

*Science, Technology and Society Studies in Korea: Background and Prospects**

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THIS PRESENTATION AIMS at reviewing the evolution of science, technology and society (STS) studies in Korea and raising some tasks for the future. When Korea was liberated from the Japanese colonial rule of thirty-five years in 1945, there were less than fifty scientists trained at university level. By 1993, Korea had more than 15,000 S&T personnel (including M.A.'s and Ph.D.'s). Science and technology witnessed considerable growth, particularly from the 1960s, after the division of the country and the devastating Korean War. By the early 1990s, Korea had 106 National and Public Research Institutes; and 1500 research institutes in the private sector which accounts for more than 70 per cent of the total R&D expenditure. One estimate given by the Korean Institute of Science and Technology puts the figure of total S&T human resources in the industry sector around 38,600 personnel (including the 15000 S&T mentioned above). The categorical goal of Park Chung Hee regime was economic build-up which, in turn, was the *raison d'être* of science and technology.

The first economic policy, modelled after Japan, was quite successful. After a generation, Korea could emerge as a promising economy in the developing world. Science and technology were nothing but a means for high economic growth. As is well known, the success

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achieved by the country in the last three decades was described as a 'miracle' to be emulated by other countries. The creation of the Korea Institute of Science and Technology (KIST) and the Ministry of Science and Technology (MOST) were good examples. Both were created to bring out the linkages between the factors of science and technology and economic institutions for attaining higher economic returns. During the period between 1960s and 1980s, when science and technology institutions were directed towards economic goals, very little or no consideration was given to science and technology for their own sake. MOST was even called Division of Export, Ministry of Commerce and Industry. *Kwahak Kilsul Ipkuk* (nation building with science and technology) was the national motto. The people accepted the material growth and changes without much resistance. In a way it was a 'golden time' for science and technology which can be seen in the phenomenal increase in state funding during 1960s and 1990s. As such, the overall investment in science and technology rose from less than 1 per cent to 2.5 per cent of GDP during this period.

The 1970s was a turbulent decade for science and technology in several developing countries. But it was not so in the case of Korea. Besides, the Korea Atomic Energy Research Institute (KAERI), KIST and the Korea Advanced Institute of Science (KAIS), some specialised institutes of chemistry, machinery, energy, etc., were established during this period. All of them were located in a new science city in Taedok. They symbolised the turn towards heavy and chemical industry. Though the government pushed the development of science and technology without any obstacle, it felt the necessity of making people understand the benefits and economic potential of science and technology. Thus appeared the 'scientification of the whole nation movement', reminiscent of North Korea's catch phrase 'Fortification of Whole Country'. The popularisation of the science and technology movement led by the government was very much a 'one-sided' and marginal component, and was destined to fail. Insofar as the public understanding of science and popularisation of science is concerned, it may be said that the movement outside the government was carried out more effectively. For instance, a publisher, Chonpakwahaksa, began to produce popular science books *Hyon-daekwahaksinso* (Modern Science Series) in 1972. Among 150 pocket books, there were many on history and philosophy of science or STS. It may be said that these publications exerted considerable influence on students. The 1970s may be said to be the period for the modest

beginning of STS activities in Korea. In 1977 the academic science community, journalists and publishers joined to form the first ever Korea Science Writers Association. It raised major issues on science, technology and society through occasional meetings. Much more popular and active was the Korean History of Science Society, which was founded in 1960, but revitalised in 1974. It catalysed the critical view of science and technology through frequent meetings and seminars. It is no wonder that the majority of STS scholars are from the history of science.¹

In 1970, I began to teach the first ever course on 'Science and Society' at the Seoul National University.² At the level of university, STS was introduced at the Korea Advanced Institute of Science as early as in 1973. It held a joint symposium with the STS programme of Cornell University. This was, however, shortlived and the programme was virtually suspended. For Korean scholars, it was big news when the Seoul National University announced the opening of the graduate programme in history and philosophy of science in 1984. Though the programme was internalist-oriented, it offered a course on sociology of science. It was taught by fresh Ph.D.'s in sociology of science. Among the scholars who were trained at the Ph.D. level in the broad field of STS studies, mention may be made of, Kim Hwan-Suk (*Determinants of Technological Change in the Korean Machine Tool Industry: A Comparison of Large and Small Firms*, University of London, 1988); Cho Byong-Hee (*The State and Physicians in Korea, 1910-1985: An Analysis of Professionalisation*, University of Wisconsin, 1988); Yoon Jeong-Ro (*The State and Private Capital in Korea: The Political Economy of the Semiconductor Industry, 1965-1989*, Harvard University, 1989); and Kim Kyung-Man (*Explaining Scientific Consensus: Toward a Social System Grounding of Scientific Validity*, University of Chicago, 1989). However the expansion of STS courses was very slow in the 1980s.

