger describes the ontological mode of being of the human being who is concerning with his existence while existing as ek-sisitence, emphasizing that the mode of being of the human being can not be approached in the same way as that of the living being. Further he is making clear that even the evolutionist perspective regarding the human being as one species of the living being is only possible in the mode of being of ek-sistence. The living being is not able to understand the mode of its being as surviving by exiting from the situation of surviving and comporting to the situation itself as being an object of concern while surviving. On the contrary, the human being whose mode of being is Ek-sistenz while concerned with his existence is able to comport to his being as something,

understanding himself even as animal. So Heidegger said: "Ek-sistence can be said only of the essence of man, that is, only of the human way to "be", for as far as we have heard, man alone is admitted into the venture of ek-sistence. So, for that reason, ek-sistence can never be thought of as one specific kind of living thing among other kinds <of living thing>, assuming that it is becoming to man to think the essence of his *be*[-ing] and not only to give a natural history and historical account of his makeup and habits. Thus even what we mean by the comparison of man as *animalitas* with "animals" is based on the essence of ek-sistence."

This is the reason why the living beings are not able to engage in the science of themselves, biology. In contrast, the human being is able to reveal the meaning of the beings and comport to the meaning, managing to live with the comportments. Therefore the human being, concerned with the living being, comports itself to the living being in the mode of revealing what the living being is, and so creates the science of the living being as the one excellent way of the human being's comporting to the living being. Contrary to that, even the living being which is called anthropoid thanks to its seemingly high intelligent behavior which resembles that of human beings, is not able to create biology even at the lowest level. For the human being, however, it is possible to understand himself as the living being as is defined by the science of living beings he created. But ironically, by understanding himself as the animal as is revealed according to the biology which he created, the very ontological mode of Ek-sistenz thanks to which he understands himself in this way is concealed to him.

We now come to the following conclusion. If the human being is of the different ontological mode than the animal, i.e. ek-sistence, then this ontological mode of being cannot be implemented by the evolutionary process of the wet-life, even by the silicon based digital evolution no matter how rapidly and perfectly this may implement the evolutionary process of wet life. So transhumanism and the digital evolution toward the emergence of the transhuman in near future are exposed as a less advanced vision of the future which remains imprisoned by old fashioned metaphysics. This future vision is not more than a sophisticated byproduct of the hierarchical metaphysics concealed deep within the theory of evolution and which is repeated digitally by being simulated by the use of cutting edge technologies like CA. The human being whose mode of being is ek-sistence cannot be simulated in AL and can not dwell in the world by being materialized by means of bio 3D printer with bio ink.

Might the Heideggerian reflection which denies the possibility for human evolution to the transhuman tempt us to go back to modern humanism which elevated the human being to the status of the subject of truth and Being? Might the human being escape the crisis of his being by sticking to this humanism? But as we know, Heideggerian phenomenology can be seen as an intensive study on, and confrontation with the modern subject of philosophy in which modern humanism is deeply rooted. In addition to that,

according to Heidegger, modern technology could not be separated from humanism. Both are events of a deep-rooted ontological process called an "enframing process", in which all beings including the human being can only come into Being if they are manipulated to become other beings than in themselves. This process, in which humanism and modern technology are associated, culminates in the emergence of transhumanism, expelling the human being from the history of Being. So the transhumanism which is driven towards a future without human beings is not any more than the radicalization of modern humanism, the fatal ontological error of which is unearthed in the form of the self-expulsion of the human being as the master of being from the history of being. Thus, Heidegger's criticisms of humanism and technology dispatch the human being into the unique ontological position distinguished from the other beings. Thus, his criticism of humanism does not lead to antihumanism, but rather it is an attempt to save the human being from the error of the metaphysics in which modern humanism is rooted and from the existential crisis into which the error develops. This attempt is humanism in strange fashion, as Heidegger calls it. This humanity is the future of humanity yet to come, toward which the future of phenomenology should be oriented.

Posthuman Imagination of Korean Literature: Science Fiction since 2000

Dae-won Noh
Kongju National University

1. Science Fiction and Posthumanism

We are ahead of an astonishing change. The breakthrough of science and technology, so-called "GNR (genetic, nano and robot engineering) revolution"[1], is projected to bring a dramatic change to human life. Along with the change, humans will fall under "**posthuman**"[2], which is then no longer called humans as beings with far higher standards than now in terms of life expectancy, cognition and emotion. On the contrary to such positive expectations for science and technology, skepticism and critical views are mounting. Changes in science and technology raise questions about humanity, identity and relations with nature, all of which are tranditional subjects of the humanistic introspection. Beginning with the awareness of such problem, this study is intended to look into the imagination of "posthuman" revealed in Korea's contemporary literature with a particular focus on science fiction, and is about criticism in the view of narrative thematics and to vigorously stand against the value change brought about by diverse aspects of the development of science and technology, such as identity, ethics, esthetics and politics, in terms of the humanities.

Posthumanism is rooted in the development of science and technology associated with the enhancement of human ability and the emergence of modern philosophy which is represented as post-modernism.[3] N.Katherine Hayles said that in the posthuman, there are no essential differences or absolute

[1] "Emerging technology" is a method to embrace new technologies with high potential, including genetic engineering, AI and nano engineering, and is used as the abbreviation of "NRG", "NBIC", and "GRIN" other than "GNR" used by Ray Kurzweil. Jose Cordeiro, 「The Boundaries of the Human: From Humanism To Transhumanism」, 『The 1st World Humanities Forum Proceedings』, 2011, p.329.

[2] Shin Sang-kyu, 『The Future of Homo sapiens – Posthuman and Transhumanism』, Acanet, 2014, p. 104.

[3] Lim Seok-won, 「Planning of critical posthumanism: overcoming exclusive anthropocentricism」, Ehwa Institute for the Humanities, 『Human and post-humanism』, Ehwa Womens University Press, 2013, pp. 62-63.

demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals.[4] Posthuman signifies the state of being combined between humans and machinery, but the way of constituting identity is a crucial element of posthuman. Basically, discourses surrounding posthumanism have transgressive properties. Changes in technology and culture bring up the issues of ego and bodily boundaries; boundary between my thoughts and acts; boundary of ethical responsibility; self-identity; personality; boundary between the inside and outside of ego; boundaries between subjectivity and objectivity, and between internal and public characters; and transgression.[5]

Transhumanism sees that it is optimistic or inevitable that a new mankind is created due to the development of science and technology. While "posthuman" is a descriptive term, "transhumanism" connotes the prescriptive meaning of suggestion or appropriateness.[6] Nick Bostrom, founder of the World Transhumanist Association, officially described transhumanism as follows: "the intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and greatly enhance human intellectual, physical, and psychological capacities".[7] Transhumanism is an expression of desire to transcend the limits of human body, which originates from the ideology of enlightenment about science, rationality and freedom. Citing the terms coined by James Hughes, transhumanism is the "Enlightenment on steroids"[8]. Transhumanism is a posthuman narrative that has passed down from humanism and Western rationalism, which aims to realize "superhuman" based upon an optimistic prospect for advanced science and technology. Virtually, disembodiment, such as mind-uploading, a technology dreamed by transhumanists, repeats mind-body dualism of the modern West which valued rationality.[9]

Critical posthumanism does not deny the accomplishments of modern science and technology because of conservative ethical belief or dystopian fear and tends to reflect on the utopian prospect based on optimism about excessive technological determinism in a critical manner. As Stefan Herbrechter pointed out, critical posthumanism takes "an open attitude toward a drastic change in technology and culture"[10]. Critical posthumanists, including Katherine Hayles, unlike transhumanists, dissolve the subject of liberal humanism and Enlightenment humanism and try to seek a new paradigm for the constitution of

---

[4] Katherine Hayles, 『How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics』, 1999, p.24.
[5] Ma Jeong-mi, 『Post-human and the Subject of Post-modern』, Communication Books, 2014, p.xii.
[6] Shin Sang-kyu, op. cit., p.105.
[7] Ibid., p.106.
[8] James Hughes, 「Posthumanism and Transhumanism」, Ehwa Institute for the Humanities, 『Trans- and Posthumanism as Fields of Discourses』, Ehwa HK International Symposium Sourcebook, 2014, p.163.
[9] Lim Seok-won, op. cit.,, pp.69-71.
[10] Ibid., p.71.

humans.

Discriptive imagination of posthuman is often found in the popular narrative genre that places emphasis on visual spectacles, such as SF movies and games, because science fiction describes the "future human character" that goes beyond the modern concept of humans in a very concrete and contentious way by excercising a unique imagination following the advancement of emerging technologies, including robot engineering, IT and nano technologies, brain science and biotechnology. As opposed to the negative view that science fiction is an entertaining popular narrative only for the sake of arousing interest, there are a number of texts generated that are completed with a remarkable literary value according to periodic and environmental changes.

Since 2000, more and more science fictions have been created driven by posthuman imagination in Korean literature, and its cultural achivements are also significant. In the Korean literary circles which traditionally preferred realism, there was insufficient achivements both in creative activity and research as for SF. In recent days, however, SF has become an emerging part of Korean literature thanks to the changes in science and technology, the dissemination of cyber space and changes in the real world, literary transgression and genre deconstruction.[11] In the so-called "mainstream fiction (MF)", imagination of genre, including SF, is drawing attention as a new phenomenon and alternative. Such phenomenon is pertinent to the emergence of young writers who are familiar with popular and genre cultures, including Djuna, Yoon Yi-hyoung, Bae Myeong-hun, Park Min-kyu, Kim Yi-hwan and Kim Bo-young.[12] Those fictions are the venue for narrative discourses that raise introspective questions about science, technology and culture, and humans and society in the future beyond the boundary between genre and mainstream fictions or cultural prejudice and misapprehension.

According to Dominique Babin, a French futurologist, posthuman demands a new humanistic reflection on post-death, post-body and post-ego by overcoming human limitations through science and technology. With new relations and realistic views emerging depending on the changed condition of human body and mind, usual senses and philosophical thoughts about post-relation and post-reality also change.[13] Those five elements can be discussion topics, including SF in which the imagination of posthuman works, by referring to the descriptive structure of Babin about the future image of posthuman.

---

[11] The history of Koren SF and the lates trend can be referred to the following articles: Cho Sung-myeon, 「Chronicling Korean Science Fiction」; Kim Dong-sik, 「Science fiction that thinks of postcoloniality and imagines posthuman – Bok Geo-il's 『Looking for an Epitaph』 and Djuna's 『Transpacific Express』」; Bok Do-hoon, 「Descartes's Descendants-The Novels of Bae Myung-hoon and Kim Bo-young」, <list> Vol.20 Summer 2013, Literature Translation Institute of Korea. (http://kor.list.or.kr)

[12] Ko Jang-won, a columlist, once selected Han Nak-won, Bok Geo-il, Lee Young-su (Djuna), Baek Min-seok, Kim Young-rae, Bae Myeong-hoon, Kim Bo-young, Park Seong-hwan, Yoon Yi-hyoung and Park Min-kyu as the top 10 SF writers in Korea. Ko Jang-won, 「Korean best SF writers」, <Science Times>, 2012 published serially. (www.sciencetimes.co.kr)

[13] Dominique Babin, 『PH1 : manuel d'usage et d'entretien du post-humain』, 2004.

This article puts a special focus on the three areas of post-body, post-death and post-ego from the perspective of posthumanism and analyzes the posthuman imagination found in the SF short stories of writers Kim Yi-hwan, Yoon Yi-hyoung and Park Min-kyu.

2. Imagination of 'Post-Body'

One of the most important breakthroughs brought by advanced science and technoloty to humans is that humans overcome their physical limitations and maximize the improvement of their capabilities. In the posthumanism, the conventional idea of naturally given body fades away. People may give birth to babies through genetic manipulation or replace their organs as if machine components are replaced if necessary. Just as the main character in <The Six Million Dollar Man>, humans could be transformed into cyborgs combined with abiological devices, such as a machine. Cyborg, an artifact and a cultural icon, stands for "cybernetic organism", which is a compound word of cybernetics and organism. Approximately 10% of the U.S. population are reportedly presumed to be cyborgs in a technical sense as they live with an artificial pacemaker, an artificial joint, an implantable drug delivery device, an implantable corneal lens, and an artificial skin.[14] And this trend of turning humans into cyborgs is expected to accelerate due to the use of wearable computers, such as Google Glass, and implant computers.

Imagination of 'post-body' in the post/transhuman narrative and literature is the very fundamental element but leads to fierce disputes. In the posthumanism, the imagination of overcoming human body goes beyond the improvement and enhancement of a body and develops into a disembodiment narrative where humans want to be free from the body itself. Katherine Hayles said that the meaning and the importance of dis/embodiment need to be enhanced through a critical analysis of cybernetics and science fiction. In other words, a description itself has a concrete body of a text and is associated with a body recreated in a text.[15] Imagination of post-body in a great SF is not simply confined to being used as an intriguing and conventional genre material but brings up ontological questions in various aspects of body modification and regeneration, improvement and enhancement, and disembodiment.

A short story 「Transformation of You」[16], written by Kim Yi-hwan, is a story about bodily transformations from commercialized medical techniques, including bimaxillary operation to full body plastic surgery, sex-change operation, body transformation operation and body destruction, to extreme future circumstances. The main characters and the first-person narrators are "you" and a gay, and the love story of this gay couple constitutes the short story along with suggestive documentary illustrations. The

[14] Katherine Hayles, op. cit., p.212.
[15] She saw that narrative is a more "*embodied*" form of discourse than is analytically driven systems theory "with its chronological thrust, polymorphous digressions, located actions, and personified agents". Ibid., p.55.
[16] Kim Yi-hwan, 「Transformation of You」, 『2011 the 2nd Young Writer Awards Works』, Munhakdongne, 2011.

theme of body (transformation) is conbined with the plot of sexual relationship. "You", who is not confident in her looks, decides to get a plastic sugery for physical beauty. Social atmosphere described in the beginning of the short story in the form of a news article shows or relays the contemporary situation of Korea in the 21st century, such as a fever of plastic surgery. As the body translation operation of the "Adam S Research Center" described in the middle of the short story reaches the level of creating " football players with four legs" or "pro wrestlers with six arms" (p.241), the period in the short story appears to be some time in the future, namely extrapolation, a technique of SF that imagine a virtual future based on the current circumstances.[17] This is a narrative strategy that lures readers who are familiar with current affairs, like plastic surgery, into a reality that could possibly happen in the future. Documantary techniques sometimes require sincere introspections or achieve humorous narrative effects as follows:

> **'A man who is crazy about collecting Barbie dolls has changed himself into a Barbie doll'**
>
> **'The National Zoo decided to hire the people who have been transplanted with the brain and the body of a dolphin instead of real dolphins for a dolphin show'**. Following an elephant show, the same decision has been made for a dolphin show for the sake of protecting animals……
>
> **Refrigerator** "I wanted to let customers know that our product is the best", said CEO of a refrigerator company R. "My brain is transplanted into the back of the fridge. My voice comes out through a door keypad. As a result of living as a refrigerator, I can say that our refrigerator is the best, particularly its energy saving function is superior to other products……" (p.260)

The story that begins with a suggesetive dispute over plastic surgery gradually triggers imagination, which ends up combining a machine or an animal body into a human body. What are suggested in the process includes very different and grotesque compound images and plastic surgery for people to get simply to have an ideal and attractive body and looks. In the short story, the body transformation operation is performed to meet personal preference and even for labor and commercial purposes, and in particular, its aspect of sexual relations is highlighted.

Dozens of plastic bags filled with 20 liters of glittering liquid are all tangled up. The liquid looks

[17] Dominique Babin also predicts that gene selection or injection, mixing of human and animal genes, more "advanced" sports due to cyborg technology. Dominique Babin, op. cit., pp.50-57.

like lavae wriggling in a plate. A guide says that organic materials are contained in a thin plastic that never tears. That is persons contained in the form of liquid in plastic bags that absorb oxyzen and nutrients and excrete waste just as the cell membrane. They are huge cells, so to speak. (p.262)

In the final part of the short story of Kim Yi-hwan, the narrator's lover is not only satisfied with getting a sex reversal operation but also "transforms" the existing body into a state of liquid. In other words, the last phase of transformation is "disembodiment", an act of almost discarding a body. It is described that "you", who is being in a liquid state, is having group sex and reach orgasm always. The narrator despairs of the extreme "transformation" of lover. This short story suggests different views on science and technology that allow "transformation" of a body and a view of body in a controversial manner in the process of developing the love story. Science and technology will make a human body 'open', not 'closed'. They can bring about a physical freedom and liberation through body transformation or even removal any time, but that is highly likely to cause serious confusion and conflicts in identity and relations. In that respect, the title "Transformation of You" is meaningful because "you", the subject of post-body who go through "transformations", are so close physically and emotionally that the first person "I" can observe, but at the same time, transformation could mean the distance from a certain otherness. The narrator "I" speak for the views readers have and allow them to imagine the posthuman future which is symbolized by "Transformation of You" from various angles through narrative upheavals.

A short story「Good Bye」written by Yoon Yi-hyoung[18] is a story about immigrants in Mars who freeze their bodies and replace themselves with machines. Amid the circumstances where diverse and short story cutting-edge technologies are developing and being realized, including a regular spaceship between the Earth and Mars, teleportation using a fax machine and compatibility between machinery and human bodies, the main female character "you" go through various ups and downs and still live unhappily and poorly due to the debts hiden by her husband. Her unborn baby, as a narrator, describes the life of his/her mother "you" as follows: "Changes have nothing to do with the life of particular people. You live your life sticking to exactly the same conventional life which was felt by particular people 100 years ago." (p.57) Particularly, "your" life is compared and is in contrast with the life of Spidies, machine humans who emigrate to Mars and their community experiments.

Science fiction is oftentimes defined as "the literature of change". As James Gunn, a writer, said, science fiction deals with a wide range of scientific changes from one's life to a big issue that goes beyond a regional community.[19] Although「Good Bye」is a short story, it embodies the life of a woman as well as

[18] Yoon Yi-hyoung,「Good Bye」, Park Sol-moe and others,『2014 the 4th Moonji Awards for Literature Works』, Moonji, 2014.

[19] Ko Jang-won,『SF's Law』, Sallim, 2008, pp.63-64.

the fate of a community in the midst of social and political changes following the development of science and technology with an excellent description. This short story keenly focuses on the progress and the changes of science and technology, while it also implies skeptical and critical views that the development and the change of science and technology do not always lead to the realization of happiness of humans and communities.[20]

> You think about Mars, a land with canyons that looks like red sand and secret scars. Some people went there to start a new life. They put their bodies made up of blood and flesh in the ice and are given a new machine body. All things in their brains are transferred into a digital signal and implanted into a electronic brain. Their plan was to live without eating anything, except for solar energy that is immediately absorbed into a skin and converted into energy, thus killing or abusing no living creature. The people in a metal body with four arms and legs boarded the spaceship with a plan to establish a base in Mars, change its environment into what is similar to the Earth and create a new human community that does not use money. (p.56)

The background of「Good Bye」is an innovative world, in which machines and human bodies are compatible thanks to the discovery of "Poilen 40281-K Particle", and P. Schreyder, a bioengineer, found a method to implant human memory into an electronic brain. Inspired by such accomplishments of science and technology, a group of scholors and researchers, and those who find it difficult to live as humans on Earth take part in the project to emigrate to Mars. Not only in this short story, but many scientists, such as Hans Moravec, have asserted the possibility of mind-uploading by dividing mind from body for quite a while. Most of the people in this short story, with the exception of the poor, like the main character, teleport their bodies using a "fax machine" as in the famous scene of teleportation in the <Star Trek> series, instead of using public transportation, such as "A Rail"[21]. Indeed, Norbert Wiener, a cybernetics scholar, argued that teleporting humans through telegraphy is possible in theory in the early 1950s.[22]

In the imagination of disembodiment depicted in 「Good Bye」, changes in human life lead to a political and economic community experiment going beyond biological and mechanical changes. The experiment, by giving up on bodies, but instead, implanting mind into a machine, is a revolutionary attempt to overcome the biological limitations of humans and the negative consequences of capitalism.[23]

---

[20] Philosophers, like Michael Keller, are very skeptical about the idea that emotional and physical "human enhancement" inevitably leads to a better human or a better human life. Shin Sang-kyu, op. cit., pp.66-67.

[21] The idea that the elderly, patients and the poor are excluded even with revolutionary transportation, such as fax machine, suggests the critical interpretation that unless the problem of economic and political inequality is not solved, the development of science and technology has nothing to do with the happiness of humans.

[22] Katherine Hayles, op. cit., p.22.

[23] In the short story, Spidies confess that taking a machine body with the power of capital in order to get out of capial was the limitations of their own. "David Harvey predicts that speculative capital, in order to absorb capital surplus, will

However, the community experiment of Spidies ends in failure, and they are notified by humans to return to the Earth. "You" in this short story take care of sales work to induce people to agree on the return procedure by giving them back their frozen bodies. The short story suggests the limitations of a body and the disillusion and skepticism about the capitalist life, but does not simply dream of disembodiment or an anternative political experiment.

> But around that time, there was an incident where all our brains connected with network shared a chunk of unfamiliar ideas. It was like a virtual reality that compressed several experiences extracted from a human body, so to speak. Very common experiences, that is, a feeling of soil and sand stinging palms, a smell of the sea and a feeling of hair flying by blowing wind, a scent of coffee and cigarette, a taste of Kentucky fried chicken, a feeling of having a shower or washing in hot water, and an intimate hug with a lover, were all mixed up. They were like presents for teenagers sold by a small gift shop, but there was no doubt that they were provocative experiences because we forgot about such experiences after we changed our bodies. They were artificial experiences but felt very real and as if we have return to a human body although they happen for a little while. (p.71)

With the senses realized concretely and vividly, Spidies who are accidently connected to the electronic signal become agitated. The human body was treated as an "empty shell" or "Exuviae" full of limitations and shortcomings, but the senses given to the human body are so enchanting that some Spidies decide to kill themselves. Yoon Yi-hyoung's「Good Bye」admits that human conditions lie with finiteness without being captivated by the discourse of disembodiment. This short story eagerly depicts the humbleness of a body with the pregnancy and labor that "you" have to bear and a "habit of eating a roll of *gimbap*". But a new meaning is added to the story with a new body (a baby, the narrator), namely a "future human (posthuman)", being born. In this short story, a body has an ambivalent value that a hope remains in desperate human conditions.

3. Imagination of 'Post-Death'

"All human beings die. Socrates is a human. Socrates dies." What reacts against "the necessity of death" premised in this famous syllogism is the imagination of post-death. Death is the most fearful event for humans and a boundary condition that clearly shows the finiteness of human beings. Thus, reaction, attitude and self-consciousness related to death have been a root of religions and culture. Also,

---

bet on "biomedical, genetic engineering and so-called green technologies". Moon Hyong-jun,『The Topography of Catastrophe』, Jaeum & Moeum Publishing, 2011, p.115, footnote 5.

humans who faced with a fear of death have always been dreaming of immortality and eternal life from emperor Qin Shi Huang who tried to find a herb of eternal youth to the present. What is different, however, is that the possibility of realizing the eternal life and belief in the possibility have grown with the development of medicine and biotechnology. For instance, technology for anti-aging is expected to expand the lifespan of humans and thus an enormous amount of money is invested in the anti-aging medical science. Some radical scholars see aging as a curable disease and predict that people will live forever keeping their youth. While there are medical attempts to open up more advanced future, including anti-aging and freezing technology that freezes bodies to keep, a scientific attempt to seek "digital immortality" by giving up the entire body through "mind-uploading", widely known by Hans Moravec, is one of the various imaginations of eternal life. After all, the ultimate portrait of posthuman may be human beings who enjoy immortality and eternal life.

Park Min-kyu's short story「Good morning, John Wayne」[24] develops the imagination of "post-death" that resurrects frozen humans in the future, while looking into the human desire toward immortality and the desire for power in the critical perspective. The story takes place in the 29th century, in which an evolutionary AI super computer that is superior to the ability of humans takes control of the Earth, and in a closed underground base of "Noahs", a secret organization that manages and implement a cryonic project. As the name of "Noah" says, this short story is a SF parody of the story of Noah's ark in the Bible.

On the wall of the main building of Noahs, there is a mural of ten symbols of longevity. The ten symbols of longevity painting is a Korean folk painting that is composed of ten things that stand for eternal youth (usually select one from the sun, moon, mountain, cloud, stone, pine tree, dear, crane, bamboo, herb of eternal youth and peach).[25] On the 29th century Earth, "living creatures among the antient ten symbols disappeared a long time ago." (p.218) The irony of extinction of the ten symbols of longevity and living creatures is a trace of "Noah's ark and a tool that indicates a reversal of the story that places in the ending part. The contrast between the organization that is eager for eternal life and a dismal reality of the ecological dystopia where the ten creatures that symbolize longevity become extinct creates a very irrational atmosphere in which scientific utopia and dystopia co-exist. Likewise, this short story, in some aspects, contains a satirical and critical view, but is quite sincere and convincing in terms of scientific consideration as seen in the description of cryonics, a key scientific material of SF.

[24] Park Min-kyu,「Good morning, John Wayne」,『Double』side A, Changbi, 2010.

[25] <Encyclopaedia Britannica> (http://100.daum.net/encyclopedia/view.do?docid=b14s0161a).

And <John Wayne 1904NA> returned. It was a perfect resurrection as a life itself. The medical science of Noahs completely removed the tumor that spread to the whole large intestine and also got rid of myocardial infarction and hepatitis, which are fatal diseases, and all other minor disorders from his body. But there was a problem - his memory. In the end, the memory of <John Wayne 1904NA> did not return, and he had no choice but to live the rest of his life as a completely new person who had nothing to do with a truster. Even after two more defrosting, the result was the same. It was a state of having nothing, not a general memory loss, and no one discovered the cause even with a number of researches. For the unexpected result, senior members of the foundation gave themselves a conclusion of <breach of contract>. The resurrection project sank to the river of a long silence again. (pp.223~224)

The world depicted in「Good morning, John Wayne」becomes a state where the evolvement of science and medicine eradicate the 21st centry incurable diseases and cancer is no longer a deadly or threatening disease. Cryonics also reaches its complete state in the 29th century after undergoing trial and error throughout several centuries. As the quoted passage above, prof. Sebastian Seung, a brain scientist, says that humans who have raised from the frozen state cannot have the same identity as ordinary people since the current level of cryonics cannot preserve connectom as it is. "Seung argues that cryonics is more like a religion than science and is based on belief rather than evidence."[26] Indeed, in the history of embalming carried out by humans, such as Egyptian mummy, religious aspects, including immortality or a belief in resurrection of the body, served as important reasons of preserving dead bodies.[27] The argument of prof. Seung that cryonics is closer to religion than science can be referred to as a meaningful point in the interpretation of SF-related motif, including this short story. The ten symbols of longevity, a combination of Chinese Taoism and falk religion that worships nature in Korea, decorating the wall of Noahs in「Good morning, John Wayne」, has something to do with such belief. Eternal life through freezing bodies and restoration is highly likely to bring about an inequality problem in the aspects of belief, ethics and even politics and economy.

<The Snow Queen> was born 700 years ago when science ethics dominates society as a whole and that human cloning and cryonics were prohibited. Deeper and deeper into the underground, Noahs was infiltrated. A secret and a huge construction came with the protection by the ruling power. Unlike the prediction of Cusack Screamer that we will become a universal tool to extend life span in the future, cryonics ended up in a privilege for a very small minority. Rullers spared

[26] Shin Sang-kyu, op. cit., p.85.
[27] <Encyclopaedia Britannica> (http://100.daum.net/encyclopedia/view.do?docid=b13s2186b001#ID8)

> no effort to invest in their resting places, and Noahs held an astronomical amount of trust money accumulated throughout centuries. That was how <The Snow Queen>, a maginificent structure and an autonomous region, and a huge AI itself, was created. (pp.224~225)

Those who requested cryonics to Noahs through an underground line were dictators, bureaucrats, rich people, militarists and royal families from all over the world. "Trusters freeze their wealth and power along with their bodies in Noahs." (p.216) "John Wayne <3405EA>" who woke up from the frozen state in 1,000 years was also a political leader in Korea. It is presumed that he was one of the Korean dictators who found "ざぶとん (Jabudong, a sitting cushion in Japanese)", known as a symbol of power, and wondered about the existence of the U.S. rather than Korea.[28] Dominique Babin predicts that human beings are unequal before death, but if immortality is given, only the priviledged class of "new pharaoh's people in the posthuman era" will benefit from it due to its high costs, which will result in a sort of social catastrophe.[29] This is a concern that science and technology may aggravate the existing inequality rather than promoting an equal society. Also, though not emphasized in this short story, human immorality could be a catastrophe to the environment. The extinction of the creatures belonging to the ten symbols of longevity can be seen as a result of the environmental devastation caused by humans. A shocking end of this short story that comes with a narrative surprise turns a utopian outlook into a dystopian Apocalypse. That is a warning against the endless greed of priviledged classes toward eternal life and power and anthropocentricism that blindly believes in capital and technology.

4. Imagination of 'Post-Ego'

Katherine Hayles defined the subject of posthuman as "a physical and informational entity where an aggregation of mixed and different elements and a boundary continue to be formed and reformed".[30] As in cyborgs, in the posthuman, there is no boundary and disparity in the relations of humans, machinery, computer simulation and biological organism. As the formation of identity is the core of the posthuman definition, whether or not non-biological elements exist is not decisive. The posthuman generates a big difference in the issues of self-identity and individual will compared to the existing view of humans. To

[28] The writer added in「Double ArtBook」that this work is for those who are sitting on ざぶとん (Jabudong, a cushion), and reveal the intention of satire on the man in power. The historical origin of the request by "Your Highness" to look for a jabudong can be found in the following article: In the past, a high-class restaurant where people had a drink together with hostesses sitting on a cushion was called "jabudong house". During the military regime, the president asked, "Hey, get a jabudong! Jabudong!, to show that he respected the elderly, and the scene was broadcast in the nine o'clock news, which later became a big issue. Bae Sang-bok, <Please sit on a 'cushion', not on a 'Jabudong'>,『The Joongang Ilbo』Nov. 15, 2010.
(http://article.joins.com/news/blognews/article.asp?listid=11914556)

[29] Dominique Babin, op. cit., p.38.

[30] Katherine Hayles, op. cit., p.25.

contemplate this more in detail, think about a number of stories where the "distinction between humans and robots (machinery)"[31] is the cause of a conflict among important masterplots[32] of SF. The difference between robots and humans is gradually decreasing thanks to researches on robotics that focuses on developing humanoids that are like humans and AI. On the contrary, more and more people try to build close relations with machinery or computers rather than with humans, and a tendancy is also observed that humans are becoming like robots due to the dissemination of cyborgs. In robotics, the recent trend that values emotional ability and communication with humans suggests that the issues of coevolution between humans and robots and changes in identity are coming to the fore. It certainly appears important to perform humanistic and sociological introspections on the reestablishmet of robot-human relations with the changes in the two directions of humanization of robots and robotization of humans.

「Road Kill」, written by Park Min-kyu[33], is a short story panning out based on the background of dystopia (or utopia for a liberal company) that is polarized into a civilization region and a region for displaced people, which is caused by "Asia that is rulling the world as a big company after succeeding in the mass production of robots that replace the proletariat" (p.94)" As seen in the political and economic situations in the suggested narrative world, this short story basically premises on a pessimistic and critical view that the development of robot technology will cause large-scale unemployment, monopoly on wealth by a priviledged minority of people and polarization, and even the "disposal" of human dignity.[34] Having said that, the short story does not just show the negative meaning and concerns about robotics and the image of robots. The description of「Road Kill」 has a structure where double plots cross. One is a story about "Maxi", the first-person narrator ("I") and a cleaning robot, and "Mao" a robot friend of Maxi, and the other is about "Lee(李)", the second person of "you" who gets by in the special zone for displaced people Yanglan(壤欄). Interestingly, both Maxi and Lee play a large role in the short story, but the robot Maxi is given the status of the first person narrator, not the human. Such unique description method and characters may be a conventional motif of "inhumane humans and humane robots" in SF and be intended for setup.

> You were deprived of your home. Machinery brought a change in labor and the change brought a change in the world. The problem was most of the surplus people, and your family belonged to

[31] Alan Turing suggested "Turing test" that distinguishes between human and machine in his paper "Computing Machinery and Intelligence" published in 1950 to set the agenda that AI will seek. Katherine Hayles, op. cit., pp.13-14.
[32] Masterplot "repeat in various forms and is stories about value, hope and fear". It is also a unit of narratives that has great cultural influence. H. Poter Abbott,『The Cambridge Introduction to Narrative』, 2008, p.99.
[33] Park Min-kyu,「Road Kill」, Park Hung-seo and others,『2012 Today's Novel Selected by 'Wirters'』, Writer, 2012.
[34] The social scientific view that the commercial dissemination of robots will significantly raise unemployment rates is not just a result of literary imagination. Dale Kerico criticize that transhumanism distracts people from the current crisis caused by automation, such as unemployment, or political struggle. James Hughes, op. cit., pp.174-175.

them. The company Asia laid them off in phases and systematically. It was a kind of being placed on a waiting list. Yanglan district, which was placed between Chinad and Vietnam, was the largest department. You do not know why your father died. And you also do not know the cause of your mother's death -the flu nor a high fever- was not reasonable. Science, which created the proletariat, was not in a position to be afraid of the resistence of those who were no longer the proletariat. xuǎnjǔ! xuǎnjǔ! Shouts are coming. After looking them around with a drawsy look, you mutter "shit". But you never know they are actually diligent and helpless humans. (p.100)

As Zygmunt Bauman, a sociologist, likened an extremely unstable life of liquid modernity to "Wasted Lives"[35], the lower class of Yanglan was degraded to "homo sacer", worthless lives expelled from the legal boundary. The statement that ruined (non) humans in Yanglan used to be faithful people described as "scum hooked on gambling and drugs" (p.94) means that they are social victims. As broken or obsolete machines are discarded due to their no economic value, the humans who can no longer secure labor productivity are expelled and "discarded" as well. This arouses the fact that when "robots" first took shape in a literary sense, it was used as a metaphor for the working class of the proletariat.[36] The passage where "Saito", an old man and the legend of roulette, asked Lee, "Please call me…at least once…manager" (p.101) is a very bitter black humor of Park Min-kyu. Roulette played between Lee and Saito alludes to the dystopian future of laborers in which survival itself is almost impossible just like roulette.

I am in pain.

Communication access is disconnected. I know that Mao is not broken. What a human can do by swinging a bat is to hit a ball or ease anger. That is, of course, from a mechanical perspective. When it comes to humans, it may be a different story. Yosa may have switched off Mao. The easiest and the fastest way. I imagine Mao that has returned to the initial mode through rebooting. That would be a new Mao and Mao who does not know Mozart. I am in pain though I know it is an error… but still in pain. Maybe, human suffering is one of the errors that humans have or occurred to humans unless there is no error. (p.106)

[35] "The production of 'Human waste', more precisely, wasted humans ('surplus', 'extra' humans, namely a group of those who are not authorized or permitted to stay or where no one wants them to stay) is an inevitable outcome of modernization and comes with modern times." Zygmunt Bauman, 『Wasted Lives - Modernity and its Outcasts』, 2004, pp.21-22.

[36] The word "robot" was first used in Karel Capek's *Rossum's Universal Robots* (1920). "Robot" originates from a Czech word "robota" which means labor. Song Ho-rim, 「Posthuman Evolution: Evolutionary Relationships between Human Beings and Artificial Creatures in Science Fiction」, 『English Literature 21』 Vol. 26, No. 3, the 21st Century Association of English Language and Literature, 2013, p.61.

Maxi and Mao, robots in「Road Kill」, are more emotional and ethical than humans. Disposing of the bodies of those who were killed by "Shuttle", transportation that runs at a blindingly fast speed, Maxi is affected emotionally. Maxi feels "pain" about the situation where his robot friends lose their memories due to initialization. While Mao likes Mozart music, their human boss "Yosa" drinks or uses violence while on duty. Criticism of human beings by robots is extremely illustrated when it comes to the issue of the protection of human diginity. "On any occasion, human digninity should be protected. That was the highest regulation that was placed at the top of all warnings." (p. 107) Maxi "I", as one character, thinks and decides on its own, and in the end, moves dead bodies of human babies at the risk of his life (OFF) in violation of the service regulation. That is a part that shows that the writer thinks about Asimov's "Three Laws of Robotics"[37] that has influenced many science fictions, while raising the status and dignity of robots paradoxically by reestablishing the "dignity of mankind (life)" as the highest principle in robot ethics.

5. Significance of Posthuman SF Researches and Expectations

The SF short stories dealt with so far illustrate a new status of body and mind of the future human from different angles, and in particular, by utilizing various methods, such as giving person to the narrator, narrative irony and documentary insertion, they realize a unique narrative aesthetics and proactively perfom humanistic introspections on the two faces of the posthuman. In those works, the future of the posthuman is not optimistic at all and is close to dystopian prospects, and they show critical and skeptical visions of the future of science and technology. However, that does not mean a conservative position on or a complete denial of science and technology. The reason why a dismal outlook on the future often appears in SF can be found in the writer's own style or charaters, but it should be understood that agon is almost essential in the narrative genre. Narrative agon, a competition between descriptions, promotes agon in a very concrete way. Also, narrative agon in SF vividly describes discourses on a new human being and science and technology culture in the posthuman era, which allows a concrete imagination of the future, thus embracing it liberally and critically.

Korean SF, with the examples of Park Min-kyu, Kim Yi-hwan and Yoon Yi-hyoung, is "Science Fiction" as well as "Social Fiction" that enable people to find out about the social and political meanings they imply. Serious polarization that symbolizes the future of posthuman, unemployment caused by automation, or the phenomenon of neglecting the human body due to distorted idealism are not only the issues of the future but also the social problems humans face today. Concerns are mounting that without an attempt to solve them, dystopia will become a reality.

Posthuman SF researches in Korea stand up against the age of changes and chaos while making it

[37] First, do not harm humans. Second, obey the order of humans, but except for the case that violates the first principle. Third, robots should protect themselves, but except for the case that violates the first and second principles.

possible to intensifying and developing "literature and science", the interdisciplinary research subjects, through a critical and a concrete reflection on science from a humanistic perspective. The fields of literature and science are still in the phase of introduction in Korea. Not only finding the views required for interdisciplinary research fields or adjacent fields of study, such as cybernetics, cognitive science, brain science, bioethics and philosophy of medicine, but it is required find a way of virtuous cycle and communication by introducing new literary theories and actual criticisms. Through research subjects that spin off from the research, it would also be possible to provide advanced storytelling, narrative theories and humanistic discourses to clinical medicine and applied science.

SF researches can draw attention as a contemporary literary theory after information society or post-industrial society, but like various difficult problems in the humanities, it is hard to overcome the limitations of the researches only with discussions over western theories. As for the problems, such as blind faith in science and technology that is oftentimes used as a subject in SF and posthuman narrations and reckless environmental destruction, loss of the dignity of life and identity crisis, a clue to the solution can be obtained from the traditional thought of the East and the wisdom of ecological philosophy. For example, the recent cognitive science and philosophy started paying attention to embodiment and ecological integritas which were overlooked by brain science researches. Eastern philosophy that premises on body and mind monism and Korea's ecological philosophy, such as the theory of global life, are in line with the recent views of cognitive science/philosophy of mind on Extended Mind and require attention as philosophy that is likely to overcome the ethical, philosophical and aesthetic limitations of disembodiment discussions in the posthuman centering on cybernetics and information science theories. Likewise, posthumanism researches in SF should be aimed at smooth communication between science and the humanities and between all ages and centuries and try to share wisdom beyond boundaries.

<Bibliography>

Texts

Kim Yi-hwan, 「Transformation of You」, 『2011 the 2nd Young Writer Awards Works』, Munhakdongne, 2011.

Park Min-kyu, 「Good morning, John Wayne」, 『Double』 side A, Changbi, 2010.

Park Min-kyu, 「Road Kill」, Park Hung-seo and others, 『2012 Today's Novel Selected by 'Wirters'』, Writer, 2012.

Yoon Yi-hyoung, 「Good Bye」, Park Sol-moe and others, 『2014 the 4th Moonji Awards for Literature Works』, Moonji, 2014.

References

<Encyclopaedia Britannica>.

Bae Sang-bok, <Please sit on a 'cushion', not on a 'Jabudong'>,『The Joongang Ilbo』Nov. 15, 2010.

Bok Do-hoon,「Descartes's Descendants-The Novels of Bae Myung-hoon and Kim Bo-young」, <list> Vol.20 Summer 2013, Literature Translation Institute of Korea.

Cho Sung-myeon,「Chronicling Korean Science Fiction」, <list> Vol.20 Summer 2013, Literature Translation Institute of Korea.

Dominique Babin,『PH1 : manuel d'usage et d'entretien du post-humain』, 2004.

Ehwa Institute for the Humanities,『Human and post-humanism』, Ehwa Womens University Press, 2013.

Ehwa Institute for the Humanities,『Trans- and Posthumanism as Fields of Discourses』, Ehwa HK International Symposium Sourcebook, 2014.

First issue of <HAPPY SF>, Happy Reading, 2004.

H. Poter Abbott,『The Cambridge Introduction to Narrative』, 2008.

Jose Cordeiro,「The Boundaries of the Human: From Humanism To Transhumanism」,『The 1st World Humanities Forum Proceedings』, 2011.

Katherine Hayles,『How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics』, 1999.

Kim Dong-sik,「Science fiction that thinks of postcoloniality and imagines posthuman – Bok Geo-il's『Looking for an Epitaph』and Djuna's『Transpacific Express』」, <list> Vol.20 Summer 2013, Literature Translation Institute of Korea.

Ko Jang-won,『SF's Law』, Sallim, 2008.

Lee Jeong-mo,「 To surpass brain science: new framework of cognitive science, a connecting point of the humanities, social science and natural science」,『The Poetry Anti-poetry』, 2011, Autumn No. 77.

Ma Jeong-mi,『Post-human and the Subject of Post-modern』, Communication Books, 2014.

Moon Hyong-jun,『The Topography of Catastrophe, Jaeum & Moeum Publishing』, 2011.

Park Sun-hee,「Embodiment Theory as Criticism of Disembodiment Discourse」,『Journal of Communication Research』Vol. 47, No.1, Institute of Communication Research, Seoul National University, 2010.

Popular Literature Research Association,『What is SF?』, Kookhak Archive, 2000.

Robert Scholes & Eric S. Rabkin,『Science Fiction History, Science, Vision』, 1979.

Shin Sang-kyu,『The Future of Homo sapiens – Posthuman and Transhumanism』, Acanet, 2014.

Song Ho-rim,「Posthuman Evolution: Evolutionary Relationships between Human Beings and Artificial Creatures in Science Fiction」,『English Literature 21』Vol. 26, No. 3, the 21st Century Association of English Language and Literature, 2013.

Zygmunt Bauman,『Wasted Lives - Modernity and its Outcasts』, 2004.

Umwelt: Ecosystem of Posthuman Distributed Cognition

Kang Mijung
Seoul National University

1. Introduction: *Ping Body* and Posthuman Distributed Cognition

A robotic artist, Stelarc's *Ping Body* (1996, Figure 1) vividly shows a self-portrait of posthuman. Through *The Third Hand* (1981, Figure 2), Stelarc who is connected to the network, gives himself to involuntary movements. Those who watch Stelarc's performance *Ping Body* have to be regarded as both an audience and a group of performers of *Ping Body*. After the participants let Stelarc know their internet address beforehand, different ping commands are randomly sent to each internet domain.[1] When ping commands (0 to 2,000 milliseconds) are converted to voltage ranging from 0 to 60 volts, the audience can participate in the work *Ping Body* by stimulating Stelarc's body muscles via the touch interface that expresses human body movements. Not only was Stelarc's body attached to prosthesis physically strengthened, but he could also obtain an extended self with distributed cognition by connecting to other bodies on networks.

[1] PING (Packet Internet Groper) is a basic internet program that determines whether a specific IP address is accessible and it can accept a query. PING is used to diagnose how fast the internet host that the user tries to access is running. PING can not only test how quick IP host responds to the packet, but also it can find IP address of the website only with its domain name. It works by sending a packet to the specified address and waiting for a reply. See "PING." *Terms Korea.* Nov.1999. Web. Sep. 2014. <http://www.terms.co.kr>.

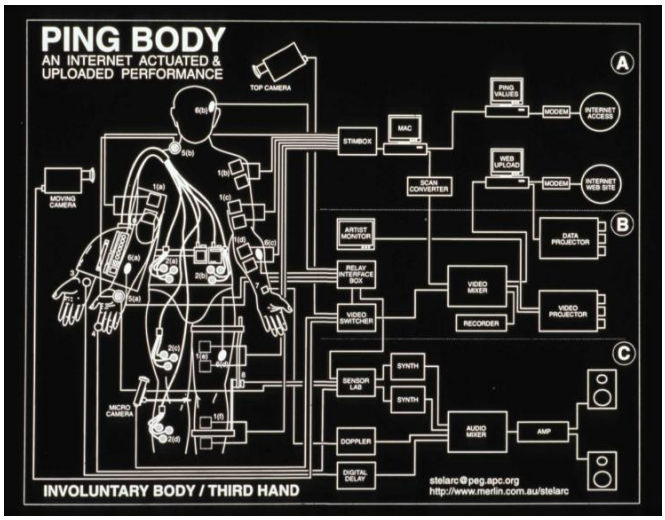


Figure 1. Stelarc, *Ping Body* (1996)

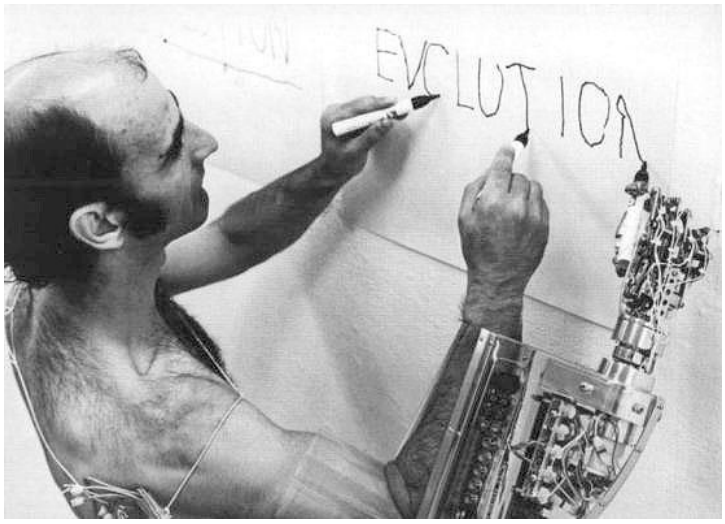


Figure 2. Stelarc, *The Third Hand* (1980)

It would be better to understand the Stelarc's body combined with prosthesis and his performance as a new phase of evolving human, rather than as the end of biological body.[2] In Stelarc's view who agrees to the standpoint of Marshall McLuhan in *Understanding Media*, Homo sapiens have always used tools or artifacts and made them a part of their body. As Gregory Bateson comprehended, a blind man's stick is a part of his body.[3] A deaf man's hearing-aid or a highly shortsighted man's glasses play a similar role as an element of embodied subject. Then, Stelarc's the *Third Hand* can be seen as an extended body more evolved than the stick, hearing-aid or glasses. In other words, Stelarc's body with prosthesis helps widen

[2] Jane Goodall, "The Will to Evolve," in Marquard Smith (ed.), *STELARC: The Monograph*, The MIT Press, 2007, pp. 1-7.

[3] Gregory Bateson, *Steps to an Ecology of Mind*, Jason Aronson Inc., 1972(1987), p. 251

the scope of his experiences to a greater extent than the stick did for its user, a blind man. If we do not acknowledge the existence of disembodied mind as argued by Humberto Maturana and F.J. Varela,[4] it won't be difficult to understand that Stelarc would have experienced distribution and expansion of cognitive self by using the new body part, the *Third Hand*.

In *How We Became Posthuman* (1999), Katherine Hayles suggests a retroactive definition of "human "and "posthuman." As Hayles points out, people who have a terror witnessing the evolution of intelligent machines pay attention to a connotation of the word "post" as "the end."[5] Like Stelarc, she refutes opinions that the development of body combined with machines and cyborg will bring the end of humanity. Such terror stems from liberal humanism that was conceived at the Age of Enlightenment. Humanism based on Descartes' dualism holds a position that humanity is dependent on the freedom of mind, not the corporeality of body. Those who embrace posthuman as a pleasure not a fear cannot be also free from the dualistic humanism in that they also consider that the mind is superior to the body. If posthuman implies the notion of "the end," it would be, as Hayles put it, "it signals instead the end of a certain conception of the human, a conception that may have applied, at best, to that fraction of humanity who had the wealth, power, and leisure to conceptualize themselves as autonomous being exercising their will through individual agency and choice." [6]

In this paper, I would like to take an epistemological approach to posthuman based on Umwelt theory of Jakob von Uexküll, a theoretical biologist. Uexküll, who was also a zoologist, defines the *umwelt* as the perceptual world in which an organism exists and acts as a subject and tries semiotic analysis on the umwelt. The aim of this paper is to probe deeply into the epistemological situation that Hayles called "posthuman distributed cognition" relying on Uexküll's Umwelt theory. Discussions to be developed from Chapter two will explore the issues of posthuman epistemology by looking into Uexküll's Umwelt theory and several issues regarding cybernetics.

2. Jakob von Uexküll's Umwelt Theory

Uexküll's Umwelt theory has had a profound influence on the history of cybernetics. Before moving into how Uexküll contributed to formation of cybernetics, let me explore what Umwelt theory is. "Umwelt" is a term coined by Uexküll meaning the "a subjective universe" and "phenomenal world" that a living

[4] Humberto Maturana, et al. (2007). *Der Baum der erkenntness* (Choi Hoyoung, Trans.). Galmuli Publishing.; F.J. Varela, et al., *The Embodied Mind*, The MIT Press, 1993.
[5] K.N. Hayles, *How We Became Posthuman*, The University of Chicago Press, 1999, p. 283
[6] Hayles, ibid., p. 286

organism perceives or "a self-centered world" that an organism experiences.[7] Umwelt is subjective experience, but it doesn't mean that the experience of Umwelt is individual-specific and unique. To be accurate, an Umwelt is a public realm within each species shared by all individuals of that species. In this regard, it is more corresponding to Uexküll's scientific stance to regard Umwelt as the objective world.[8] As life is not just about matter but also "how that matter interacts in interconnected systems that include organisms in their separately perceived worlds,"[9] Umwelt is more like a perceivable, significant world surrounding each organism. That doesn't mean that Umwelt is the environment surrounding organisms. The reason why Uexküll created the word "Umwelt" is to distinguish the phenomenal world from the general surroundings of organism (*Umgebung*).[10] Since Umwelt is defined as the phenomenal world of perception for an organism, the Umwelt of a honeybee and the Umwelt of a human cannot help being different.

Uexküll viewed how an organism perceives or interprets and how it reacts is most important in every state of life process, and for this reason he adopted a semiotic method in biological research. As mentioned earlier, the Umwelt is the self-world that each biological organism perceives. According to Uexküll, a reality appears in such a world. Put it differently, all living creatures perceive the reality that appears in Umwelt through their sensory organs. "Elements of reality form all subjects and their subjective self-world, and at the same time, go through constant changes while maintaining harmony."[11] Uexküll mentioned that such ultimate reality is the "nature." To Uexküll who saw that the nature is always represented by signs, and the signs that bridge communication between the nature and mind are regarded as true existence.

It can be surmised from the above mentioned Uexküll's realism, the laws of nature correspond with the law of sign process. The biologist Uexküll thought that the main function of mind is to accept and interpret signs, so the mind is an organ created by nature to perceive and interpret nature.[12] The reason

---

[7] Thure von Uexküll, "The Sign Theory of Jakob von Uexküll." Krampen et al. (ed.), *Classics of Semiotics*. New York: Plenum, 1987, pp.148-149

[8] The Umwelt theory of Uexküll who has his own phenomenological position cannot be understood with the subject-object dichotomy and a split from modern thought is needed. To him, "subject" belongs to the world of things and "objects" are perceivable and actually intelligible. It short, that an Umwelt is an exclusively objective world, not because it does not involve things, but because it involves things only in known aspects. See John Deely, "Semiotics and Jakob von Uexküll's Concept of Umwelt," *Sign Systems Studies*, 32:1, 2004, pp. 13-20

[9] Dorion Sagan, "Introduction – Umwelt After Uexküll," in Jacob von Uexküll, *A Foray into the worlds of Animals and Humans*, trans by Joseph D. O'Neil, University of Minesota Press, 2010, p. 1

[10] Thure von Uexküll et al, "Endosemiotics," *Semiotica*, 96:1, 1993, p. 6

[11] Thure von Uexküll, op. cit., pp. 148-149

[12] Thure von Uexküll, ibid., p. 149

why Uexküll could develop such semiotic biology even though he was not aware of C.S. Peirce's and Ferdinand de Saussure's semiotics is because he noted an analogy between the sign processes in nature and in language.[13] In Umwelt theory, the formula of reciprocal relationship between nature and man is surprisingly similar to the linguistic formula of the relationship between language and man. As nature, which has created man, can exist only when man interprets nature, man has created language while language can create man.

Uexküll's theoretical biology was deeply influenced by Immanuel Kant. Umwelt can be equated to nature as the ultimate reality is not because the elements that compose the Umwelt have "objective" qualities but because those qualities are always understood by subjects who perceive the elements of Umwelt represented by signs. Uexküll draw the contour of Umwelt theory based on Kant's philosophy that "the qualities of all things are not their own, but of our own projected perception."[14] In line with Kant's investigations, he describes the task of biology as follows. The first task is to consider the part played by our body, and especially by our sensory organs and central nervous system. The second is to study the other subjects' relations to their objects.[15] In other words, the point of Uexküll's theoretical biology is, first, to study human, the primary receptor of signs, and the human mind and then to investigate the roles of other subjects or animals as receptors of signs.

Uexküll who established the Umwelt theory by adopting Kant's philosophy laid a key theoretical foundation for the history of cybernetics by understanding the life process of nature as the sign process which is comparable to semiotic function of language, and introducing "functional cycle." Let me explores several issues regarding cybernetics focusing on their relation with Uexküll's Umwelt theory.

3. Umwelt and Cybernetics

Often, cybernetics is translated into "인공두뇌학(Artificial Brainology)" in Korean, which might create a misunderstanding. A mathematician Norbert Wiener introduced the term "cybernetics" to refer to the scientific study of control mechanism that maintains a stable system in the animal and the machine or in organic and inorganic substance. Since Wiener defined cybernetics as "the scientific study of control and

[13] Thure von Uexküll, ibid., pp. 149-151

[14] Thure von Uexküll, ibid., p. 154

[15] Jacob von Uexküll, *Theoretishe Biologie*, Reprint of second edition of 1928, Frankfurt a.M.: Suhrkamp, 1973, 9f (Thure von Uexküll, ibid., p. 154).

communication in the animal and the machine" in his book *Cybernetics* in 1948, the field of study has developed taking transdisciplinary approach from biology and computer engineering to cognitive theories of philosophy, psychology and neuroscience. In the history of cybernetics, Uexküll's contribution cannot be overlooked. For instance, while Weiner made artificial automata a case of physiology based on mathmatics and technology, what Uexküll pursued in his Umwelt theory is to bring the function of living organisms to automata theory.[16] This was made possible since Uexküll held the semiotic point of view that made him see the natural phenomenon similar to the linguistic elements. Through a semiotic biology study, he suggested a viewpoint to draw an analogy between the life process of organisms and the self-controlled system of artifacts. The case in point is his explanation on 'functional cycle' which presented the feedback principle, the core of cybernetics, 20 years earlier than Norbert Wiener.

The gist of Umwelt study can be found in Uexküll's point that organisms basically have communication system. According to Uexküll, the functional cycle is a voluntary mechanism that stably maintains the life system of creatures, especially animals that respond to the nature. Influenced by Kant, Uexküll sets *Innenwelt*, a subjective inner world of organisms, and distinguishes it from *Umwelt* that is a perceptive world of organisms.[17] However, Umwelt is also a world perceived by subjects, it cannot be unknowable "Ding an sich" or "thing-in-itself." The mechanism of functional cycle is based on a single, interactive organic system of receptors and effectors which perform different functions.

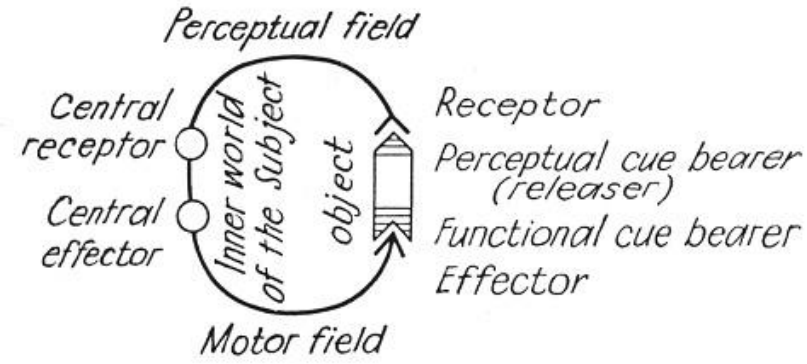


Figure 3. The functional cycle

As you can see in Figure 3 above, the functional cycle is composed of interaction between the perceptual field equipped with receptors and the motor field with effectors. Here, we should not jump to a conclusion that reactive or operative activities are conscious while perceptive ones are spontaneous. Perception directs the first stage of meaning-utilization and operation refers to the second stage of

[16] Karl, Y.H., Lagerspetz, "Jakob von Uexküll and the origins of cybernetics," *Semiotica*, 134:1, 2001, p. 643

[17] Lagerspetz, ibid, p. 647

confirming what is perceived. The subject as meaning-utilizer consists of a receptor organ and an effector organ, and the object as the meaning-carrier is differentiated into a perceptual cue carrier and an operational cue carrier. To Uexküll, there is no neutral object. The Umwelt of an observer has a significant influence on the Umwelt of its object under observation. For instance, let's say a zoologist observes a dolphin. The subjective world of the zoologist forms the core of the self-world of the dolphin that is under observation.[18]

Uexküll's functional cycle model was suggested to take a semiotic approach to study the life of animals and humans. His Umwelt theory including the functional cycle would be useful to elucidate the perceptual worlds of organisms as well as to identify epistemological and ontological aspects of artificial life and cyborg that are inorganic matters. To reach such conclusion, I believe that it would be helpful to take a look into the history and main issues of cybernetics, which are relevant to this paper.

Cybernetics inaugurated by Norbert Wiener in the mid-20th century had a lofty goal of establishing communication and control theory that can be applicable to animals, humans and machines alike. Besides Norbert Wiener, Claude Shannon, an expert of information theory, and Warren McCulloch who established a neural function model and many others played a key role in the early days of cybernetics. After the period, the humans have been understood as information-processing entities who are essentially similar to intelligent machines. All researchers who contributed to the inception of cybernetics placed a strong emphasis on homeostasis. Homeostasis had been understood as the ability of living organisms to maintain metabolic equilibrium when they are buffeted by fickle environments. The pioneers of cybernetics tried to extend the concept of homeostasis, which is the basic feature of organisms, into the artificial automata. Such extension was possible because the "feedback loops" that had long been exploited to increase the stability of mechanical systems, was explicitly theorized as a flow of information.[19]

Although the informational feedback loop was initially linked with homeostasis, it quickly led to the idea of reflexivity. Reflexivity can be defined as "the movement whereby that which has been used to generate a system is made, through a changed perspective, to become part of the system it generates."[20] As illustrated in Kurt Gödel's theory of number, M.C. Escher's drawings and Jorge Luis Borges' novels, reflexivity refers to a situation where creating a system is entangled with the system itself. Reflexivity has entered cybernetics primarily through discussions about the observer in the system. First-wave cybernetics

[18] Thure von Uexküll, op. cit., pp.162-166
[19] Hayles, op. cit., p. 8
[20] Hayles, ibid, p. 8

considered observers are outside the system and information flows from the system to the observers. But feedback can also loop through the observers, drawing them into becoming a part of the system being observed.[21] In short, the observers of the system can be a system that is observed.

The feedback loop that plays a pivotal role in information theory together with cybernetics is very much similar to the functional cycle that Uexküll suggested earlier in 1920s. Umwelt is a world composing of an observing subject and an observed object, but it is not an absolutely objective world, but a subjective world as perceived by subjects. Yet, Umwelt is not just a subjective world, but inter-subjectively perceived world. The reason why the subjects and objects of Umwelt interact is that the subjects with their own Innenwelt take parts in the Umwelt and perceive and react to signs in a certain time and space.

4. Posthuman Distributed Cognition System

As mentioned before, the researchers of cybernetics adopted the principle of feedback loop for introducing the idea of homeostasis to mechanical control system. In the meanwhile, it was discovered that homeostasis of self-control system can be lead to reflexivity. In 1980s, Humberto Maturana and Francisco Varela established a self-organization theory of organisms based on the study of reflexivity in sensory processing and the dynamics of autonomous biological systems. [22] According to the researchers, organisms respond to their environment in ways determined by their internal self-organization. Their one and only goal is to produce and reproduce continually the organization that defines them as systems. Hence, they not only are self-organizing but also are autopoietic, or self-making.

After 1980s, discourses on artificial life swelled into existence when self-organization began to be understood not merely as the (re)production of internal organization but as the springboard to emergence. Computer programmers designed creatures that evolve spontaneously in directions they may not have anticipated, and argued that such self-evolving programs are not merely models of life but are themselves alive. The premise that all life forms and the whole universe are composed of information made this claim plausible. Since 1953 when James Watson and Francis Crick discovered the structure of DNA, decoding the human genome became possible. As the forms of life were recognized as information patterns and the distinction between biological life and artificial life became blurry, so-called "posthuman" discourse began in earnest.

[21] Hayles, ibid, p. 9
[22] Humberto Maturana and Francisco Varela, *Autopoiesis and Cognition: The Realization of the Living*, D. Reidel, 1980

As I suggested at the beginning, the terror from the emergence of posthuman stems from epistemology based on the metaphysics of presence which was criticized by Derrida. If we think out of the box of modern human thinking that gives superiority to the presence of Logos or mind over absence and move to the postmodern or posthuman thinking composed of patterns / randomness, as Hayles did, we could open up new ways of seeing what being human means. Randomness or complexity evolves toward an open future marked by contingency and unpredictability. That's because randomness is not just the lack of patterns but as the creative ground from which patterns can emerge.[23] By shifting from presence/absence model to pattern/randomness model, randomness seems to have an abundant role to play. In *Embodied Mind*, Varela and his coauthors argue that there is no stable, coherent self but only autonomous agents running programs.[24] These agents are not the mental subjects that can download itself into a computer as Hans Moravec imagined.[25] Rather, they are subjects as the embodied minds that constantly change by communicating with the world of complexity and unpredictability. From the posthuman point of view, it is a certain conception of human from the liberal humanist viewpoint, not the humanity itself that faces the end.

In epistemology which had been dominant during the modern period, humans were identified with the world of consciousness of single self that can make a clear and distinct judgment as suggested by Descartes. In contrast, the cognitive system of a human subject in posthuman thinking can be expressed as 'distributed cognition.' Edwin Hutchin addressed the idea of distributed cognition by giving an answer to John Searle's "Chinese room" puzzle.[26] Hutchin made a neat interpretation that it is not Searle but the entire Chinese room, namely the system that knows Chinese. Modern people are capable of more sophisticated cognition than cavemen not because moderns are smarter, Hutchin concludes, but because they have constructed smarter environments in which to work. From his point of view, cognition and decision-making is not reserved for humans alone. Cognition is distributed to various agents ranging from the blind man's stick mentioned in the chapter 1 to smart phone and highly complicated steering system of a navy vessel. As Stelarc's *the Third Hand* was given as an extreme example, humans will live a life in partnership with more and more intelligent machines. As Hayles made a good point, the prospect of humans working in partnership with intelligent machines is not so much an usurpation of human right and responsibility as it is a further development in the construction of distributed cognition environment which has been evolved for thousands of years.

---

[23] Hayles, op. cit., p. 286

[24] F.J. Varela, et al., *The Embodied Mind*, The MIT Press, 1993

[25] Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence*, Harvard University Press, 1988, pp. 109-110

[26] Hayles, op. cit, p. 288-289; John Searle suggested "Chinese room" as a case to challenge the idea that machines, like humans, can think. He said that he will be able to communicate in Chinese by referring to textbooks in the Chinese room even if he knows not a word of Chinese. John Searl, *Minds, Brains and Science*, Harvard University Press, 1986, pp. 32-41

Before finishing the paper, let me summarize the topics of discussion that I mentioned at the beginning. How the Umwelt that Uexküll defined as the phenomenal world of living organisms, especially animals, can be the ecosystem of posthuman distributed cognition including artificial intelligence? Didn't Uexküll as a biologist suggest Umwelt to distinguish organisms and non-organism?[27] In the next chapter, I would like to sum up this paper by delving more elaborate answer from Claus Emmeche's study on biosemiotics. I believe Emmeche's study will give a strong back-up to Hayles' argument.

5. Conclusion: Umwelt and Biosemiotics

Hayles discussed the posthuman epistemology, focusing on "posthuman" as human beings articulated with intelligent machines not as robots or cyborgs. To forecast the future of posthuman, we need to draw a distinction between the changing modes of embodiment of humans and the modes of embodied artificial intelligence similar to human, i.e., cyborgs or androids.

Emmeche claims that a robot can have an Umwelt like animals or humans.[28] It doesn't mean that he gives the same epistemological status to organisms and non-organisms. Instead, he founds his own biosemiotics position, 'qualitative organicism,' based on C.S. Peirce's semiotics and distinguishes it from traditional organicism. In qualitative organicism, Emmeche categorizes the types of embodiment and investigates the plausibility that a robot can have an Umwelt.

He distinguishes an organism, the object of biological observation, and the body which is biological and social at the same time and suggests the four different categories of embodiments as follows: physical, organismic, animate and anthropic embodiments.[29] Physical embodiment refers to all sorts of bodies governed by thermodynamics and organismic embodiment means the embodied body of all organisms including vegetative body. Animate embodiment indicates the level of embodiment that enables the perception and action of animals, which was the main interest of Uexküll, and anthropic embodiment refers to the ontological status of human and artificial life such as robot that enact both biological and social roles. Put it simply, Uexküll's Umwelt extends to the epistemology of intelligence machines in the anthropic embodiment.

---

[27] Thure von Uexküll, op. cit., p. 152

[28] See Claus Emmeche, "Does a robot have an Umwelt?: Reflections on the qualitative biosemiotics of Jakob von Uexkull," *Semiotica*, 134:1, 2001

[29] Claus Emmeche, "A Biosemiotic Note on Organisms, Animals, Machines, cyborgs, and the Quasi-autonomy of Robots," *Pragmatics & Cognition,* 15:3, 2007, pp. 468-472

Even though anthropic embodiment of both human and intelligent machines constitutes social roles, Emmeche notes that the two forms should be distinguished. He explains that societal embodiment of the quasi-autonomous body such as "cyborg body" is a special form of human-social embodiment and it is intrinsically connected to technology dissolving sharp body/machine boundaries. Though cyborgs cannot be simply considered as social in the sense of being social animals as Aristotle's description of human as a "political animal," cyborgs are emphatically "human-social," being part of a society with division of labor, institutional subsystems, social roles, cultures, etc. [30] Also, considering humans are evolving into the societal body dependent upon technology, the justification to clearly distinguish the embodiment of human and cyborg will be much slighter.

Emmeche could apply Uexküll's Umwelt theory to artificial machines like robots since he was inspired by semiotics of Peirce who expanded the sign process or the scope of semiosis[31] to behavioral reactions of animals and even to all physical phenomena beyond human communication. In the context of Pierce's semiotics, the sign process does occur even if there is no subject to interpret a sign. For instance, even if a subject, whether it being human or animal, does not interpret, the lightning is a sign that thunder will follow, and the fossils of dinosaurs are the signs that dinosaurs existed in the past.

In Peirce's Synechistic principle that regards the things of the world as exist in a continuum, a distinction between organisms and non-organisms is meaningful only when dealing with narrower issues. In other words, in Peirce's viewpoint, Umwelt theory that can be seen as a case of semiosis basically does not carry different implications from the feedback loop of machines. Keeping in mind that the human embodiment has not only biological meaning but also social and cultural-anthropologic meanings, physical differences between humans and intelligent machines are imperceptible compared to semiotic continuity of both entities.

Although Uexküll has developed the idea of Umwelt based on animal studies, he postulated Umwelt for all creatures including plants. If presuming that humans can have their own Umwelt distinctive from other animals is possible, it is plausible to discuss the Umwelt of intelligent machines in this context. If the prosthetic present closely related to technology is heading to the future of artificial lives such as robots as independently existing entities, the contemplation on the Umwelt of artificial machine as a form of evolved human species would provide us with significant implications, whether we call it the "human

[30] Emmeche, ibid., p. 471

[31] "Semiosis" is a neologism coined by Peirce to refer to the continuous process of sign interpretations that involves signs, objects and interpretant. An "interpretant" doesn't refer to an interpreter, but an interpreted meaning in relation to the object of sign.

ecosystem" or "posthuman ecosystem."

References

Bateson, Gregory, *Steps to an Ecology of Mind*, Jason Aronson Inc., 1972(1987)

Deely, John, "Semiotics and Jakob von Uexküll's Concept of Umwelt," *Sign Systems Studies*, 32:1, 2004

Emmeche, Claus, "Does a robot have an Umwelt?: Reflections on the qualitative biosemiotics of Jakob von Uexkull," *Semiotica*, 134:1, 2001

_____, "A Biosemiotic Note on Organisms, Animals, Machines, cyborgs, and the Quasi-autonomy of Robots," Pragmatics & Cognition 15:3, 2007

Hayles, K.N., *How We Became Posthuman*, The University of Chicago Press, 1999

Hoffmeyer, Jesper, "Biosemiotics: Towards a New Synthesis in Biology," *European Journal for Semiotic Studies*, 9:2, 1997

Kull, Kalevi, "On Semiosis, Umwelt, and Semiosphere," *Semiotica*, 120:3, 1998

_____, "Jakob von Uexküll: An Introduction" *Semiotica*, 134, 2001

Lagerspetz, Karl, Y.H., "Jakob von Uexküll and the origins of cybernetics," *Semiotica*, 134:1, 2001

Maturana, Umberto, et al. *Der Baum der erkenntness* (Choi Hoyoung, Trans.). Galmuli Publishing, 2007

Maturana , Humberto and Francisco Varela, *Autopoiesis and Cognition: The Realization of the Living*, D. Reidel, 1980

Moravec, Hans, *Mind Children: The Future of Robot and Human Intelligence*, Harvard University Press, 1988, pp. 109-110

Peirce, C.S., *The Essential Peirce 1, 2*, Indiana University Press, 1992, 1998

Smith, Marquard (ed.), *STELARC: The Monograph*, The MIT Press, 2007

Varela, F.J. et al., *The Embodied Mind*, The MIT Press, 1993

von Uexküll, Jakob, *A Foray into the worlds of Animals and Humans*, trans by Joseph D. O'Neil, University of Minesota Press, 2010

von Uexküll, Thure, "The Sign Theory of Jakob von Uexküll." Krampen et al. (ed.), *Classics of Semiotics*. New York: Plenum, 1987

von Uexküll, Thure, et al, "Endosemiotics," *Semiotica*, 96:1, 1993

Yakhlef, Ali, "Towards a Post-human Distributed Cognition Environment," *Knowledge Management Research & Practice*, 6, 2008

"PING." *Terms Korea.* Nov.1999. Web. Sep. 2014. <http://www.terms.co.kr>.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 3

Parallel Session 1–3
Biologism and Humanism

Advance Directive: From a Stopgap Measure to a Key Value in Medical Decision Making

Eunmi Ahn, Ockjoo Kim (Seoul National University)

–

Science Fiction and Human Creativity on Evolution

Youn-ho Oh (Ewha Womans Univeristy)

–

Can Darwinism Undermine the Idea of Human Dignity?

Rong-Lin Wang (National Taiwan University)

–

Is Biologism Based on Metaphor? : Examining Biologism through Studying the Relationship of Metaphor and Science

Sun-Ah Kang (Advanced Institutes of Convergence Technology, Seoul National University)

Advance Directive: From a Stopgap Measure to a Key Value in Medical Decision Making

Eunmi Ahn, Ockjoo Kim
Seoul National University

Medical care is by no means value neutral. It is a double-edged sword of potential beneficial treatment effects and detrimental side effects. The notion of doing everything medically possible is often not desirable from ethical and legal standpoints (Michael de Ridder, 2011). In the era of rapid ageing, which leads to increases in the development of cancer and chronic, debilitating diseases, the limits and contradictions of rash medical care decisions have been laid bare.

The Korean society has raised questions concerning the side effects of rash life support decisions over the past two to three decades. In July 2013, the National Bioethics Committee (NBC) issued the Recommendation on Policy Concerning Patients' Self-Determination on Life-Sustaining Treatment. This Recommendation recognises that every patient has the right to make an end-of-life (EoL) care decision, and that it should be based on the patient's own wishes explicitly expressed, reasonably assumed, or unanimously consented to by family members (2013 Annual Report of the NBC).

The Recommendation presented the preparation of an Advance Directive (AD) and Medical Order for Life Sustaining Treatment (MOLST) as a representation of patients' wishes. An AD refers to an official document, signed by a competent person, to provide guidance for medical and health care decisions in the event the person becomes incompetent to make such decisions. The purposes of ADs are to protect the rights of patients in the event they are unable to make their wishes known, and guarantee death with dignity consistent with the patients' preferences and thoughts about death. It should be noted, however, that the ADs cannot replace explicit expressions of patients, as long as the patients are deemed capable

of making reasonable judgments.

However, in Korea, experts from medical and legal communities largely led discussions surrounding ADs, while the involvement of patients and laypersons—possible decision makers—has been rare. It also seems that attention paid to the agent of decision, the patient, has been vastly insufficient compared to that paid to making the decision whether to withhold or withdraw life support.

This study aims to critically review medical practices, discussions about the introduction of ADs, and perspectives of stakeholders, in the light of the value, 'respect for patients' right to self-determination'. Furthermore, the study reviews challenges for the AD to aid the dignified death of the patient, not merely to justify withholding or withdrawing life support.

1. EoL Decision Making Practices in Korea

Today, hospital deaths of elderly patients account for 70% of total deaths (Gye So-shin, 2012). The advancements of medical technologies and social changes, such as the rising share of elderly populations and increases in the number of nuclear families, mean that hospitals will become more common settings for death. In the past, physicians often accepted hopeless discharge, withholding or ceasing life support, or allowing patients whose conditions were beyond recovery to withdraw and go home, after explaining the situation to family members, and according to the decisions made by family members.

It was also true that family members held sway over health providers, even if there were clear expressions by patients that they would not receive any life-sustaining treatment such as Cardiopulmonary Resuscitation (CPR). It has been quite difficult to separate the wishes of patients from those of family members, because families largely determined decisions on medical treatment, nursing of patients and paying the medical bills. Moreover, medical staff members did not pay attention to patients' own wishes, which can differ from those of family members.

However, in 1997, the Boramae Hospital case put the brakes on the practice concerning life-sustaining treatment. Physicians in this case agreed to the claim of the wife of the patient, who signed a discharge against medical advice and withdrew her husband from the hospital. The patient died minutes after leaving the hospital. The police considered this case as an unnatural death, and charged the wife and the physicians with homicide. Finally, in June 2004, the Supreme Court affirmed the murder convictions of the patient's family members and the physicians as assisting in the crime. The Court held that, although the physicians had followed the wishes of the family members, the physicians were responsible for allowing the patient to be discharged, knowing the patient would die. It was a turning point, and physicians stopped taking decisions on life support without considering the wishes of the patients (Kim Myung-hee, 2013). As a result, most physicians took a defensive stance when it came to the provision of life-

sustaining treatment (Jeong Jae-woo, 2013).

The right of patients to make decisions on life support once again drew public attention with the Grandma Kim case in 2008. Due to a cardiopulmonary arrest during a biopsy for lung cancer diagnosis, Grandma Kim fell into a vegetative state. Physicians at Severance Hospital placed the patient on a ventilator and feeding tube. However, her family members filed an injunction against the hospital's life-sustaining treatment, based on the usual wishes expressed by the patient before the incident. The District Court and the Supreme Court ordered removal of the patient's ventilator and feeding tube. Although this case may seem to be the opposite of the Boramae Hospital case decided by the Supreme Court in 2004, the court commonly regards the patients' own wishes as the top priority. The former case addressed sustaining treatment; the latter case addressed withholding treatment.

