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From HPS to STS: Looking Back over My Past Sixty Years

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Song Sang-yong is one of the best representatives of the Korean STS community.[1] *He has been active on the international scene both in the history of science since the 1970s and in bioethics since the 1990s and has witnessed the birth of STS as an academic movement in the Western world as well as in East Asia. Having inspired a generation of Korean scholars working in STS, Song has been so generous as to serve as an* EASTS *advisory board member, a post he has been holding since our inception. Reaching eighty years of age in 2017, Song is nevertheless still visible in several of the international projects and networks that are making East Asia such a rich field for STS research. This article is based on his keynote speech at the Twelfth East Asian STS Network Conference in Beijing in November 2016, and its Chinese version is published simultaneously at* Science and Culture Review *(科学文化评论), a leading journal on the history of science and technology in China. Like Shigeru Nakayama's 2013 intellectual memoir,* An Autobiography of a Historian of Science *(一科学史家の自伝), it outlines Song's long and fruitful career in STS—teaching, engaging in, and exploring the possibilities of STS for East Asia.* EASTS *is very grateful to have the input and collaboration of a scholar of Song's caliber and would like to pass his experiences on to coming generations of East Asian STSers.*

—EASTS *Editorial Office*

Sixteen years ago, at the East Asian STS conference in Beijing, I gave a country report titled "STS in Korea." Today I am going to tell you about my personal involvement with STS.

I graduated from Seoul National University (首爾大) with a bachelor of science degree in chemistry in 1959. The College of Liberal Arts and Sciences (文理大) there was the most liberal school in Korea. I took eight courses in German literature and five in biology. I audited seven courses in English and three in French. I read Friedrich

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[1] In this article, all Korean names are presented in the conventional way, in which surnames precede given names.

Paulsen, Arthur Schopenhauer, Heinrich Heine, Heinrich von Kleist, Gottfried Keller, Goethe's *Götz von Berlichingen* and *Faust*, W. Somerset Maugham, Graham Greene, Elizabethan Lyrics, and André Gide. There was no minor system at that time, but I did ostensibly take two other fields as minors.

As I was interested in interdisciplinary fields between science and the humanities, I reentered the philosophy department as a junior the following year. It was then that a nationwide student uprising broke out, protesting a rigged presidential election. This was the April Revolution, which ended with the fall of the Rhee Syngman (李承晩) government. I joined the demonstration near the capitol building at the last moment. There was great chaos, but we enjoyed a freedom that had been unprecedented since the founding of the country. The new democratic government lasted for only eight months until the military coup in 1961.

During that short spring, I became a founding member of two important societies. I worked as secretary for the Korean Humanist Association (1960–65) and the Korean History of Science Society (1962–82). Bertrand Russell (president of the Rationalist Press Association) and Julian Huxley (president of the British Humanist Association) were my heroes. I communicated with Russell and translated his short article on communism, which appeared in the university newspaper two days after the coup. I contributed articles on Huxley's transhumanism to two Korean journals. At that time, I was a naive believer in scientism; I never doubted that science would bring us endless happiness. Within science, my chief interests were biology and biochemistry—no wonder I sided with the mechanistic view of life in my bachelor's thesis. In my master's thesis, I concluded that Darwin's theory of natural selection ran counter to teleology. I was a convinced mechanist, naturalist (soft materialist), and agnostic (courteous atheist).

However, I was so glad when Linus Pauling, the Nobel Prize–winning chemist, was awarded his second prize, the Nobel Peace Prize, in 1962. I had already read John Hershey's *Hiroshima* and Takashi Nagai (永井隆)'s *Bell of Nagasaki* in 1949, and so now I read Pauling's *No More War* (1958) and wrote a long essay on the test ban movement for the university newspaper. My concern with the nuclear issue has continued to the present day.

I went to Indiana University for graduate studies in 1967, a time when race riots, the Vietnam War, and poverty were the issues of the day, and as a result, campuses were not calm. While I was at Indiana, there was an incendiary fire in the university library, a boycott by students, the detention of the president in his office, and the US Army was put on alert, among other things. These were the times that saw the assassinations of Martin Luther King Jr. and Robert F. Kennedy, the confrontation at the Democratic Convention in Chicago, the election of Nixon, and the landing of Apollo 11 on the moon. It was the most exciting period in the history of the United States.

