

북한 과학 기술 형성사

**Kang Ho-je, *Pukhan kwahak kisul hyöngsöngsa I*
[History of Science and Technology in North Korea I]**

Seoul: Sönin, 2007. 440 pp. ₩26,000.

Charles K. Armstrong

Received: 30 June 2009 / Accepted: 30 June 2009 / Published online: 18 November 2009
© National Science Council, Taiwan 2009

Despite Kim Jong Il's call for an "IT revolution" in North Korea some 10 years ago, North Korea is not exactly world-renown for its scientific and technological expertise. To the extent that North Korean technology appears in the world media at all, it is usually in articles about Pyongyang's nuclear program. Of course, the main focus of international media attention is not so much on North Korea's level of technological development—still thought to be relatively primitive—but its level of threat. North Korean technology is generally associated with crude militarism, not scientific sophistication. According to much of world opinion, especially in the US, Japan, and South Korea, North Korea is a political renegade and economic disaster that devotes far too much of its sparse technological resources to missiles and nuclear weapons.

Whatever the validity of such images today (and clearly the above stereotype tells only one part of the story), North Korea was not always such a basket case. As Kang Ho-je's deeply researched and wide-ranging history reminds us, North Korea once had an economic growth rate and level of industrialization that few developing countries could match. Furthermore, in the course of this early economic development (dating from the end of Japanese colonial rule in 1945 to the late 1950s) North Korea overcame severe handicaps in scientific training and resources to produce an impressive body of researchers, technicians, and scientific publication and organization. For example, at the time of liberation, there were only about 400 university-trained scientists in all of Korea; of these, only around 5% were in the

C. K. Armstrong (✉)
Columbia University, New York, USA
e-mail: cra10@columbia.edu

North when the peninsula was divided into Soviet and American occupation zones. It is true that more than 80% of the heavy and chemical industries built by the Japanese were in the North, due to the proximity to natural resources there, but almost everyone who knew how to operate those facilities had gone back to Japan or was in South Korea. Just 4 years later, in 1949, North Korea's supreme leader Kim Il Sung could boast that the number of scientific and technical graduates had increased from just 20 to 1,400—nearly a 100-fold increase.

A quantitative increase is not the same as qualitative development, but Kang argues that both quantitatively and qualitatively, science and technology made great advances in North Korea until the beginning of the 1960s. Thereafter, for reasons Kang explores in detail, North Korean science went into a quantitative and qualitative decline from which it has yet to recover.

It should be kept in mind that the term “science” (*kwahak*) in North Korea (officially the Democratic People's Republic of Korea or DPRK) has a somewhat different meaning than the word generally suggests in English. *Kwahak* in North Korea is both more inclusive and more limited than “science” in English (or for that matter *kwahak* in South Korea, which tends to follow the American usage). On the one hand, like the German *Wissenschaft*, “science” in North Korea means scholarly knowledge of all kinds, not just natural science. Hence, the North Korean Academy of Sciences, established in 1952, included humanities, social sciences, and natural and applied sciences. Its first director was Hong Myōng-hūi, a prominent novelist. Later, in the early 1960s, the academy would break up into separate academies of natural science, social science, agriculture, and others.

On the other hand, scientific knowledge tends to be viewed instrumentally in the DPRK, as it was in the former Union of Soviet Socialist Republics (USSR). “Pure” research is not strongly encouraged, and scientific work is subordinate to political imperatives. Obviously, science is not always politically innocent in the democratic West either, but the degree of political control and instrumentalization of all forms of knowledge in North Korea is more obvious and direct than in societies that are less politically “monolithic” (a term the DPRK has used unabashedly about its own system). Therefore, Kang's attempt to de-subordinate science from politics in his study of North Korea is important but all impossible; as his book shows, politics drove science from the beginning of the regime and with increasingly negative results after the end of the 1950s.

Needless to say, the Soviet Union, which occupied Northern Korea from 1945 to 1948 and helped install a communist-dominated government led by Kim Il Sung, played an indispensable role in the development of science and technology in the DPRK. Yet, as Kang points out, North Korean science was no mere replication of Soviet science. Kang suggests that Soviet influence was pronounced for the first 10 years of the DPRK (others might give a longer or shorter period for Soviet preponderance) but, thereafter, North Korean science followed its own path. Identifying “North Korean-style science and technology” is one of the main themes of this book.