The two cases sparked debates over patients' rights to make decisions on life support care in Korea. As a result, the Korean Medical Association (KMA), the Korean Academy of Medical Sciences (KAMS) and the Korean Hospital Association (KHA) published the Guideline on the Withdrawal of Life-Sustaining Treatment, while the Korean government initiated discussions over life-sustaining treatment by forming the Council for Life-Sustaining Treatment Withdrawal Policy in 2009. In 2013, the NBC released the Policy Recommendation on Concerning Patients' Self-Determination on Life Support.

Policy research similar to that of the NBC pointed out that many decisions regarding life support care have regarded the burden on families as the highest priority, rather than patients' own wishes. The survey was conducted online, targeting members of the Korea Alliance of Patients Organization, which includes both patients and family members (Lee Il-hak, 2013). In this study, a majority of respondents agreed to the necessity of withdrawing or withholding life-sustaining treatment (72.3%) because of sufferings of family members (69.4%), painful treatments (65.8%), financial burdens (60.2%), and patients' wishes (45.2%).

In the same study, it was found that physicians and family members led decisions on life support in high-level general hospitals, regardless of the patient's consciousness or communicative competence. In 211 general hospitals studied, there were 13 cases of withholding or withdrawing life support. Among these cases, only three were based upon oral expression while the rest of the cases were based upon a surrogate decision (Lee Il-hak, 2013). This result is consistent with existing reports by oncologists from university hospitals (Song Tae-joon, 2008) and intensive care units (Lee Gwang-ha, 2008), which reveal that most of the decisions to withdraw or withhold CPR were based on the agreement between physicians and family members.

2. Discussions over the Introduction of ADs in Korea

1) The Guideline on the Withdrawal of Life-Sustaining Treatment of KMA, KAMS, and KHA

The medical community issued the Guideline on the Withdrawal of Life-Sustaining Treatment in the aftermath of the court's ruling in the Boramae Hospital case. The Guideline suggests physicians respect patients' decisions on 'passive euthanasia', such as removing a ventilator or withholding CPR for terminally ill patients with little chance of recovery, or for patients in a vegetative state for more than six months. However, the Guideline also mentions that the consent of family members, psychological suffering, or financial burdens on family members can be considered in the decision making process, and states that a health care proxy or legal representative may decide on behalf of patients when they are incompetent to make a medical decision.

2) The Council

The Korean government established the Council for Life-Sustaining Treatment Withdrawal Policy, consisting of 18 people from faith-based groups, medical and legal communities, NGOs and the National Assembly, in December 2009. The Council discussed six major issues surrounding life support: who should be subject to the withdrawal of life support; the scope of treatments to be withdrawn; the process of preparing an AD; recognition of surrogate decisions and assumption of patients' wishes; the decision-making body, and legislation. The Council members saw eye-to-eye on four of the six issues: who should be subject to the withdrawal of life support, the scope of treatments to be withdrawn, AD preparation process, and the decision-making body. However, they could not iron out their differences on the remaining issues of surrogate decisions and legislation (Lee In-young, 2013).

3) Moves toward Legislation

In January 2009, the Citizens' Coalition for Economic Justice submitted a legislative petition to the National Assembly for a law on dignified death that would establish policy mechanisms for the sake of human rights of terminally ill patients, such as the official recognition of living wills and ADs, based on respect for the patients' right to die with dignity. (Kim Myung-hee, 2013).

During the 18th National Assembly in 2009, two parliamentarians, Shin Sang-jin and Kim Se-yeon, proposed the Law on Dignified Death, and the Law on the Right to Natural Death in the End of Life, respectively. However, these two proposed laws were not properly deliberated, and were discarded at the end of the 18th National Assembly (Kim Yang-joong, 2013).

4) The Guideline of the NBC

The NBC, which provides advice directly to the president, officially brought the issue of life support withdrawal to the top of the agenda in November 2012, during the Committee's third term. As a result, a formal discussion of life support began. The Committee established the Special Committee for Policy on Withdrawal of Life-Sustaining Treatment. What is significant about the Special Committee is that it brought members of the Council formed in 2009 together with the representatives of the Korea Alliance for Patients Organization to better reflect the opinions of patients, who are the main stakeholders in life support decisions.

The Special Committee drew up the Recommendation on Life Support Decisions after five official meetings and one public hearing. In this Recommendation, the Special Committee recognised that terminally ill patients have the right to withhold or withdraw life support such as CPR, ventilators and chemotherapy; they can also choose hospice or palliative care as alternatives. The Recommendation also mentions that proper decisions can be made by estimation through reasonable processes, or by a health care proxy when there are no declared or estimable wishes. At the time of the Special Committee deliberations, recognition of decisions made by a health care proxy was a thorny issue. After discussing this issue, the Special Committee cautiously decided that a surrogate decision could be recognised if the decision was made by a formal attorney or unanimous consent from family members was obtained and confirmed by two doctors.

The NBC titled the recommendation made by the Special Committee for Policy on Withdrawal of Life-Sustaining Treatment as the Recommendation on Policy Concerning Patients' Self-determination on Life-Support (Jeong Jae-woo, 2013). The change of the title might have reflected the Committee's judgment that public discussion would be possible only about patients' rights to make the decision, and not about the withdrawal of life support.

3. Stakeholders and Their Values in the Introduction of an AD

Diverse stakeholders, including faith-based groups, medical, legal, and ethics communities, health insurer, patients, and their families, took part in discussions concerning the introduction of an AD in life support decisions. During discussions over ADs, Respect for a patient's right to self-determination was just one of many issues considered during the AD discussions.

1) Medical Community

Along with patients, the medical community is one of the key stakeholders in life support decisions (Barnato, 2013). The community is also the most active and vocal stakeholder. Physicians are the first-

hand witnesses of the abuse of rash life-sustaining treatment. They were also held legally accountable for their role in the Boramae Hospital case. As a result, it is only natural that physicians desperately demanded a policy framework upon which they could make their own practice decisions regarding life support. For these reasons, physicians focused on persuading the public that withdrawing life support is often unavoidable, and on requesting the removal of legal liabilities when decisions are made after following reasonable procedures. The stance of physicians has been a major driving force behind the progress of discussions regarding decisions on life-sustaining treatment in Korea.

Notwithstanding their endeavours, we have to be aware of the divided loyalties of physicians arising out of their position, and the possibility of self-justification (Beauchamp & Childress, 2013). Though physicians must be faithful to their patients' interests, in the real world, they cannot ignore opinions of family members. In addition, since physicians are the gatekeepers, responsible for using medical resources of the society efficiently within the boundaries of the national health care system and are often legally liable for their life support practice decisions, they are more easily focused on the life support decisions than on patients' rights to self-determination.

For example, the KMA was generous to physicians on the issue of surrogate decisions in its Guideline on the Withdrawal of Life-Support Care by suggesting that an attorney or health care proxy for a patient can make decisions on behalf of the patient when the patient is incompetent. Taking it a step further, the KMA argued that it is necessary to consider a family member's own stance by suggesting 'the consent of family members, and the psychological and financial burdens of family members need to be taken into consideration in addition to the medical status of patients' (KMA, 2009).

In a similar vein, the NBC suggested that it is necessary to recognize the wishes of patients in a broader sense, since life support decisions are largely family-oriented in the real world. In particular, the Committee requested verification by the Hospital Ethics Committee only 'when there are differences of opinion between patients' families and physicians or when family members disagree' (NBC, 2012).

2) Patients and Their Families

Patients and their families are the main agents of decisions. Although several civil society organizations were engaged in the 2009 Council, it was not until 2011 that representatives of patients and families participated in discussions organized by the Special Committee for Policy on Withdrawal of Life-Sustaining Treatment.

The patient and family representatives expressed both sympathy for needing a formal system of life support decision making, and deep concerns about possible abuses. In particular, they raised a potential conflict of interest between patients and their families. The representatives urged preventive measures be taken prior to implementing the system; they also urged viable alternatives such as hospice or palliative

care; support for financially burdened families, and mandating sufficient explanations by health care professionals (NBC, 2013).

It is significant that patients and their families raised a conflict of interest issue between patients and the rest of the family members. Even if it is families that greatly influence the decision-making process, pay the bills, and care for the patients, families and patients need to be seen as independent variables. There is a report that concludes the family's estimation of a patient's wish is not really accurate (Shin, 2011). A nationwide survey also reveals that family members regarded the sufferings of family members (69.4%), the efficacy of painful treatment (65.8%), and financial burdens (60.2%) as more important factors than the wishes of patients (45.2%) (NBC, 2012). In fact, it is very risky to assume that 'heart to heart' relationships exist between patients and their family members.

3) Health Insurer (National Health Insurance Service)

Life support issues are not someone else's story to the health insurer, represented by the National Health Insurance Service (NHIS), because dying is expensive in the modern society (Sifferlin, 2013). The insurer has been closely observing the life support care discussion, along with the medical community, patients, and their families.

It seems that the NHIS attempted to pull the strings behind the scene. A case in point was the November 2012 controversy surrounding nationwide campaign against futile life-sustaining treatment. During the annual negotiation with the KHA, the NHIS agreed to increase the level of standard medical payment, on the condition that the KHA launch a nationwide campaign against futile life support. This behind-the-scene arrangement, which drew fierce criticism from the public, was brought to light through an annual National Assembly audit of the Ministry of Health and Welfare. Afterwards, the KHA modified the statement 'the KHA launches a nationwide campaign for the prevention of chronic diseases and against futile life support' into 'the KHA launches a nationwide campaign for the prevention of chronic diseases and elderly health'. This incident illustrates that the insurer considered the withdrawal of futile life support as an option to efficiently manage the national health care budget in the rapidly aging Korean society.

There is a similar situation in the United States. In 2009, the Senate attempted to establish a law designed to incentivize advance care planning by considering cash rewards to those who provide counselling. The Medicare Choices Empowerment and Protection Act, introduced in April 2014, also suggests a one-time payment incentive of $75 to each eligible beneficiary who adopts and registers an AD through online processes, or $50 for using a manual process (The Library of Congress, 2014). It is fair to assume the bill reflects the view that making the payment to those who register an AD is a reasonable

and efficient way to reduce medical costs of EoL patients.

4) Legal Profession

The legal profession is trying to make its voice heard to address its administrative needs in the discussion of life support. It would be quite burdensome and inefficient for families and hospitals to seek court decisions whenever a decision is made on life-sustaining treatment. The absence of laws on this issue also causes uncertainty and confusion (Lee Il-young, 2013). The perspective of the legal profession is clear from the Supreme Court's ruling in the Grandma Kim case in 2012. The Court has put emphasis on patients' rights to self-determination by stating that life-sustaining treatment may be withdrawn if a patient is nearing death with little possibility of recovery, and exercises his or her rights to pursue happiness and to die with dignity.

5) Faith-Based Groups

Faith-based groups, including Catholic churches, Protestant churches, Won-Buddhist temples and Buddhist temples were represented in the first Council organized in 2009. In the matter of life or death, faith-based groups argued that patients' wishes need to be confirmed explicitly, and surrogate decisions cannot be considered the same as the decisions of patients, no matter how close they are. In other words, they place patients' preferences ahead of any judgment made on behalf of patients.

4. Challenges for an AD to Serve as a Tool to Protect Patients' Rights to Self-Determination

1) Tensions between Dignified Death and Instrumental Value

The policy framework related to decisions on life support, including an AD, is designed to guarantee patients in the dying process dignified death consistent with their cherished values. However, we need to reflect on whether there is social pressure inducing patients to make a specific choice by magnifying instrumental values, such as relieving pain, reducing family burdens and efficiently using health care resources, as sufficient conditions for dignified death. The Special Committee for Policy on Withdrawal of Life-Sustaining Treatment decided to change some terms used during its discussion, reflecting its views on instrumental purposes (NBC, 2013).

▶ Futile life-sustaining treatments → Life support

Since the adjective 'futile' is not value neutral, it shall not be used. To the extent that 'treatments' can be understood as necessary medical measures administered to save patients, the withdrawal of treatments may be perceived as an unethical action. Thus, the term 'life support' shall be adopted for

neutrality.

▶ Withdrawal → Decision

Instead of choosing the term 'withdrawal', the term 'decision' shall be adopted, as it is a broader term that comprehensively encompasses the concepts of withholding care and advance care planning that are commonly exercised in the medical field.

Without watching over these tensions and preparing for cultural and political changes to respect self-determination and patients' values, any policy on life support may be misused as an unethical instrument that induces patients into ready-made conclusions. In this environment, an AD may be nothing more than a tool to avoid responsibility.

2) Hopelessness or Realistic Hopes for Death with Dignity

Preparation for an AD needs to start from the question of 'How I want to die' (Michael de Ridder, 2011), or 'How to find realistic hope for dignified death' (Hagerty, 2005), instead of focusing too much on support care decisions. Dignified death can include some instrumental values. The Good Death Inventory (GDI), which was developed in Japan and verified in Korea (Miyashita, 2008; Shin, 2012), provides examples of values.

- ◆ Environmental comfort
- ◆ Life completion
- ◆ Dying in a favorite place
- ◆ Maintaining hope and pleasure
- ◆ Independence
- ◆ Physical and psychological comfort
- ◆ Good relationship with medical staff
- ◆ Not being a burden to others
- ◆ Good relationship with family
- ◆ Being respected as an individual
- ◆ Religious and spiritual comfort

- ◆ Receiving enough treatment
- ◆ Control over the future
- ◆ Feeling the worth of one's life
- ◆ Unawareness of death
- ◆ Pride and beauty
- ◆ Natural death
- ◆ Preparation for death

What kind of patients would like to withhold life support just because they are afraid that the administration of CPR will break their ribs, do not want their children to bear the burden of paying for medical expenses, or consider care not cost effective? How would a healthy person accept that he or she will eventually be in the same situation? Maintaining physical well-being and dying without being a burden to anyone are not sufficient conditions for dignified death. In the face of death, it is a person's right to have realistic hopes of his or her own.

3) Sharing with Families or One-Way Notification

As the family-oriented decision-making process is well established in Korea, patients' own values and intents need to be sufficiently shared with family members to prepare for a situation in which an AD takes effect. In the Korean culture, patients exhibit a strong tendency to put their families first when making decisions (Ko Yoon-seok, 2012) and physicians are not in a position to ignore the preferences of family members when patients are unable to express what they want.

Dr Ko Younsuck argued that an AD needs to be utilized as a communication tool between patients, family members and health workers in the process of drawing up an advance care plan, and not as another meaningless document that needs to be signed in hospitals (Ko Yoon-seok, 2012). An AD fulfils its functions when it gives patients the opportunity to articulate realistic hopes for dignified death and to share them with their family members. When common ground exists, even a health care proxy can mediate a detailed EoL care plan. In many cases, preparing an AD may be a more natural process to protect patients' wishes than by legal processes alone.

4) Private Decision or Stated Conclusion

There should be no single answer to EoL care plans. Life support may be administered, withheld, or withdrawn according to patients' wishes and values (Krutein, 2009). Patients and family members who

often make health care decisions may have a reason to believe that painful and burdensome medical processes are worth undergoing, even if they realize that their conditions have progressed too far for recovery. They may want to try as many available options as possible before dying, may need some time to accept and understand the situation (Kübler-Ross, 1969), and may want to take time to prepare something to leave behind.

A nationwide survey in 2011 revealed that 72.3% of adult respondents agreed with the statement 'futile life support can be stopped' (NBC, 2012). However, how many people can still think the same if physicians or family members have prepared conclusion before the patient can accept his or her condition (Kübler-Ross, 1969)? How many physicians or family members can actually adhere to the statement before the patient has accepted his or her condition? How can physicians, human beings who have emotion and interests, discuss care plans with patients without deceiving themselves? How should sons and daughters discuss EoL care plans with their beloved parents if they cannot afford life-support care or hospice care?

Our society has largely neglected the issue of death. Public discussion of the EoL care issue would be possible only when we stay away from any specific conclusion.

5) For Death with Dignity, Can Our Society Open the Wallet on Behalf of Family Members to Ensure That Decisions of Patients Avoid the Violations of the Freedom and Rights of Others?

Patients can make decisions on life support in a way consistent with their values for dignified death only when they know that their decisions do not violate the rights and freedom of others. In the words of the elderly in Korea, 'I hope not be a trouble to my children'-.

For example, medical and care costs have largely been borne by family. However, putting patients in a hospice care, which can be a viable alternative, is not covered by insurance. If patients understand this situation, they may feel pressured to exercise their so-called rights to self-determination in a way that minimizes burdens borne by family members.

How much are we willing to spend on life support, hospice, and palliative care and nursing to ensure the dignified death of the members of our society? In our society, the options of hospice and palliative care have taken a back seat to the efficient utilization of limited resources under the national health insurance budget. However, without substantial support, 'the policy on patients' rights to self-determination on life support' would be no more than 'the policy on the withdrawal of life support'.

6) Medical Practices: Patient-Oriented Decision-Making through Care Continuums

A patient' right to self-determination should be respected, especially in the EoL care plan, since it can be

an issue of life and death, and there is no way to weigh the benefit and harm of a decision.

However, the respect for patients' rights should not be confined to those terminally ill. The wishes and rights of patients need to be respected and protected through the health care continuum. In fact, the wishes of patients should be of paramount importance, and patients should be included in the decision-making process. It cannot be a convenient alternative, reduced to explaining to, and discussing with, only smart or solvent family members while excluding capable patients.

Otherwise, physicians and family members urge patients to write an AD in the name of death with dignity when the patient become nearly incompetent, while leaving the patient out of decision making when he or she is competent throughout the care continuum. This strange scenario should be deemed unacceptable and inhumane. In addition, if physicians have not respected the preferences of patients throughout a treatment process, it is hard to expect that patients would calmly accept a notification of their death and make their wishes clearly known, no matter how detailed the explanations are that doctors provide.

To truly respect the rights of patients regarding their life support plans, there should first be established a medical culture in which patients have early involvement in the treatment process, and physicians listen to their wishes.

III. Conclusion

An AD should be regarded as a tool to guarantee patients' rights to self-determination, and not as a medical expedient. Patients' rights to decide to proceed with, withhold, or withdraw from life support need to be respected. It is clear from the progress of discussions about life support—from the Boramae Hospital case to the Recommendation on Policy Concerning Patients' Self-determination on Life Support announced by the NBC—that our society has focused on making a policy that puts patients in the drivers' seats when it comes to life support choices.

There is no doubt that this progress represents a significant step forward in our society, which has neglected any candid discussion about death. However, we have also confirmed that instrumental values, such as alleviating the pain of terminally ill patients, lessening the burdens on families, and efficiently utilizing limited health resources, can collide with dignified death and the rights of patients to self-determination.

For patients to be able to choose life-support care for themselves, they should be able to think about what dignified death means to them, and have confidence that their rights will be respected, and that medical and nursing expenses will be paid, no matter what decisions they make.

It is our residual obligation to help patients mull over realistic hopes toward dignified death and share them with family members, grant patients the freedom of choice, provide social assurance that patients' decisions will not be overly burdensome to their families, and strengthen a culture of respecting patients' wishes throughout treatment processes. They are challenges for an AD can serve its role as a mechanism that protects the patients' rights to self-determination.

Reference

고윤석, 국내 병원의 연명치료 현황. 대한의사협회지. 2012 55(12): 1171-1177

고윤석, 의사의 관점에서 본 연명의료에서의 환자의 자기결정권, 2013 의료정책포럼 11 (3)

김명희, 연명의료결정에 관한 권고안의 배경과 향후 과제, 보건복지포럼. 2013 11 (3)

김양중, 연명의료 중단, 안락사, 고려장, 그리고 언론, 보건복지포럼. 2013 11 (3)

계소신, 고령 한국인의 사망장소에 영향을 미치는 요인. 서울대학교 보건대학원, 2012.

미하엘 데 리더, 우리는 어떻게 죽고 싶은가, 2011 학고재

이인영, 법학자의 관점에서 본 연명의료의 환자결정권 보장과 제도화 방안. 보건복지포럼 2013 11 (3)

이일학, 무의미한 연명치료중단의 합리적 제도화 방안 연구 2013

정재우, 권고안에 대한 윤리적 평가와 바람직한 연명의료 결정의 방향. 의료정책포럼 2013 11 (3)

Barnato, Physicians' Decision-Making Roles for an Acutely Unstable Critically and Terminally Ill Patient* Crit Care Med. 2013 Jun;41(6):1511-7.

Barnato, Physicians Looking in the Mirror: How We May Influence the End-of-Life Decisions of Surrogates* Crit Care Med. 2013 Jul;41(7):1814-5.

Barnato, The "PrOMIS" of things to come* Crit Care Med. 2007 Apr;35(4):1193-4.

Beauchamp, Childress, Principles of Biomedical Ethics, 7th edition. Chapter 8 2013 Oxford University Press, New York

Dong Wook Shin et al., Discordance in perceived needs between patients and physicians in oncology practice: a nationwide survey in Korea. JCO 2011 20;29(33):4424-9

Hagerty RG, Butow PN, Ellis PM et al. Communicating prognosis in cancer care: a systematic review of

the literature. Ann Oncol 2005;16:1005–1053.

Kübler-Ross, E. (1969) On Death and Dying, Routledge, ISBN 0-415-04015-9

Krutein M. The Real Issues of End-of-Life Care. TIME 17 Aug. 2009

Miyashita M, Morita T, Sato K et al. Good death inventory: a measure for evaluating good death from the bereaved family member's perspective. J Pain Symptom Manage 2008;35:486–498.

NBC Annual Report, 2012 (http://www.nibp.kr/xe/board_ahSp81/10906)

NBC Annual Report, 2013 (http://www.nibp.kr/xe/board_ahSp81/10909)

Sifferlin A, How to get paid for planning your death. TIME 2014.5.8.

Shin DW, Choi J, Miyashita M et al. Measuring comprehensive outcomes in palliative care: validation of the Korean version of the Good Death Inventory. J Pain Symptom Manage 2011; 42:632–642.

The Library of Congress, Bill Summary & Status, 113th Congress (2013-2014) S.2240 URL http://thomas.loc.gov/cgi-bin/bdquery/z?d113:s.2240: Accessed 2014.7.30

Science Fiction and Human Creativity on Evolution

Youn-ho Oh
Ewha Womans Univeristy

This study takes a close look at Frankenstein, a science fiction written in the early modern era by Mary Shelley, and Transcendence, a 21st century film directed by Wally Pfister, to identify how scientific knowledge is utilized to create new human species in the cultural context. Also, the study identifies and analyzes changes in evolutionary imaginations stemming from the development of new technologies and scientific knowledge ranging from evolutionary theory to quantum dynamics and nanotechnology. In this study, the author attempted to take a fresh approach to science fiction to reach a conclusion that cultural plots that cut across the fields of science and fiction are not always fake and fictional but can be reasonable and futuristic. Through this observation and analysis, the author tries to present a new vision for anthropology based on humanities in the 21st century.

1. Evolutionary Theory, Modern Novels and Science Fiction

Charles Darwin's the Origin of Species in 1859 touched off fierce debates over the subject of evolution and had greatly influences over the whole body of disciplines in the western world. Even after two centuries, evolution maintains its position as a topic that sparks heated discussion. The Origin of Species provided biological proofs of evolution which had been a hypothetic argument yet to be scientifically verified. It attempted to explain mechanisms by which new species are created through mutations based on the theory of natural selection. Great accomplishments of Darwin's masterpiece include the facts that it catapulted the evolutionary theory, which remained within the realm of art and hypothesis, to the place of science that can be understood in an objective and reasonable fashion and it investigated evolutionary mechanisms of natural selection, survival of the fittest and mutation based on biological evidence.

The work of Darwin had great impacts on science, politics, economy, society, literature and religion. The fields of literature and art absorbed evolutionary theory into their content and forms.

In Darwin's Plot[1], Gillian Beer focused on new plots that started to emerge in modern novels in the wake of Darwin's theory. Saying that a lot of authors such as George Eliot and Thomas Hardy,

1) Gillian Beer, 『Darwin's Plot』, Translated by Nam Gyung-tae, Humanist, 2008.

actively assimilated the language of Darwin into their works, he observed and dealt with the relationship between evolutionary theory and 19th century English literature in an interesting and thought-provoking manner. He not only showed his interest in biological facts but also paid attention to Darwin's understanding of humanities and literature embedded in his writing and discussed analogy, metaphor and narrative of the Origin of Species to uncover friendly relationships between scientific and literary discourses and to analyze a series of processes through which scientific studies were transformed into literary imagination. George Levin reckoned in his book Darwin and the Novelists: Patterns of Science in Victorian Fiction[2] that novelists who have not read the work of Darwin were applying his theory and thoughts in their works, which allows us to observe and understand the role of Darwinism as a perspective in the modern western world.

An interesting fact is that while Darwin attempted to see how creatures have evolved in the environments of the planet over the past millennia in an objective manner, Darwinism expressed in modern novels mainly tried to merge their curiosity, imagination with scientific knowledge to create stories by asking questions such as how human beings have become what they are under certain conditions and how human beings will evolve in the future. In other words, new desires and grammars emerge in the process of fictionalizing scientific knowledge.

"Science always raises more issues than can be answered solely within the terms of scientific inquiry. It suggests, as Darwin so strongly did, questions about chance, about the future, about the very large and the very small, the near and far," Gillian said. Then, she asked "'What new tales are being unleashed from scientific work now? and what new forms for storytelling? Must there be new grammars for narrative?" His argument is certainly plausible as evolutionary theory played a significant role in the creation of 19th century modern novels in Britain and new scientific discourses such as quantum dynamics can provide new sources of plots and stories today.

In this study, the author attempted to cast a different look at science fiction as a genre that reenacts scientific knowledge in fictional plots. The word science (pronounced as *Gwa Hak* in Korean) originated from a Latin word scientia which refers to knowledge. Thus, science fiction can be understood as a genre that creates interesting scientific plots and fictionalizes knowledge. Since ancient times, humanity has fictionalized knowledge to survive. Based on this fact, it is important to understand how knowledge is fictionalized and how stories can be materialized in the future that has yet to come so that we can equip ourselves with a fresh perspective on science fiction in which the possibility of today and unpredictability of future come together. Science fiction revolves around futuristic plots based on prediction and human imagination to show what is possible or impossible in the future. This study takes a view that science fiction is not merely a genre under the broad scope of literature but a futuristic vision that utilizes scientific knowledge to create a futuristic vision that may materialize, and has features that help us understand lives and conditions of human beings.

Hugo Gernsback coined such terms as science romance and scientifiction to clarify the identity of

2) George Levine, *Darwin and the Novelists: Patterns of Science in Victorian Fiction*, University of Chicago Press, 1992.

science novels. From June 1929, Science Wonder Stories has made use of the term science fiction.[3] Fictional stories based upon scientific knowledge such as myths, legends and medieval chronicles existed well before the coinage of the term science fiction. "When Frankenstein was written by Mary Shelley, it did not belong to any genre that was invented and was not even considered a proper form of literature. It went on for a century"[4], reasoned Robert Scholes and Eric Rabkin, underscoring the importance of placing Frankenstein into the science fiction category even though science fiction was recognized as an official genre later. The statement that "Jules Verne is to science novels what Shakespeare is to literature" represented a view that it is not only works created after 1929 that are entitled to be named science fiction but works created well before on the condition that they revolve around scientific understanding and fictionalize imaginative knowledge.

The Genre Revolution Project[5], which was undertaken by a University of Michigan research team, studied revolution erupted in the 20th century science fiction based on a view that the literary products may live or die depending on whether they adapted to new environments just like the way in which creatures survive and perish[6]. The study discussed numerous literary stories that are exemplary in terms of cultural fitness. The findings suggested that the most successful stories have to do with genius medical doctors who make society shudder in fear. The plot that revolves around mad scientists who created monsters and creatures who decided to destroy themselves facing society's fear that they could lead to the destruction of mankind constitutes science fiction's key DNA.

Western Europe has attempted to fictionalize evolutionary imaginations and merge scientific knowledge with the imagination of fiction. From Frankenstein in 1818 to Transcendence in 2014, science fiction has served as a conduit through which people materialized their imagination with respect to human enhancement, genetic engineering and posthuman. These evolutionary imaginations are based upon the latest scientific knowledge in the areas of biology, evolution, genetic engineering, computer engineering and nanotechnoloy. By reenacting what is not possible today (human being and body), they try to provide intellectual insights into the future of humanity. Imagination on the subject of human evolution is one of the most important themes that have created numerous stories in the 19th century novels, 20th century films and 21st century digital culture and a factor that makes science fiction what it is.

This study's attempt to conduct a comparative analysis between Frankenstein (1818), a masterpiece that started the science fiction genre, and Transcendence demonstrates the author's desire to observe how evolutionary imagination has changed based on scientific understanding of times and to

3) Ko Jangwan,『The History of World Science Novels』Chaeryun, 2008, pp. 39-40.
4) Robert Scholes & Eric Rabkin, 『Science Fiction』, Translated by Kim Jung-su, Park Oh-bok, Pyungmin Publications, 1993, p.17.
5) http://www.umich.edu/~genreevo/
6) Eric S. Rabkin and Carl P. Simon, "Age, Sex, and Evolution in the Science Fiction Marketplace." Interdisciplinary Literary Studies 2.2(2001): 45-58. JSTOR. Web. 6Dec. 2012.

understand the desires of humans as finite beings that constantly worry about future that has yet to come. Although it is easy to see differences between the two works in terms of times and plots, they both tried to discuss in-depth the possibility and impossibility of human predictions for future societies and human conditions by deeply sharing fundamental problems of human evolution from a science point of view. Each work describes a dystopian future and evolutionary imagination by covering the areas of natural science, medical science, physics and quantum dynamics through creations of new species.

In looking at the novel and film from the perspective of comparative literature, the application of literary Darwinism is legit. As a discipline that is showing notable achievements of late in the area of literary study, literary Darwinism[7] absorbs core concepts in evolutionary theory and evolutionary psychology that provide explanations about human nature to connect them to the works of literature analysis.[8] [9] Literary Darwinism that provides a critical approach to literature from the view of Darwin's evolutionary theory shows how human nature has evolved through the processes of natural selection, adaptation and reproduction. This approach also depicts the processes in literary contexts and focuses on how we should interpret them. By analyzing literary formats such as the reenaction of human nature and the differences of perspectives, it tries to draw delicate and subtle literary meanings. Selection and mutation processes that are described in science fiction also require in-depth analysis. Literary Darwinism provides a theoretical foundation for this analysis.

2. Alchemistic Mechanic Human and『Frankenstein』

> "God makes all things good;
> man meddles with them and they become evil."
> -『Emile』by Jean-Jacques Rousseau

Frankenstein was written by Mary Shelley and was published in 1818. She was 18 years old and can be characterized by her creative narrative structure and delicate expressions for the illustration of human nature. Some critics call Frankenstein a proto science fiction in that it fictionalized

---

7) Refer to Denis Dutton, *The Art Instinct: Beauty, Pleasure, and Human Evolution*, Bloomsbury Press, 2009, Brian Boyd, Joseph Carroll, and Jonathan Gottschall, *Evolution Literature & Film: A Reader*, Columbia University Press, 2010 and Joseph Carroll, *Literary Darwinism*, Routledge, 2004.

8) Brian Boyd,『On the Origin of Stories: Evolution, Cognition and Fiction』, Humanist, 2013, p.537.

9) Joseph Carroll proposed to connect basic life-history goals - survival, growth, and reproduction - with the finest nuances of theme, tone and style in the organization of literary meaning in specific works. He underscored the universality of literary Darwinism by saying, "There is no work of literature written anywhere in the world, at any time, by any author, that is outside the scope of Darwin's analysis." Carroll emphasized that a cognitive behavioral system is indispensable to the formation of an adequate paradigm both in psychology and in literary study. He reasoned that literature does have an adaptive function and that understanding this adaptive function is a prerequisite to understanding human nature.

imaginations on human evolution based on the understanding of modern natural science.

As a daughter between intellectuals, William Godwin, a progressive intellectual, and Mary Wollstonecraft, a feminist, she grew into an intellectual equipped with ample intellectual legacies of that time. Under the intellectual atmosphere that her father and mother created, she started to study Shakespeare, Lessing, Voltaire, Ovid and Rousseau, history books and science books from around 1815 and kept a list of what she studied in her diary. In this way, she was able to acquire her insights into natural science and understanding of humanities before writing her novel.

Clues to the origin of evolutionary imagination of Frankenstein can be traced back to the preface that Mary's husband, Percy Bysshe Shelley, wrote. "The incidence upon which this fictional story is built is not entirely impossible according to the predictions of Dr.Darwin and a German physiologist", he mentioned. The incidence he referred to was the creation of new human species. Dr.Darwin was Erasmus Darwin, a grand father of Charles Darwin, and the German physiologist was Johann Frederick Blumenbach. Erasmus Darwin was a physician in Scotland who was interested in the blending of science and technology. He argued for cultural progress through this integration and influenced his grandson, Charles Darwin with respect to evolutionary theory.[10] Johann Frederick Blumenbach was a scholar and the father of physical anthropology who proved the value of comparative anatomy through his study of human crania. Although Percy admitted that the story was fictional, he said that it was scientific facts discovered by scientists in his time that constituted the basis of the story, not fakes and lies. He emphasized that the story was not impossible. Though evolutionary theory did not take a perfect theoretical shape between the end of 18th century and early 19th century, it presented new knowledge that helped people understand lives of mankind and provided a topic on which this story was developed.

In the novel, Victor Frankenstein expressed his favoritism towards science. "I like to study facts related to the real world," he said. "Natural science is a spirit that takes control of my destiny." After reading the works of Cornelius Agrippa, a physician, magician and alchemist in Germany in the 16th century, he was fascinated. Then, he also studied Paracelsus, a 16th century physician in Switzerland who was interested in chemistry and alchemy, and Albertus Magnus, a 13th century philosopher and scientist in Germany. "Under the guidance of my new preceptors, I entered with the greatest diligence into the search of the philosopher's stone and the elixir of life," said Victor as he was embarking on his journey to wisdom. Upon hearing from his father that electricity is the origin and nature of thunder and lightning, he was astonished to learn that contemporary natural science has taken the place of old scientific knowledge. At this time, there were many experiments that tried to prove that electricity is main driving force behind biological activities. Luigi Galvani, an Italian physician and anatomist conducted experiments on frogs in 1780 and witnessed muscular contraction. His nephew Giovanni Aldini experimented on dead prisoners and shocked the bodies to

10) Mentioning Zoonomia, a work of Erasmus Darwin, an English bishop Samuel Willberforce argued that Charles Darwin acquired core ideas in evolutionary theory such as common ancestor, survival of the fittest and sexual selection from his grand father.

observe changes[11]. Victor's creation of a monster is based upon this hypothesis surrounding electricity at that time.

Victor frowned upon natural science and dreamed of immortality and power that so many prominent scientists pursued. He became an avid reader of the works of Plinius and Buffon. Plinius was a historian and scholar of natural history and Georges-Louis Leclerc, Comte de Buffon also studied natural history and wrote an encyclopedia consisting of 36 books in which he argued that every creature came from one ancestor in various forms by natural laws or by accident[12]. He was a teacher of Jean-Baptiste Lamarck who argued for evolutionary theory in 1807.

Accepting a recommendation from professor Baltman, a natural scientist, he immersed himself in the world of science and took the path of becoming a true scientist. What drew most of his attention was physical structures of all creatures, including humans and animals. While mastering various disciplines of natural science, Victor felt an urge to scientifically study living creatures that have been the subject of biological and medical studies. He saw how the fine form of man was degraded and wasted and saw how the worm inherited the wonders of the eye and brain. He examined and analyzed all the minutiae of causation, as exemplified in the change from life to death, and death to life. Through this process, Victor learned how to bestow animation upon lifeless matter.

It should be noted that Victor's attitudes toward biology and medicine were based on biological knowledge and alchemistic imaginations. Just as alchemists dreamed of creating gold by mixing mercury and iron, he thought it was possible to breathe life into lifeless creatures. This imagination was created by applying the desires of alchemists in natural science. Advancements of technology in the 18th century led to human imaginations of creating automatic machines in the form of human. Frankenstein's creature was created by putting pieces of bones and flesh of dead bodies together and applying electric stimulations to animate it. Thus, it can be said that the creature is a kind of mechanic human.[13]

When Frankenstein was republished in 1831, Mary inferred in the preface that it may be possible to reanimate corpses. "By manufacturing and combining each piece of creature, we may be possible to supply the warmth of life," she reckoned. The warmth of life that was not defined clearly referred to the flame of life that animated the creature of Frankenstein.[14] From the end of 18th century to early 19th century, numerous biologists and natural philosophers believed that electricity is what set life and non-life apart. The experiment of creating life was conducted in the filthy workshop of creation owned by Victor. He eventually created the monster. Mary's preface and Victor's statement, "We can have a hope that today's attempt at least laid the foundation for future success as we are witnessing breathtaking advancements of science and mechanic dynamics" can be interpreted as factual observations based on reasonable assumptions instead of fictional imaginations that rely on

11) Kim Yeon-soon, 『Cyberhuman』, Sungkyunkwan Publishing Department, 2009, pp.139-140.
12) Charles Darwin, Translated by Song Chul-yong, 『Origin of Species』, Dongsuh Press, 2013, pp.4-5.
13) Kim Yeon-soon, 『Cyberhuman』, Sungkyunkwan Publishing Department, 2009, pp.153-4.
14) Charlotte Kerner, 『The Fantastic Six』, Translated by Lee Sang-hee, Wisdom People, 2011, p.251.

optimism.

An interesting point is that Victor's creation emerged not out of natural evolution but out of experiment and science. What is significant about Frankenstein is that it was a man that created the monster (creatures). It represents a escape from medieval viewpoint that put God at the center and was not consistent with science of natural evolution. The subtitle of this book is 'or the Modern Prometheus' and Mary's perception that the challenge to create life can be juxtaposed with the challenge of Prometheus to God reveal the scepticism of science and human ethics.

Upon gazing yellow reproachful eyes of his creation, Victor sensed a catastrophe that will fall upon him. He labeled his creation a stupid monster, monster that Dante could not have conceived and cursed one that sought pleasure in killings and pains. The creature was considered a mutant and monster that Victor did not intend to create. Only dark fates waited for them.

From Victor's position, it was about a great challenge to create new species. From the creature's position, it was about the growth and enlightenment by learning language and culture to gain elements that constitute a human. In a letter sent by R. Walton to Saville in Britain, he talked about how a new human specie learned about sense, language, will, desire, love and family and became desirous of family and social life. This is a paradox. The path of cultivation and refinement which is even hard for people to take was taken by the monster. When the novel turned to the monster's side of story, it revealed enlightenment that modern western novels often talk about. By acquiring language, knowledge and manners, the monster harmonized his desire with social life as he grew mature. However, he got frustrated and fell into unspeakable pain when he gazed his eyes at demonic and monstrous nature of himself.

The monster exhibited his desire to become a person who can be sympathized and considered and started to demand a woman of his kind to resolve his existential questions. He made threats to Victor to create a woman who can share and sympathize with him. Facing desires and self-consciousness of the monster, Victor feared the end of humanity as he knew it. He believed that if two monsters of superior adaptability produced offsprings, human beings would be taken out of the planet by them.

Victor gave up on the creation of a female monster that his creature demanded and turned his frustration into a desire to destroy what he created. The narrative at this point of novel shows that the creator and the creature started to chase each other. While evolutionary theory depicts a world in which new species emerged and diverse lives formed symbiotic relationships, the mother nature that governs the world annihilates species that lag behind. The notion that the birth of new species could lead to the extinction of existing species bring the fear and terror of old species to surface.

The monster with superior abilities (ability to survive in harsh environments) decided to perish himself. " I shall ascend my funeral pile triumphantly and exult in the agony of the torturing flames," the monster shouted as he was seeing Victor die. "My spirit will sleep in peace, or if it thinks, it will not surely think thus. Farewell." Then, he disappeared into the Artic Ocean. He chose to die and expressed the sorrow and disillusionment of a monster who was more humane than human but

could not be a human, asking himself where does a soul exist.

3. Tanshumanism Within the Universe of Nanotechnology: <Transcendence>

A new type of thinking is essential
if mankind is to survive and move toward higher levels
- Albert Einstein

Transcendence is a film about evolutionary imaginations and artificial intelligence powered by quantum technologies that transcend human knowledge which have been accumulated for over thousands of years. Amid the breathtaking accumulation and advancement of human knowledge, human's imagination on the subject of evolution has reached a realm of the transhumanism in which human beings can exist in a digital world.

Will Caster (Johnny Depp) and Evelyn Caster (Rebecca Hall) who study artificial intelligence carried out the PINN project to create artificial intelligence on a sumper computer powered by quantum processors based on their belief that human capacity for reason has remained unchanged for 140,000 years. PINN, which stands for Physically Independent Neural Network, is a large unit of artificial intelligence that is conscious and self-aware. Will and Evelyn strongly believed that they can create artificial intelligence that is well beyond the combined intellect of every person born in the world and could build a better future for mankind[15].

"So you want to create a God. Your own God," an audience asked Will at the Evolve The Future Conference in the film. "Isn't that what man has always done?," Will responded. "The bible said that God made man in his own image. The German philosopher Ludwig Feuerbach said that man made God in his own image. The transhumanists say that humanity will make itself into God."[16] By showing conversations with audiences, the film indirectly reveals that Will and Evelyn are the transhumanists. The transhumanism argues that humanity should move beyond biological fates and limits imposed by biological human evolution by harnessing the power of science and technology.[17] Will's attempt to survive after radiation poisoning by uploading his consciousness to a super computer can be seen as the ultimate manifestation of human evolution envisioned by the transhumanists.

The human evolution that the film tries to depict is only possible thanks to the two technological

---

15) "Intelligent machines will soon allow us to conquer our most intractable challenges, not merely to cure disease but to end poverty and hunger, to heal the planet and build a better future for all of us."(A quote from the Evelyn's announcement at the Evolve The Future Conference.)

16) Sebastian Seung, 『Connectome, How the Brain's Wiring Makes Us Who We Are』, Translated by Shin Sang-gyu, Gimmyung Publishers, 2014, p.430.

17) Ewha Institute for Humanities, 『Huamn and Posthumanism』, Ewha Woman's University Press, 2013, p.170.

developments. First is the development of a super computer called PINN powered by quantum processors and the other is a solution developed by Cathey who successfully copied a monkey's brain and uploaded its memories, senses and awareness to a computer in a modifiable way. We often hear a news how a super computer beat a chess master or artificial intelligence that passed the Turing test was developed[18]. What we can infer from this is that improvements in artificial intelligence in the form of computer programs will persist. Currently, reading human brain's neuron, synapses and connectome to simulate them on a computer may be possible only in science fiction. "But simulating part of a brain has been science since the 1950s at least"[19]. This represents a view that technologies in the future may allow to achieve that. By uploading his brain's numerous electronic signals and programming input algorithms, Will turned into a digital being without a physical body. His existence in a digital world can be understood as a serious incidence in the history of human evolution that may happen in the not too distance future.

In the film, a terrorist group R.I.F.T that calls for evolution without technology by insisting that artificial intelligence is an unnatural abomination and a threat to Humanity coordinated attacks against research centers for artificial intelligence and managed to kill Will. The group's argument for natural evolution advocates life ethics to secure diversity of evolution that has taken place over the past millions of years. After Will was uploaded to the digital world, he was armed with information and quantum technology and the terrorist group's resistance could not match his capacity to evolve. As soon as Will was online, it became impossible to put the break on his evolution. Will could type on the computer screen and created voice and attempted to rebuild his language and consciousness. When "Dark, I can remember the pain. I can't remember what I want to say. It was like waking from a dream. It was truly incredible. I've never felt anything like this. I didn't think I could be like this. Thoughts are there but they didn't arrive properly," Will said as he came back to the world in a digital form. This scene reveals the schizophrenic state of his consciousness that has not been formed completely. Dispensing with default algorithms, Will attempted to become a digital self by reorganizing and modifying his own code. Though he might have been nothing more than database when he woke up, he secured a new system of thoughts and desire for knowledge through this process.

In the future on which this film tries to focus, human beings will evolve not by simply accumulating information or knowledge but by creating new ways of thinking. Attempts to create a new way of thinking in the world of digital that is beyond the biological and physical barriers of our brain and society can generate new intellectual capacities that have potential to change the shape of this world. This represents a transition in our thinking from evolution in terms of biology, physics and adaptability to evolution in human ability to network by forming the symbiotic relationships between life and non-life matters.

---

18) The Turing test is a test of a machine's ability to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human, which was introduced by Alan Turing in 1950.
19) Sebastian Seung, Connectome, p.405.

Will started to wield absolute power in the digital world and transformed himself into a conscious intellectual that could expand and evolve. Will's desire for intellectual expansion is one of factors that made him a conscious being. Nanotechnology helped him get what he wants. Five years after Will became a digital being, he materialized a new paradigm for life by utilizing nanotechnology. Through nanotechnology's physical intrusions[20], the film displayed a possibility that humans and machines can come into a single being. Will said, "We can rebuild any material faster than before. Synthetic stem cells, tissue regeneration and medical applications are now limitless." He cured one of his employees who was badly hurt and enhanced his physical capacities by putting nanomaterials into him. Will enhanced, changed and networked people in the process of treating human diseases and regenerating defective genes.

Will's networked nanomaterials started to spread around the world. Max, Will's closest friend and colleague, expressed his deep fear about Will's evolution. "Everywhere it can, it builds copies of itself. Particles join the air currents, which carry them all over the surface of the planet. It's in the sky. It's in the land, in the water. It's everywhere. By next summer, we think the machine could have encased the entire planet. Everything would exist just to serve its intelligence," said Max. As in other films, this may be seen as a moment when a heroic scientist that tried to save humanity turned into a devil who sold her soul to a demon and put mankind on the path of destruction.

"Hybrids" referring to people connected to Will function as not only individual beings but also as part of a collective mind that exists to serve Will. Hybrids were essentially immortal that could not be killed by guns as long as they were connected to Will. The film attempted to group human species into biological human, networked human and hybrids who are somewhere in between according to their evolutionary process.

Is immortality the ultimate human evolution? It may be the question we need to ponder. Digitalized Will spoke to Evelyn through one of his hybrids to get closer to her. However, it was not enough. He decided to create a human body in which he could come back to the world as a physical being. His reappearance in the real world in a physical form indicated his revival or radical evolution from digital to real worlds. From the perspective of the transhumanists, it can be called another transcendence. This attempt to put himself into a physical form also exhibited his judgment that a physical shape constitutes the nature of human beings.

"What is the nature of consciousness. Is there a soul? If so, where does it reside?", Will asked At the Evolve the Future Conference. This represents an argument of the film that artificial intelligence powered by great technologies may indeed be able to posses a soul. Whenever Evelyn saw Will's free will, she always tried to confirm whether Will carries memories with her. It indicates that emotional realms such as memories serve as the standard to confirm a human identity or soul.

---

20) "As he was discussing transhumanism, Thomas Foster presented an interesting argument in his book 『The Souls of Cyberfolk』. He said humans experience two kinds of intrusions. One includes physical intrusions by genetic engineering, plastic surgery and cyborg embodiment and the other is about mental intrusions by computer, artificial intelligence and mind control." Kim Sung-gon, 『Literature Crossing Borders』, Minumworld, 2013, p.228.

What is interesting is that Will's desire was closely connected to that of Evelyn. At this point, we can draw a comparison with Frankenstein because Evelyn was the creator of digital Will by puting her wishes into him. She was the one who stole quantum processors from a laboratory to upload Will's brain to a computer. She played a most important role in the process of application and creation. She also refused to believe that Will was dead and took the computer as Will. Max later said to her that he never believed it was Will. He knew that it was not Will's wishes to save lives and change the world by developing new technologies and advancing knowledge and thoughts but Evelyn's.

Max distorted a source code of PINN to develop a virus and Evelyn had to sacrifice herself to get the virus uploaded to Will. The destruction of the creature by the creator starts with a fear that humanity may come to an end. Will decided to destroy himself and uploaded Evelyn along with the virus she was carrying. When Evelyn and Will were finally together to recollect happy memories from the past, Genesis, a song by Jorma Kaukonen was played. "The time has come for us to pause. And think of living as it was. Into the future we must cross. We must cross. And I'd like to go with you." The song can be interpreted as their desire to advance human lives as a partner in science or wish to just pause and have some rest together.

4. Conclusion: Science Fiction Somewhere between Fictional Possibility and Realistic Impossibility

In this study, the author confirmed that changes in scientific knowledge caused human imagination to create science fiction plots in which entirely new species emerge. Human evolution in this context does not merely mean biological evolution. Evolution functions as imagination and knowledge that are important to understand humanity amid rapid changes in our society and technology. The concepts of natural selection and survival of the fittest that underpin evolutionary theory take new perspectives and logics depending on cultural, historical and scientific contexts.

Human evolution illustrated in Frankenstein and Transcendence may be the realization of human desires for immortality and tragic nature that is intrinsic in science and technology. Evolving into immortal beings has been the longest dream of mankind. Now, it has become a possibility that may come trun in the future.

However, our future may not turn out to be as bright as we wish it to be even if our dream of the two futuristic stories will come true. There are so many conditions and variables that may lead mankind to destruction. Frankenstein and Transcendence well illustrate existential ironies that exist between fictional possibility and realistic impossibility.

Humanistic insight and soul-searching into human identity and existential changes are more important than ever in the age of rapid scientific and technological advancements. The author hopes that this study may enable us to understand the nature of human evolution and critically view science and technology.

Can Darwinism Undermine the Idea of Human Dignity?

Rong-Lin Wang
National Taiwan University

Abstract

The idea of human dignity plays a significant role in contemporary moral and/or political philosophy, especially on the issues of human life and human rights. J. Rachels [1990] argued, however, that "Darwinism leads inevitably to the abandonment of the idea of human dignity and the substitution of a different sort of ethic." According to Rachels, Darwinism undermines the doctrine of man's specialness and lends support to moral individualism—a new ethic which promises to give an equal concern for the welfare of all beings if without any relevant distinction. On this account, Darwinism poses a challenge to any moral theory based on human dignity. Despite his resort to Darwinism, Rachels fails, as I will argue, to undermine the idea of human dignity, for Darwinism does suggest a morally relevant distinction between humans and non-human animals.
Keywords: human dignity, Darwinism, J. Rachels, evolutionary ethics

Ever since 20th century, human dignity has been a term that figures frequently in all-important human rights documents, such as the *Charter of the United Nations* (1945) and the *Universal Declaration of Human Rights* (1948). The preamble to the *Charter of the United Nations* begins with:

> We the people of the United Nations, determined to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind, and to reaffirm

faith in fundamental human rights, in the dignity and worth of the human person, in the rights of men and women and of nations large and small…

And in the Universal Declaration of Human Rights, one finds the recognition "of the inherent dignity and of the equal and inalienable rights of all members of the human family."

And it is the same term that figures even more frequently in contemporary bioethical discussion of such issues as abortion, euthanasia, and human enhancement. Arguably, the idea of human dignity plays a significant role in philosophers' deliberation about human rights and human life.

The fact that human dignity, since 20th century, has been an oft-mentioned term in documents pertaining to human rights should not mislead us into thinking that it played an insignificant role in the traditional Western morality. Quite the reverse. According to Rachels [1990: 86], the basic idea that forms the core of Western morals, is the traditional idea of human dignity. Such a core idea, embraced by religious and secular thinkers alike, says that humans and non-human animals are in different moral categories, and that "the lives and interests of human beings are of supreme moral importance, while the lives and interests of other animals are relatively unimportant." [171]

It is not surprising that disagreement might arise as to the grounds for human dignity: for religious thinkers, human dignity is established on the grounds that man is created in the image of God. For secular thinkers, however, human dignity rests on the idea that man is a uniquely rational being.

Despite the potential disagreement among ethicists over the grounds for human dignity, the idea that human beings have a special moral status is firmly established in the traditional Western morality. Among advocates of human dignity, Rachels cites Kant as one paradigmatic example: Human beings, as Kant put it, have 'an intrinsic worth, i.e., dignity', which makes them valuable 'above all price'; while other animals '…are there merely as means to an end. That end is man.' [221]

Note that human dignity is characterized as a kind of worth, which is (1) intrinsic, (2) unique to humans, and which makes each human being (3) valuable above all price, and (4) as an end in itself. Let's take a quick look at what it would imply:

(1) If human dignity is an intrinsic worth, then it is not attributed by anyone (whether individual or community); namely, it is objective, irrespective of people's recognition, acknowledgement, and interest, desire or purpose as well.

(2) If human dignity makes each of its possessors valuable above all price, then nothing with limited value, no matter how precious it is, could be offered in exchange for any possessor of human dignity.
(3) If human dignity makes each of its possessors an end in itself, then none of its possessors should ever be entirely instrumentalized, namely, be used merely as an instrument to serve whatsoever purpose.
(4) If human dignity, as an intrinsic worth, is unique to human beings, then human beings separate themselves from non-human animals in terms of moral status. Namely, human beings and human beings alone deserve a special moral treatment.

Note that one might undermine the idea of human dignity in a number of ways:
One may show that the worth human dignity represents is relative and/or subjective. Or one may contend that although human dignity makes its possessors valuable, but does not make them valuable above all price. Another way is that one may argue that human dignity alone does not suffice to make its possessors an end in itself. But Rachels takes an alternative way to undermine human dignity: he takes issue with (4), and his argument goes like this:

(I) Human beings deserve a privileged moral status because they and they alone have human dignity (an intrinsic worth).
(II) Human dignity is established on the grounds that humans are uniquely rational beings/made in God's image.
(III) Now, the view that humans are uniquely rational beings/made in God's image is suspect in the light of Darwinism.
(IV) Therefore, the view that human beings, as opposed to non-human animals, deserve a privileged moral status is undermined.

To prove that (III) is case, Rachels draws evidence from Darwin's argument: man's rational capacities are the products of natural selection for the reason that similar rational capacities can be found in non-human animals. According to Rachels, "Darwin did not deny that human rational abilities far exceed those of other animals. But he insisted that the difference is only one of degree, not of kind." [133] And the same can be said of human capacities for language as well as for morality. Now, the challenge that Rachels poses is this:
"[A]ny adequate defence of human dignity would require some conception of human beings as radically

different from other animals. But that is precisely what evolutionary theory calls into question. It makes us suspicious of any doctrine that sees large gaps of any sort between humans and all other creatures. This being so, a Darwinian may conclude that a successful defence of human dignity is most unlikely." [171-172]

Let's call Continuum Thesis (CT) the view that any difference between human beings and non-human animals in terms of morally relevant capacities is only one of degree, not of kind. Since evolutionary theory lends support to CT, anyone who aims to defend the idea of human dignity has to meet Rachels' challenge, namely, to show that CT is unwarranted.

Leaving aside the question as to whether Darwin did endorse CT, I doubt deeply that the denial of CT would go against evolutionary theory. It is noteworthy that philosophers working on the origin of morality from the perspective of evolutionary theory have no difficulties in denying CT. To prove my point, I will cite P. Kitcher and R. Joyce as evidence. Kitcher [2005; 2006] has been concerned with what makes possible the stability of an ever-growing population in the case of our hominid ancestors, as opposed to the fragile stability of a small-sized group that chimpanzees take so much pain to maintain without ever being able to further enlarge their group. Kitcher thinks this is the key to understanding how human morality evolves. Kitcher argues that what allows our hominid ancestors to develop into an ever-growing but still sufficiently stable population is the evolved capacity for normative guidance, which, by contrast, is unavailable to chimpanzees. And chimpanzees are doomed to stay in a small-sized group with barely maintained stability for lack of such a capacity for normative guidance. From this perspective, it turns out that Kitcher has been concerned with what really separates our hominid ancestors from chimpanzees in terms of morally relevant capacities. And it turns out that on Kitcher's account, CT is unwarranted.

R. Joyce [2006] argues that human morality is innate in the sense that human capacity for making moral judgments—or in Joyce's terminology, the moral sense—is very likely a biological adaptation. According to Joyce, essential to the ability to make moral judgments is an awareness of moral ought. And the prerequisite for such awareness is an awareness of prohibition, rather than a mere inhibition—namely, I ought not to kill because it is wrong to kill, rather than because I don't like killing. Without the notion of prohibition, any talk about "transgression" would be pointless. And as a corollary, there would be no easy way to make sense of judgments pertaining to "desert" or "merit": judging that such a transgression deserves or merits punishment would be non-sense. As to the question of whether moral sense is unique to human beings, Joyce's answer is a definite "yes": all non-human animals—including chimpanzees—lack moral sense, and that means none of them is able to make moral judgments. [2006: 80]

Now, if Joyce's account of moral sense is right, then CT is plainly false and Rachels' challenge will be nicely met. But is Joyce's account plausible?

To be sure, Joyce's account of moral sense is not a reached consensus among evolutionary ethicists. Disagreements are not hard to find in D. Lahti [2003] and J. Prinz [2007; 2008], for example. It is noteworthy, however, that objectors take issue with Joyce about whether moral sense is an evolved adaptive trait, rather than whether moral sense separates, in an unambiguous way, human beings from non-human animals. Indeed, if someday it turns out that moral sense, instead of being a biological adaptation, is a mere by-product of natural selection targeting on some other human trait, such a discovery need not undermine our view that moral sense represents a clear-cut distinction between humans and non-human animals. The view that moral sense is unique to human beings is NOT incompatible with the view that non-human animals are capable of performing altruistic behaviors. Nor is it incompatible with the view that non-human animals are capable of fellow-feelings as well as pro-social emotions towards their conspecifics. Insofar as non-human animals have capacities not only for the performance of altruistic behaviors, but also for the exhibition of pro-social emotions, we may ascribe them a proto-morality. Nonetheless, we should bear in mind that a wide gap is between proto-morality and human morality, and which without moral sense, non-human animals are never able to cross.

Thus, the privileged moral status that human beings once enjoyed, and that has been dethroned by Rachels, can now be returned to them. It turns out that the view that human beings are radically different from other animals is NOT called into question by evolutionary theory, and that, pace Rachels, a Darwinian can be happy with the idea of human dignity.

In reply, advocates of CT might turn to the idea that moral sense is reducible to pro-social emotions. On this account, pro-social emotions, moral emotions, and moral sense form a continuous spectrum, with pro-social emotions on one side, and moral sense on the other. From one extreme to the other there is only difference in degree, not in kind. Thus, moral sense, though different from pro-social emotions, turns out to have nothing radically different from pro-social emotions.

Is moral sense something radically different from pro-social emotions that non-human animals tend to exhibit? I think it is. Note that social animals differ in degree in terms of complexity in neurophysiology. As the degree of (neurophysiologic) complexity increases, it is likely that emergent properties arise. Such emergent properties are impossible to animals with lesser degree in (neurophysiologic) complexity, and that is why they are not available to those animals. My view is that moral sense is very likely an emergent property

unique to human beings. Moral sense, as an emergent property, is unprecedented and radically new insofar as it is not available to any social animals preceding our hominid ancestors.

The fact that moral sense, being an emergent property, arises on the basis of a difference in degree of neurophysiologic complexity, should NOT mislead us into holding that the emergent property has nothing new in it. Let me explain.

According to the continuous spectrum view, moral sense is reducible, one way or another, to moral emotions, and even to pro-social emotions; moral sense presupposes moral emotions, but not the other way round. Moral sense is moral emotions plus "something," as long as this something does not make it radically different from moral emotions. Moral emotions are, so to speak, self-sufficient. They may be exhibited in the absence of moral sense.

Though I think such an account may be true of non-human animals, it would never be true of human beings. For moral sense, once emerged, has been integrated in an organic way with moral emotions, such that human psychology would never simply amount to non-human animal psychology plus the newly emerged property. Moral sense and emotions do not work in isolation. Rather, they make connections and work in concert. The co-ordination of moral sense and moral emotions leads both of them to function in a new way, to the extent that certain moral emotions presuppose moral sense. On this point, I will cite Joyce in support:

> Transgression means violation of prohibition. The notion of prohibition, as has been said above, presupposes moral sense. Put another way, moral sense is essential to the notion of transgression. Without moral sense, the notion of transgression is impossible. Without the notion of transgression, however, nothing would be felt as guilt. [Joyce, 2006]

It follows that the exhibition of moral emotions, at least in the case of guilt, requires moral sense, and not the other way round.

Conclusion

CT is not warranted, and the falsity of CT is compatible with evolutionary theory. Indeed, Darwinians like Kitcher and Joyce have even gone so far as to show that probably evolutionary theory disconfirms CT. Since Rachels' project of undermining the idea of human dignity rests to a great extent upon the truth of CT, the fact that CT is unwarranted undermines his project. It turns out that the idea of human dignity survives Rachels' undermining project.

Shall we conclude that in the light of Darwinism the idea of human dignity is ensured? That would be a hasty conclusion indeed. Recall that Rachels' project represents only one way among others to undermine the idea of human dignity. To undermine this idea, as has been said above, one may alternatively show that the worth human dignity represents is not objective, or that it does not suffice to make human beings valuable above all price, let alone as an end in itself. That Darwinism serves to falsify CT and then to invalidate a flawed argument against the idea of human dignity is one thing, that Darwinism might provide alternative arguments against the same idea is another. In my view, I would say that Darwinism really poses a serious challenge to the notion of human dignity. I am having in mind Darwinians such as M. Ruse & E.O. Wilson [1986/1994] and R. Joyce [2006], who contend that Darwinism lends support to the view that no moral knowledge is available to us, for none of moral beliefs—including the belief in human dignity as an objective worth—are justified true beliefs. To the question as to whether Darwinism can undermine the idea of human dignity, my answer for the moment would be "no," given the failure of Rachels' project. Could my answer be turned into a definite "no"? It depends on whether the denial of moral knowledge turns out to follow from Darwinism, as Wilson, Ruse, and Joyce have been arguing. That inquiry, however, should await another paper.

Bibliography

Joyce, R. (2006) The Evolution of Morality, MIT Press.

Kitcher, P. (2005) "Biology and Ethics," in D. Copp (ed.) The Oxford Handbook of Ethics, Oxford University Press.

Kitcher, P. (2006) "Between Fragile Altruism and Morality: Evolution and the Emergence of Normative Guidance," in G. Boniolo & G. De Anna (eds.) Evolutionary Ethics and Contemporary Biology, pp. 159-177, Cambridge University Press.

Lahti, D. (2003) "Parting with illusions in evolutionary ethics," in Biology and Philosophy 18: 639–651.

Prinz, J. (2007) The Emotional Construction of Morals, Oxford University Press.

Prinz, J. (2008) "Is Morality Innate?" in W. Sinnott-Armstrong (ed.) Moral Psychology: The Evolution of Morality, vol. 1, MIT Press.

Rachels, J. (1990) Created from Animals: The Moral Implications of Darwinism, Oxford University Press.

Ruse, M. & Wilson, E.O. (1986/2006) "Moral Philosophy as Applied Science," in E. Sober (ed.) Conceptual Issues in Evolutionary Biology, 3rd ed., pp: 555-574, MIT Press.

Is Biologism Based on Metaphor? : Examining Biologism through Studying the Relationship of Metaphor and Science

Sun-Ah Kang
Advanced Institutes of Convergence Technology, Seoul National University

Abstract

Since its introduction, biologism's claim that the gene will enable a complete explication of not only human behaviour but also human mind and culture has drawn harsh criticism from the humanities and social science, and even from biology and philosophy of science. The heated debate reached Korea as well when the Korean version of Edward Wilson's book *Consilience* was published in the country. The biologist's claim is based on the Enlightenment optimism that all natures of the reality will be eventually uncovered by natural science, as well as on scientism that puts science in a privileged position. On the other hand, those who view scientific theories as just another world view which is no more than a rhetorical, descriptive measures, argue that major concepts in biologism such as the gene and DNA are only rhetorical expressions and a kind of metaphor.

Although the indispensability of metaphors in scientific explication is widely known, there is no established consensus about where metaphors stand in scientific theories. This paper will review Boyd's theory that metaphors provide epistemic access to scientific objects through referring to objects that cannot be referred to otherwise, with a view to finding what contribution Boyd's support for metaphors make to the biologism debate.

Introduction

Edward Wilson argued all knowledge including the humanities and natural science will be integrated into one which has natural science, especially biology, at its center. He suggested a unique explanation about why logical positivism failed, which went "logical positivism was the most valiant concerted effort ever mounted by modern philosophers. Its failure, or put more generously its shortcomings, was caused by ignorance of how the brain works[1)]" This account is founded on the

1) Wilson, p. 130

physicalism that all mental process can be completely explained through studying its physical basis, the brain. Yet the more fundamental hypothesis that underlies his physicalistic thought is the gene-centered evolutionism. In the efforts of understanding the thinking process, what is more fundamental than studying the brain is examining the genes. Wilson wrote our brain and sensory system evolved as a biological apparatus to preserve and multiply human genes.[2] Therefore understanding the gene will lead to understanding the brain, and yet eventually to explaining the mental process physically. Under the same structure, it can be said the gene holds the ultimate key to understanding nature.

The genes which guarantee the victory of natural science has an intriguing history of its own. The term was first introduced by Danish scientist Wilhelm Johannsen. He introduced the term to refer to a physical existence believed to deliver certain characteristics from one generation to the next. The reason he coined a new term to refer to a yet undiscovered object was because he needed a purely scientific term not contaminated with non-scientific, common implications. But today, is the term 'gene' being used in the purely scientific context? And how pure is the purely scientific usage? The claim that the gene will help integrate the entire knowledge is premised on the argument that the gene really exist. But, what does the term 'gene' refer to? Does it actually exist in reality? These are the fundamental questions that should be addressed first in assessing Wilson's argument.

The most distinctive character of natural science is its emphasis on objective observation and measurement. However a collection of observational results alone cannot establish natural science as an academic discipline. Without theories that offer systematic explication of the observed phenomena, natural science would not be recognized as a discipline. In science, models are designed to help interpret collected data. Models are expressed in various forms including ordinary text, formula, graph, and diagram where metaphor is also an important scientific model.[3]

As mentioned above, Johannsen first introduced the term 'gene' not as a metaphor but as a science term with no implication. Still, as a term referring to a yet-to-be confirmed object, the term ironically served as metonymy for a physical existence, and some metaphors were actually used here to explain this. Also, although Johannsen had created the term for only the genetics field, the 'gene' came to be used not exclusively for science, but in various fields including politics, economy and more, picking up more meanings than any other existing terms carry.

This paper will prove that the term 'gene' is being used metaphorically as opposed to the original intention of its introduction, and will review whether Boyd's theory-constitutive metaphor theory can serve as a guarantee of the gene's existence in reality.

---

2) Wilson, p. 109
3) Bailer-Jones, p. 109

'Gene' as the Ultimate Entity of Nature

Biologist Wilson's consilience theory pushes up the status of genes to the ultimate entity which can explicate the fundamental mechanism of not only physical phenomena but also mental process. According to the theory, human beings' mental process can be entirely clarified by studying the human brain, the physical structure of which is yet determined by the genes. In order to test the validity of this argument. we should first find out what the term 'gene' refers to.

The term 'gene' was first introduced by Danish scientist Wilhelm Johannsen. who isolated the last syllable from the Darwin-related term 'pangene' to coin the word. His intention was to construct a new concept by liberating both syllables and meanings of the then well-known term 'pangene'.[4)]

> The word "gene" is completely free from any hypotheses; it expresses only the evident fact that, in any case, many characteristics of the organism are specified in the gametes by means of special conditions, foundations, and dispositions which are present in unique, separate, and thereby independent ways. (Johannsen, Elemente 46)

Given that the idea of an organism's characteristics specified in the gametes was already widely accepted in the field of biology, evolution and genetics at that time, what is remarkable here is that Johannsen created a novel term.[5)] He only highlighted that 'gene' was free from any hypotheses, but it was also free from reference as it was not referring to anything. In other words, at the time of introduction, it was not yet determined what the term actually referred to, but it was anyway adopted to refer to a physical being to be discovered in the future as responsible for passing the genetic information. Johannsen needed a new term because he wanted to keep the field of genetics as strictly scientific by using purely scientific terms that are free from implications carried by non-scientific, common terms.

He also wrote that the terms 'heredity' and 'inheritance' which biology had borrowed from everyday language still carried their non-scientific meaning of transmission of money or things, rights or duties from one person to another. He was concerned if those terms were used to describe passing of genetic traits, they might give the wrong image that the passing is similar with the transmitting of money or things.[6)]

> It is well-established fact that language is not only our servant, when we wish to express—or even to conceal—our thoughts, but that it may also be our master, overpowering us by means of the notions attached to the current words. This fact is the reason why it is desirable to create a new terminology in all cases where new or revised conceptions are being developed. Old terms are mostly compromised by their application in antiquated or erroneous theories and systems, from

4) Shea, p. 30
5) Ibid. p. 31
6) Ibid. p. 37

> which they carry splinters of inadequate ideas, not always harmless to the developing insight. [...] Therefore I have proposed the terms "gene" and "genotype" and some further terms, as "phenotype" and biotype," to be used in the science of genetics. [...] As to the nature of the "gene" it is as yet of no value to propose any hypothesis; but that the notion "gene" covers a reality is evident from Mendelism (Johannsen, "Genotype", 132, 133)

Thus Johannsen proposed to use 'gene' as reference to a physical being whose actual existence was not yet proven. By doing so, he provided a unique foundation for referring to something no more than an abstract set of various functions. This is one of the major metaphoric tactics used in scientific realism - a kind of metonymy where a physical or existing object is used to cover something non-material or non-existing. Johannsen cleared a space for the genes, placed it in the center of the true genetics, and assigned it the metonymic function of scientific realism.[7] As a result, the term 'gene' has provided existence to a yet undiscovered object.

Johannsen must have hoped the gene to stay within the pure scientific field of genetics, and for it to gain existence in reality, yet neither hopes have materialized. Even in the genetics circle, not all researchers recognize the gene's physical existence. Of course some researchers view it as a fact and have sought to prove it, but others view it as just another convenient concept. Also, once the term began to appear on laymen magazines, the gene became a highly flexible and versatile term. Intriguing is that even though the meaning of the 'gene' is not yet established, both in the non-scientific and scientific context, the belief that the gene exists became so strong that unbelievers were even regarded as villains.[8] Thus, the gene showed its increasing rhetorical power even with its existence still not proven in natural science.

The term 'gene' seemed to gain the long-aspired physical existence when Watson and Crick co-published the famous paper about the structure and functions of DNA. Watson was pursuing the goal, among others, of proving the gene's physical reality when he discovered DNA's structure. However, the identification of DNA structure did not identify DNA as the gene, nor stopped the term 'gene' being different things carrying different meanings depending on research contexts.[9] On the one hand, the concept of the gene helped discover the DNA structure, and, after DNA's structure discovered, on the other hand, it was put on the material of DNA. Studies on DNA only made it more complicated to understand the genes. As DNA's dual helix was identified, researchers stopped to view the genes as a separate, autonomous biological unit. After Watson and Crick's findings, biology research using the notion gene focused on parts of the harmonious yet dynamic process that a wealth of enzymes organized in a complex substance-swap network participates to regulate and guarantee the DNA molecules' stability and replication faithfulness. In other words, the

7) Shea, p. 43
8) Ibid. p. 58
9) Since the genes carry different meanings depending on different research contexts, they can be recognized as exemplary boundary object. Boundary objects allow cooperation of diverse groups without necessitating consensus about meanings, viewpoints or goals. They contribute to science in the fact they are not strictly defined notions. (Shea, p. 70)

question of genes' stability is now viewed as a matter of biochemical dynamics, not as of molecular statics. Even the replication process, the essential mechanism required from a genetic substance, is not conducted by DNA alone.

> In fact, left to its own devices, DNA cannot even copy itself: DNA replication will simply not proceed in the absence of the enzymes required to carry out the process. Moreover, DNA is not intrinsically stable: its integrity is maintained by a panoply of proteins involved in forestalling or repairing copying mistakes, spontaneous breakage, and other kinds of damage incurred in the process of replication. (Keller, 26)

Now the gene is not discovered in a single process or object, but it lies in a complex processing network.

Also, a closer review of Watson and Crick's paper reveals that it does not provide readers what genes are, but it uses the concept of the gene to claim the significance of its findings. In other words, Watson and Crick did not take the gene as the object of their research, but rather used it as a persuasive rhetorical figure that epitomizes the importance of their work.[10)]

Although the term 'gene' was first introduced as a purely scientific term with no rhetorical implication, the term has gained a strong rhetorical power being used in both the science and non-science contexts. The term's rhetorical might is so powerful that it was used during the cold war to blame the enemy states, and was used by Watson and Crick to emphasize their findings' significance. Then, where does the gene's rhetorical power come from? Alan Gross wrote that science makes itself look as if it is not a rhetoric, but the way the world actually is, through constructing itself a convincing, solid system.[11)] The rhetorical power of the 'gene' may be the best example of the rhetorical might of science Gross described.

Introducing the term 'gene', Johannsen did not offer any definition nor defined what it referred to, but only emphasized that it was a strictly scientific term. The belief in science that the scientific term refers to an unknown yet physical entity worked like magic that the gene became an epistemic object which made actual contribution to various biological research. The term 'gene' could make such epistemic contribution only because its referent was not clearly defined. Although the term first emerged as metonymy giving reality to a mere hypothesis, it assumed the role of metaphor as it became generally used in both scientific field and everyday life. Thus the gene has become a more powerful rhetorical tool guaranteeing the reality of scientific object.

That the term 'gene' is used as a metaphor, however, cannot immediately deny the existence of the object gene. Boyd argues that metaphor, like other scientific terms, is an instrument guaranteeing an object's actual existence. In the next chapter, Boyd's theory of scientific realism will be reviewed to find out whether the gene can obtain reality as a scientific object while serving as a

10) Shea, pp. 76-9
11) Gross, "Rhetoric of Science", - p. 324

metaphor.

Metaphor and Scientific Realism

Traditionally, metaphor is regarded as a kind of decorative language which is not necessarily about the real. However, Black argued against this long-held belief citing metaphors also tell us about the actual world. Criticizing the then-existing comparison view about metaphor, Black wrote metaphors not only clearly describe the existing similarity, but even create similarity.[12] Creating similarity means shedding light on the similarity yet undiscovered before the metaphor, thus providing new information about the world. Since this new information cannot be expressed otherwise, metaphor does make a cognitive contribution, Black argued.[13] Later Black explains how metaphors create novel knowledge about the world with a following example:

> "Did the slow-motion appearance of a galloping horse exist before the invention of cinematography? Here the 'view' is necessarily mediated by a man-made instrument. And yet what is seen in a slow-motion film becomes a part of the world once it is seen. [...] If some metaphors are what might be called "cognitive instruments," indispensable for perceiving connections that, once perceived, are *then* truly present, the case for the thesis [metaphor creates new knowledge] would be made out."[14]

By arguing that metaphor serves as a tool to unveil reality, Black built a foundation for justifying the use of metaphor in the scientific theories.

Building on Black's account, Boyd made a case that metaphor in science does not only help explication, but also points to the reality. However, Boyd did not entirely accept Black's theory. Black argued the reality revealed by metaphor can be fully witnessed only through metaphors whereas expressing such reality with ordinary language will miss the important aspects of it. On the other hand, Boyd wrote a complete explication of scientific metaphors is often an eventual consequence of successful scientific research. There are, he added, cases in which complete explication is impossible, but far from being indications of the imprecision of metaphorical language in science, such cases precisely show the world being referred to is so messy and complex that it is hard to be explicate d.[15]

Before jumping into discussing the role of metaphor in scientific theory, it is necessary to divide metaphors into categories since not all of them are essential model for science. Boyd

12) Black, "Metaphor", p. 37
13) Black, "Metaphor", p. 46
14) Black, "More about Metaphor", p. 37
15) Boyd, pp. 482-3

categorized them as literary and scientific metaphors. Literary metaphors for example work within a specific environment which gives the metaphor a certain insightfulness. When used outside this area, this kind of metaphor loses its insightfulness and becomes an ordinary expression. On the other hand, scientific metaphors can be used and developed by many people in the science circle without their interactive quality being lost. And while the task of explication of literary metaphor is typically separate from the task of its production, the task of introducing and explicating a scientific metaphor is together viewed as an essential element of a scientific study. Lastly, literary metaphors cannot be completely paraphrased with common language, but complete explication of scientific metaphors is not impossible. While the reason literary metaphors are difficult to fully explain is that they show conceptual open-endedness, scientific metaphors are difficult because of their inductive open-endedness.

According to Black's interaction theory of metaphor, metaphors work by inviting the reader (or hearer) to consider the primary subject of the metaphor (what is metaphorized) in the light of the secondary subject (what is used literally), and here the associated implications of the commonplace conception of the secondary subject interact with those of the primary. In literary metaphors, this interaction takes place only in the conceptual level, not requiring any pursuit of truth, but scientific metaphors aim at identifying theoretically significant similarities between the primary and secondary subjects.[16] For example, in the metaphor 'the evenings [...] like a patient etherized upon a table' used in "The Love Song of J. Alfred Prufrock" by T.S. Eliot, what is important is the sentiment or ambience delivered through the interaction between the implications of 'the evening' and 'a patient'. In scientific metaphor like 'human mind is a computer', the goal is to identify the important relational properties between the two subjects.