Science still seemed to be a guarantee of progress, in spite of the tragedies of Hiroshima and Nagasaki. However, the image of science suddenly became tarnished in the 1960s by environmental degradation, such as at Minamata Bay and in the *Torrey Canyon* disaster. Science was a target of the counterculture movement that swept over industrialized countries in 1968. The attack on science came from within as well as from outside the scientific community. The critique of science was not confined to intellectuals but widely pervaded the general public. The antiscience movement aimed not only at high tech but also at science itself. This challenge to the goals and results of

science policy came to doubt the inherent norms of science and its epistemological status.

I was, in a way, one of the 1968 generation. In the Department of History and Philosophy of Science (HPS), we were mainly trained in internal history and value-free philosophy. But students were very much interested in science and society, and I could not be free from their influence. When I attended the Fourteenth International Congress of the History of Science in Tokyo and Kyoto in 1974, the desire for a social history of science was utmost. Most of the staunch internalists were to be found in the science and society sessions. There, I met Joseph Needham, Willy Hartner, Jean-Jacques Salomon, Thomas Kuhn, Erwin Hiebert, Derek J. de Solla Price, Melvin Kranzberg, Nathan Sivin, S. R. Mikulinsky, Sergey Kapitza, Abdur Rahman, Peng-Yoke Ho (何丙郁), Kiyoshi Yabuuchi (薮内清), Masao Watanabe (渡辺正雄), Eikoh Shimao (島尾永康/馬永康), Mitsukuni Yoshida (吉田光邦), Atsuhiro Shibatani (柴谷篤弘), Shigeru Nakayama (中山茂), and Tohru Hiroshige (広重徹).

In 1970, following my recommendation, the College of General Studies (教養課程部) at Seoul National University began to offer courses in the history of science and natural science. I taught both but made the latter a mixture of philosophy of science and science and society. At the College of Liberal Arts and Sciences, I created advanced courses: History of Science I and II and Science Studies I and II. Science Studies I was philosophy of science, and Science Studies II was science and society. For Science Studies I in 1972, I chose Kuhn's 1962 *Structure of Scientific Revolution* as the text. After 1977, I taught science and society courses at Sungkyunkwan (成均館大), Hallym (翰林大), and Yonsei (延世大) Universities. I adopted a topical approach in organizing my courses, gave updated reading materials, and encouraged lively discussion. Later on, science and society came to be called science, technology, and society at Hallym University (see below for an outline of the course I offered there in 1986). After retirement, in 2003, I taught an STS-oriented philosophy of science course at Hanyang University (漢陽大) for two years.

Course Title: Science, Technology, and Society

Textbooks:

Cho, Hongsup, ed. (1984). *Contemporary Science/Technology and Human Liberation* (in Korean). Seoul: Hangilsa.

Nakayama, Shigeru (1982). *Contemporary History of Science and Society* (Korean translation). Seoul: Pulbit.

Song Sang-yong (1984). *History of Science for General Courses* (in Korean). Seoul: Usongmunhwasa.

Ziman, John (1986). *The Force of Knowledge: The Scientific Dimension of Society* (Korean translation). Seoul: Chongumsa.

Topics:

1. What is STS?
2. Two cultures
3. Science and religion
4. A-bomb and the nuclear power plant
5. Energy
6. Computer revolution
7. The promise and danger of biotechnology

8. Bioethics
9. Pollution and the environmental movement
10. Research and development
11. The military, industry, and science
12. Antiscience movement and critical science
13. Science and technology in the Third World
14. Futurology vs. limits to growth

Though the Korean government pushed the development of science and technology, it felt the necessity for a public understanding of science and technology. Thus appeared the Scientification of the Whole Nation Movement (全國民科學化運動), reminiscent of the North Korean slogan "Fortification of the Whole Country" (全國土要塞化). I maintained that both the positive and negative aspects of science and technology should be known to the public. The popularization movement led by the government was very much lip service and destined to fail, but the movement outside the government was carried out more effectively. One publisher began to produce popular science books (the Modern Science Series, 現代科學新書) in 1972. As editor in chief of the series, I included many titles on the history and philosophy of science and on STS among the 190 pocket books issued over five years. The series exerted a deep influence on students.