From the overall perspective of STS studies, particularly concerning their origins in Korea, translation of relevant STS literature to the Korean language assumes considerable importance. In 1982, Nakayama's book, *Kagaku to shakai no gendaishi* (*A Contemporary History of Science and Society*, 1981) was translated into Korean by two student dissenters (Lee Pil-Ryul and Cho Hong-Sup). This was soon followed by *Contemporary Science and Technology and the Liberation of Man* (1984) edited by Cho Hong-Sup; and Ziman's *The Force of Knowledge* (1986). These three books became standard texts of

STS courses. Since then, some fifty books (translated versions) directly related to STS studies have been published including, Robert E. Yager's *Science, Technology and Society as Reform in Science Education* (1997) and Andrew Webster's *Science, Technology and Society: New Directions* (1998). They addressed the general public and theoretical books are very rare. We have two versions of Kuhn's *The Structure of Scientific Revolutions*. Merton's *The Sociology of Science* was also translated. In the late 1980s there was an active group of scholars who published papers and books which continued in the 1990s. Mention may be made of Cho Hee-Hyung's, *Science, Technology and Society and Science Education*, Seoul: Kyoyukkwahaksa, 1994. Choi Kyunghee's *The Understanding and Use of STS Education*, Seoul: Kyohaksa, 1996. The last one reflects the worldwide trend of science education. These activities prompted the Ministry of Education to recommend the introduction of STS studies in the new curriculum of high school science.³

There had been a campaign for establishing independent departments of science studies in universities for twenty years. It eventually materialised when Korea University and Chungang University opened graduate programmes in science studies in 1995. An undergraduate department of science studies was set up at Chonbuk National University around the same time. Some other universities launched programmes in technology policy, science administration or technology management. In the 1980s there was short-lived Korean Society for Science and Technology Policy. Informal seminars on economy and technology were recurrently organised by the Korean Society for Technology Management and Economics, beginning in 1991. It drew 250 members, consisting mainly of corporate engineers, ex-bureaucrats and university professors. However, there were very few natural and social scientists. It adopted the Business School approach. The society has its own journal called *Science and Technology Policy*, published in cooperation with Science and Technology Policy Institute (STEPI), which is a government-sponsored institute controlled by the Ministry of Science and Technology.⁴

Together with science and technology policy and history of science, another field of STS which drew considerable interest is the sociology of science. The word 'sociology of science' was first known to Koreans in 1972 through Lim Hy-sop's translation of *Knowledge and Society* edited by Parsons. The most prominent sociologist of science is Kim Kyung-Man. His dissertation at the University of Chicago was

published in 1994 (*Explaining Scientific Consensus: The Case of Mendelian Genetics*, New York: The Guilford Press, 1994)⁵. Kim is published frequently in such journals as *Social Studies of Science* and *Social Epistemology*. Sociologists in Korea, like the American scholars in 1930s, used to be indifferent to science and technology. However, the situation began to change with the appearance of young sociologists of science and technology in the early 1990s. The Korean Sociological Association now has sections in sociology of information, sociology of medicine and environmental sociology. Sociology of information is most popular, with seventy members. Medicine and environment has twenty members each in their respective sections. Korean Society for Philosophy of Science, which started in 1995, is very much concerned with the social dimension of science and technology. Eight universities have courses in sociology of science and technology at the undergraduate level and six at the graduate level. There are five full-fledged sociologists of science, technology or medicine in different universities. Quite a few sociologists, whose main interest was in industry, are turning toward science and technology. The obstacle for the promotion of sociology of science is that universities seldom show willingness in employing STS scholars. Communication and cooperation with neighbouring disciplines is another problem. Currently there are scholars trained in sociology of science in search of appropriate positions.⁶

Kim Hwan-Suk, the first Korean Ph.D. in sociology of science and technology from Imperial College of Science and Technology, took initiative to launch a group for studying science, technology and society in 1996. About thirty members from sociology of science, history and philosophy of science, political science, public administration and economics constituted this society.⁷ They have regular meetings every month and organise a session on sociology of science and technology at the meetings of the Korean Sociological Association. The Korean Society for STS is expected to emerge soon, with this group as a base. Besides professional societies and launching courses in STS studies at different levels, international connectivity has been important for the institutionalisation of STS in Korea. Most of the existing scholars were trained abroad in the prominent STS centres in the West. Several well-known STS scholars visited and interacted with scholars at various conferences and meetings specifically organised in this emerging field of studies from the late 1980s.⁸ The Third Korea-Japan History of Science Seminar in 1986; The Eighth International

Conference on the History of Science in East Asia; the International Conference on Science, Technology and Culture in 1996; and the UNESCO Regional Conference in Seoul on 'Science and Technology and Change in Asia and Pacific' are some of the main conferences that were convened in Korea during the last few years. More than three Koreans have been visiting scholars in STS programmes at Pennsylvania State University, Cornell University, Edinburgh University and The United Nations University since the 1980s. In 1996, for the first time, I participated at the joint American Society for Social Studies of Science (4S) and the European Association for Science and Technology Studies (EASST) meeting held in Bielefeld, Germany. All these contacts provided great stimulus to the growing STS community in Korea.