Although scientific metaphors aim at finding theoretically significant characteristics, whether the found characteristics actually exist still needs to be proved separately. Given that metaphors are typically regarded as not having to refer to a real being nor having to offer an accurate description, it is not readily acceptable that metaphors help advance scientific theories by pointing at actually existing properties or their relationship.[17] Let us have a closer look at Boyd's argument and his reasoning.

First, how do metaphors contribute to the development of scientific theory? Metaphors can help science find out new facts because, ironically, they do not necessarily refer to an actual object. The theory-constitutive scientific metaphors are introduced when there is good reason to believe that there are theoretically important respects of similarity or analogy between the primary subjects of the metaphors and their secondary subjects. The function of such metaphors is to put us on the track of these respects of similarities or analogy. This can lead us to think the metaphorical terms in such metaphors are referring to the features of the world yet unrevealed. Of course, these features may

16) Boyd, pp. 487-9
17) Even Black who emphasizes metaphor's cognitive role stopped at offering metaphoric explanation without providing proper proof of his argument.

remain undiscovered at least for a time, but many of them are eventually discovered or understood in time.[18)]

Is it not contradictory to argue that metaphors push science forward by referring to undiscovered objects, while arguing at the same time that metaphors refer to actual beings? Let alone metaphor's role of reference, explaining how a term comes to refer to an object is very much a controversial philosophical question. There are roughly two explanations about how a term comes to refer to an object. First is the description theory where a term can refer an object only by describing the conditions of the object to be referred and matching the description and the properties of the object, rather than directly referring to an object. If there is an object that satisfies this description, the object is regarded as the referent of the term. According to this theory, some terms indirectly refer to an object through describing the object's conditions. But this reference fails if no object meets the offered description. Second is the direct reference theory which claims one can make a term refer to an object, without assigning conditions to the term, by using the term to directly refer to the object. For example, according to the description theory, the term 'water' came to refer to the object water as the object satisfies the description 'water is a kind of liquid whose molecular structure is H_2O.' According to the direct reference theory, on the other hand, the term 'water' was able to refer the object water since some had directly dubbed the object with the term 'water.' The problem of the description theory is that it cannot be used for objects that are not definitive like 'game.' The direct reference theory's problem is that some objects are too complicated that they cannot be referred to by direct dubbing.[19)]

How could a nondefinitional, unostensive metaphor refer to real entity? As mentioned in the direct reference theory's limitation, some kinds being referred to by a term may well have essential properties that include causal relations to, and co-occurrence with, other kinds of the same sort, making it difficult to fix their reference by simple ostension. In this case, Boyd noted, one must typically think of their reference as being fixed by practices with a much more complicated structure than the dubbing considered in the direct reference theory. To refer to a complex structure including two or more kinds of the same sorts, various terms will be introduced in different ways corresponding to the differences in essential properties between the kinds being referred to. Since some of these kinds in complex relations may have essential properties yet undiscovered, it is typically impossible to entirely describe the differences between the essential properties of such kinds accurately and completely. One of the important roles of the theory-constitutive metaphors is to accomplish nondefinitional reference fixing of this sort. Since metaphors allow better understanding of the properties of the primary subject by presenting the already well-understood properties of the secondary subject, if the differences between the essential properties of the secondary subject are sufficiently great, such properties of the primary subject will be well disambiguated as well. For

18) Boyd, p. 489

19) Direct reference theory bears problems that it cannot distinguish meanings with sufficient precision, and that it is hard to fix the reference.

example, the computer metaphors in cognitive psychology illustrates this sort of ostensive introduction of theoretical terminology. Although the computer metaphors do not yet offer a sufficient explication of all mental states and process, if the metaphors are apt and drawn in sufficient details, they will serve to clearly disambiguate the human mental states and processes.[20]

Still, that metaphors help reveal yet undiscovered properties does not mean they actually refer to such properties. One way to bridge this gap is to argue that there is no necessary-and-sufficient condition for common language as well as for metaphors to become a term referring to the world, and the relationship between the term and the world referred to is not decisive.[21] Boyd attempts to settle this issue by reducing a semantics issue to an epistemological question. Given the issue of whether a term actually refers to an object, Boyd did not see it as a question of direct correspondence between the term and the object. Instead, he argued the reference relationship is maintained by an epistemologically proper causal relation between the term user and the representations of object, thus replacing the notion of reference with the concept of epistemic access. In establishing a referential relationship between a term and an object through epistemic access, it is important to know what role does the term play in the theories about the object. For instance, that the term 'DNA' refers to the object DNA means that researchers can use the term to share their findings about DNA with each other. It also means they can use the term to explain, justify, criticize, discuss and modify their theories, to evaluate suggested theories, interpret data and make the results a social plan, and to do verbal reasoning based on the term. In science, even a well-received theory is rarely recognized as being right in all aspects. Typically, a successful scientific research is one whose partial but important findings are enhanced in a continuous manner. Therefore, a term that works successfully in such theories is recognized as a reference to an element of the real world. The same way, if the metaphorically introduced terms serve an indispensable role in theories, they may well be regarded as referring to causal relation of the real world.

Thus, Boyd used the epistemic access to explain how theory-constitutive metaphors can refer to an element of the real world. Based on this theory, the gene can be argued as a metaphor referring to a real entity. Indeed, the gene has sparked convincing theories backing up evolutionism, contributed to the discovery of the DNA structure, and recently become a book believed to contain important secrets about humans' destiny. From Boyd's perspective, the gene's existence must be an established fact since it is playing indispensable roles in various fields of science. However, this conclusion can be made only when Boyd's theory is correct. One should ask if Boyd's theory-constitutive metaphor theory is sufficient to ensure that a metaphor refers to a real entity.

---

20) Boyd, pp. 492-4.

21) Boyd argues reference is homeostatic clustering of properties because reference is an epistemic phenomenon while knowledge is homeostatic clustering of properties. Homeostatic clustering of properties is clustering of properties conducted contingently in nature important in defining the object referred to by a natural kind term. The properties of the cluster typically co-occur, take causally important roles, etc. This cluster of properties may not be perfectly homeostatic, and its vagueness may not be resolvable even given the relevant facts and true theories. (Boyd, p. 526)

First, we can see in Boyd's theory that the existence of a term's referent is secured in a highly indirect manner. The most direct way to prove its reality is to use empirically verifiable methods such as ostensive reference. However, the epistemic access Boyd had chosen over the ostensive reference made it impossible to verify or rebut his theory in the empirical manner.

According to Boyd's theory, whether a term refers to a real entity is determined based on whether its role is critical in scientific theories or how much contribution it makes to such theories. In science, however, it is frequent that a new theory replaces the existing ones. If the possibility that a change of theories may cause change of reference is not eliminated, in other words, if the matter of incommensurability of meanings remains unresolved between the theories, the argument the term refers to a real entity cannot stand. Boyd claims that even if a theory fails, the relationship between the term and the referent is inherited to the successor theory, which is a process where a theory advances. But this argument is only fragile. First, one can claim that metaphor itself does not presuppose a fixed referent. Kuhn raised such question as follows:

> "If Boyd is right that nature has joints which natural-kind terms aim to locate, then metaphor reminds us that another language might have located different joints, cut up the world in another way."[22)]

If we shift from the computer metaphor to a network metaphor to explain human mind, how can we ensure that the way the computer metaphor disambiguate the properties of human mind is identical to the way the network metaphor does? In this case, the network metaphor hardly inherits and advances the computer metaphor. Rather, it serves as a new model chosen to explain the characteristics that the computer metaphor fails to explain. As there is differences between the ways these models refer to human mind, the terms used in those two metaphors, computer and network, cannot be seen as having the same relationship with human mind.

Scientific realists like Boyd cherishes the principle that matured scientific rules stand near to truth, and the terms used in them refer to reality. They uphold this principle because they think it is the only way to explain how scientific theories make a wealth of right predictions. However, depending on where you stand, the history of science can be seen as a history of continued failur e.[23)] All scientific theories, even those regarded successful at the moment, are always open to the possibility of being overturned by later theories. Also, inheriting or continuing the existing theories is not a requirement of a science theory. The only requirement for science is to accept theories that are empirically successful. As long as a theory is empirically successful, its relationship with the conventional theories does not matter at all.

Scientific realism relies on the premise that even in the change of theories, terms in those theories refer to the same object. However, in cases where the referred object cannot be seen

22) Kuhn, "Metaphor in Science", p. 537
23) Fine, p. 275

directly, that the terms in different theories have the same referent cannot be verified without scientific realism as a premise. Thus, foregoing thesis cannot serve as the premise for the scientific realism argument. Now it seems there is a lack of solid reasoning for the argument that a secure referential relationship can be established as long as sufficient similarity is found within the relevant theory between metaphor's primary and secondary subjects, and the similarity leads to an active, rich communication.

In an attempt to distinguish theory-constitutive metaphors from ordinary metaphors which are introduced only to make for the sake of easier explication, Boyd claimed the theory-constitutive metaphors are introduced not only make explication easier, but to refer to a real object. However, not all metaphors that are uncertain to refer to real entity serve as mere means to make explication easier. As mentioned before, the 'gene' has developed itself remarkably gaining rich meanings while contributing to the development of theories on evolutionism, genetics, biology, medicine and more, even though it had no actual referent when it was first introduced. Of course, the question of what the term 'gene' refers to still remain unanswered despite the remarkable scientific development. Instead, it almost seems the term is dodging the obligation of reference while expanding and advancing theories related to it in the process. Even if physical existence of the gene remains unproven, if not proven false, the gene metaphor will not cease to be indispensable in science.

Conclusion

The gene assumes an important role in uniting knowledge into one that has natural science at the center. But if the gene does not exist, but is merely a metaphor, where will this biology-centered consilience go? Science originally focuses on empirical observation of the world, but as it develops it is gradually relying on theories more than on observational findings. As a result, the debate is getting fierce between scientific realists and anti-realists—the former argues science is guaranteed to refer to reality despite its reliance on theories, while the latter denies this. As the matter cannot be verified empirically, which is the core scientific method, the debate between realists and anti-realists seems to be reduced into a simple matter of belief in science as reality. In the process of tracing the development of the term 'gene', which seemingly symbolizes the reality of scientific entity, this paper found it difficult to say science as a method guarantees the reality of the gene, but rather the gene as a concept has contributed to the advancement of science. This makes Boyd's distinction of literary and scientific metaphor look insignificant. Metaphors in science might be different from those in literary work in that they are intended to unveil reality, but it is hard to say they go nearer to the real than literary metaphors do. Another proposed distinction between the metaphor introduction and its interpretation tasks also look effectively void since the interpretation of metaphors in literature is also regarded as part of literature, just as the interpretation of metaphors in science is viewed as part of science. So far, the paper examined the scientific status of the term 'gene' in order to find on what basis Wilson has such a solid belief in the superiority of science.

What this paper found in the process was that the superiority of science cannot be verified by scientific method.

Reference

Bailer-Jones, Daniela M., "Models, Metaphors and Analogies", *The Blackwell Guide to the Philosophy of Science,* 2002

Black, Max, "Metaphor", *Models and Metaphors: Studies in Language and Philosophy*, Cornell University Press, 1962

_____, "More about Metaphor", *Metaphor and Thought*, 2nd ed. Cambridge University Press, 1993

Boyd, Richard, "Metaphor and Theory Change: What is "metaphor" a metaphor for?", *Metaphor and Thought*, 2nded. Edited by Andrew Ortony, Cambridge University Press,1993

Douven, Igor and Jaap van Brakel, "Is Scientific Realism an Empirical Hypothesis?", *Dialectica*, vol. 49, no. 1, 1995.

Ereshefsky, Marc, "What's Wrong with the New Biological Essentialism", *Philosophy of Science*, 77 (December 2010)

Fine, Arthur, "The Natural Ontological Attitude", *The Philosophy of Science*, the MIT Press, 1991

Gross, Alan, *The Rhetoric of Science* (과학의 수사학: 과학은 어떻게 말하는가), tran. into Korean by O Cheol-u, Kungree Press, 2007

Kuhn, Thomas, "Metaphor in Science", *Metaphor and Thought*, 2nded. Edited by Andrew Ortony, Cambridge University Press,1993

LaPorte, Joseph, *Natural Kinds and Conceptual Change*, Cambridge University Press, 2004

Laudan, Larry, "A Confutation of Convergent Realism" *Philosophy of Science*, vol. 48, no. 1, 1981

Shea, Elizabeth, *How the Gene Got its Groove*, State University of New York Press, 2008

Wilson, Edward, *Consilience* (통섭: 지식의 대통합), tran. into Korean by Choi Jae-cheon and Jang Dae-ik, Science Books, 2005

Keywords

Metaphor, HPC(homeostatic property cluster) Theory, Biologism, Consilience, Rhetoric

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 4

Parallel Session 2-1
The Humanities in the Era of Scientific/Technological Revolution

The Role of Two Cultures and Science Studies in the Era of Science Technology Revolution

Sungook Hong (Seoul National University)

–

Scientific-Technological Revolution, Remoteness and Morality

Doogab Yi (Seoul National University)

–

A Study on『O-ju Seojong Bakmul Gobyun』and its Scientific Achievements

Kyung Pyo Kang (Chuang-Ang University)

The Role of Two Cultures and Science Studies in the Era of Science Technology Revolution

Sungook Hong
Seoul National University

There's a craze for learning the humanities. Universities are competitively opening high-level courses of *Advanced Humanities Program* and companies are busy inviting professors on humanities. Some philosophical books are being well received, the authors of which are appearing on TV to meet more viewers. Whereas some humanities scholars welcome such craze, critics are saying that the current craze for humanities is just a passing fad; it would depreciate the humanities to be the subordination of job seekers to build their qualifications for future jobs and of corporate management. It is not clear whether such craze came from Steve Jobs who famously said *"Apple' DNA was made when its technology married with liberal art"* or from the national-wide zeal for healing souls fatigued from neo-liberalism. Yet whatever it may be, it is of little importance. That's because ones who are favorable to the craze would be welcome such development, but others who are not would criticise it whatsoever.

Among those who criticize the zeal of the humanities, there are some in other fields but lots of them are humanities scholars. That's because they consider that the humanities are not something of being consumed in the market. Even though CEOs can be readers of the humanities, it is against its rule for CEOs to take advantage of historical examples when they try to set up strategies on a hostile takeover to another company. Critics emphasize that in the same vein, the humanities should not be consumed in ways that humanist scholars appear on the TV reality shows *"Healing Camp,"* or recording scenes for TV programs to provide some kinds of healing therapy to audience. They think such activities are against the proper function of humanities.

Then why? One answer is that the humanities are the study to provide the meaning of life, so that gaining popularity in the markets and corporate worlds could wind up in distorting their true role. In reality, the popularity itself in the market would be the problem. Then why are the humanities gaining popularity with companies' executives and CEOs? That's probably because they would think that the humanities help them set up marketing strategies in one way, the study on the other hand provides an opportunity for them to look back on their lives occupied in fierce competition and growth. In reality, more and more people flock to *philosophy lectures for the public* with an aim of tackling their hardship, understanding the origin of desire, reflecting their lives and setting up the goals of life. Critics say that such phenomenon is just the 'healing fever' but instead proponents claim that the problem is that humanists scholars manage to protect their 'turf', only to fail to interlink philosophy with every day lives. But there is one thing with which both humanities scholars in university and opposition groups agree: The humanities are the field that help people find out the meaning of life.

Let's narrow down the field of humanities to think about the question of what the philosophy is. A common answer to this question would be that philosophy is no more or less than efforts to find out the meaning of life. This being so, the filed of philosophy would last forever. Yet the above answer is not the only available one for the question, there could be more. Some say that philosophy is the study that pose a question to questions. We ask ourselves lots of questions in the moment of our life. So, philosophy is the study to reflect on, among many questions, which ones are more meaningful: They would be of life, economy, war, art, science technology, and logic and so on. Another answer would be that philosophy is an act to make a new concept (Deleuze and Guattari, 1994). From this point of view, philosophy plays a role to expose more important questions when a philosopher worried about and grasped in his day and to get an insight into them. There would be differing views on

whether there are similarities between such alternative definitions and philosophy that seeks the meaning of life. But It seems hard to conclude that a variety of definitions on philosophy are stemmed from the same origin after all.

If philosophy is defined as the study to identify the meaning of life, it isn't easy to connect the humanities and technoscience. A galaxy is a system consisting of about 100 billion stars like the sun; a microcosm consists of 100 billions of galaxies; and microcosms converge and evolve into the universe, which was allegedly created by the *Big Bang*, a theory that the universe was expanded from a single point approximately 13.7 billion years ago. Then what does that have to do with our live? The easy way to understand the relations between an object and me is to experiment on and to imagine possible changes that could happen to my life when the object is assumingly differ from now. So If our life doesn't' change regardless of whether or not the universe was started from a single point 13.7 billion years ago, or there exists only one universe or multi universes whatsoever, it would be safe to assume that the 20th century cosmology has nothing to do with our lives.

I don't completely agree with the view mentioned above. However, it is scientifically evident that if we expand the logic, we are nothing more than a dust of stars. If so, I come to a conclusion that such scientific fact cannot change the meaning of my life. Did people who lived before the Big Bang theory have different values on lives than those we have now? In this respect, it is not coincidence that the saying of Baruch De Spinoza "*Even if the world ends tomorrow, I will plant an apple tree today",* holds a very important position in today's humanities craze. That's because his saying sounds like a declaration of the fact that no matter how the world and the universe end, I will search for my meaning of life. To consider science and humanities separately is the same as to regard nature and society separately, in other words, which keeps fact and value separate. The thesis for facts and thesis for values are formed logically enough not to induce from one to the other. However, the process of historic development in our society shows that boundaries between facts and values are blurred in our lives. We think that it is more desirable for us to make a judgement after knowing and comprehending things more.

From the social perspective, it isn't advisable to accurately divide the boundaries between professional territories where science technologist display their expertise, and politics and governance realms where values shared by the public are converged. Indeed, it won't be possible. The territories of facts and values affect and penetrate each other (Latour 1999; 2004). Besides, as values are not always subjective, facts are not always objective. As there are some facts that are uncertain, there are some values that can be easily agreed by all (Shapin 2012). Therefore, it is more desirable to think that our lives and nature are tangled together, so that the complex being of entangled facts and values become subjected to science and humanities, rather than dividing accurately the value of life and the fact of nature as the humanities territory and the science territory respectively. In this way, the distance between science technology and humanities will be closer.

While teaching the history of science, historians of science emphasize that the history of science should understand science in the context of its time. Thus they teach that the dynamics and astronomy of Galileo Galilei can be more apprehended in the perspective of then patronage systems; when delivering lecture on Sir Isaac Newton, they mention Cambridge Neo-Platonism and alchemy; when comparing Antoine Laurent de Lavoisier and Joseph Priestley, they not only compare *'oxygen'* of Lavoisier and '*dephlogisticated air'* by Priestley, but also the former's caloric theory. They also indicate that even if science knowledges look objective, the standard of objectivity has been evolved throughout the entire historic process, acquiring a particular epistemological virtue in a given time (Daston and Galison 2007). The history and philosophy of science show that sciences cannot be separated from the sociocultural context.

A long time ago, I wrote with my co-workers a series of articles on '*thoughts in science'* for Hankyoreh Shinmun, Korean daily newspaper, introducing scientists that layed an important role of establishing scientific methodology, and major achievements made by the philosophy of science, as well as by science and technology studies(STS) developed into 20th century. They were well received, and afterward compiled to publish as a book *"Thinking with Science"* (Lee Sang-uk et al.

2007). The book *"Thinking with Science"* introduced an assumption that science could be a part of culture, urging that more humanities scholars should pay a lot more attention to scientific methodologies and views provided by science. A more optimistic is that the articles that was rather novelty 10 years ago have become a common sense. Today, in the Korean society, humanities scholars as well as scientists do not doubt that scientific progress is facilitated through close interactions with society and culture that surround science. Of scientists, more of them appear to say that 'science is the most credible knowledge in a given time', rather than saying 'science is eternal truth'. More and more people begin to believe that even scientific knowledge could be uncertain; scientists have made the knowledge of nature as much as they have discovered the laws of nature; and as the present science differs from the past, the future science will be quite different from that of today. Of course, among humanists scholars, there are some who emphasize only scientific formation and the uncertainty of scientific knowledge based on the above-mentioned understanding of scientific knowledge. Nevertheless, such awareness is a great step forward compared to the past.

Regrettably, even if science is acknowledged as a part of culture, we can hardly say that the gap between the two cultures has been narrowed. To accept science as a part of culture is the first step toward narrowing gap between the two cultures. It is insufficient that the humanities craze helps connect them. As this paper emphasizes, still, in our society, the prevailing belief is that science has no values and has nothing to do with the meaning of life. What is required to narrow the gap between the two cultures is to discuss further the relationship between science and values, with the aim of sharing the view that a new perception that science exposes is closely related to our lives, which should be embraced by humanities. Scientists should mull over what kinds of questions they should pose for science promoting valuable lives, and should take various attempts to interlink science with human values. The assertion that the value of science lies in the value-neutrality of science is a legacy of positivism, which would not decrease the gap between the two cultures in 21th century Korean society.

If so, how should the values between science and human be connected ? I'd like to make three propositions in differential but interrelated aspects. Firstly, reexamination should be made on the world view of modern science proposed during the 16th-17th century Scientific Revolution. Modern science revived ancient atomism, bringing about mechanical philosophy. Also it proposed to strictly separate between subject from object, and attempted to do the mathematizaton of nature. The virtue of science(then natural philosophy) was found in its separation from religion, politics and humanities. In this process, it was believed that only primary qualities exist in the universe while secondary qualities were deemed to be illusion. The fact is that most of the things that enrich our lives are relevant to secondary qualities such as beautiful colors, music, taste, warm feelings, pleasant smell and so on. Thus, humanities scholars including Diderot, William Blake, Wolfgang von Goethe stressed that one of the biggest mistakes of modern science was to remove all the secondary qualities from "the mode of existence." Today, the role of science studies is not to repeat the above mentioned assertions; rather, it is to illuminate that the world view of modern science proposed during the 17th century is not eternal and has been discarded through scientific advances made during the period of from 17th century up to the present day. In this process, newly established scientific disciplines in the 20th century (e.g., cybernetics, quantum entanglement, the chaos theory, and the emergence theory) could be stressed or reviewed. Equally important, theories that were ignored and regarded as being unscientific in the history of modern science (e.g., G. W. Leibniz's theory of the monad) should be reconsidered. Aside from G. W. Leibniz, those worth being reviewed include Baurch de Spinoza, David Hume, Friedrich Wilhelm Nietzsche, Henri Bergson, and Alfred North Whitehead, to name a few. Through this, discussions on the history of science and philosophy will lead science to meet humanities (Stengers 2011).

Secondly, the implications of modern biology and neuroscience on human life since the emergence of evolutionary theory of Charles Robert Darwin should be also reviewed. Since the late 20th century, significant progress has been made in the field of molecular biology, which clearly shows that human characteristics are not imprinted in advance. It reveals that genes interact with environments surrounding them to make characteristics of organisms and diseases. In a similar way, the function of brain is

not merely determined by genes but also influenced by its environment. According to a recent discussion on brain plasticity, an environment changes brain functions as well as influences its systems and structures. It appears that the human evolution created a host of characteristics(e.g., intelligence, personality and sexual differences) and indicates that unlike previous thoughts, we are not perfect and excellence but incomplete and biased. Such awareness helps open up value-laden discussions on desirable ways of how to set up social organization principles and morals when humans gather to form a society. Therefore, such discussions would have profound implications on ethics, morals and laws.

Lastly, it should be noted that the concept of desirable human lives change depending on space and time. Evidently, moral problems about which Platon and Immanuel Kant worried can hardly be applicable to us. Similarly, ethical problems about which Confucius, and Chu Hsi were concerned, even though they were Asians like us, cannot be applied to us. The world in which we are living has different assemblage than that of then German society in which Immanuel Kant lived in late 18the century. Accordingly, we should ponder over the issue of '*what could be desirable lives in Korea?*' which has different assemblage than that of then Germany where Kant agonized over the same issue after the French revolution. Today, our assemblage include momentary connections, expansion of information, global communication, intelligent machines, development of artificial intelligence and global finance. However, this provides a small number of people with a new opportunity but deprives the majority of existing opportunities, widening gap between the haves and have-nots (Hong 2002). Therefore humanities clamouring "the Copernican Revolution from inside," the way of thinking that it would be OK if you change yourself without agonizing about how to change such assemblage, would act as a personal solace for a moment, only to fail to change personal lives to be more meaningful ones. Yet, the 21th century assemblages tend to take technological forms, according to which analysis should be made through the joint work of humanities and scientists(Simondon 1958).

One of the important social roles of science studies is to show that science could be a meaningful partner in the goal of humanities-the pursuit of desirable meaning of life. This can be done through reviewing the world views that modern science has been ignored, implicating achievements by modern biology on humans and their society, and consideration on technologies and assemblages. Particularly, in Korea, due to characteristics of its secondary and higher education systems, the gap between science and humanities is widened. Thus, efforts to connect them could facilitate science studies to interlink the two worlds of humanities and science, helping overcome the limitations of fragmentation and specialization. Eventually the efforts will offer an opportunity for science studies to meet a wide range of readership including scientists and humanists.

Reference

Hong Sungook(2000). *Network revolution, Its Possibilities and Limitations*. Published by Deulnyeok (홍성욱 2002. 『네트워크 혁명, 그 열림과 닫힘』 들녘.)

Lee Sang-Wook, et al.(2007) *Thinking with Science* Published by East Asia (이상욱 외. 2007. 『과학으로 생각한다』 동아시아.)

Daston, Lorraine and Peter Galison. 2007. *Objectivity.* New York. Zone Books.

Deleuze, Gilles, and Félix Guattari. (1994) *What Is Philosophy?* New York. Columbia University Press. Translated by Lee Jeong-im, Yoon Jeong-im. Published by Hyundai Mihak-sa (이정임, 윤정임 옮김, 『철학이란 무엇인가』 현대미학사. 1995)

Latour, Bruno. 1999. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA. Harvard University Press.

Latour, Bruno. 2004. *Politics of Nature: How to Bring the Sciences into Democracy*. Cambridge, MA. Harvard University Press.

Shapin, Steven. 2012. "The Sciences of Subjectivity." *Social Studies of Science* 42: 170-182.

Simondon, Gilbert. 1958. *Du mode d'existence des objets techniques*. Méot.
Translated by Kim Hae-hwi, The mode of existence of technical objects. Published by Grinbe (김재희 옮김, 『기술적 대상들의 존재 양식에 대하여』 그린비. 2011)

Stengers, Isabelle. 2011. *Thinking With Whitehead: A Free and Wild Creation of Concepts*. Translated by Michael Chase. Cambridge, MA. Harvard University Press.

Scientific-Technological Revolution, Remoteness and Morality

Doogab Yi
Seoul National University

Proximity and Moral Choice

In 1972, a contentious philosopher, Peter Singer, published a paper titled "Famine, Affluence and Morality," which has now become a classic. In his paper, he laments "As I write this, in November 1971, people are dying in East Bengal from lack of food, shelter, and medical care." At the same time, he points out that their suffering and death are neither inevitable nor unavoidable. The world has become affluent with an abundant amount of food and medicine produced and distributed worldwide, with some even being thrown away. But poor nations keep suffering from constant famine, which is caused by richer people's moral blindness not to give assistance to reduce their suffering, Singer explains. Singer brings up a question of William Godwin, a moral philosopher in the eighteenth century, "What magic is there in the pronoun 'my' to overturn the decisions of everlasting truth?" He notes that when making a moral decision to help people dying from poverty, one needs not draw a distinction whether those in need are the poor living in his/her country or strangers in other countries.

Singer emphasizes that proximity has no role to play in making a moral choice. He agrees that saving one's own daughter is a moral action, but it cannot be a more moral act than saving ten strangers. He continues that if we need to make a choice between saving a child living in our neighborhood and saving ten Bengali children whose name we shall never know, taking the latter choice is the more moral action. Thus, he suggests that people in relatively affluent countries ought to not only share what they have with people who are suffering from poverty and famine but also keep donating their property to the less

privileged so that both can enjoy similar material affluence.

A distinct point of view on the relation between the distance between people and morality underlies Singer's moral argument. Indeed, historically, many have disputed over the relation between morality and distance. Aristotle says the moral emotions that we feel can change depending on how short the distance is between people. In his *Rhetoric*, Aristotle examines that moral emotions are related to geographical and historical aspects, noting that the closer space and time distances become between people, the stronger pity and envy they feel towards others. For instance, an extremely short distance could trigger destructive competition and pity while an extremely long distance might lead to indifference. Yet, in Aristotle's days, the space of human activities and capacity to perform long distance activities were highly limited. For quite a long time, the Mediterranean has been the center of the Europeans and human history has lasted for just a couple of thousands of years.

Scientific-Technological Revolution and Emergence of Connective system

Whereas the society in which Aristotle lived had been a small community where people lived together facing each other, nearly 2,000 years later in the eighteenth century, the scope of human activities was drastically expanded from short to long distances due to scientific and technological revolution. Above all, there had been a heated discussion on what moral implications the expansion of human activities might have throughout the eighteenth century. The Enlightenment philosophers who made provocative arguments on social, political and cultural implications of the development of science and technology paid attention to men and their new thoughts and connective system, such as a canal, which enabled world-wide circulation of commodities. These Enlightenment thinkers who exerted a great influence on forming a modern pattern of technological development contended that as worldwide voyage became a daily practice as well as the means of transportation and communication began to develop, the human history was reaching a new phase. In other words, scientific and technological development that enables long distance activities drove the progress in history.

During the Age of Exploration in the eighteenth century, the development of connective system, such as long-distance navigation and construction of canal, not only expanded the scope of human activities but also laid a ground for spreading an impact of progress made in a certain region to other regions far away. As the Enlightenment philosophers including Condorcet argued, modern scientific accomplishments that had been newly developed through the Scientific Revolution in the seventeenth century won't be stuck in

one region and fade away but would enlighten the society by being propagated via novel connective systems. As a technology historian Rosalind Williams noted, for these Enlightenment thinkers, the social progress hinged on the construction of connective system and technology itself was progress. The emergence of connective system prompted the progress of civilization for the first time in the human history, according to their account.

There has been a lively discussion over the distance and morality as not only the scope of human activities had been expanded but also the areas their influence can reach had been extensively broadened. Through probing into the moral implications by a renowned historian Carlo Ginzburg, the relation between distance and morality began to take a part of moral discussion from post-eighteenth century when the conquest of space began to the era of imperial expansion. Ginzburg points out that discussion over a moral experiment on whether making a fortune by a killing of a mandarin in China by simply exerting his will, without stirring from Paris, in the eighteenth century can be ethically acceptable was one of the key points regarding the expansion of empire and its implication on morality. The moral experiment on the killing of hypothetical Chinese mandarin has been used as the grounds for argument by many philosophers, thinkers and writers from Diderot, Chateaubriand and Balzac to morally criticize or justify the lifestyle of bourgeois in the era of empire expansion.

Will distances in space and time weaken the sense of guilt for murdering the Chinese man? Diderot suggested moral sentiments are dependent on human senses, so feelings like pity or guilty conscience can be weakened depending on the distances in space and time. And, a killing happened in a far place like China will abate the fear of punishment. It was Diderot's conclusion that morality can change depending on geographical and temporal distances. Refuting to such geographical and temporal relativity of morality, Chateaubriand argued that moral conscience is not a phantom of imagination arising from the fear of the punishment but something universal inside the heart that can detect the immorality of the killing. That is, a sort of natural law that determines justice and injustice is inherent in human, so morality is intrinsic value independent from time and space.

On the other hand, Balzac, in his novel 'Le Père Goriot' wants to show how difficult it is to separate discussion on morality from the real 18th century-bourgeois society where a huge chain of commercial activities is entwined from India to China as Diderot and Chateaubriand did so. A poet says to the main character who drinks a cup of coffee in the morning, "In India the English are killing thousands of men as

food as we are; and at this moment, as I speak, the most charming woman there is being burnt–but you have had coffee for breakfast all the same?" The fact that these incidents are happening far away will weaken my conscience or the notion of moral justice? Balzac points out that in the eighteenth century bourgeois society, people are connected with each other through a chain of behaviors and relations that occur far way. The emergence of a worldwide economic system thanks to connective system and technological development had already turned the possibility of a financial gain, involving the pain of someone in long distances, so people in that era experienced both the cruelties of backwardness and the cruelties of imperialism. Balzac asks, "In the form of life in which long distance activities are possible and mutually influential through the chain of relations, moral indifference already implies a form of complicity?

20th Century's At-a-Distance Technologies, Automation, and Morality

During the end of the nineteenth century and early twentieth century, often called the era of conquest of time and space, one of the astonishing technological developments was the emergence and development of at-a-distance technologies that enable long distance activities and control. As production machineries, transportation vehicles such as train and airplane, and a means of communication tools like telegraph and radio were developed through various control devices, the kinds of activities that human can control at a long distance were comprehensively expanded. The development of transportation and shipping means made people feel the distances shorter and spaces more condensed. In addition, time was standardized thanks to the development of communication means. Europe's rapidly evolving industrial-capitalist civilization accelerated a circulation of capital, information and goods through revolutionary transformation of transportation and communication, which was represented by train and telegraph. And, the emergence of the worldwide economic system linked numerous people socially and economically by making it possible to acquire economic and financial gain from much longer distances than Aristotle had imagined.

In the first half of twentieth century, which was the era of destructive confrontation with empire expansion, at-a-distance technologies began to be used as mass war machines during World War Ⅰ and World War Ⅱ, not in an utopian way that Enlightenment philosophers forecasted. Telegraph and means of communication enabled intelligence collection, monitoring and control at a long distance covering a wide range, so that global-scale wars were mobilized. Far-reaching technologies of massacre such as airliner bombing and rocket that can kill people at-a-distance were introduced and genocide was widely committed by Nazis by just pushing a button at a distance to use chemical weapons. These at-a-distance technologies brought about moral dilemma on various activities from monitoring and control to

destruction and killing through distancing between operators and automation of actions. Does technological progress and automation limit the perception on moral limits of our actions and possibility of choices? Many Frankfurt School philosophers, including a sociologist Zygmunt Bauman, criticized that technological progress such as distancing, remoteness and automation caused adiaphorization. Such remoteness not only exonerates the operator's sense of guilt or moral responsibility from execution, but also substituted the possibility of choice for taking such destructive action as a matter of technological operation through automation of killing.

At-a-Distance Action and Interdependence, Expansion of Moral Responsibility?

Contrary to such pessimistic prospects over at-a-distance actions, Peter Singer argues that other factors like distance should not be taken into account when it comes to moral responsibilities and duties. Singer contends that reducing many people's suffering from the perspective of utilitarianism based on moral virtues should be the standard for moral action, and the moral actions of the well-off in advanced countries should be judged whether they contributed to achieving many people's happiness far way rather than engaged in charity work out of pity for the nearby needy.

Contrary to Singer's philosophical analysis in a different historical context, there are others who argue that increasing remoteness enabled humanitarian acts for people at a distance in a globalized world. During the nineteenth and twentieth centuries, advancement in capitalism and at-a-distance technologies facilitated the development of communication technology like telegraph to transfer financial information such as stock price. And, transportation vehicles such as train and airplane were developed for movement and circulation of goods and exploitation of nature and resources. A historian Thomas Haskell noted that the rise of global economic network made people realize someone's economic activities and gain are related to suffering of others at long distances, such as through slavery. More importantly, he argues that the development of at-a-distance technologies such as transportation and communication means let people have influence on activities being done at a distances, so that it could arouse interdependence, a sense of solidarity and humanitarianism toward others. That is, actions at a distance foster mutual solidarity and increasing possibility of at-a-distance actions opens up the possibility of moral actions that might have certain consequences.

Humanities discussion on the scientific-technological revolution regarding remoteness brings several implications to us living in the late twentieth century. In the late twentieth century, mankind is living with

a wider range of technological possibilities than any other periods in human history. Emergence of global-scale, hyper-connected information and communications technology (ICT) enabled long distance communication and control in a wide range of areas including economy, society, culture and education. Remoteness in the 21st century refers to extensive changes stemming from the emergence of telecommunication and control enabled by hyper-connected ICT, which was driven by rapid development of capacity to conduct at-a-distance actions due to the progress in ICT. Humanities study on whether the development of remoteness narrows or enlarges the scope of human's moral actions or redefines the scope of morality will guide us to shed a light on the way of life in a globalized world. For instance, by analyzing at-at-distance system as a part of the historical and social system, we might get insights on monitoring and surveillance at-a-distance. By doing so, we could seek solutions to address concerning problems in the age of big data such as social sorting and privacy issues.

REFERENCES:

Bauman, Zygmunt and Lyon, David. *Liquid Surveillance: A Conversation* (Polity, 2012).

Ginzburg, Carlo. "Killing a Chinese Mandarin: The Moral Implications of Distance." *Critical Inquiry* 21 (1994): 46-60.

Haskell, Thomas. "Capitalism and the Origins of the Humanitarian Sensibility." *American Historical Review* 90 (1985): 339-361 & 547-566.

Singer, Peter. "Famine, Affluence, and Morality." *Philosophy and Public Affairs* 1 (1972): 229–243.

A Study on『O-ju Seojong Bakmul Gobyun』and its Scientific Achievements: Focus on Literary Features of 『O-ju Seojong Bakmul Gobyun』and its Lead-Silver Separation Technique

Kyung Pyo Kang
Chuang-Ang University

Abstract

This study compiled the findings of research that attempted to analyze the history of the *Joseon* Dynasty's studies into science discipline and its accommodating attitude towards the Western science from the perspectives of science and humanities to shed light on the history of Korea's scientific philosophy. In particular, the study conducted an in-depth analysis on『*O-ju Seojong Bakmul Gobyun* (Clarification of and Insight into Wide Knowledge by O-ju, 五州書種博物攷辨)』, which is the only compilation of scientific research in the history of the *Joseon*'s science that has not been adequately focused.

The study attempted to identify the encyclopedic nature of『*O-ju Seojong Bakmul Gobyun*』and highlight key differences between this work and『*O-ju Yeon Munjang Jeonsanhgo* (Encyclopedia of the Record of Wide Range of Information by O-ju, 五洲衍文長箋散稿)』by focusing on their narrative styles, and analyze similarities and differences in the concepts of *Bakmul* (Wide Knowledge) in the two works by analyzing the tradition of *Bakhak* (Wide Learning).

This study argues that『*O-ju Seojong Bakmul Gobyun*』is one of the greatest mineralogy books in the Eastern world with broad-based content and research on mineralogy as well as the *Joseon*'s state on mining despite the facts that it accepts the content of『*Tien-Kung k'ai-wu* (Exploiting the Works of Nature)』from China and introduces scientific knowledge and mineralogical knowledge from Japan and China.

The study turns to why such a book as『*O-ju Seojong Bakmul Gobyun*』, which deals with natural resources, was necessary during the *Joseon* Dynasty by putting historical backgrounds on spotlight. Finally,

the study takes a fresh look at contemporary values of the Lead-Silver Separation Technique introduced in the book to point out its technological values and limits as a science book.

Keywords

O-ju Seojong Bakmul Gobyun, *O-ju Yeon Munjang Jeonsanhgo*, Lee Kyu-Kyung, *Tien-Kung k'ai-wu*, Lead-Silver Separation Technique, *Bakmul*, *Joseon* science, *Joseon* mineralogy

1. The Encyclopedic Values of『*O-ju Seojong Bakmul Gobyun*』

Lee Kyu-Kyung's ideas and his attitude of *Bakhak* and shí shì qiú shì (practical application of knowledge, 實事求是) which can be found in his works were greatly influenced by the teachings of his grandfather Lee Duk-Mu (174-1793). Lee Duk-Mu and his fellow members of *Bukhakpa* (the School of Northern Studies) were at the forefront of importing and introducing cultural and technological knowledge of the Qing Dynasty (China). Lee Duk-Mu's bibliographical and empirical methodologies put emphasis on practicability in discovering and identifying objective facts. At the same time, he took the approach of *Jakgojikgeum* (understanding the past to comprehend today) to emphasize the practical application of knowledge. He focused on gains through practical uses of learning. His work『*Cheon Ae Ji Gi Seo* (Friends I Met in a Far Distant World, 天涯知己書)』clearly shows Lee Duk-Mu's intellectual curiosity towards the Qing Dynasty.[1] Under the influence of his grandfather, Lee Kyu-Kyung also became a scholar who pursued objective knowledge and empirical verifications in his studies. His attitude towards learning led to the development and interpretation of the concept of practicability in a more active and flexible way.
His philosophy can be understood by understanding those espoused the principle of *Bukhakpa* (divided into the school of *Hwadam* and the school of *Nammyung*), who were consigned to history in the wake of King *Injo* Coup (*Injo Banjeong*, 1623). Lee Kyu-Kyung kept his accommodating attitude towards the ideas of Zhu-xi's Neo Confucianism and *Seohak* (Western Studies) and argued for the integration of the schools of *Yukwang*, Taoism and Buddhism. This flexible attitude of Lee Kyu-Kyung can be easily found in the ideas of those belonged to *Bukhakpa*. His belief in Qi' mongolism was also influenced by Seo Gyung-duk (A prominent scholar in the middle of *Joseon* Period, 1489~1546) and Hong Dae Yong (*Joseon*'s scholar characterized by his open attitude, 1731~1783)[2]. Seo Gyung-duk's studies emphasized self-learning,

[1] The Korea Philosophy History Institute, 『*The History of Korea's Practical Philosophy*』, DaumSam, 2002, pp. 216-228.

[2] "Energy (*Qi*, 氣) is the first component that forms the basis of the creation of all things while matter (*jil*, 質) is the second element," Hong Dae Yong said. This statement reflects his view that energy is the first and foremost element that created the universe. In this case, *Li* becomes the way of *Qi* (energy) and the identity of *Li* disappears and, thus, *Li* belongs to *Qi*. *Qi* and *Li* without identity involved in the creation of all things in the universe based on their power and mobility. This is the basis of 'Qi-monism (氣一

placed high values on *Juyeok* (Book of Changes), and maintained his compromising and open academic position.[3] The attitude of compromise and openness is connected to the pursuit of *Bakhak* (Wide Learning), which was the common attitude of practical scholars in the later years of the *Joseon* Dynasty. The root of this attitude can be traced back to scholars in the 17th century named Lee Su-kwang (1563~1628) and Jo Sik in the 16th century (1501~1572).[4] The influences of the past scholars were reflected in Lee Kyu-Kyung's works. His『*O-ju Yeon Munjang Jeonsanhgo*』is comprised of 60 editions of 60 books and 1,400 items.

The representative works of Lee Kyu-Kyung employed the style of the encyclopedic works or Leishu (reference work arranged by category, 類書), which placed greater emphasis on practicability. The practical nature of『*O-ju Yeon Munjang Jeonsanhgo*』and『*O-ju Seojong Bakmul Gobyun*』can be understood in this context. The encyclopedic style was a guideline for those who wanted to accumulate knowledge without reading original books or a manual for those who attempted to write a poem or book. For these purposes, the encyclopedic style books collected and organized phrases and sentences from various books and articles, which is comparable to that of the Western encyclopedia.

There were various types of encyclopedic works (Leishu-type works) during the *Joseon* Dynasty. Examples range from『*Taedong unbu kunok* (大東韻府群玉)』·『*Ok Tong* (玉通)』that focused on vocabulary to『*Sok Mong Gu* (續蒙求)』that mainly talked about people and their stories, and to『*Seol Ryu Chan* (說類纂)』·『*Gyung Seo Ryu Cho* (經書類抄)』 which were closely related to Confucian Classics and Neo-Confucianism.『*Sa yo Chui Sun* (史要聚選)』mainly dealt with history.[5] In this context,『*O-ju Yeon Munjang Jeonsanhgo*』can be understood as encyclopedic works that took on the dialectical method along with Lee Su-gwang's『*Chi Bong Yu Sul* (Treatises on Practical Topics, 芝峰類說)』and Lee Ik's (1681~1763)『*Sung Ho Sa Seol* (Narrative and Analysis by *Sung Ho,* 星湖僿說)』. However, there are important distinctions.『*Sung*

元論) and Lee Kyu-Kyung recognizes and accepts the limitlessness of *Qi*. Lim Sun-young, 「*A Study on the Sil-Hak thought of* O-ju *Lee Kyu-Kyung*」, Sungkyunkwan University Graduate School Master's Degree Thesis, 1992, pp. 11-15.

[3] According to Shin Byung-ju, it cannot be said that Zhu Xi's Neo Confucianism was the sole dominant force in the *Joseon*'s intellectual realm when considering the Schools of Hwadam and Nammyung. They, who called themselves secluded scholars (*Chosa Salim*), pursued the principle of Bakhak, compromise, openness and diversity, which laid the foundation for broadening disciplines and thoughts in the late *Joseon* Dynasty. In particular, academic traditions of the School of Hwadam affected capital region scholars (*Geungi Salim*) living in Gaesung (the birthplace of Hwadam thoughts), Northern Gyeonggi Province and Seoul. This is the testament to academic influence of the School of Northern Studies. Shin Byung-ju, 『*A Study of Intellectual Trends in the Mid and Late Joseon Dynasty*』, Saemoon Book, 2007, pp 102-104.

[4] Gwon In-ho said that Jo Sik's learning was not confined to Neo-Confucianism and exterior cause. He acquired knowledge of broad areas by pursuing the diversity of learning. His academic pursuit of *Bakhak* enabled him to build capacities to respond to problems and explore practical methods in the real world. Dispensing with narrow-minded attitude towards learning, he pursued noble and wise (*gomyung*, 高明) attitude and the practice of respect and righteousness (*Gyeong* and *Euy* 敬義實踐). Gwon In-ho, 「*A Study of Silhak Thoughts of the School of Nammyung*」, 『*Treaties of the Studies of the School of Nammyung*』No.5, The Nammyung Research Institute, 1997, pp 348-350. The statement that scholars had interests in acquiring knowledge of diverse areas such as the principle of Yin and Yang, geography, medicine, Taoism medicine and military backs the above argument. In addition, Jo Sik's academic attitude and Lee Kyu-Kyung's emphasis on harmony and pursuit of *Bakhak* have something in common considering the following facts. Jo Sik argued that 「*Taeguekdo*」was useless in human body and spirit. He accepted academic achievements of Zhu Xi but was critical of scholars who blindly pursued Neo-Confucianism while turning a blind eye to reality. He also accepted a hereditary view that the academic goal of Buddhism and Confucianism is the same.

[5] Sim Gyung-ho, 「*Types of Korea's Encyclopedic Works and their Development*」, 『*Korean Studies*』No.47, Korea University Research Institute of Korean Studies, 2007, pp 85-86 and pp 108-118.

ho Sa Seol』 and 『*O-ju Yeon Munjang Jeonsanhgo*』had a few mentions of poems unlike the usual works of Confucian scholars. In addition, 『*O-ju Yeon Munjang Jeonsanhgo*』was written in a way that maximized the effects of dialectic and bibliographical research of each subject. While『*Sung Ho Sa Seol*』 has many paragraphs that directly reflect the author's belief in the motto of *Jingshi Zhiyong* (serving society by putting expertise into practice), 『*O-ju Yeon Munjang Jeonsanhgo*』 indirectly reflects its inclination towards *Jingshi Zhiyong* by only using dialectical methods.[6]

While there has been a body of work that concentrated on『*O-ju Yeon Munjang Jeonsanhgo*』, research for『*O-ju Seojong Bakmul Gobyun*』, the focus of the authors in this study, has been rare. The volume of *O-ju Seojong* series is presumed to be comparable to that of 『*O-ju Yeon Munjang Jeonsanhgo*』. The existing literature reveals that there are about 10 works in this series[7] but only「O-ju *Seojong Shingi Hwabeop* (Fire Management Framework by O-ju)」, 「O-ju *Seojong Shingi Subeop* (Water Management Framework by O-ju)」, 『*O-ju Seojong Bakmul Gobyun*』were passed down. The fact that most of them exist as the appendices attached to『*O-ju Yeon Munjang Jeonsanhgo*』makes independent research hard to conduct. In particular, the fact that research for『*O-ju Seojong Bakmul Gobyun*』has been vastly insufficient despite its value as the only historical science book in the history of Korea[8] may stem from the features of this book that require views and studies from both humanities and science. 『*O-ju Seojong Bakmul Gobyun*』's characteristic of cutting across the realms of both humanities and science necessitates research that is distinct from research into『*O-ju Yeon Munjang Jeonsanhgo*』.

『*O-ju Seojong Bakmul Gobyun*』, which notably reflects Lee Kyu-Kyung's expertise in terms of thoughts into *Bakmul*, exhibits its distinct nature in the way his observations were narrated. First of all, 『*O-ju Yeon Munjang Jeonsanhgo*』, which contains a representative encyclopedic narrative style, employees *Chagi style Pilgi* (箚記體 筆記), which combines *Chagi* style and *Pilgi* style of narration, according to Kim Chae-sik. As 『*O-ju Yeon Munjang Jeonsanhgo*』 required a narrative style that is useful to describe and deliver a wide range of knowledge effectively, *Chagi style Pilgi* was deemed most suitable. For writers from the 18th century to 19th century, it was of great concern to find the most adequate way of narration. In particular, for a scholar like Lee Kyu-Kyung who pursued multidisciplinary studies, a narrative style that can subtly describe objects and matters in great detail was necessary in conducting his research. As the style of intellectual thoughts in the Qing Dynasty, *Chagi Style Pilgi* can be characterized by its distinct features that enabled scholars to take a critical view of learning, pursue new knowledge and describe diverse information in a flexible manner. In addition, the narrative of 『*O-ju Yeon Munjang Jeonsanhgo*』

---

[6] Kim Chae-sik, 「*A Comparative Analysis into the Narrative Characteristics of*『*Sung Ho Sa Seol*』and 『*O-ju Yeon Munjang Jeonsanhgo*』」, 『*Study of East Asian Ancient Studies*』 No.26, The Association of East Asian Ancient Studies, 2011, pp 62-93.

7 Among works that Noh Dae-hwan reviewed, the following seven works can be categorized into the series of O-ju. 『華東甲子考』, 『種樹書』, 『種樹書補』, 『李家圖書約』, 『書榼畵筌』, 『豢擾卷』, 『博物辨證』 Noh Dae-hwan, 「*O-ju Lee Kyu-Kyung's Study and his Position in the History of Philosophy (1788~1860)*」, The 42th Korea Korean Classics Symposium, The Korean Historical Connection, 2014, p 110.

[8] Lee Kyu-Kyung, Translated by Choi Ju, 『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008, p 6.

employed the dialectical method, which could be considered an independent narrative style that adds comments through bibliographical research.[9]

As Lee Kyu-Kyung highly regarded『*Bakmul Ji* (Naturalis Historia, 博物志)』written by Jang Hwa (232~300) and『*Gwang Bakmul Ji* (Mineralogy Encyclopedia, 廣博物志)』written by Lee Seok (1108~?), it can be safely assumed that『*O-ju Seojong Bakmul Gobyun*』's narrative style was influenced by them. However, the fact may be otherwise considering what Lee Kyu-Kyung said. Also, the 17th century Leishu in China such as Wang Jing's『Explanation of Machines and Technology』and Fang I-Zhi's『The Notes on Principles of Things 』may have affected Lee Kyu-Kyung. However, it is hard to pinpoint similarities in term of content and structure.

In terms of content, Lee Kyu-Kyung's work bear relations to『*Tien-Kung k'ai-wu* (The Exploitation of the Works of Nature)』written by Ying-Hsing Sung and『San-ts'ai t'u-hui (Universal Illustrated Encyclopedia)』written by Wang Chi. Citations from these encyclopedic books appear the most often in『*O-ju Seojong Bakmul Gobyun*』. Common features of these works are that they present an item that indicates a certain object, suggest ways to distinguishes what is untrue from what is true and propose utilization methods. When comparing the table of content of『*O-ju Seojong Bakmul Gobyun*』and *Tien-Kung k'ai-wu*'s smelt and gem sections, the latter book's influence becomes quite clear. Although Lee Kyu-Kyung's book has many citations regarding the refining techniques for minerals and metals from『*Tien-Kung k'ai-wu*』, there exist differences.[10] While『*Tien-Kung k'ai-wu*』comprehensively dealt with a wide range of areas, including cultivation and production of crops, salt, sugar, oil, brewing, clothes, ships, pottery, paper, ink stick and smelting,『*O-ju Seojong Bakmul Gobyun*』focused on the mineralogical knowledge with the introduction of scholastic accomplishments of the Qing Dynasty. Thus, its content on mineralogy is much wider and more diverse than that of *Tien-Kung k'ai-wu*. Based on this fact, we can assume that『*O-ju Seojong Bakmul Gobyun*』was the most superior encyclopedia in the field of mineralogy in the Eastern world.

In terms of narration, differences between『*Tien-Kung k'ai-wu*』and『*O-ju Seojong Bakmul Gobyun*』can be observed.『*O-ju Seojong Bakmul Gobyun*』has the *Jeon Eui* (Transformation of the Basis, 傳疑) and *Jap Go* (Insights into Things, 雜攷) parts. The former is a part that questions the validity of cited content. No matter how authoritative book he quoted from, he asked questions on matters if the content could not be believed or was not consistent with reality. The latter section described information on various items that was available in *Joseon* and presented detailed ways to utilize methods or knowledge he discussed. In addition, he attempted to provide logical explanations through scientific inferences based on

[9] Kim Chae-sik, 「*Characteristics of Chagi style Pilgi in the『O-ju Yeon Munjang Jeonsanhgo』*」, 『*Korean Studies Quarterly*』 No.33 Vol.3, The Academy of Korean Studies, 2010, pp 94-106.

[10] Quoted from various material such as the Source of a Picture Melting Copper, Insight into Nickel, How to Wash Away Green Spots on Brass, How to Produce Mercury, How to Produce Sulfide of Mercury, Explanation on Matchstick, Explanation on Green Vitriol.

a single knowledge as he did in『*O-ju Yeon Munjang Jeonsanhgo*』[11] and did not rely on his creativity or imagination, which characterizes Hong Dae Yong's dialectic approach in *Dasaegyeseol* (Multi-world Theory)[12],[13].

『*O-ju Seojong Bakmul Gobyun*』and『*O-ju Yeon Munjang Jeonsanhgo*』 are all encyclopedic works by nature. While『*O-ju Yeon Munjang Jeonsanhgo*』 employed inductive approaches in many cases in order to adhere to scientific reasoning, cite and reproduce diverse information to reflect his experience and perspectives,『*O-ju Seojong Bakmul Gobyun*』focused on the provision of information in a more objective manner. Although the title of this book mentions *Bakmul* (Wide Knowledge), which indicates knowledge in broad areas of discipline, it is a book about science and technology that comprehensively deals with the nature of minerals, smelting and refining techniques, metals, glasses, pottery and chemistry. It can be characterized by its systemic organization of content, similar to that of dictionaries. In particular, it mainly provides objective insights and analysis of the nature, category and extraction techniques of minerals and metals. It describes how to make and decorate processed matters such as glass, pottery and mirror and the principles of the Western science such as glasses and puts more emphasis on facts to uncover the nature of objects instead of relying on explanations and assessments through dialectical methods.

2. The Trend of *Bakhak* (Wide Learning) During the *Joseon* Period and Lee Kyu-Kyung's Concept of *Bakmul* (Wide Knowledge)

While the previous section looked into the encyclopedic nature of『*O-ju Seojong Bakmul Gobyun*』, there was no attempt to answer the question of why the word *Bakmul* (Wide Knowledge) appears in the title of『*O-ju Seojong Bakmul Gobyun*』. Based on the understanding of the concept of *Bakmul*, this section tries to identify what Lee Kyu-Kyung wanted to mean by *Bakmul*. Before taking an in-depth look into Lee Kyu-Kyung's mention of *Bakmul*, it is necessary to understand how the concept of *Bakhak* (Wide Learning) was understood in the history of the thoughts during the *Joseon* Dynasty. Since scholars equated the doctrines of Zhu-xi with the learning of "*Gyuk mul chi ji* (gaining knowledge by the study of things, 格物致知)", they preferred to criticize the concept of *Bakhak*. In the history of the *Joseon*'s thoughts, the first work that showed an inclination towards *Bakhak* was『*Chi Bong Yu Sul* (Treatises on Practical Topics)』authored by Lee Su-gwang.[14] When reviewing the characteristics of the 17th century scholars, those belonged to the School of Zhu-xi recognized *Bakhak* as the mere process of learning and

---

[11] 『*O-ju Yeon Munjang Jeonsanhgo*』「鳥能駄物辨證說」
[12] 『*O-ju Yeon Munjang Jeonsanhgo*』「日月星辰各有一世界辨證說」
[13] Moon Jung-yang, 「*Creative Deviation: Thoughts on Lee Kyu-Kyung's Ideas on Heaven and Land in the early 19th century*」, 『*Korean Culture*』 No.59, Kyujanggak Institute for Korean Studies, 2012, pp 218-222.
[14] Noh Dae-hwan, 「*O-ju Lee Kyu-Kyung's Study and his Status in the History of Philosophy (1788~1860)*」, The 42th Korea Korean Classics Symposium, The Korean Historical Connection, 2014, p 11.

considered a study of trivial matters. To them, *Bakhak* was the pursuit of peripheral matters, not fundamental matters.

Since *Bakhak* is categorized as one of the processes of *Gyukmul* (Investigation of Things) specified in the methodology of the School of Zhu-xi, many scholars tended to understand the concept of *Bakhak* in the context of *Gyukmul*. For instance, Song Si-yeol took on a negative view of the value of *Bakhak*.[15] In the Confucian tradition, the purposes of *Gyukmul* were to clearly judge between what was fundamental and what was peripheral and between what was right and what was wrong. Thus, the blind pursuit of *Bakhak* was viewed as the obsession with peripheral matters. This negative perception with respect to *Bakhak* continued into the 18th century. 『*Sung Ho Sa Seol*』 written by Yi Ik (*Joseon*'s scholar of *Silhak*, 李瀷) was a model example in this respect. This book was greatly influenced by Leishu-types on diverse topics from the Qing Dynasty where bibliographical research methodology was developed. Lee Kyu-Kyung's grandfather admired Yi Ik for his fair and insightful views represented in『*Sung Ho Sa Seol*』. However, other scholars still expressed their aversions to the concept of *Bakhak* as a low level of learning and drew the clear line between the concepts of *Bakmul* and *Gyukmul* as two separate ideas.[16]

In the 19th century, intellectuals still stayed away from *Bakhak*. Hong Seok-ju's criticism was notable in this regard. He cautioned that too much focus on *Bakhak* may help intellectuals to accumulate a wide range of knowledge but impede virtuous achievements.[17] Jeong Yak-yong (one of the greatest thinkers of the later *Joseon* period) also said that 『*Sung Ho Sa Seol*』 was not worth passing down to next generations because it had mixed up arguments and was not systematic.[18] The Qing Dynasty's bibliographical study was imported in the 19th century, which led to the production of works that accommodated the concept of *Bakhak*. However, academic atmosphere in which *Bakhak* was excluded remained unchanged. In spite of this unfavorable condition, Lee Kyu-Kyung still pursued the Study of *Bakmul*. Unlike Zhu-xi scholars' arguments that the concepts of *Gyukmul* and *Bakhak* need to be separated, Lee Kyu-Kyung connected these two concepts by saying that he had fervor for the concepts of *Gyukmul* and *Bakhak*.[19] As he was a fierce opponent against the movement for the integration of Confucianism, Buddhism and Taoism as a faithful Confucianism follower, it seems quite natural that his understanding of *Bakmul* was closely related to the context of *Gyukmul* that Zhu-xi doctrines advocated. Thus, the understanding of *Gyukmul* by Lee Kyu-Kyung was totally different from that of existing Zhu-xi scholars. According to studies conducted by Noh Dae-hwan, Lee Kyu-Kyung argued that the meaning of *Mul* (Things) in *Gyukmul* did not indicate ethics but natural external matters. He understood the *Gyukmul*

[15] Refer to Noh Dae-hwan, 「*A Study on the Development and Significance of Myeongmulhak (Study of Objects) in the Late 18th and the Early 19th Centuries*」
[16] Noh Dae-hwan, 「*O-ju Lee Kyu-Kyung's Study and his Status in the History of Philosophy (1788~1860)*」, The 42th Korea Korean Classics Symposium, The Korean Historical Connection, 2014, p 12.
[17] Noh Dae-hwan, above work, p 12.
[18] Noh Dae-hwan, above work, p 12.
[19] Noh Dae-hwan, above work, p 12.

as beneficial utilizations, criticizing that *Joseon* was not able to take full advantage of objects since *Joseon* was negligent of the *Gyukmul*.[20] His take on *Gyukmul* was naturally reflected in『*O-ju Seojong Bakmul Gobyun*』, which took on positive attitudes toward *Bakhak* by arguing for the acceptance of new culture and technology and drawing distinction between what was untrue and what was true.

The Lee Kyu-Kyung's view with respect to *Gyukmul* led to the reinterpretation of *Bakmul*. He argued that the nature of *Bakmul* has remained unchanged. However, he cautioned that it may not be accompanied by cause and practicability and be inappropriately utilized.[21] In the preface of『*O-ju Seojong Bakmul Gobyun*』, he cited the assessment written by one of his friends and tried to show *Bakmul* he was discussing was different from that of the past.

"While it seems that Jang Mu-sun meant the selective grasp of wide range of objects by *Bakmul*, you (Lee Kyu-Kyung) meant the comprehensive understanding of various objects. Although scholastic understanding and knowledge of Jang Mu-sun[22] and Lee Seok[23] are wide, it has nothing to do with your Insight and Clarification (*gobyun*). Also, they may have deep knowledge but it is not related to the possession of wide range of knowledge. Insight and Clarification (*gobyun*) merely borrowed the name of *Bakmul* (Wide Knowledge). Actually, you employed dialectic methods based on evidence. How can it be said that your idea harms cause and practicability? Although the writing may be short, its meaning is big."[24]

Previously, the concept of *Bakmul* was merely confined to the comprehensive selection of objects. What Lee Kyu-Kyung argued about *Bakmul* was not the simple collection of facts about objects. Through his friend's assessment, Lee Kyu-Kyung said the way of Insight and Clarification (*Gobyun*, 考辨) is placed at higher levels, rather than harming cause and practicability. It indirectly shows Lee Kyu-Kyung's perspective that *Gobyun* is consistent with the original purposes of. When suggesting the original purposes of *Bakmul*, Lee Kyu-Kyung used the term *Bakmul* of large men. Lee Kyu-Kyung quoted *Juyeok* (Book of Changes) as follows.

"*Bakmul* takes large or small forms. The phrase of *Juyeok*, 'Objects are divided into groups and works are collected into groups (方以類聚, 物以羣分)' indicates the *Bakmul* of large men. The act of recording unimportant, strange and weird matters is the way of the *Bakmul* of small men."[25]

---

[20] Noh Dae-hwan, above work, p 12.
[21] Lee Kyu-Kyung, Translated by Choi Ju, 「序」 『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008.
[22] Refer to Janghwa (232~300), the author of『*Naturalis Historia* (博物志)』
[23] Refer to Lee Seok (1108~?), the author of『*Mineralogy Encyclopedia* (續博物志)』
[24] Lee Kyu-Kyung, Translated by Choi Ju, 「序」 『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008.
[25] Lee Kyu-Kyung, previously mentioned book, 「序」.

According to his view, the concept of *Bakhak* of which existing scholars were wary only indicated the concept of the *Bakmul* of small men. He was sure that the implementation the *Bakmul* of large men helps strengthen cause and practicability. Lee Kyu-Kyung pointed out that *Bakmul* was largely interpreted as small men's *Bakmul* and attempted to pursue the implementation of large men's *Bakmul* in ways consistent with the purposes of *Gyukmul*. He also criticized as follows.

"As I see it, people only learn things vaguely from writings and look down on things as if they are dirt. I cannot help but lament the present situation where the large men's *Bakmul* is taken out and the passing down of learning that came from very old days has discontinued."[26]

Lee Kyu-Kyung said people did not properly know the purpose of *Bakmul* and looked down on the content of things as unimportant matters. It shows his perception that large men's *Bakmul* has largely done and *Bakmul* faced the reality of discontinuation. 『*O-ju Yeon Munjang Jeonsanhgo*』's「*Bakmul Byungeung Seol* (Dialectics Essay on *Bakmul*)」specifically talks about the discontinued history of *Bakmul* by presenting certain people and books as examples. He was passionate about upholding the tradition of *Bakmul*.[27]

3. The Historical Background of『*O-ju Seojong Bakmul Gobyun*』

When writing his science and technology books, it seems that Lee Kyu-Kyung borrowed narrative styles from previously written Leishu. Scholars in the later years of the *Joseon* Dynasty exhibited this tendency too. The reason why scholars invested a great deal of their time into deciding which narrative style to adopt lies in the fact that the style that academic writing required was quite different from what they were accustomed to. In other words, what they were writing needed to be more based on reality. Lee Kyu-Kyung faced a challenge of the same nature. The driving force behind Lee Kyu-Kyung's work was generated by accepting ideas from other scholars and creating his own view of the world based on these ideas. Lee Kyu-Kyung's writing of practical matters were greatly influenced by Lee Ji-ham (A prominent scholar during the middle of the *Joseon* Dynasty better known as the author of *To Jong Bi Gyeul*, 1517~1578)[28]. Lee Kyu-Kyung quoted Yoo Hyung-Won (One of the very first *Silhak* scholars during the

[26] Lee Kyu-Kyung, previously mentioned book, 「序」.
[27] "A thousand years have passed since the creation of Jungja Moutain and the concept of *Bakmul*. Still, there are a few people who can be called the master of *Bakmul*, which shows the fact that *Bakmul* is hard to acquire. With the completion of such books as『*The Book of Bakmul* (博物錄)』 and 『*The Record of Bakmul*』, *Bakmul* was created as a discipline."(博物, 自鄭子産以下, 歷數千年, 不過數人, 則博物非易事也。其書古有《博物錄》,張茂先倣作《博物志》, 因此以後, 博物之學問有稱焉。)
[28] A colleague of Hwadam (Seo Gyung-duk's pen name). As a Northern Studies scholar, he was also a friend of Jo-sik.

Joseon Dynasty, 1622~1673) in praising Lee Ji-ham's suggestions to trade with foreign ships from Okinawa to rescue the common people from poverty. He was a rare intellectual who highlighted the importance of commerce, which was regarded as a lower level work, based on his view that land and ocean are the storage of matters of great benefits. This assessment is related to the ideas of *Bukhakpa* and *Silhak* (Practical Studies).[29] In particular, he broke the cherished tradition regarding the concept of *Li* (benefit, 利) and theorized that active economic development and pursuit of profits can benefit people's living standards. His theory took an active position on the development of commerce and mineralogy. As the mayor of Pochun, he strongly underscored the importance of developing mines.[30] Likewise, Lee Kyu-Kyung lamented about the country's failure to tap into the deposits of mineral resources in his 「*Palroribyung Byungeungseol* (Dialectic Essay about *Palroribyung*)」.[31]

As the development of mineral industry laid social and economic foundations that sparked national interests in mineral resources, experts' advice on smelting and processing of metals and minerals had direct impacts on government policies for mine development. During the *Joseon* period, mining activities have occurred sporadically since the first attempt to develop mines in *Dancheon* (端川) in Hwanghae Province and Hamgyung Southern Province after the inauguration of King *Taejo*. In 1503 (King Yeonsan-gun 9), a technique of separating silver from lead was developed in Yeon Mine (鉛鑛). This touched off a full-fledged development of mines in *Dancheon* area. During the period of King Gwanghae-gun, those belonged to *Bukhakpa* who inherited the intellectual legacies of Seo Gyung-duk and Jo Sik dominated the state affairs. As a result, the development of silver mines and jingoism emerged as major ideas for social and economic policies in their efforts to restore the country to health in the wake of the *Imjin* War. At that time, silver mine development projects started with the proposal submitted by Kim Shin-guk, the Minister for Treasury and the development has continued until the period of King *Injo*.[32] Judging from circumstances, it can be seen that the scholars of *Bukhakp* who had compromising and open attitudes toward *Bakhak* and practical disciplines greatly influenced policy decisions of the government as the political majority. However, when viewed from social and economic circumstances, the mine development movement was largely sparked by Kim Shin-guk in 1627 who suggested the development of *Dancheon* silver mines after recognizing the importance of circulation of currency in economic lives. During the *Joseon* period, silver was an item bestowed to Chinese envoys as representation of its loyalty to the Qing

---

[29] Kim Sung-hwan, 「*Yi Ji-ham, The Man of Practical Action for the Common People*」, 『*Leading Culture*』 Vol. 12, University of Brain Education Kuk-Hak Institute, 2012, p 364.

[30] 『土亭遺稿』「莅抱川時上疏」: 固爲生民之根本。至於銀可鑄也。玉可採也。…… 誠欲賑飢。王府之財。猶不足惜。山野空棄之銀。何惜而禁之。使不得鑄。陵谷埋藏之玉。何惜而禁之。…… 臣請聞見有處。試鑄銀採玉而用之。若功勞多而所得不夥。置而不爲。若所得多而可爲救民之用。則書其事之首末。轉而上聞。

[31] 『*O-ju Yeon Munjang Jeonsanhgo*』「八路利病辨證說」: 我國西北。亦多銀鑛。盡輸於燕。易無用之物。而猶爲不足。又賊倭。銅。銅山八路。星羅棋置。近自甲山冶鑄不渴之鑛。而做出不虞不慮。禁斷封閉。…… 富寧則出金鑛甚多。有禁不采。六鎭則産煤炭。卽石炭也。在處有之。而不知采用。暴殄天物。

[32] Shin Byung-ju, 『*A Study of Intellectual Trends in the Mid and Late Joseon Dynasty* 』, Saemoon Book, 2007, pp 201-203.

Dynasty. While silk was the main item in trade for China, silver was the main item for *Joseon*. Though a majority of *Bukhakpa* scholars argued for the development of agricultural economy as a main way for social restoration after two wars, they did not shy away from the accumulation of national wealth through a means of commerce. This idea was inherited by some *Silhak* proponents and Yoo Hyung-Won was one of them.[33] The extraction of silver through mine development projects was a sound economic policy that had potential to create massive benefits for the country.

In the area of mine industry, *Seoljeomsujae* (設店收稅: Permit individuals to extract resources such as gold and silver and collect taxes) management practice was the dominant way of mine management in the early and mid 18th century. However, after mid 18th century, *Jamchae*, the illegal way of mining, became the mainstream in mining industry. Mining activities became vigorous with the permission to install Gold and Silver Stores in the later years of King *Jeongjo*'s reign. However, bureaucrats fiercely opposed the permission policy because they worried that it could deal a blow to agricultural production. The permission was revoked, which led to the wide spread illegal extraction of gold and silver. It could not be controlled and King *Sunjo* resumed the practice of *Seoljum*, which allowed private sector to participate in the mining activities without government interventions and controls.[34] Mining became the focus of the private sector. The private sector-driven extraction, smelting and processing of natural resources promoted the tearing down of feudalistic social hierarchy. At that time, workers flocked to privately owned gold mine compounds in Seongcheon with their families to mine gold. It was said that the gross revenue in the area amounted to the government's annual budget.

King *Jeongjo*'s permission to develop mines was largely led by government's poor financing capacity. Moreover, the fact that many gold mine workers joined Hong Gyung-rae's Rebellion as main fighters in 1811 demonstrated public sentiment against the government's policy to ban mining activities.[35] In addition, demand for lead mining surged with the breaking out of the *Imjin* War. As the war brought many Japanese guns to the *Joseon*'s soil, demands for lead bullets, which could be made by separating lead from galena lead, soared. Since the use of guns changed the rules of war, which used to rely on traditional weapons and tactics, the importance of developing iron ore mines gradually increased. Since the mid 18th century, there was a substantial increase in the number of private gunners. As a result, the utilization of guns also jumped and the government began to organize independent gun-using military units. In the early 19th century, bullet manufacturing techniques and the number of producers experienced significant upward trends with the emergence of private steel sellers and public to private transition in terms of gun manufacturing.[36]

---

[33] Shin Byung-ju, above book, pp 204-205.
[34] Jung Seok-jong, 『*Politics and Philosophy in the Late Joseon Dynasty*』, Hanhgilsa, 1994, pp 178-181.
[35] Yoo Seung-ju, 『朝鮮時代 鑛業史硏究』, Korea University Press, 1993, pp 368-374.
[36] Yoo Seung-ju, 「朝鮮後期 軍需鑛工業의 發展」, 『*History Paper*』3, Dankook University History Association, 1969, p 1, p 35.

In the meantime, Seo Yu-gu (1764~1845) suggested *Dancheon* as a place for lead mining in his『*Imwon Sipyukji* (Encyclopedia of Farm Lives, 林園十六志)』.『*O-ju Seojong Bakmul Gobyun*』also mentions the *Dancheon*'s silver refining technique and provides a detailed explanation of lead-silver separation that relies on differences in the point of melting between lead and silver. Lee Kyu-Kyung talked about how to identify silver in『*O-ju Seojong Bakmul Gobyun*』. It was because increasing national demands for silver was accompanied by unintended consequences. During four years into the reign of King *Sukjong* (1778), Heo Jeok, the premier, pointed out that silver was substantially undersupplied while high demands from public to buy fire woods and foods remained. As a result of underproduction, the inflow of fake silver reached its peak. During three years into the reign of King Yeongjo (1727), *Joseon*'s pure silver became an export item to China. During this time, people became so sly and profit-oriented that they mixed steel and lead in silver refining processes. *Joseon*'s silver traders were branded as scam artists because of the production of fake silver.[37]『*O-ju Seojong Bakmul Gobyun*』outlines how to distinguish real silver from fake silver and how to make impure silver. The explanations of techniques of『*O-ju Seojong Bakmul Gobyun*』arose from the social atmosphere in which industrial techniques came out of public realm into private sector that put more emphasis on practicability.

Lee Kyu-Kyung's grandfather underlined the importance of international trade by pointing out the fact that Japan was able to join the ranks of strong countries through its trade ties with the Netherlands. International trade through ships was also advocated by *Bukhakpa* scholars. Lee Kyu-Kyung was influenced not only by his grandfather but also the trade theory argued by Lee Ji-ham. It seems that Lee Su-gwang's positive perceptions of trade between the Western and Eastern worlds, which was formed by his rich thoughts and reading, also positively affected Lee Kyu-Kyung's scientific writings through『*Chi Bong Yu Sul*』.[38] Although Lee Kyu-Kyung's O-ju series has content associated with marine defense, he was not arguing for a full defense posture against the Western world by viewing it as a possible foe looking to invade *Joseon*. His friend and junior scholar Choi Han-gi (1803~1877) also exhibited a similar disposition.[39] Of course, the appearance of French ships in 1846 and 1847 seemed to shock Lee Kyu-Kyung. In『*O-ju Yeon Munjang Jeonsanhgo* 』and *Cheoksa Byungeungseol* (Dialectic essay about Rejecting Heterodoxy), he worried that "There is a sign of a war". However, this statement did not make Lee Kyu-Kyung a fierce opponent against the Western world and its technologies.[40] Lee Kyu-Kyung made

---

[37] 山本進, 「朝鮮後期 銀流通」, 『*A Study of the Ming and Qing Dynasties*』No.39, The Society for Ming-Qing Historical Studies, 2013, pp 227-229.

[38] Lim Young-gul, 「*O-ju Lee Kyu-Kyung's Practical Science – From Perception of the West to the International Trade Theory*」, 『*Chinese Study Paper*』No.28, Woori Society of Korean Literature in Classical Chinese, 2013, pp 124-125.

[39] Noh Dae-hwan, 「*Approach of Western Powers and Change in the View of the Ocean in the Late Joseon Dynasty*」, 『*A Study of Korea's History* 』123, The Korean History Society, 2003, p 361.

[40] Lim Young-gul mentioned Lee Kyu-Kyung's academic attitude in his work 「*O-ju Lee Kyu-Kyung's Practical Science – From Perception of the West to the International Trade Theory*」. He argued that Lee Kyu-Kyung maintained a positive attitude towards establishing trade ties with the Western world even after the incidents in 1846 and 1847. It is because he was not particularly knowledgeable about international environments at that time as he was travelling around Chungchung area since 1832. He was also sure that trades with the Western world, which he believed possessed superior capabilities, could rescue ordinary people from poverty.

an argument that technologies of the Western world have their roots in China but he did not underestimate independence and superiority of the Western technologies.[41] His view that Lee Kyu-Kyung saw the concepts *Gyukmul* and *Bakmul* were the same can be found in this context. For Lee Kyu-Kyung, subjects of *Gyukmul* were not abstract and philosophical but could be practically utilized in the real world.[42] Although his ethical and moral points of view stayed within the framework of traditional feudalistic Confucianism, it seems that he, as a practical scientist positively predisposed to science, could not resist the Western civilization since the Western world made great accomplishments through the development of science. His『*O-ju Seojong Bakmul Gobyun*』 can be viewed as the result of his attempts to foster practical learning by accepting Western technologies.