In 1977, professors, journalists, and publishers who were associated with science got together to form the Korea Science Writers Association (韓國科學著述人協會). It raised important issues on science, technology, and society through occasional meetings. Much more powerful was the Korean History of Science Society (韓國科學史學會), which was revitalized in 1974. This greatly helped to nourish a critical view of science and technology through frequent events. It is no wonder that the majority of STS activists come from a history of science background. In 1980, seven scientists signed the "Declaration of 134 Intellectuals" (134人知識人宣言) against a second military coup. I was one of thirty signatories who were fired from universities for four years. Under three repressive military regimes in Korea, the criticism of science and technology was involved in the democratization movement. Environmental and nuclear issues had been taboo since the 1960s, but the proscribed citizens' movement against pollution and nuclear power plants had become so strong by the late 1980s that the government could no longer curb it. This movement opened up a lively debate on important issues within STS.

In 1981, I reported on the present status of STS at a UNESCO symposium. I also led a UNESCO workshop for high school science teachers, to introduce STS into science education. In the late 1980s, there was a flurry of papers on STS in science education journals, reflecting a worldwide trend in science education. As a result, the Ministry of Education encouraged the inclusion of STS in a new curriculum for middle and high school science. In 1984, I was a visiting scholar in the School of Philosophy at Leeds University. I was with Jerry Ravetz, a pioneer in the STS movement, who still referred to himself as a radical. While I was in the United Kingdom I visited Bob Young of the *Radical Science Journal* in London and Roy McLeod of Sussex University. All of them were American émigrés who left during the McCarthy era. I was unable to meet with Hilary Rose and Steven Rose, but I was fascinated by Gary Werskey's 1978 book *The Visible College*. It was translated into Korean by Song Jinwoong (宋眞雄) as

Gwakakgua Sahoejueui (*Science and Socialism*) in 2016. I was so glad to meet him at the International Congress of History of Science in Beijing in 2005. In 2011, Les Levidow [note: an *EASTS* editor] came to the International Conference on STS at Seoul National University. After the conference, he was asked to talk about the radical science movement at a dinner with Korean STSers.

In 1987, I was a visitor for a whole year in the Department of History and Philosophy of Science at Cambridge University, where Joseph Needham made me a member of Gonville and Caius College. We met every week at high table. Francesca Bray [note: current *EASTS* associate editor], an author of the Science and Civilisation in China series, and I had been good friends in Korea, and I acquired even more friends in the history of science in China group through the Needham Research Institute. While at Cambridge I flew to Budapest and Beijing and took train and bus to Dubrovnik, Yugoslavia, for conferences. By the turn of the millennium I was able to visit nearly all the world's socialist countries, including Vietnam and Cuba.

It was surprising to find a program on STS at the Korea Advanced Institute of Science way back in 1973, yet it held a joint symposium with a similar program at Cornell University. Then the program was virtually dissolved. It was big news when in 1984 Seoul National University announced the opening of the graduate program in the history and philosophy of science (科學史與科學哲學協同課程). Though that program was internalist (rather than externalist) oriented, it offered a course on the sociology of science. Later, STS was added. The program has since produced thirty-six PhDs in the history and philosophy of science, and five in STS. The College of Medicine at Seoul National University has a Department of Medical Humanities (人文醫學教室), and this has produced fourteen PhDs in the history of medicine and five in the medical humanities.

For some twenty years there had been campaigning for the establishment of independent departments of science studies at universities, and I had visited the presidents of major universities and the Ministry of Education in pursuit of that goal. It materialized in 1995, when the government agreed to the creation of STS programs at four universities. Korea University (高麗大) opened a graduate program in science studies (科學技術學協同課程), and an undergraduate Department of Science Studies (科學學科) was set up at Chonbuk National University (全北大). The Korea Advanced Institute of Science and Technology (KAIST, 韓國科學技術院) opened its Graduate School of Science and Technology Policy (科學技術政策大學院) in 2002. In addition to the graduate program on the history and philosophy of science and technology at Pusan National University (釜山大), the sociology department of Kyunghee University (慶熙大) invited three US-trained sociologists of science.