As the author points out in his introduction, this book is the first comprehensive overview of scientific and technical development in the early years of the DPRK. Most studies of North Korea have focused on politics and ideology, and even those that have examined economics and society have tended to see these as dependent on

politics. Kang claims this is the first book to look at North Korean science and technology in their own right, not as factors in politics and ideology. In this, Kang is probably correct although a number of important articles on North Korean science and technology have been published in South Korea in recent years, especially by Kim Kün-bae (as referred to in Kang's highly useful bibliography). Kang's book began as a dissertation in the Department of the History and Philosophy of Science at Seoul National University. The history of science is not yet a very widespread field in South Korea, and much work remains to be done on the history of science in post-colonial Korea, North and South. This book represents a major step forward in the historiography of Korean science and technology since the end of Japanese colonial rule.

The author's second purpose, in addition to laying out an overall history of North Korean science and technology, is to describe in detail the Ch'öllima Movement of the late 1950s and its relationship with science and technology in North Korea. Briefly put, the Ch'öllima Movement, named after the mythical Korean winged horse who could fly 1,000 *li* (400 km) in 1 day ("Thousand-*li* horse" or "Ch'öllima"), was a campaign launched in 1958 to mobilize North Korea's human and material resources for the development of heavy industry. Resembling both the Stakhonovite movement of the USSR in the 1920s and the contemporary Great Leap Forward in China, the Ch'öllima Movement became the prototype for mass mobilization campaigns in North Korea to this day. As recently as May 2009, the DPRK launched a "150-day speed battle" to increase industrial and agricultural production. Officially Ch'öllima has never ended.

According to Kang, Ch'öllima was the turning point. Up to then, North Korea had made impressive gains in economic and technological development by making the best use of human resources and encouraging innovation. Scientists trained in Japan and those who had crossed over from the South were put to work in national development despite their ideologically "suspect" background. Scientific ability was valued over political ideology. However, between the onset of Ch'öllima in 1958, and the Fourth Korean Workers' Party Congress in 1961 that launched the First Seven-Year Plan, political ideology eclipsed scientific knowledge and economic efficiency. From the early 1960s, both economic growth and scientific innovation slowed down. Indeed, the goals of the 1961 Seven-Year Plan were not met until 1970, 3 years behind schedule. Henceforth, North Korea would consistently fail to meet the targets of its economic plans, until the entire national economy would nearly collapse in the mid-1990s.

The book is divided into six chapters. Following an introductory chapter and a chapter on the foundations of technological innovation in the DPRK, chapters three and four are devoted to the Ch'öllima Movement and its subsidiary Ch'öllima Work Team Movement, closely examining their connection to the onset of North Korea's economic failure and scientific and technological stagnation. Chapter five looks at the Taean Work System, an industrial policy of the early 1960s. The final chapter sums up the book and offers conclusion. The organization of the book flows very well, and the concluding summaries in each chapter are particularly useful.

This book is very much an institutional history. It has little to say about the content of scientific development in North Korea, which is a shame, because North Korea did make some genuine contributions to scientific knowledge. The

Japanese-trained chemist Ri Sŭng-ki, for example, invented the new artificial fabric “vinalon” out of readily-available Korean limestone, and became a scientific celebrity in the DPRK as a result. Although not the “miracle fabric” North Korean propaganda made it out to be, vinalon was a genuine North Korean innovation and a significant factor in North Korea’s developing ideology of *juče* or self-reliance. The book could have also benefited from greater contextualization and comparison. For instance, the USSR is largely absent from the narrative after the Korean War, but surely North Korea’s science and technology continued to evolve in close contact with the Soviet and East European scientific worlds, as well as that of China, throughout the period covered by this book. Similarly, comparisons with contemporary and subsequent South Korean scientific development would have strengthened the reader’s understanding of how much the two Koreas diverged (or, indeed, how similar they were) in this area.

Overall, the book gives an excellent overview of the institutional development of scientific education and research in the first 20 years of the DPRK. It is ultimately a sobering tale of great initial promise and increasingly diminishing returns. Perhaps the most distinctive aspect of “North Korean-style science and technology” is its ability to cling tenaciously to outmoded methods of organization and mobilization long past the point of exhaustion. It remains to be seen whether recent North Korean innovations, including a domestic “IT Campaign”, sending students to West, and the new Pyongyang University of Science and Technology, will be able to rescue North Korea from its economic, scientific, and technological predicament. Given the current political climate in and around the Korean peninsula, that goal still seems very distant.

Dr. Kang, who holds an undergraduate degree in physics, has little to say about North Korea’s nuclear energy program, which began in the mid-1960s, the chronological endpoint of this book. Presumably, the nuclear program will be discussed in Volume II. We should hope that the second installment of this study will be as illuminating and original as the first.