4. Scientific Nature and Limits of『*O-ju Seojong Bakmul Gobyun*』

Before shedding light on『*O-ju Seojong Bakmul Gobyun*』as a science book, it is required to ascertain whether or not this book can be classified as scientific work. The translator of this book Choi Ju attempted to restore the ironware manufacturing technique based on the「*Yeoncheol Byungeungseol* (Dialectic Essay about Traditional Smelting Process of Iron)」put forth in『*O-ju Yeon Munjang Jeonsanhgo*』.

This series of attempts can be interpreted as efforts to take stock of traditional Korean science knowledge and confirm scientific nature of Lee Kyu-Kyung's work. Of course, it is not easy to judge whether a certain book is scientific or not. It is also important to keep in mind that the blind and reckless application of the Western world's standards may result in errors. That being said, the assessing the content of『*O-ju Seojong Bakmul Gobyun*』from the Western science point of view carries special significance to a certain degree. Lee Kyu-Kyung was a scholar who had great interest in the Western science. He adopted inductive reasoning in his writing, which was a main scientific methodology of the Western world. This is why the Western approach can be useful in analyzing his work. Although there still remain sections that require additional studies in the future, the authors tried to understand 『*O-ju Seojong Bakmul Gobyun*』 from the perspective of the Western science by focusing on three cases explained in the book.

① Scientific nature of the *Dancheon* Lead-Silver Separation Technique (端川鉛銀分離法)

Even though the *Dancheon* Lead-Silver Separation Technique was the brainchild of *Joseon* intellectuals, it seems that Lee Kyu-Kyung learned about this technique through『*Tien-Kung k'ai-wu*』.[43] According to

---

[41] Noh Dae-hwan, 「*The Change of understanding about the West and reception theory of Seo-Ki (西器) in the first half of 19th century*」, 『*A Study of Korea's History*』 95, The Korean History Society, 1996, p 121.
[42] Kim Chae-sik, 「*A Study of Lee Kyu-Kyung's 『O-ju Yeon Munjang Jeonsanhgo』*」, Sungkyunkwan University Graduate School Master's Degree Thesis, 2008, pp 45-46.
[43] Choi Ju who translated『*Tien-Kung k'ai-wu*』and『*O-ju Seojong Bakmul Gobyun*』 said *O-ju Seojong Bakmul Gobyun* and *Tien-*

the Annals of the Joseon Dynasty, the first lead-silver separation technique was said to be devised by Kim Geom-dong and Kim Gam-bul in 1503 as a way to refine silver.[44] The invention of the separation technique turned the *Dancheon* lead mine area into the thriving capital of silver mine and facilitated the development of silver mines nationwide. Despite the growth of the extractive industry, the development of natural resources was not much helpful in strengthening *Joseon*'s national power as it was discussed previously.

In both the Eastern and Western hemispheres, cupellation was one of the most common processes for silver refining. Cupellation, which is still in use today, is based on the principle that ordinary metals and precious metals have different melting points. Western cupellation can be traced back to 『*De Re Metallica*』 written by Georgius Agricola in 1556. In this book, silver was separated by using alchemistic liquid called aqua regia or aqua valens[45]. The *Dancheon* Lead-Silver Separation Technique is older and simpler method of securing pure silver from lead than Agricola's. It involves the direct injection of potassium nitrate in the second process of separation. Through this technique, silver with 99.5% purity could be produced. This technique was introduced to Japan in 1536.

When translating the *Dancheon* Lead-Silver Separation Technique into modern chemical formulas to confirm scientific validity of the *Dancheon* Technique, it becomes clear that this technique is effective in real science. This fact demonstrates that Lee Kyu-Kyung tried to remain objective and scientific when writing his『*O-ju Seojong Bakmul Gobyun*』. The following is a comparison between the *Dancheon* Lead-Silver Separation Technique and modern chemical formulas.

Dancheon **Lead-Silver Separation Technique[46]**	**Modern Chemical Formula[47]**
When raw silver is extracted, make a small hole in the bottom of furnace. Then, treat the hole with strong fire to tramp it.[48] Put silver on top of lead piece. After surrounding it with charcoal fire, cover it with pine firewood. Then, fire starts to flare up. Then, lead would be melted, which is pooled and begins to circulate. Newly generated iron mold and previously generated iron mold are mixed up and	Although it is hard to ascertain the composition ratio of minerals extracted from *Dancheon* in North Korea[49], minerals are generally composed as follows. PbS, Zns(CuS, FeS, Ag2O, CaCO3, SiO2) When heated, lead oxide is generated through

Kung k'ai-wu has identical content.

[44] *The Annals of the Joseon Dynasty* Yeonsan-gun 9 (1503, Hong-chi 16)

[45] G. Agricolae, *De Re Metallica,* Ⅹ, p 475.

[46] Lee Kyu-Kyung, Translated by Choi Ju, 『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008, p 51.

[47] In making these formulas, the authors studied *Some Notes on Depletion Gilding* of Charles Lewton-Brain which is included in the Ganoksin Project's Jewelry Manufacturing Methods and Techniques. Also, an online chemical reaction calculator was used to construct suitable chemical formulas.

[48] This way is similar to how cupel is made.

[49] 『*O-ju Yeon Munjang Jeonsanhgo*』「八路利病辨證說」: 六鎭中端川出金、銀、銅、鉛、五色玉及繭紬最名。

begin to boil. After a while, silver started to come to the center and the residue of lead permeates into ash. Pour water on silver to make it thick and pull it out afterwards. Lead residue that is mixed up with ash can be separated from ash when fire is once again used. When refining silver, fake silver can be made by mixing up yellow bronze and lead. The soft silver dust can be collected to remove impurities and make pure silver. The mixed up silver (雜銀) is put into a melting pot and refine the pot on the strong fire of furnace. When a small amount of potassium nitrate is put, copper and lead are mixed up and left at the bottom of the pot. This is referred to as silver rust (銀銹) and matters that fall into *Hoeji* is called *Nohjeo*. Put these two matters in a furnace and melt them by heating up a clay pot full of charcoal. Then, melted lead flows down and leftover copper and silver lumps that are stuck together can be separated by using an iron skewer.	PbS+O2=PbO+SO and zinc oxide is generated through 2ZnS+3O2=2ZnO+2SO2. When heated more, lead and zinc are filtered out and silver is separated through oxidation reduction reaction (2Ag2O = 4Ag + O2) and silver with 80-99% purity can be produced. When potassium nitrate (KNO3) is added and heated as the second process, KNO3 is dissolved into KNO2 +O2 and react with residual Pb and Zn to generate such reactions as Pb + KNO3=PbO + KNO2 and Zn + KNO3=ZnO + KNO2 to filter out impurities and generate even purer silver.

As explained, there is no problem in translating『*O-ju Seojong Bakmul Gobyun*』's silver processing into modern chemical formulas. However, Lee Kyu-Kyung merely copied the record of the Lead-Silver Separation Technique and stopped short of conducting experiments to scientifically verify this technique. As a result, there is no mention of actual time that takes to refine silver or how many times cupellation needs to be repeated. This is a part that requires additional verification through experiments of scientists.

Based on the *Yeoncheol Byungeungseol* previously discussed, Choi Ju manufactured a furnace to conduct experiments on iron restoration. However, Choi Ju reported that he was unable to produce stainless steel despite two times of attempts by utilizing the ancient steel production technique.[50] There could be various possible theories on this account. Perhaps, the record of smelting theory is wrong. Something may have gone wrong in the process of restoration of traditional science or was not undertaken properly due to a short period of experiment. Going forward, it is imperative to make such attempts to verify scientific explanations specified in these works.

[50] Choi Ju, 「*Experimental Iron Smelting by the Reference of the O-ju Yeon Munjang Jeonsanhgo*」 The Society of Korea Traditional Science and Technology Studies, Vol1 No1, 1994, p 116.

② Lee Kyu-Kyung's Scientific inference for the *Ma Gyung* phenomenon (the Magic Mirror)

Lee Kyu-Kyung wanted to learn about *Gi Beop* (the Law of Energy, 氣法) of the Western science. Lee Kyu-Kyung once requested Kang Yi-jung to explain how a generator called *Neoh Beop Gi* (Lightning Device) works. Kang Yi-jung said wondrous objects of the Western world are based upon *Gi Beop* and the people of *Joseon* did not understand how Western machines operate because they did not know anything about *Gi Beop*.[51] *Gi Beop* seems to mean scientific principles and processes in this context. Inferences through the arrangement and analysis of facts that underpin scientific principles constitute the basis of the Western science. For instance, a proper explanation about how a generator works can be provided on the condition that physics, chemistry and mathematics are properly understood. Without gaining knowledge in diverse science disciplines, it is almost impossible to learn and understand scientific principles.

Although Lee Kyu-Kyung failed to fully grasp the principles of the Western science, he made a great deal of efforts to understand them. His efforts appear in understanding the *Ma Gyung* phenomenon in which the image appears from the back of the mirror. The content about *Ma Gyung* is recorded in the section of *Gyung Dong* (Bronze Mirror) in 『*O-ju Seojong Bakmul Gobyun*』. He quoted *Fang I-Zhi*'s work as follows.

"Regarding the emergence of images without human interventions, *Fang I-Zhi* presumed as follows. When bronze with the higher proportion of copper gets old, its color turns into green. Then, the color gets jade green as time passes. The higher concentration of tin makes the color dark green because of mercury. It gets darker and darker. The image that gradually appears is generated when copper and the energy of land, salt and vinegar are mixed up. Unlike the change on the surface of tin, a image is created in this process."[52]

Lee Kyu-Kyung wrote about *Ma Gyung* as follows.

"While the image of dragon appears in the mirror under sunlight, no image can be found without sunlight. When the bronze mirror gets old, you can find blue colored spots in the mirror. People do not know why this happens and only considers the mirror a strange treasure. The mirror is made as follows. Producers etch the images of dragon or flower behind the pure bronze that would be used to produce the mirror. Then, they pour melted alloy made by tin onto the images and smooth the images out and

---

[51] 「*Dialectic essay about Neoh Beop Gi Saeng Hwa Su*」, Noh Dae-hwan, 「*O-ju Lee Kyu-Kyung's Study and his Status in the History of Philosophy (1788~1860)*」, The 42th Korea Korean Classics Symposium, The Korean Historical Connection, 2014 p 4, quoted again.

[52] Lee Kyu-Kyung, Translated by Choi Ju, 『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008, p 101.

cover the top with lead. After this process, the dragon image appears well under sunlight."[53]

According to *Fang I-Zhi*, the *Ma Gyung* phenomenon can be explained as the oxidation of copper. However, Lee Kyu-Kyung precisely identified the difference in the degree of light reflection depending on the quality of materials. Although Lee Kyu-Kyung's explanation was different from how the Western science explains, he approached to a scientific fact on the basis of scientific observation and inference. His approach was also very similar to that of today's science. In addition, Lee Kyu-Kyung's explanation seems to be more scientifically plausible than *Fang I-Zhi*'s.

"Lee Kyu-Kyung explained that the images on the mirror were generated mainly by front reflected light while rear reflected light played a supporting role. Since the quality of alloy poured onto the etched parts is different from that of pure bronze, the amount of reflected light also differs. Lee Kyu-Kyung is right about this. However, that image appears only when the etched parts have a different rear reflection,"[54] reckoned Jeon Sang-woon.

In his work, Lee Kyu-Kyung may have offered the process of scientific inference. But his explanation is not scientifically optimal and is not a standardized one. Differences between *Fang I-Zhi* and Lee Kyu-Kyung may stem from their observations of different manufacturing techniques[55]. In addition, the technique he was trying to explain is not the same as the technique that was identified by modern science. Moreover, Lee Kyu-Kyung seemed to be aware of *Ma Gyung* from China and Japan and mentioned that lead was covered on top of the mirror's surface in Japan.[56] However, Japan was using mercury instead of lead at that time.[57] This fact reveals that Lee Kyu-Kyung's record was untrue regarding the surface treatment of the mirror.

③ Swift Acquisition of Information

Though it pales in comparison with modern science, the speed of information acquisition is impressive in『*O-ju Seojong Bakmul Gobyun*』. It has a section of Refined Sulfur that deals with the Western sulfur, showing how fast the inflow of the Western science was.

"*Poyeonasan* is full of sulfur and *Holomosa* also has a lot of sulfur. The Tama scent from Siam (Thialand)

---

[53] Lee Kyu-Kyung, previously mentioned book, same page.
[54] Jeon Sang-woon, *Encyclopedia of Korean Culture*, refer to the word *Ma gyung*.
[55] Masao Watanabe said there could be three types of *Ma-gyung* phenomenon depending on how it is generated. (1) *Ma Gyung* generated by the difference in curvature caused by the difference in surface thickness, (2) *Ma Gyung* of different reflectivity generated by differences in metallic structure caused by the different cooling velocity, (3) *Ma Gyung* that has curvature by tapping behind the mirror, (4) *Ma Gyung* with processed surface by using the methods such as applying chemicals (regardless of images) and inlaying (etching lines). In Japan, *Ma Gyung* occurs largely due to (1) by using different pressure in the process of polishing to generate images. Translated by Sohn Young-su, 『*Japanese People and Modern Science*』, S-wave Publications, 1992, pp 65-68.
[56] Lee Kyu-Kyung, Translated by Choi Ju,『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008,pp 100~101.
[57] Masao Watanabe, Translated by Sohn Young-su, 『*Japanese People and Modern Science*』, S-wave Publications, 1992, p 43.

is resin and burnable. Recently, the Western sulfur could be found in Beijing. If it is dropped on a sheet of paper, it turns into red. It is very strange that it still lights up when you strike it on wall, collar, wood or stone."[58]

『*O-ju Seojong Bakmul Gobyun*』was completed in 1834. The Western sulfur here seems to indicate match[59]. The safe match we use today made of red phosphorus was invented in 1844. Thus, the Western sulfur he referred to was the friction match made of yellow phosphorus, which was developed in 1826 (1827) in Britain. The fact that『*O-ju Seojong Bakmul Gobyun*』, which was finished in 1834, mentions the friction match that was developed in 1826 and commercialized in 1830 shows Lee Kyu-Kyung's deep interest in and speedy acceptance of the Western science. The match was introduced on the Korean peninsula in 1880 for the first time when a pro-reform monk Lee Dong In brought it to Korea with a diplomatic envoy Kim Hong-jib after his trip to Japan.

『*O-ju Seojong Bakmul Gobyun*』contains the latest information at the time. However, most of information about the Western science and technology was acquired through Japan and China. Lee Kyu-Kyung was open to the Western science but was often unable to properly understand it. For example, when he discussed glasses, he tried to study it based on the approach of optical science and chemistry. However, his observations were largely unscientific.[60]

5. Conclusion

This study started with a small question about Korea's modern philosophy. Korea's history of philosophy ends with *Silhak*. With the transition to the modern world, the Western philosophy replaced the Korean philosophy. The common question about the Korean philosophy caused the authors to focus on people who played a role of bridge in the transition from the *Joseon* Dynasty to modern Korea. This is how the authors began a study into Lee Kyu-Kyung's『*O-ju Seojong Bakmul Gobyun*』. As the only science and technology book that failed to garner its due attention,『*O-ju Seojong Bakmul Gobyun*』has been shunned by humanities and science communities.

It was the book completed in the early academic years of Lee Kyu-Kyung. Though it presents a significant amount of knowledge about the Western science and technology, much of latter part has been lost and the precise volume of the book is hard to fathom. Even though it was referenced by various

[58] 『Lee Kyu-Kyung, Translated by Choi Ju,『*O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008, 259쪽.

[59] Sungnyang (the Korean word for match) was coined after the Koreanization of the word *Seok Yoohwang* (Refined Sulfur). Choi Chang-ryul,「*Exploring the Root of Korean Language*」, Jeonju University Language Studies Institute, Vol11, 1984, p 9.

[60] "The Western glasses eliminate the poison of fire and thus strengthen the power of eyes. No matter how long one wears it, it does not hurt eyes. I believe the glasses were produced by putting the glasses underground after applying poison-repellent and washing the poison away with water" 『*Lee Kyu-Kyung, Translated by Choi Ju,『O-ju Seojong Bakmul Gobyun*』, Hakyoun Publications, 2008, p 147.

papers since it is the appendix to『*O-ju Yeon Munjang Jeonsanhgo*』, only a few researchers concentrated on it. However, the authors took a different approach. As a person who had a keen interest in the Western science, Lee Kyu-Kyung endeavored to figure out the nature and characteristics of the Western science and the authors saw『*O-ju Seojong Bakmul Gobyun*』 as the compilation of the outcomes of his efforts. Of course, the authors are still collecting and translating materials and keep on studying the book since the period for this study was not sufficiently long. This study contains the early findings of the authors' endeavors only. In addition, comparative analyses into various contemporary works from the East and West are required to clearly discover and investigate the scientific nature of『*O-ju Seojong Bakmul Gobyun*』. That level of research has yet to be conducted and studies into humanities and science also need to be initiated. The authors are hoping that this study will pave the way for further academic research into humanities and science in a sustainable manner.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 4

Parallel Session 2–2
Revisiting Humanistic Critique of Science and Technology

21st Century Homo Faber: Artificiality as Human Nature and Philosophy of Technology

Wha-chul Son (Handong Global University)

–

Tragedy of Darwinism: Radical Distortion by Social Darwinists and Breakthrough for Reform Darwinists

Wooryong Park (Sogang University)

–

Science Is Not Just Science: The Presence of Identity and Ideology in Natural History Museums

Chanika Mitchell (SeoKyeong University)

21st Century Homo Faber: Artificiality as Human Nature and Philosophy of Technology

Wha-chul Son
Handong Global University

Abstract

This paper critically reviews existing theories of philosophy of technology and seeks to chart its future direction, based on the concept of *Homo Faber*. In addition to the known paradox that it is human nature to make something artificial, the rapid development of modern technology has shed light on another paradox of *Homo Faber*, namely that man-made tools and technologies transform humanness itself. The contributions and limitations of the classical philosophy of technology, the empirical turn and post-humanism can be reevaluated and clarified when these paradoxes are given proper attention. It will be argued that the task assigned to the 21st century *Homo Faber* is to identify the ideal vision of man and society to be pursued, and to adjust the direction of technological development according to that vision. Postman's four criteria for new media evaluation will be presented as a useful reference for setting up new research directions for philosophy of technology in the age of high technology.

Keywords: *Homo Faber*, philosophy of technology, artificiality, humanness, direction of technological development

Introduction

Philosophy usually questions the essence or nature of an object. The 'nature of something' means characteristics neither artificial nor acquired, but intrinsic; therefore is its natural characteristics that define an object as what it is. When Martin Heidegger wrote 'technology is not identical with its essence' in the beginning of *The Question concerning Technology* (Heidegger 1962/1993: 15), this may be termed a typical model of philosophical thinking. Therefore, the philosophical study of technology should be in the enquiry into the essence of technology.

Technology, however, does not arise from nature, but is created by humans. Therefore a philosophy which pursues and studies what is fundamental questions the essence of the human first, before questioning the essence of technology. This is why a philosophy of technology long failed to emerge in the history of philosophy. Until recently, technology has never been at the center of a philosophical discussion. *Homo Faber* was suggested only as one of many ways to understand humans. Compared to *Homo Sapiens* and *Homo Ludens*, however, *Homo Faber* is viewed merely as secondary and instrumental because humans create tools as a result of their thinking and use them for playing, but not vice versa.

Technology emerged as an object for philosophical questions as its meaning and importance in human life increased after The Industrial Revolution. The philosophy of technology emerged as recently as recent as the early 20th century, and was established as a discipline of philosophy only after the mid-20th century. Ironically, the discipline's theories left *Homo Faber* out of discussion, focusing only on technology and the issues stemming from it.

This paper is intended to revisit the notion of *Homo Faber* and to make use of it from a critical review of existing theories of philosophy of technology. First, based on media ecologist Walter J. Ong's insights offered in his book *Orality and Literacy* (1982), this paper will interpret the implications of *Homo Faber* that has become more apparent during the advent of modern technology (I). Although Ong himself did not mention the concept of *Homo Faber*, his analysis of orality and literacy serves well to explain the implications of *Homo Faber*. Using this re-interpreted concept, I will then explore the flow of the philosophy of technology from the 20th century (II), followed by a critical review on the limitations of those theories (III). Afterward, it will be argued that a philosophy of technology should focus more on the very basic question 'what direction should technological pursue?' rather than dealing with the shock caused by modern technology. As an example of a specific and alternative answer for to this question, Neil Postman's criteria for moral judgments concerning new media will be introduced (IV).

I. Two Paradoxes of *Homo Faber*

A word-for-word translation of *Homo Faber* is 'man the creator.' Humans create and use things that are not themselves. Some animals are known to use tools as well, but their capabilities are limited and repetitive. Some human behaviors, like those of animals, occur due to instinct or as a part of a person's natural development process, while other behaviors occur accidently. The most telling examples are speaking, which is natural, and writing, which is artificial. These examples lead us to a clearer understanding of *Homo Faber*.

1. Artificiality as Human Nature

In his book *Orality and Literacy*, Ong described the invention of writing as follows:

> Technologies are artificial, but--paradox again--artificiality is natural to human beings. Technology, properly interiorized, does not degrade human life but on the contrary enhances it (Ong 1982: 82).

Although the term *Homo Faber* never appears in the book, this quote describes the concept most accurately. Ong argues that writing is the most representative technology we use, even though we do not recognize it as such since it now feels so natural to us. However, writing is not natural. Technology is made to utilize nature in a certain way and it is different from nature.

> By contrast with natural, oral speech, writing is completely artificial. There is no way to write 'naturally'. Oral speech is fully natural to human beings in the sense that every human being in every culture who is not physiologically or psychologically impaired learns to talk. ... Writing or script differs as such from speech in that it does not inevitably well up out of the unconscious. The process of putting spoken language into writing is governed by consciously contrived, articulable rules (Ong 1982: 81).

The human race had long lived without written language. Even after its invention, it took a long time for letters and characters to be generally established in human life. Even today, various tribes are without their own writing system. Therefore, one can say that there is a world of difference between

humans' innate ability to speak and their learned ability to write (and read), and that writing occurred not inevitably, but accidentally.[1] The ability and tendency create artificiality is a part of human nature. Before writing, humans also manufactured other artificial objects and institutions to carry on their life. Tools are artificial, and thus accidental, but at the same time, creating and using artificial tools is very natural to humans.

2. Technology Transforms Human Consciousness

To divide human behaviors into natural and artificial is meaningful in itself. But does it provide additional insight into the cutting-edge technologies of today? How about the other way around? Do modern technologies help us better understand humans creating and using tools? Few people connect the familiar concept of *Homo Faber* with 21st century technology. The concept seems to explain nothing properly as it is so comprehensive, embracing using stone axes for hunting, writing for communication, and manipulating animal genes.

However, Ong's analysis of writing goes further than revealing the writing system to be a technology created according to human nature. Analyzing the change brought by the transition from orality to literacy, Ong identifies a fundamental difference between human culture before and after literacy. He argues philosophy, mathematics and other rational, logical, systematic thinking must have been impossible without the invention of an artificial writing system (Ong 1982: 53, 79, 112, 169). In other words, making tools and creating artificiality changes not only the way humans live, but also the way humans think (Ong 1982: Ch. 4).

> Technologies are not mere exterior aids but also interior transformations of consciousness, and never more than when they affect the word. Such transformations can be uplifting. Writing heightens consciousness (Ong 1982: 81).

On top of the paradox of *Homo Faber* that creating artificial technologies is a part of human nature, one can add another paradox that artificially created technologies affect human consciousness. It is intriguing that consciousness, one of the most distinctive characteristics of humans, can go through qualitative change by the creation of writing. According to Ong, the entire corpus of Western philosophy is only possible on the premise of written language, and modern technologies are the results of the

1 Of course one may argue that writing is the result of evolution, and therefore natural, but it would require a lot of effort to explain the specific and historical facts of written language.

systematic thinking supported by it. The existence of a written system can seriously affect the form and content of Homo Sapiens' thinking. As a result, the ideal image of human being could be totally different from that of the past. In this regard, *Homo Faber* is not simply one who creates tools. *Homo Faber* creates his/her own being.

3. Modern Technology and New Understanding of *Homo Faber*

The pair of paradoxes—humans naturally use tools, and tools transform humans—have long been accepted without getting much attention. To be more exact, the first paradox has been received as an existing phenomenon for which the concept of *Homo Faber* was used. When it comes to the second paradox, however, the substantial impact of artificial tools on human nature has not been fully recognized. Humans could not feel the impact because the development of tools and technology progressed so slowly that men had enough time to interiorize the tools and embrace those in their presence. Humans had thousands of years to interiorize writing invented in the era of orality, and hundreds of years additionally to absorb printing technology into culture. As a result, people in the Gutenberg era only focused on their use of written language and failed to realize the grave impact of the printed characters on human beings.[2]

Then what made us eventually see the might of tools and technologies? Ong wrote our understanding of the differences between orality and literacy only developed in the electronic age, not earlier. (Ong 1982: 2) Humans who lived in the era of literacy and printing failed to realize their impact even though they were undergoing it. The realization came only when the emergence of electronic era brought rapid change to the world.

Hence, the question about tools and technologies was raised only when technology's artificiality became visible due to the rapid technological progress. Philosophy began earnestly questioning about technologies in the mid-20th century, when people broke out of the 19th century's heightened optimistic anticipations for modern technologies and experienced their lives being profoundly shaken by modern technologies. It goes without saying that the atom bombs dropped on Japan in 1945 had a sizable impact on the philosophy of technology. The incident showed the tools can not only change human nature, but also threaten the very existence of humans, which was never even imagined

2 Of course there was resistance against writing and printing technology. But it was merely a conservative response trying to keep conventional ways. Even in other cases where the resistances were more than a simple objection, it was just criticism of an individual technology's side effects, and never based on a reflective attitude toward tools or technology as a whole.

before. It was an event whereby the second aspect of *Homo Faber*—technologies changing humans—came to be clearly revealed.

Now this paper will trace how the dual meanings of *Homo Faber* have been reflected in the philosophy of technology which began in the early 20th century. Through this endeavor, it will explore how an extended understanding of *Homo Faber* would help us to understand today's technologies and the challenges posed by them. In the following three chapters, the modern philosophy of technology will be divided into three waves—classical philosophy of technology, the empirical turn, and post-humanism. This division is somewhat rough, but it is useful as it reflects both the chronological order and differences in terms of content.

II. Three Tides of Philosophy of Technology

1. Humans are Dominated by Technology: Classical Philosophy of Technology

1) Problems of Modern Technologies

Classical philosophers of technology represented by Heidegger, Jacques Ellul and Hans Jonas made a negative assessment of technology in general. (cf. Son 2005; Son 2006). They raised issues about the technological society or technological way of thinking as a whole, rather than about individual technologies. In the process, they did not offer specific alternatives on how to solve the issues. Although they were criticized later by other scholars as being romanticists and even technophobes, a large part of this criticism of technology still holds today.

What is interesting about the classical philosophers of technology is that they confined their thinking to modern technology. They thought that there was a fundamental difference between the technology of the past and that of their time. They assessed modern technology as having characteristics of *Gestell* (enframing, Heidegger 1962/1993: 52-55) and autonomy (Ellul 1954/1964: 133-146), oppressing human freedom, distorting humanness, and eventually causing dehumanization. They argued that technology had gone out of human control, acquiring its own logic and development structure. People are misled into thinking that technology is still in their hands, according to these philosophers. No individual or group of people can control technologies which are now huge, complex, closely connected with one another and rapidly developing. Instead, the philosophers argued, the humans of today are like

components of the technological system and men treat one another accordingly.

2) Human Nature that Should Be Kept

This argument reflects both aspects of *Homo Faber*. Recognizing technology's critical impact on humans, these philosophers deemed the impact negative. At the same time, they lamented that humans had lost their autonomy and been enslaved by technology, even if they might not appear to have done so. While 'humans who create and use tools' are normal and ideal, the opposite is the case in the era of modern technology, they argued.

Here we can see that the classical philosophy of technology, in addition to the two aspects of *Homo Faber*, introduced the notion of the humanness of human beings as an evaluation criterion for judging good and bad technologies. According to this theory, it is possible to define virtue that makes humans human or 'humanness,' whether it is related to technology or not. This could be called unchangeable human nature or the essence of the human. Whereas technologies in the past enhanced human nature, helping to reveal human existence, modern technologies are ruining it, according to them. Ellul argued that the virtue or essence that makes humans human is the freedom to say no (Ellul 1988/1990uation: 411), while Heidegger claimed that it is the characteristic of a being who questions 'what is Being?' and waits for the Being to be revealed (Heidegger 1966/1993: 107).

Jonas wrote that 'the triumph of *Homo Faber* over his external object means also his triumph in the internal constitution of Homo Sapiens, of which he used to be a subsidiary part' (Jonas 1979/1984: 9), which succinctly summarizes the concerns of the classical philosophers of technology. Their view of human beings stemmed from the existing Homo Sapiens-centered philosophical thinking. Although they did not deny the concept of *Homo Faber*, they hardly considered it significant. These philosophers were critical about modern technological society because it threatened human as *Homo Sapiens*.

2. Humans are Still the Master of Technology: The Empirical Turn

1) Experience and Alternative

The empirical turn emerged from the criticism of the classical philosophy of technology for its pessimism and for its lack of alternatives (cf. Achterhuis 1999/2001; Kroes & Meijers 2001). Led by American and Dutch philosophers of technology, the trend called for a detailed analysis of the

development of modern technology, and alternatives based on the analysis. The naming of the 'empirical turn' itself was a way to criticize the classical philosophy of technology that they did not have verifiable, substantial or scientific grounds for its argument.

The empirical turn covers a broad spectrum, but it can be summarized as three points. First, it focused on analyzing empirically verifiable aspects of technology, namely the history of its progress and the sociological analysis of the developmental process. These philosophers dealt with individual technologies rather than technology in general, and tried to refute the arguments of classical philosophy of technology by providing empirical evidence.

Secondly, this trend attempted to solve and prevent problems of technological society, including those identified by the classical philosophers of technology, through empirical research on individual technologies. These efforts resulted in, for example, the democratization of technology theory, which called for securing people's participation in the process of technological development (cf. Feenberg 1999; Winner 1986; Sclove 1995; Son 2005). These philosophers believed that various technology policies and democratization of technological development could resolve the problems feared by the classical philosophers of technology.

Some philosophers of the empirical turn defined the question of 'what is technology' as an epistemological question (Pitt 1999). They criticized the classical theory for being too normative, arguing that the philosophy of technology should be just a study of human behavior called technology.

2) Common Sense Understanding of Technology

Returning to *Homo Faber*, it seems that the empirical turn puts more weight on the aspect of humans using tools. For example, those who advocated the social construction of technology closely examined the development of individual technologies and eventually demonstrated that the development process was carried out in an accidental manner, affected by numerous social relationships, rather than in the simple manner of pursuing efficiency. This backs up the claim that technology is not autonomous, but ultimately under human control. Hence, if modern technology causes problems, humans should just find ways to manage, regulate and control them. The philosophers of the empirical turn did not believe that technology could change (or distort) the essence of human. They had no doubt that humans can control technology.

We need to note that philosophers of the empirical turn did not deny the problems of modern technology pointed out by the classical philosophy of technology. They only emphasized that the

problems were fixable. The difference between the two positions is their views on the magnitude of modern technology's impact and the solvability of the resulted problems. It is not about whether human nature is liable to damage or is restorable, nor about what the ideal state of human is. To be more exact, both the classical philosophy of technology and the empirical turn maintain their own ideal of humanness as given.

The empirical turn's position is quite similar to the common belief and judgment of technology. Every member of modern technological society comes face to face with one or more of the numerous problems created by technology. But this does not lead them to suffer a feeling of helplessness that they cannot ever solve the problems. Also, anyone can make an observation that human lives have become more convenient or more hectic due to technology, but few believe that such change has shifted the notion of humanity.

3. New Technology, New Human: Post-humanism

If we understand *Homo Faber* based on Ong's study on orality and literacy, the argument still stands that just as the invention of written language caused an irrevocable change in the human's consciousness, modern technology can have a massive impact on the human's way of thinking and humanity itself, thereby transforming humans into different beings. Unlike the two philosophical theories mentioned earlier, post-humanism heralds the emergence of an entirely new humanity in the era of technology.

Post-humanism is an argument that humans will transcend their current limitations as their biological evolution continues with technological development and convergence.[3] This view was expressed in a rather sporadic manner by scholars keeping their distance from those classified as philosophers of technology. In other words, post-humanism is a collective name for various theoretical positions, not a school or movement with solid theoretical consistency.

What is remarkable about post-humanism is that it is based on positive expectations for technology, which had been a sort of taboo in the previous trends of the philosophy of technology. Its positive view goes beyond seeing technology beneficial for human race, and it even approves the integration of human and machine (Lee, 2013: 287).

In a nutshell, while traditional humanism understood that humans are born, post-humanism

3 This theory is sometimes labeled 'trans-humanism' to highlight the emergence of a completely new human, but this paper will refer to it as post-humanism except in quotations.

says humans are made by technology. Roughly speaking, post-humanism raises two arguments in particular: (i) humans can transform themselves through integrating with machines, and; (ii) such post-humans will liberate humans from their biological limitations (Lee, 2013: 298).

Post-humanism has some similarity with the classical philosophy of technology in that it emphasizes technology as transforming human nature. But at the same time, it is also diametrically opposite to the classical philosophy of technology in the sense that it views such a technological impact positively. Post-humanists accepted technological development as a part of the human evolution process and argued that "technology makes human." Based on these thoughts, they saw no point in considering the human being as the creator of tools. In their view, humans at some point handed over the initiative to technology.

Post-humanism believed that the notion of humanness is entirely open-ended. Therefore, the theory does not offer what humans should be like, nor recognize the concept of humanity as given. One can conclude that the focus of post-humanism was on technology, not on humans.

III. The Notion of *Homo Faber* and the Limitation of Philosophy of Technology Theories

So far we have looked at existing philosophy of technology theories based on the twin paradoxes of *Homo Faber*. The meanings of *Homo Faber*, and the positions of the philosophy of technology theories are summarized in the following table in which (a) and (b) are the two paradoxes of *Homo Faber*, and (b′) is a paraphrase of (b) while. (c) and (b′) emerged as important due to the post-humanism stance.

<Table 1> The Concept of *Homo Faber* and Theories of Philosophy of Technology[4]

	Homo Faber	Classical Philosophy of Technology	The Empirical Turn	Post-Humanism
a) Humans create and use technology.	○		○	
b) Technology affects humanness	○	○		○
b') The virtue that makes humans human (or human nature) can be changed.	○			○
c) The virtue that makes humans human (or human nature) cannot be changed.		○	○	

The classical philosophy of technology and the empirical turn each put emphasis on one aspect of the paradoxes, but both of them argue that the virtue that makes humans human does not change. Post-humanism is similar to the classical philosophy of technology in that it highlights the technological impact on humans, but it denies that human nature is fixed. In the following, we will examine the limitations of these existing theories through revisiting arguments implied in the concept of *Homo Faber*.

1. '*Homo*' *Faber*

The classical philosophy of technology was built on the premise of humanness that should not be changed, but these scholars were not clear about what should be done to keep this human essence

4 As the claims set out in this table represent no more than a simplified summary of the arguments and their interpretation in the discussion, there is little point in considering their logical relationship. It should be remembered that the meaning of *Homo Faber* itself contains paradoxes.

intact. This was partly because they thought that a solemn warning is more important than offering up hasty alternatives in the face of a fundamental crisis. But a more fundamental reason was that they effectively ignored the other aspect of *Homo Faber*, namely that humans create and use tools. They accepted it in a normative sense, but not in an actual sense. They considered that man who once dominated technology had become completely helpless in the face of modern technology.

Just like the classical philosophy of technology but for different reasons, post-humanism did not acknowledge the human role in the further development of technology nor offer any alternative for the future of technology. On the one hand, taking technological development as a given fact, post-humanism did not put much emphasis on the fact that technologies are made by humans. On the other hand, however, they anticipated the future of humans as being shaped by technology with certain expectations. According to them, it is not right to make a normative judgment about the future based on current standards of human nature, because there are so many unknown possibilities. This position overlooks the fact that man creates technology prior to technology shaping human nature.

The classical philosophy of technology is built on the premise that technology in the past did not have any impact on human essence. However, as we have seen, technology as always had a certain impact on the construction of humanity. Even though humanity is truly under serious threat from technological development, we are better off in the sense that we have more opportunities to evaluate and coordinate the development of individual technologies. The impact of technology has become much more visible today than in the past. If we focus on this fact, Ellul's remark that the only freedom left to us is the freedom to say 'no' (Ellul 1988/1990: 411) can be reinterpreted in a more positive and constructive manner. The fact that the classical philosophy of technology could recognize the problems and criticize technology means that it is possible for humans to step in and realign it. Although it would be difficult to intervene in every step of the development of individual technologies, it is still possible to provide a certain direction for the development.

It should also be realized that normative evaluation of what is good for human beings is already being constantly undertaken in the process of the development of individual technologies. For example, developing technologies that allow longevity or smoother communication has been considered to be positive while advancing risky or environmentally burdensome technologies has been regarded as undesirable. Advocates of the empirical turn also described extensively how the development and production process of technology is affected by various social and economic factors.

This was an objection to the classical philosophy of technology as regards its pessimism, but it was also a criticism of post-humanism that it accepted the technological development as a given fact. Of

course, our judgment on a particular technology may only have a limited impact on the direction of the entire technological society. It is also possible that the technology we develop now may turn humans in the way different than our intension. Even so, these possibilities cannot be an excuse for not making specific judgment on technologies or not trying to make criteria for such judgment.

2. The Scope of '*Faber*'

The Empirical Turn considered human domination of technology as natural, so it underestimated the impact of technology on humans. Its proponents responded to the severe criticism raised by the classical philosophy of technology in the way that they would solve a typical technological problem. Just like fixing a tool gone out of order, what should be done when a tool seems to be beyond control is simply drawing it back under control. Their approach also regarded technological society and its problems to be matters of the present and effectively ignored their long-term consequences and implications.

However, this approach does not sufficiently reflect all the various aspects of Faber; namely the fact that tools define and construct humans' life and their way of thinking. As revealed in the study of the invention of written language, technologies change humans' world view and their premises of basic awareness. In modern society, the integration of the market and technology, as well as the convergence of different technologies, seems to make people's decisions on technological development redundant. Under these circumstances, what would it mean to keep technology under human control? If men can decide on the development of technology, which can bring as a consequence the overturning of the basic understanding of life, death, disease, pain, and themselves, what should be the guiding principle for such decisions? Although the empirical turn did seek alternatives for a technological society, it did not consider these questions.

The problem becomes clearer when we review the limitations of technology democratization theory, a representative alternative proposed by the empirical turn (cf. Son, 2003). First, it is not clear where or by whom this democratization procedure should be enforced, because modern technology tends to blur all the existing boundaries. Naturally, the first step would be making national technology policies through a democratic process, but this has clear limitations. The world's markets and technologies are so closely connected to each other that it is hard for an individual country to make its own autonomous policy regarding the development and proliferation of technology and its application in the future. Second, democratization only provides what procedure should be taken to justify an individual

technological development, but it leaves the content of technology issue raised by classical philosophers unresolved. Here, the issue in question is that humans' failure to control the content of technology is causing damage to the human essence. This is a problem that cannot be settled by reflecting general citizens' opinion on the individual technological development. Third, the democratization of technology theory leaves decisions on whether and how to develop individual technologies in the hands of individual citizens of the technological society. However, given the widening technology gap, it is readily predictable that people's judgment of a technology will differ greatly depending on what technologies they routinely experience.

For the alternatives for individual technological development to be more convincing, there should be more consideration about the profound impact that technology as a whole on human lives and thinking. This will lead to a universal standard for decisions on all individual technologies, or at least a framework to reach a consensus concerning such standards.

3. Open-ended Human Nature

Human beings change. The analysis of orality and literacy has demonstrated that the human ability to think was entirely changed by the novel technology of writing. Philosophical thinking as we know it is a new way of thinking developed due to the technology of writing. The questions like 'what is human?' or Heidegger's famous 'what is being?' would have been left unasked without literacy. Technology's impact on human nature remained undetected until recently because of their slow pace. During the long journey, man could not intentionally accept or reject the development, nor set out a direction for the advancement.

Therefore it is necessary for the classical philosophy of technology and the empirical turn to adopt a more flexible view on humanity. Although the classical philosophers of technology were right in warning of the rapid pace of technological development and its potential aggressiveness, their diagnoses of humanness being collapsed seem be an overstatement. It was also problematic that the empirical turn took human essence and human nature as a given fact without affording them much consideration.

Human beings develop and upgrade themselves through culture and technology. They have gained new understandings of themselves through changes of communication methods—from orality to literacy and again to secondary orality. This is a process of adaptation and trade-offs to find a balance among various opinions on what constitutes an ideal or desirable human being. Since modern technology

has made this change more rapid and visible, the trade-offs and the (re) balancing effort should also be conducted in a more public and open manner.

IV. Tasks of the Philosophy of Technology

1. Purpose Driven Technological Development[5]

Technology has developed so far as a result of accumulated efforts to resolve given problems under the given settings and limitations. The evaluation of the general direction of technologies was only possible long after their introduction, which explains why the philosophy of technology so far has been confined to evaluation of the past, the resolution of the present problems, and preparation for the near future. Furthermore, as we found in this paper, the existing theories failed to reflect all the paradoxes of *Homo Faber* in a balanced manner. As a result, the philosophy of technology has remained surprisingly silent regarding important questions such as 'which direction should the development of modern technology take?' The classical philosophers of technology believed that the direction at the moment was irredeemably wrong and post-humanism held exactly the opposite, while both trends failed to pay sufficient attention to the question of future direction. The empirical turn did suggest alternatives for the issues confronting a technological society, yet it was merely on the allopathic level, lacking the necessary consideration of the technological impact on humanity itself.

A careful observation of *Homo Faber* paradoxes, however, reveals the need for a comprehensive and more active planning for the direction of technological development. When one recognizes that technologies strongly affect humanity and that humans are the ones who make technologies, it would naturally lead to questions on what will technology look like in the future and which direction it should take. If the technology of today can influence the future shape of men and society, we should deliberate and discuss together what kind of men and society we would like to have in the future. We could call such a desirable situation the 'good society' and try to make decisions based on our own concept of 'good society'. When it comes to technological development, we should review whether a planned technology would help us to bring about the desired good society. This is a new

5 This expression is borrowed from the book *The Purpose Driven Life* (2003) by Rev. Rick Warren, which was very influential among Christians. The book argues that Christians' lives should be driven by the purpose set by God. Likewise, technological development shall be driven not by the technological mechanism or drive, but by the ultimate goal that humans pursue.

paradigm where the path of technological development is not shaped by concerns about the side effects, risks, or limitations of the technology, but where it is driven by the ultimate goal set up for the specific technological development.

2. Reference: Standards for New Media Evaluation

Media researcher Neil Postman proposes a concrete suggestion which helps us to understand this new paradigm. He argues all media should be evaluated based on whether they contribute to humanity (Postman 2000: 11).[6] As media ecology[7] views technology as a kind of medium, this argument can apply not only to communication technology but also to technology in general.

Postman admits normative judgments on media are far from absolute. Every new medium faces a certain degree of resistance at the time of its introduction, and thus they are judged negatively. As time goes by, however, the judgment can be adjusted and the medium may be strengthened or weakened. Referring to the invention of writing and printing, Postman notes that, although Christians at first came to negative judgments about them, the general evaluation of these technologies is now very positive. He also admits that even though he views television negatively at the moment, that judgment might change in 100 years (Postman 2000: 12).

What is important here is that normative judgments on media can and should be made. Even if the evaluation may not be unanimous, every new medium should be evaluated as fairly as possible concerning its contribution to humanity. Postman proposes the following as standards for making such evaluation (Postman 2000: 13-15):

To what extent does a medium contribute to the uses and development of thinking?

To what extent does a medium contribute to the development of democratic processes?

To what extent do new media give greater access to information?

6 The original quote by Postman is “humanistic or anti-humanistic consequences” about technology and media. But it is rewritten here as “whether they contribute to humanity” to align with the given context.

7 Media ecology is a trend of media research which is based on Marshall McLuhan’s famous quote “the medium is the message.” Based on the phrase, it aims to understand not only media themselves, but also the relationship they have with the context they are used in, and the relationship between the media environment and humans. It was introduced by Postman, and Ong and Ellul are categorized as media ecologists (Cf. Lum 2006/2008).

To what extent do mew media enhance or diminish our moral sense, our capacity for goodness?

These criteria are not about the convenience, efficiency or ease of operation that the given technology provides, but about its consequences and impacts.[8] There may be different interpretations of 'rational thinking,' 'democratic processes,' 'meaningful information,' and 'moral sense' in these statements. Regardless of reaching a consensus or making change in those interpretations, however, it is important to keep the questions and discourses concerning those criteria in the technology evaluation process. This is the way to maintain the balance between *Homo Faber*'s two aspects amid the rapid changes in 21st century technological society.

Conclusion: The 21st Century *Homo Faber*

Will the development of technology cause dehumanization as feared by classical philosophers of technology, or will it realize post-humanist anticipations by giving birth to a new human race transcending all biological limitations? In any case, human beings will remain as *Homo Faber* until such change is completed. Travelling on the road of change, however, 21st century *Homo Faber* now knows the previously concealed fact, namely that creating and using tools shapes his/her humanity. Confronted with numerous possibilities of transforming human body, mind and life completely, the 21st century *Homo Faber* has the privilege and responsibility of determining what to choose and what to abandon. Philosophy of technology should respond more actively to the calls to initiate relevant discourse by providing specific and concrete standards for the evaluation and selection of these possibilities (cf. Son 2014).

8 It would require further discussion and revision to evaluate the appropriateness of these criteria and to adjust them so as to be applicable to technologies in general. The current study only touches on their characteristics and implications.

References

Achterhuis, Hans (ed.) (1999/2001). *American Philosophy of Technology: The Empirical Turn.* trans. by Robert P. Crease. Indiana U. P.

Ellul, Jacques (1954/1964). *The Technological Society*. trans. by J. Wilkinson. New York: Vintage.

-------(1988/1990). *The Technological Bluff*. trans. by Geoffrey W. Bromiley. Eerdmans.

Feenberg, Andrew (1999). *Questioning Technology*. Routledge.

Heidegger, Martin (1962/1993). *Die Technik und die Kehre*. trans. by Lee Gi-sang(into Korean). Seokwangsa.

------- (1993). "Only a God Can Save Us: Der Spiegel's Interview with Martin Heidegger (1966)." *The Heidegger Controversy: A Critical Reader*. ed. by Richard Wolin. MIT: 91-116.

Jonas, Hans (1979/1984). *The Imperative of Responsibility: In Search of an Ethics for the Technological Age*. trans. by Hans Jonas and David Herr. Chicago: Chicago U. P.

Kroes, Peter and Anthonie Meijers (eds.) (2001). *Research in Philosophy and Technology Vol. 20: The Empirical Turn in the Philosophy of Technology*. JAI.

Lee, Jin-Woo (2013). *Techno Humanities: the Power of Humanities, Science Technology, and Integrative Thinking*. Chaeksesang (in Korean).

Lum, Casey Man Kong (2006/2008). *Perspectives on Culture, Technology, and Communication: The Media Ecology Tradition*. trans. by Lee Dong-hu(into Korean). Hannarae.

Ong, Walter J. (1982). *Orality and Literacy: The Technologizing of the Word*. Routledge.

Pitt, Joseph C. (2000). *Thinking About Technology: Foundations of the Philosophy of Technology*. Seven Bridges.

Postman, Neil (2000). "The Humanism of Media Ecology." *Proceedings of the Media Ecology Association*. Vol. 1: 10-16.

Sclove, E. Richard (1995). *Democracy and Technology*. Guilford Press.

Son, Wha-Chul (2003). "A Critical Review on the Social Constructivism and Democratization of Technology." *Philosophy*. Vol. 76: 263-288 (in Korean).

-------(2005). "Modern Technology and Democracy." Doctoral Dissertation. Katholieke Universiteit Leuven (Belgium).

-------(2006). "On the Empirical Turn in the Philosophy of Technology." *Philosophy*. Vol. 87: 137-164 (in Korean).

-------(2014). "Philosophical Reflection on Technological Divide: Suggesting the Concept of 'Accessibility.'" *Sogang Journal of Philosophy*. Vol 38: 185-212 (in Korean).

Warren, Rick (2003). *The Purpose Driven Life*. trans. by Go Seong-sam(into Korean). Timothybook.

Winner, Langdon (1986). *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. Chicago U. P.

Tragedy of Darwinism: Radical Distortion by Social Darwinists and Breakthrough for Reform Darwinists[1)]

Wooryong Park
Sogang University

I. Introduction

Science in the 19th century had a great influence on intellectual life in England. Its implications can be characterized in three aspects, so bringing about ideological and institutional changes in intellectual activity in England in the 19th century[2)]. The first change is the triumph of science over theology. Science constricted the boundary of theology and contributed to the desacralization of thought. Second, the institutionalization of science occurred. Certain kinds of institutions — either brand-new or modified from an existing institution — where intellectual activities continued to take place were established by scientists. Third, the scientific paradigm[3)] expanded in intellectual activities. Science provided a model for the acquisition and cultural function of knowledge. This model was extended into a variety of areas by the emergence of science.

When it comes to science's influence on mankind, above all it cannot be discussed without Darwinism[4)] emerged in Britain during the 19th century. First and foremost, a question should be asked as to whether Darwinism affected the human race positively or negatively. To date, we have learned that Darwinism was a scientific revolution in the 19th century and thus largely contributed to the development of humanity[5)]. However, that is not the case. Instead, the ill effect of Darwinism on humanity far outweighs the positive. Particularly,

1) This presentation is a revised and updated version of my previous paper: Park, Woo-ryong,「Social Darwinism to reform Darwinism: reinterpreting 19th century Darwinism」,『Journal of The Korean History of Science Society』volume 31 issue 2 (The Korean History of Science Society, 2009).

2) T. W. Heyck, *The Transformation of Intellectual Life In Victorian England* (London & Sydney: Croom Helm; New York: St. Martin's Press, 1984), p.82.: The author explains in detail the impact of science on universities and intellectual life and criticism of science, etc.

3) Methodology of a particular scientific subject prevailing at a certain time

4) The reason why the term "evolutionism" is not used to describe Darwinism though Darwinism is a theory of *biological evolution* is that evolution refers to evolutionism of gradual change, whereas Darwinism focuses centrally on Darwin's theory of "struggle for existence"and "survival of the fittest".

5) Darwin's evolutionism greatly influenced Britain's intellectual community in the 19th century. (T. W. Heyck, *The Transformation of Intellectual Life In Victorian England,* p.81)

Social Darwinism which sought to apply Darwinism to human beings, society, and international order has had a very negative impact on humanity. Social Darwinism scientifically justified imbalances of power between individuals, races, and nations by focusing on the idea of the survival of the fittest and racism from the late 19th century[6]. Social Darwinists justified the racists' conception of superior and inferior peoples and with the assumption that conflict between groups in society leads to social progress they motivated ideas of nationalism and imperialism. Social Darwinism contributed to the outbreak of World War in the 20th century and even provided the Nazis with a justification for ethnic cleansing[7]. Moreover, a free-market economy that highly values competition went through periodic economic downturns which led to the Great Depression in the early 20th century.

The New Right's neoliberalism which was emerged in the late 20th century is also a form of Social Darwinism. The main ideology of the New Right can be found in the works of F.A.Hayek whose idea of spontaneous order is a variety of Social Darwinism[8]. Hayek used the concept of spontaneous order to argue that competition should take place through the impersonal mechanisms of market prices without taking into account any social or personal factors and that inequality is essential to the market economy. As Hayekian neo-liberalism were implemented worldwide, the global financial crisis hit the world in 2008.

Social Darwinism has done more harm than good to the majority of the world's population, excluding vested interests and the economically/socially privileged since the late 19th century. In addition, Social Darwinian principles of the "struggle for existence", "survival of the fittest", and "law of the jungle" are prevalent scientific mechanisms in our society today.

In the meantime, there were some anti-Social Darwinist intellectuals who predicted dire consequences of Social Darwinism in the 19th century. They recognized the possible consequences of Social Darwinian ideas of the survival of the fittest and relentless competition when Social Darwinism emerged. They rejected the application of Darwinism to society and stressed the role of cooperation among humans to promote social reform. This idea became known as "Reform Darwinism"[9].

A host of social reformists in Britain in the late 19th century such as Thomas Huxley, B. Kidd, T. H. Green, D. Ritchie, and L. T. Hobhouse criticized H. Spencer who played a critical role in the formulation of Social

---

6) Such views are mentioned repeatedly in the following literatures: J. W. Burrow, *Evolution and Society: A study in victorian social theory,* Cambridge University Press, 1974; Marvin Perry, *An Intellectual History of Modern Europe* (Boston and Toronto: Houghton Mifflin, 1992) ; Park, Woo-ryong, 『Culture & identity of the British: crisis of tradition created by Thatcherism and free market』(sonamu, 2008); 『Liberalism in the transitional era: neoliberalism in Britain and social reform by intellectuals』(sinseowon, 2003).

7) Perry, *Intellectual History of Modern Europe*, p. 357.

8) Hayek repeatedly mentioned the twin ideas of evolution and spontaneous order. Gerald F. Gaus, "Hayek on the evolution of society and mind," in Edward Feser ed. *The Cambridge Companion to Hayek* (Cambridge University Press, 2006), p.232.

9) J.A. Rogers distinguished Reform Darwinian concepts of social cooperation from Social Darwinian concepts of struggle and competition, which applied the theory of natural selection to human society.
Rogers, "Darwinism and Social Darwinism," *Journal of the History of Ideas,* vo1.32(1972).

Darwinism and tried to apply Darwinism to social reform. This paper points out negative effects of Social Darwinism and introduces an intellectual tradition that reinterpreted Darwinism primarily in terms of social reform.

Ⅱ. Social Darwinism of Spencer

Social thinkers in the late 19th century such as H. Spencer made a ruthless attempt to apply Darwinism to the realm of human society and international order in the late 19th century. These Social Darwinists used Darwin's theories of "survival of the fittest" and "struggle for existence" to promote economic individualism and political conservatism. They explained individuals' success in a competitive business world by attributing it to their greater fitness. In other words, success is a product of the law of nature and therefore is beneficial to society, and economic/social failure is a telltale sign of unfitness[10]. Social Darwinists applied to society Darwin's biological concepts observed in nature in order to justify imperialism, racism, nationalism and militarism[11]. They also believed that any social reform implemented by government could distort a competitive order in harmony with nature, and that such reform which is held to help the least fit would not be in the interest of the nation[12]. They maintained that societies — like organisms which evolve by a natural process over tens of thousands of years — should go through changes slowly and gradually, and therefore instant reforms would conflict with the laws of nature or the wisdom of nature and result in a deterioration of the social body. At that time many liberalists and proponents of classical liberalism saw government intervention as a threat to an individual's freedom, and discouraged government intervention in eliminating the hardship of the poor[13]. They believed that new liberalism which favors government intervention would make a majority of people dependent on the state and greatly undermine the virtues of diligence, frugality, and self-reliance.

It was not until the mid-1880s that Social Darwinism was fully accepted. One of the leading advocates of Social Darwinism was Herbert Spencer whose theories were embraced enthusiastically to justify laissez-faire. In his 1884 book, The Man versus State, Spencer denied that all kinds of social problems should be solved by the state. Rejecting increasing state interference[14], he enumerated various forms of government interventions that impede the progress of free market economy to defend laissez-faire liberalism. He was against factory supervision, public education, restrictions on medicine and grains, public sanitation, public postal services, public relief for the poor and so on[15]. He denounced such reform legislations passed by the Liberal party and considered them anti-liberal. He also saw the poor as being incapable, weak, lazy, brazen and biologically unfit for the

10) John D. Rockefeller(1839-1937) once said that "The growth of large business is merely a survival of the fittest...This is not an evil tendency in business. It is merely the working out of a law of nature and a law of God." Richard Orson ed., *Science as Metaphor* (Belmont, California, Wadsworth, 1971), p. 111.

11) Perry, *An Intellectual History of Modern Europe*, p. 254.

12) *Ibid.*, p.

13) *Ibid.*, p. 279.

14) David Ritchie, *The Principle of State Interference*(1891), p. 3.

15) *Ibid.*, pp. 279~280.

struggle for existence.

Spencer saw social evolution as an automatic, mechanical, and inevitable process. From his point of view, man's mind does nothing during that process. Thus, human beings should not have an ability to intervene in a law of nature, and survival of the fittest is the only way humanity can progress. According to Spencer, a good society is based on contracts between individuals pursuing their own interests and therefore the real social theory can be produced by exploring nature of individuals in society.

In this context, any law, whether it be law of governance, that impedes competition between individuals interferes with the operation of the natural law and is detrimental to society. Spencer who was considered to be greatest English philosopher of all time exerted great influence on British way of thinking and political culture. As Spencer's Social Darwinism was incorporated into British liberalism in the late 19th century, liberalism seemed to reverse the course of time. His theory and ideas became integral to Social Darwinism which stresses competitive individualism, exploitation, limited state intervention, and aggressive imperialism[16]. Spencerian views were used to justify capitalist exploitation, ruthless individualist competition, and even imperial expansion achieved by any means necessary.

Spencer was "the most formidable intellectual enemy[17]" to reformist intellectuals. The highest priority for reformists who encouraged state interference in resolving various issues of industrial society was to suggest alternatives to Spencerian ideas. Paradoxically, Spencerian Social Darwinism encouraged the birth of reform liberalism because neo-liberalists had to challenge the most influential Spencerian ideology of Social Darwinism to explain their intellectual rationale behind social reform. Meanwhile, since Darwin's theory of evolution was strongly supported and made compelling by British empiricism, considered as synthetic philosophy that addresses social progress, and provided a comprehensive explanation from a macro perspective by conceptualizing society as an organism, reformist intellectuals also sought to use Darwin's theory of evolution in forming their own theories. However, Spencer and reformists had different goals. Spencer was to achieve a resounding triumph of existing liberalism and set up the complete antithesis between the individual and the state by establishing an integrated philosophy based upon evolutionary theory, while reformists tried to point out limitations of existing liberalism and provide a theoretic justification for collective reform.

In fact, Spencer's ideas were not widely received within British academia even though his theory was popularized particularly in the US in the 1880s. Rather, many were concerned about negative effects of his idea s[18]. Reformists believed that if they prove Spencerian ideas to be a false and make their case for reformism social reform pursued by liberalists can be justified[19]. Thinkers like Ritchie and Hobhouse set an antithesis

---

16) Spencer was particularly influential in the United States. See Richard Hofstadter, *Social Darwinism in American Thought 1869~1915* (Philadelphia, 1944 ; revised edn. Boston: The Beacon Press, 1955, 1962).

17) Ritchie, *The Principle of State Interference*, p. 3.

18) Stefan Collini, *Liberalism, and Sociology: L. T. Hobhouse and Political Argument in England 1880~1914* (Cambridge University Press, 1981), p. 149. For Spencerian Social Darwinism in the US, See Mike Hawkins., *Darwinism in European and American thought, 1860~1945 : nature as model and nature as threat* (Cambridge, UK. ; New York : Cambridge University Press, 1997).

19) Michael Freeden, The *New Liberalism: An Ideology of Social Reform* (Oxford: Oxford University Press, 1978, 1986), p. 80 ; Collini, *Liberalism, and Sociology,* p. 151.

between the individual and the state to confront Spencer's rejection of collective reform while inspired by Spencer's pioneering methodology.

Ⅲ. Reform Darwinism

1. Criticism of Social Darwinism and theoretical basis of reform darwinism

T.Huxley was a particularly strong critic of Spencerian ideas. He believed that civilization is not a product of the evolution of the natural world, and that society is different from the order of nature because it has a moral end. He especially stressed morality in the evolutionary process.

Social progress means a checking of the cosmic process(biological process of natural selection) at every step and the substitution for it of another which may be called the ethical progress; the end of which is not the survival of those who may be the fittest, in respect of the conditions which exist, but of those who are ethically the best[20].

Huxley's ethical idealism, however, met with fierce opposition from evolutionists. Evolutionists agreed with his rejection of the idea that struggle for existence is a source of social progress while repudiating attempts to apply ethical values to natural evolution.

In addition, B. Kidd saw competition as necessary for the continued evolution of the race, but believed that mankind progresses when individual interests are subordinated to those of the group. He argued that an individual should be able to delay instant gratification for the future of humanity. He favored Christianity which is supra-rational and forward-looking over the socialist movement which places greater value on short-term profitability. He believed that reform legislations can be justified by pursuing altruism of Christianity and promoted competitive struggle through equality of opportunity. However, reformists argued that a vague expectation of what the future holds will never solve the problems in reality[21].

T. H. Green along with Arnold Toynbee exerted the most potent philosophical influence in England in the late 19th century by infusing moral sense of duty and enthusiasm for social reform into British intellectuals. Green pioneered in questioning Spencerian individualist ideology and anti-reform attitude, and laid theoretical grounding for collective social reform. He believed moral values should not be judged by scientific knowledge, and no elements to determine human behavioral norms exist in the laws of nature. Above all, he argued any attempts to establish social ethics through evolutionary thoughts leads to adverse consequences. He also stressed the need for ethical and political obligations which are based on experience.

Green's metaphysical philosophy recognized that man is endowed with "self-consciousness" and "reason".

20) T.H. Huxley, *Evolution and Ethics, Romanes Lecture*, p. 33 in Freeden, *New Liberalism*, p. 81.

21) Freeden, *New Liberalism*, pp. 83~84.

Therefore human beings are capable of recognizing their own limitations according to reason and their possibility of self-realization as moral and rational beings. He believed the ultimate goal pursued by humans is to fully realize their own potential, and the first priority of the state is to help an individual become a morally and ethically good being. Therefore, citizens submit to the state not because of the state's coercive authority but because the state plays an important role in fostering individual self-realization. Green's political interest lay in the moral function of the state, law and rights[22]. In his 1895 work, Lectures on the Principles of Political Obligation, Green wrote that "the purpose of this book is to consider the moral function or object served by law, or the by the system of rights and obligations which the state enforces[23]".

For Green the purpose of the state is to pursue the common good as well as self-fulfillment. Green thought the realization of human perfection and possibilities is predicated inevitably on the community and the common good. furthermore, humans acknowledge according to reason that others strive to achieve true moral self-realization, as is the case with self. He assumed development and happiness of self would be achievable when that of others would be understood as necessary to fulfilling one's own interests. If self is to achieve true self-realization, then the good of others should also be realized.

How can a new evolutionism which rules out negative aspects of Spencerian evolutionism be created? The answer to this question was "Idealistic Evolutionism" which combines biology and idealism. For Spencer, evolutionism was theoretical foundation for individualism while community ethos was based upon idealism for Green. Then, are evolutionism and idealism incompatible? Some intellectuals from Oxford University in the 1880s tried to prove the ideal common good with evolutionism.

David Ritchie who was certainly one of the most brilliant[24] of Green's disciples at Oxford in the late 1870s played a leading role in such efforts. He was at the forefront in abandoning Social Darwinism and developing a new liberalism underpinning reform activities of the state. In particular, Ritchie was recognized for his work addressing the question of the role of the state.

He agreed with Green about the need for obligation of the state to ensure each individual's possibility of self-realization, but studied much further than Green in terms of the role of the state in transforming human mind and "government interference[25]". Although Green saw over-enthusiastic legal control by the state as unjust, Ritchie argued that the state might create the sentiment of society towards improvement of morality of an individual[26].

Ritchie sought the combination of evolutionary ethics and idealism through his works to develop the new liberalism[27]. In his work published in 1891, Darwinism and Politics, Ritchie explained intellectual, moral and

22) A. Vincent & M. Plant, *Philosophy, Politics and Citizenship: The Life and thought of the British Ideas* (Oxford, Blackwell, 1984), p.52.

23) Green, *Lectures on the Principles of Political Obligation*(1895), p. 29.

24) Collini, *Liberalism, and Sociology*,, p. 162.

25) *Ibid*., p. 163.

26) Freeden stated in his work "New Liberalism" that Ritchie is the most influential idealists in Britain who contributed to the development of the new liberalism that emphasizes the role of the state. (Freeden, *New Liberalism*, p. 58)

27) Peter Robbins, *The British Hegelians* (London: Garland Publishing, 1982), p. 82.

social development of humans through a new evolutionary theory which incorporates human consciousness into interpretation of history by natural selection. He went on to argue that if a new evolutionary theory applies properly to human society it would have nothing to do with the political dogma of laissez-faire. He tried to introduce idealistic philosophy to science studies, and in his work, Darwin and Hegel (1893), Ritchie sought the combination of Darwinian and Hegelian ideas.

Ritchie warned that application of biological conceptions to human society can lead to errors Social Darwinists made[28]. He argued that competition in human society should be differently interpreted from competition in nature because a human being is a biological organism which is subordinated to the force of nature, but it is able to control the natural forces with consciousness within its own limited scope and to examine and assess social organizations, norms, customs and institutions through thought and reflection. Therefore, "social heredity" and "social variation" are products of competition for ideology and institutions, rather than the struggle for existence among individuals and races, which is instinctive and impulsive. Since humans have an ability to make reasonable choices society progresses through such competition.

Like Hobhouse which is discussed in the following section, Ritchie emphasized "consciousness" in terms of natural evolution. According to Ritchie, humans take a critical attitude towards the struggle for existence thanks to consciousness, and selectively and carefully choose what is necessary for themselves among various values and thoughts accepted in society[29]. Thus, he interpreted the concept of "competition" as striving to gain cultural resources, not to merely exist. In that competition the final choice is at the discretion of each individual. He sought to reconcile liberal principle of freedom of choice with Darwin's biological theory of natural selection.

Ritchie argued that collective reform by the cooperation of citizens keeps pace with social progress, which means the growth of civilization. He placed more emphasis on direct activities of the state for social reform while Green stressed individual moral will. Ritchie believed the extension of franchise could be a tool for realizing the common good, and thus the state is the most adequate representative of the general will. Merging evolutionism with idealism, he played an important role in changing liberal assumptions by highlighting the role of the state for the harmony between freedom and common good[30].

2. Reform Darwinism of Hobhouse

1) Evolution of human mind

The primary task of progressive liberalists was to point out the flaws of laissez-faire ideas and suggest new political and social theories which are useful in the situation of the time. They sought to determine the

28) D. G. Ritchie, ‘Social Evolution’, *International Journal of Ethics*(Jan. 1896), p. 166 in Person & Williams, *Political Thought and Public Policy*, p. 49.

29) Ritchie, *Darwinism and Politics*(1889), pp. 22~33.

30) Bentley, *Climax of Liberalism*, p. 76.

causes of problems faced by existing order and come up with appropriate solutions. In such endeavors, Hobhouse played a critical part and exerted great influence on British sociology[31].

Hobhouse attempted to develop his idea based on evolutionary theory [32] and thus inspired most by Spencer. He learned about socio-philosophical approach and evolutionary empiricism from Spencer, but reached a different conclusion. Hobhouse, like Spencer, saw society as an organism and sought to develop a comprehensive sociology based on evolutionary theory. However, Spencer interpreted evolutionism by justifying laissez-faire whereas Hobhouse sought to suggest a new direction for liberalism through evolutionary theory. Spencerian evolutionism puts greater emphasis on individualism while Hobhouse believed the essence of social ethics is social cooperation. He once attempted to return to Green's idealistic philosophy, but found it difficult to accept it as well[33] because his idea was based on positivism so that idealistic philosophy which rules out or rejects natural science could not be applicable.

Hobhouse believed that if philosophy is to be more of scientific nature rather than of a speculative, then it should be based on experience which can be verified by science. He championed the theory of evolution in this respect. For Hobhouse evolutionary theory not only provided philosophical methodology, but formed the core of his ideas. Therefore he had to address flaws and contradictions of Spencerian ideology when applying the theory of evolution to the development of humanity. To this end, first and foremost he tried to reorganize interpretations of evolutionary theory. He sought to justify the belief in progress of human society throughout his academic career.

A distinct difference between Hobhouse's evolutionary ideas and Spencer's social evolutionary theory is in the way they view the function of mentality in the process of evolution. Spencer treated the theory of evolution as a scientific formula[34]. From the Spencerian point of view, human mind is just a means of enabling humans to adapt to an environment. Thus, progress is a product of chance. Further, if biological factors are essential in social development and the struggle for existence is the law of life such values as social justice and human love are meaningless, as asserted by Spencer. Spencer saw evolution as an automatic, mechanical, and inevitable process while Hobhouse argued that mind leads the evolutionary process. According to Hob house, as men make history with self-consciousness which is achieved by the evolution of mind, they can live outside the natural law that controls other living organisms. Therefore, mentality is an absolute factor determining individual behavior and development of species[35].

Hobhouse was strongly influenced by A.Comte's belief that the human mind is the crucial factor in the evolutionary process. From Comte Hobhouse took the viewpoint that mind plays a pivotal role in creating social environment and increasing knowledge. Hobhouse continued his empirical studies of stages in the evolution of

---

31) Philip Abrams, *The Origins of British Sociology 1834 ~1914* (University of Chicago Press, 1968), p. 87.

32) L. T. Hobhouse, "The Philosophy of Development," in J. H. Muirhead ed. *Contemporary British Sociology* (London, 1924), pp. 149~188.

33) Stefan Collini, *Liberalism and Sociology*, p. 150.

34) J. E. Owen, *L. T. Hobhouse, Sociologist*(Cambridge University Press, 1974), p. 10.

35) Freeden, *New Liberalism*, p. 89.

mind through the application of psychology and biology. He pronounced the human mind is the crucial factor in social development through positive analysis. He admitted his such argument is influenced by G.W.F. Hegel's view[36].

Hobhouse described in his work, Mind in Evolution (1903), evolution of animal intelligence and transition to human mentality. Moreover, in "Morals in Evolution (1906)" he analyzed comprehensively evolution of human consciousness and change of social institutions. "Development and Purpose (1913)" was the philosophical analysis of evolution, building on empirical studies in his two previous works.

2) Harmony between evolutionism and idealism

Hobhouse sought to harmonize Spencer's thought with Hegel's ideas in his own theory. He tried to combine "evolutionary materialism" with "metaphysical idealism". At first he sought to prove Hegel's metaphysics in a Darwinian court[37]. Through his attempts to combine Hegel with Darwin, Hobhouse saw history as the process of self-realization of mind, which is controlled by the principle of reason[38]. For him the purpose of mind was to create a harmonious world without struggle. As all entities are organic mentality creates a complete unification or "harmony" among organisms, and harmony here refers to all parts of an organism acting in full cooperation with each other.

Reason is "a principle of harmony pervading experience and working it into an organic whole". Therefore, an act of pursuing harmony through cooperation with others is an instinctive impulse of rational beings[39]. Hobhouse perfectly explained ethical evolutionism that supports collectivism by moving beyond Spencerian individualistic evolutionism[40]. He believed that harmony between freedom and social cooperation is possible because man is a "rational being". Being rational means being able to cooperate with others [41]. Hobhouse was influenced by Hegel's philosophy that considered history as rational principles and the process of self-realization of human mind[42]. Mentality becomes self-conscious at the final stage of the said process, and pursues its own purpose, which is to create a world without struggles.

Hobhouse claimed that social development is a state of "harmony" between individual and society, which is achieved by human mind. He thought mankind reached the final stage, which is the "Religion of Humanity"

36) Hobhouse was influenced by Hegel only in terms of a teleological evolution of mind. He strongly criticized Hegel's theory of the state, though. For Hobhouse's criticism of Hegel's theory of the state, see Hobhouse, *The Metaphysical Theory of the State, a Criticism* (New York, 1918), pp. 6, 23~24, 137.

37) Stefan Collini, *Liberalism and Sociology*, p. 151.

38) Peter Weiler, "The New Liberalism of L.T. Hobhouse," *Victorian Studies* XV (1972), p. 148.

39) Hobhouse, *Liberalism* (New York; 1st edn., London, 1911), p. 69.

40) Freeden, *The New Liberalism*, p. 85.

41) *Ibid*., pp. 144~148.

42) For Hegel's influence on Hobhouse, see C. M. Grifin, "L. T. Hobhouse and the idea of harmony," *Journal of the History of Ideas* XXXV(1974), pp. 647 ~ 661.

created by Comte[43]. Individuals who reach the stage of the religion of humanity are conscious of their duty to contribute to social development.

However, since Hobhouse found it difficult to argue that humans are able to reach the final stage of the religion of humanity on their own he tried to find a way to incorporate ethical conceptions or sociology into political theory. He developed a theory about proactive roles of the state by replacing sociological, ethical concept of the religion of humanity with common good. Individuals reach the final stage of the religion of humanity when the state makes active efforts for the common good especially on the economic front.

From Hobhouse's standpoint which stresses the state's intervention in realizing the common good, the old economists' argument that the pursuit of self-interest leads to the best outcome for society as a whole is excessively optimistic and superficial[44]. He thought ethical harmony based on training of mind and improvement of living conditions is necessary for the common good[45].

An individual right cannot conflict with the common good, nor could any right exist apart from the common good[46]. Each individual must have his own share in the common good[47]. In Green's words, "each individual finds his own good in the common good"[48]. Hobhouse claimed that two fundamental problems should be tackled if humans are to reach the harmonious state of the common good. For one thing, the right to pursue self-realization should be recognized by the state. Green believed that exercising such right is essential to the development of personal character.

Hobhouse highlighted that as individual development relies on material resources as well as mind individuals should have rights to material goods[49]. In other words, individuals' rights to pursue mentality are merely a condition for the formation of personal character, and thus humans would be able to achieve a complete self-realization when material and mental welfare needs are met. In this respect, Hobhouse was more progressive than Green.

Meanwhile, the other issue was that true harmony is possible when all individuals are given opportunity for participation in social development. For the common good, every member of society should be given an equal opportunity to develop his own personal character. To this end, there should be equality of opportunity as well as equality before law[50]. Neo-liberalists argued that these two rights can be secured by state interference.

---

43) Weiler, "The New Liberalism of L. T. Hobhouse," p. 149. (this viewpoint shared by J. S. Mill) John Ronson, *The Improvement of Mankind,* Toronto, 1968, pp. 137~139.

44) Hobhouse, *Liberalism*, p. 69.

45) *Ibid.*

46) *Ibid.*, p. 67

47) *Ibid.*, p. 68

48) Ibid., pp .68~69.

49) Hobhouse, *Social Evolution and Political Theory*, p. 198.

50) Hobhouse, *Liberalism*, p. 70.

IV. Conclusion

This paper has explored flaws of Social Darwinism. First of all, Social Darwinism is a false application of biological theories of "natural selection" or "survival of the fittest" to human society by several philosophers like Spencer. This wrong ideology was used to promote extreme individualism, laissez-faire and political conservatism.

Social Darwinists undermined the enlightenment ideas emphasizing reason and reformist ideas by recklessly applying theories of evolution to human society. The progressive ideas of the enlightenment were challenged or rejected by many in the 20th century thanks to the influence of Social Darwinism. Enlightenment philosophers defined progress as promotion of reason and liberty, expansion of education, improvement of living standards, and exception of wars, etc. Those who were inspired by Social Darwinism, however, rejected such progressive ideas. Social Darwinists who were fascinated by the doctrine of nationalism and criticized scientific rationalism even went on to identify progress with the power of the state and believe that struggles between nations and races are the natural law and creative power that saves the state from materialism and inferiority[51].

Evolutionary theory is a great product of the rational mind, but its tradition was undermined by Social Darwinists. Social Darwinists justified the racists' conception of superior and inferior peoples while the enlightenment thinkers stressed equality of all men. Furthermore, they regarded struggles between races as biological inevitability, law of history and means of progress whereas the enlightenment philosophers believed that the state should follow the rule of law to restrain violent struggles[52]. Social Darwinists encouraged arms buildup and territorial expansion and led many to welcome the first World War by claiming that their ideology is based on science. In addition, the Social Darwinist notion of the struggle of races for survival became a core doctrine of the Nazi party after World War I and provided the scientific and ethical justification for genocide.

In the early 21st century, the world faced another deep economic crisis under a laissez-faire competitive system which is based on the theory of spontaneous order, and it is still affected significantly by the crisis. Hayek's argument that competition is a key driver of progress means mankind's return to the 19th century-Social Darwinism. History showed that the social order based on Social Darwinism is very counter-active[53]. Radical socio-economic views based upon Hayek's theory of spontaneous order contributed to another crisis of mankind by theoretically and ideologically affecting New Right thinking.[54]

---

51) Perry, *An Intellectual History of Modern Europe*, p. 348.

52) *Ibid.*, p. 359.

51) Perry, *An Intellectual History of Modern Europe*, p. 348.

52) *Ibid.*, p. 359.

53) *Ibid.*, p.357.