Kim Hwan-Suk (金煥錫) [an *EASTS* advisory editor], the first Korean PhD in sociology of science and technology from what is now Imperial College London, took the initiative in 1996 to launch a group studying science, technology, and society. In the same year, I participated for the first time at the Bielefeld Conference on STS, organized by 4S and EASST. Some thirty of the group's members hailed not only from sociology but also from the history and philosophy of science, political science, public administration, and economics. They started reading the *Handbook of Science and Technology Studies*, edited by Jasanoff et al., and held monthly meetings. They also organized the session on the sociology of science and technology at meetings of the

Korean Sociological Association. By 2000 it had developed into the Korean Association of Science and Technology Studies (韓國科學技術學會).

It was in 1997 that the Council for Democracy in Science and Technology was born as a part of Chamyoyondae (參與連帶, People's Solidarity for Participatory Democracy), a major civil movement in Korea. In 2000, the group was renamed the Citizens' Science Center (市民科學中心), to reduce the impression of its being too radical. It was also led by Kim Hwan-Suk, and active members included Lee Young Hee (李榮熙) [an EASTS advisory editor], Kim Dong-Kwang (金東光), Park Jin-Hee (朴眞嬉) [an EASTS advisory editor], Park Byungsang (朴炳相), Kim Myong-Jin (金明振), Han Jae-kak (韓在珏), Kim Byoungyoon (金丙允), Kim Byoungsoo (金炳秀), and Lee Jongmin (李鍾珉). The center carried out a good many ambitious programs, such as science shops, consensus conferences, engineering ethics, technology assessment, appropriate technology, and STS education. Frequent statements, press releases, and requests for legislation were made. The Citizens' Science Center became independent in 2005, and I was made nominal chair of the board of directors.

In 1994, I joined the highly influential Korean Federation of Environmental Movements (KFEM, 環境運動聯合). Though I concentrated on environmental education in KFEM, I was also active in campaigns against such government projects as the Donggang Dam, the Saemangeum Reclamation Project, the Four Big Rivers Restoration Project, and nuclear power plants. I was a key member of the Korean Society for Environmental Philosophy (韓國環境哲學會) and the Korean Association of Environmental Sociology (韓國環境社會學會).

In 1995, Qiu Renzong (邱仁宗), a Chinese philosopher of science, invited me to Beijing along with the Japanese philosopher of science Hyakudai Sakamoto (坂本百大), and together we founded the East Asian Association of Bioethics, which was expanded into the Asian Bioethics Association in Kobe in 1997. I founded the Korean Bioethics Association (KBA, 韓國生命倫理學會) the following year. The birth of Dolly the cloned sheep in 1997 had aroused great concern among Koreans. Hwang Woo-Suk (黃禹錫), a veterinarian, came suddenly to prominence at the center of a reproductive technology in which Korea was at the top. In 2004, Hwang surprised the world by establishing a stem cell line from a cloned blastocyst. Another breakthrough the following year in creating patient-specific embryonic stem cells brought him to international stardom. Right after his 2004 paper came out, the Korean Bioethics Association formed the Ad Hoc Committee on the Research Ethics of Therapeutic Embryonic Cloning. As KBA president, I sent a letter to the editor of *Science* concerning the problem of the ethics committee. The letter was published, with Hwang's response, more than six months later. At its general meeting, the KBA adopted a statement challenging Hwang to an open discussion on the ethical problems of his research: institutional review boards, authorship, and the acquisition of eggs. Hwang's two papers were shown to be nothing but fakes. However, Korea doesn't seem to have learned much from the Hwang scandal, and I believe that scientism (科學主義) is to be blamed. East Asia has a deep-rooted tradition of scientism, which lasted for more than a century. In the nineteenth century, East Asia was under the challenge of Western imperialism. East Asian countries had to make desperate attempts to survive, and it was believed that the only way was to catch up with Western science and technology.

At the East Asian Conference on Bioethics in 1995, Chen Yuan-Fang (陈元方), a Chinese medical doctor, gave her paper "Japanese Death Factories and the American

Cover-Up," which had been inspired by Sheldon Harris's 1994 book *Factories of Death: Japanese Biological Warfare 1932–45, and the American Cover-Up*. The most horrible abuse of science was the human experimentation carried out by the Nazis and the Japanese army during World War II. Ruthless human experiments were carried out in the name of science at Auschwitz and at the "Factory of Death" in Pingfang (平房), China. There, in what was called Unit 731, Japanese doctors experimented on, tortured, and killed more than three thousand Chinese, Russians, Mongols, Manchus, Koreans, and even Americans, in systematic studies on bacteriological warfare.

