

**Manyong Moon, *Hankuk Kwahak Gisul Yeongucheje Jinwha*
한국 과학기술 연구체제의 진화 [*The Evolution of Science
and Technology Research Systems in South Korea*]**

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Sungsoo Song

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This book was published as a part of the Science and Civilization in Korea series planned by the Korean Research Institute of Science, Technology, and Civilization at Chonbuk National University. As with other volumes in the series, this work presents substantial historical discussions on its topic. The topic examined by the author is science and technology research systems in South Korea since liberation from Japanese colonial rule. The author defines “research systems” as follows: they “mainly refer to research institutes, the spaces in which research and development activities are performed, and the institutions surrounding them, and can encompass the scientists and engineers who lead research within them and even the research accomplishments and culture created by these people” (24–25).

The questions that the author raises regarding research systems in South Korea are, “What historical trajectories have research systems in South Korea undergone, what are the factors that have driven such an evolution, and what are the characteristics emerging from the process? Do unique ‘South Korean research systems’ exist? If so, then when, through what occasions, and how were they created?” (30). Based on such questions, this book mainly traces the historical flows through which research institutes in South Korea have changed. These streams consist of national research institutes, government-funded research institutes (GRIs), corporate research institutes, and university research institutes.

Chapter 2 addresses national research institutes that existed before the establishment of the Korea Institute of Science and Technology (KIST). Although there have hitherto been introductions to the National Horticultural Technological Institute (NHTI) and analyses of the Atomic Energy Research Institute (AERI), discussion of other research institutions has been insufficient. By examining the cases of not only the NHTI and the AERI but also the Central Industrial Research Institute and the Ministry of National Defense (MND) Scientific Research Institute, the author shows well the

S. Song

Department of Physics Education, Pusan National University, South Korea

email: triple@pusan.ac.kr

roles and limitations of national research institutes up to the first half of the 1960s. Research institutes at that time were significant for their social confirmation of the very existence of scientific and technological research by gathering and prompting researchers to engage in activities, rather than for their research achievements. However, because national research institutes operated within the regulations under the Government Organization Act and the State Public Officials Act, they were limited insofar as they were not easily able to recruit outstanding researchers or to engage in creative research activities. In this context, the scientific and engineering community in South Korea continued to dream of “proper research institutes,” which culminated in the establishment of the KIST in 1966.

What is insufficient about chapter 2 is the fact that, although case analysis of the relevant research institutes is faithfully conducted, the topography of overall research systems during the period does not emerge with clarity. For example, the author mentions that the nation had eleven scientific and technological research institutes belonging to government agencies in 1959 and seventy-nine scientific and technological research institutes in 1965, but scarcely addresses or provides information on them. As with other chapters, this one should provide detailed analysis on overall research systems by making use of various statistical data. If such cases as the Central Industrial Research Institute, the National Horticultural Technological Institute, the Ministry of National Defense Scientific Research Institute, and the Atomic Energy Research Institute had been arranged within this bigger picture, chapter 2 would have been even more substantial. In addition, while the author mentions that the AERI was an “institution evaluated as South Korea’s first contemporary scientific and technological research institute” (43), there is insufficient discussion of the sense in which such an assessment is possible.

The main actor of chapter 3 is KIST, the first government-funded research institute in South Korea. Because at the time universities focused on education while private corporations focused on production, the conditions in South Korea for performing serious research and development (R&D) had yet to be prepared. In such a situation, a strategy was adopted of establishing research institutes under government leadership, in the form not of national research institutes but of GRIs. The author’s analysis of this is that “it was to overcome the inefficiency in operation characteristic of existing national and public research institutes, to attract outstanding researchers by providing good treatment, and to allow research institutes to be operated autonomously by avoiding interference and control such as personnel management and complicated financial auditing” (154). Considered to be something almost unique to South Korea, and difficult to find in other countries, GRIs have served as an important medium for the Korean government’s pursuit of its science and technology policy.

The author received a doctoral degree in 2006 for his dissertation “The Early History of KIST, 1966–1980: From Contract Research to National Project Research,” which in turn was published in 2010 as a single volume titled *The Formation of Contemporary Research Systems in South Korea: The Establishment and Transformation of the KIST, 1966–1980*. Written on the basis of such solid research, chapter 3 is even more substantial than others. Particularly noteworthy is the author’s observation that the relevant personnel in South Korea played active roles instead of remaining passive objects during the process of establishing the KIST, and that the KIST played the role of a “reverse brain drain center” by actively attracting ethnic Korean scientists

and engineers who had been working abroad. In addition, the author amply demonstrates how, in its early years, the KIST performed the role generally played by research institutes while at the same time supporting R&D in industry and contributing to the establishment of national plans. When he observes that “the news that the KIST, established with South Korea’s decision to dispatch combat troops to the Vietnam War, would establish a research institute similar to itself in Vietnam, prompts us to feel the irony of history” (156), the author’s historiographical sensibility is also evident.

Chapter 4 deals with the construction of public research systems in the 1970s. Research systems in South Korea can be said to have been reorganized in the 1970s, with a focus on GRIs. This is directly demonstrated by the fact that, as the number of GRIs in science and engineering increased to nineteen by 1980, they spent more on R&D than did all other research subjects combined from 1976 onward. In addition, the author also notes that the successive establishment of GRIs occurred in concert with the task of creating research parks such as the Seoul R&D Park and the Daedeok Research Park. While pointing out several problems caused by the wholesale expansion of GRIs, the author assesses the phenomenon overall as significant because, through the 1970s, South Korea’s research systems “enter[ed] the stage of transition from the training of the technological personnel or the construction of research bases to R&D itself” (209).