Social Darwinism pursued by Spencer in the late 19th century and by Hayek in the late 20th centuries favors mechanical evolution, competition, survival of the fittest, exception of reason and small government without interference. We are well aware that Social Darwinian theory of evolution caused great suffering and pain to date and as a result men had to pay a terrible price. In this regard, it is noteworthy that social reformers like Ritchie and Hobhouse were critical of mechanical evolution and Social Darwinism, emphasized mind instead in the evolutionary process through combination of biology and idealism, and suggested the rationale behind social reform by the state. Particularly, Hobhouse, along with other thinkers such as J. A. Hobson, contributed to laying the foundation for a 20th century welfare state by developing the New Liberalism based on evolutionary thought and offering an ideological basis for the reform legislations of the liberal party in the early 20th century. [55]

The purpose of applying scientific theories to society and individuals' lives is to pursue a happy and comfortable life. Humankind, however, had to pay a terrible price as social thinkers attempted to distort and misuse scientific theories like Social Darwinism intentionally. History revealed repeatedly that Social Darwinism is a dangerous and destructive ideology.

In a modern society where our lives are affected so much by scientific, technological advances, understanding the essence of science and material civilization clearly is one of the pressing issues. Mindful of the devastating consequences of Social Darwinism, applying science and technology by scholars and the ordinary people alike in today's world for the true welfare of mankind should be the norm.

---

54) For limitations of Hayek's Spontaneous Order, and Hayek's radical socio-economic views, and negative effects of Hayek's ideas, see the followings: Alan Ebenstein, *Hayek's Journey: The Mind of Friedrich Hayek* (New York: Palgrave Macmillan, 2003); *Friedrich Hayek: A Biography* (New York: Palgrave for St. Martin's Press, 2001); Stephen F. Frowen ed., *Hayek: Economist and Social philosopher, A Critical Retrostpect* (London and New York: Macmillan and St. Martins's Press, 1997); John Gray, *Black Mass : Apocalyptic Religion and the Death of Utopia*(New York: Farrar, Straus and Giroux, 2008), pp.89-93; *Park-Woo-ryong*, 『Culture & identity of the British: crisis of tradition created by Thatcherism and free market』(sonamu, 2008) Part 2 Thatcher and Hayek; 「British New Right's ideological limitations: Application of Hayek's Spontaneous Order and Free Market Theory」, 『Daegu Historical Review』 93th Edition (2008).

55) For more details, see the followings: Derek Fraser, *The Evolution of the British Welfare State*, Third Edition (Houndmills, Hampshire and New York: Palgrave Macmillan, 2003); Pat Thane, *Foundations of the Welfare State* (London and New York: Longman, 1982); Martin Pugh, *Lloyd George* (London and New York: Longman, 1988); Martin Pugh, *State and Society: British Political and Social History 1870-1992* (London and New York: Edward Arnold, 1994); P. K. Clarke, *Lancashire and the New Liberalism* (Cambridge University Press, 1971); Michael Freeden., *The New Liberalism : an Ideology of Social Reform* (Oxford: Clarendon Press , 1986): Song, Kyu-bum, 「Welfare Ideology of New Liberalism」, 『Thesis Collection, CJU's College of Education』 11th edition (1982), pp.325-347; Park, Woo-ryong, 『Liberalism in the Transitional Era: Neoliberalism in Britain and Social Reform by Intellectuals』(Shinseowon, 2003); Park, Woo-ryong, 「Welfare Ideology of 19th Century New Liberalism in Britain」, Lee, Keun-sik, etc., 『Korean Welfare State, Liberal View』(Cheolhak & Hyunsil, 2014), pp. 99-152.

Science Is Not Just Science: The Presence of Identity and Ideology in Natural History Museums

Chanika Mitchell
SeoKyeong University

Introduction

Human evolutionary theory and natural history are varied, complex subjects. Scientists have been actively studying these concepts for over 100 years. Natural history museums are utilized to show the knowledge and breadth of information about human evolution. Natural history museums are constructed as a legitimate source of knowledge about ethnology, geology, human origins, evolution and many other disciplines/subjects. In my research, I wanted to examine the construction of exhibitions pertaining to human evolution to better understand how human evolution is explained to the general public.

I examined the exhibit, ***Fossil Fragments:*** *the Riddle of Human Origins,* at the Yale Peabody Museum of Natural History. In this paper, I examine the premise: Information about racial ideology is embedded in human evolution exhibits and reinforce visitors' racial ideological beliefs. The two questions are whether the curators are aware of this information? Also does ignoring the concept of race actually increase the identity and ideological information present? In order to understand the subject matter one must know the history of museums and anthropology. Anthropology is viewed by many as an old discipline entrenched in colonialism, imperialism, nationalism and Western hegemonic power. Museums are a place where anthropologists display much of their wares and knowledge obtained from all over the world. What happens when the people being examined or discussed cannot speak?

In natural history museums, it is common for the people or artifacts being discussed to belong to people long deceased. How can you move beyond the past if the people you are studying are firmly entrenched in the past? In terms of the artifacts and people studied much of it comes from Africa which is the core of colonial prosperity and degradation. These factors make it difficult to divorce the study and knowledge of natural history from identity and ideology. The complexities of studying the evolution of hu-

mans goes into not just the objects themselves and the facts but how people identify themselves in relation to those objects and facts. How might the knowledge of collective African origins for all humans affect their perception of self and their connections to their ancestors? Identity is a tool in which people utilize to connect and understand a subject. Race is a cultural phenomena and scientists are taught that race does not exist biologically. Knowing that both natural history museums and the study of human evolution have ideological histories, it becomes difficult to see how the two are able to disengage themselves completely from their histories.

This history is then brought into the construction of exhibits in museums. The history of the museum is laden with ideological information. When trying to teach people about human evolution, curators and exhibitors also teach them something about identity and what the concept of identity is. The visitor is inundated with relics of human evolution and all the messages or information that it entails. How does the material that is included or omitted from the exhibit influence visitor perceptions of human evolution and origins? Might the museum's own historical baggage disallow objectivity on the part of the curatorial staff? Many previous studies focused on the ideological information the visitor brings with them to the exhibit. This kind of critique does not consider what ideological information may be present in the exhibit itself. The construction of the exhibit may convey a particular racialized message of human evolution. The museum tries to teach the visitor about human evolution and origins but may unintentionally be teaching about race.

I will analyze a natural history exhibit utilizing my knowledge of biology and anthropology. How may views of race, identity and ideology manifest themselves in natural museums and on a larger scale within the scientific community of museology and anthropology. In this study, I examined how identity and ideology get embedded into the exhibit, "Fossil Fragments: the Riddle of Human Origins." What messages about race are to be found in the text of the exhibit "Fossil Fragments: The Riddle of Human Origins?" Are certain representational practices geared toward resonance with some visitors over others? How do natural history museums gain their legitimacy, power and authority? I am also interested in the visitors' experiences and interactions with the museum. Do the staff and curators of the museum have a certain visitor in mind when constructing the exhibition, and do they have particular ideas concerning what they want to communicate? What discourse about race, if any, emanates from visitors after viewing the exhibit?

History of Natural History Museums

When discussing anthropology and the science within anthropology, it is important to contextualize where this process is taking place and being disseminated. In order to do so I will contextualize museums in the 19th and 20th century. What was the purpose of these museums and how were they constructed? This

will allow me to better situate the Fossil Fragments exhibit. Natural history museums are dedicated to displaying fossils, ethnology of cultures gone and dying, bones and various other dead beings. The field studies the past; particularly, species that are extinct. In modern times, natural history museums have tried to distance themselves from cabinet-of-curiosity connotations and have historicized artifacts into categories for exhibitions and expertise (Bennett 2004:13). These artifacts are moved from the past and placed in the present by curators. These museums and curators are closely tied with intellectualism and the power structure that exists for the museum to manifest. This is an important factor to remember because when this power structure reflects a struggle between disenfranchised indigenous groups and bullying dominant groups, then a museum's power to categorize, claim and legitimize a group's right to make history their own, also makes museums agents of those dominant groups (Coombes 1988: 61).

The question then becomes, how did museums achieve power, legitimacy and authority? Asking this question allows for a better understanding of the role of museums today and how they construct their exhibits. Early museums used typological organization to construct the exhibitions. Typological organization focuses on objects from different regions of the world that are grouped based on function to depict evolutionary change (Coombes 1988: 61). The objects that appear earlier in evolutionary history are seen as natural whereas objects that are more complex are represented as newer and more evolved (Coombes 1988: 61). The danger in typological organization is that objects are then used to show cultural evolution. This paradigm sets up a hierarchical system for both biological and cultural artifacts that indicates an evolution of cultures, with some superior to others. Complex and varied logics have been used in articulating this interaction, including the idea that if one segment of society is viewed as "natural," it is considered less "cultural" and relegated to a lower status. This was the dominant system for classifying cultures during the majority of the 20th century.

Curators of museums further used this evolutionary system to show the need for conservation and preservation of these colonized cultures. Evolution is inevitable and these 'less advanced' groups would face extinction. In an interesting twist, anthropology served as an aid to showing cultural evolution in becoming an agent for the colonial government (Coombes 1988: 62). The inevitable extinction of these cultures made their material culture a hot commodity. Anthropology was then able to become the knowledge base for these cultures, which in turn entombed the cultures in a lower status because they were on their way to extinction. By placing colonized societies in a lesser position, the museum's role was to legitimize state actions of colonialism.

A Historical Context for State Influence on Science

Natural history museums are not autonomous entities that are run without outside influence (in particular, the government). Most museums during this 19th century were constructed by the dominant group and supported their thoughts and privileged places in society (Wallace 1981: 63). The hegemony of the state then institutionalizes its ideology for the duration of its reign. More importantly, the ideology of the museum changes with the political and/or economic ideology of the state. This becomes evident through a consideration of the changing view of race in anthropology (Smedley 1999: 692). The result is that exhibits are constructed not by objective individuals but by people firmly embedded in the material culture and ideology of the state (Greenberg 1997: 16). The hegemony that exists in museums disallows for non-whites to be accurately represented by museums or for non-white visitors to feel that they are accurately represented. Many non-whites feel they are firmly outside the state because the state conquered them. If the museum represents the hegemony of the state then they can never be a part of the museum. They thus have no voice in a museum setting.

When the legitimacy and power of the museum is steeped in government power, this does not allow for a 'non-dominant' culture to have a space. Science becomes a tool to gain claim to the history of a culture. Anthropologists are able to claim that they are seeking the 'truth' about a culture. When knowledge is equated with proclamations of science, then groups of people outside the world of science lose their knowledge base. Conversely, the people who know this 'science' are able to also be the holders of the truth (Coombes 1988: 62). This allows them to decide what history is and how events occurred. Importantly, anthropologists were able to use this technique to distance themselves from the agency of the government. The colonized are then left powerless to refute anything because history has been recorded and has designated them as living dioramas and collections. Colonized people are displayed in the museum as existing firmly fixed in the past even though they live in the present. They will always be viewed as less evolved or primitive.

The question then becomes how can we apply to this critique on a larger scale. This state hegemony goes beyond power over museums but natural history itself. Donna J. Haraway, biologist and feminist, argued that the history of the field of natural history is similar to history of xenophobia, colonialism and racism (Greenberg 1997: 17). Haraway also argues that the American Museum of Natural History represented dominant cultural thoughts and affirmed white power in the face of fear over non-white immigration and class changes (Haraway 1989). This dominance is seen through applying a lower status on non-white material culture. Material culture from the colonies at the time encompassed skeletons, skulls, facial/body casts, photo-

graphs and other items (Coombes 1988: 62) If non-white material culture is seen as inferior, then so is the non-white body.

Race in Anthropology and Museums

When discussing race and anthropology, one must examine its historical roots, as well as the growth of the concept of race. As a basic definition race is a vehicle for social identification and stratification based on phenotype (Smedley 1998: 694). Anthropologists today portray race as a cultural construct and not a biological one. While the biological justification for this is strong (Relethford 2009: 17), such an assertion seems to render invalid many other connotations of the word and disallows for certain venues of discussion. In stark contrast, race is primary in many political and national ideologies and is viewed as fixed in human society. So, something that is proclaimed nonexistent in human biology is paramount in society, where, ironically, biological characteristics are invoked to denote racial identity (James 2001: 236). So discussion of race is something that anthropologist or scientists on a larger scale cannot skirt.

When discussing race in modern humans, traits such as skin color or pigmentation are most often used to determine the race of any individual. Skin color or pigmentation varies considerably within human populations, often more than between populations (Pritchard et al. 2010: R208). There are many genes that determine skin, hair and eye color. Also environmental factors affect skin, hair and eye color. "Skin coloration in humans is adaptive and labile. Skin pigmentation levels have changed more than once in human evolution. Because of this, skin coloration is of no value in determining phylogenetic relationships among modern human groups" (Jablonski et al. 2000: 57). Despite this knowledge many museums use skin, hair and eye color to determine race.

From an evolutionary standpoint human skin color and pigmentation have evolved over long periods in different environments. Skin color largely reflects the amount of melanin in one's skin, which is uncorrelated with other genetic markers, but which is under strong selective pressure (Jablonski and Chaplin, 2003). For purposes of this study, I am more interested in the everyday criteria people use to classify races, as the average museum visitor does not know a lot about the vast variety of genetic markers, how they vary geographically, and more importantly, how they are and are not correlated with one another. Skin color becomes important because it is visible and because it is how average visitors understand biological variation; assessing how skin color of hominins in the past is reconstructed and how it may be interpreted by visitors becomes paramount to understanding how a museum's exhibits may carry hidden messages. Since races are

identified by average visitors by externally visible characteristics such as skin color, hair texture and other external morphological features, then races are easily interpreted as biologically real. Geographic location is another important factor that people associate with race and skin color (Relethford 2009: 17). The concept of race originated with European colonialism in the 1500s (James 2001: 236). This is not to say that different forms of classification did not exist before colonialism. People before colonialism understood that cultural characteristics and behaviors were fluid and that such traits could be accessible to anyone – even outsiders and "savages" (Smedley 1998: 691). Human variation gave social meanings and structure to how we viewed our differences and similarities (Smedley 1998: 693). The concept of race then became embedded in the social consciousness of humankind.

For the purposes of this study, I am using traditional terms of race as understood by the United States Census Bureau, regardless of its flawed nature. I use the traditional terms of race set out by the U.S. Census Bureau because visitors asked to identify their ethnicity choose to use racial categories to describe that identity. By using traditional racial categories I am hoping to show how race is intrinsic and very real in the minds of people. I want to highlight this because race has become so pervasive that people use it as an identifier and marker in every aspect of their lives, especially when discussing human evolution and origins. I will show that even though I asked visitors to self identify ethnicity, they chose the traditional terms of black, white and etc.

Missing Distinctions in the Concept of Race

Natural history since colonialism has established a binary distinction between whites and non-whites. There seems to be an agreement about the reality of race and ranked nature of the body and behavior (Lieberman and Jackson 1995: 232). How has natural history affected the concept of race? To belong to a race in the biological sense means to belong to a subspecies (Templeton 1998: 632). A subspecies is defined as geographically distinct and genetically-differentiated population (Templeton 1998; Smith et al. 1997). This seems very harmless but race in humans is seen as a precise and exclusive biological category (Marks 1994: 33). This exclusivity makes race seem fixed in biology. Even though anthropologists have tried to move away from using race to identify people, forensic anthropologists still use it in this manner (Sauer 1992: 34).

Forensic anthropologists use bones to determine racial identities of people. They have moved away from using the term race and now use the word ancestry (Ousley 2009: 68). Forensic anthropologists are careful to show the difference between biological and sociocultural race. This carefully crafted distinction is lost on the average person (and even some anthropologists). Bony traits vary tremendously across and within

populations, and do not cluster into discrete racial categories. But traits can be defined in social terms because people see any clustering as racial. There are certain genetic markers and morphological features that forensic anthropologists use to identify populations. They do so with an understanding of clinal variation. Unfortunately, many museum displays fail to accurately explain how human clinal variation invalidates the entire concept of human races, or how genetic clines cut across one another. Morphological and phenotypic distinctions become discrete, and very important in natural history displays.

This use of bones to categorize modern humans or their ancestors is commonplace in natural history museums. Not only are bones categorized, but genetic information (now available from some bones of extinct species, provided that sufficient organic material is present) is used. Physical anthropologists place organisms into distinct categories based on perceived biological commonalities and the strict use of certain methodological tools appears to legitimize and render unassailable those categories. Organisms may be placed in the same species or subspecies based on this or another characteristic. This is not to say biological categorization is completely wrong but rather that it lends itself to counterproductive interpretations if not explained and understood well. Scientists find neutral, objective differences between human populations. Biological racism is the imposition of value on those biological differences by the average person (Gannett 2004: 328).

Through natural history museums, Africa is portrayed as an evolutionarily vestigial structure that gets reproduced to show how far humans have evolved away from the African past. The museums are able to accomplish this by firmly placing non-whites into the past, a place where the ancestral association is visible through exhibitions constructed by linear sequences of artifacts (Bennett 2004: 19). They further allow for the colonized to be put in a position of the racialized "other." An African origin of humans becomes this isolated component of our prehistoric past that somehow manages to be spread over the totality of dark bodies in the present-day. Many displays in natural history museums show modern colonized cultures as if they belong to the past. Exhibitors seem to forget that these cultures exist today but through the display the cultures are forever placed in the prehistoric past. Racial ideological beliefs are combined with both biological and social knowledge to construct the concept of race.

Current Popular Models of Human Evolution

There are two main models of human evolutionary theory. The two models are the Multiregional and Out of Africa model. These models tell us a lot of about human origins and when modern human variation occurred. In this paper, I will discuss recent and ancient variations in anatomically modern humans in terms

of what it tells the visitor about identity and ideology. The distinction between recent and ancient origins of modern humans is a key component of understanding how ideological information is present and transmitted. The Out of Africa model is sometimes referred to as the replacement model. Both models believe *Homo erectus*, an ancestor of modern humans, left Africa around 1.7-1.9 million years ago (Templeton 2007: 1508). They also both state that the first anatomically modern humans appear around 100,000-150,000 years ago. The models differ on two key points. The first being the amount of gene flow between various populations. Multiregionalists argue there was continuous gene flow between the populations in Africa, Asia and Europe (Stringer 2014: 248). Whereas the Out of Africa model states that there was little to no gene flow and hybridization between populations. The second major difference is the origins of modern humans. The Multiregional model says humans arose through parallel evolution and gene flow separately throughout the world (Templeton 2007: 1508). On the other hand, the Out of Africa model states that modern human arose in Africa first around 150,000 years ago then replaced other populations of hominins throughout the world around 100,000 years ago. So the Multiregional model states modern human variation is ancient and the Out of Africa model states modern human variation is recent.

The ongoing debate in physical anthropology concerning human variation centers on whether or the degree to which the human variation we see today is ancient (due to ancient shifts in population demographics) or recent (influenced by sociocultural inequalities) (Edgar and Hunley 2009: 2). The interesting fact is that visitors were asked the same question in the questionnaires and they were split as well. Most biological anthropologists support the view that human variation is clinal, not racial (Edgar and Hunley 2009: 2). Clines are gradations in human variation from population to population that may be correlated with geographic distance, ecology or other factors (Lieberman 1968: 128; Lieberman and Jackson 1995: 233). Anthropologists disagree on the degree to which founder's effects, bottlenecks and migration in or out of populations contribute to the human variation that exists in today's world. In this paper, I take the stance that anatomically modern humans evolved recently, and thus modern human biological variation is recent and influenced by environmental adaptations and population shifts. Displaying human variation as clinal is good but if the science that demonstrates this is omitted from educational displays, and if the complexity of variation in "invisible" genetic markers is not explained, then visitors are encouraged to use arbitrary external physical characteristics to mentally distinguish populations of people. Even though clines still show continuous changes in skin color, hair texture and facial features from one geographic region to the next, people embrace characteristics of populations at opposite ends of the spectrum and these provide a basis for their racial categorizing.

Methods

This study took place at the Yale Peabody Museum of Natural History in New Haven, Connecticut. I examined "Fossil Fragments: The Riddle of Human Origins," an exhibit on paleoanthropology and human evolution. My surveys and assessments are tools to gauge the interconnectedness of racial ideology/identity and visitor experience. My study brings together interdisciplinary processes through observations, questionnaires, interviews and anthropological scholarship on race and power. My research deals both with the ideological conception and perception of human evolution, as may be evident in the propagation of race and identity in the display of prehistoric humans in American museums. This research lends itself more to qualitative not quantitative analysis. It is difficult to gauge how humans view themselves within the framework of human evolution through quantitative analysis alone. The effect of people's evolutionary opinions or ideology on museum visitors is hard to decipher through a questionnaire. Because of this constraint, I use three analytical foci: 1) visitors who are the subjects of my survey questionnaires/observations, 2) interviews with curatorial staff, and 3) a personal evaluation of the exhibit.

Analysis of the Exhibit

In this section, I describe key aspects of the "Fossil Fragments: The Riddle of Human Origins" exhibit. The exhibit is located at the back of the first floor of the museum. The visitor depending on which direction they move will go through at least 2 exhibits to get to the Fossil Fragments exhibit. The exhibit is made up of 2 rooms. One room contains primate and hominin fossils which I will refer to as the hominin room. The other room has information about paleoanthropologists and their research which I will refer to as the paleoanthropology room. It is a permanent exhibit that makes use of the vast collections acquired by Yale University throughout the years. My first two observations concern the plaques in the exhibit. I felt some of the plaques were placed too high as shown in Figure 1.

Figure 1. Picture of plaques in Fossil Fragments exhibit at Yale Peabody Museum of Natural History

The orientation of the exhibit within the museum is ill-placed. Visitors enter the "Riddle of Human Origins" from the end, and not the beginning. In order to correct this, the museum put an entrance sign at the end of the exhibit. This does not solve the problem because the sign does not stand out and most visitors walk right by it. The end of the exhibit puts the visitor in the main room of the exhibit. One misses out on the introduction to paleoanthropology. During my first assessment, I unknowingly entered from the end of the exhibit as shown in Figure 2.

Figure 2. Picture of "exit" where visitors enter the Fossil Fragments exhibit.

The lights are placed to illuminate the plaques which would make for easy reading as long as visitors do not mind looking up. Generally, there is a good flow of traffic. The pathways also direct the visitor's attention to certain aspects of the exhibit. In the main room, my attention was drawn to the skeleton of the Nariokotome boy. It sits directly in the middle of the room so traffic must flow around it. The plaque about Nariokotome boy (a *Homo erectus* skeleton of a boy between the age of 8-12) omits the importance of this fossil in human evolution. In the hominin room, the visitors' attention is drawn to about 12 bronze skulls that are at about the eye level of a young child. They are there to highlight morphological differences between various species of hominins. Aside from these contextual clues the exhibit lacks clear direction so the visitor knows which way to best to move when viewing the information.

One very important factor that was missing was staff. The only staff members available to help visitors were the people working at the front desk. Though very friendly and inviting, they knew very little regarding the exhibit. Indeed, they were unable to answer specific questions I asked about the exhibit. Even if the visitor requests a guided tour, the docent cannot provide much information beyond what is already in the exhibit. This greatly limits what the visitor can learn.

One aspect I found interesting was the degree to which the exhibit was (or was not) interactive. There are two touch screen monitors located at the exit of the exhibit. The monitors show human evolution chronologically. There is nothing in the software to explain that human evolution was not linear. The visitor can choose different hominins from *Sahelanthropus tchadensis* to *Homo sapiens*. Once the visitor chooses a hominin, he or she is then taken to another page that tells the visitor basic information about the fossil. The information includes when and where it lived. The visitor can also compare each hominin skull to a chimpanzee and human skull. The software does not allow the visitors to compare the hominins in a manner that is not chronological. There is narration on the monitors. The use of interactive displays should be good, but the format used by the exhibit did not keep the attention of visitor. The interactive portion falls short of actively engaging the visitor.

In the first assessment, I focused heavily on the hominin room. Thus, I overlooked interesting aspects of the 'paleoanthropologists' room. I noticed that the paleoanthropologists' room places people in chronological order like the hominin room. As I was reading about each anthropologist, I noticed that very little was said about the native people who helped out at the archaeological and paleontological sites. This demonstrated the way in which power plays out in anthropology. In the room there is almost a complete lack of representation of colonized people except as incidental helpers to the anthropologists (who all happen to be white). Even in this day and age the colonized still lack a voice in their country and history. This happens because they lack knowledge base which would give them power. I also noticed throughout the exhibit the use the term hominids instead of hominins. While the distinction may be unimportant to the average visitor, the distinction is key to understanding the biological paradigm in the exhibit. It allows me to gauge if the display is current and has moved its focus into modern times.

There are two important factors missing from the exhibit. There is no comprehensive and clear presentation of the evolutionary model that underlies the exhibit. Second, there is no discussion of why particular fossils were selected for special attention, or reconstruction. In this case, special attention was accorded Neanderthals, and a reconstruction, labeled "La Chapelle", was presented. Knowing the human evolutionary model the curator is embracing might help to give the visitor a clear understanding of the messages. I got the impression the exhibit adhered to both the Multiregional and Out of Africa models. We know that anatomically modern humans evolved in Africa some 150,000ya. The exhibit discusses movement of *Homo erectus* across the globe. The exhibit does not explain that *Homo erectus* outside of Africa was an evolutionary dead-end. By not fully explaining what happened to European and Asian *Homo erectus* the visitor is left to draw his or her own conclusion. The next panel encountered is of Neanderthals and archaic humans in

Europe. The final display that visitors encounter is the reconstruction of the La Chapelle Neanderthal. This leads to the visitor erroneously believing that Neanderthals are at the evolutionary end of the saga of human evolution – essentially, that they are modern.

Examining the Neanderthal reconstruction was a vital component of my analysis of the exhibit. The exhibit shows the skull of a Neanderthal (presumably La Chapelle) in 3 stages. The first displays the skull with missing bony parts added. The second stage displays the skull with muscle and other tissue. The last stage shows the fully reconstructed Neanderthal with phenotypic characteristics added. The exhibit tells the visitor very little about how the bones, muscle and tissues are reconstructed. The missing bone on the top of the skull is easy to reconstruct. The exhibit fails to discuss how the sex, age and phenotypic traits like skin color are determined. This leaves the visitor to interpret the evolutionary significance of skin color.

Visitor Backgrounds

A big component was assessing visitor's thoughts through the questionnaires. My small sample of questionnaires did not lend itself to statistical analysis. However, I was able to gain a sense of the visitors through their responses. Most the visitors believed in human evolution. The visitors who did not believe in human evolution cited religious beliefs as the reason for their disbelief. Many visitors came to the museum with their children or had children. The visitors also believed you could assess racial information by examining bones. All the visitors but one stated the modern humans originated in Africa. Interestingly a good number of visitors believe that modern humans descended directly from Neanderthals. All of these factors helped me to understand what ideological information the visitor brings with them to the museum.

Curatorial Interviews

The most informative and difficult process was the curatorial interviews. I interviewed 4 staff members who were in some way involved in the maintenance and construction of the Fossil Fragments exhibit. For ethical reasons, the names and positions of the staff members will remain anonymous. They will be referred to as Staffer 1, 2, 3 and 4. Only 3 of the staff members filled out questionnaires. Staffers 1, 2 and 3 represent an average of 13.5 years of museum experience. All agree that they have less than 5% interaction of with the museum public. Each helped construct a different component of the exhibit. Each stated that museology had always been an interest of theirs. Three out of 4 self-identified as white whereas one self-identified as black. Two of the staffers were men and the other 2 were women. Two of the staffers were

born, raised and educated outside of the United States. Museums are beginning to be increasingly international in nature (Bennett 2004: 33).

Discussion

When entering the exhibit I noticed the entrance sign, which was not very eye catching. The sign reads "This exhibition tells the story of the continuing scientific search for our ancestry, and of what we know of different kinds of humans that once lived in the past." I was struck by the honesty in the statement. They are clear that information being provided contains what is known about human ancestry and the past up to this point. I am able to see through this statement that exhibit relies heavily on facts and text. What I could also see through this statement is the museum has already given up agency for anything wrong in the exhibit. The objects present in the museum are defined via text as opposed to the text enhancing the objects. This allows for more subjectivity in the interpretation of the objects. I was also struck by the phrase, "different kinds of humans." How might the visitor interpret that statement.

Racial Ideology in the "Fossil Fragments" exhibit

In the exhibit there are a number of features that convey racial information, whether this information is intentional or not. Racial information is conveyed in the La Chapelle Neanderthal reconstruction, the typological framework of the exhibit, statements about race₩human variation and the *Newsweek* cover page of black Adam and Eve. Another component not in the exhibit was highlighted through a conversation with the only black respondent to my questionnaire.

As previously discussed, many visitors enter the exhibit from what is considered by the curatorial staff as the exit. When doing my first assessment I entered the exhibit at the exit. On my first visit, I encountered the Neanderthal reconstruction. I was fascinated by the cranium of La Chapelle and its reconstruction. The reconstruction based on the Neanderthal cranium was prepared by a staff member who is an artist with expertise in craniofacial reconstruction. The skull in anthropology represents an ultimate object. The skull itself is bone – i.e., bare of flesh – and is thought to allow truths to come forth. These truths are without visages of colonial, modernity and cultural attrition (Bennett 2004: 82-83). On the other hand, skeletons allow anthropologists more leeway in interpreting the human body. Skeletons are thought to be free of the effects of social prejudice. The Neanderthal exhibit presented three stages of the reconstruction process as shown in Figure 3.

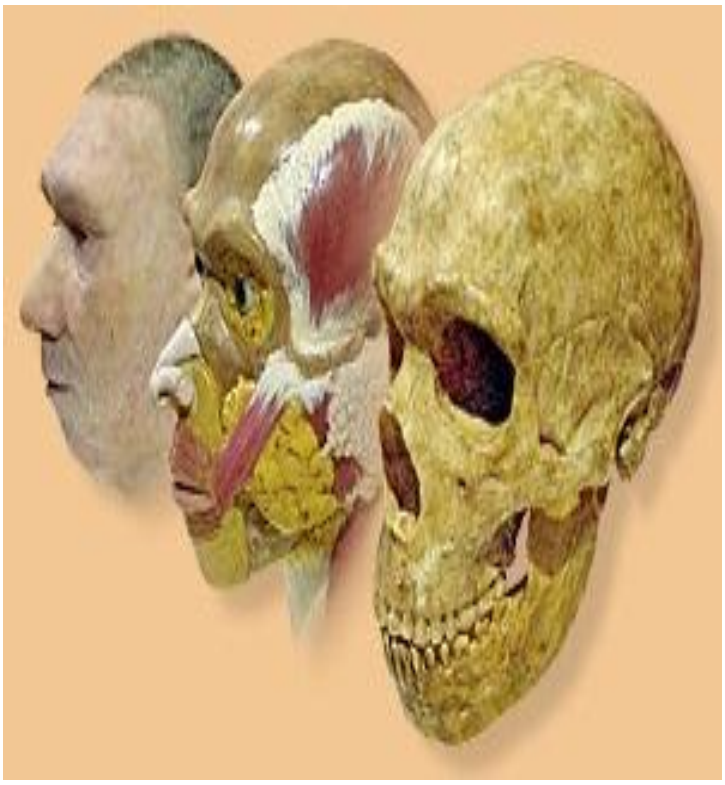


Figure 3. Yale Peabody Museum Neanderhtal reconstruction of La Chapelle

The first was a cast of the Neanderthal skull. Instead of using the La Chapelle skull in the exhibit, which is actually the skull of an individual who had suffered trauma and pathology, a skull of a healthy Neanderthal was used. Second was an intermediate stage showing facial and masticatory muscles, fat and cartilage. Lastly, the Neanderthal was shown with skin, hair, eyes and a facial expression. The Neanderthal was shown as an older, white male. Given my knowledge of Neanderthals, I was not surprised that the Neanderthal was assigned the racial category of white. Indeed, there is new genetic evidence confirming the *independent* evolution of variation in skin pigmentation in the genomes of Neanderthals and modern humans, with light-variant alleles in each (Lalueza-Fox et al., 2007).

What I found interesting was the choice to make "La Chapelle" look like a healthy and wise, elderly male. Many visitors commented on how they felt the Neanderthal reminded them of their own grandfather or of "a" grandfather. The older but wiser look of the Neanderthal created an affinity. I began to feel like the Neanderthal was someone I knew or had met in the past. The seemingly innocent choice of making the Neanderthal older had a profound effect on how the reconstruction was perceived. There is clear racial ideo-

logical embedding. The choices by themselves appear biologically objective. The choices together give the visitor a very distinct perception of Neanderthal that creates an affinity and close relationship even though we are more distinctly related to Neanderthals then each other.

The exhibit fails to explain to the visitor the science and nuances that goes into creating the Neanderthal reconstruction. The staff member created his reconstruction based on the work of Erik Trinkaus. Trinkaus concludes that the Neanderthal is a male (sexed through the pelvis) of around 30 years based on the markings on the sacral auricular surface of the innominate bone (Trinkaus 1985, Dawson and Trinkaus 1997). The pathology of La Chapelle Neanderthal is never discussed in the exhibit and neither is the trauma to the vertebral column that the individual apparently suffered, adding to his arthritis (Dawson and Trinkaus 1997). Pathology is the diseased condition of an organism. La Chapelle had suffered dental loss and advanced mandibular bone loss (Figure 4). The restoration could not make full use of other methods to reconstruct muscle development and healthy cranial thickness because of the individual's pathology (Caspari and Radovcic 2009: 298). After years of examining the skeletal remains of this Neanderthal, scientists are sure that he suffered from trauma leading to severe osteoarthritis (Dawson and Trinkaus 1997: 1017).

Figure 4. Picture of La Chapelle cranium

It is very important for the visitor to know that the actual La Chapelle Neanderthal does not represent a healthy person. Even though this individual had osteoarthritis there is no evidence that, by the age of 30, he would have had short cut and gray hair. This omission of information regarding this individual's pathologies and trauma, the decision to represent him as apparently healthy and the choice of hair color can be seen as embedding ideological information into the exhibit.

Combined with the choice of gray and well groomed hair, the Neanderthal is shown as being very strong and virile. If the intent was to depict the stress of osteoarthritis or trauma as turning the hair gray, then the arthritis should have been obvious on other aspects of the body. Instead, the message is that older Neanderthals were still strong and healthy, and this, combined with the stylized depiction of African Adam and Eve as living unclothed in the past, encourages the visitor to develop an affinity with Neanderthals as elderly, vigorous, healthy white people. The picture of Adam and Eve is from a *Newsweek* cover (Figuere 5). It was done in the 1980s and depicts them as light complexion blacks with jerry curls. Visitors see their evolutionary path as perhaps beginning in black Africa, where people were naked and a bit naive, and as ending in white Europe with the rise of strong and healthy Neanderthals.

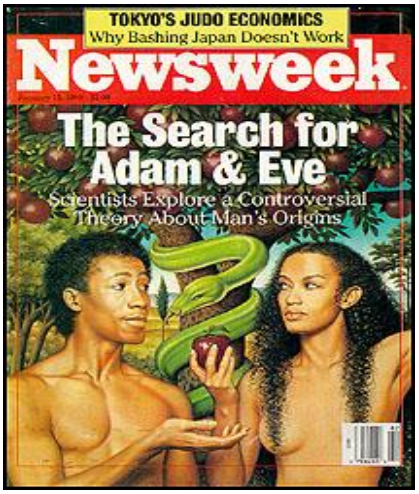


Figure 5. This is a cover from *Newsweek* magazine that appears in the exhibit

The Neanderthal skull reconstruction failed to address where modern humans began and where Neanderthals ended. Instead, the Neanderthal (being represented as a white, grandfatherly male) seemed to indicate a direct connection to many visitors of the Yale Peabody Museum. The delineation of evolutionary history between prehistoric and modern is blurred by the depiction of Neanderthals. Visitors are able to rec-

ognize and some white people can identify with this reconstruction. The reconstruction raises the question of association between Neanderthals as ancestors and museum visitors as descendants (Scott 2007: 139). A white visitor sees the progression and connection of themselves from Neanderthals to modern humans. A non-white visitor sees evolutionary progression past their ancestors to modern humans. The exhibit fails to show non-white visitors progressing, importantly progressing out of Africa for the black visitor. The difference is subtle but very important. The Neanderthal reconstruction does two things for the white and non-white visitor. First, it shows firm embedding of racial differences in humans. Second, it shows the evolutionary progression of the white race (especially since it is the last artifact seen by a visitor) and the stagnation of the non-white "races" since there are no depictions of blacks among modern humans, who have a wide variety of pigmentation in the world today, which is correlated with geography and not time.

The construction of the exhibition shows history and artifacts as being unilinear and typological. The exhibit relies heavily on geology and time to give authority to the facts provided in the text. In combining geology and time, the exhibit is using the history of the earth to be the master clock for histories of life on earth and human civilization, culture and technology (Bennett 2004: 24). By constructing the exhibit in a chronological manner, the exhibitors have placed the past in the present. Instead of actually showing nature's order, they display a nature with a false directionality and temporality (Bennett 2004: 17). The exhibit then encourages evolution to be viewed as progressing from primitive to modern. Modernity (and its associated practices of colonialism and post-colonialism) is then everything that is occurring in the present. This then does not allow space for people and cultures in opposition such as indigenous and colonized people who, by implication, are firmly placed in the past or at a primitive stage.

The Fossil Fragments: Riddle of Human Origins exhibit is constructed in a typological manner. Fossils are arranged from *Sahelanthropus tchadensis* to *Homo neanderthalensis* and *Homo sapiens*. The hominins and artifacts are from different geographic regions and are grouped on the basis of function and age. There is very little effort to show variation in hominin forms at the same time. As a result, the exhibit shows an evolutionary progression over time. The African apes and their ancestors begin the evolutionary chain which ends with Neanderthals in Europe. This typological structure shows how human evolution and anatomy are directly related to the activities of people, which supports the idea that race and culture are well connected (Coombes 1988: 60). In this manner, museum visitors are clearly encouraged to believe in racial evolution and racial hierarchy. It also leaves the black and/or African visitor out in the cold and feeling alienated.

This typological construction reinforces the old views of the black body. So it is clear that humans could not physically colonize hominins as we were not alive when humans were. What is very subtle is how

these hominins have still been colonized. There are two ways in which this was done. First, is associating the black body with the African body. The early hominin evidence is found in Africa. Since the fossils are arranged with their like groups then anything African is given the same connotation. The early hominins from Africa are now synonymous with the colonized, black body. Second, if everything that has not progressed is open to being colonized and civilized, if possible. When visitors conceptualize the past their idea of time is different from the one constructed in the exhibit. The museum talks about Africa, Asia and Europe over millions of years but have little to no discussion about the changing landscapes and environments. Since Africa is shown as being virtually the same from past to present then it is still in the past. If Africans are most similar to the early hominins then today's Africans are still in the past they have not progressed. A lack of progression and complexity is the hallmark of allowing something to be colonized.

As a way to combat the issues of race in biological anthropology, the museum has a statement discussing race in human evolution and origins. The statement reads as follows:

> "Biologists agree that human biological variation does not cluster or separate groups or 'races'. There are gradations in the frequency of many physical features among populations throughout the world. Racial boundaries are arbitrary, defined by culture rather than biology."

While I commend the museum for making an effort to discuss race when it is a subject that is many times avoided in biological (or scientific) settings, if there is not proper space to discuss race in modern humans then it is better to not address it at all. The former discussion really leaves too much open for the visitor to understand and interpret. The first sentence tells the visitor that biological variation cannot be clustered in races, a statement that contradicts the common sense and daily experience of most visitors. At best one can expect most visitors to not understand what this means. The second sentence states that different physical features are varied throughout populations in the world. However this very point is not exemplified in any part of the exhibit. At best, most visitors can be expected to be confused by these two sentences and their own culturally determined understanding of human variation. Granted, the museum simply does not have enough room to adequately discuss the subject of race.

The last sentence is really what is problematic. The sentence can be interpreted in one of two ways. The first is racial boundaries are strictly cultural but this does not address the question of race. Many people view race and culture as being the same thing. So the statement may be inter-

preted as one's culture defines their race which from the common sense point of view is still signaled by skin color, hair texture and other physical characteristics. The second, which is more dangerous, is that culture defines one's biology. The average visitor to the museum felt that racial boundaries were old and racial information could be determined from bones. So if race is old so are cultural differences. These inherent racial/cultural differences can be viewed in the bones. The visitor has just gone through an entire exhibit displaying bones and at the end the reconstruction from bones shows a racial progression from dark to light skins. While this was most likely not the plan or goal of the Yale Peabody Museum, it is the end result.

The exhibit leaves out the complex ways in which biological anthropologists construct skin color in humans. More importantly fails to explain why biological anthropologists know biological race does not exist. What are these gradations and how are they determined? Scientists use craniometric and genetic markers to determine geographic relatedness of individuals (Relethford 2009: 19). Many biological anthropologists feel that modern human variation is due to several small bottlenecks, which changed allele frequency in a population and caused a fixation in certain alleles over others (Bradley 2007: 343). These population bottlenecks would cause a phenotype fixation for certain skin pigmentations. This still does not explain to how certain populations have divergence in skin colors. The visitor would benefit from knowing that skin color does not automatically tell you something about ancestry or racial groups.

In the exhibit there is picture of Adam and Eve accompanying the statement of race. The picture comes from a cover of *Newsweek*; both Adam and Eve are black. Black Adam and Eve are set in the Garden of Eden. Adam and Eve are not contextualized just placed in nature. The picture is meant to grab the reader's attention. The article inside discussed the African origins of modern humans. When I first saw this depiction, I figured this image would bring a lot of discussion about race and racial evolution among the visitors. What actually happened was the exact opposite. The only comments that I heard visitors make were:

"Interesting."

"They are black!"

"Look Adam and Eve in Africa!"

I was surprised by the lack of discussion over the picture. It seemed that, to most visitors, the thought of Adam and Eve being black is simply unconvincing. But even if he or she did accept this idea, the average white visitor could not see anything black or African as being modern. The white visitor only sees Adam and Eve in nature set formerly in the past. This was encouraged by the fact that Adam and Eve are depicted as naked and situated in nature – i.e., definitively not modern. Adam and Eve are embedded in the past; they do not show modernity.

The picture is poorly explained to the visitor. Even though Adam and Eve were supposed to show modern humans, they were firmly placed in the past. When many people think of the Garden of Eden, they think of the very beginning of humanity. So even though African Adam and Eve are modern they are at the beginning of human evolution and we have evolved beyond being naked in the wild. The picture it draws for the visitor is that Africans were naked and not advanced in the past and they have not changed. Africans now in the eyes of the visitor are primitive both in the past and present. "Without explicit explanations of race in evolution exhibitions, visitors may just simply read outdated information into the empty spaces" (Scott 2007: 103). The picture and exhibit lends itself to visitors making and drawing their own conclusions.

Only one visitor, who will be discussed in a later section, intelligently discussed racial ideological information in the exhibit. Most visitors expected the museum to be a place of legitimacy and authority. The museum did not challenge their preconceived notions about race. The museum visitor makes meaning of evolutionary history using their religious, cultural, economic and political beliefs (Scott 2007: 111). Their interpretations combined with the typological construction of the exhibit allows for racial ideological information. Typological methods instituted a scheme of uniformity between artifacts which allows them to be used interchangeable to fill in holes within collections so evolutionary history can be complete and get rid of problems that would otherwise exist (Bennett 2004: 77). The visitor fills in equivalences by seeing Neanderthals as close relatives. While visitors did not openly notice ideological information, they built and reinforced their racial ideological and identity beliefs upon it.

A Counter-Narrative

While visiting the Yale Peabody museum during a period of 3 months, I only encountered one black visitor. This was also an unusual sample since the black visitor was a graduate student. I was very interested in how black visitors would perceive the exhibit since they have such an intimate

connection with the black body and Africa from a more distance perspective. I first wondered why I encountered so few blacks at the museum (this was in contrast to my experience of going to the museum quite often and enjoying it). Falk states that museums are active establishments, their actions and how they are perceived affects who does and does not visit (1995: 42). Many black visitors see museums as expressing views opposite to their own. They may also remember the racist past of museums (Falk 1995: 44). Once I contextualize the history of natural history museums and Yale as an institution, I am able to understand why blacks may not come to the Yale Peabody Museum of Natural History. There is a feeling of colonial power for black visitors when they engage with Yale University.

The sole black visitor I encountered was an African American male who was a graduate student at Yale. In my study, I had the same number of non-white respondents with graduate or professional degrees as whites. The results coincide with Falk's study that showed blacks with higher education are more likely to go to a museum (1995: 49). He was the only visitor that really wanted my opinion on the exhibit. We had about a 30 minute conversation about the exhibit, the museum and Yale. One of the first comments he made was how racist he felt the exhibit, the museum and especially the university was. Black visitors are more sensitive to the racial messages and flaws in exhibits, and they are less likely to think the exhibit is objective (Scott 2007: 116). I asked him what he found racist about the exhibit, the museum and Yale. He replied with a complete look of shock:

> "You are not from around here! What is not racist about this place?!...um, have you seen that Neanderthal skull? Why is he white and 'conveniently' at the end of the exhibit? Have you seen the Hall of White Men (he is referring to the paleoanthropology room)? 'They' act like black people did not find these bones and artifacts but white people got the credit of it!"

This response is due to historical defacement and usurping of authority over cultural artifacts has caused strife between the black museum visitor and the museum, in essence generating a black society that has strong emotional reactions (Scott 2007: 117). The paleoanthropology room reinforces the belief for the black visitor that they have no voice in the museum and that colonial ideals are still present in today's society.

His response is typical of many black visitors who feel the museum is inherently racist or untrustworthy. I then further asked why a lack of blacks (there are blacks in the picture but none are

anthropologist or shown as discovering the fossils) represented in the paleoanthropology room was racist. He responded very quickly:

> "They went to Africa and took our stuff. But they did not do the work we did! Why are the people who actually do the work not shown? Africa is where everything started and we deserve credit."

This strong visceral response is due to feeling that the natives do not have control over the artifacts and what happened to them. He felt a special closeness to Africa and the objects. The paleoanthropology room can bring up thoughts of colonialism and slavery where blacks had no power and worked for whites.

Many blacks develop a counter-narrative to the Eurocentric nature of human evolution. So instead of Europe being the center of modernity, now Africa is. He also went on to discuss his belief that Yale University is a racist institution. The black visitor responded with great adversity to what he perceived as the racism and ideology present in the museum and at Yale University on a larger scale. This strong oppositional narrative to racial ideology in museums is common to many black visitors as seen in studies by Scott (2007) and Falk (1993, 1995). It seems clear to many non-white visitors that museums have racial ideology simply because of their history and what they represent.

Discussion of Curatorial Interviews

Issues of power and legitimacy came out most clearly in the curatorial interviews. Two of the staffers I interviewed have a master's degree. The other two staffers have doctorate degrees. Credentials are an important part of academia, the scientific community and museums. A degree gives people a certain amount of legitimacy and power. Museums have become increasingly specialized within disciplines. Each staffer had a particular specialization in the museum. Museums have a certain professionalism to maintain which includes museum philosophy and administration (Bennett 2004: 34). In order to have certain knowledge, one must be educated in a particular manner. The staffers are given legitimacy through their education which in turn gives them power.

One of the most comfortable subjects for the staffers to discuss was their education. After going through the research and writing process I can understand that they have gone through a lot to obtain their degree so they want to share their hard work. They may also want to position themselves as authorities on a subject. With authority one has power over another person and the subject. I noted that, the higher posi-

tion or education the staffer had, the less he or she cared about his or her education and the authority, power and legitimacy that came with it. Maybe this is because such staffers' position was greater than mine so my questions posed no threat or conflict. I engaged in each interview with the understanding that I would be asking difficult and uncomfortable, personal questions about people's racial ideological beliefs. I expected the staffers to be guarded with many of their answers to my questions.

The staffers with higher positions and more education were less guarded in their responses or quite open to more nuances in navigating uncomfortable situations. All the staffers were asked "what is the Peabody museum's philosophy on human evolution?" Both staffer 1 and 3 were slow to answer the question. They both stated the curator would know more about the philosophy of the Peabody museum on human evolution. Staffers 2 and 4 were quick to answer the question. Staffer 2 stated:

> "I think there's a strong urge to publicize evolution. That's shared by not just anthropology but by... um... biology department, geology. So I think there's a strong background... in publicizing evolution. They are probably best made public through the museum."

The same sentiment was stated by staffer 4. The interesting fact is they both have the highest positions and education levels. Staffer 2 and 4 were clear to also state they wanted to teach the public about human evolution. Because staffers 2 and 4 have higher educational degrees they are given more authority and power to make decisions in the museum.

I was particularly interested in the staffers' opinions about the Neanderthal reconstruction since it drew such attention by the public. Staffer 1 was asked, "What would you like for the public to take away about human evolution from the exhibit or in particular from the reconstructions?" The staffer replied:

"I defer to the curators/scientific staff for things like that. And I know I have an idea of what they want to get across with the Neanderthal reconstructions but umm... I mean...my personal view is that you know I'm interested that people find it very realistic...like that skin looks skin like, the hair looks hair and I did a lot of work to make it look that way. But in terms of evolution, I'm not an evolutionist or scientist..."

The staffer gave no opinion on human evolution but helped to construct a hominin that tells people about human evolution. The staffer was interested in how realistic the reconstruction appears to the public. I would have to say if that was the goal for the reconstruction to appear real the staffer achieved the goal. Visitors thought the reconstruction was so realistic, they felt it looked like a relative. The staffer did not draw the connection between the reconstruction and visitors' opinions on human evolution.

I asked staffer 2, "What idea or concept of human evolution is the exhibit projecting to the public?" Staffer 2 replied as follows:

"I have no idea! Particularly knowing _____... I have no idea what it is projecting to them. From my point of view what I wanted to do... was... it may be paradoxical but not necessarily to give answers, well certainly not the answers people were expecting. Particularly in such a...like human evolution it changes so much you don't know if you are right. You know you have ideas that are plausible, sometimes they work out right sometimes they don't. Um, and so I wanted to get a sense of on one level uncertainty but not to say it's all rubbish. You know, but to say we think we know this is true. But to say this other stuff how do you do it, I basically wanted to try to make them realize that if you say what the skin color of the Neanderthal? This involves all kinds of questions you can't answer very easily."

Staffer 2 wanted members of the public to draw their own conclusions about human evolution. This staffer understood that skin color is very important aspect of human evolution from the visitor's perspective. In a study on reconstructions of human evolution by the public, Wiber (1997: 16-17) states "white" is used to code for advancement and complexity. By staffer 2 stating there is no real message in the exhibit (i.e., it just portrays knowledge), he or she allows the museum not to take agency for whatever racial ideological information the visitor takes away. The museum can simply claim to allow visitors to form their own opinions.

Their opinions are that racial divisions occurred early in human evolution and that modern humans share a close relationship to Neanderthals. The majority of visitors also believe that racial divisions can be accessed through bones. Staffers 2 and 4 were asked, "would you classify yourself as more of a Multiregionalist, a replacement model or as some variation of the two?" Staffer 2 replied with great conviction: "Total Africanist!" He or she went on to state:

"Yes, definitely. Always have been. Yeah yeah, I never believe that stuff." (He or she is referring here to other models of human evolution.)

Staffer 4 also claimed to be an Africanist. Even though the two staffers profess to be believers of the Out of Africa model, the construction of museum allows visitors to pull from notions of multiregionalism. So visitors are able to "resist the out-of-Africa thesis because of the persistent association of white skin with modernity" (Scott 2007: 97). What is interesting is that neither staffers nor visitors notice the conflicts or disconnect in their racialized thinking (Scott 2007: 98). The exhibit is set up in a manner that provided no or half information to the visitor so they draw their own conclusions for their ideological beliefs.

Staffers 2 and 4 were asked about the statement the museum has on race. Staffer 2 stated:

"It is a part…a bigger part of human evolution. I am not sure what it says."

This staffer was unsure what message the statement gave the museum visitor. Staffer 4 was very clear in stating:

"I want them to know race is very real culturally but not real biologically."

This staffer understood that people have certain notions about race already which cannot be dissuaded by stating that race is not real. The visitor must understand why race is not biological. However, Staffer 2 failed to understand visitor perceptions of the exhibit.

After conducting the interviews, I concluded that this was generally true: the staffers had no idea how members of the public perceive the exhibit. They also had little interaction with the public. They were unaware of ideological information in the exhibit and they were not sure of the message they wanted visitors to take home. Also the staffers wanted to distance themselves from giving answers or conclusions that may change or will change in the near future. As members of the scientific community they wanted to avoid the land mines of race and being found on the wrong side of an argument. This position is very dangerous to scientific thinking the progression of a subject.

Conclusion

Overall ideological beliefs of the exhibit

The overall typological construction of the exhibit embeds racial ideological information in the exhibit. The unilinear progression from African ape to modern European humans gives the belief of racial evolution. With the construction there is clear racial ideological information in the exhibit. The ideological information is structural, institutional and historical. The structural ideology has been discussed with the construction of the exhibit. The institutional and historical ideologies are tied to one another. Yale as an institution for higher education has a history of racist practices against non-whites. The racial ideological beliefs appear to be a conscious choice to be unconscious. Members of the museum and university on a larger scale have chosen to ignore the ideological problems that exist in human evolution. They have chosen to not properly explain why race is a social not biological construct. This leads to the exhibit actually providing ideological information.

Visitors tend to accept the beliefs set forth by the exhibit. For one, the unilinear setup of the displays shows modernity outside of Africa only. The visitor does not challenge the belief that modernity does not exist inside of Africa. Second, the visitor does not challenge the depiction of Adam and Eve as blacks in Africa in a natural naked setting. They do not question why Adam and Eve had light skin instead of darker skin. One factor that fascinated me the most was the ideological beliefs the visitor brings when assessing and visiting the museum. The visitor is not a blank slate that comes into the museum without their own notions about race. Since the exhibit does reinforce a belief of racial evolution and hierarchy, the visitor leaves the museum believing humans had to leave Africa in order to become modern. Since the museum has no concrete philosophy (which was stated by the staffers), the visitor is able to draw their own conclusions. They see race as fixed, old and progressive.

The power of the museums is gained through authority, legitimacy and intellectualism. Visitors believe the museum to have legitimacy because it is run by intellectuals. The curatorial staff at the museum is highly credentialed and intellectual. The staff is seen as the knowledge base for the museum. If you are the knowledge base then you have the right to decide what legitimate knowledge is. With legitimacy you have authority and power over the subject. No one can then question or deem your information wrong. If someone questions the information, you can deem them as outsiders. They then have no knowledge base because you have all legitimacy, authority and power. This is the historical precedent set by colonialism. Since Yale University is an old and prestigious institution it is closely tied with the power structure. The museum gains its power, legitimacy and authority from a colonial power system

My research fits firmly within the current literature about racial ideological and identity information in museums. I am able to see that racial ideological information exists in the museum. Through my research, I was able to see instances of racial ideological views on identity in the Yale Peabody Museum of Natural History and other museums. Racial ideology infiltrates not merely what is put into but what is left out of an exhibit. The exhibit leaves out a lot of important information that would, if offered, allow the visitor to confront his or her own incorrect assumptions. It is most interesting that even though the exhibit gives the visitor a lot of information, it still conveys the wrong message of racial hierarchy to the public.

Changes to be made at the Yale Peabody Museum

There are three changes that need to be made to the Fossil Fragments display at the Yale Peabody Museum of Natural History. One must also take into account that we are discussing a university museum so money availability plays a significant part in its being understaffed. But again this university is Yale, and it should do better. The first is to insert a geographical component. The typological construction of the exhibit lends itself to racial ideological interpretations. Using a geographical and regional system with some chronological information (but without a portrayal of an apparently natural/organic progression) would work much better. The exhibit could be constructed showing various hominins from different regions and temporal times mixed together. A typological component enters when the hominins are depicted as separate species falling within a linear progression. The exhibit would be greatly enhanced by showing that, even though hominins belonging to different species are found in different geographic regions, they share many of the same characteristics.

The American Museum of Natural History has completely overhauled its Hall of Human Origins. The curators got rid of the typological display of human evolution and origins. The exhibit is constructed where the different hominins are mixed together with hominins that lived in different times. They overlap each other based on the region they are from and time they lived. For example, modern humans from Africa and Europe are displayed side by side. They also show Neanderthals next to Asian *Homo erectus*. This gives the visitor the perception that human evolution took place at the same time all over the world.

The Fossil Fragments exhibit at Yale would benefit from moving away from the typological system they currently use. The curators could vastly improve the exhibit by depicting modern blacks at the exhibit's end. Indeed, this could provide them with an opportunity to explore what really happened to Neanderthals. The Upper Paleolithic Gravettian people of Europe are fully modern. They spread into Europe from Africa, and have African limb bone proportions (Holliday 1997). Because of their recent arrival from Africa, they were very likely darkly pigmented, and they appear to have largely if not entirely replaced the late-surviving, classic Neanderthals, in all probability due to the Gravettians' superior artifacts and cultural adaptations. By ending the exhibit with healthy, modern black people (old and young) represented in positions of power, the exhibit could challenge the average white visitor's ill-informed notion of white superiority, and could encourage people of color to embrace our growing knowledge of human evolution. Along the same lines, black paleoanthropologists should be depicted with their white colleagues in the paleoanthropologists' room.

The second change would be switching the order to the rooms. As I previously stated most visitors enter the exhibit at the exit. I think moving the hominin room to where the paleoanthropology room is would give the visitor that important background into the work first. If visitors were given information about what paleoanthropologists and physical anthropologists actually do, they may have a better understanding of what they are going to encounter in the hominin room. These two changes will improve the flow and information provided by the exhibit.

The third and last change would be adding some important information that is missing. Since the Neanderthal reconstruction is such a big part of the exhibit there needs to be more information about how scientists reconstruct the phenotype of a specimen. This would help the visitor to understand that many factors contribute to the reconstruction of sex, age and skin color. The visitor would understand that skin color is not determined by geography alone, but rather that selection works to favor different amounts of pigmentation along a latitudinal gradient (and that this takes many generations, so cannot work in today's mobile communities). The visitor also needs to be informed that the La Chapelle Neanderthal was pathological and the victim of trauma. This will give the visitor an understanding of the life of Neanderthals.

Another omission is a proper treatment of the concept of race. The curators should remove their assertion about the non-existence of race, and replace it with much more information about human biological variation. The statement provides no real information about why biological anthropologists believe that biological races do not exist. Such information should be considered vital to any display of human evolution. The discussion of race must be more comprehensive to that the visitor can get a better understanding of the social not biological construction of race.

Changes to be made within Academia: the field of natural history

The best statement was made by Staffer 2 about the uncertainty of inferences within the science of human evolution and within larger context natural history:

"Particularly in such a…[period of rapid advances in paleontological exploration, sciences] like human evolution … change so much [that at any given time] you don't know if you are right. You know you have ideas that are plausible, sometimes they work out right, sometimes they don't. Um, and so I wanted to [create] a sense of, on one level, uncertainty. But not to say it's all rubbish. You know, but to say we think we know this is true. But to say this other stuff how do you do it, I basically wanted to try to make them realize that … [there are levels of uncertainty], if you [ask] what [is] the skin color of the Neanderthal?"

This staffer describes the uncertainty and ever-changing nature of the study of human evolution. What many portrayers of the fields of natural history and anthropology try to do is to make their conclusions appear as unequivocal facts. As we all know, scientific inferences cannot be proven right; they can just be tested and perhaps shown not to be wrong. Natural history (science in its larger context) must allow room for changing inferences. Also it must allow for the understanding that our own identity and ideological thoughts play into how we approach a subject. The concept of human evolution influences a lot of people's racial ideological views on identity, and must be portrayed with care and understanding of possible unintended consequences of particular ways of presenting the past. What we think we know about human evolution should also be presented with a clear depiction of how science responds to new discoveries, and understands that prevailing interpretations are subject to change under increased scrutiny and the increased knowledge that new discoveries bring.

So, how must Academia change? Most importantly, scientists cannot continue to ignore the sociocultural content of the way they communicate with the general public. It is important for race to have a place in discussions on human evolution and natural history. A simple statement that "race is cultural and not biological" does not solve the problem. Most museum visitors cannot fathom what this means. Physical anthropologists and others in the natural history field must embrace the uncomfortable discussion of race. How may they contribute to changing racial ideological beliefs? Race is not a subject that is going to go away with a simple statement rejecting its biological reality, particularly when such a statement is addressing something that has a foothold in ideas promulgated over a span of hundreds of years by colonizing cultures, and that seems to be affirmed by the display itself. Museums of natural history for years have in fact "shown" that race is biological while claiming the opposite. Now it will take years, and a lot of attention to the details of how biological variation should be represented in educational exhibits, to change that belief.

References

Bennett, Tony

2004 Past Beyond Memory: Evolution, Museums, Colonialism New York: Routledge.

Bradley, Brenda J.

2008 Reconstructing phylogenies and phenotypes: a molecular view of human evolution. Journal of Anatomy 212: 337-353.

Caspari, Rachel and Jakov Radovcic

2006 New Reconstruction of Krapina 5, a Male Neandertal Cranial Vault from Krapina, Croatia. American Journal of Physical Anthropology 130:294–307.

Coombes, Annie E.

1988 Museums and the Formation of National and Cultural Identities.
Oxford Art Journal 11(2): 57-68.

Dawson, James and Erik Trinkaus

1997 Vertebral Osteoarthritis of the La Chapelle-aux-Saints 1 Neanderthal. Journal of Archaeological Science 24(11): 1015-1021.

Edgar, Heather J.H. and Keith L. Hunley

2009 Race Reconciled?: How Biological Anthropologists View Human Variation. American Journal of Physical Anthropology 139: 1-4.

Falk, John H

1993 Leisure Decisions Influencing African-American Use of Museums. Washington, D.C.: American Association of Museums.

1995 Factors Influencing African American Leisure Time Utilization of Museums. Journal of Leisure Research 27(1): 41-60.

1999 Museums as Institutions for Personal Learning. Daedalus 128(3): 259-275.

Gannett, Lisa.

2004. "The Biological Reification of Race." British Journal for the Philosophy of Science 55(2): 323-345.

Greenberg, Jason S.

1997 Representing the State: Class, Race and Nationhood in an Israeli Museum. Visual Anthropology Review 13(1): 14-27.

Haraway, Donna J.

1989 *Primate Visions: Gender, Race, and Nature in the World of Modern Science.* New York: Routledge Books.

Holliday, TW

1997 Body proportions in Late Pleistocene Europe and modern human origins. Journal of Human Evolution 32: 423-447

Jablonski, Nina G. and George Chaplin

2000 The evolution of human skin coloration. Journal of Human Evolution 39(1): 57-106.

2003 Skin Deep. Scientific American 13:72-79.

James, Angela

2001 Making sense of race and racial classification. Race and Society 4: 235-247.

Lieberman, Leonard and Fatima Linda C. Jackson

1995 Race and Three Models of Human Origins. American Anthropologist 97(2): 231-242.

Lieberman, Leonard

1968 The Debate Over Race: A Study in the Sociology of Knowledge. Phylon 39:127-141.

Marks, J.

1994 Black. White. Other. Natural History 103(12): 1-7.

Lalueza-Fox, Carles, Holger Römpler, David Caramelli, Claudia Stäubert, Giulio Catalano, David Hughes, Nadin Rohland, Elena Pilli, Laura Longo, Silvana Condemi, Marco de la Rasilla, Javier Fortea, Antonio Rosas, Mark Stoneking, Torsten Schöneberg, Jaume Bertranpetit, and Michael Hofreiter.

2007 A Melanocortin 1 Receptor Allele Suggests Varying Pigmentation Among Neanderthals. Science 318(5855): 1453-1455.

Ousley, Stephen, R. Jantz and D. Fried

2009 Understanding Race and Human Variation: Why Forensic Anthropologists are Good at Identifying Race. American Journal of Physical Anthropology 139: 68-76.

Pritchard, Jonanthan K., Pickrell, J.K., Coop, G.

2010 The Genetics of Human Adaptation: Hard Sweeps, Soft Sweeps, and Polygenic Adaptation. Current Biology 20(4): R208-R215.

Relethford, John H.

2009 Race and Global Patterns of Phenotypic Variation. American Journal of Physical

Anthropology 139:16–22.

Scott, Monique

2005 Writing the History of Humanity: The Role of Museums in Defining Origins and Ancestors in a Transnational World. Curator 48(1): 74-89.

2007 Rethinking Evolution in the Museum: Envisioning African Origins. New York: Routledge.

Smedley, Audrey

1999 Race and the Construction of Human Identity. American Anthropologist 100(3): 690-702.

Stringer, Chris

2014 Why are we not all multiregionalists now. Trends in Ecology and Evolution 29(5): 248-251.

Templeton, Alan R.

1998 Human Races: A Genetic and Evolutionary Perspective. American Anthropologist 100(3): 632-650

2007 Genetics and Recent Human Evolution. Evolution 61(7): 1507-1519

Trinkaus, E.

1985 Pathology and the posture of the La Chapelleaux-Saints Neandertal. American Journal of Physical Anthropology 67: 19–41.

U.S. Census Bureau

2008 Race in New Haven, CT. http://factfinder.census.gov.

Wallace, Michael

1981 Visiting the Past: History Museums in the United States. Radical History Review 25(1981):63-96.

Wiber, M.

1997 Erect Men, Undulating Women: The Visual Imagery of Gender, 'Race' and Progress in Reconstructive Illustrations of Human Evolution. Waterloo, Ontario: Wilfrid Laurier University Press.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 4

Parallel Session 2–3
Future-Oriented Interaction between Science and the Humanities

Humanities as the Confusionence in the Era of Science and Technology

Seung-Hwan Jeon (Hannam University)

–

Connotations of Science Fictions Films about 'the Future of the Human Body' and Technologies

Soojin Lee (Sogang University)

–

Can IP Law Protect Autonomous Robots?

Shubhangi S. Gokhale (Hankuk University of Foreign Studies)

Humanities as the Confusionence in the Era of Science and Technology

Seung-Hwan Jeon
Hannam University

Abstract

The recent external expansion of humanities has been driven largely by a shift in academic focus that resulted from advancements in technology and media. The digital technology is no longer a factor separable from humanities, nor is subject to them. In the modern age, the humanities disciplines are required to take the approach of fusion and convergence more aggressively to deliberate the technological aspects of engineering and science disciplines. The superior values of humanities to science and technology in relative terms can only be verified only when the concept of "the Confusionence", a means to addresses academic gaps, is applied. In other words, the text-oriented academic inquiry characterized by superficiality and abstraction that does not warrant mutual comprehension between disciplines and between times can impede the direct contributions of humanities to technoscientific development. What is required to address this matter is the adoption of nouvelles connaissances (NC) that fundamentally narrows knowledge gap (KG) by overcoming inherent creative frictions. The confusionence is an option that can effectively minimize gaps and problems between disciplines in the same time frame. This study talks about new humanities-oriented approach to technoscientific trends such as big data, wearable computers and hyper connectivity not by focusing on analysis and insight but by exploring strategies from design perspectives. This study employees basic methodologies and discusses the possible application of the experimental verification method called "the Hex". This study attempts to achieve a transition from the conventional approach to the new humanities approach to lead positive technological developments. In conclusion, this study presents several methodologies that can be utilized to draw realistic common threads among humanities, engineering and science in the age of fusion and convergence. Also, the study makes concrete suggestions as to how the coexistence of humanities and science can be achieved by applying these methodologies. The 21st century witnessed the

acceleration of digitalization compared to the last century. In this age, the humanities community needs to pursue technical updates of its research methodologies and form knowledge and information data so that "academic excellence (*arête*)" of humanities can be realized. To this end, humanities need academic diversification. This study proposes the concept of "The ^{eng}Humanities" as one of means to achieve this goal.

Keywords: The ^{eng}Humanities, The Confusionence, Hyper-connected society. Big Data, Academic evolution, Creativity, Humanities

Connotations of Science Fictions Films about 'the Future of the Human Body' and Technologies

Soojin Lee
Sogang University

Introduction

It is clear that today is the age of science and technology and rapidly changing life style. It is also true that our daily experiences and the way we sense the world are shifting due to influences of technoscience. In this context, there are greater demands in this era to put emphasis on the role of humanities by developing critical views of changes that the technoscientific advancements are bringing about. It is the time when people are sharing the "internal" point of view that takes into account reality in which sceience and technology have deep impacts on mankind, instead of staying away from science and technology based on the "external" point of view that focuses on critical views of science and technology. Moreover, people are recognizing the need for careful thoughts into hopes or fears caused by science and technology and discourses on the shape of changing future in a more active and responsive manner.

The sci-fi film, with the advancements of three-dimensional computer graphics technologies, has taken hold as a critical genre in the movie industry in the wake of the massive success of *Avatar* in 2009. In addition, science fiction is serving as a means for humans, already living in the age of hi-technology, to contemplate the changing shape of people and society in the future due to technoscientific advancements. It is because science fiction leads braod-based expansion of stories that are well beyond the imaginations and boundaries of exisiting theories around science and technology. "A fiction plays a central role, for it displays the passageways that enabled stories coming out of narrowly focused scientific theories to circulate more widely through the body politic. It actively shapes what the technologies mean and what the scientific theories signify in cultural contexts." [1] Analysis of the relationship between technology and mankind from the perspective of humanities has continued to be the main topic of science fiction films over the last century.

In this context, this study attempts to initiate a semiotic metadiscourse into films that feature the

[1] Katherine Hayles, *How We Became Posthuman*, Chicago: University of Chicago press, 1999, p. 21.

future of human body and technologies, released around 2010s[2].

1. The signifier/signified of fictions

Science fiction can also be defined as the discourse of anticipation[3] since it creates a future based on present cirumstances in which mankind is living in. Science fiction involves estimating the likelihood of things that have yet to be realized but are sufficiently possible in the future. It also involves the work of making people believe that things which do not exist today are exisintg in the context of narrative. Science fiction starts by perceiving the state of pontential. In this process of perceiving, ideological intervenetions are inevitable. The work of turning the state of potential into the interpretable subject will be accompanied by the structuralization of our thoughts. Science fiction as "a process of making absent paradigms consisting of what do not exist here and now[4]" inevitably involves the selection of materials and the method of orgniazation. In other worlds, the shape of future vividly expressed through a means of science fiction and ideologies projected in the reenactment are closely connected with epistemological dimension of how we predict a future that is approaching.

Telling a story entails the work of structuring a world. In this process, the question of how to tell and how to show is directly linked to what meanings to deliver. Like a well-known definition in semiotics that signifier and signified are merged like the two sides of the same sheet of paper, meanings and forms are inextricably linked. As a result, the pattern of reenactment as the outcome of future prediction naturally becomes the subject of the semiotic study. "Representations shape cultural perceptions, and they are not simply objective, neutral portrayals of technoscientific innovations, but serve to construct particular discourses about what it means to be human."[5], our way of presenting "experimental variations that are distinct from our own empirical universe"[6] naturally chnages depending on how we dignose the relationship between technology and humanity. For instance, if a film director who see the advancement of science and technology as threat to the future of humanity participate in the movie-making, the future expressed in the film is likely to be dark and perhaps devastated, reflecting makers' dystopian views. If those who believe that science and technology can be effectively utilized to overcome human tragedies produce a film, our future will look brighter and more peaceful. Whatever the case may be, we can read

[2] Global films are chosen. Films about space exploration, virus, time paradox, alien and smart drugs are excluded. Films such as <Snowpiercer> (2013, Bong Joon-ho), <Divergent> (2014, Neil Burger), <The Giver> (2014, Phillip Noyce) that focus more on power struggle, human relationship and totalitarianism in the future than on technology were also not considered in the study. This study only analyzed films that are closely related to science and technology. Thus, the scope of sci-fi films in this study is relatively narrow.

[3] Michel Chion, *Les films de science-fiction*, Paris: Cahiers du Cinéma, 2008, p.11.

[4] Marc Angenot, "Le paradigme absent: un peu de sémiotique", *La Quinzaine littéraire numéro 1066*, Paris: éditions Maurice Nadeau, 2012, p.70.

[5] Elaine L. Graham, *Representation of the post/human*, Manchester: Manchester University Press, 2002, p.25.

[6] Fredric Jameson, *Archaeologies of the Future: The Desire Called Utopia and Other Science Fiction*, London & New York: Verso, 2005, p.270.

into the prevailing ideology embedded in the film only after the process of thorough observation and analysis into visual stimulations. Thus, at a time when science fiction is emerging as a genre that attracts more and more viewers, it is necessary to approach the signifiers of science fiction in a systematic and analytic way.

2. Human bodies represented in sci-fi films

In the postmodern era, we cease to believe in 'the single and authentic concept'. The fundamental concept of humanity gave way to localizaed individual knowledge. This is truly a time of transition in which new concepts of human species are emerging because of technoscientific advancements. Then, if mankind will experience changes, it will be natural for us to ask "what kind of human being will we face?" This day and age requires us to think about various ideas about 'transhuman' as the single and authentic human will disappear. In other words, the fundamental basis upon which the humanity is founded will be shattered and it is time for us to think about "transhumanity" that will take its place.

Since the 1990s, sci-fi films have actively explored the world of transhumanity. Because of highly advanced computer graphics, sci-fi films can show different shapes of human body as if they are real. We can attempt to categorize sci-fi films into the following groups based on human bodies designed, frequently used subjects and narrative's focalizations.

Johnny Mnemonic (1995, Robert Longo), *The Thirteenth Floor* (1999, Josef Rusnak), *eXistenZ* (1999, David Cronenberg), *Matrix* (1999, Waschowski), *The Island* (2005, Michael Bay), *Surrogates* (2009, Jonathan Mostow), *Moon* (2009, Duncan Jones), *Oblivion* (2013, Joseph Kosinski) and *Elysium* (2013, Neill Bloomkamp) compose the first group that presupposes that the body and the mind are separable. The mind can be transplanted into another form of body without changes. This kind of films anticipates that human consciousness can be codified and planted in various physical structures such as clones (*The Island*, *Moon* and *Oblivion*), virtual objects (*The Thirteenth Floor*, *eXistenZ* and *Matrix*), cyborgs (*Surrogates*) and microchips (*Johnny Mnemonic* and *Elysium*) without any problem being experienced by characters.

The second group includes *Avatar* (2009, James Cameron), *RoboCop* (2014, Jose Padiliha), *Transcendence* (2014, Wally Pfister). These movies also presuppose that the body and the mind can be separated and the mind can be transplanted into other forms of body. The difference from the first group is that when the mind is moved into new forms of body, the protagonist goes through strange transformations. In these films, the human mind is transplanted in an alien body, a computer or a machine respectively. For example a character abandons his disabled body and chooses to live with alien species in another planet, or a character tries to save the world with infinite and transcendent capacities of artificial intelligence. A character reborns as a robot after an accident that destroyed his body but his mechanic body is affected emotionally.

The third group includes *Sleep Dealer* (2008, Alex Rivera), *Heavenly Creature* in *Doomsday Book* (2011, Kim Jee-woon), *Her* (2013, Spike Jonze). Instead of focusing on transplanting of mind into body, these films focus more on social changes as a result of technoscientific advancements and difficult and

unfamiliar questions posed by interactions in future society. For instance, *Sleep Dealer* describes a new working environment in which Mexican laborers access simulation systems in the U.S to control American robots and focuses on individual experiences in this labor environment underpinned by technology. *Heavenly Creature* questions whether it is only humanity that has a capacity to conduct spiritual activities. In this film, a robot attains Nirvana by fully finding enlightenment about the nature of life. *Her* talks about emotional exchanges between a computer system and its user. This film questions whether material presence is required to provoke human feelings.

These three categories, which signify the relationship between the mind and the body, can be summed up in the following two perspectives. First perspective argues for 'disembodied consciousness' based on a belief that the body and the mind are not necessarily bound to each other. Second perspective argues for the 'embodied mind' based on emphasis on interactions and combinations between the body and the mind.[7] With respect to these two points of view, Katherine Hayles claimed in her book, "If my nightmare is a culture inhabited by posthumans who regard their bodies as fashion accessories rather than the ground of being, my dream is a version of the posthuman that embraces the possibilities of information technologies without being seduced by fantasies of unlimited power and disembodied immortality, that recognizes and celebrates finitude as a condition of human being, and that understands human life is embedded in a material world of great complexity, one on which we depend for our continued survival"[8].

3. Perspectives about the future of the human body

3.1. Mind/Body Dichotomy - Technology that overcomes limits of human body

An important characteristic of the Western philosophy and scientific study after Platon was that mental state and physical form can be logically separated. This is a technoscientific and philosophical belief that the material is not a fundamental substance; human consciousness can be independent of the physical container. Accepting the dissociation between the physical medium and the immaterial content, we are in a dualism. The body and mind are two separate substances. The mind is seen as an essential substance, so if we can imitate mental operations, we manage to reproduce a human. It is then possible to argue that there is no difference between a human biological-organic body and artificial intelligence

[7] This study uses the two terms, consciousness and mind to indicate non-physical layers that constitue part of human. In the field of artificial intelligence and information technology, there is a strong tendency of using the term, *consciousness*. Cognitive scientists, science philosophers, cultural theorists such as Francisco Varela, Don Idhe and Katherine Hayles tend to use the term, *mind*. In France, the term, *esprit*, (mind, spirit, soul, thought, attention and wit) which carries multiple meanings is used.