Hong Sungook, an internationally-known historian of science and technology at the University of Toronto is very active in Korea, publishing articles on science and technology studies.⁹ He was a student activist in the 1980s and one of the forerunners of the STS movement in Korea. It was only last year that the Council for Democracy in Science and Technology (CDST) was born as a part of *Chamyoyondae* (People's Solidarity for Participatory Democracy, PSPD), a major citizen movement in Korea. The council is also led by Kim Hwan-Suk and is carrying out many ambitious programmes. From the point of STS activism, there are some episodes which began in the 1980s. In 1980, seven scientists signed the 'Declaration of 134 Intellectuals' against the military takeover. Two of them were sacked from the university. Under three repressive military regimes in Korea, criticism over decision-making in science and technology was spearheaded by the democracy movement. Discussing environmental and nuclear issues had been virtually impossible since the 1960s. However, the citizens' movement against pollution and nuclear power programme became so strong in the late 1980s that the government could no longer curb it. It opened the critical debates on the important issues having a bearing on STS studies. Some Marxist-oriented students were keenly interested in the scientific-technological revolution, and organised a separate movement on their own. It was developed for the science and technology labour unions in some government-controlled research institutes. Bernal's *Social Functions of Science* (1939) and *Science in History* (1951) were among the books that influenced them. There were several Left factions, including PD (People's

Democracy) and NL (National Liberation), active in issues relating to science and society. They had their own journals such as *The Science Generation* and *Science and Man and Alternative Science*. They are still active even after the fall of socialism.

Ever since the introduction of Western science and technology, scientism has been paramount in East Asia. Tremendous optimism about science and technology masked people from nourishing a critical bent of mind. In Korea, efficiency rather than flexibility was a virtue for the achievement of rapid industrialisation. Such tendencies resulted in a rigid hierarchy and compartmentalisation in the society. Scientists and engineers were socialised to be content with the status quo for a long time. The rapid pace of modernisation and industrialisation process that has taken place in the country for the last few decades was, however, not without social burdens. It brought forth many problems: demolition of traditional values, urban hazards, environmental degradation, etc. The scientific community as well as the government paid little attention to them. Now we can see the prospect of overcoming the unfavourable climate for STS. In addition to the environmentalist and anti-nuclear movements, there is an increasing awareness of the social implications of biotechnology and information technology. The recent start of the Korean Bioethics Association is a pointer to this growing consciousness. On the part of the government, we can see some positive changes. The government now tries to see science and technology as a culture. It reshuffled the Korea Science Foundation to the Korea Foundation of Scientific Culture, and increased subsidies exceptionally. The Korean Association for the Advancement of Science was created to enhance public understanding of science and technology. The Ministry of Science and Technology has many capable officials trained in science policy studies, mostly at Sussex, Manchester and Edinburgh. These persons could be opinion builders for STS in the bureaucracy. However, Korea Science and Engineering Foundation (KOSEF) is yet to introduce the STS category in its programme schedules. Currently, Korea is in a serious economic crisis under the IMF system. The present predicament forces us to re-examine every aspect of our accomplishments and failures. There is no doubt that the concern for STS will be heightened in the course of evaluating the role of science and technology in the present situation of crises, which has engulfed the South East Asian nations.

NOTES

1. See Park Seong-Ray.
2. I also taught the same courses at other universities. I was deeply impressed by the science movements while studying in the United States in the 1960s. Later, I was stimulated by the challenge of social history of science at XIVth International Congress of the History of Science in Japan. In the 1980s I interacted with J.R. Ravetz and Robert Young in the UK to learn about the radical science movement.
3. I initiated teaching STS courses in 1981 which led to the UNESCO workshop for high school science teachers to introduce STS into science education.
4. There was strong pressure among the members to change the name of the society to the Korean Society for Technological Innovation.
5. Donald T. Campbell, Kim's mentor, in his foreword to this book, observed that it is 'a pioneering contribution to the next phase of the sociology of scientific knowledge'.
6. Kim Kyung-Man (Sogang University), Kim Hwan-Suk (Kookmin University), Yoon Jeong-Ro (Korea Advanced Institute of Science and Technology), Cho Byong-Hee (Keimyung University) and Lee Young-Hee (Ph.D. from Yonsei University, 'A Comparative Study on the Development of Technological System and Work Organisation: Focused on the Case of Hyundai, Toyota, and Volvo Corporations'). There are scholars who have completed doctoral degrees from prominent STS institutions from Sussex, Bielefeld, Edinburgh who are in search of jobs.
7. They started with reading the *Handbook of Science and Technology Studies* edited by Jasanoff et al. (1995).
8. A. Rahman from India; Yoichiro Murakami, Fumihiko Satofuka, Keiji Yamada, Kunio Goto, Togo Tsukahara and Hideto Nakajima from Japan; Pallo Gabor from Hungary; John Ziman from the UK; Roy MacLeod from Australia and Trevor Pinch from the US are some of the scholars who visited Korea during the last few years for various meetings and conferences.
9. For instance, 'Who's Afraid of Science: Critical Reflections on the Recent "Science Wars"', *Korean Journal* (Journal of the Korean History of Science Society), 19 (2), 1997, pp. 151-79.

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