Chapter 5 mainly analyzes research systems in the 1980s. The dramatic increase in R&D activities by the private sector can be cited as the most visible change in South Korea’s research systems at that time. From 1983 on, the government and private sector share of R&D investment began to reverse, and corporate research institutes, which numbered only fifty-three in 1981, had by 1991 exceeded the thousand mark. The author evaluates this phenomenon thus: “During this period, with the successive and full-fledged establishment of corporate research institutes and with a reversal in which the private sector’s R&D investments surpassed the government’s R&D investments, a transition to research systems led by the private sector began” (215). In addition, the author analyzes in detail the ways in which GRIs in South Korea changed through the 1980s and also notes the effect of the National Research and Development Program, initiated in 1982 as the Specific Research and Development Program, on R&D activities in South Korea.

One shortcoming of chapter 5 is that it does not sufficiently explore the ecosystem of corporate research institutes. After addressing the Samsung Advanced Institute of Technology as an example of the research institutes attached to large corporations, and the Cuckoo Electronics R&D Center as an example of those attached to small and medium corporations, the author mentions the Research Institute of Industrial Science and Technology and the Mogam Institute for Biomedical Research, both of which are nonprofit foundations. However, it is not enough simply to try to map the entire ecosystem of corporate research institutes by using such a small number of examples. In addition, in the case of the industrial technology research consortia in which the author is interested, the Consortium of Semiconductor Advanced Research, which is linked to the rapid growth of the semiconductor industry, should also be included. The author’s evaluation of the rise of corporate research institutes in the 1980s likewise should be presented more boldly. He points out that “the rise of corporate research institutes in the 1980s was a result of the combination of government policy, which induced and supported the establishment of research institutes, and the will of corporations, which confirmed interest in and the need for R&D” (234). It should be further emphasized

that, unlike in advanced countries, private firms' R&D activities were promoted on the basis of the South Korea government's firm intervention and support. In other words, the South Korean government not only strengthened wholesale support for private sector R&D in terms of finance, taxation, personnel, and so on, but it also took unprecedented measures including the establishment of standards for acknowledging corporate research institutes and the implementation of special provisions regarding compulsory military service for male researchers.

Chapter 6 traces research systems in South Korea since the 1990s. The most important characteristic of this period can be found in the fact that universities emerged as new research subjects. In other words, "although below corporate and government-funded research institutes in absolute scale, universities' R&D costs recorded the highest increase relative to [the R&D costs of] other [research] subjects during this period" (285). The author intensively analyzes the historical process and current state of the expansion of university research institutes and then reviews developments in corporate research institutes, national and public research institutes, and GRIs, thus faithfully mapping the topography of research systems in South Korea today. In particular, he takes note of an unbalanced structure that centers on large corporations while addressing corporate research institutes. In South Korea, the top five corporations in terms of sales turnover account for approximately one-third of all corporations' total R&D costs, while the top twenty account for more than half (318). In conclusion, the author diagnoses that it is necessary to find a path of developing "separately but together" (364), where diverse research subjects in South Korea play their respective roles yet pursue cooperation.

Throughout chapter 6, the author summarizes the historical flow of university research institutes and the government's ensuing roles. However, a more detailed discussion would be desirable. For example, he concludes that the "Center of Excellence" program, initiated in 1989 and including Science Research Centers and Engineering Research Centers, served as an important turning point in universities' construction of research capacity (303). However, his efforts to demonstrate aspects of the program through concrete examples are insufficient. In addition, because the Brain Korea 21 Program (fostering the next generation of researchers since 1999) and the 2003 Promotion of Industrial Education and Industry-Academic Cooperation Act are similarly evaluated as having considerably affected universities' research activities, additional analysis of them seems necessary. The author also raises the interesting argument that "as government support increased, applied research and development research tended to increase [while the relative share of basic research decreased] in universities' R&D activities" (310), and a meticulous analysis of this, too, is to be expected.

At the end of the book, the author likens the history of research systems in South Korea to one particular winter sport: "As in short track speed skating, in research systems in South Korea, research systems representative or characteristic of each era, from national research institutes to GRIs, corporate research institutes, and to university research institutes, have emerged by turns" (381). This is a splendid way of concisely expressing the historical characteristic of research systems in South Korea. However, in order to discuss "[uniquely] South Korean" research systems beyond research systems "in South Korea," some of the points mentioned throughout the book should be presented more clearly. Above all, it should be highlighted that,

while research systems in advanced countries have been formed in the order first of universities, then private corporations, and finally public agencies, they have undergone the reverse sequence in South Korea. In addition, it is necessary once again to stress that the GRI is a uniquely Korean-style institution that is difficult to find in other countries, and that the Korean government has intervened actively in the processes through which private corporations and universities emerged as research subjects. I suspect that the author did not clearly highlight such points because of his characteristic academic modesty.

Sungsoo Song is a professor in the Department of Physics Education at Pusan National University and president of the Korean Association of Science and Technology Studies. His books include *When Science and Technology Meet Culture* (2009), *In Search of Interfaces between Technoscience and Society* (2011), and *Great Figures in the History of Technology* (2015) (all written in Korean).