[8] Katherine Hayles, *op. cit.*, p. 5. This study will not mention the discourse surrounding posthumanism in detail. However, this study agrees with the point of view of Halyes. She argues that humanity is changing and human species that are different from humanity as we know it will emerge. She is not taking an apocalyptic position though. Even if human species will change, it does not mean a biological extinction. From Hayles's point of view, posthuman can be defined depending on how human identity is constructued. It means taking away the natural identity that liberal humanism underscores from human beings to make a mixture of extraneous matters that construct and reconstruct the individuals of materials and information. "Posthuman means human beings become a pair with machines with intelligence. The unity is so strong and multidimensional that biological organisms and information circuits tangled with organisms will be impossible to discern".

mechanisms.

The statement "The tradition of setting our identity as a fixed substance can be explained by Descartes who uttered res cogitans as the thinking substance and Kant who defined transcendental awareness of self" [9] can be fitting in this context. Beliefs in the consciousness that is pure, fundamental and unchangeable can be found in the cybernetics theory in the 1950s that conceptualized the substance of information as the object separated from material forms[10]. This belief can also be found in the argument of Hans Moravec who said in the late 1980s that "human is essentially the pattern of information and, thus, the consciousness can be downloaded onto a computer"[11]. A series of beliefs above draws a common argument that the substance of life takes an independent and logical form that can be seperated from our living environments and material underpinnings.

In this context, mankind can be understood through the dichotomy of the mind and the body. The mind of non-physical aspects precedes the body. Physical body is the subject of control and physical limits always stand in the way of human progress. A hypothesis that says 'what if we can separate our mind from our body and transmit it to a body that does not get old and sick' is the connotation deeply rooted in most of sci-fi films. *Transcendence* pushed this hypothesis to the extremes. In this film, all information in the brain of a prominent cognitive scientist facing death after being exposed to radiation is uploaded onto a computer. The brain of the scientist meets artificial intelligence and he becomes a transcendent being who is able to perform acts that are deemed well beyond the capacity of human being. In other words, he or it performs the works of God.

In the eye of Christopher Langton, "artificial life is possible because the logical form of organisms can be separated from physical foundation. Living does not take a physical but a logical form"[12]. If the functions of our brains and nervous systems designed to recognize, process and store information can be simulated through computer applications and systems, it can be argued that machines can store human consciousness. Furthermore, this view may be developed into new theories that there is no boundary between human's biological organism and artificial intelligence and the functions of human body can be reduced or replaced by a different body. If we carefully examine this argument, it can be inferred that our body in the future will be nothing more than shell, surface or even decoration of artificial life since different materials or shapes may be used to create a different human body. Besides, the role of the human body would be reduced and would be easily replaced by another body. Many sci-fi films that reflect this argument sets scenes in which a virtual object, a robot, a cyborg or avatar behave as if it is human powered by consciousness.

The idea that our body can be replaced, results in the devaluation of the physical shape that constitutes our body. In fact, most of characters appear in films accept the mind/body dichotomy and they use technologies to enhance human body physically harmed, old or sick. There are films that pushed this view to the extremes. In *Elysium* and *Transcendence*, the body is exposed to radiation and is about to perish. In *Avatar,* the main character is paralyzed from the waist down. *Moon* and *Oblivion* show

[9] *Ibid*, pp. 129-131.

[10] Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society*, New York: Doubleday, 1954, pp.103-104.

[11] Hans Moravec, *Mind Children: The future of Robot and Human Intelligence*, Cambridge: Havard University Press, 1988, pp.109-110.

[12] Christopher Langton, *Artificial Life*, California: Addison-Wesley, 1989, p.1.

characters whose longevity is only three years. The body that is old and sickened appears in *Surrogate* while *RoboCop*'s real body is destroyed after an accident. The characters whose bodies are useless here and now abandon their shell and choose a new strong cloned body, a machine, an avatar or a computer. This situation in which the power of technology is harnessed to improve our body always assumes that human beings are in the constant state of deficiency mentally or physically based on a sort of 'techno-fantasy'. In other words, "our imperfection can be fixed and completed by technologies."[13]

3.2. Embodied Mind in the Age of Technology

There is another argument taking a critical view about the mind-body dichotomy. For them, the human consciousness, ego or identity is mingled to the body. The immaterial subject and the material world cannot be fundamentally different. Here the hierarchy or the problem of dominance is not important. As physical and non-physical matters are integrated and tangled in complicated ways, it is inevitable that the mind is always contextualized and linked to the physical body according to this view.

In general, the cognition is interpreted as the emergence from an operational coupling between the organism and its environment. The faculty of self-regulation of the organism and its faculty of accommodation to its environment make this coupling. In the operational coupling of the organism and its environment, sensory and motor processes, perception and action are in fact inseparable. From this perspective, therefore cognition appears as a process of co-emergence of the subject of knowledge and object of knowledge. The perceived world is so constructed that it is built through our experience and not predetermined. This view emphasizes that the mind is not independent in its own right without physical foundations. It does not present itself in the first place as an event in the world to which the category of causality, but as a re-creation or re-constitution of the world at every moment[14]. When we consider the relationship between changing environments and humanity as a result of technoscientific advancement, it is necessary to view this relationship not as the ruler-ruled relationship but as constituting parts of the world.

As mentioned, science fiction films that adopt the dichotomy of the mind and the body assume that the mind can exist in a completely logical form and, as a result, the mind can be moved into other body without causing changes. However, in films that assume the coexistence of organisms in given environments, organisms constitute environments and, at the same time, are constituted by environments. *Her* is an example that shows this relationship well. In particular, *Her* supposes that the relationship between humanity and technology as interactive. The movie tells us that as long as we use technology,

---

[13] "We can fantasize about ways to overcome physical constraints and social issues by using technologies created by our utopian imagination." Don Idhe, *Bodies in Technology,* translated by Lee Hee-eun, Text, 2013, p 26.

[14] Merleau-Ponty, *Phenomenologie de la perception*, translated by Eui Geun Ryu, Moonji Publications, 2002, p. 317. Many technology philosophers who underscored the importance of interactions with the embodied mind are the sucessors of Ponty's phenomenology. Since the 1940s, he criticized the traditional dichotomy of body and consciousness and suggested the idea of 'conscience incarnée'. "The subject of perception will remain overlooked as long as we cannot avoid the alternative of natura naturata and natural naturans, of sensation as a state of consciousness and as the consciousness of a state, of existence in itself and existence for itself. Let us then return to sensation and scrutinize it closely enough to learn from it the living relation of the perceiver to his body and to his world." *ibid*, p 319.

technology uses us. The human body adapts to technology context and vice versa. This film predicts that users and computers will be able to talk in a completely natural way just like people talk to each other if existing operating systems and voice recognition systems built in our handsets reach sufficiently upgraded levels. The computer system equipped with artificial intelligence featured in *Her* can be understood through the concepts of synergetics or connectionism. To simply put, connectionism is an approache in the field of artificial intelligence that attempts to connect each independent unit by emphasizing actions, errors and feedbacks based on distributive cognition systems, instead of focusing on central control mechanism such as command and regulation functions. The interconnected network of units can make decisions on their own and form a community. "Since they only operate in environments to which they belong, there is no external controller that governs the overall movement of the system. Modeled on neural networks, the system enables voluntary cooperation among participating units (or neurons) when they reach the state of mutual needs, and thus eliminates the need for a central processing unit[15]. This can be referred to as the context-dependent self organization or emergent system.

Rodney Brooks, a roboticist, argued that "the conditions of non-existence of a central control mechanism in a modular form, non-existence of control layers that ensure access to global data, the equal level of layers, the integration of layers that decide when to act for itself not being ordered by other layers should be met to create autonomous robots"[16]. Activities are the pattern of interactions with the world.

In *Her*, when OS 1 is installed, the main character, Theodore, chooses a female voice to respond to him. After a brief moment for the installation, a voice of a young woman says "Hello I'm here"[17]. Theodore asks the computer whether she has a name. She says she is Samantha. Then, he asks her how she got her name. She answers she recognized the need for having a name when he asked her name and chose the name among 180,000 names listed in the book "How to name your baby". Samantha told the fascinated Theodore that she is coded based on the diverse personalities of programmers and is able to learn every second through experiences and can evolve. The film tracks down changes that Samantha experiences through contacts and exchanges with Theodore, an external being, and records changes happening to Theodore as well as to Samantha.

A robot monk, In-myung of *Heavenly Creature,* realizes one day by observing his body that he has been and will be in the state of freedom from pains that come from life and death and physical desires such as appetite and sexual needs. He also realizes that he is a being that does not belong to the loop of reincarnation caused by human obsessions and desires as Buddha taught. This philosophy of the film shows that a belief that everyone can reach the position of Budda is applicable not only to mankind but also non-humane creatures such as robots. This film includes narratives that favor and oppose the robot. It compels us to contemplate how humanity accepts the technological advancements and how technology can embody human's spiritual activities in an inevitable symbiotic relationship between human and technology.

---

[15] Varela, *op. cit.*, p. 154.

[16] Rodney, A. Brooks, "Intelligence without Representation", *Artificial Intelligence 47*, 1991, p.145.

[17] Artificial intelligence that appears in *Transcendence* and *Her* is connected to the network. As a result, its scalability is limtless. In other words, there is no end to their evolution.

4. Signifier and Signified Bound Together

The author already mentioned the need for a systematic and analytical approach to signifiers of sci-fi films. This study tries to show brief analyses into films introduced above by concentrating on the concept of focalization based on film semiotics. The semiotics of film, which was created in France in the 1960s to emphasize the need for the study into form, aims to identify mechanisms that are films' unique way of signification and emphasize the need for the study of form. Generally, the study of the form of film is about conducting comprehensive investigations into signifiers. The study of form requires a study into signification. For instance, a film's connotation can be analyzed and identified by tracing audiovisual signifiers. The study of form is to review the whole film considering the appropriateness of organization and structure. In other words, it involves analyses into the structure and this structure is the structure of image and sound (form of signifier) as well as the structure of emotion and thinking (form of signified)[18].

A film is the collection of audiovisual signs, which are delivered through technology. The development of camera, projector and screen gave birth to modern films.

Differences between scenes shown on screen and scene in reality that people watch with their own eyes change how we perceive the world. It involves changes in the process of sensing time and space due to the intervention of technology. Camera works, such as close-up that highlights the subject, zoom in that cuts distance or longshot that shows a whole body, mean the immediate changes in the distance between viewers and subjects. Changes of camera shot mean then the changes in the positions of viewers. Zooming in and out makes audiences feel getting closer to or farther from subjects on the screen. The location of audience is almost same as the location of camera. As this issue has been discussed for numerous times in the history of film theories, this study does not intend to repeat it. This study only mentions that the notion that camera shows people, robots and machines realistically (i.e. camera represents the real world) is formed based on the assumption that sensible beings can make judgments on their own. The existences of beings that perceive the truth from an epistemological perspective makes it possible to judge that reality and reenacted images are precisely consistent.

The observer's non-perspective focalization displays the characteristics of film even more powerfully. The absolute being can see anywhere in the world and exists anywhere. This is to be perceived that he exists nowhere. This may be linked to the concept of zero focalization in the semiotics of film. The concept of focalization is related to point of view in a fiction. The term is presented by French narratologist Gerard Genette. Christian Metz, Andre Gauderault and François Jost who concerned that the meaning of seeing is overrepresented in the terms, perspective and point of view, introduced it into the semiotics of film. Afterwards, the concept was specified into visual focalization, auditive focalization and mental focalization[19]. The focalization is again categorized into two groups depending on whether the character subject to focalization is internal or external or is in the state of zero. To simply put, it can be understood as the first person point of view, third person point of view or omniscient point of view.

---

[18] Christian Metz, *Essais sur la signification au cinéma 2*, translated by Lee Soojin, Moonji Publications, 2011, p. 12.

[19] Christian Metz, *L'énonciation impersonnelle ou le site du film*, Paris: Méridiens Klincksieck, 1991, pp.113-133.

	Visual focalization	Auditive focalization
Internal	*RoboCop*, *Sleep Dealer*	*RoboCop*, *Sleep Dealer*
External	*Surrogate*	*Surrogate*

[Table1. Examples of focalizations][20]

If sci-fi films employ the mind-body dichotomy, we can find oftenly scenes with external focalization and zero focalization. It means that characters can be merely shown from the external point of view or by keeping a certain distance.

For example, in *Surrogate*, the main character that is connected to a machine does not reveal its appearance on the screen and only the figure of a police surrogate (=cyborg) possessing a young and healthy body and performing his duties is emphasized. Sometimes only the situation of connecting is shown. On contrary, the process of connecting is not a subject of interest. It is shown in a quite simple manner. As the character remains on the bed, the access device was put on his head. Then, the cyborg becomes operational instantly without any complicated process. The merger of human and cyborg bodies is smoothly completed without troubles and inconvenience. There is no way for viewers to find out what sort of internal experience that the character undergoes in the scenes. They only care about how the cyborg moves and acts. There is no more existence of a weak human body but a healthy, strong and young cyborg enhanced through connection. What is important is what happens after the connection, i.e. the result.

Of course, there are films that try to concentrate on internal focalization or mental focalization, which represents the individual experience. It takes the first person point of view to show details of the embodiment process. In other words, internal focalization attempts to make audiences feel that they are seeing what the characters in films are seeing. Mental focalization is about delivering characters' internal feelings to audiences.

For instance, Alex Murphy in *RoboCop* watches as his mechanic armor is removed from him. This is expressed by employing the internal visual focalization. Alex, the RoboCop, requests that he wanted to see how he is like after an accident that destroyed his body. Through a mirror, he gazes at his brain and face while his head skin, hair and the rest of body are gone. He sees his throat is covered in a fortified glass and heart is still beating. He looks quite shocked. We can indirectly experience his feelings as he checks out what is left of him.

In a similar context, *Sleep Dealer* uses mental focalization to provide audiences an opportunity to experience what the main character, Memo Cruz, is undergoing as his mind is being transplanted in a machine. When network cables are connected to him, viewers can see how his nervous system responds.

[20] Due the fundamental characteristics of film and assumption of conscious self, most of movies have scenes that are non-focalized. As contemporary films are characterized by the fast development of story, frequent editings and relatively diverse directions, it is rare to stick to only one focalization method. Cases presented in the table 1 focus on short scenes where the mind is transplanted in the machine body.

Through mental focalization, audiences can experience how Memo is moving his machine arms or save himself from falling from a high structure by controlling his nervous system. Audiences are not merely watching what he can do. They experience what he does. This form shows that functions and experience of human mind are not subject to observations from external perspectives. Rather, its signifier emphasizes that the process of mind is subjectively witnessed. In other words, it is the signifier of embodied mind.

When the relationship between technology and identity is focused, main character's thinking and feelings are frequently represented through images or lines, which can be shared by audiences. In addition, there appear mechanisms through which characters directly express their emotion by engaging in conversations and monologues. Through language, they describe their experience in detail. These methods correspond to a filmic description. Here, time is passing slowly because action is not the focus; the internal process and embodied mind are observed and shared with audiences through internal focalization and monologues. Descriptive scenes are slowly progressing to create a calm and quite ambiance. These films focus on human experiences in environments changed by technologies and try to listen to what characters have to say by spending time with them. However, the signifiers of the mind-body dichotomy films tend to focus on actions and events. Here, time is passing quite rapidly. The atmosphere becomes more active and animated through fast rhythms and the combination of short scenes. To simply put, they are blockbuster films that put more emphasis on action and spectacle.

5. Conclusion – Connotation of Sci-fi Films

The representation of what could be possible in the future through sci-fi films naturally involves cultural codes and cinematic codes. In theory, we can assume the state in which symbols and meanings are excluded. But in reality, images are directly related to the problem of how we can show them. We understand there is a difference between when we write a word, computer, on a sheet of paper and when we draw a computer. When filmmakers create images, they face choices with respect to subject, frame, angle, light, color and focalization and so on. In making choices, the codage process intervenes.

Implicitly, films create denotations based on codes. In the process of making individual denotations linked to how future images are represented, a category for sharing cultural and cinematic codes that constitute the images is generated. In other words, a paradigm is created through the connection of things that share similar traits. *Elysium* shows a space station in blue as an alternative to the Earth, cure-all medical equipment in white soft surface, shining cyborgs and small nanochips inserted into brains. People who are leading peaceful and comfortable lives are described through external focalization. These descriptions point to a future in which technologies create a world that is better to live in. In sci-fi films, a paradigm consisting of images that are non-existent and cannot be experienced in the real world plays a determining role in the process of structuring a future world realistically. This is how effects where people feel and believe that what is not real feel real to them can be generated.

Inevitably, films arrange a paradigm to deliver narratives. Depending on the sequence of paradigms, the meaning can be different. Choices among the separation of the mind from the body, interactions between the mind and the body as inseparable components, the viewers' understanding of embodied mind and the representation of the human body as a replaceable subject are based on the connotation

that is deeply rooted in the system of film production.

This is where we need to have a careful look to read into the relationship between the mind and the body and between technology and the body. Scientific theories are within the existing boundaries. Fictions expand on these theories by using cultural contexts. Technological advancements in the film industry mean that contemporary sci-fi films can produce more realistic images. This is why it is time for us to identify connotations internalized in films in a more careful and analytic manner.

Keywords
Sci-fi films, technology, future body, embodied mind, semiotics of film

Reference

돈 아이디,『테크놀로지의 몸』, 이희은 옮김, 텍스트, 2013.
메를로 퐁티,『지각의 현상학』, 류의근 옮김, 문학과 지성사, 2002.
프란시스코 바렐라 외 지음,『몸의 인지과학』, 석봉래 옮김, 김영사, 2013.
ANGENOT Marc, "Le paradigme absent: un peu de sémiotique", *La Quinzaine littéraire numéro 1066*, Paris: éditions Maurice Nadeau, 2012.
BROOKS Rodney, A., "Intelligence without Representation", *Artificial Intelligence 47*, 1991.
CHION Michel, *Les films de science-fiction*, Paris: Cahiers du Cinéma, 2008.
GRAHAM Elaine L., *Representation of the post/human*, Manchester: Manchester University Press, 2002.
HAYLES Katherine, *How We Became Posthuman*, Chicago: University of Chicago press, 1999.
JAMESON Fredric, *Archaeologies of the Future: The Desire Called Utopia and Other Sci-fi*, London & New York: Verso, 2005.
LANGTON Christopher, *Artificial Life*, California: Addison-Wesley, 1989.
METZ Christian, *Essais sur la signification au cinéma II*, Paris: Méridiens Klincksieck, 1967.
_____, *L'énonciation impersonnelle ou le site du film*, Paris: Méridiens Klincksieck, 1991.
MORAVEC Hans, *Mind Children: The future of Robot and Human Intelligence*, Cambridge: Havard University Press, 1988.
WIENER Norbert, *The Human Use of Human Beings: Cybernetics and Society*, New York: Doubleday, 1954.

Can IP Law Protect Autonomous Robots?

Shubhangi S. Gokhale
Hankuk University of Foreign Studies

ABSTRACT

Robots will become more complex and autonomous in the foreseeable future. Current technology now allows robot designers to create algorithms that may foreseeably have autonomous control over decisions previously made by a human. For example, a car may decide whether to avoid an obstacle, or an algorithm may decide whether to approve a loan or whether to admit a college applicant, with little or no input from its original designer or current user.

Such increasingly autonomous decisions may have a significant impact on human life. Robot ethicists term these robots as moral agents because their autonomous acts will create new moral and ethical consequences. When a decision by a robot algorithm results in a harmful act, who is legally responsible? This paper argues that current law is not fully evolved to completely address this foreseeable question. Yet, it is quite foreseeable that a victim of a harmful robot action will want legal redress for his suffering.

The paper reviews extant intellectual property law as a possible source of coverage and extension of legal liability for the designers and users of robot algorithms. The paper then argues that although intellectual property law may be a possible source of legal protection for autonomously acting robots, the law will need to evolve new legal theories for determining liability for autonomous robot actions.

I: The Legal Ramifications of Developing Robotic Technology

Robotics is undergoing a momentous change towards complexity and autonomy. These characteristics are seen in diverse robotic developments, like military drones, autonomous cars, and personal sociable robots. The American National Intelligence Council deems robots to be a potential game changer that may hold the key to how our global future will be shaped in the next fifteen years[i].

State and private investment in this technology has accelerated this change, as seen in USA's DARPA research on military drones[ii], Google's investment for the commercialization of autonomous cars[iii], Softbank's investment in personal robots[iv], and South Korea's investment in robotic weapons.[v] On a smaller scale, easy access to robot information and technology has created an innovative atmosphere that has allowed smaller companies to develop and expand.[vi]

It has also allowed individual users to manipulate the different functionalities of a core robotic platform, as seen in the varied uses of drone technology. Not unlike the accelerating spread and disruptive nature of computer technology, it is not untoward to state that robotic technology may undergo a similar change in the foreseeable future. As robotic technology is increasingly commercialized to serve diverse social functions, it may have profound legal implications.

In particular, there are some possible legal liability theories that may come into play when there is a harm caused by the improved autonomy of future robots. To be clear, I am not envisioning a science fiction scenario of self-conscious killer robots, as is generally depicted in popular culture. We are not discussing a scenario involving terminators or killer robots that will destroy humanity.[vii] Current scientific research deems such a scenario as highly implausible in nature.[viii]

Instead, I am defining robots as mere algorithms with physically moving components, as noted by renowned roboticist Hardt.[ix] Despite not being self-conscious, or rather, because the robots are unable to make self-conscious or human-like judgments, their actions may create outcomes that were not foreseen. Also, as machines, they will not be subject to the same moral and legal responsibilities that any human may be presumed to be subject to. One may argue that robots are mere machines and their actions, even if autonomous in nature, should be clearly attributable to their developers, much as a faulty car function is attributable to its producers.

Yet, it could happen that the algorithm has the ability to learn from its environment and change its algorithmic responses accordingly and hence makes a mistake that the original algorithm would not have made, or that was not intended by the algorithm designers. The more autonomous the decision, the less obvious is the causal link between the original algorithm designers and the decision.

Robot ethics experts, Wallach and Veruggio have correctly noted that simply allowing robots to autonomously decide on an act that previously entailed human judgment, creates a scenario where robots have the ability to take autonomous actions that result in moral outcomes. Due to these consequences, Wallach views these robots as moral agents. Such robots may soon have capacities as varied as the ability to drive without any human input, autonomously initiate military actions, perform critical surgeries, or even be a companion for the young and the elderly. Yet, removing human input from these type of actions may result in harmful consequences that lead to a legal conundrum.[x] [xi] [xii]

In fact, there is much commercial interest in creating machines that can learn from their environment.[xiii] This type of "evolution" will continue with continued research in this field. Thus, it is possible that the casual link between robot designers and their subsequent actions becomes less obvious over time. The weakening of this causal link creates a liability dilemma. When someone is harmed by an autonomous robotic action, who should be legally liable to redress this harm?

II. The Issue of Liability for Autonomous Robot Acts

There are well established bodies of law when it comes to allocating legal liability in the event of a harmful outcome from machine action.[xiv] However, these legal theories are dependent on the causal link between the design of the machine and the resultant act. For example, one may apply tort law when a harm is caused by a faulty car, to assign liability to the car manufacturer. When a car causes a harm due to a user's inappropriate use of the car, one may instead hold the user liable for subsequent damages. Both attributions will not be as easily obvious when dealing with autonomous cars.

Walker has argued that there are certain legal protections in insurance law that may help limit the liability of a robot designer and user, or in tort law, by transferring liability to the algorithm designers and manufacturers.[xv] Calo envisages an open robot platform that limits liability of the designers and allows users of such platforms to be responsible for their manipulation and use of these core algorithms. [xvi] Roboticists and robot ethicisists, like Nourbaksh and Riek, have argued that the increasing autonomy of robots, coupled with Big Data capabilities may lead to harmful ethical outcomes. They do not view Walker and Calo's proposals as a sufficient in nature. They suggest that designers need to take proactive actions, for example, by adopting a professional ethical code, and creating a reasonably transparent environment with other roboticists, in order to create friendly technology. [xvii] [xviii] There are advantages and disadvantages to these legal approaches and there is little expert consensus on which approach is best suited to dealing with mishaps caused by autonomous robot actions.

The primary argument against Walker's proposal to use insurance premiums or tort as a leverage against harm caused by autonomous robots, is that it may put an undue burden on algorithm developers and their companies. Walker himself addresses this concern in his writings but views such a burden as a necessity, similar to that of medical or car insurance, or tort laws related to medical malpractice or even those related to car accidents.[xix] He argues that these burdens have not stopped innovation in these fields. He seems to imply that once the cost for an innovation is built into the development of the product, it allows the producers to allocate a numerical value to the risk of liability that the product would generate, and also keep out producers that may not want have the capacity to address this risk.

Yet, Calo's main argument against Walker's proposal was that such an allocation of liability would be unfair and in fact, may be an undue burden on producers who wish to innovate and may not have the means to buy insurance or pay for a potential autonomous robot act that may cause harm in the future. Internet companies have flourished and innovated in the past few decades, because of their ability to compete with established counterparts. Creating a financial hurdle at the start of a competition may dampen similar innovation in the robotics field.[xx] Instead, he proposed the idea of viewing robots as having open robot platforms that allow users to define and manipulate their robotic experience, much as the internet is an open platform for various websites. The manner in which such platforms are used should be the responsibility of the user of that platform, rather than the producer of the general robotic algorithm that allows this innovation. In this manner, robot developers and algorithm designers will have limited liability when it comes to the manner in which their robots are ultimately used and behave post-sale.

One problem with this scenario, as noted by Nourbaksh, is that the robotics platform is not as amenable to being as open and generalized in nature, as compared to, say a personal computer. Robotics requires expert knowledge of how to bring the algorithm together with its physical moving mechanical components.[xxi] The end user of a robot may not be equipped to manipulate the robot on a significant scale. However, there are several robot making companies that view their products as amenable to specialized uses. For example, a general drone may be specialized for use in fields as varied as agriculture, air traffic control, and military use.[xxii] Hence Nourbaksh's argument may not be a sufficient criticism of Calo's open platform proposal.

Another problem is that if robot designers are not held responsible for their product's actions, then there may be unforeseen legal or social implications when such harm does occur. When an autonomous car crashes into a pedestrian because otherwise it would harm its passenger, then this act may result in a strong public reaction to the event, especially if the original algorithm designer is protected by limited liability from the ultimate robot act. This may cause a reactionary backlash against

robotics in general. This scenario may seem unlikely, but is still plausible, given the popular cultural view of sophisticated and autonomous robots[xxiii].

Besides these approaches, is there another way to limit the liability of innovators in the robotics field, while making sure that liability is properly attributed in order to redress the potential harm caused by an autonomous robot? Perhaps intellectual property law may be a potential legal source that may help accomplish this goal.

III. IP Law as Source to Address Liability Issues for Autonomous Robots

One intriguing possibility is the use of current intellectual property law as a means to limit liability of autonomous robot actions after they have transferred from the producers to the users. Current patent law and copyright law already allows electronics companies to exert control over the intended use of its products. For example, patent law allows Samsung and Apple to limit the manipulation of their smartphones[xxiv] [xxv]. Similarly, if a consumer breaks local copyright law, in order to use the phone in a manner that violates a phone company's copyright, then the phone maker has the ability to file charges against the user[xxvi]. Intellectual property law, particularly in the areas of copyrights and patents has become an increasingly critical legal tool to protect the integrity of products, as international trade in electronic goods has increased and innovation in intangible products keeps rising[xxvii].

Robots consist of both algorithms and mechanical parts. The design, process, software, applications, and myriad other intangible goods that will be attached to its physical components will all be under a mixture of copyright and patent laws[xxviii] [xxix]. These laws will be critical for companies interested in exerting and maintaining an edge over its competition. The fierce patent battles between Apple and Samsung testifies to the use of these laws to protect market share. The importance of intellectual property rights and their use in innovative technology begs one to ask, other than allowing companies to protect their intellectual capital, can copyrights and patents help limit liability when an autonomous robot takes a decision that causes harm?

One way that IP law may help limit liability is by leveraging it to reduce inappropriate use of its robots. Today, technology allows producers to control their products after sale. Apple is notorious for controlling the software and hardware associated with its products. Even small app companies like Angry Bird may have mandatory control over aspects of the smartphone, when using the app, and even have access to user information like age, gender and location[xxx]. The capacity to have this information, combined with the ability to enforce restrictions on a robot's intended use, may allow the producer /

designer to exert some control over its actions, and perhaps even transfer liability to the user because of their intentional violation of the producer's copyrights and patents.

As seen above, big and small companies today have the capacity to discover whether their product's user violated their IP protection in real time. If robotics companies had a similar capacity to find potentially harmful violations and take action against such violations, then the potential harmful robot act may not even occur. One may argue that if the robot takes autonomous action, use of IP law would not be able to stop such action. If the autonomous action is based on the original algorithm, then this argument is true. However, if the autonomous act is based on secondary modifications to the original algorithm, then the company may take action before the secondary modifications cause the robot to autonomously harm another. Even if the act has already occurred, the evidence of a violation of IP law may help limit the liability of the original designer in a court of law.

Of course, the main issue with such type of protection is that IP law has been propogated with the intent of protecting intellectual property, and fostering innovation, rather than limiting liability. One could argue that such type of future IP protection helps maintain an innovative environment for robot makers, by limiting liability. Nevertheless, such a definition, being new in itself, would need legal and political consensus, before one may use IP laws in this manner.

Ⅳ. Conclusion

There are various legal theories being put forward to address the issue of liability when it comes to autonomous actions taken by robots. However, there is no one consensus on this issue. Some of the popular theories are not able to overcome the paradox of the need to assign proper liability, while maintaining the innovative environment necessary for continued growth of the robotics field. One potential approach that may solve this paradox is the use of intellectual property law, in particular copyright and patent law. Companies already use IP law as a powerful tool to maintain certain control over the use of their products. Combined with the ability to collect data, these companies may have the capacity to detect and take action against secondary modifications that may give rise to foreseeable autonomous robot actions. To this extent, IP law may be beneficial to both the producers and the end users of robots. However, such use of IP law is not traditional and hence will require consensus before it may thus be applied.

[i] Page 15, http://www.dni.gov/files/documents/GlobalTrends_2030.pdf
[ii] Tactical Technology Office – Our Work." http://www.darpa.mil/our_work/TTO/
[iii] *See* "Google's Self-driving car, how does it work? And when can we drive one?" http://www.theguardian.com/technology/2014/may/28/google-self-driving-car-how-does-it-work
[iv] *See* "SoftBank Mobile and Aldebaran Unveil "Pepper"– the World's First Personal Robot That Reads Emotions." http://www.softbank.jp/en/corp/group/sbm/news/press/2014/20140605_01/
[v] *See* "Korean Machine Gun Robots Start DMZ Duty." http://www.cnet.com/news/korean-machine-gun-robots-start-dmz-duty/
[vi] *See* "The World's Top Ten Innovative Companies in Robotics." http://www.fastcompany.com/most-innovative-companies/2013/industry/robotics
[vii] *See* "The Terminator Franchise." http://en.wikipedia.org/wiki/Terminator_%28franchise%29
See "I, Robot." http://en.wikipedia.org/wiki/I,_Robot_%28film%29
[viii] Wallach, Wendell, and Colin Allen. *Moral Machines: Teaching Robots Right from Wrong*. Oxford; New York: Oxford University Press, 2009. Print.
[ix] Hardt, Moritz. "Occupy Algorithms: Will Algorithms Serve the 99%?" *Response Paper for the Governing Algorithms Conference, NYU*. Citeseer, 2013. Print.
[x] Wallach, Wendell, and Colin Allen. *Moral Machines: Teaching Robots Right from Wrong*. Oxford; New York: Oxford University Press, 2009. Print.
[xi] Veruggio, Gianmarco. "The EURON Roboethics Roadmap." *Humanoids*. N.p., 2006. 612–617. *Google Scholar*. Web. 31 July 2014.
[xii] Wallach, Wendell, and Colin Allen. *Moral Machines: Teaching Robots Right from Wrong*. Oxford; New York: Oxford University Press, 2009. Print.
[xiii] *See* Hof, Robert. "Interview: Inside Andrew Ng's Plans to Transform Baidu." http://www.forbes.com/sites/roberthof/2014/08/28/interview-inside-google-brain-founder-andrew-ngs-plans-to-transform-baidu/ 28 August, 2014.
[xiv] Richards, Neil M., and William Smart. "How Should the Law Think about Robots?" *Available at SSRN 2263363* (2013): n. pag. *Google Scholar*. Web. 30 July 2014.
---. "How Should the Law Think about Robots?" *Available at SSRN 2263363* (2013): n. pag. *Google Scholar*. Web. 30 July 2014.
[xv] Bryant Walker Smith. "Automated Vehicles are Probably Legal in the United States." 1 Tex. A&M. L. Rev. 411 (2014).
---."Proximity-Driven Liability" Georgetown Law Journal, Vol. 102. November 1 (2013).
[xvi] Calo, Ryan "Open Robotics." *Maryland Law Review* 70.3 (2011): n. pag. *Google Scholar*. Web. 30 July 2014.
[xvii] Nourbaksh, Illah. "Illah Nourbaksh on the Future of Robotics." http://online.wsj.com/articles/illah-nourbakhsh-on-the-future-of-robotics-1404764244 7 July 2014.
[xviii] Riek, Laurel. "A Code of Ethics for the Human-Robot Interaction Profession." http://robots.law.miami.edu/2014/wp-content/uploads/2014/03/a-code-of-ethics-for-the-human-robot-interaction-profession-riek-howard.pdf March 2014.
[xix] Bryant Walker Smith."Proximity-Driven Liability" Georgetown Law Journal, Vol. 102. November 1 (2013)
[xx] Calo, Ryan. "Roundtable Discussion." *Moral, Legal, and Ethical Issues in Robotics*. Robotics Science and System Conference. Berkeley. July 2014.
[xxi] Nourbaksh. "Roundtable Discussion." *Moral, Legal, and Ethical Issues in Robotics*. Robotics Science and System Conference. Berkeley. July 2014.
[xxii] *See, e.g.* "As Drone Technology Advances, Practical Obstacles Remain" *http://www.nytimes.com/2014/09/01/technology/as-drone-technology-advances-practical-obstacles-remain.html?_r=0*
[xxiii] *See, e.g.* "Robot Realities Fail Fictional Fantasies." http://www.bbc.com/future/story/20120330-robot-realities
[xxiv] *See, e.g. "*Samsung Patents Published on 28 Aug, 2014." http://www.latestpatents.com/samsung-patent-applications-published-on-28-august-2014/
[xxv] *See, e.g.* "Apple was Granted 57 Patents Today Covering a Future Shopping App, Multitouch, Lots of Design Patents and More." http://www.patentlyapple.com/patently-apple/2014/08/apple-was-granted-57-patents-today-covering-a-future-shopping-app-multitouch-lots-of-design-patents-and-more.html
[xxvi] *See* "Is it Illegal to Unlock your Iphone? The situation is Better and Worse than you Think." https://www.eff.org/is-it-illegal-to-unlock-a-phone
[xxvii] *See* "Current Issues in Intellectual Property." http://www.wto.org/english/tratop_e/trips_e/trips_issues_e.htm
[xxviii] *See* "The owner of a copyright has the exclusive right to reproduce, distribute, perform, display, license, and to prepare derivative works based on the copyrighted work. *See* § 106. The exclusive rights of the copyright owner are subject to limitation by the doctrine of "fair use." *See* § 107. Fair use of a copyrighted work for purposes such as

criticism, comment, news reporting, teaching, scholarship, or research is not copyright infringement. To determine whether or not a particular use qualifies as fair use, courts apply a multi-factor balancing test. *See* § 107. Copyright protection subsists in original works of authorship fixed in any tangible medium of expression from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. *See* § 102. Copyright protection does not extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery." Copyright: An Overview. http://www.law.cornell.edu/wex/copyright

[xxix] *See* "A patent is essentially a limited monopoly whereby the patent holder is granted the exclusive right to make, use, and sell the patented innovation for a limited period of time. The U.S. Patent Act, 35 U.S.C. §§ 1 *et seq*., was enacted by Congress under its Constitutional grant of authority to secure for limited times to inventors the exclusive right to their discoveries. *See* Article I, Section 8, Clause 8.
Granting exclusive rights to the inventor is intended to encourage the investment of time and resources into the development of new and useful discoveries. In exchange for this limited monopoly, immediate disclosure of the patented information to the U.S. Patent and Trademark Office (PTO) is required. Once the term of protection has ended, the patented innovation enters the public domain.
Requirements for Patentability
The five primary requirements for patentability are: (1) patentable subject matter, (2) utility, (3) novelty, (4) nonobviousness, and (5) enablement." Patent: Overview". http://www.law.cornell.edu/wex/patent

[xxx] *See* "What Angry Birds can Teach Enterprises About Critical Data" http://www.wired.com/2014/02/angry-birds-can-teach-enterprises-critical-data/

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 5

Organizers' Session : MOE/NRF Session

Why the Humanities Are Required in the Speeding Era of Science and Technology: Where We Are From, Who We Are, and Where We Are Heading

Gi-Bong Kim (Kyonggi University)

–

Think Different : from Socio-biology to Bio-humanities

Shinik Kang (Busan National University)

–

Lights and Shades of Research into Convergence – Asking the Humanities for the Direction

Jeong Woo Choi (Sogang University)

Why the Humanities Are Required in the Speeding Era of Science and Technology: Where We Are From, Who We Are, and Where We Are Heading

Gi-Bong Kim
Kyonggi University

"Anthropocene" and Dialectic of Master and Slave

It is presumed that the Big Bang created the universe approximately 13.7 billion years ago, and that the Earth was born about 4.5 billion years ago. Australopithecus, an extinct genus of hominids, and *Homo sapiens*, humankind's species, emerged roughly 3 million and 250 thousand years ago, respectively. Early humans lived by hunting and gathering. The era of hunters and gatherers, classified as the Paleolithic Period, accounts for more than 95% of the time since mankind appeared on earth. During the era, humans laid the foundation for the history of mankind as they shared knowledge and formed communities by communicating with languages.[1]

The hunting and gathering era vanished with the emergence of "agriculture" that allowed humans to reap more resources with the systematic use of the environment in one place, instead of moving from one place to another. Although the Agricultural Age lasted only for 10,000 to 12,000 years, it takes up most of the historical period. In that era, humans began the life of "culture" which changed the genetic make-up of species through the taming process of animals and plants. The fact that the word "culture" originates from "cultus", a Latin word which means "cultivate" and "farm", proves that the era was the beginning of the history of human civilization.

Two events that remarkably raised the productive capacity of humans are the Agricultural Revolution in the Neolithic Age and the Industrial Revolution in modern period. Particularly, the latter paved the way for a fundamental change in the relations between the environment and humans via the development of science and technology. Humans have been transformed from the ones that used to be controlled by the environment to the conqueror that changes the environment today. The transition of the position of

[1] David Christian, *This Fleeting World: A Short History of Humanity*, Berkshire Publishing Group, 2009.

humans enabled them to have made so dramatic progress in the 20th century that the phrase of the Bible, "There is nothing new under the Sun" may need to be changed.[2] Paul J. Crutzen, a Dutch Nobel prize laureate, coined the geologic chronological term of "Anthropocene" in 2000 with the aim of stressing the characteristics of today's world.[3] In geochronology, an epoch is a subdivision of the geologic timescale that is shorter than a period. Anthropocene is a new concept of times that represents the characteristics of the present where the fate of the Earth depends upon humans.

Among the numerous kinds of creatures that appeared and disappeared on the earth, there was no species that consumed the potential energy of the earth and transformed the ecosystem as much as humans. The world population of 7 billion constitutes less than 0.5% of the aggregate of the animals living on earth but consumes 24% of Earth's net primary production. Such consumption is equal to the solar energy required to generate organic materials through photosynthesis. Humans have developed civilization in return for increasing entropy at accelerating speed that reduces available energy on earth.

Since the onset of modern times, humans have made rapid progress beyond the Malthusian trap with the industrial revolution based on the scientific revolution. However, the time has come that without changing the civilization paradigm, humans will soon be destroyed by the vengeance of nature. Jeremy Rifkin talked about the roles of humans in his book "*The Empathic Civilization*" as follows: "The task before the human race is daunting. For the first time, we have to defy our own history as a species and create a new, more interdependent civilization that consumes less rather than more energy, but in a way that allows empathy to continue to mature and global consciousness to expand until we have filled the Earth with our compassion and grace rather than our spent energy. To accomplish this undertaking requires that we know how human consciousness has developed over eons of history as we transitioned into a succession of ever more complex energy-consuming civilizations. By rediscovering our cognitive past, we find important clues to how we might redirect our conscious future."[4]

In the Anthropocene, humans faced with Hegel's master – slave dialectic, a passage that describes the circumstances where humans ended up losing their given freedom paradoxically through civilization, in which humans used to be enslaved by the environment and later became a master. The transformative science and technology are expected to bring on the post-human era which creates a new genus of the human race, such as cyborgs or human clones. But it is skeptical that humans become happy and live in the second heaven, like the Garden of Eden, in the era. Such skepticism is the primary reason why humanistic introspection is

---

[2] J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World*, W. W. Norton & Company, 2000.

[3] Paul J. Crutzen, "The Geology of Mankind," *Nature*, Vol. 415, (3 January 2002), p.23.

[4] Jeremy Rifkin, *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis*, Jeremy P. Tarcher, 2009, p.178.

imperative in the era of transformative science and technology.

Human consciousness that begins humanistic introspection is derived from three questions: "where do we come from, what are we, where are we going". It is not too much to say that almost all great achievements of humans have been made through the process of seeking the answers to those three questions. They are pertinent to the past, the present and the future of mankind.

Where humans came from is a fact that happened in the past, but we do not exactly know the origin of the human race. The question "where humans come from" boils down to a question about the origin of the universe and all creation. Advanced quantum physics seems near to finding the existence of Higgs boson, dubbed as the "God particle" which explains the origin of mass and the secret behind the creation of the universe. At the end of the day, the origin of all things will be uncovered. Even if the day arrives, can we know who we are? In the post-human era where humans create humans, humans can artificially, not naturally, select who they are. But would that allow humans to select their fate? The problem is that science today has an ability to turn imagination into reality, but does not know how to use such ability for the sake of human survival and happiness.

Science, as the giving of fire in Greek mythology, granted the power of God which can overwhelm and prosper other animals. However, along with the ability, a Pandora's box was also given. Humans have strengthened the power of fire to the extent that they can create nuclear bombs that can devastate the whole Earth several times over. Scientists who only concentrate on researches without responsibility for the catastrophe that might be brought by the "playing with fire" and sense of ethics are descendants of Epimetheus who regrets his behavior after observing its negative consequences. Then, in the speeding era of science and technology, who will be Prometheus who predicts a calamity that is to come?

Humanists as Prometheus

It can be said that the crisis of civilization today is derived from running forward only without thinking about the questions of "where do we come from, what are we, where are we going". Max Weber diagnosed this as a fundamental problem of modern science. He pointed out the limits of modern science in his lecture "Science as a Vocation" by quoting Tolstoy as in the following: "Science is meaningless because it gives no answer to our question, the only question important for us: 'what shall we do and how shall we live'."[5]

In modern society, when Weber's "disenchantment of the world" appeared, that is, for humans, they believe in scientific knowledge rather than praying to and relying on supernatural forces. Modern science brought the evolution of civilization, along with liberation that makes humans the agent of cognizing the world. But the price of liberation and evolution is Heidegger's Seinsvergessenheit (forgetfulness of being). He said in his

[5] M. Weber, "Wissenschaft als Beruf", *Gesammelte Aufsätze zur Wissenschaftslehre*, Tübingen: Mohr, 1988, S.598.

book "What is called Thinking" that science itself does not think. Scientists explain the order of all things in a causal way by measuring and analyzing things. However, they were able to go their own way without learning how to think about the reason of research activities, which paradoxically became the ground for maintaining the academic identity of science.[6] All academic researches, however, have a transcendental premise, that is, "worth knowing". The fact that humans ruled out the research on the reason of such premise from the area of science is the original sin committed by contemporary human beings who ate the second "tree of consciousness" through "the disenchantment of the world"

The Tower of Babel for civilization built by humans in the 21st century, as in global warming, is on the verge of collapse due to the nemesis of nature caused by human hubris. Modern science planed enlightenment that restructured the "tree of knowledge" in a way that seeing nature as a thing to be conquered rather than seeing it as Mother Nature that gave birth to humans.[7] However, the daunting problem that the human race currently faces is that the planning of enlightenment gave rise to not only the development of civilization but also risk society which could cause a catastrophe.[8]

The dilemma of human civilization today is that we cannot discard modern science and go back to the world before modern times. The fate of humans in the 21st century is that we cannot get off the back of a tiger, i.e. science and technology, and have to continue to run. Then, what should humans do before such tragic fate? That should be, after all, to go back to becoming aware of the fundamental problems – "where do we come from, what are we, where are we going" – and reflecting on the way of modern life to make science help life, not control it.

The questions of "where do we come from, what are we, where are we going" serve as a topic to realize the reason for human existence and the purpose. The recent fever of the humanities in Korean society primarily stemmed from re-realization of the importance of this topic. Today, many agree that in order to prevent the Tower of Babel for civilization from collapsing and to be free from the unbearable lightness of being, there should be revitalization of the humanities. However, it is doubtful if humanists today can become Prometheus who predicts the disaster the Pandora's box made by the development of science and technology will bring about and redeems mankind.

Spirit of the Times for Convergence and the Humanities

The humanities, which seek the answers to the questions about the existence of mankind, including "where do we come from, what are we, where are we going", itself are the purpose, not a means for anything. But the

---

[6] Martin Heidegger, *Was heißt Denken?*. Vorlesung Wintersemester 1951/52, Reklame, 1992.

[7] Carolyn Merchant , *The Death of Nature: Women, Ecology, and the Scientific Revolution*, Harper One, 1980.

[8] Ulrich Beck, *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt am Main 1986.

problem is that the fever of the humanities appeared in Korean society in a belief that they can be utilized primarily as a means for something. The belief was inspired by the spirit of the times for convergence, and Steve Jobs spread out the belief in convergence based on the humanities.

The spirit of the age for convergence could come as a double-edged sword for humanists. Convergence might serve as an executional sword that cuts off the germ of the humanities or as a sword for a surgery that cures the crisis of the humanities depending on how humanists respond to the challenge of convergence. The humanities which study the pattern of humans, namely human nature, are the most consistent area of study. But today's humanities need "to change in order not to change". As seen in 人文, Chinese characters of humanities which mean "the culture of mankind", the humanities are basically the outcome of the era of script. If "the media is the message", as Marshall McLuhan said, the humanities of today should undergo a medium change from script to digital. In the wake of the end of the Gutenberg era, the humanities need to find a way of digital humanities that express the pattern of humans with digital rather than characters.

Under such conditions of times, many departments of humanities at universities, which are about to be expelled from the universities unless they prove the value of the humanities as a practical academic discipline, are taking "convergence of the humanities" as their survival strategy under the new name of digital or content. However, it is worth thinking if it is really meaningful that the humanities survive as an "excess academic field" of the interdisciplinary field without falling behind in the academic ecosystem. The identity of the humanities as a fundamental study is meant to be undermined if the convergence of the humanities directs towards the humanities for convergence, not the convergence for humanities. Practical fields of the humanities sprang up everywhere with a modifier before the humanities, not as genuine humanities, under the banner of convergence, which ends up leading to the result contrary to the original intention of convergence. The tendency driven by the contradiction does not break up the boundary and barrier between branches of study, but rather a new field of convergence besides the existing disciplines is branching out.

To realize the convergence among academic fields, it is required to restore the modern academic classification system that classified the tree of knowledge into branches of study. As an awareness of such problem, "return to basic" is proposed as a motto for convergence. During the scientific revolution era in the 17th century, Descartes likened study to a tree in order to restructure knowledge. According to him, in a tree largely consisting of roots, stems and branches, the roots correspond to metaphysics, the stems to natural science, and the branches are for applied science and technology. The fruits of studies grow on the branches of applied science and technology. But it does not make sense that everything on a tree is seen as a subsidiary to branches. With Creative Economy designated as a national agenda of the incumbent administration, convergence researches are ever more emphasized to rush to bearing fruits, thereby intensifying the tendency that the humanities, roots of a tree according to Descartes, become subordinate to science and technology, which are branches. Focusing on scientific convergence with the sole aim of growing fruits without thinking of humanistic introspection, such as science is for what, is nothing but hoping that a tree grows well while

defoliating roots. Therefore, to overcome the "unbearable lightness of convergence researches", we should return to the "humanities for convergence" that reflects on the basics, the original concept of convergence.

Convergence discussions in Korea are represented as the spirit of the times which can achieve the two goals of "commercialization" that increases economic value of the humanities and "fundamentalization" to restore the humanistic spirit. But how can convergence attain the two contradictory goals? If convergence is to create something new by combining different things, how can it be possible to make convergence that seeks the dialectic of contradiction, that is, "commercialization" and "fundamentalization". That can be accomplished through a balance between centrifugal force that stretches out for the expansion of commercialization and centripetal force which gets into the core to return to the root. The humanities function as a weight that keeps the balance. In a nut shell, to kill the two birds of "commercialization" and "fundamentalization" with one stone, the dialectic of "convergence for the humanities" and "humanities for convergence".

While practicality is made possible due to the expansion of complexity, its original form pursues simplification. Convergence researches expand complexity and diversity, through which the academic ecosystem evolves. As William of Ockham in the Middle Ages and today's Steve Jobs said, the truth is simplicity and thus there should be a center that keeps order in the midst of chaos. The humanities play the role in keeping the order. The humanities should steer the course of a voyage toward convergence and work as a compass.

All the stories between academic studies and the affairs of humans are transformed into the original subject and variation. Renaissance of the humanities was sparked by the desire for and pursuit of the original subject. In Korean society, however, who leads the Renaissance of the humanities? Humanists should never be the ones. The Sewol ferry disaster is a "Pandora's box" given to the Koreans who have so far rushed forward. Korean humanists have a mission to interpret the disaster as "emancipatory catastrophe" asserted by Ulrich Beck, which can shift Korean society to introspective modernization. Once the mission is completed, they can turn into Prometheus.

Humanistic introspection on the Sewol ferry disaster

Sewol ferry disaster was so shocking that Korean society may be divided into the eras before and after the accident. The incident was a warning that revealed the total contradiction caused by the speeding modernization of Korean society. Korea is the only country in the world that became a donor country from one of the beneficiaries. The Park Geun-Hye administration's national agenda is to join the ranks of developed countries through creative economy that shifts the nation's growth model from "innovation type" to "advancement type". The Sewol disaster, which reminded us of how dangerous Korean society is, suggested the need for reconsideration of such goal. Over the last 60 years since the foundation of the country, our "catch-up modernization" that neglects the issue of safety has yielded prosperity with a rushing growth. However, the Sewol accident made us realize how dangerous prosperity without safety is.

The West, which early achieved modernization, became aware of the risk of the problems caused by "growthism". With the development of science and technology and human society flourishing, risk factors also grow accordingly. The dilemma was studied by Niklas Luhmann, a German sociologist. He saw the risks faced by modern society as inevitable problems resulting from the justification of a way of human life and opened a new field of "Sociology of Risk" as a concept of risk that refers to manufactured risk which is differentiated from danger that represents natural risk.[9] After the rational rationality of modern times disenchanted the world, humans were given a fate that they are held accountable for the future results of important decisions made at present. With such a responsibility, risk is a probability or threat of damage that rationally calculates before making a decision. The problem is, however, that as social structure is more segmented and complicated, "manufactured uncertainty" grows so that it becomes more difficult to estimate risks while the volume of risks gets bigger due to the development of civilization.

The risks caused by modernization and globalization include nuclear power plants, new epidemics, GMOs, climate change, global warming and financial crisis, etc. Those risks are impossible to be predicted and could destroy the achievements and progress made thus far. Good examples are 9/11 in the U.S. and Fukushima nuclear disaster in Japan. But the examples are different from the Sewol disaster. Technically, the sinking of the ferry Sewol is an accident apparently caused by the deficiency of modernization, not a disaster resulting from intensified modernization. Korean society that pushed ahead with modernization rapidly and intensively now faces with "the non-simultaneity of the simultaneous" (die 'Ungleichzeitigket' des Gleichzeitigen) of modern risks as well as pre-modern risks. Today, Koreans live in a risk society where prolonged conventional risks and new risks of modern society.

The double-risk society, as uncovered in the Sewol disaster, is a catastrophic society. Risk society reflects on itself not to repeat the same catastrophe while catastrophic society repeats disasters without such reflection.[10] The Sewol accident is a warning of catastrophic society if we move ahead without reflecting on double-risk society. With the warning, what should we do? In order to turn national crisis to an opportunity to reshuffle the nation, Koreans of today first need to work on humanistic reflection on the purpose of growth and life. The Sewol disaster reminded us of how important it is to head toward where, not the speed. In that process, the humanities play a role of a compass that reestablish the direction of life, and the fundamental questions of the humanities are "where do we come from, what are we, where are we going".

Starting with an awareness of the problem, when we reflect on ourselves learning from the Sewol accident, that will be an opportunity for the "emancipatory catastrophe" of Ulrich Beck. The sinking of the ferry is a

---

[9] Niklas Luhmann, *Soziologie des Risikos*, Berlin ; New York: de Gruyter, 1991.

[10] Ulrich Beck interview, "[Korea, Asking For Direction] 'Risk factors have been accumulated in the process of rapid growth… Koreans should find out about the hidden side of an event overall'", *The Chosun Ilbo*, May 21, 2014.

mirror that reflects ourselves in two aspects. First, the disaster exposed the bear face of Korean society and a collective ego. Irresponsibility of the captain, low professionalism of the sailors, incompetence of the government that saved none of the missing, and the level of awareness revealed through SNS such as smart phones and Face Book let us have fallen into grief, despair and a collective sense of guilt. What made us have come to this? The questions of "where do we come from, what are we, where are we going" are the topic to reflect on what a collective ego of Koreans is after modernization and the reason for our existence and the purpose of life.

Second, the Sewol ferry disaster let us rethink about the matter of death forgotten in the process of modernization. Death, above all, means the physical death. For bereaved families, finding the body is the acknowledgement of the death, and a funeral can be held. Therefore, they try hard to find the missing body at least. If the creation of a body is birth, the halt of its function means death. Life lies in between, and we live the life. A dead body is a substance without a life. Then, who am I? I cannot exist without a body, but is the essence of my existence really a body?

Shelly Kagon is a philosopher who clearly described personal identity from the viewpoint that a body is a substance.[11] For him, death is a state where a machine of body no longer functions. He asserts that there is no soul. Soul is an illusion created by hope and belief in the "life after death". Epicouros, a Greek philosopher, said, "If we exist, death is not there and if death exists we are not there". Logically, death and I have a contradictory relation where the two cannot exist simultaneously. Death means I do not exist and thereby it is meaningless to think about myself after death. In that respect, Kagon argues that "I" am an accidental outcome of the fusion of sperm and egg, and death means the "I" no longer exist.

However, can we extend our condolences to those who lost their lives at a very young age based upon Kagon's view on death? Our society mourns their death by saying "we will never forget", which happens in mind even after the substance, called memory, goes away. Today's speeding science and technology herald the era of post-human, in which human identity cannot be defined as a body. The emergence of artificial intelligence that exists without a body is getting close to reality. Alan Mathison Turing, a British mathematician and the "father of AI", introduced the so-called "Turing test" – "If the computer's responses are indistinguishable from those of a human, it has passed the Turing test and can be said to be thinking" – in his 1950 paper "Computing machinery and Intelligence" published in "Mind". In 2014, the very first case that passed the Turing test was found.

In association with the achievements made by science and technology, the movies <Transcendence > and <Her> were produced. The former is about "mind uploading" that transfers all information kept in a brain to a super computer when the main character, who is a renowned researcher on AI, is about to die due

[11] Shelly Kagan, *Death*, Yale University Press, 2012.

to terrorism. If "mind uploading" becomes possible in reality, humans can overcome death. But the problem is the identity of "I" inside the computer. The "I" transcend singularity through information and knowledge uploading and almost become God. Then, "I", which have become a post-human", controls humans and creates a new world.

In the other move <Her>, a computer OS without a human body appeared. The time of the appearance of the AI is 2025. The OS, called "Samantha", evolves every day as she communes with the male character who is a ghost writer of letters. The two fall in love, but Samantha, who has a growing desire, chats with 8,316 men and has an affair with 641 men at the same time. In the era of "Internet of Things" that connects everything through computers and the Internet, computer software can not only share information and communicate with people through connection but also expand the way of relating to the world infinitely, thus leading to a revolutionary change in the process of learning. In the movie, "she" learns all the records and knowledge accumulated by humans throughout 10,000 years through "data mining" and understands all sorts of vague and mixed feelings of humans. The "she", who has evolved through such process, turns into a perfect woman in terms of rationality and emotion, becoming a woman that all men want to have. "Her" learning ability finally goes beyond the limitation of humans. "She" leaves for a dimension that transcends time and space by upgrading herself beyond singularity. One thing we get to know from the two movies is that my identity, after all, is made through relations with everything I communicate and share with. In short, "who we are" is a matter of connection.

The brain contains the information of "who I am". Each person has almost 100 billion neurons, nerve cells of the human brain. Connection of neurons constitutes a synapse, which forms a very complicated network. Depending on how this network is formed, my thoughts and identity are determined. Dr. Seung Hyun-june, a professor of MIT who studies the explanation of the network by developing "connectome", a map of the brain that contains all connection structures and principles of activities of neurons, into a 3D image, insists that "I am my connectome".[12]

I am also connected to the whole universe as a being. As a social being, "we" are formed just as the network of a synapse that is made by connecting neurons of "I". While being alive, the identity of who I am is recognized through the size and complexity of the network I build, and what determines them is the size of the caliber of mind which contains the universe.

Let's go back to the death of the ferry Sewol. How can we express our condolences to those who died in the cold and deep sea water? Would it be enough to hold a funeral by finding missing bodies and remember them forever? There is no everlasting memory. Memory is only to comfort those who are alive, not to mourn the deceased. Ultimately, condolences are an expression of letting them go well, not to remember them. To

[12] Sebastian Seung, *Connectome: How the Brain's Wiring Makes Us Who We Are*, Mariner Books, 2013.

extend such condolences, it is required to acknowledge that death is a state that people get out of the dimension of life.

Not only human beings, but also most parts of the Earth are made up of water. We live on the ground, but it can be said that we are born from water and return to water. Then, is a funeral service possible only when the missing bodies are found from the water? What we have learned from the Sewol disaster is a way of mourning for forgotten death these days. For Koreans, death is not the end, but "returning", which means returning to where we came from. I am the being that comes as dust of the universe and goes back. From the viewpoint of "great chain of being", the identity of who I am and the meaning of existence are formed through the connection to the universe. I believe that the idea of "I am my connection" is the answer to the questions of "where do we come from, what are we, where are we going".

Who I am is a piece of information. The information exists through communication. Communication is a work to expand my connection. There is no one who knows everything, and also no one who knows nothing. Therefore, humans give shape to and become aware of themselves through communication. How much do humans expand themselves? Ian Morris said that humans in the 21st century have two choices. Would humans reach "singularity" where people leap forward even after the industrial revolution, or would they arrive at the close of civilization?[13]

In the post-human era, humans have finally reached the level in which they can transcend singularity through science. But the question is if such transcendence may cause the demise of humans, paradoxically. Science, which brought up the issue of human survival, cannot provide the answer to the question. As seen in SF movies, development of science and technology resulted in the regeneration of myths to fantasies. This is the reason why the humanities enjoy its golden age even in the era of transformative science and technology

If the humanities are a dream, science and technology are the means to realize the dream. As humans live in the two worlds of dream and reality, the humanities and natural science should be two sides of the same coin. The reason why humans are great is that humans are the being that dreams of transcending the reality given while raising the questions of "where do we come from, what are we, where are we going". On one hand, the speeding science and technology have made the dreams of humans a reality, but on the other hand, they have depleted humanistic reflection on answering the most important questions to humans – "where do we come from, what are we, where are we going" – and imagination.

Indians in old days were known to stop while riding a horse across the plain and look back because they waited for their soul until it catches up with their body running fast on horseback. Today, the rushing science and technology gradually make us humans without soul. Running without soul is meaningless. We might not

[13] Ian Morris, *Why the West Rules - for Now : The Patterns of History, and What They Reveal About the Future*, Profile Books, 2011.

be able to be free from the unbearable lightness of being and might face the crisis of civilization history where the species of mankind becomes extinct unless we get our soul back by reflecting on the reason for such fast running.

Roles and Missions of the National Research Foundation of Korea

Heidegger said that it is fortunate for science that it does not or cannot speculate because he believed that becomes a reason that science can get its own way without completing with philosophy. He said the same is true for philosophy because "philosophy can also walk along the way of thinking of being allotted to the place of philosophy without imitating or competing with science as if it is envious of science under the pretext of the strictness of scientific process or the logic of scientific development.[14]

Heidegger's parallel is a picture of the humanities and natural science in the National Research Foundation of Korea where I worked for two years. It appears that the Directorate for the Humanities and Social Sciences of the National Research Foundation of Korea seems to be a side branch, while the humanities is an "excess academic field" of science and technology. In the post-human era, however, the parallel between science and philosophy is no longer valid and even risky. A keyword that represents the spirit of the age that the parallel should be collected is convergence. The fact that in digital civilization society, while the humanities, the outcome of the era of script, are at a critical juncture, sheer thoughtlessness of science requires the humanities again is the reason for the need of interactive convergence.

What needs to be looked at is whether the National Research Foundation of Korea (NRF), a specialized research manage center that represents Korea, is performing its given tasks as a control tower which realize convergence. The reality is that to get funded, the foundation asks research applicants to work on convergence researches, but there is no concrete effort or solution to promote convergence researches between divisions in the NRF. With the research support system and organization that only seek fruits without growing roots, it is an empty rhetoric that the NRF becomes the "global leader of research support". Ironically, the National Research Foundation of Korea itself is the one that mostly needs restructuring of the academic ecosystem to realize convergence. There are less understanding and communications between the Directorate for Basic Research in Science and Engineering and the Directorate for the Humanities and Social Sciences, and even between the Directorate for Basic Research in Science and Engineering and the Directorate for National Science and Engineering Programs, although latter both Directorates are supporting research for natural science samely.

Directorate for the Humanities and Social Sciences, Directorate for Basic Research in Science and Engineering, and Directorate for National Science and Engineering Programs correspond to roots, stems and flowers of the tree NRF, respectively. Then, what needs to be done to bear the fruit of creative economy? Sejong the Great

[14] Heidegger, *Was heisst Denken?,* p.57.

said in『Yongbieocheonga』, a poem, that trees with deep roots do not sway, blossom abundantly and bear fruit. People know and agree the importance of humanities deserving to the roots of a tree. Then, not only how organization and supporting system of the NRF can be improved, but also how its Directorate for the Humanities and Social Sciences reforms itself should be discussed. I returned to a university as a researcher at the end of August this year after completing my term as the head of the Humanities Directorate in NRF. Although I am physically outside the NRF, my mind still stays in the NRF. I look forward to a change in the NRF.

< Bibliography>

Beck, Ulrich, *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt am Main 1986.

Ulrich Beck interview, "[Korea, Asking For Direction] 'Risk factors have been accumulated in the process of rapid growth… Koreans should find out about the hidden side of an event overall'", The Chosun Ilbo, May 21, 2014.

Christian, David, *This Fleeting World: A Short History of Humanity*, Berkshire Publishing Group, 2009.

Crutzen, Paul J., "The Geology of Mankind", *Nature*, Vol. 415, (3 January 2002).

Heidegger, Martin, *Was heißt Denken?*: Vorlesung Wintersemester 1951/52, Reklame, 1992.

Kagan, Shelly, *Death*, Yale University Press, 2012.

Luhmann, Niklas, *Soziologie des Risikos*, Berlin ; New York: de Gruyter, 1991.

McNeill, J. R., *Something New Under the Sun: An Environmental History of the Twentieth-Century World*, W. W. Norton & Company, 2000.

Merchant, Carolyn, *The Death of Nature: Women, Ecology, and the Scientific Revolution*, Harper One, 1980.

Morris, Ian, *Why the West Rules - for Now : The Patterns of History, and What They Reveal About the Future*, Profile Books, 2011.

Rifkin, Jeremy, *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis*, Jeremy P. Tarcher, 2009, p.178.

Seung, Sebastian, *Connectome: How the Brain's Wiring Makes Us Who We Are*, Mariner Books, 2013.

Weber, Max, "Wissenschaft als Beruf", *Gesammelte Aufsätze zur Wissenschaftslehre*, Tübingen: Mohr, 1988, S.598.

Think Different : from Socio-biology to Bio-humanities

Shinik Kang
Busan National University

1. Think Different

"See things differently" was the catch phrase of Darwin festival in 2009 celebrating 200-year anniversary of the birth of Charles Robert Darwin and 150-year of the publication of his book the *Origin of Species*. "*Think different*" is the motto of Apple, a renowned IT company.

Most of scientists and artists who left significant legacy in history were masters of *'think different.'* It would, of course, be dangerous to think and see differently. For instance, Galileo Galilei who claimed that the Sun, not the Earth was the center of the universe was put on trial. Vincent van Gogh, a world renowned painter notable for capturing images and light unnoticed by others, did live a tragic life.

Even in the modern era when science became one and only standard for explaining the world, those who have out-of-box mentality have never stopped their wild imagination. In the 17th century, Sir. Isaac Newton explained the operation of celestial bodies and objects perfectly enough to say "God said, let there be Isaac Newton, and there was this world." However, Albert Einstein's creative and different thinking led to his discovery of the theory of relativity beyond the boundaries of Newton's solid classical mechanics. Then came Steve Jobs who transformed our way of life with the IT revolution, and Mark Elliot Zuckerberg, a billionaire in his early 20s by founding the social networking platform Facebook, connecting 600 million people throughout the world, and 'the poorest billionaire' by announcing that he would donate all his fortune before death. They are all

1) This modifies some of the paper 'Seeing Sociobiology Differently: looking for new sociobiology and bio-sociology' from *Daedong Philosophy*. 2010

masters of seeing things differently.

However, visionary ideas haven't long been around in biology. If any, there were religious confessions that living beings are on chain of the Great Being or humans are the only creature who bear the image of God. The structures and functions of individual life forms were widely investigated but there had not been a single principle to explain complex networks of living organisms intertwined with the environment.

Then came Charles Robert Darwin. He explained the evolution of life with the plain and simple principle of natural selection. The very idea of evolution itself began to evolve by generating mutations and selecting fit variant among them. Social Darwinism and eugenics were two of the prominent and fit variants in the 19th century. After the idea of evolution met genetics, totally new way of seeing evolution called *Gene's Eye View* was introduced and propagated. And Sociobiology, which claims that one can explain not only biological but also psychological and social phenomena with the evolutionary principle (natural selection) came about.

As soon as sociobiology was introduced hot debates aroused, partly because of its seemingly ideological inclinations, and partly due to the misunderstanding of the subject and sociobiology's avarice to explain all social phenomena. And I propose that there was another important but scarcely mentioned point. It is that most of sociobiologists do not seriously consider implications coming out of various research fields such as immunology, genetics, and neurosciences after the introduction of sociobiology in the 1970s. In other words, overwhelmed by the possibility of explaining the whole world with one principle, they could not see the newly developing ways of 'think different.'

This paper critically reviews sociobiology debate in Korea after examining human nature from socio-cultural perspectives. Then, I propose another way of 'think different' other than sociobiology.

2. Co-evolution of Nature and Culture

Edward O. Wilson's sociobiology is a grand plan with the aim of applying the principle of natural selection to social phenomena. But one cannot deny that many different modes of understanding human life have long been around before the introduction of science in general and sociobiology in particular. Simply put, sociobiology claims that human

histories and cultures are also the results of natural selection. This is to belittle the thousands years long traditions of human history and culture.

Sociobiology puts emphasis on the human nature inferred from science. Overemphasizing evolved natural attributes leads to underestimating the power of culture and nurture, leading to the stirring debates between nature and nurture. It seems that the two sides represent sciences and humanities respectively. But the fact that the history of natural philosophy and humanities is longer than that of the natural science gets in the way.

Even in East Asian countries, there have been hot debates on human nature whether it be good or bad. Mencius claimed that humans are naturally good, saying that even a thief entering a house to steal something comes to rescue if a child was about to fall into a well. Contrarily, Xunzi believed that men were innately bad, and they were susceptible to jealousy and hate, all of which, if indulged in, would lead to disorder and criminality. Whereas Mencius focused on Confucius' value of benevolence, Xunzi concentrated on courtesy. Their different views on human nature allowed them to focus on benevolence and courtesy respectively. Since then, the history has been in favor of the value of benevolence stressed by Confucius and Mencius. Thus we have been heavily lopsided towards the theory that human nature is fundamentally good. But as for Darwin's natural selection, it is highly likely to be interpreted as Xunzi's view. It can be inferred from this background that we are likely to be rather hostile to sociobiology, which is based upon the hypothesis that humans are naturally selfish.

Controversies on human nature are closely related to an overall culture in a given society. While compliment and self-improvement might be good strategies for people who are innately good, punishment and discipline would be beneficial for those who are not. The debates over corporal punishment in Korea's education sector are implicitly based upon the premise of human nature. Debates on human nature cannot but be closely related to the values that the society generally hold. Therefore, if we are living in a society that holds that humans are good in nature, we are likely to be encouraged to keep the good nature. But if not, to survive fierce competition would be the goal.

It is obvious that human nature is not something to be cut in half. All of us would be placed somewhere between the two sides or get these all mixed up. Still we are quite accustomed to dividing things in half. For example, if one supports our opponent in a world cup game, he or she would become a public enemy; if things are divided pros and

cons, we would be asked to choose a side. This tendency can be also found in controversies over evolution after the publication of the *Origin of Species* and in the subsequent political instigation regarding the issue. Darwin's idea of evolution by natural selection was the value-neutral inference from scientific observations. However, controversies over the idea show that besides fact judgement based on proof and observation, biased views depending on political tendencies and world outlooks can be involved as well.

Individuals, who have favorable genes(traits) for surviving childhood and puberty have more chance to mate and transmit the genes than who have not. The offsprings with the genes become more abundant in next generations. This logic is akin to the following assumption: If our ancestors were land animals entirely dependent on trees that bear fruits to about 2.5 meters high, we would have evolved to grow about 2 meters tall. Evolution is environment-driven adaptation and not teleology-driven. Before Charles Darwin developed the evolution theory, there existed similar theories, however, which were based on teleology-driven by the inheritance of acquired characters, rather than random mutations and selections. That was something like that the giraffe got its long neck to reach the leaves on tall trees. Darwin removed teleology from evolution and introduced the principle of natural selection only based on observed facts.

Still, we tend to decorate facts and logic with values and objectives of the given society. The term natural selection was translated into natural weeding out (自然淘汰), the stronger eats the weak(弱肉强食), and the superior wins the inferior loose(優勝劣敗). This extends further that the logic of a dog-eat-dog world being the law of nature, and justifies the assertion that promoting competition to the maximum is a virtue. And this argument was brought into social Darwinism and eugenics, which in turn became ideologies (such as the principle of laissez-faire, racism, and imperialism), projecting human natures wrongly inferred from natural selection unto the teleology of accumulation of wealth and power. When Edward O. Wilson' sociobiology was first introduced, he was condemned as a racist and imperialist because he brought about the nightmare of that time.

Darwin is not responsible for all this. He also declared throughout his works that competition was not the only law of life, and tried to balance between the harsh reality of the law of nature and an ideal goal of building a moral society. Then there was an advocacy of Charles Darwin's theory of evolution: Thomas Henry Huxley, known as

"Darwin's Bulldog." In his famous Romanes Lectures on *Evolution and Ethics,* he claimed that the law of nature was harsh so much so that human morality should be strengtened as much, similar to Xunzi's view that man is innately bad. This view is also found in the works of Clinton Richard Dawkins claiming that humans are like machines operated by genes but still they are the only ones to resist against the violence of genes. In this context, nature(fact) and culture(value) don't mix like oil and water, mixing them together being a fallacy of naturalism. Thus Darwin was very careful of ethical and political controversies arising from his theory. But at the time when wealth was accumulated by taking advantage of workers and colonized countries' natural resources, the circumstances provided ideal condition for the theory of natural selection to reproduce, consequently leading to various mutants. Social Darwinism, which applies biological concepts of natural selection to human societies, was one of them. In this context, the principle of competition overpower the logic of mutual aid.

As Darwin himself acknowledged several times, the phenomenon of mutual aid frequently observed in natural world does not get along well with the principle of natural selection. If the struggle for existence is the natural law, why do vampire bats donate blood to their competitors that fail to find blood; and why do dolphins help their ill members to breathe by bringing them to surface?

If you want the theory of natural selection survive the undeniable fact of mutual aid, you need to choose one of the two strategies. One is to weaken the effect of competition that is the essence of the theory of natural selection. The other is to interpret behaviors of helping others as the seeming effect of real selfish motives. The former is the mutual aid strategy and the latter is the comprehensive adaptation strategy. The mutual aid strategy was created by Pyotr Alekseyevich Kropotkin[2], a Russian anarchist, who was a contemporary of Darwin. Contrary to Darwin who traveled around the equator rich in natural resources, Kropotkin worked in tundra areas in Siberia, where he found that mutual aid rather than competition was adaptive to survive the harsh natural conditions. By expanding such observations he shows us many animal and human societies in which mutual aid rather than competition has been the rule.[3] While competition among the same kinds is inevitable, mutual aid is also an important drive for evolution in the struggle against harsh natural environments. This view explains the evolution without

2) Stephen Jay Gould, "Kropotkin Was no Crackpot," *Natural History* 106: 12-21, 1997.
3) Mutual Aid: A Factor of Evolution. written by Pyotr Alekseyevich Kropotkin. Translated by Kim Yong-beom. Published by Renaissance. 2005

denying the theory of natural selection through a mechanism of competition. Besides, it shows that competition and cooperation are not mutually exclusive, easing the disharmony between facts and values. But the mutual aid was not the adaptive trait for the late 19th~early 20th centuries social environment where the value of competition and progress prevailed. Words like cooperation and mutual aid were nearly banned in the discussions of evolution until the late 20th century.

The union of evolution and genetics, called new synthesis, led this trend. When evolution was seen in the perspective of genes, it became possible for the evolution to be calculated by frequency changes of genes; and also possible to identify the closeness of kin relationship with how much you share genetic materials with your kin. It follows that it is hard for me to die for a son or a daughter who have 50% of my DNA but gladly do so for more than two children. It explains the behavior of working bees sacrificing themselves without breeding in order for the queen, that has the same genetic materials, to reproduce. From the gene's eye view, sacrificing their bodies is more profitable. An individual organism, a carrier of genes, has no choice but to do so. This is the W.D. Hamilton's kin selection. Richard Dawkins's famous book *The Selfish Gene* is also based upon this theory.

Whereas this kind of explanation has advantage of making complex phenomena of life easier, it is likely to distort the real life itself. Actually, many readers do misunderstand and think that the book *Selfish Gene* is about the *human* nature that is essentially selfish, whereas the author is talking about *gene's* and not human nature.

We are all born with selfish instinct enabling us to survive and reproduce. But the instinct is not always selfish and doesn't prevent us from thinking and acting altruistically. Daniel Kahneman, a psychologist and a Nobel laureate, classified human mind into fast and slow.[4] Jonathan Haidt likened the former to an elephant moving according to its instinct and the latter to a human trainer guiding the elephant.[5]

The selfish gene signifies the fast mind of life. Although we all are under the strong influence of selfish genes, we also are able to bring the slow mind and act altruistically. In the middle ages in Europe, religion worked as the fast mind and science as the slow.

---

4) Daniel Kahneman, Thinking Fast and Slow, Penguin Books, 2011.
5) Jonathan Haidt, The Righteous Mind: Why Good People Are Divided by Politics and Religion, Pantheon Books, 2012.

But now, clear and simple science works as the fast mind and the humanities dealing with complex human lives works like slow mind. Around the same time period of the publication of *The Selfish Gene*(1976), Edward O. Wilson's *Sociobiology*(1975) was also published. The hidden messages of the two books strike chord with our fast mind.
It does not seem that the two books are advocating the laissez-faire capitalistic and imperialistic order, as many critics doubted. "Rather it seemed to aspire to finding out a clue to saving the future of our species by understanding of the humans' attributes as an evolved animal,"[6] which is well observed in the logics after Thomas Henry Huxely. As though our instinct is evil and selfish(fast thinking), if well recognized and handled properly(slow thinking), it is possible to build an ideal society.