At the Nuremberg Trials, twenty-three German physicians were prosecuted for their involvement in the Nazis' human experiments. As for Unit 731, however, nobody was ever punished: the United States pardoned its staff in exchange for the valuable information it won from them. We had sessions on Unit 731 in San Francisco, Tsukuba, Beijing, and Seoul. Nie Jing-Bao (聂精保), Guo Nanyan (郭南燕), Keiichi Tsuneishi (常石敬一), Kenzo Hamano (浜野研三), Takashi Tsuchiya (土屋貴志), Ryuichi Ida (位田隆一), Dan Wikler, Hans-Martin Sass, and I were all there.

I was elected a member of UNESCO's COMEST (Commission Mondiale d'Éthique des Connaissances Scientifiques et des Technologies) in 2003 and was vice-chair from 2004 to 2008. Lu Yongxiang (路甬祥), president of the Chinese Academy of Sciences, and Jun Fudano (札野順) [note: a former editor of *EASTS*] were fellow members from East Asia. COMEST was then covering the ethics of information technology, space, freshwater, energy technology, and nanotechnology, and I was in charge of its code of conduct for scientists. The 1999 World Conference on Science (WCS) in Budapest, co-organized by UNESCO and the International Council for Science (ICSU), adopted its epoch-making "Declaration on Science and the Use of Scientific Knowledge" and its "Science Agenda—Framework for Action." The Budapest conference was significant for placing the emphasis on achieving responsibility and ethics in science through scientists' genuine, honest soul searching. The follow-up to the WCS was left to COMEST and to the ICSU's Standing Committee on Responsibility and Ethics in Science.

Creating a code of conduct for scientists was not easy, for some member states, including the United States, were against further standard setting. COMEST decided to utilize UNESCO's 1974 "Recommendation on the Status of Scientific Researchers" as a starting point in the search for such a code of conduct. I wrote the background paper on revising that recommendation. In 2006, COMEST held six consultation meetings on the recommendation, in Tokyo, New Delhi, Geneva, Bangkok, Seoul, and Belo Horizonte, and I attended those in Bangkok and Seoul. More consultation meetings on other continents were planned, but not held, and then my term ended.

In Korea, in an effort to respond to the recommendations raised by the WCS's "Science Agenda—Framework for Action," the Korean Academy of Science and Technology (KAST, 韓國科學技術翰林院) was in 2002 handed a project by the Ministry of Science and Technology: "A Study on the Charter for Scientists and Engineers" (科學技術人憲章研究). Having been asked to take the project on, I organized an interdisciplinary team of seventeen researchers, evenly divided into older scientists, engineers, and medical doctors from within KAST, and younger STS scholars, including ethicists, historians, philosophers, and sociologists of science from outside. The research was carried out mainly by the STSers for six months, with

the scientists acting very much like advisers (though there were fourteen advisory members in addition).

The report submitted to the Ministry of Science and Technology was an impressive piece of progress toward a charter or a code of conduct for scientists and engineers. There should have been follow-up measures on the part of the government, but the ministry took no further action. Two years elapsed without visible change, and the report was completely forgotten. Just before the Hwang scandal, an ad hoc task force was formed within the Korean Federation of Science and Technology Societies (KOFST, 韓國科學技術團體總聯合會). This fifteen-member drafting team was composed of a philosopher, social scientists, and STSers including myself, as well as some top scientists. At the very outset, we all agreed that the proposed charter should stand for neither scientism nor antiscientism—well-balanced views were essential. In reality, however, there were fierce disputes between scientists and nonscientists. While the scientists defended pure science, ethical neutrality, and freedom of research, humanists and social scientists emphasized the adverse aspects of science and technology, social responsibility, and ethics. The result of three months of discussions was destined to be a compromise—the charter turned out mediocre and dull. I proposed a joint project to come up with a code of ethics for scientists and engineers, involving three institutions: Korean National Commission for UNESCO, KOFST, and KAST for the Ministry of Science and Technology. However, after Hwang's fall from grace, the government was interested only in guidelines for research ethics. KOFST alone produced a very unsatisfactory code of ethics, and in great haste.