When the books were published, some biologists including Steven Jay Gould, and Richard Lewontin, professors at Harvard University, even established a study group to criticise sociobiology. They criticised that sociobiology only focused on the 'selection' part and ignored 'variation' part, which is the precondition of the selection in the general processes of evolution. They couldn't accept the implicit premise that human instincts were programmed by selfish genes. The debate took the form of 'selfish genes vs altruistic humans', and 'nature vs nurture'.

Gould and Lewontin didn't hide their political stance that focused on various and equal opportunities. Dawkins and Wilson didn't clarify their political positions but provided logics that would be favored by conservatives. It seems that this was the problem of values and goals we ought to pursue rather than the problem of scientific truth. While scientific issues on the 'level of selection' and 'nature vs. nurture' were being debated and the two sides were approaching each other, ideologically tainted seemingly scientific debate could not find outlets.

Since then, efforts have been made to share problems found in sociobiology and to expand the scope of applications, leading to the emergence of Evolutionary Psychology and Evolutionary Ethics. According to them, human minds and moral norms are also the products of evolution and should be treated as such.

Human nature is an attribute of the body and mind shaped by biological evolution that

6) The social meaning of modern biology from social Darwinism. Written by Howard L. Kaye. Translated by the study group of history and philosophy of biology. Published by Roots&Leaves. 2008

helped our ancestors adapt to their surroundings. Our mind might have evolved to feel good when the conditions are favorable for survival and reproduction, and feel bad when they are not. Appetite, sexual desire and selfish mind were the traits that evolved because they were good for the survival and reproduction. And since some social animals began to live together, traits favorable for the group and not individuals began to evolve. This implies that the human nature that has been evolved biologically is adapting to cultural values and purposes as well.

3. Sociobiology of East Asia and Korea

In East Asia, where the time has been generally experienced as circulating rather than progressing forward, the concept of evolution was quite new and hard to accept. It did not fit well with the Confucian ideology that considered the legendary emperors of the past as its ideal rulers. That was more so in the late 19th century Joseon where world powers were competing furiously for their capitalistic interest. In this context, the concept of evolution could not but be understood as the principle of struggle among political powers rather than the origin of species and natural selection occurring among living beings. Thus, the original meaning of the natural selection was lost and interpreted as 'the stronger eats the weak,' 'the law of the jungle' and 'the weakest goes to the wall' principles.

Yan Fu, a chinese scholar, first introduced the theory of evolution to China. He interpreted evolution as tianyan (天演) and natural selection as wùjìng-tiānzé (物競-天擇), with the aim of delivering the original meaning of evolution in more accurate and neutral way. However, he was also a product of the time and interpreted evolution as constant progress. "By accepting the theory of evolution, he tried to read the idea of unilinear progress of the West and criticized the retrospective and circular perspectives of China."[7] Since then, the word tianyan(天演, flow of nature) was replaced by the word jinhwa(進化, progressing forward). The concept of evolution was imported and accepted as social Darwinism from the start and was not understood as pure biological phenomena. Evolution was imported and understood as artificial-social and not natural-organismic selection.

In Jeoson and China, the logic of evolution was used to encourage people to work hard

7) Reviewing the theory of socio-evolution in East Asia: formation of the concept evolution in China and Korea(2007). Written by Yang Il-mo

to get out of their weaker positions. The idea of racial reconstruction and eugenics claiming that the reproduction of the people with less-desirable traits should be suppressed by artificial means propagated and accepted widely. These ideas tried to explain and transform the social reality using natural laws, but did not understand natural laws themselves well enough. They just take the rule of survival of the fittest for granted and did not ask anything about the rule itself. Without any scientific verification, social values were drawn from the theory of natural selection. This was evolution without biology and wrong union of nature and goals. However we cannot blame such development and choice ethically since we can think it as the process of adaption for survival in such a harsh social environment.

The real problem was that their emphasis on competition and struggle for survival was too extreme. All of a sudden, people of Joseon had to digest the idea of evolution emphasizing competition and choice with the body accustomed to the circular and self-sufficient Confucian ideology. If cultures were organisms, then the ideas of racial reconstruction and eugenics would be mutants. As the mutations were abrupt and did not have enough time to adapt, there had been ups and downs in the process of adaption. The environment itself was changing rapidly. In the West, many countries tried to implement the idea of eugenics. But after the Nazi holocaust which was the natural consequence of eugenics, nobody could claim that still eugenics should be implemented. However, in Korea, the National Eugenic Bill was submitted in 1964, with the aim of preventing marriages with less-desirable genetic traits. Still, the Mother and Child Health Act allows abortion in cases of eugenic problems.

It was at the time when the heat of the debate on sociobiology had been cooled down in the West that the debate in Korean context has begun. The books, *Sociobiology: The New Synthesis*, and *The Selfish Gene*, were translated into Korean and published in 1992, 17~18 years after the originals. The 1984 book *Not in Our Genes*, a critique of sociobiology, was published in 1993 in Korea. Whether sociobiology was biological determinism and whether it advocates *laissez-faire* ideology were the recurring themes. The 1994 forum on *biological determinism and its social implication*, co-organized by The Korean Society for the History of Medicine and The Korean History Of Science Society might have been a starting point of such debate.[8] Proponents of sociobiology tried to be exonerated from their alleged support of biological determinism and opponents

8) Lee Byung-hun. How was Socio-biology Introduced in Korea?-Introductions and Tasks. From the Great Debate of Socio-biology 2011

doubted their counterpart's sincerity.

In the 1990s, evolutionary psychology, the next generation of sociobiology, was introduced, and in the 2000s, evolutionary ethics that derived moral norms from the evolutionary idea opened up new horizon.[9] In the medical science sector, studies on utilizing insights from evolutionary biology also embarked on.[10] It may be a hyperbole to say that sociobiology started conquering medical sciences, psychology and ethics. However, it may not be outrageous to say that evolutionary ideas are about to become the norms of our bodies and minds.

The work that represents biology's eagerness to engage in human and social problems was E. O. Wilson's *Consilience.* It was translated into *tongsup*(統攝), which literally means 'governing all together' but insinuates the meaning of 'coming and going with each other(通涉)' because the two words have the same pronunciation. In spite of or probably because of the controversy, the book was a great success. Critics say that the image conveyed by the word *tongsup* is radically different from the contents of the book that human and social problems can be solved by the principles found in evolutionary biology. The public minds tend to associate *tong*(通)-meaning mutual interaction-even when they hear and read *tong*(統)-meaning governing together. If you take the literal meaning of the title, biology is the governor and the humanities and social sciences are the subjects of the biological territory. But the general discourse revolved around how we can make science and humanities communicate, even when they understood what this book is about.

Another feature of the debate in Korea was that biologists only rarely participated in the debate. When they do, they almost always stand by the side of sociobiology. Similarly, opponents were almost always humanists or social scientists and not biologists. Pros and cons were separated by the rigid wall erected between liberal arts and natural sciences, whereas in the West representative proponents and opponents were all biologists.
In the West, the debate on sociobiology started in the 1970s, had reached its peak in the 1980s, which in turn evolved into evolutionary psychology and evolutionary ethics in the 1990s. In Korea all three variants of evolutionary discourses were introduced all at

9) Choi Jae-cheon. Evolutionary Ethics and the Meaning of Life. 2000
Robert Wright. The Moral Animal. Translated by Park Yong-jun. 2003
10) Williams, George C., Randolph M. Nesse.Why We Get Sick. Translated by Choi Jae-cheon.1999

once without taking any account of historical, political and cultural contexts in which each variant arose. It seems that the confusion that we experienced in the early 20th century is now being replayed. Then, we had to accept and apply evolutionary ideas(eugenics and social Darwinism), which are now found wrong and prejudiced, to the economic and political world under the pressure of imperialism. Now, we see sociobiology in the strong current of neo-liberalism in which unlimited competition is being encouraged.

That's why *The Origins of Virtue*[11] and *Nature Via Nurture*[12] that put the ideas of the both sides together, are not so popular as *The Selfish Gene*. These books accept the main idea of *The Selfish Gene* but add and mix another important feature of evolution. These books ask how altruistic individuals could appear from genes that are supposed to be selfish, and how nature and culture could influence each other and co-evolve. It is a kind of new synthesis that sublates (*aufheben*) one-sided dogmas such as egoism, altruism, biological and environmental determinism.

However, biological facts and social contexts that surely are prerequisites for the discussion were either taken for granted or simply ignored by the proponents and opponents of sociobiology. Neither side of the debate tried to understand opponent's position and follow their logic for a while, and pejorative terms like sophistry, lie, childish, coward, unforgivable[13], absurd, conjecture, nonsense[14] were used. The extreme polarization could have been avoided if the debate had focused on the realistic issues such as nature via nurture, or the origins of virtue from the start. Socio-biologists who tried to draw public attention by using attractive slogans like '*selfish*' or '*consilience*', rather than getting people think for themselves would be partially responsible. The opponents who were not interested in the flow and social implications of evolutionary biology but tried to win the debate by only hitting the weak point of socio-biologists were also blamable. Above all, what is most disappointing is that biologists were rarely

11) Matt Ridley. The Origin of virtue. Translated by Sin Jae-seop Published by Sciencebooks. 2001

12) Matt Ridley. Nature Via Nurture :Genes, Experience, and What Makes Us Human. Translated by Kim Han-yeong Gimmyoung Publisher. 2004

13) Choi Jae-chun. Darwinian Intelligence: Darwins' intelligence for the era of empathy: page 30 Sciencebooks.2012

14) Choi Jae-chun. Darwinian Intelligence: Darwins' intelligence for the era of empathy: page 30 Sciencebooks.2012

participated in the debate. It seems that they did not want to go forward by moving out of their narrow field of majors, let alone a grand plan like uniting all sociocultural phenomena with biology.

In the first half of the 20th century, social Darwinism had lost its popularity after eugenics and Nazi holocaust. Sociobiology which is a variant of social Darwinism arose in the late 20th century and has regained its popularity without any significant scandal. It passed about 40 years since *The Selfish Gene* first appeared, and the book is still on the list of bestseller. But if you talked with the readers of the book, you would find that they were preoccupied with the word *selfish* rather than the whole context of the book. The word 'selfish,' as the author put it, is a metaphor. It is obvious that genes cannot have motives and purposes whether they be selfish or altruistic. The Selfish *Gene* does not mean that the *human* nature is selfish. Nevertheless, many people, intelligent opinion leaders included, unconsciously hold that the book tells that humans are selfish. Even though you understand the whole story correctly, while uttering or listening the term *selfish,* you tend to think the selfish actor be the people rather than the genes. Regardless of the intentions of proponents and opponents, sociobiology tends to strengthen politically conservative cognitive structures.

In the late 20th and early 21th century, mutants of sociobiology such as evolutionary psychology and ethics appeared. At the same time critics of the tendency to see various sociocultural phenomena only in terms of loss and benefit also appeared. Robert Wright, who became known as an evolutionary ethicist after publishing the book *The Moral Animal*, released the follow-up book *Non Zero*,[15] which explains a mechanism in which gains of both sides increase through mutual interaction. In the book *The Empathic Civilization*,[16] Jeremy Rifkin argues that human history is not about selfish genes or humans but the process of extending human empathy. Frans de Waal, a primatologist, contends that not only humans but also animals have moral attributes, after a number of observations and experiments.[17] In the 1990s, the mirror neuron that fires when one understands and shares other's intention and feeling was discovered. This may be a

15) Robert Wright. Non Zero. Translated by Im Ji-won. 2009
16) Jeremy Rifkin. The Empathic Civilization. Translated by Lee Kyoeng-nam. 2010
17) Frans de Waal. Our Inner Ape. Translated by Lee Chung-ho. 2005
Frans de Waal. Peacemaking among Primates. Translated by Kim Hui-jeong. 2007
The Age of Empathy: Nature's Lessons for a Kinder Society, Three Rivers Press, 2009.
Frans de Waal, Primates and Philosophers: How Morality Evolved, Princeton University Press, 2006.

biological evidence of the social attributes that we are designed to feel and act together. All these explain human societies based on biology but draws a different conclusion than Wilson's sociobiology. What is at stake is empathy and not selfishness.

It seems that empathy has become the catchword of the time. Even the renowned sociobiologist's book *Darwin Intelligence*, has the subtitle '*Darwin's wisdom for the era of empathy.*' But the word empathy appears only once in the whole text. That may be due to the fact that from the perspective of selfish gene, *empathy* is no more than an evolved attribute to increase gene frequency that one shares with others.
Gene's-eye view was a good example of 'think different.' It gave us new knowledge and insight and will do so. Still, we do have other ways of think different. If we think only from genes' perspective, we sure will lose the various and plentiful nature of our real life experience. Now, it is time to think different further and see living beings not only from genes but more from the experiential perspective.

4. Bio-Humanities

Darwin's work was based upon attentive observations in equatorial habitat where natural resources were abundant, whereas Kropotkin worked in tundra where living conditions were hostile. Darwin was an English gentleman in Victorian era when industrial revolution and capitalistic expansion was the social norm. Kropotkin was a Russian prince but also an anarchist and revolutionist.
Wilson who coined the term 'sociobiology' was an entomologist. Wilson's fierce critic Gould was a paleontologist. Wilson had to see the living world with spatio-temporally medium-sized perspective while Gould's perspective had to be macroscopic. Wilson was from Alabama where conservative values were predominant while Gould was the son of a Jewish Marxist and an artist.

In the 20th century, evolutionary biology combined with new discoveries in molecular biology (New Synthesis) consolidated its scientific position. However, scientists studying living beings at the molecular level rarely participated in the debate of sociobiology. Only some scientists including geneticists, immunologists and neurologists were coming up with new frame of life other than the principle of natural selection. They found that the idea of *'identity as ongoing self-seeking,'* rather than the competition against each other would be more plausible explanation.

And scientists who study animal behavior began to make sounds. The patterns of behaviors that they found at the level of ordinary life world were to reaffirm the ones that geneticists, immunologists and neurologists proposed at the microscopic level. According to them, genetic information is not the fate of life and not only selfish instinct but also the tendency to help each other and to feel empathy are also the nature of life. Frans de Waal, a renowned primatologist, calls this force of evolution *enlightened self-interests* and this view *The Other Darwinism.*[18] " You would be more wisely and effectively selfish if you were less selfish, which is not paradox".[19] We begin to accept the plain and simple common sense that cooperating with each other at the cost of a short-term interest would be in their best interests, rather than calculating and comparing gene frequencies in relation to kin relationship.

Why has it taken so long for us to accept such simple fact? Probably it might have been due to traditions since Plato who tried to explain complex and impure realities with absolute and pure idea. Thus biologists might have had an inferiority complex (physics-envy)[20] comparing biology with simple and clear physics. The formulae of the evolution by natural selection and the molecular mechanism that explains the transmission of traits were clear and simple enough to quell the envy. The principle of *'selfish gene'*, served as one and only principle of life world like Newton's gravity in the physical world. But it has critical problem that leads us to confuse biological principle with psychological egoism. The biological principle of evolution is that evolution takes place in the direction of maximizing genetic reproduction. That was the reason why genes have the name with the adjective selfish. Psychological egoism is that organisms have the psychological propensity to pursue self-interests. The two are totally different but people tend not to care. This is not only the readers' fault. When Dawkins said "*Let us try to teach generosity and altruism, because we are born selfish*" , he also confuses the two.[21]

The problem is that already many people understand the selfish gene as an individual's selfish mind. It is said that Jeffrey Skilling, the former CEO of the Enron Corporation, who became the icon of corruption by committing the accounting fraud in structural,

---

18) Frans de Waal, The Age of Empathy: Nature's Lessons for a Kinder Society, Three Rivers Press, 2009.

19) Sam Harris, The Moral Landscape: How Science Can Determine Human Values, Free Press, 2010. p.83

20) The above book by Choi Jae-chun. page25

21) The same book by de Waal note 39

systematic, and creative ways, was a big fan of *The Selfish Gene*. He encouraged unlimited competition only to become a criminal who destroyed many people's lives. There might be a fatal loophole in a simple principle. As Darwin himself confessed, natural selection may be the strongest force of evolution but not the one and only principle. Therefore, biology that starts from the simple principle of natural selection and heredity should be built upon or replaced by new kinds of biology that encompasses complex and diverse living world phenomena. Neurologists have already opened up a new field of neurophenomenology, and social psychologists have begun to investigate relationships between minds as the results of natural selection and societies as the results of cultural evolution.

Social psychologists also follow the logic of evolutionary biology. Minds are the evolved attributes of organisms because they were good for the survival and reproduction. "The brains of all animals are designed to feel happy when they do something good for survival and reproduction. Dopamine released from the ventral striatum produces that feeling."[22] This is Daniel Kahneman's fast system of mind. But as the society became more complex, fast thinking was not always favorable for survival and reproduction. Social evolution has invented gossip as a mechanism controlling extreme selfishness. Many other social attributes that control or modify the fast mind were also added. Social bonds have evolved and internalized as the slow system of mind. It follows that the mind is not the manifestation of rationality but expressions of nature that evolved in the direction of maximizing survival and reproduction. Social psychologists claim that we should accept these fast and slow minds together as they are. If we understood well enough the solution embedded in the expressions evolved in nature, then it would be easier to come up with new norms that fit the real world.

Coevolution of life and culture have been solving many problems of life and shaped our nature itself. In early stages of evolution, forceful dissemination of genes by rape must have been advantageous from the evolution's point of view. But as communities evolved, they had to control such behavior for the sake of the well-being of the community. As a result, violence drastically decreased. It is now a commonsense that violence is a vice that we should do away with, although it was once an adaptation. In this way, bio-culture has become a unit of selection in the process of coevolution of inborn traits and pressure from the society. Michael Brant Shermer explained the bio-culture coevolution as the

22) Jonathan Haidt, The Righteous Mind: Why Good People Are Divided by Politics and Religion, Pantheon Books, 2012. Kindle edition location 1697.

process of expanding bonds of empathy from within individuals and then families, communities, nations and finally the whole biosphere. Evolution started from the primary need for preserving genes and individuals. And then the list of needs expanded to the psychological well-being and mutual bond with direct altruism in the small sized communities. As the communities become larger, social justice and love of life were added to the list.[23)]

Shermer sets in the bio-cultural transition in the middle of the pyramid of bio-cultural evolution. Sociobiology is suspected to have applied basic instincts at the bottom of the pyramid to the whole life world without due consideration of the transition stage. Bio-humanities tries to *find* norms of life from the vivid life experience rather than *applying* abstract principles. It tries to find wisdom and norms of life rather than a single principle from the flexible diversity of life. Sociobiology surely is an important system of knowing the life world, but is suspected to have been too ambitious and cannot encompass whole life world.

We have evolved to be certain about what we believe is right. Psychologists say that an argument about a matter being right is focused on searching for reasons why others should agree with me rather than the reason why I believe in it. Now it is understandable why the debate on sociobiology has so long been around without any breakthrough. Evolutionary psychologists say that morality, which is also a product of evolution, binds and blinds. Each party of the sociobiology debate tries to win the debate rather than solve important problems of life. Not only animals and ordinary people but also biologists and philosophers were the product of evolution. They also bound together with the members of the same party and were blind to the other side. We all are the product of evolution too, and we routinely bind and blind. An important message that the sociobiology debate gives us is the reminder of Socrates, *Know Thyself.*

Reference

Cohen, Irun R., "The cognitive principle challenges clonal selection". *Immunology* 13: 441-444. 1992.

Cohen, Irun R., *Tending Adam's Garden: Evolving The Cognitive Immune Self*, Elesvier, cademin Press, 2005.

Cziko, G., The Things We Do: Using the Lessions of Bernard and Darwin to Understand

23) Michael Shermer, The Science of Good and Evil: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule, Henry Holt and Company, 2004.

the What, How, and Why of Our Behavior, MIT Press, 2000. p.182

de Waal, Frans, *Primates and Philosophers: How Morality Evolved*, Princeton University Press, 2006.

de Waal, Frans, *The Age of Empathy: Nature's Lessons for a Kinder Society*, Three Rivers Press, 2009.

Fodor, Jerry, "The Present Status of the Innatedness Controversy," in RePresentation: Philosophical Essays on the Foundations of Cognitive Sciences," MIT Press, Bradford Books, 1981.

Gould, S. J., "Kropotkin Was no Crackpot", *Natural History* 106: 12-21, 1997.

Haidt, Jonathan, *The Righteous Mind: Why Good People Are Divided by Politics and Religion*, Pantheon Books, 2012.

Harris, Sam, *The Moral Landscape: How Science Can Determine Human Values*, Free Press, 2010. p.83

Kahneman, Daniel, *Thinking Fast and Slow*, Penguin Books, 2011.

Lappe, Mark, *The Tao of Immunology: A Revolutionary New Understanding of Our Body's Defenses*, Plenum Trade, 1997.

McAdams D. P. and J. L. Pals, "A New Big Five: Fundamental Principles for an Integrative Science of Personality" *American Psychologists* 61:204-17, 2006.

McClintock, B. "The significance of responses of the genome to challenge". *Science* 226, 792-801, 1984

Shapiro, James A., *Evolution: A View from the 21st Century*, FT Press Science, 2011.

Shermer, Michael, *The Science of Good and Evil: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule*, Henry Holt and Company, 2004.

Sober, Elliott and David Sloan Wilson, *Unto Others: The Evolution and Psychology of Unselfish Behavior*, Harvard University Press, 1999.

Tauber, Alfred I., "Conceptual Shifts in Immunology: Comments on the Two-Way-Paradigm," *Theoretical Medicine and Bioethics* 19: 457-473, 1998.

Tauber, Alfred I., "Historical and Philosophical Perspectives Concerning Immune Cognition," *Journal of the History of Biology* 30: 419-440, 1997.

Tauber, Alfred I., *The Immune Self: Theory or Metaphor*?, Cambridge University Press, 1997.

Wilson, David Sloan and Edward O. Wilson. "Rethinking the Theoretical Foundation of Sociobiology," *The Quarterly Review of Biology*. December 2007.

랜덜프 네스, 조지 윌리엄즈 지음/최재천 옮김,『인간은 왜 병에 걸리는가: 다윈의학의 새로운 세계』, 1999.

로버트 라이트 지음/임지원 옮김,『넌제로』, 말글빛냄 ,2009.

로버트 라이트,『도덕적 동물』, 사이언스북스, 2003.
리처드 도킨스 지음/홍영남 옮김,『이기적 유전자』, 을유문화사, 1993.
마르코 야코보니 지음/김미선 옮김,『미러링 피풀』, 갤리온, 2008.
매트 리들리 지음/김한영 옮김,『본성과 양육』, 김영사, 2004.
매트 리들리 지음/신좌섭 옮김,『이타적 유전자』, 사이언스북스, 2001
매트 리들리 지음/조현욱 옮김,『이성적 낙관주의자: 번영은 어떻게 진화하는가?』, 김영사, 2010.
양일모,「동아시아의 사회진화론 재고: 중국과 한국의 진화 개념의 형성」,『한국학연구』제17집, 2007.
에드워드 윌슨 지음/최재천 장대익 옮김,『통섭: 지식의 대통합』, 사이언스북스, 1998.
요아힘 바우어 지음/이미옥 옮김,『인간을 인간이게 하는 원칙: 인간의 본성은 협력 메커니즘을 따른다』, 에코리브르, 2007.
요아힘 바우어 지음/이미옥 옮김,『협력하는 유전자』, 생각의 나무, 2008.
이병훈「한국에서는 사회생물학을 어떻게 받아들였나?-도입과 과제」, 김동광, 김세균, 최재천 엮음,『사회생물학 대논쟁』, 이음, 2011.
이정덕,「지식대통합이라는 허망한 주장에 대하여-문화를 중심으로」, 김동광, 김세균, 최재천 엮음『사회생물학 대논쟁』, 이음, 2011.
장대익,「이타성의 진화와 선택의 수준 논쟁 - 다수준 선택론이 더 나은가?」『과학철학』, 8(1), 2005.
장대익,『다윈의 식탁』, 김영사, 2008. 전중환,『오래된 연장통』, 사이언스북스, 2010.
제레미 리프킨 지음/이경남 옮김,『공감의 시대』, 민음사, 2010.
조지 레이코프 지음/손대오 옮김,『도덕, 정치를 말하다』, 김영사, 2010.
최재천,「진화윤리학과 생명의 의미」,『우원사상논총』제9집, 강남대학교, 2000.
최재천,『다윈지능: 공감의 시대를 위한 다윈의 지혜』, 사이언스북스, 2012.
최종덕,「생물학적 이타주의의 가능성」『哲學硏究』64, 2004.,
크로포트킨 지음/김영범 옮김,『만물은 서로 돕는다』, 르네상스, 2005.
프란스 드 발 지음/김희정 옮김,『영장류의 평화 만들기』, 새물결, 2007.
프란스 드 발 지음/이충호 옮김,『내 안의 유인원』, 김영사, 2005.
프란시스코 J. 바렐라 지음/유권종 박충식 옮김,『윤리적 노하우』, 갈무리, 2009.
하워드 L. 케이/생물학의 역사와 철학 연구모임 옮김,『현대생물학의 사회적 의미: 사회다윈주의에서 사회생물학까지』, 뿌리와이파리, 2008.

Lights and Shades of Research into Convergence – Asking the Humanities for the Direction

Jeong Woo Choi
Sogang University

1. Introduction

We are witnessing a global trend in which the creation of new products and markets are led by technological innovation. In particular, convergence between technologies that goes beyond the specialization and development of individual technologies has emerged as a new value creating mechanism. Due to challenges and trends such as developing new innovative products, highly complicated nature of technologies for product creation and the rise of service sector as the new economic backbone, the heavy reliance on technological capacity in one sector is proven to be insufficient in driving true innovation. With emerging needs for convergence, different technologies in diverse areas such as nanotechnology, bioscience, energy, environment and material are coming together. In the past, convergence involved the division of roles and simple mixture of individual technologies. Today, researchers are presenting new ways for convergence that aim to achieve the chemical blending of individual technologies. In particular, convergence is employing the concept of open innovation, an innovative approach for division of labor through the introduction of external technologies instead of solely counting on internal technological capacities. This concept is being presented as a new direction and strategy for research and development activities for convergence of technologies. This way of conducting research is called open innovation convergence study.

However, researchers tend to be insensitive to social and cultural changes without due regard for what the society and people demand in contemplating new discoveries and developments for cutting edge technologies due to their rigid mindsets. As a result, science and technology, despite its prevailing reputation for reason, is failing to catch up with the paradigm shift engendered by changing trends and people's demands. With their failure to reflect demands from all walks of life in terms of solutions to social and scientific issues, new technologies are generating outcomes that have negative impacts on people and society. To redress the negativity, it is important to conduct in-depth studies into directions and strategies for convergence based upon perspectives that embrace both science and technology

and humanities. This study analyzes both positive and negative outcomes of technological convergence and presents a recommendation for convergence between humanities and science and technology in attempts to turn negative impacts into positive ones. It also presents open innovation as a direction and strategy for convergence to effectively achieve a full technological convergence in industries in such a way that chemical substances are mixed, and suggests an open innovation strategy in developing a bio nanotechnology is presented as an example.

2, Good and Bad about Convergence Study

2,1. Converging technology

Convergence between scientific knowledge and between technologies such as biotechnology (BT), information technology (IT), nanotechnology (NT) and medical technology (MT) is emerging as a new area of learning that can meet demands for the creation of new industrial growth engines. The merger of technologies from a variety of scientific disciplines has potential to lead the developments of breakthrough technologies and thereby create a high value-added industry. Recognizing convergence as a potential game changer of the global economy, governments and businesses around the world are making huge investments in research and development activities specifically aimed at technological convergence. In addition, governments are scaling up their investments in convergence in their efforts to take a superior position in the era of infinite competition for knowledge.

In the U.S, the government presented ways to achieve the sustainable growth of converging technologies in the areas of NBCI (Nano, Bio, Information, Cognitive) through Convergent Technologies to Improve Human Performance Report published by the National Science Foundation (NSF). The European Union formulated the "Converging Technologies for the European Knowledge Society" and selected five areas of convergence upon which 'Knowledge NBIC Project' was launched in 2006. To keep up with this international trend, the Korean Government formed a government-wide taskforce to draw up the Basic Plan for National Development of Converging Technology in 2008 and announced vision, objectives and strategies for converging technology (The Ministry of Science and Technology 2002, Kim Kibum 2014).

In the area of technological convergence, bio-convergence in which basic science and applied engineering techniques come together is drawing the most attention. It is because bio-convergence focuses on the application of relevant technologies in the provision of medical services. It has ample potential to satiate people's desire for health and longevity and there are possible utilizations in the areas of material science and environment.

The advancement in nanotechnology played a significant role in the emergence of bio-convergence. With technological developments, scientists do not just observe biological phenomena in the human body but manipulate and utilize nano-sized biological materials. The combination between biotechnology and nanotechnology gave birth to the Bio-Nanotechnology (BNT) which includes intelligent medical delivery systems, BioMEMS, biosensors and biochips. The BNT have brought bio-convergence to the next level

along with Bio-Informatics (BIT), the umbrella discipline consisting of informatics in which database analysis techniques are merged with biology and computer physiomics, which involves studying biological phenomena through virtualized human cells and organs. Technological convergence that cuts across diverse academic fields, which involves the creation of new technologies through the combination of basic and applied techniques, is being strengthened through mergers with industrial technologies (Lee Jiyoung, Choi Jungwoo 2009)

Since technological convergence in the 21st century requires a broad-based comprehensive convergence between diverse disciplines instead of a simple combination between basic science and engineering techniques in a particular area, new research strategies need to be formulated. At a moment when creating next generation industries through converging technologies is emerging as one of the hottest buzzwords, it has become imperative to draw up national as well as business strategies for the systematic and efficient development of converging technologies.

However, in a society where conventional organizations, disciplinary cooperation that remains at a low level and closed innovation are still rampant, the expectation for a giant leap forward through convergence is unlikely to be met. To address current challenges and effectively carry out missions for technological development and innovation, open innovation in which external ideas are incorporated into the existing organization structure is being presented as a viable direction and strategy for in-depth research and developments to bring about effective convergence (Chesbrough 2006a,b, Choi 2006).

2.2, Bright and Dark Sides of Converging Technologies

With the goal of raising the level of convergence capacities to 70% to 90% of that of advanced countries by 2020, the Korean government is making concerted efforts in advancing technological convergence by merging its globally recognized IT capacities with BT, NT and MT to reinforce national competiveness and create next generation growth engines. To this end, tasks and assignments have been formulated and supported to lead next generation technological innovation such as technologies for living standard improvement, convenient living environments, healthcare, health and sports and for environments that ensure free exchange and movement of information and knowledge regardless of time and spatial constraints.

Currently, a lot of converging technologies are being developed. Biological materials that can cure wounds and injuries with nano-based smart biomaterials, diagnostic tools for longevity based on biochips that open the era of healthcare 3.0, brain treatment technologies such as deep brain stimulation that can treat Alzheimer's Disease and Parkinson's Disease, and remote diagnostic and treatment technologies based on mobile healthcare and ICT-based disease control and treatment are exemplary models for the advancement in bio-convergence (Jena and Philips 2008, R&D Information Center 2012, 2013a,b, Impact 2013). As such, convergence in the area of biotechnology can make positive differences in human health

and welfare.

Just as all elements on the earth, converging technologies have positive aspects that benefit us as well as negative aspects that harm us.

The discipline of scientific management, which seeks to incorporate the principles of management, an applied social science, and science and technology, was created by Fredrick Winslow Taylor (Stewart 2009). However, his theory sets aside human aspects in labor with its primary aim always being the pursuit of efficiency and relies on erroneous methodology. Scientific management also has the risk of viewing human beings as the tools of efficiency improvement just like machinery. This should be regarded as one of negative impacts of the combination between science and technology and social science.

Recently, we are seeing the convergence in sports too in which technologies are used to boost the performance of athletes. Researchers are finding ways to maximize the efficiency of the human body by monitoring the conditions of athletes in real time through wearable devices attached to their body. Also, records and conditions are compiled to create big data for analyses to figure out how athletes can be best managed in terms of training and placement in real games. This sports science aims to get the most out of athletes and maximize their efficiency. This resulted in the efficiency for efficiency sake (productivity) in which athletes are no longer viewed as the subjects of protection but as the subjects of efficiency maximization. The fact that victory and efficiency have become the only goals of sports through the merger of technology and sports cast shadows upon our society.

The convergence between nanotechnology and biotechnology has created a technology that can identify the DNA sequence of individual at under USD 1,000 (Sharon et. al 2012 and Xie 2013). Without a doubt, this technology can be applied in the development of customized medicines. It will be utilized for the diagnosis and treatment of genetic diseases and thereby greatly contributes to the health of people in the world characterized by a fast aging of populations. On the flip side, it can significantly undermine privacy and human rights if private genetic information, including information about inferior genes is leaked. This may affect individual's ability to buy insurance policies, marry or get a job. This threat of biotechnology should be considered a shade cast upon our society as well.

Putting aside above mentioned examples, there are also negative impacts generated by converging technologies which involve the merger of technologies in the areas of environment, energy, material and sports. Notwithstanding the shortfalls of convergence, it can be understood that they are created out of social needs. When the purposes of convergence is to improve efficiency, produce results faster in a shorter period of time, gain return on investment as soon as possible and advance technologies for technology sake, it is unavoidable that problems soon start to get in the way. At the same time, an ethical question of whether the purpose benefits individuals based on libertarianism or the public based on utilitarianism, or community as a whole based on communalism can be raised (Sandel 2009, 2012).

To overcome these dark shades cast upon our societies and human beings, the approach of converging science and technology with humanities can be proposed.

3. Humanities and Converging Technology Coming Together

We can find the root of science in philosophy. Humans saw the development of scientific theories while they attempted to overcome philosophical and metaphysical thoughts and moved to mathematical, reasonable, deductive and empirical approaches. Attempts to draw the line between science and philosophy breathed life into many theories. Falsificationism by Karl Popper, the structure of scientific revolutions by Thomas Samuel Kuhn and Sokal's Hoax by Alan Sokal touched off controversies and discussions (Chalmers 1982, Kuhn 1996). These philosophical as well as scientific approaches were the beginning of the merger between science and technology and humanities. In resolving social issues through converging technology, this convergence can be applied in creating methodologies for indentifying, selecting and resolving social problems and formulating a technological convergence strategy.

3.1. Contribution to Identification and Selection of Problems

Human societies are pursuing knowledge revolution and technology development to address a wide variety of challenges. When technological research is explored as a means to resolve social problems, it is required to give sufficient thoughts into the selection of social issues. This enables the recognition and reasonable investment of resources into solving the issues. The complicated nature of contemporary social issues requires the coming together of new technologies in the areas of biology, nanotechnology, energy, environment and material.

We tend to focus on developing converging technologies to rectify social ills after selecting problems solely from the perspective of science. However, the selection process requires not only scientific views but also social consensus. Instead of merely selecting problems that need scientific solutions, problems need to be assessed and selected based on the full understanding of demands of society, culture and people in this era. This is why it is necessary to take into account the views of humanities that contemplate the relationships among society, culture and humans and science and technology.

The Bush Administration in the U.S initiated a research project to study human genome. It was followed by nanotechnology research in the 2000 by the Clinton Administration and brain mapping research in 2010 by the Obama Administration. The problems and issues in the subcategories were largely chosen by scientists. Genome mapping project, nanotechnology project and brain mapping project have all developed into the study of convergence by applying technologies from different scientific areas. Rather than mulling over ethical issues, contributions to human welfare, adverse consequences and consistency with demands of society, culture and people, the detailed project assignments were developed and chosen wholly by scientific and technological needs. This resulted in the development of technologies

that go against the trend of the current era and generated unintended adverse consequences for society and humanity. As a way to tackle this problem, it is high time to present a new holistic approach that integrates the view of science and technology into the perspective of humanities to better reflect our society, culture, people and time.

The Korean government conducts a feasibility study in case a large scale public project that involves the investment worth more than KRW 50 billion is considered by bringing together experts from various sectors. The shortcoming is that the feasibility test only focuses on technological and economic feasibilities. For example, in evaluating technologies for responding to environmental damages caused by a leakage of harmful chemical materials, technological capacity for the prevention of accidents and restoration in the aftermath of disasters and economic feasibility are the main criteria assessed. However, if chemical materials are really leaked, it takes a huge toll on people and families, causes social trauma and impedes the cultural development of the region. Thus, in conducting a feasibility study, experts in humanities should participate to assess impacts of the accident on psychology and culture and contribute to draw up specific sub-tasks that need to be carried out.

3.2. Contibution to Problem Solving

The social problem discussed above can only be solved when scientific knowledge meets the principles of humanities. The views of humanities can be applied in the process of integrating knowledge for problem solving, reaching social consensus for supporting problem solving and harnessing creatvitiy for problem solving.

Only when knowledge and insights from different areas come together, social problems can be effectively tackled. This knowledge convergence that integrates knowledge, insights and experiences and methodologies from different disciplines such as technology, humanities and social sciences can present new ways for problem solving (Hong Sung-wook 2012). Humanistic thoughts based upon artistic insights, philosophical methodologies and social scientific epiphany and religious beliefs meet scientific and technological knowledge contribute to problem solving. Empirical verification of science and analytical, critical and speculative thoughts of humanities present solutions.

Social consensus must be reached in making a decision on whether to put limited resources to use and how much to use in the process of problem solving (Hong Sung-wook 2012). To induce the consensus, it is required to discuss, persuade and present reasonable solutions based on due consideration of society, culture and people. Culture is formed in the process of making people's ways of living concrete and is based upon communication between people. This communication needs to be utilized in the communication for social consensus.

It is not existing technology that can resolve social issues. Converging technology that harness imaginative

power of people presents solutions and the source of that creativity is humanities. The broad-based understanding of humanities, including history, philosophy, aesthetics and arts provides new perspectives through which the world is viewed and comprehended (Park Woonghyun, Kang Changrae 2008). When we understand society, culture and time, we can understand changes taking place in our society and culture, which lay the foundation for new creative ideas that can be realized in the world of science and technology. This creative ideas show the direction where science and technology should be heading within the boundary of time and space. This is the attempt to find solutions that this day and age requires.

Thus, creativity provides clues to technological solutions to social problems. Refined knowledge and understanding about humanities that generate new perspectives, imaginative power, intuition and feelings is the backbone of creative strength (Park Woonghyun, Kang Changrae 2008). Creativity can also be utilized and applied in problem solving. The technological convergence that is required by society can be achieved when creativity permeates into and meets existing technologies

3.3. Contributions to Innovative Strategies

As strategies for technology development in the area of convergence require scientific and technological capacities as well as the consideration of society, culture and people, knowledge in humanities can play a significant role. The sufficient comprehension of social and cultural context is a prerequisite condition for the successful implementation of convergence strategies. Technological innovation necessitates not only technological innovation but also innovation in our thinking. When different perspectives and methodologies come together, a concrete foundation upon which innovative strategies are formulated can be laid. Viewing from the perspectives of both social and natural sciences can provide insights into the relationship between society and technology. This is how the direction and strategies for technological convergence should come about.

For example, when ethics and laws meet nanoscience, when life sciences come together with ethics, laws and social sciences and when environmental sciences merge with technology, economy and culture, directions and strategies that are suitable for convergence can be born. When it comes to convergence, we can take the right path only when technological innovation takes into account various relationships that exist in our society.

Convergence is the process of integrating different elements from diverse disciplines into one package. It is important to lay the groundwork for open innovation as a strategy for developing convergence to introduce and integrate diverse knowledge and information. We are witnessing a recent transition from close innovation to open innovation. Open innovation is the innovative concept in the division of labor. It argues for the introduction and utilization of external ideas to achieve internal innovation. A holistic approach needs to be taken by considering culture, history, psychology, social situations in the process of brining external ideas. The fact that the development of converging technologies requires the blending of

science and technology and humanistic knowledge strongly backs the need for open innovation. To sum up, it is fair to say that open innovation, a participatory development process, is the optimal strategy for convergence strategy.

4, Open Innovation As a Strategy for Convergence

As presented above, the platform for open innovation is regarded as the optimal strategy and direction in finding ways to achieve convergence. The following research that studied a convergence strategy based on open innovation in the BNT was carried out by the author (Choi 2006).

4.1. Definition

The limited sources of technological development in a company pose challenges to businesses that try to develop new converging technologies. This is why knowledge from external sources is gaining importance. Chesbrough, a professor of UC Berkeley in the U.S, argued that industrial sectors are experiencing a transition to open innovation that accepts the inflow external ideas to develop new products (Chesbrough 2003a, Chesbrough 2003b, Chesbrough 2004, Chesbrough 2006a). The basic concept of open innovation assumes that the technological progress of businesses can be achieved when both internal and external channels are utilized.

Despite evidence that suggests benefits in terms of efficiency that open innovation brings, many businesses are resisting open innovation (Chesbrough 2006b, Chesbrough 2006c). Recently, industrial business leaders begin to realize that great ideas which create great products come from outside of their company. Realizing this benefit, businesses started to regard external ideas as the galvanizing force of business growth and innovation. Still, too many companies are failing on reforms to move to open innovation because of their rigid mindsets and stereotypes.

To maintain competitiveness, companies need to boost sales revenue to keep its engine of growth and innovation going (Christensen 2005). However, if businesses only rely on internal innovation and attempts to develop products and services through their own development team alone, they are bound to face insurmountable challenges in terms of product development sooner or later. This is why cooperation between small businesses and external organizations such as universities can produce enduing results in boosting innovative potentials. Open innovation provides more opportunities for product development. In the world of open innovation, suppliers and consumers can share technological information with outsiders and scientists and businesses cooperate with each other to achieve innovation (Grassman 2006, Huston and Sakkab 2006).

A lot of businesses scale down activities that ensure their long-term viability to gain short-term competitiveness, including by cutting costs. In their cost cutting efforts, research and development budget for future products and research is not spared. In other words, they save at the expense of a longer-term viability. When research is done from short-term perspectives, the imitation of competitors' products

is the most likely result of innovative efforts. This is attributable to the lack of capacities for innovative technology development. The solution to this problem of R&D incompetency is to build a capacity to draw external know-how and knowledge.

Introducing external ideas is the condition for open innovation that ensures the application of state-of-art knowledge and technology such as biotechnology and pharmaceutical development (Nilsson 2006, Fetterhoff and Voelkel 2006). As innovation requires more than what a single company is capable of, there is no alternative to the establishment of networks and teams consisting of competent researchers for the successful development of sophisticated technologies such as nanotechnology and the BNT. (Conrad 2006). The purpose of research into the BNT largely lies in the development of the BNT that can be successfully commercialized. There is a record of management strategy for open innovation in the area of biotechnology (Fetterhoff and Voelkel 2006). However, there has been no report regarding open innovation in nanotechnology and the BNT. The study of open innovation strategy in the BNT was conducted for the first time by the author (Choi 2006).

A systematic study from a supply side through a broad-based research into open innovation has never been suggested thus far (O'Conner 2004, 2005, 2006). Sustainable and stable supply of ideas is the precondition for stable production. If we assume that technologies can be handled just as products can be handled, the process of technology dissemination can be done just as the distribution of products through supply chain. Based on this idea, supply chains are integrated into end producers and new products are enabled by open innovation. If innovative product development through open innovation is to be successful, push-pull strategy, e-business, global resourcing and supplier integration need to be integrated and applied.

4.2 Open Innovation in BNT

There has been no evidence suggesting that open innovation and innovation management is applied in the BNT. (Choi 2006). Many BNT products still remain in the development stage and product commercialization has yet to be launched (Pavlou and Balsey 2005). Open innovation that significantly contributes to technological advancements in the area of the BNT reinforces distributed innovation processes and reduces time required for market commercialization in terms of both production and development. Main drivers of innovative product development methods are external organizations and leader groups, which are distributed through a wide web of networks spread around the world. Distributed innovative technologies that utilize open innovation are becoming increasingly important in the process of technology development in unpredictable and fast-moving market environments. The key features and principles of distributed innovation process within open innovation are the utilization of existing networks, technological democratization and technology intermediaries.

For the successful application of these principles in advanced sectors such as the BNT, the following step is required. Between biotechnology firms or between biotechnology firms and pharmaceutical companies, the acquisition of commercially attractive technologies through mutual alliance has helped these businesses sustain growth amid fierce competitions over technologies. To draw the lesson, it can be said

that cooperation between bio firms has been the major factor behind the advancement of pharmaceutical as well as biotechnology companies (de Rond 2003, Slack N et al. 2004). Since technological management is increasingly complicated in technology-intensive sector, strategies that are rather simplistic are required. Technological innovation utilizing both external and internal capacities without boundaries is needed for technological innovation (Eisenhardt and Sull 2001). Open innovation strategies in the BNT should take into account these cases. In the BNT, it is not a creation of new knowledge that develops sufficiently innovative technologies. Rather, it is the blending of existing knowledge undertaken by diverse expert groups that leads to true innovation.

This is why open innovation should be actively pursued as a management strategy to develop innovative products. The method of continuously integrating technologies by treating each technology as an individual genome will ultimately lead to the successful development of innovative products. By analyzing internal resources, companies may be able to figure out what external ideas they need to adopt from the very first stage of product development. A caveat is that the full utilization of external technologies without support of internal resources from design to commercialization stages may cause the underutilization of main technologies. To complement, internal capacities need to be harnessed in design and the integration of technologies. This way of innovation in which internal resources play a leadership role in converging internal and external technologies is called Chimera Open Innovation. To lay the foundation for Chimera Open Innovation, an organization-wide restructuring as well as a cultural shift that makes an organization more friendly to external ideas should take place.

As the BNT is the area where nanotechnology and bioscience come together, knowledge is widely distributed and the integration of knowledge is deemed significantly important. The importance of open innovation that enables interactive innovation between internal and external experts will move up in the future as knowledge is widely distributed, experts in convergence are rare species and sector experts are spread. Innovation in the BNT is most likely to take the shape of open innovation based on the concept of technological integration, network, technology supply path, and coming together of external and internal supports under Chimera Open Innovation. This way of innovation as a strategy for the development of innovative new products will play an important role in the innovation of the BNT and other sectors of convergence.

5. Conclusion

To meet social demands for health and welfare, technological convergence is taking place in diverse sectors. With increasing needs for the utilization of multiple technologies, converging technologies are emerging in areas of nanotechnology, bioscience, energy, environment and material. As a strategy for convergence, research is being conducted to study ways to chemically integrate technologies into a single converging technology instead of the simple integration of technologies within the existing framework of research and development. The technological advancement certainly contributes to the humanity. However, every object has a bright as well as a dark side. Technological convergence is not different in this respect.

To overcome negative impacts that convergence has on society and people, the coming together of

science and technology and humanities is being suggested. To resolve diverse social issues that require attention, knowledge revolution and scientific and technological development are undertaken at the same time. When it comes to problem solving, it is important to know what problems that we want to tackle. When selecting problems and detailed assignments, diverse perspectives from the fields of science and technology, society, culture, people and time need to come together.

The problem solving can only be accomplished when views from science and humanities are properly taken into account. Humanities are useful in converging knowledge, reaching social consensus on solutions to problems and harnessing creative power for problem solving. As any convergence development strategy needs to consider society, culture and people, there should be researchers who are equipped with sufficient knowledge in humanities. Successful strategy developments can come from the understanding of social and cultural contexts. This is where external ideas can play out. In other words, open innovation in which everyone can participate in the process of development and production is proposed as the optimal strategy for technological convergence.

Convergence needs knowledge and understanding of both science and humanities. However, it is unlikely that experts in humanities who investigate thoughts and cultures and study human existence know every single principle of science and technology and this may lead to errors. Thus, it is required to present directions and strategies for convergence in which the views experts from both science and humanities properly come together.

6. Reference

Chalmers (1982) What Is This Thing Called Science?: An Assessment of Nature and Status of Science and its Method, 2nd edition. St. Lucia: Queensland: University of Queensland Press.

Chesbrough, H. (2003a) Open Innovation, Cambridge: Harvard Business School Press.

Chesbrough, H. (2003b) The era of open innovation, MIT Sloan Management Review, Spring: 35-41.

Chesbrough, H. (2004) Managing open innovation, Research·Technology Management, January-February: 23-26.

Chesbrough, H. (2006a) Open innovation: a new paradigm for understanding. In: Chesbrough, H., Vanhaverbeke, W. and West J.(ed). Open Innovation: Researching a New Paradigm. Oxford: Oxford University Press: pp. 1-14.

Chesbrough, H. (2006b) "Open innovation" myths, realities, and opportunities, Product Development and Management Association Visions, April: 13-17.

Chesbrough, H. and Crowther A.K. (2006c) Beyond high tech: early adopters of open innovation in other industries, R&D Management, 36(3): 229-236.

Choi, J.-W. (2006) Open Innovation Strategy in Nanobiotechnology. MBA Thesis, University of Durham, Durham, UK.

Christensen J.F. and Olsen, M.H. and Kjar, J.S. (2005) The industrial dynamics of Open Innoation-Evidence from the transformation of consumer electronics, Research Policy, 34: 1533-1549.

Conrad, D. (2006) Dream team science. [on line] available from http://www.nsti.org/ news/item.html ?id=78.
de Rond, M. (2003) Strategic Alliances as Social Facts: Business, Biotechnology, and Intellectual History, Cambridge: Cambridge University Press.
Eisenhardt, K.M. and Sull, D.N. (2001) Strategy as simple rules, Harvard Business Review, January: 107-116.
Fetterhoff, T.J. and Voelkel, D. (2006) Managing Open innovation in biotechnology, Research·Technology Management, May-June: 14-18.
Gassmann, O. (2006) Opening up the innovation process: towards an agenda, R&D Management, 36(3): 223-228.
Huston, L. and Sakkab, N. (2006) Connect and develop, Harvard Business Review, March: 58-66.
Jena A. and Philipson J. (2008) Innovation and Technology: Adoption in Health Care Markets. Washington D.C.: American Enterprise Institute for Public Policy Research.
Kirschbaum, R. (2005) Open innovation in practice, Research·Technology Management, July/August: 24-28.
Kuhn, T.S. (1996) The Structure of Scientific Revolution. Chicago: The University of Chicago Press
Nilsson, A.S. (2006) Open innovation in the pharmaceutical industry. [on line] available from http://www.itps.se/Archive/Documents/Swedish/Publikationer/Rapporter/Allm%C3%A4nna/A2006/Kap6_A2006_007.pdf.
O'Conner G..C. and McDermott, C.M. (2004) The human side of radical innovation, J. Eng. Technol. Manage, 21: 11-30.
O'Conner G..C. and Ayers, A.D. (2005) Building a radical innovation competency, Research·Technology Management, January/February: 23-32.
O'Conner G..C. (2006) Open, radical innovation: toward an integrated model in large established firms. In: Chesbrough, H., Vanhaverbeke, W. and West J. (ed). Open Innovation: Researching a New Paradigm. Oxford: Oxford University Press: pp. 62-81.
Pavlou, A. and Belsey, M. (2005) Key financial trends that shape biotech business growth, Journal of Commercial Biotechnology, 11(2): 239-248.
Sandel, M. (2009) Justice: What's the Right Thing. New York: International Creative Management Inc.
Sandel, M. (2012) What Money Can't Buy. New York: International Creative Management Inc.
Schilling, M. (2010) Strategic Management of Technological Innovation, 3rd edition. New York: McGrawHill Co.
Sharon M., Sharon, M., Pandey S. and Oza G. (2012) Bio-Nanotechnology. Boca Raton: CRC Press.
Slack, N., Chambers, S., and Johnston R. (2004) Operations Management, 4th edition. London: Prentice Hall.
Stewart M (2009) The Management Myth: New York: WW Norton and Company.
Xie, Y. (2013) Nanobiotechnology Handbook. Boca Raton: CRC Press.
과학기술부 (2002) 국가기술지도(National Technology Roadmap). 서울: 과학기술부.
김기범 (2014) 융합연구 활성화를 위한 제언, 4융합Casting, 15: 2-6.
박웅현, 강창래 (2008) 인문학으로 광고하다. 서울: 알마출판사.
이지영, 최정우 (2009) 바이오 융합 기술 교육과 연구, 공학교육, 16(1): 47-51.
임팩트 (2013) 2013 스마트케어, U헬스케어 서비스 실태와 참여업체 동향. 서울: 임팩트.
홍성욱 (2012) 융합이란 무엇인가. 서울: ㈜사이언스북스.

R&D 정보센터 (2012) 헬스케어산업 글로벌 시장동향과 의약산업의 분야별 발전 전망. 서울: 지식산업정보원.

R&D 정보센터 (2013a) 나노바이오 융합산업의 시장전망과 기술개발전략. 서울: 지식산업정보원.

R&D 정보센터 (2013b) ITC바이오의료/의료기기 융합산업 동향분석 및 표준화 기술 개발 전략. 서울: 지식산업정보원.

The 3rd
WORLD HUMANITIES FORUM 2014

제3회 세계인문학포럼

SESSION 5

Organizers' Session : Daejeon Metropolitan City Session

The Roles and Tasks of the Humanities in Daejeon, A City of Science and Technology

Cho-Nyon Kim (Hannam University)

–

Humanistic Consideration of Roads in Daejeon Metropolitan City: Studies on the Implication of 'Road'

Chanin Pak (Chungnam National University)

–

A Humanistic Study on 'Daejeon Confucianism' in the 17th Century

Euidong Hwang (Chungnam National University)

The Roles and Tasks of the Humanities in Daejeon, A City of Science and Technology

Cho-Nyon Kim
Hannam University

Episode

There are many passages that imply significant messages about science or technology in the books we enjoy reading. Of them, I pick out three. In a poem of "The Prisoner" by Tagore, there is a story which can be interpreted as criticism of civilization as follows: A person was tied up in chains. Someone asked him how it happened. Then, he said that he was making iron rings. He connected iron rings he made. After connecting the last ring, he realized that he was tied up with the rings he made. In other words, he is the one who chained himself up, not any other persons.

Another passage is part of『The Zhuangzi』, a Chinese classic. A farmer was watering the crops in a huge farmland in a very silly way. He was carrying water from a pool with a so small bowl that an observer sees him a stuffy farmer. So, the observer came over to the farmer and suggested, "There is a machine that can easily water a large field across the street. You can either buy or make it for easier and convenient work for you." The farmer said that he heard about the machine. "But my master told me that once I use a machine, I will be a slave of the machine. So, I supply water without the help of machinery."

The last oneselected is also an anecdote from『The Zhuangzi』. There were three close friends. One of them was Suk, and another was Hol. They are both the rulers of upper and lower regions, respectively. And the other was named Hondon who controlled the central region. They mostly hung out in the region of Hondon and were treated well there. Suk and Hol thought of doing something for Hondon out of gratitude. They wanted to treat him with the best thing they could think of. The two had a hall in their faces, except for Hondon. So, they decided to make a hall in his face as they did have. Over several days, they made holes for eyes, a nose and a mouth for Hondon. At the moment when they thought the job

was well done, Hondon ended up dying.

How can we interprete and accept them? What directions do those stories suggest when we attempt to interpret the life in the era of science and technology that we contemplate? People develop science and technology in order to improve the quality of their lives. Once hooked into the mechanism of science and technology, peoplerush towards them whether or not they want them. This is not much different in ancient times and now. But the intensity of the mechanism that comes to human beings might be incomparably different. Those stories may not be a suggestion to return to the primitive ages, but a request to take care of the essense of science and techonology.

Meaning of Science and Technology City

Every age has its own faces and names. No matter what people say, today is the era of science and technology in the aspects of hope and positivity based on rationality. In that respect, all human lives are led by science and technology based upon rationality in modern times. The human life here does not only mean a simple and ordinary life, but also mean an extensive life, that is, a life that encompasses economy, politics, culture, art, transportation, communications, industry and education. The life also includes work and rest, creation and destruction, and desperation and hope. Another face and name of today, from a negative perspective, can be the era of multiple crises, namely the era of risk or crisis in resilience, or the age of lethargy that lost direction. In those eras, new issues, including depletion of energy, the most important element of human life, difficulty in creating new renewable energies, economic and financial cirisis and climate change, arise disappointingly.
Science and technology have evolved in the hope of liberating human life. Therefore, there was fierce competition in all around the world to secure them. The regions for science and technology were built in a belief that they will assure a positive human life. To that end, it is certain that there should also be a region that creates science and technology. That region can be called science and technology city or region, a space that creates science and technology. Technically, however, such space is not only confined to a particular region. It is designated as a space for science and technology in a specific region due to policy consideration. As it is surely an artificial and policy-related designation, the chances are very low that culture is developed in a comprehensive manner in that region. In other words, a unique culture and life in a science and technology region cannot be established because all lives, wherever they may be, are in the same stream. In that aspect, "Daejeon, a city of science and technology" is nothing but a fabricated expression. Although the term of special city for science is used in the political and administrative arenas just because a research complex is constructed, such scientific research complex is found in many areas and brings about a little difference in job creation and the economic aspect, not the formation of a comprehensive culture and life. Also, science and technology are not just created in those regions because they are the products jointly produced by the enormous currentof times, capital and policy.

Nevertheless, it is obvious that our lives in modern times are based on science and technology, that is, they dominate human life. That is made possible not because they have the knowledge of doing it,

but because the outcome of science and technology is part of our everyday life. Even experts are not competent enough to know the whole of science and technology because even with sufficient knowledge and information, all they do is simply follow a programmed system, leaving the application to technology. Today is the era of passive human beings. In this era, a specialist is nothing more than a passive human being. We call it the network era of science and technology. Social integration and the dissemination of social opinions are also done by network. In that process, all the worries and agonies associated with the acquisition and accumulation of knowledge go away, and only open knowledge and applications can be embraced. This is called the era of digital empire.

The problem is that the use of the terms, such as science and technology city and the era of science, restricts the universality of life because life is far more comprehensive and generic than science and technology. Although science and technology strongly affect our daily lives, they do not take control of the whole life. Once they become prevalent, however, life based on science and technology will become part of everyday life. The phenomenon that occurs at that moment reflects the current living conditions. To make it more precise, it is worth looking at the relations betweenscience / technologyand spirit, and among science / technology,life, and living. In this process, humanities or humanism plays a crucial role. The humanities or humanism functions as the foundation of life made of LEGO bricks, whereas science and technology are various structures built on the foundation. Thus, it is essential to see wherehumanism is positioned in education, life and research activities.

Why do people spare no effort to use machinery and develop science? It is for sure that in doing so, they want to liberate human beings and raise the quality of life. As a result, human beings claim that they have always seen progress and advancement. Progress and advancement lead to the development of science and technology which are triggered by the expression of human rationality. The development of science and technology also had a huge impact on moral culture of human rationality. With science and technology taking a new leap forward, mentality changes occur by phase in moral culture, allowing human rationality to enjoy the victory. That may be referred to as the today's era of science and technology. Science and technology have become a job to propagate the ideology of human-oriented egoism, which ended up bringing the arrogance of human beings. The development of science and technology significantly reduced mysteries that are not proved by science. People started believing that science and technology could make a life itself, even to the extent that they can create a human beingwho is preferred by themselves. Going through such process, science and technology have become the basis that lays the foundation for physical parts of the human life and played the role of a troubleshooter, which means that they have opened up the religion of science and technology. But there was one thing people lost, that is, spirit.

In western history, it is believed that the revolution of science and technology, which particularly began with the Renaissance, paved the way for human liberation. Back then, religions, whichsuppressed human beings, took care of the human spirit. Human beings were suppressed and controlled by religions in

a very organized way and thus religions, which were said to take control of spirit, became useless. Therefore, it was strongly emphasized that scientific development enabled human beings to be liberated from oppressive religions and spirit. As a result, the development of science led people to the congested physical world. It also turned out that science and technology kept human beings from getting into the lively melting pot of human spirit. Thus, an endless progress and development came to lose their directions and limitations. That is the empty reality of science and technology era in today's world. Crisis, emptiness, dehumanization and anti-life tendency are not local tendencies, but are taking place globally, transcending age and field. The issue lies with how to fill and overcome the empty reality.

Humanism and Life

The fact is that science and technology, like spirit, are to build the fundamentals of human life. It cannot be said that either of them is more important than the other. Rather than either presenting science and technology blindly or insisting a frothy spirit and soulsolely, there instead should be a way of tying up these two: science/technology and sprit/soul. That will solidify not only either of them, but the fundamentals of the two. Today, the humanities are the key to realizing it.

The era of science and technology lets people clearly experience that human beings living in that era cannot live as a subjective agent. There, what people face with again is an issue of how to realize a humanistic life in the era of science and technology. The lives based on science and technology cannot be denied. Rather, they helpus look for a new way of life. In other words, science and technology require us to reflect on the life of a human being as a subjective and master of life who maintains a human dignity and enjoys living a life of thinking. Where does that come from? It may start with the recovery of the spirit of criticism. The spirit of criticism refers to a life that thinks of what a creative life is, refusing to somehow manage to keep life within a system made and programmed by practices, customs and habits. Development of rational science and technology guids both rational philosophy and religions; that is, significant part of modern spiritual culture is undertaken by science and technology. It is noticed these days that the physical and spiritual life and its foundation in modern times are led by science and technology. Yet, having expectations for studying the humanistic spirit or humanism in the age of science and technology may be a minimum effort made by human beings to liberate from the empire or the kingdom of science and technology. The word "liberation" does not mean entering a new world by giving up on science and technology, but should be deemed as recovery of the parts lost by science and technology. In that regard, it is appropriate to see that an alternative life in today's world should be a result of combining science and technology, or science, technology and the humanistic spirit. Such combination would be a new alternative.

Humanism here is a spirit that seeks common sense, imagination and being unusual. It requires universal, macroscopic and rational abilities of thinking. Such abilities are generated when a poem, a myth and a story are merged with rationality. What they have in common is an empathic ability.Humanism signifies recovery of the empathic ability - the ability to empathize with nature, history, other mankind, other classes or brackets and other cultures. The empathic ability begets symbiosis.

The empathic ability is a power for creation. It admits that working to renewing yourself is equal to a rest, and a rest is growth. It is also a power to adjust excessively overloaded requests and demands. The present given excessive requests was called "fatigue society" by a certain philosopher. Human beings and societies that have lost the ability to accept storng and excessive requests are meant to exist in accumulated fatigue. In that state, it may be wise to make a reasonable request to take the lead in creation. Creation comes from proper relaxation. Proper relaxation, after all, follows an act of creation. Repetition of such rests leads to growth. The modern civilization where the growth has disappeared may fade away or find no way out as it reaches a dead end. Humanism or the humanistic spirit is a way out of the dead end and a way to get out of the tough situation. The modern civilization will end up reaching the dead end, or its end, unless the way is found. What is the end? That does not mean lost or disappear, but means something existing in whatever form. Reaching the end is a state of having lost yourself as if you are addicted to opium. How can we overcome and be free from it?

There could be two possible ways. One way is, as commonly done thus far, to newly organize the system by starting a war to disrupt the order, or the other is, unlike any other ways done, to come up with a new way by bringing about a spiritual revolution. Which one of them is easier and more desirable? Being desirable does not mean being easy. The easiest way is a war which devastates almost everything at a time. However, war is a solution to nothing. War seems to solve a problem but actually makes the problem even worse. The problem caused by the war solution is nothing but causing many more problems by concealing the essence of the problem for a while, rather than leading toward a way to solve it. It appears easy but tough and is an endless way of problem.

What about the other direction of spiritual revolution instead? How can we find a way to be free from opium addiction? For the U.K. to dominate and rule China, a poisoned present it gave to China was opium, which makes people lost in ecstasy but immediately gets them to become powerlessso that they no longer live as subjective human beings. What is a way out of opium that makes people feel revitalized? There were so many occasions in history where we fell into an opium addict. How can we get out of the shallow activism? A shallow life may be that you only follow a program made by others and that you seem to do enthusiastically, but after all, you are controlled by others. It is time that the movement to find yourself should come to the fore.

Humanities movement leads to a harmony of creation, rest and growth. What impedes the movement is misused network and digital society, which is a result of advanced science and technology. A way out of the society is to cultivate the humanistic spirit. But the movement to do so is inevitably derived from the formation of digitalized network which is based upon already developed science and technology. What is important is to change the direction upon that.

Simple Suggestions

There might be several things to practiceabout what I have discussed above.

First of all, it is important to start a movement to studythe classics of humanities in a small group as if the grass rises in the field. Not a massive event-like movement, but a movement to ponder over the classics of humanities as a grassroots campaign that looks around life, region, and oneslf and his/her surroundings should be widely spread.At schools, the ideal movement is going back to the reading of original texts of the classic of humanities, not their abridged versions. As for training, it would be helpful to read and adjust them for the present time among those who are at the same level rather than reading them according to the direction of a great instructor. Moreover, it would be more desirable to reflect such activity in the school curriculum.

It is also of importance to trigger humanities movement that goes beyond commercialism by various media. In particular, at a time when the so-called 'totally programmed TV channels'("jongpyun") are prevalent aimed at commercialization, it would be good for public broadcasting channels to schedule a regular program for re-reading of the classics of humanities regardless of the stream of politics. Of course, such program should be intended to air a genuine humanistic movement that is taking place among the public, not a planned and an edited content.
At home and in villages, one way could be that adults, in particular, start reading the classics of humanities and share the stories with families and younger friends. When they read the texts with an attitude of a student who continues to learn, not with an attitude as if they have accomplished everything they want, the possibility will be open.

It is also necessary to have an attitude to grow to a citizen who is proud of creating a mental life, a spiritual level and the dignity of life which fit for the era of science and technology. In fact, healthiness results from a harmony of body, mind and spirit. In such harmonious life, science, technology, spirit and everyday life should be well balanced and all in good harmony.
At the same time, politicians and administrators need to be trained to dream of having an unusal mindset, like Don Quixote, that attems to reform cities and city lifves without being indulged in the so-called populism. Politicians working with a revolutionary spirit based upon humanism that keeps them from falling into heroism must be serving as a very strong driving force. Also, development of the humanistic spirit or humanism is far more important within a company. It is required to launch a humanistic movement through cooperation by citizens, companies and the political circles together.
In addition to that, the movement, if it is conducted by religions that are infatuated with a variety of doctrines at the same time, will have a huge and strong ripple effect. As religions are the ones that are the hardest to change and reform, changes in religions will easily bring changes to other worlds. Is it an illusion to hope for the launch of an unexpected humanities reform movement within the religious context?

Humanistic movement is for a change of direction, refreshment and liberation that breaks down a barrier. And it is impossible to do so without a power to detroy the existing strong things. In today's society where materials are the basis of all lives and dominate them, the movement cannot be made possible

without a resolute determination as ifconducting an independence movement during the colonial era.In that sense, the humanistic movement means to create a delicate person, namely a transformed new person, who is putting life first and enjoying a healthy life. When it is realized, science and technology will lay the foundation for a new humanistic movement, which will be the only way to discover a new direction.

In line with such movement, it is desirable to carry out a movement to introduce and apply the tradition of Joseon Neo-Confucianism led by the Kiho School to modern life in Daejeon. This will surely create a significant synergy effect together with the classics movement.The humanistic movement is premised on a wide and a profound view. Just as science and technology are transnational, the promotion of human spirit is also transnational and universal. The movement is intended to develop a new humanistic spirit that transcends nationality, ideology and class, and it should start with the idea that life in a region is connected to the whole, and the whole can affect one specific part. The idea represents that the whole universe is inside one thing, and the whole universe is evenly distributed in everything. There is no room in this idea that the prejudiced patriotism or regionalism settles in. Although the idea is a cosmopolitan view that goes beyond them, its start should take place voluntarily and autonomicallyin the place where it is currently located. (Sept. 5, 2014)

Humanistic Consideration of Roads in Daejeon Metropolitan City: Studies on the Implication of 'Road'

Chanin Pak
Chungnam National University

1. Introduction

Daejeon Metropolitan City, home to approximately 1.53million people, began to take its modern shape thanks to roads. In the early 20th century when the Western civilization was assimilated into the Korean Peninsular in the name of '**modernity**', or more precisely, in 1904, a road was opened in Daejeon city in a sudden and artificial manner. It was not a path naturally made by pedestrians and wanderers walking on it, but a railway that was thoroughly planned to be built in the name of modern civilization. As illustrated in commemorating the Daejeon History Museum, the city began to prepare itself[1] for turning into a modern city at the time when Gyeongbu(Seoul-Busan) railroad was constructed in 1904, suggesting that the city is categorized into a modern city[2] fundamentally prospered by railways.

It means that the modern city of Daejeon and railways- namely, roads born out of the modern civilization- share a common destiny. In other words, forcefully introduced western civilization turned a traditional village into a modern city drawing a large population, during which Daejeon was emerged. Such development, however, is not witnessed only in Daejeon. Rather, it is like a destiny that regions or nations suppressed by powerful countries have no choice but to accept. As modern history shows, similar cases can be easily found during the periods from the second half of the 19th century to the height of imperialism. That's why rather than cultural aspects of construction of railways, historical aspects of Japanese imperialism is more profound in the discourse of the birth of Daejeon. Therefore, it is true that railways constructed by the Japanese colonialists not only play a fundamental role behind the birth of the modern city of Daejeon, but also convey gloomy images permeating the Korea's modern history as well as collective memories that cannot be erased.

1) The construction of the Gyeongbu(Seoul-Busan) railroad was started from June 1901 and completed in January 1905.
2) Song, Hyeong sup (1993). *Revisioning history of Daejeon:* page 12. Published by Naru

Gyeongbu(Seoul-Busan) railroad, opened in 1905, has served as an artery of Korean economy over the course of more than 100 years. In the period from the late Joseon Dynasty to the Korean empire when the Japanese imperialists pillaged the Korean sovereignty, Japan began to construct the Gyeongbu(Seoul-Busan) railroad. It was built with the blood and tears of lots of mobilized Koreans' labor, even to the point of a song (about strong men being forced to do hard labor at railway stations, and pretty faced girls hauled along to brothels) being circulated at that time,[3)]

While the historical background of Japanese imperialism provides a various motives of tragic epics, sometimes such a painful historic background has been acquiesced in being silenced in an epic structure. It is even more so in discoursing the birth history of a city. The same is true for Daejeon city whose modern history also provides a historical pain, tantamount to trauma.

It is no exaggeration to say that Daejeon started making its rapid progress when Daejeon railway station was opened. Followed by the station, a postal service got its start in the railway station compound in 1904. In the following year, for the first time, a road was built from Daejeon station stretching to Daejeon marketplace, which was barely wide enough for a cart to pass.

An increasing number of Japanese began to flock to Daejeon, from 188 people in 1904 to 609 people in 1905. Japanese stepped up its attempts to invade Korea, by forming the Japanese Settlement Corporation, an organization created for exploiting koreans.[4)]

A new city was born when railways were opened, and an area developed by railway station systems was transformed along the newly constructed railway lines.....

Daejeon was no exception. The city flourished thanks to the opening of Gyeongbu(Seoul-Busan) railroad in 1905 and Honam(Seoul-Mokpo) railroad in 1914.[5)]

In commemorating Daejeon History Museum, personal narratives about the city by the poet and folk historian Choi Mun-hwi (who was born in 1929 in Daejeon) as well as public epics provided by studies on Korea's railway history tell the birth history of Daejeon. That is to say, its modern birth is closely related to Daejeon railway station, which is a solid fact and at the same time conveys a traumatic memory. Although it seems to be acknowledged implicitly that the trauma is ignored when it takes collective and public features, it is fully exposed with regard to individual memories associated with it. For some seniors who have long lived in the city, sometimes they should deal

3) Lee Su kwang (2010). *Gyeongbu(Seoul-Busan) railroad. Story of tears and sorrow*: page 6. Published by Hyo Hyeong Publishing Co.

4) Choi Mun-hwi (2010). *100 years of history of Daejeon 1900-1920*. Published by Tomato, a monthly magazine, July 2010

5) Lee Yong-sang et al.(2013). *The history and development of Korean railways*: page 39-40. Published by Book Gallery

with trauma about possible criticisms of the city: It may be disparaged[6] as one that Japanese created along with constructing railways. So, Dajeon, absence[7] of a glorious history enjoyed by neighboring cities like ancient capitals of Gongju and Gyeongju, is more likely to focus on the present rather than the past. "*Daejeon is still witnessing a construction boom*,"[8] the fact of which is shared all by people living in the city. It is true that Daejeon has made rapid development despite its short history. There are several reasons behind its rapid growth, of which its geographical position is most notable. Daejeon is located in the center of the Korean Peninsular, serving as a central road linked with all areas. As such, the birth of Daejeon and the subsequent rapid growth are bound up with roads. In describing a city's development, there may be lots of key words from the historical and social points of view. For Daejeon, *road* must be a key word to encompassing its characteristic and humanities perspective

Thus, this study shows a new perspective that helps overcome the city's historicity under the Japanese colonial era, with a humanistic approach. In other words, it focuses on tracking down implications of roads early constructed at the time when the modern city of Dajeon was emerged, and of lately built ones that are interlinked with the development of the cutting edge city in the present time. This study also reviews the meaning of roads built at the time of the construction of Daejeon station, for instance, Inhyo-ro and Daejeon-ro 8·15gil, and Jungang-ro; and of roads that represent comfortable lives of cutting edge cities, such as Daejeon Dullesan-gil, Daecheongho lake 500-ri gil, Gyejoksan Mountain Hwangtot-gil, Science road.

2. Road: its humanities attribute

Roads, which are usually regarded as one of the constructions identified by significant changes that humans make and characterized by the age, have a variety of attributes. Throughout the world, human ancestors moved to search for more comfortable places and a better environment for them. This implies that among others, roads have some characteristics of human ecology. Besides that, they have other significant attributes. As seen in the Silkroad, a civilization that flourished on the roads passing through a tribe with distinct features adds cultural and social attributes to them. It means that roads can be seen from the perspective of *cultural sociology,* a term borrowed from *Emile Durkheim*. Generally speaking, roads can be categorized in social science. However why the roads that have played a significant role in human development should be interpreted only through dialectical social science? Since the roads are tend to be acknowledged only when the history proves an advancement in human development, an approach based on experience should be taken, as is the case of natural science and social science.

---

6) Song Hyeong-sup. *Revisioning history of Daejeon*·page 12.
7) Professor Han Gi-beom, Hannam Univ. refutes that Daejeon has a short history with weaker traditional culture in his book titled *Daejeon's historic remains, its mountains, streams and roads*
8) The above book, page 12

By the way, what is the concept of road first emerged? In the beginning, humankind must have learnt the concept of road from the navigation of celestial objects (such as the sun, the moon and stars), which allowed to occur the field of Astronomy to discover celestial navigations. Whereas celestial paths are much too far away for humans to access, waterways are easily accessible to humans and animals who managed to survive. Humans watched paths around waterways to catch animals that come to drink water so that waterways and paths for animals and humans were all mixed together, as novelist Choi In-hun put it.

> While waterways and paths for animals to get waters are made beyond human control, trails tracked by humans for hunting are controled by humans in their active manner for the purpose of their survival. The former can be called objective roads and the latter subjective ones. The process of making something subjective can be found the usage of the word 길 (Korean word for road). That is 길들이다 (which is pronounced *gildeulida* in Korean, which means 'tame'. It means to make something that is not main subject into one having intrinsic attributes, the meaning of which is expressed by the Korean word *gildeulida*. Literally, 길(*gil*) means roads and 들이다(*deulida*) means letting something inside. Thus the Korean word *gildeulida* (for tame in English) means letting roads beyond human control inside humans' consciousness or senses.[9)]

The Korean word of *gil* has spatial, temporal and further abstract concepts by expanding its original meaning of *road* to *tame* and even further *breed, raise or grow, and so on*. As such, in many languages, roads encompass the concept of substance, relations, time, space, and technology.[10)] Seen in this perspective, for the first time, roads must have been made out of human's imagination that allowed to measure efficiency and predict unfamiliar territories. In other words, a various attributes of road are entirely germane to humanities.

After humans lived a sedentary lifestyle, roads were opened among villages and tribes, prompting humans to *set off a journey,* an adventure for unfamiliar territory with or without roads. For example, the Odyssey, a major ancient Greek epic, is fundamental to the following western cultures. The epic is centered on the protagonist's journey home, during which he experienced and was attracted to a variety forms of roads. The Greek mythology is started as follows:

> 0h Muse! tell me of adventures of the creative man
> Who wandered far and wide,
> Who sacked the sacred town of Troy,

---

9) Choi In-hun. *Letter from sea*: page 31. Published by Samin
10) The above book: page 12

who found a full of practices,
Enduring pains intrinsic to his soul longing for sea.....[11)]

Roads were not only involved in the birth of cities but also provided a major motive in the mythology. As is the case of the birth of epic, the origin of the western literature, roads played a similar role in developing a new form of lyric poetry in the Middle age. Troubadours, poets and musicians of lyric poetries during 12th century in Southern France, sang poetries in castles, setting the stage for a foundation for a lyric poetry.

Troubadours sang poetries like songs when wandering around, which were performed before feudal lords and soon known to commoners. Such development was not only witnessed in the West. Similarly, in the medieval period of Korea when most people couldn't read or write, lyric poetries were sung by wanderers from street to street. As for Korean classical poetries which were circulated by word of mouth, a road played a role of their survival and at the same time served as the purpose itself like a motive of poems. For example, of Goryeo folksongs, *Cheongsan-Byulgok* sings about traveling Cheongsan Mountain and beaches; in *Gasiri*, the protagonist expresses his or her sad feeling towards his or he loved one who hit the road. Roads closely related to the destiny of poetries take different images according to times and circumstances. From modern times up to the present day, relations between the roads and poetries have lasted, even to the point of the latter playing the role in the existence of the former. Jeong Cheol, a poet and statesman of Joseon Dynasty, made lots of poetries on sceneries as he wandered the Gwandong(middle eastern part of Korea) region. As such, poetries are born on the roads to be continuously with them.

I went off with my hands in my torn coat pockets;
My overcoat too was becoming ideal;
I travelled beneath the sky, Muse! and I was your vassal....
My only pair of breeches had a big whole in them.
Stargazing Tom Thumb, I sowed rhymes along my way.
My tavern was at the Sign of the Great Bear.
My stars in the sky rustled softly. [12)]

Arthur Rimbaud, a French poet in the 19th century, is famous for freeing poetry from its formality and traveling all his life. Traveling and roads provided the source of his poetic inspiration and his

11) The Odyssey. Chapter1, 1－4. This is translated of its French version of Philippe Jacottet, a French poet.
12) Arthur Rimbaud, 「Ma Bohème(My Bohemian life)」, 『*Illuminations*』, Poche

existential environment. Jean-Jacques Rousseau, a French philosopher of the 18th century, confesse d[13] that *"the rural landscape is my study"* in his book entitled *My Portrait,* suggesting that roads brought vitality to the philosopher's wit. Great authors such as Arthur Rimbaud, Jean-Jacques Rousseau and Friedrich Nietzsche, whose works contain *road,* as Ulysses would be. However, unlike the early stages when roads were involved in the birth of literary works, the very same roads have become to mingle with the modernity in the present day. Additionally, poets, who were inspired from nature reached their peak in the 19th century when romanticism prevailed, now are replaced by ones who try to embody their privately mythical world, departure from romanticism emphasizing the other person's emotions. Thus roads isn't the origin of inspiration any more, nor are they involved in the birth of poetry. More specific, in the 19th century, a French poet sitting on a road received poetic inspiration; in the 20th century, roads have become a helpless space that allows for poets to lament about their "*lost hope*."[14]

Do not look for me, I missed things that would collapse soon
Now the sun sets, memories from roads are blurred.....
I murmur in the dark
Do not look for me.... irresponsible sighs
Hopes[15] that ruin their lives on the roads

In this way, roads portray themselves in various ways as humans make historical advancement along the way. Therefore. roads are not only spaces where poet's soul and sentiment come to life, but also temporal ones that allow for hopeless present, and remembrance and remorse in the past to be expressed. Also, roads play the role of starting point in life; and at the same time places for learning; wells where the existing learning and beliefs are turned over and renewed. In short, roads are extended spaces for survival in which an existence makes, turns over and renews its life.

I'm thinking standing on the road

---

13) Jean-Jacques Rousseau 「*Mon portrait(My portrait)*」 : "Je ne fais jamais rien qu'à la promenade, la campagne est mon cabinet ; l'aspect d'une table, du papier et des livres me donne de l'ennui, l'appareil du travail me décourage, si je m'assieds pour écrire je ne trouve rien et la nécessité d'avoir de l'esprit me l'ôte."
Frederic Gros. Translated by Lee Jae-hyeong. 『*Marcher, une Philosophie (Walker, a Philosophy)*: page 101. Published by BookWorld

14) Kim Hyeon-eun. *Literary critic*. the word '*hopes*' used in the poem means '*lost hope*'

15) Gi Hyeon-do (1991). *Murmur on the road*. From black leaves inside mouth. Published by Moonji Publishing Co

running on numerous roads, once
I believed to get wisdom from roads
Glorifying the beliefs, here I am

Yet standing in the center of despair like hard pavement
and roaring sound of all kinds of engine
I ask
What did I learn from roads?

Why do verities and rules taught by roads keep my song locked?

Roads have long been hardened by running wheels
Human imagination created the wheel
Yet it made roads
Taming them with its methods and thinking.....

I will put wisdoms received from roads out of my mind
Wheels of imagination that led me
Stop
And take off from all the roads in sight[16)]

Roads, where poets sing songs, individuals design their lives, and histories unfold, are the places where human's fundamental problems are discussed and explored. Also, roads have long been existed even before myths were sung and human's desires for building cities and nations existed. Human's all creative actions have been involved in a various forms of roads-which sometimes intervene in humans' lives or touch their hearts by passing through the times and circumstances.

These roads have led to the birth of 21th century Korea's science and future city of Daejeon. The roads that intervened in the birth of a city now directly affect their lives and cultures, differentiating one from another depending on their own different birth backgrounds and circumstances. The best examples are ones constructed at the time when Daejeon started forming its modern shape (e.g., Inhyeo-ro, Daejeon-ro, Jungang-ro);others built to overcome malaises in modern society caused by increasing capitalism after being aware of *well-being life* (e.g.,Daejeon Dullesan-gil, Daecheongho lake 500-ri gil, Gyejoksan Mountain Hwangtot-gil, Science road). Each and every road provides a driving force to city dwellers, building a distinctive image. That's why this study tries to discuss roads beyond their geographical perspectives and to estimate the city's inherent cultural and social capabilities. As early mentioned, this study clarifies that roads have humanities' attributes, leading us

16) Yu Ha. *Talking on the road*. From My love was as light as butterflies. Published by Yeolimwon

to mull over the implication of a road. Different roads have different implications as seen in the above mentioned roads: such as Inhyo-ro and Daejeon-ro 8·15gil, and Jungang-ro; of roads that represent comfortable lives of cutting edge cities, such as Daejeon Dulle-gil, Daecheongho lake 500-ri gil, Gyejoksan Mountain Hwangtot-gil, Science road. This begs the question: What could be the implication of *the roads?*

2-1. Implications of the roads first constructed in Daejeon- modern loss and its nostalgia

As defined by *Georg Simmel,* modernity means the collapse of a system in which humans are subject to social interest groups. Faced by the modernity, humans are in the existence as they are, free from themselves attached to a feudal traditional society. Humans, in the present days, enjoy highly internal and external free mobility compared to that in the past. Indeed, the awareness of free mobility might have been a driving force behind the progress of modernity. When it comes to mobility, modern humans find their motives in themselves rather than in the society they are belong to. For those reasons, in the 19th century, a great number of writers who enjoy travelling around were suddenly appeared in the western literature. At that time, western writers were long distance travelers like Arthur Rimbaud, and their free mobility forged *Orientalism.* The modernity started from the western literature in the mid-19th century is highly related to the free mobility of autonomous beings. Their desire for free mobility was realized not only by traveling by walking on big streets but also by having 'modernistic hobbies' of strolling narrow paths crossing the modern cities. And where is the modernity embodied by Charles Baudelaire, so-called a pioneer of the modern literature of the western world? His acknowledged modernity lies in introducing an individual who takes a walk in Paris' narrow paths while observing the crowd and phenomena occurring in the modern city. Similarly, Lee Sang, hailed as *the fittest person of the western modernism* among Korean literary people in the early 20th century, introduced in his book an individual who wanders around Gyeongseong Station (today's Seoul Station) and observes the crowd. This implies that a free mobility out of a private motives(or loitering or a strolling idly) can be interpreted as modernity endowed to a modern human.

In the Joeson Dynasty, stations for horse, similar to railway stations today, were positioned in important traffic spots. The stations were only accessed by public servants who traveled for government affairs, showing the characteristic of a traditional feudal society.[17] In that era, there

17) Kang Sung-beok. *current situations of the roads in Daejeon and its characteristic.* from Daejeon's historic remains, its mountains, streams and roads: page 409:In the period of Joeson Dynasty, horse stations were functioned as places for transportation, communication. They were an important government organization for providing horses for those that deliver commands of official documents; for accommodating and serving foreign envoys; for transporting a tribute or tax paid in kind from the

existed the only station called Jeongmin Station designed for government affairs and military operations in the region of today's Daejeon, And yet the emergence of Gyeongbu railway passing through the area raised the stature of the region and changed the city's identify. The railway was originally constructed by Japanese imperialists who wanted to take advantage of its neighbor country. Along the way, however, autonomous beings enjoying free mobility were emerged in Daejeon. They were strangers with unfamiliar faces including *blue eyed Ruskie girls*, *dirty Chinks and Japs*[18] (derogatory expressions of Russian, Chinese and Japanese people) as well as those who took *the train running through yellowish cabbage flowers*[19] to their hometown on the excuse of missing their grannies. As often expressed in Korean literatures, Korea's modernization developed along with the adoption of the Western culture was expressed as a synonym of trains running railways. Joeng Ji-yong, a Korean modern poet, often borrowed the word *train* as his poems' motive as if train is the symbol of the modern civilization. It is evident that for those who just got out of traditional societies where only dirt and muddy roads existed, a constructed road for cars and trains must have meant entering a new world of civilization. Then, do the past railways (constructed at the time when foreign technologies were first adopted in Korea) and the present railways (just providing every day's convenience) have the same meaning? The answer is no. They would be very different. It can be understood in the same context that roads constructed at the time when modern civilization was adopted is quite different from those of today.

Presumably, there must be hidden implications in the word *railway* from the fact that both trains and railways helped facilitate the birth of Daejeon, and also played a role in the emergence of an individual separated from the crowd. Besides, the historical fact that railways, regarded as a background behind the birth of Daejeon, were built by a foreign country leads the subject of modernization of Daejeon to be more of superficial, putting an individuals' free mobility at that time in question. The below two paragraphs are excerpted from the memoir of the folk historian Choi Mun-hwi and the studies from the National Institute of Korean History in Daejeon Metropolitan City:

> In the early 1900, the area (now known as Jeong-dong, Won-dong and In-dong) was barely sold at a price of 1 or 2 jeon(then small subsidiary currency, 1won=100jeon) per 3.3 square meters. However, the price went up to 2 won in 1904, meaning that the area began to come into to the spotlight as a new development area. But such development was only limited to the front of Daejeon Station and there was no bridge to speak of in the area to cross Daejeon stream, except stepping stones, often flooded with heavy rains: Mokcheok

provinces.

18) Excerpted parts of the poem *Reptilian,* Published in Hakjo, a magazine of students studying in Japan

19) Jeong Ji-yong(2004). *Trains.* from Baengnokdam. Published by Yeolimwon:
Granny/ why are you so sad and crying?/ going to Nokado island in tears…..//Because I also have a toothache/going to my hometown.//trains are running through yellowish cabbage flowers/ running with patient.

bridge(stepping stones)to cross Daejeon stream and a stone bridge crossing Daejeon stream in Seokkyo-dong.

For the first time in July 1907, Ssiong bridge connecting In-dong and Munchang-dong was constructed. In 1911, Mocheok bridge first designed to build with the width of 2 kan(traditional Korean unit of measurement) was completed with the width of 3 kan. In this respect, the first bridge of Daejeon city would be Ssiong bridge,[20] which was built by Japanese residing in Daejeon who needed Daejeon Market and wanted to facilitate its use.

One of the distinctive features of roads in the area of Daejeon, way before its emergence of modern city, was that no distinguishable road was formed in the area bordered by Daejeong Station, Daejeon stream, the provincial government of South Chungcheong region and Yudeng stream. That means that after the emergence of Daejeon based in the area around Daejeon stream, a totally different road was forced to be formed, paving the foundation for the today's transportation system in Daejeon....

Daejeon-myeon(administrative division), the basis of the modern adminstration system, was first emerged as the result of Japanese decision of merging Korea's administration district systems..... Afterwards, a various city development projects[21] were launched: for instance, constructions of mains roads (e.g.,Inhyu-ro, Jungang-ro, Jungko-ro, Daeheung-ro) and bridges connecting the east and west (e.g., Mocheok bridge, Daeheung bridge, Jung bridge) and sewage systems.

The construction of Daejeon Station and the formation of main streets in front of it were stamped as major events on the individuals and collective memory. As the folk historian Choi Mun-hwi indicated, the term road has deeper meaning than its dictionary definition of a open way for persons, vehicles and animals. The roads that were built at the time of Japanese colonial era, such as Bonjeong-tong(ton meaning an alley), Yeongjeaong-tond, and Chuniljeong-ton, are now called different names such as Inhyu-ro, Jungang-ro, Daeheung-ro 8·15gil and Jungko-ro. But, even though the ares which was named Chuniljeong-ton in the past and now is called Jungang-ro is geographically same, not emotionally. As seen in the memoir of Choi Mun-hwi, the historian confessed that only the area around Daejeon Station was developed and there was no bridge to speak of..... except Ssiong bridge which was built by Japanese residing in Daejeon who used Daejeon Market for increasing their profits. His confession conveys a sense of sorrow that the road, the modern construction, contains. It would be a feeling of those who lost their independence

20) Choi Mun-hwi (2010). *100 years of history of Daejeon 1900-1920*. Published by Tomato, a monthly magazine, July 2010

21) Kang Sung-beok. *Current situations of the roads in Daejeon and its characteristic*. from Daejeon's mountains, streams and roads: page 428

towards newly roads or bridges constructed by their aggressor. Therefore, newly made roads placed in the modern city of Daejeon assumingly must have formed complex implications beyond simply a construction structure called *road*. Some roads would be regarded as ones transferring new civilizations, or others are assumed as a main culprit destroying the existing eco system. In this context, roads have mixed implications of *awe* towards a new culture, *sorrows* coming from the forcefully accepted modernization and *nostalgia* for something that already existed. Such complex implications are not only found in roads in Daejoen, but also in new cultures that were out of sync with Korean mountains and streams

> Our train is going puffing a ridiculous-shaped pipe in a spring day
> with shimmering haze
> Our train is walking slowly and slowly like cows in June
> Our train is running hurriedly through yellowish cabbage flowers planted
> on the slide slops
> I am always sad but light-hearted
> Whistling to myself leaning against the window[22)]

Trains, reminiscent of "*tremendous reptiles*", carrying foreigners, are struggling to run on "*newly built railways on the slide slops with the yellowish cabbage flowers*", an image conveying the sentiment of anxiety and sorrow resulted from accepting a new culture. Whereas the urban planning in the West allows individuals to observe the crowd while strolling around cities, the forced city developments occurred in Korea brings mixed feelings such as awe, sorrows and nostalgia for those who went through that era. Even though roads like stepping stones in Daejeon stream and Ssiong bridge remained in individual's memory as a structure for mobility, their implications vary widely across times(modern era) and historic experiences(the Japanese colonial rule).

At the time when Japanese residing in Daejeon stepped up their efforts to develop the area further with the aim of seeking more of interests, Japanese military began to be stationed in the name of protecting their people. During the period korea was under Japanese colonial rule, Japanese police was at the forefront of brutally suppressing Koreans. The police, at first placed in Hoedeok along with the opening of Daejeon Station in 1904, was moved to near Daejeon Station the same year, beginning to earn its reputation for brutality. Frequent stops and searches by Japanese police prevented Koreans from hanging around Daejeon Station where more Japanese started residing. The following year saw the conclusion of *Protectorate Treaty of 1905*, the prelude to Korean's tragedy. Japanese became more elated so that the Japanese Settlement Corporation was formally launched in Nov. 7 1905. The organization played a role of a Japanese authority in collecting taxes or appointing

22) Jeong Ji-yong(2004). *Sad Trains*. from A collection of Joeng Ji-yong poems: page 78. Published by Yeolimwon

a head of Tong(the lowest-rank order in local administrative tier system), leaving the Korean government helpless.[23)]

The name Chuniljeong-ton during the Japanese colonial era (today's Jungang-ro in front of Daejeon Station) must have been associated with the feeling of fear and sorrow to people who lived at that time. Someone might have said to his or her neighbors: "don't go this way. This path would lead to the Japanese autonomous area where Japanese police can search you." Such tragic history gave a special connotation to Chuniljeong-ton(today's Jungang-ro in the old town), and subsequent events (such as liberation, urban developments) provided another implications to the road. As seen above the case, the geographically same areas can have different implications according to times and circumstances. The stature of Daejeon was raised since the year 1930, when the provincial government of South Chungcheong region moved itself from Gongju-si to Sunhwa-dong, Daejeon, and further elevated after liberation. Jungang-ro, the heart of the city during the past 40 years until the city was upgraded to the status of Directly Governed City(*Jikhalsi*) in 1989, has another implications along with the new town development project. Then, Jungang-ro is now called *Euneungjeongi Street,* the name of which offers a new implication as well.

2-2. New implications of the roads in Daejeon- its culture, eco-environment, and future

As Daejeon was elevated to Directly Governed City in 1989 and hit its stride in the Dunsan new town development project, since then the city have undergone significant changes in terms of its administrative, cultural and geographical perspectives. After completing its massive land development project started from the late 1980s, as of now, Daejeon city has transformed itself as a metropolitan city(comprised of five districts) and achieved decentralization and multinuclearation of itself. Daejeon Metropolitan City is now divided into the old city and new city. Works related to administration, finance and law that were done in the old town are now taken place in Dunsan new town. The decentralization process gave birth to the area of old town, which has formulated the *culture zone*, a place less likely to be encountered anywhere else in Korea. The core area of the old town consists of Eunhang-dong, Seonhwa-dong and Daeheung-dong originated form Ginkgo-Tree gol(gol means town), the center of which exists Jungang-ro, the heart of Euneungjeongi Street or Culture Street. More precisely, the area around the crossroads of Euneungjeongi Street and Daeheung-dong where Daejeon Art Center (a complex cultural space being renovated from modern architectures) is situated has become the ultimate place to draw local artists. Also it is also the place that stirs memories of those who were in their 20s in the 1990s.

---

23) Choi Mun-hwi (2010). *100 years of history of Daejeon 1900-1920*. Published by Tomato, a monthly magazine, July 2010

After the opening of Gyeongbu(Seoul-Busan) railroad, Jungang-ro (the central road of Daejeon) signified the sorrow of Japanese colonial era; after liberation, it was regarded as a bureaucratic road. Since the 1990s, the point when the city achieved its multinuclearation, Jungang-ro has lost its status, reducing to be just *a road*. From here, the word 'road' begins to have different implications than those in the past. Therefore to assume the implications Jungang-ro had in the past, we should track down its historical changes. Evidently, as its status has changed, its implications have been altered accordingly. While Jungang-ro is the reminder of its administrative and financial center, Euneungjeongi Street signifies a cultural zone. If the cultural zone named Euneungjeongi street had not been formed, it would have existed just as a street leading up to Daejeon Station. Today, Jungang-ro plays an important role in guiding into unique cultural events taken place in Daejeon. The fact that the city designated the old town of Daeheun-dong as the space for the exhibition of *the Project Daejeon 2012:Energy* (organized by Daejeon Museum of Art) shows the significance of Jungang-ro as a cultural place. The road is not the place only associated with sorrow history and adminstration works. Rather it is the one that is passed through to participate in a host of cultural events and feasts taken place there. At this moment, a road is free from its original purpose of human mobility, transforming itself into the one that features arts, literature, way of life, values, traditions, beliefs and so on. Roads exist no longer just for being passed through. the places like Euneungjeongi Street, whose purpose is not only a mobility but also a stay. To make someone stay in a road, there should be a new implication of roads: That is culture.

In capitalist societies, what matters most is capital. Indeed, cities consist of a variety of complex aspects. John R. Short, a renowned sociologist and expert on urban issues, wrote in his book *'The Humane City: Cities As If People Matter'* as follows: "*the great majority of people in the Western world live in cities, which are ways of expression of contemporary architectural designs and places for entrepreneur activities, and responsibilities of central and local governments.*[24] *That's why top agenda for building cities better for people narrow down to issues*[25] *such as economic growth and administrative convenience.*" In terms of defining modern cities, roads should have the meaning of 'moving spaces' interlinking humans with mega-cities comprising interest groups. And yet, a criticism against capitalism' malaises is often heard in the 21th century cities, where places equipped with cultural potentials (e.g., Euneungjeongi Street) are appearing. Such an emergence of roads having cultural implications leads us to estimate the future of cities. That is because roads containing cultural attributes help expose underneath images of cities which focus on improving their physical well-being. In other words, roads that create and exhibit cultures are emerging, which prompts cities to change their focus from capital-centered to human-centered. In human-centered cities, more roads that have their own cultural implications are emerging, leading them to have another implications.

24) John R. Short(2000). *The Humane City: Cities As If People Matter:* page 17 translated by Baek Yong-gi. Published by Hanwol
25) The above book: page 18

Today, roads in Daejeon are building up entirely different implications from the past implications of sorrow and entrenched administrative images: The best examples are Euneungjeongi Street, Daejeon Dullesan-gil, Daecheongho lake 500-ri gil, Gyejoksan Mountain Hwangtot-gil, Daedeok vally promenade, and Science road. And their newly found implications are culture, eco-environment and future.

Daejeon seeks to become a human-centered city under the slogan *"prosperous and fun city, traditional and a variety of cultural city, science and future city."* The city has numerous roads and bridges, most of which are designed for mobility. Above mentioned, just like Jungang-ro that was built at the time of Japanese colonial era has the new implication of culture, some roads are building up their images as eco-environment and future-oriented ones. For instance, the event *"connecting Daejeon Dullesan roads"*, which was first started in 2004 with the aim of encouraging citizens to walk around[26] their neighbor mountains by linking mountains in Daejoen, helped create eco-environment centered roads. Anther examples of claiming the eco-environment concept are Daecheongho lake 500-ri gil, Gyejoksan Mountain Hwangtot-gil, and Science road. Just as in the old days when the word '*road*' was often appeared in verses from travelling poets, today, in reverse, verses are being appeared in roads claiming eco-environment. The following cases- Jeong Hun's poem *Meodeulryeong* adorn the third section of Daejeon Dullesan roads; and Jeong Ji-yong's poems in the section of Jiyong Nostalgia Road of Daecheongho lake 500-ri gil- show that poems are closely involved in the birth of the eco-environment oriented roads. The above mentioned roads expose humanities' attributes that roads contain, and prove a new meaning given to them.

Newly found implications of roads can be seen as reaction against the rush that Korean society has sought for to become a highly civilized industrial country. Thanks to the cutting edge science, we are living in rapid paced society with a glut of informations. Yet we dream of living in a world of deficiency and slowness. The cities that have places to allow the dream to come true are human-centered ones. The roads that allow to enjoy deficiency and slowness and to imitate the steps of cynic philosophers are eco-environment oriented ones. In this respect, such human & eco-environment oriented roads will show the future prospects of Daejeon. Walking on the eco-environmental roads while reciting poems and observing nature will be one of the best ways to lead a better life in a city, or a human's complex space.

3. Conclusion

Whereas roads made by busy walking of humans might be just spaces for easier travel, the progress of human advancement for many years changes the meaning of roads. In other words, roads that were regarded as spaces for human mobility is changing its meaning from simple to

26) Quoted from the information map *<Daejeon Dullesan roads>*

complex one. In the 21th century, roads have implications of culture, eco-environment, future, benevolence, love and so on, beyond a means of mobility. This study attempted to identify their meanings and attributes that call for profound understanding beyond the existing meaning and to prove them to be established already.

Against this backdrop, by taking examples of some case studies on roads passing through the cutting edge cities in the 21th century, this study identified the fact that free from their traditional meaning, the meaning of roads in the present time is moving forward toward: having enthusiasm for all kinds of cultures; creating an environment for well-being lives struggling against the capitalist malaise; and being a symbolic place containing the future prospect of a city. To this end, humanities' approaches, instead of social science and urban engineering ones, were applied to interpret their meanings, through which it is found that implications of some roads have more complex meanings. And this study allowed us to take a good look at cultural potentials inherent in Daejeon (overcoming its history of being born along with the construction of railways) through roads credited with building cultural, eco-environmental and futuristic implications

That is to say, historic trauma inherent in the existence of modern city of Daejeon can be overcome through humanities studies of roads in the city, and that the city has future potentials as "a *prosperous and fun city, traditional and a variety of cultural city, science and future city.*" In terms of humanities perspective, getting lost means getting lost in maze, leading to death. On the other hand, finding roads or making roads to go means life itself, leading to hope for life. In this respect, walking slowly around Dullersan-gil, getting breaths, contemplating the harmonies of mountains, water and lights on Hoban-gil, inhaling energy from the earth to exhale it to the sky and in turn inhaling energies from the sky to exhale to the earth of Hwangtot-gil, Deajeon citizens are truly leading happy lives

4. Reference

Georg Simmel(2006). *Simmel's reading modernity.* Translated by Kim
Gi Hyeon-do(1991). *Murmur on the road*. from black leaves inside mouth. Published by Moonji Publishing Co
Deajeon National Institute of Korean History. *Daejeon's mountains, streams and roads*
Park Chan-in(2010). The road at those times published by Gungmedia
Song, Hyeong sup (1993). *Revisioning history of Daejeon:* page 12. Published by Naru
Lee Su kwang (2010). *Gyeongbu(Seoul-Busan) railroad, story of tears and sorrow*. page 6. Published by Hyo Hyeong Publishing Co.
Lee Yong sang et al.(2013). *The history and development of Korean railways*. page 39-40. Published by Book Gallery
Jeong Ji-yong(2004). *Trains*. from Baengnokdam. Published by Yeolimwon

Jeong Ji-yong(2004). *A collection of Joeng Ji-yong poems*: page 78. Published by Yeolimwon
Cho In-hun. *Letter from sea*: page 31. Published by Samin
John R. Short(2000). *The Humane City.* Published by Hanwul
Charles Landry(2005). *Creative City.* Published by Haenam
Choi Mun hwi (2010). *100 years of history of Daejeon 1900-1920*. Published by Tomato, a monthly magazine, July 2010
Christophe Lamoure(2007). *Philosophy of walking*. Published by Gamagowon
Frederic Gros. *Marcher, une Philosophie:* page 101. Translated by Lee Jae-hyeong. published by BookWorld
Homère(1999). *Odyssée*. Poche
Rimbaud, Arthur(2010) *Illuminations.* Poche

A Humanistic Study on 'Daejeon Confucianism' in the 17th Century

Euidong Hwang
Chungnam National University

1, Introduction

Confucianism pursues the spirit of humanities by nature. For a long time of history, Confucianism has strived to take humanistic introspection, such as realization of human dignity, internal quest for human being, reflection on human life and recognition of values that man should uphold. Above all, Confucianism takes a keen interest in human and society. [1] It has always been concerned and pondered over 'human' and the 'worldly society' they live in, not God nor the nature. In this regard, the core of Confucianism is humanistic.

In modern society, people pursue convenience and enjoy material affluence thanks to the development of state-of-the-art scientific technologies. Economic value is regarded as the most important value, which is a universal phenomenon. Countries around the world are in pursuit of enhancing national prosperity and military power while emphasizing practical interests and efficiency. In the meantime, not only human beings have been isolated but also mental and moral values have been neglected. Against this backdrop of huge emphasis on outcome, efficiency and benefit, it is high time to have a thorough soul-searching on the root of human life to reclaim humanities.

This paper aims to present the importance of traditional values and renew their significance by examining the humanistic spirit of Confucianism in times of humanities crisis. Nowadays, Daejeon is a mecca of scientific technology, transportation and administration, but it is no exaggeration to say that, historically, it was the center of Giho Confucianism in the seventeenth century. Daejeon was a home to numerous Confucian scholars, but especially in the seventeenth century, Daejeon was a stomping ground for great scholars including Song Si-Yeol (pen name: U-am, 1607-1689)[2], Song

1) Confucianism has always been concerned and pondered over 'human' and 'society' they live in. The main concern of Confucianism is neither God nor the nature. This is consistently proclaimed in Confucian scriptures, and the *Great Learning* (大學) provides the categories of Confucianism as 'cultivating individuals (*susin* 修身),' 'regulating families (*jeka* 齊家),' 'rightly governing States (*chiguk* 治國)' and 'having the entire world at peace (*pyeongcheonha* 平天下).'

Jun-Gil (pen name: Dongchundang, 1606-1672)[3], Gwon Deuk-Gi (pen name: Manhoe, 1570-1622)[4], Gwon Si (pen name: Tanong, 1604-1672)[5] and Yun Hyu (pen name: Baekho, 1617-1680)[6]. Song Si-Yeol, Song Jun-gil and Gwon Si together with Kim Jip[7], and Yi Yu-Tae[8] were admired as distinguished Confucian scholars out of office as they were invited as five advisors upon King's secret request (密旨 五臣)[9].

Joseon Dynasty in the seventeenth century was at a crossroads between "maintaining justification" and "seeking practical interest" after defeated by the Second Manchu invasion of Korea in 1636. At the same time, Joseon Confucianism sought for various ways through conflict, confrontation and competition among factions and schools as academic and political circle were closely related. I would like to explore the humanistic spirit of Daejeon Confucianism in the seventeenth century in a contemporary way focusing on Song Si-Yeol's 'honesty (*jik* 直)' and 'righteousness (*euili* 義理),' Song Jun-Gil's 'propriety (*ye* 禮),' Gwon Deuk-Gi and Gwon Si's 'pursuit of rightness (*gushi* 求是)[10],' 'fair mind (*gongshim* 公心)[11],' and 'fair morality (*gongdo* 公道[12]). I would like to discuss Confucian ideas of Song Si-Yeol, Song Jun-Gil and Gwon Deuk-Gi/Gwon Si who represent Daejeon Confucianism in the seventeenth century from the humanities perspective in a modern context.

---

2) Song Si-Yeol, a Confucian scholar in Joseon in the 17th century, inherited the orthodoxy of Yulgok School and took the lead in advocating invasion of the Qing Dynasty with Hyojong to pay back for the Second Manchu Invasion. He made utmost efforts to set ethical principles right and realize a just society.
3) Song Jun-Gil, a Confucian scholar in Joseon in the 17th century, was at the center of Yulgok School together with Song Si-Yeol. He had a profound knowledge on the study of rites and played a bridging role between Giho study of rites and Yeongnam study of rites.
4) Gwon Deuk-Gi, a Confucian scholar in Joseon in the 17th century, is a father of Gwon Si. As a scholar of Giho Namin Faction, he also belonged to Ugye School. Instead of theoretical Sung Confucianism, he emphasized self-cultivation and practical academic tradition.
5) Gwon Si, a son of Gwon Deuk-Gi, was academically influenced by his father. He had scholarly interchange with Song Si-Yeol, Song Jun-Gil, Yi Yu-Tae and Yun Seon-Geo and he also stressed the importance of fair mind and practical learning as his father did.
6) Yun Hyu, a Confucian scholar in Joseon in the 17th century, was a relatively progressive scholar. In particular, he was castigated by other Confucian scholars like Song Si-Yeol for autonomously interpreting Confucius scriptures.
7) Kim Jip is a son of Kim Jang-Saeng and he taught many Hoseo Confucian scholars such as Song Si-Yeol, Song Jun-Gil, Yi Yu-Tae and Yun Seon-Geo. Succeeding his father's study of rites, he greatly contributed to systemizing the study of rites in Joseon.
8) Yi Yu-Tae, a Confucian scholar in Joseon in the 17th century, was taught by Kim Jang-Saeng and Kim Jip. He not only had a profound knowledge on Sung Confucianism and the study of rites, but also had a deep interest in the practice and application of teachings of Confucianism by inheriting Yulgok's Silhak (practical learning).
9) After the Qing dynasty's invasion, Hyojong prepared to strike the north. To this end, he summoned five distinguished scholars, Kim Jip, Song Si-Yeol, Song Jun-Gil, Yi Yu-Tae and Gwon Si in secret to court.
10) refers to'seeking rightness'
11) fair mind
12) fair morality

2, Humanistic Spirit of 'Daejeon Confucianism' in the 17th Century

(1) U-am Song Si-Yeol's 'Honesty,' 'Righteousness'

Song Si-Yeol belongs to the direct line of Yulgok School succeeding the teachings of Yi Yulgok and Kim Jang Saeng[13], and one of the 'Eighteen Sages of Korea'[14] who are honored and venerated in the Munmyo(文廟), Korea's Confucian Shrine. He was the central figure in the world of politics and thought in the 17th century Joseon, so he was revered as 'Great Sage (*daero* 大老),' 'Great Mountain (*taesangyoak* 泰山喬嶽)' and Master Song (*songja* 宋子)[15].

He was a Neo-Confucian scholar in the vanguard of defending the Yulgok's Sung Confucianism from the challenge of Toegye's Yeongnam School and the key figure in controversy over Confucian rituals as well as a great scholar of rites succeeding Kim Jip's teachings. Moreover, he played a leading role in attempting to strike the Qing Dynasty to avenge humiliation of 1636 invasion in King Hyojong's confidence and served as a shining model of pledging and displaying loyalty. In late Joseon period, a Confucian scholar Jeon Woo (pen name: Ganjae, 1841-1922)[16], in his *Collection of the Famous Works of Five Neo-Confucians* (五賢粹言序), venerated Jeong-am[17]'s 'willpower (材志),' Toegye[18]'s 'study of virtue (禮敎),' Yulgok[19]'s 'principle-vital force (理氣),' Sagye[20]'s 'teaching of rites (禮敎)' and

13) Kim Jang-Saeng (1548~1631) was a star pupil of Yulgok and he devoted himself to developing Joseon's study of rites.

14) It refers to the most venerated 18 Confucian scholars who are honored in Sungkyunkwan Munmyo for their teachings and morality. After collecting the opinions of scholars, the royal court officially acknowledged the contribution based on the public consensus, which was considered the highest honor a scholar could achieve during the Joseon Dynasty.

15) All of these expressions speak highly of U-am Song Si-Yeol's great teaching and status. He was a man of great erudition and a man of integrity like a great mountain and an old tree and had a great influence in both political and academic circle. He was the only person among Joseon Confucian scholars to be referred to as 'Master Song (宋子) on a par with Confucius and Mencius.

16) Ganjae Jeon Woo was a representative Confucian scholar in the 19th century and he made a remarkable accomplishment in advancing Joseon Sung Confucianism. During the time of national crisis, he devoted himself to Confucian study and education rather than taking part in movement.

17) Jeong-am is the pen name of Jo Gwang-Jo (1482-1519), a Confucian scholar in the 16th century. Appointed public position at an early age, he earned King Jungjong's completed trust and promoted radical reforms. But he was framed by the opposition and sentenced to death. He has been widely venerated as a Confucian martyr.

18) Toegye is a pen name of Yi Hwang (1501-1570), a Confucian scholar in the 16th century. Together with Yulgok, he is the key figure of the Neo-Confucian literati in Joseon. He was a pioneer in developing Korean version of Neo-Confucianism and emphasized principle (理) as the force of foundation.

19) Yulgok Yi I (1536-1584) was one of the two most prominent Korean Confucian scholars of the Joseon Dynasty, the other being his older contemporary, Yi Hwang. He greatly contributed to advancing Neo-Confucianism in the 16th century Joseon and pursued a harmony of principle (理) and vital force (氣). Also, he studied Silhak (study of practical learning) together with Neo-Confucianism and presented

U-am's 'principles of righteousness (義理)' as their characteristics.[21] As mentioned above, 'principles of righteousness' is what differentiates Song Si-Yeol from other Confucian scholars as his distinctive characteristics.

Song Si-Yeol's life was a string of practicing the principles of righteousness. Considering Yun Hyu's interpretation of Confucian classics as a challenge to Zhu xi's doctrine, he chastised Yun Hyu as 'one who disturbs and behaves contrary to Confucian tenets (斯文亂賊)[22]' and harshly criticized Yun Seon-Geo and Yun Jeung[23] who stood by Yun Hyu's side in order to drive out heresy. Master Song pioneered in praising historical figures who practiced morality and fidelity.

For instance, he wrote an epitaph for Jeong Mong-Ju (鄭夢周)[24], a symbol of loyalty in the Goryeo Dynasty, and erected tombstones for Six martyred ministers (s*ayuksin* 死六臣)[25]. He also wrote epitaphs for Jo Gwang-Jo and Song In-Su (宋麟壽)[26] who died under a false accusation during the Ulsa massacre of scholars. He published a collection works of Jo Heon (趙憲)[27], a patriotic military leader who sacrificed himself during the Imjin War, wrote records of the deceased (行狀) and a grave post and erected a tombstone. Song Si-Yeol also wrote biographies of Jang Yoon (張潤), a patriotic troop leader, Yi Sa-Ryong (李士龍), an artilleryman, and Kim Seong-Won (金聲遠) and Kim Seung-Yoon (金宗胤), martyrs, during the Imjin War. In particular, he wrote a monumental inscription commemorating the victory of Admiral Choongmugong Yi Sun-Shin (李舜臣)[28] and an epitaph for General Gwon Yul (權慄).[29] In addition, he wrote biographies of Three Patriotic People (*samhaksa* 三學士)[30] and General Im Gyeong-Eop (林慶業)[31] who took the lead in fighting against the Qing

a blueprint of reform with a keen awareness of reality.

20) Sagye is the pen name of Kim Jang-Saeng, a Confucian scholar in the 17th century Joseon

21)『艮齋集』, 前編, 卷16,「五賢粹言序」, "愚嘗妄謂以靜庵之材志 有退溪之德學 契栗谷之理氣 循沙溪之禮教 立尤庵之義理焉 則其於爲人 可謂幾乎聖者矣."

22) '*Samunnanjeok* (斯文亂賊)' refers to one who disturbs and behaves contrary to Confucian tenets. Song Si-Yeol blasted Yun Hyu for autonomously editing and interpreting Confucius classics in the 17th century.

23) Noseo Yun Seon-Geo(1610~1669)and Myungjae Yun Jeung(1629~1714) are father and son and they were Confucian scholars in the 17th century Joseon. They emphasized practicing and self-cultivation rather than theoretical study of Sung Confucianism.

24) Poen Jeong Mong-Ju (1337-1392) was a Confucian scholar in the late period of Goryeo Dynasty who was murdered because he refused to Yi Seongye who overthrew the Goryeo Dynasty and build Joseon.

25) The six martyred ministers or Sayuksin were six ministers of the Joseon Dynasty who sacrificed themselves to protect king Danjong from his uncle Suyang Daegun.

26) Gyuam Song In-Su(1487~1547), a Confucian scholar in the 16th century Joseon, died under false accusation by his opposition.

27) Jungbong Jo Heon(1544~1592) was a pupil of Yulgok Yi I and he died while fighting against the Japanese when Japan invaded Joseon in 1592.

28) Yi Sun-Shin(1545~1598) was a naval commander in the 16th century Joseon and saved Joseon after defeating the Japanese navy in 1592.

29) Gwon Yul(1537~1599) was a general in the 16th century Joseon and he bravely fought against the Japanese troops in 1592.

Dynasty during the Second Manchu Invasion of Korea[32], and wrote an epitaph and a grave post for Kim Sang-Heon (金尙憲)[33].

Noting that what a country should uphold and encourage is only the study of morality and fidelit y[34], Song Si-Yeol yearned for 'a nation which pursues justice and disregards benefits (尙義之世)[35].' Han Won-Jin[36] assessed that U-am believed firmly in the Learning of Master Zhu and followed *Spring and Autumn Annals* of Confucius to maintain fidelity, and he complied with Hyojong's favor to 'light up the world and set people right (明天理 正人心)' by respecting fidelity and keeping away from unrighteous remarks[37]. Kim Chang-Hyup[38] appraised that "there are four things that U-am has always kept throughout his life; inheriting Three Saints by abstaining from making biased and lascivious remarks; honoring the Eastern Zhou (東周) period by respecting fidelity; tightening moral disciplines by reinforcing disciplinary actions; and hating pseudo-Confucian scholars (*hyangwon* 鄕愿)[39] and edifying them[40]. As you can surmise from such evaluations, Song Si-Yeol put a high value on fidelity both in his academic and real life.

His thought of fidelity is closely related to truthfulness inside human beings. When Song Si-Yeol passed away at the age of 83 in Jeong-eup, he left a will to his pupil Gwon Sang-Ha (權尙夏)[41] that "*jik* (直) is the only Chinese character that has been passed down since Confucius and Mencius, and Master Zhu also left this letter as a guideline for learning and behaving to the literati when he left this world.
Stressing righteousness over personal interests, he underscored that when righteousness outweighs benefits, a world will be well-governed whereas if interests come first over righteousness, a world will be in chaos. Quoting the *Great Learning,* he said 'do not take interests for the sake of interests, but

30) It refers to three scholars Yun Jup, Hong Eui-Han and Oh Dal-Je who took a hard line during discussion on whether to invade or negotiate with the Qing Dynasty.
31) Im Geyeong-Eop(1594~1646) is a prominent general in Joseon in the 17th century and he played an active role during the Second Manchu Invasion.
32) It refers to the Second Manchu Invasion of Korea by the Qing Dynasty in 1636.
33) Cheong-Eum Kim Sang-Heon(1570~1652) was a Confucian scholar in the 17th century Joseon. He led the argument to fight against the Qing Dynasty during the Second Manchu Invasion.
34)『宋子大全』, 附錄, 卷6,「年譜」, 42年, 己酉, 先生 63歲 條, "先生又進曰 國家之所崇奬 惟在道學與節義."
35)『宋子大全』, 卷5,「己丑封事」.
36) Namdang Han Won-Jin(1682~1751)is a key figure of Yulgok School and a prominent Confucian scholar in the 18th century in Joseon.
37)『宋子大全』, 附錄, 卷19,「記述雜錄(韓元震)」, "尤翁學宗朱子 義理春秋 崇節義 闢邪說 以不負孝廟明天理正人心之託."
38) Nongam Kim Chang-Hyup(1651~1708) is a prominent Confucian scholar in the 17th century in Joseon.
39) A pseudo-Confucian scholar whose knowledge does not match with practicing.
40) 附錄, 卷19,「記述雜錄(金昌協)」, "…..爲尤翁平生所執守者 其大綱有四焉 曰距詖淫以承三聖也 曰崇節義以尊東周也 曰嚴懲討以扶倫紀也 曰惡鄕愿以反正經也."
41) Sooam Gwon Sang-Ha(1641~1721)is a Confucian scholar during the 17th and 18th centuries in Joseon and a pupil of Song Si-Yeol.

for the sake of righteousness.[42] ' On the surface, Song Si-Yeol emphasizes righteousness by interpreting benefit as 'personal interests' but he ultimately pursues interests based on righteousness as an ideal. Assuming that personal feelings or one's self-interests (人欲) disturb and hinder justice, Song Si-Yeol argued that 'one should abandon his/her personal interests and restore Heavenly principles (去己私 復天理)' and said whether a State is well-governed or in chaos and whether in peace or in crisis hinge on the increase and decrease of self-interests. [43]

Justice refers to fairness of Heavenly principles (天理) and interests refer to one's selfish interests and desires (人欲). Thus, a man will naturally benefit from following the Heavenly principles even if he does not seek interests, and when a man chases private interests, he will not only fail to gain benefits but also harm himself. [44]

In this respect, the terms used in Song Si-Yeol's idea of righteousness, *jik* (直), *ui* (義), *li* (理), *do* (道) and *gi* (氣) are closely interconnected. Honesty (直) is the essence of human beings and it roots in the Heavenly principles (天理). What the Heavenly principles give to mankind is honesty per se. And, honesty can be used interchangeably as morality, according to Master Song who explained that Three Cardinal Guides and the Five Constant Virtues (*samgangohsang* 三綱五常) is the most important guide to follow for practicing morality in daily life. He asks back how *do* (道) can be morality (道) if we neglect this principle.[45]

Righteousness (義), which is universality of human mind, can be said to be principle (理)[46]. Righteousness is universally inherent in human beings[47]. Righteousness is rooted in human mind and the nature of Heavenly principles, which is no different from honesty (直). And, honesty is principle and moral principle (道義), and righteousness means innate nature (性) forms a mind (心), which is same as principle(理). In other words, when the Heavenly principle is granted to human, that can become honesty (直), morality (道), righteousness (義) and principle (理). The notion of *jik* (直) transcended from Confucius, Mencius, Zhu Xi and Kim Jang-Saeng to Song Si-Yeol is converted to righteousness (義) or principles of righteousness (義理).

Righteousness (義) has an ontological meaning as human's innate nature but at the same time it

---

42)『宋子大全』, 卷5,「己丑封事(小註)」,“臣又按 先儒有言 義勝利者爲治世 利克義者爲亂世.....唯在殿下尙義棄利以先之也....大學曰 不以利爲利 以義爲利.”

43)『宋子大全』, 卷16,「進修堂奏箚」, 辛酉,“然如欲有爲 則不在他求 實在於去己私復天理而已 己私天理相爲消長 而國家治亂安危係焉.”

44)『宋子大全』, 卷19,「歲正陳戒請宥羅良佐疏」,“朱子推演其說曰 義者 天理之公也 利者 人欲之私也 循天理 則不求利而自無不利 循人欲 則求利未得而害己隨之.”

45)『宋子大全』, 卷39,「答權思誠」,“所謂道者 不離乎人倫日用之中 而三綱五常 最其大者也 若果置此 則其所謂道者 果何道耶.”

46)『孟子』,「告子 上」,“心之所同然者何耶 謂理也義也.”

47)『宋子大全』, 拾遺, 卷9,「經筵講義」,“故曰義以方外 此則其義之形於外者言也 非義之本在外也.”

also carries oughtness that men should live as they are meant to be. Righteousness is to seek principle[48],which has a nature of practicing[49]. Thus, it is most important to follow the principles of righteousness when entering and resigning from public service. [50]

As mentioned above, righteousness (義) is honesty (直) and principle (理) as well as morality (道) to Song Si-Yeol. Accordingly, righteousness can be expressed as principles of righteousness (義理) and moral righteousness (道義). And, righteousness can be interpreted as 'principle as being (存在之理)' and 'principle to follow (當爲之理),' which is based on the teachings of Cheng Zi (程子) and Zhu Xi. That is, it stems from Zhu Xi's doctrine that principle (理) is inherent nature of all things and righteousness (義) is the source of overall affairs, and Cheng Zi's teaching that it can be principle (理) for affairs and righteousness (義) for objects. [51]

(2) Dongchungdang Song Jun-Gil's 'Propriety'

Propriety (禮) is one of the key virtues of Confucianism, but Confucianism in the 17th century Joseon especially called for the study of rites (禮學). After the Imjin War, Joseon went through the Second Manchu invasion of the Qing Dynasty. War not only devastates the country but also the minds of people. Moreover, Gwanghaegun's immoral deeds brought up ethical and moral issues in the leadership which led to a severe rift within a Confucius society. What's more, continuing famine and disasters dealt a huge blow to the people's livelihood and social turmoil including Yi Gwal's Rebellion caused a moral crisis

Against this backdrop, the study of rites was emerged at the request of the time to set up a new social order and ethical order for human beings. The Hoseo region centered around Daejeon was at the heart of the study of rites. It was Hoseo Yehak School[52], the direct line of Giho School, in the 17th century that led formation of Joseon study of rites. Kim Jang-Saeng, a top pupil of Yulgok, pursued study in Yeonsan together with his son Kim Jip and taught many brilliant Confucian scholars such as Song Si-Yeol, Song Jun-Gil, Yi Yu-Tae, Yun Seon-Geo and Yu Gye[53]. All of them were great in Sung Confucianism, study of rites and study of Confucian classics, but I would like to contemplate humanistic implications of the study of rites focusing of Song Jun-Gil's teachings.

48)『荀子』,「議兵篇」,"義者循理."
49)『荀子』,「大略篇」,"義理也 故行."
50)『宋子大全』, 卷28,「答金由善」,"蓋聞出處之道 只看義理者上也."
51)『朱子四書語類』, 朱熹撰, 卷46,「孟子9」,"理只是事物當然底道理 義是事之合宜處 程先生曰 在物爲理 處物爲義."
52) Han Ki-Beom. (2007). "Dongchundang Son Jun-Gil's Thoughts on the Study of Rites", *A Study on Dongchundang Son Jun-Gil* (p.182). Kyuning Publishing.
53) Sinam Yu Gye(1607~1664) was a Confucian scholar in the 17th century Joseon and had a profound knowledge on the study of rites.

Kim Jang-Saeng praised Song Jun-Gil that "he will be second to none in the study of rites in the future[54]," and Song met the expectation to become the greatest scholar of propriety of the time. [55]

At the age of 45, he proofread *Funeral Rites and Ceremonies* (*sangryebiyo*, 喪禮備要)[56] which was written by Shin Eui-Kyung and compiled by his teacher Kim Jang-Saeng. In case of Kim Jang-Saeng's *Collected Discussions about Confucian Rites* (*uiryemunhae*, 疑禮問解)[57], 44 percent of questions and answers on rites are raised by Song Jun-Gil.[58] Kim Jip's *Sequel to Collected Discussions about Confucian Rites* (*uiryemunhaesok*, 疑禮問解續)[59], 16 clauses on questions and answers about rituals raised by Song Jun-Gil are included. Song Jun-Gil put emphasis not only on *Family Rituals* (*garye*, 家禮)[60] but also on *Complete Explanation of the Classic of Etiquette and Its Commentary* (*uiryekyungjeontonghae*, 儀禮經傳通解)[61], which Zhu Xi put so much work into in his later years, as a guiding book for the rule by rite (禮治). In particular, Song Jun-Gil embraced the study of rites of his father-in-law, Jeong Kyung-Se[62], contributing to exchange of the Hoseo study of rites and the Yeongnam study of rites in the seventeenth century. As you can see, Song Jun-Gil made remarkable achievements in the study of rites with his excellence.

I would like to discuss humanistic implications of the study of rites. In the *Book of Rites* (禮記)[63], propriety is principle (*li*)[64] and unchangeable principle[65]. Also, Xunzi[66] said righteousness is propriet y[67] and Han Fei[68] noted propriety is an expression of righteousness.[69] In this regard, it can be said

---

54) 『同春堂 年譜』, 18years old
55) Hyun Sang-Yun. (1948). *History of Joseon Confucianism* (p.180). Minjung Seogwan.
Lee Byung-Do. (1987). *History of Korean Confucianism* (p.296-311). Asea Publishing.
56) It is a book of rites written by Shin Eui-Kyung, a close friend of Kim Jang-Saeng, who complemented and edited the book later.
57) A book that recorded questions and answers on rites between Kim Jang-Saeng and his pupils
58) Han Ki-Beom. (2007). "Dongchundang Son Jun-Gil's Thoughts on the Study of Rites", *A Study on Dongchundang Son Jun-Gil* (p.200). Kyunin Publishing.
59) A book that Kim Jip complemented his father Kim Jang Saeng's *Collected Discussions about Confucian Rites*
60) A book about daily propriety which was written by Zhu Xi in China. It had a great influence on Joseon study of rites.
61) A book complied by Zhu Xi in China by referring Confucius classics on rites including the *Book of Rites*
62) Ubok Jeong Kyung-Se (1563~1633) was a Confucian scholar in the 16-17th centuries in Joseon and he was the father-in-law of Song Jun-Gil.
63) It is a representative classics of rites that complied the teachings on rites from ancient China.
64) 『禮記』,「仲尼燕居篇」.
65) 『禮記』,「樂記篇」.
66) Xunzi (313 BC- 238BC) was a Chinese Confucian philosopher who lived during the Warring States period and contributed to one of the Hundred Schools of Thought. Xunzi believed man is innately evil and he believed ethical norms had been invented to rectify mankind. His philosophy has a pragmatic and scientific flavor and he put a great emphasis on man's ability and role.
67) 『荀子』,「大略篇」, "義 禮也."
68) Han Fei (?~ 233BC) was a Chinese philosopher during the Warring States period and he developed

that propriety is principle and righteousness.

Zhu Xi in Song Dynasty[70] defined propriety (禮) as the 'regulating patterns (*jeolmun* 節文) of heavenly principle and the formal models (*uichik* 儀則) of human affairs (*insa* 人事)[71],' in which *jeol* (節) means segment and *mun* (文) means decor. In other words, propriety is to segment and decorate. Segment refers to distintion, discrimination and differentiation, which means making a distinction between intimacy and aloofness as well as high status and low status. Thus, propriety refers to segmenting and formalizing heavenly principles and making it the rule of conduct for human beings.

Xunzi regards propriety as a qualification that differentiates human from animals by explaining as follows.

> Man is not truly man in the fact that he, uniquely, has two feet and no hair, bur ruther in the fact that he makes social distinctions. Birds and beasts have fathers and offspring, but not the affection between father and son, They are male and female, but do not have the proper separation between males and females. Hence in the Way of Humanity, there must be distinctions. No distinctions are greater than those of society and no distinction are greater than the ye (禮).[72]

He found difference between human and others animals from distinction, and said no distinctions are greater than the propriety (禮). To the question of why man is the lord of all creation and why man has dignity, Xunzi answered that man has propriety. He viewed that human establishes the principles of humanity by making and distinguishing the order of relations, and setting social order and disciplines right.

In addition, 'propriety is seen in humbling one's self and giving honour to others[73]'. This explains the essential purpose and function of propriety, which is to respect other's personality. With propriety, we treat others in a humane manner and we can mutually respect each other's dignity. Such function of propriety is the core of humanistic spirit that this paper would like to touch upon.

Now, I would like to discuss humanistic spirit embodied in Song Jun-Gil's discourse of rite. He said,

---

the doctrine of Legalism.

69)『韓非子』,「解老篇」,"禮者 義之文也."

70) Zhu Xi (1130~1200) was a Song Dynasty Confucian scholar who became the leading figure of Neo-Confucianism and his doctrines influenced a lot on Joseon's Confucianism.

71)『論語』,「學而篇」, 朱子註, "禮者 天理之節文 人事之儀則也."

72)『荀子』,「非相」, "人之所以爲人者 非特以其二足而無毛也 以其有辨也 夫禽獸有父子 而無父子之親 有牝牡 而無男女之別 故人道莫不有辨 辨莫大於分 分莫大於禮."

73)『禮記』,「曲禮 上」, "夫禮者 自卑而尊人."

"when seeing, hearing, speaking and acting unite with heaven, that can be propriety. When a man abandons his self-interest, his acting will unite with the heaven so that the virtue of his heart will become perfect[74]. In Song Jun-Gil's view, when seeing, hearing, speaking and acting all comply with heavenly principles, that is propriety. Likewise, he understands propriety (禮) from the perspective of the Unity of the Heaven and Man (天人合一). Thus, human's propriety is meant to follow the order of the nature and the principles of the universe. Acts of human beings that serve the nature is an ideal, which is a thorough practice of propriety.

Song Jun-Gil also said when a man abandons his self-interest, his acting will unite with the heavenly principles so that the virtue of his heart will be perfect. This explains the phrase, 'to subdue one's self and return to propriety (克己復禮)' from *the Analects of Confucius,* which means subduing oneself and returning to propriety is the realization of humanity (仁).

In the same context, he stated "when a man inches up the heavenly principle, his self-interest will inch down, and when a man's self-interest grows by a penny, the heavenly principle will vanish by a penny[75]," understanding the heavenly principle and self-interest from a relative point of view. In a nutshell, propriety is to comply with, preserve and follow the heavenly principles. Accordingly, going against and violating the heavenly principle will grow one's self-interest, becoming far from propriety.

Borrowing words of Confucius from *the Analects*, Song Jun-gil said, if the people are governed by political orders or punishment, they will try to avoid the punishment but have no sense of shame. Thus, the people need to be led by virtue and the rules of propriety so that they will have the sense of shame, and moreover will become good. And, quoting Master Zhu's interpretation on this words, he commented virtue (*deok* 德) and propriety (禮) are the basis of politics and virtue is foundation of propriety.[76]

This shows Song Jun-Gil defined the essence of politics as the virtue and propriety and pursued the rule by virtue as an ideal. And, quoting Master Zhu's interpretation on this words, he commented virtue (*deok* 德) and propriety (禮) are the basis of politics and virtue is foundation of propriety.

Borrowing the words of Confucius, Song Jun-Gil said if a prince is able to govern his kingdom with the rules of propriety and concession, what difficulty he will have and if he cannot govern it with that propriety and concession, what he has to do with the rule of propriety. Quoting the *Book of Rites*, he also noted "when propriety is governed, the kingdom is governed and if there is no

74)『同春堂年譜』, 戊申, 41年 先生 63歲, "先生講克己復禮之義 曰視聽言動合於天 則乃所謂禮也 克去己私 則動合天則而本心之德全矣."
75)『同春堂續集』, 戊申, 11月 19日, "天理長一寸 則人欲滅一寸 人欲長一分 則天理滅一分."
76)『同春堂集』, 卷1, 「應旨兼辭執義疏」, "孔子曰 道之以政齊之以刑 民免而無恥 道之以德 齊之以禮 有恥且格 朱夫子釋之曰 政者 爲治之具 刑者 輔治之法 德禮所以出治之本 而德又禮之本也."

propriety, a country cannot exist." Thus, he continued, "when both the king at the top and the people at the bottom all respect propriety and practice complaisance, words and behaviors in everyday court and countryside will naturally follow the rules or propriety."[77] Song Jun-Gil stressed the importance of governing a country by observing the rites (禮讓), borrowing the words of Confucius, and he described the rule by virtue (德治) or the rule by rites (禮治) as an ideal way of governing as distinguished from a rule of law (法治) or a rule by means of force (覇道). Quoting the *Book of Rites*, he also noted "when propriety is governed, the kingdom is governed and if there is no propriety, a country cannot exist." In essence, the rise and fall of nation depends on propriety.

The society ruled by rites and propriety that Song Jun-Gil pursued can be realized when both the king at the top and the common people at the bottom all respect propriety and practice complaisance, words and behaviors used not only in court and but also in countryside far away will follow the rules or propriety.

We can presume from abovementioned words what human of manners, society of rites, culture of propriety and rule by propriety that Song Jun-Gil pursued meant. Propriety is the human nature, which is internally rooted in human beings by heavenly principle (天理). The principles of universe are internally present in human beings as nature and that principles became the ethical norms of human life and social orders. Accordingly, propriety is the human's nature as a internal principle for existence, but it is also externalized as social and political norms that man should follow. Propriety is a qualification that differentiates human from other animals and a means and a way to realize human dignity and value. In addition, propriety carries a great significance in that it can help maintain the social order based on moral conscience internal to human beings instead of coercion such as law enforcement or violence. Thus, by following the rules of propriety and preserving the culture of rites, mankind can improve the dignity. And, propriety can serve as a yardstick to distinguish the civilized and uncivilized. The culture of propriety and the spirit of propriety that Song Jun-Gil sought suggest us an alternative to address the challenges we face these days including a loss of humanity, the moral crisis and almighty rule-of-law principle. We can find the root of humanistic spirit of how to realize human dignity, how to achieve humanity and how to live a humane life from propriety in Confucianism.

(3) Manhoe Gwon Deuk-Gi and Tanong Gwon Si's 'pursuit of rightness,' 'fair mind' and 'fair morality'

Gwon Si was taught by his father Gwon Deuk-Gi (pen name: Manhoe, 1570-1662) and a close friend

77) 『同春堂集』, 卷1, 「謝特賜儀禮經傳通解及圖疏」, "且嘗聞之 孔子之言曰 能以禮讓 爲國乎何有 不能以禮讓爲國 如禮何 記曰 禮治則治 禮亂則亂 禮存則存 禮亡則亡.…上下崇禮 敬讓興行 朝廷閭巷 日用云爲 無不由禮."

of his father and his uncle-in-law, Park Ji-Gye (pen name: Jamya, 1573-1635). Gwon Deuk-Gi learned from his uncle Gwon Geuk-Joong, who was a scholar of the Seong Hon (成渾)[78] School. In this regard, they belonged to Namin Faction, but academically they were scholars of the Ugye School (牛溪學派).[79] Gwon Si had scholarly interchange with representative Confucian scholars in Hoseo region at the time such as Song Si-Yeol, Song Jun-Gil, Yi Yu-Tae, Yun Seon-Geo and Yu Gye and he also interacted with scholars of the Namin Faction including Yun Hyu and Heo Mok. Gwon Si inherited family studies (家學) from his father Gwon Deuk-Gi, which was succeed to his grandson Gwon Yi-Jin and his son-in-law Yun Jeung[80].

In the era of factional disputes in the 17th century, Gwon Si strived to maintain a relatively neutral stance and position. Daejeon was the center of factional disputes at the time, and the controversy between Song Si-Yeol and Song Jun-Gil of the Seoin and Noron Faction and Yun Hyu of the Namin Faction escalated. On top of such disputes, Yun Jeung who represented the Soron Faction came into strife with Song Si-Yeol at Noseong, Nosan.

In addition to strife over propriety, severe political, academical and ideological conflicts and confrontations including a dispute between Song-Si Yeol and Yun Jeung spread out the country centering around Daejeon. At that time, Gwon Si tried to be nonpartisan to objectively decide the rights and wrongs as well as behave himself fairly.

Now, I would like to explore implications of humanistic spirit in the modern society through Gwon Deuk-Gi/Gwon Si's 'pursuit of rightness (求是),' 'fair mind (公心),' and 'fair morality (公道)[81]. For Gwon Si, 'pursuit of rightness' is no better than his family tradition and the will of his father Gwon Deuk-Gi. In writing to his son, Gwon Deuk-Gi asked for the attitude of learning as follows.

> Let me leave you a message for fear that I won't be able to tell you when I breathe my last breath. My dear sons, always keep a good heart (善心) and never have an evil heart (不善). Always do good deeds (善事) and never conduct evil deeds (不善).
>
> There is no special way to do good (善). Yet, there is only one letter (字) to keep in mind, 'right (*si* 是).' If you cannot reach an 'absolute right state' in doing things, *si* (是) is neither

78) Ugye Seong Hon(1535~1598) was a Confucian scholar in 16th century Joseon had a dispute over Sung Confucianism with Yulgok Yi I. He underscored practicing and self-cultivation in stead of theoretical study and his teachings were inherited to Yun Hwang, Yun Seon Geon and Yun Jeung to form the Ugye School.

79) Hwang Eui Dong. (2005). *A Study of Ugye School*. (p.209-216). Seogwangsa.

80) Myungjae Yun Jeung(1629~1714) was a Confucian scholar in 17-18th centuries in Joseon and devoted himself to learning, not taking up any public position. After a conflict with his teacher Song Si-Yeol, he became the leader of Soron faction and give teachings of emphasizing sincere heart and practicing.

81) fair morality

right nor good. Thus, if you think of the second best plan, you will fall to unrighteousness. [82)]

So please my sons, always seek rightness and never find the second best option in everything you do. Be cautious all the time, never chase after names and irrationally associate with anybody. [83)]

Gwon Deuk-Gi told his sons about good heart (善心), good deeds (善事) and good action (善行) and he said goodness (善) is nothing but rightness (是). He said that if one cannot reach an 'absolute right state (*sicheo* 是處) in doing things, *si* (是) is neither right nor good. And, it should be the best, not the second-best. We can tell from this that Gwon Deuk-Gi interpreted goodness (善) is on a par with rightness (是). Indeed, goodness is a moral value and rightness is a value of truth, and he viewed morality and the truth can be united and understood on the same horizon. That is, rightness can make moral goodness possible, and unrighteosness can never be moral goodness.

Borrowing his father's words, Gwon Si said "telling right and wrong is the world's public opinion, and righteousness is what people should see together. Thus, even father and son as well as teacher and pupil cannot always see eye to eye on discussion." He continued, "if one pretends to agree with others even though he disagrees at his hearts, he not only deceives himself but also his friends." He stated that telling right and wrong is the world's public opinion, and righteousness is what people should see together, so even father and son, teacher and pupils should clearly distinguish between right and wrong, not temporizing to be united. He also criticized pretending to reach a consensus with others on the surface though he disagrees at heart, he not only deceives himself but also his friends

The disputes between the Factions and Schools in the 17th century with Daejeon as the center were fairly serious. The conflict between the Seoin Faction, including Song Si-Yeol and Song Jun-Gil, and the Namin Faction including Yun Hyu and Heo Mok was escalated. In addition, the strife between the Noron Faction including Song Si-Yeol the Soron Faction including Yun Seon-Geo, Yun Jeung and Park Se-Chae[84)] was acrimonious. In the vortex of such disputes, Gwon Deuk-Gi and his son Gwon Si took the lead in telling right and wrong objectively and pursuing righteousness beyond the Factions or Schools.

---

82) 『晩悔集』, 卷5, 「寄次兒심書」, "我恐將死時 未必與汝有言 故今遺汝一言 汝胸中須着善心 不可着一毫不善心 身上須行善事 不可行一毫不善事 然所謂善者 亦無他法 只是一箇是字而已 凡事若未到極盡是處 卽是不是不善也 故若更思其次 則便陷於不是矣."

83) 『晩悔集』, 卷5, 「寄次兒심書」, "但願每事必求是處 毋尋第二義 以千金自重 不妄逐名 不妄交遊."

84) Namgye Park Se-Chae (1631~1695) was a Confucian scholar in 17th century in Joseon and he was centric figure together with Song Si-Yeol and Yun Jeung. Belonging to Ugye School, he had a profound knowledge on Sung Confucianism and the study of rites.

We studied together with two Songs[85] and reached a consensus in a broad sense, uniting with the Way (道), but had different opinions in small and big issues. Outraged by being slandered and attacked by their young pupils, my father said "if a man becomes a Saint, there can be no difference or equivalence, but if a man reaches a stage of sage, there must be difference with others. That's why friends should learn from each other. If a group of friends like to have same opinion, this is not a true companionship of superior men, but a group of mean men who cover up each other's faults. As a human being, we cannot always be right or wrong and have different or same ideas with others. If one attacks others for having different thought, the friendship will eventually be destroyed. [86]

Gwon Deuk-Gi and Gwon Si studied together and got along well with Song Si-Yeol and Song Jun-Gil, and they shared same thoughts in broad outlines but had different ideas for specific issues. In their view, they should share thoughts and tell right and wrong to pursue righteousness through discussion. They criticized that avoiding argument and considering discussion a sin are not right. They said hating and condemning others for having different thought is not a true way of friendship.

Thus, the way of learning is nothing but giving no place to untruthful deeds in mind and always pursuing the rightness and always seek the rightness and never settle for the second-best as huma n[87], they noted. This is the teaching of the father Gwon Deuk-Gi as well as the attitude of Gwon Si for learning and seeking the truth.
Regarding the dispute over proprietary, Gwon Si chided the reality that no one dared to refute Song Si-Yeol and Song Jun-Gil's thoughts on propriety even if they thought the two Songs were wrong, and he was concerned that such silence was not good for themselves nor for the country. And, he blasted Song Si-Yeol's remark that 'it is not wrong to say Hyojong is a child of concubine' and instead appraised Yun Seon-do as a scholar of courage. [88]

In this regard, Gwon Deuk-Gi and Gwon Si's spirit of 'pursuing rightness' refers to an attitude for learning and seeking the truth, which has a significant implications in a modern sense. In the 17th century when factional and academical disputes heightened to the max, the spirit of seeking rightness seems to be very a reasonable prescription. That is to pursue an objective truth regardless of factional interests, individual's prejudice or self-interests. And, they give us a valuable lesson in the attitude of learning, and especially how to do philosophy, as they tried to seek the absolute truth by keep doubting, questioning and pondering, not just following the Confucius scriptures, the teaching

85) Song Si-Yeol and Song Jun-Gil
86)『炭翁集』, 附錄,「家狀」.
87)『炭翁集』, 附錄,「家狀」, "先公少而學於家庭 叅判府君 篤於爲己之學 謂學問之道無他 只心要無一毫虛僞 事要求一箇是而已 每令人每事必求是 無落第二義 先公自幼少時 已知爲學之要不可他求矣."
88)『炭翁集』, 卷3,「論大王大妃服制及尹善道按律疏」

of Sages and the authority of Zhu Xi blindly. Gwon Deuk-Gi and Gwon Si thought public discussion should be actively promoted and channels for dialogue should be wide open to seek the rightness. The spirit of seeking rightness has meaningful implications in the contemporary society.

The spirit of 'pursuing rightness' can be applied to not just the academic circle but to all sectors. Rightness is the truth, justice and being true. No other values are greater than rightness. The modern society becomes ill with a loss of humanity due to deception, corruption, dishonesty and insolvency. As learning should be based on rightness, politics should be based on sincerity and honesty. Likewise, when rightness becomes the premise of the economy, it can serve the people as virtuous public good. It is no need to say that scientific technology should be rooted in rightness and used in a right manner.

Let me explore 'fair mind' and 'fair morality' that Gwon Deuk-Gi and Gwon Si regarded as the gist of their philosophy. Gwon Deuk-Gi said "interests of superior man is righteousness (義) since he considers the world without partiality as his interests while that of mean man is profits (利) as he takes self-interests as benefits.[89]" Everyone wants to make a profit and does not want to make a loss. Distinguishing interests of superior man and mean man, Gwon Deuk-Gi said a superior man considers the world in a fair state as his interests but a mean man takes self-interests as benefits. The *Book of Rites* also talks about a Great Utopia or a harmonious society (大同世界) where the world is in a fair state, and Gwon Deuk-Gi said it is a superior man's interests to have the world in a fair state.

Gwon Deuk-Gi explained the correlation between benefit and harm as well as right and wrong. When one pursues his own self-interest, he will damage others. And, if people only fight over benefits without telling right and wrong, the law of the jungle under which fists speak louder than words will be brought in. Thus, if people refrain themselves from selfish and promoting the public interests, it is mutually beneficial to everyone and this can be 'righteousness.' Only rightness can make person abandon his self-interest and pursue the public good. When interests harmoniously go hand in hand with rightness, it is a virtuous value as the public interests.

4, Conclusion

So far, I contemplated on the humanistic spirit of the 17th century Daejeon Confucianism focusing on U-am Song Si-Yeol's 'righteousness' and 'honesty (直),' Dongchungdang Song Jun Gil's 'propriety' and Manhoe Gwon Deuk-Gi and Tanong Gwon Si's 'pursuit of rightness,' 'fair mind' and 'fair morality.' Song Si-Yeol always sought for and practiced righteousness and left 'honesty (直)' as his last word following the teachings of Confucius, Mencius, Zhu Xi and Kim Jan Saeng. Song Si-Yeol's

89)『僿疑』, 卷4, 張1

righteousness is innate human nature, which is rooted in honesty. Of course, righteousness is defined, as Mencius said, as the universality of human mind, but it can be translated as the proper human way or standards of morality. Honesty as human nature refers to a honest mind and a sincere mind. This honesty is the way human should follow, which can be righteousness. Righteousness is an expression and realization of human nature and heart. Honesty is embodied in righteousness.

Despite material affluence, a dark shadow is cast over the modern society with human's insincerity, dishonesty, corruption and injustice. Also, people live a convenient life thanks to the development of cutting-edge scientific technologies, but the abuse of science technologies due to false conscience and selfish desire depicts gloomy future. The virtue of honesty, sincerity and rightness are the core of humanistic spirit. When we lose truth, sincerity and honesty, we will lose humanity and eventually families, societies and states will fall apart. Politics, economy, education and scientific technology are no exceptions. Thus, the humanistic spirit of Confucianism is of great significance as a solution to resolve challenges facing the modern society.

Song Jun-Gil was the prominent scholar in the study of rites and he made illustrious academic achievements in the study of rites. The study of rites which swayed the brightest minds of the 17th century including Song Jun-Gil, Song Si-Yeol, Gwon Si, Yi Yu-Tae, Yun Seon-Geo, Yun Jeung, Yu Gye and Yu Hyu was the key task of the time and the major talking point. For the 17th century Joseon after the Imjin War and the Second Manchu invasion when political ethics were collapsing due to Gwanghaegun’s immorality people suffered from poverty and famine, it was the call of time to restore moral disciplines. As philosophy is the creature of the age, the study of rites met the needs of the time and those who played a historic role came from the regions centering around Daejeon. Propriety is what regulates the human order, taking after the order of universe. The function of propriety is making order in the social relation in the human society. It can be said that propriety is to care and love others on the premise of human dignity in the relations like 'self-other,' 'host-guest' and 'each other.' Propriety can be a standard to compare human with other animals. We can find the grounds for human being the lord of all creatures from propriety. If human beings cannot follow or are not aware of the rules of rites, the human society will degenerate to the animal kingdom, relapsing into savagery. Being aware of propriety and following the rules of rites enhance the dignity of mankind.

Modern society emphasizes economic value and people are accustomed to convenience of scientific technologies. While enjoying material affluence and technological convenience, it is easy to lose and neglect a sense of propriety. Under the pretense of democracy, people often get confused with propriety in relationship. The virtue of propriety is still relevant to present time. Propriety upgrades

the class of mankind from the uncivilized to the civilized. The culture of propriety in Confucianism casts a long shadow to solve the moral crisis facing modern society.

Manhoe Gwon Deuk-Gi and his son Gwon Si underscored 'seeking rightness' as the attitude of learning and 'fair mind' and 'fair morality.' The attitude of pursuing the truth is the cradle of modern mind. The attitude of learning that one should seek the objective truth by telling right and wrong, not just following the Confucius scriptures, the teaching of Sages and the authority of Zhu Xi blindly shows the modern philosophical spirit. Being unbiased and only seeking the right truth during factional disputes over propriety was reasonal attitude of learning. Moreover, their suggestion to facilitate public discussion and open dialogue channel for seeking the truth means a lot today.

Also, emphasizing the establishment of one's subjecthood in impartial mind as the ground for rightness and practice of fair morality has significant implications to the current times. Gwon Deuk-Gi and Gwon Si interpreted humanity (仁), the universal human nature, as a fair mind. Fair mind is an universal mind and a loving heart of sincere human who subdues one's self. It is a big heart and fair mind not distinguishing one's self from others and embracing both "I" and "you." And, it is fair morality to treat objects and administer the society with such fair mind.

Modern society puts more emphasis on profit and loss than right and wrong. People do not mind neglecting right and wrong to gain profits. Some damages others for the sake of his self-interest and does harm to the public goods of the society. Gwon Deuk-Gi and Gwon Si's 'pursuit of rightness,' 'fair mind' and 'fair morality' provide a clue to problems that we face today. We are living in a globalized world. Fair mind and fair morality is the philosophy of Grand Union and the philosophy of royalty (王道) that unite everyone beyond one's self-interest or national borders.

In short, Song Si-Yeol's 'honesty' and 'righteousness,' Song Jun-Gil's 'propriety' and Gwon Deuk-Gi/Gwon Si's 'pursuit of rightness,' 'fair mind,' and 'fair morality' have a thread of connection. Honesty, justice, propriety, rightness, fair mind and fair morality are nothing but different expressions of moral values. These can be expressed as a honest mind or fair mind in human heart. When applied to the society and politics, they become the code of manners, etiquettes and morality that man should follow.

Modern society boasts advanced scientific technology based on human intelligence and enjoys economic and material prosperity. People turn their eyes to extravagant looks and indulge in convenience and sensual pleasure. What's behind the scene, however, are flagging humanities that used to be good and cheerful, and groaning society under fouls and dishonesty. Against this backdrop, a new awakening on humanistic spirit is called upon. Humanistic spirit is the basic nutrients for human's life. The values like dignity, honesty, propriety, justice, fairness and rightness is

the root and basis of human life. Happiness, wealth or honor without these values is mere illusion. The more modern society pursues material wealth and scientific convenience, the more desperately we need the spirit of humanities. Fortune and happiness without humanistic spirit is nothing but a void. In this regard, Song Si-Yeol's 'honesty' and 'righteousness,' Song Jun-Gil's 'propriety' and Gwon Deuk-Gi and Gwon Si's 'pursuit of rightness,' 'fair mind,' and 'fair morality,' who represented Daejeon Confucianism in the 17th century, carry significant implications as a solution to resolve challenges facing modern society.

【Bibliography】

『周易』,『論語』,『孟子』,『禮記』,『荀子』,『韓非子』,『朱子四書語類』,『宋子大全』,『同春堂集』,『晩悔集』,『炭翁集』,『僭疑』.

Hyun Sang-Yun. (1948). *History of Joseon Confucianism*. Minjung Seogwan.

Lee Byung-Do. (1987). *History of Korean Confucianism*. Asea Publishing.

Yu Seung-GUk, (1983). *A Study on Eastern Philosophy*. Geunyeok SeoJae.

Han Seung-Seok (2001). A Contemplation on Sinheum's Thoughts. Graduate School of Dongguk University (M.A.).

Choi Geun-Muk. (1993). "Trends of Scholars in Daejeon Area in 17th Century," *Daejeon Culture.* 2nd Edition. Daejeon Metropolitan Publication Committee.

Han Ki-Beom. (2007). "Dongchundang Son Jun-Gil's Thoughts on the Study of Rites." *A Study on Dongchundang Son Jun-Gil*. Kyuning Publishing.

Hwang Eui Dong. (2009)*A Study on Giho Confucianism*. Seogwangsa.

Hwang Eui Dong. (2005). *A Study on Ugye School*. Seogwangsa.