Ever since the introduction of Western science and technology, scientism has had the upper hand in East Asia. Blind faith in science and technology has prohibited people from developing a critical mind-set. In Korea, efficiency rather than flexibility was a virtue, in order to achieve rapid industrialization. Such tendencies resulted in rigid hierarchy and compartmentalization of society. Scientists and engineers were pacified and for a long time were made to be content with the status quo. Now, though, we can see the prospects for overcoming such an unfavorable climate for STS.

STS emerged as an established field in the 1970s with the help of the sociology of scientific knowledge in Europe and America, but it is not very well known that there were predecessors back in the early twentieth century. "Science of Science" was the title of an article by María Ossowski and Stanislaw Ossowska in the Polish journal *Organon* in 1936. Even earlier, in 1926, Boritchevski, a Russian, wrote an article titled "Science of Science as an Exact Science." Science of science, according to him, dealt with the fundamental problems of science by dialectical materialism. J. D. Bernal's *Social Function of Science* (1939) was the first fully fledged scientific analysis of science, based on Marxism. After World War II, science of science (*Wissenschaftswissenschaft* in German, *nauko znawstwo* in Polish, and *наука науки* in Russian) was extensively studied in the socialist bloc. It was an important topic in China even after the fall of socialism in Europe.

With the collapse of socialism in the 1980s, the zeal for radical science became hardly visible. The turn of the century witnessed amazing developments in biotechnology and nanotechnology, which brought forth interest in the ethics of science and technology. Accelerated climate change reminds us of a crisis far more urgent than those of the 1960s. Nevertheless, the critique of science and technology draws little attention in the STS community.

Vannevar Bush, one of the most prominent figures who led the Manhattan Project, wrote a report to the US president in 1945 titled "Science, the Endless Frontier." After twenty-two years had passed, though, the title he chose for one of his books was *Science Is Not Enough*. It is our urgent task to crush scientism. My work in STS has been more Low Church than High Church, according to Steve Fuller's distinction. If I have time, I would like to write the history of STS.

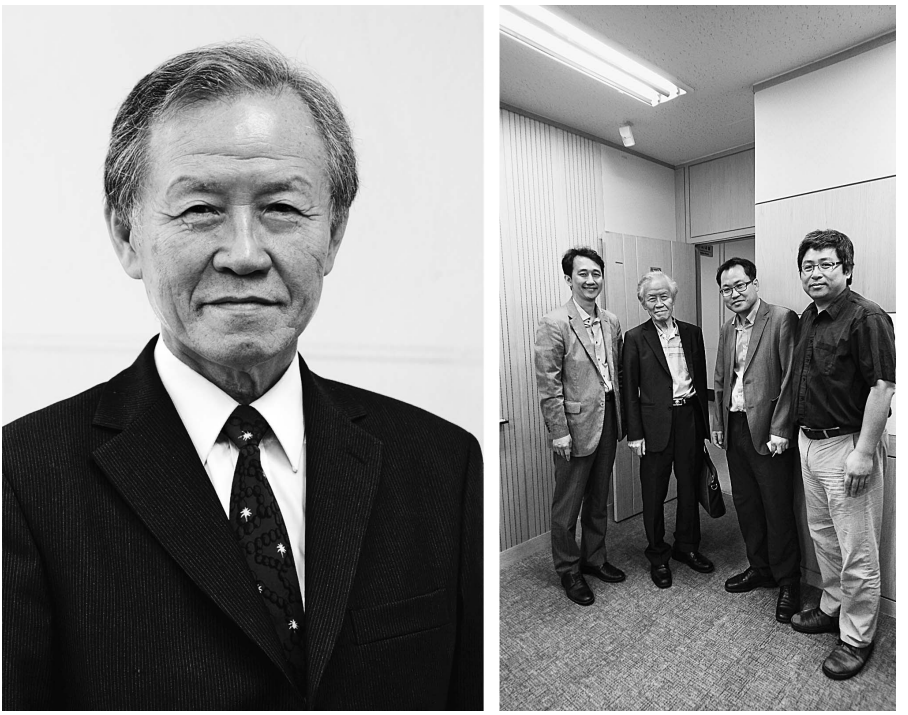

Fig. 1 Left: Professor Song Sang-yong. Right: Professor Song (second from left) in an editorial meeting with (from left) *EASTS* editor in chief Wen-Hua Kuo, editor Kim Eun-sung, and associate editor Bak Hee Je, Kyung Hee University, 17 June 2016.

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