

Jeongsup Yeom 염정섭 and Soonyeol Soh 소순열, *Agricultural Technology and Korean Civilization* 농업 기술과 한국 문명 (Paju: Dulnyouk Publishing, 2021), 552 pp.

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Published as the twenty-first volume in the “Science and Civilization in Korea” (SCK) 한국의 과학과 문명 series published by the Korean Research Institute of Science, Technology and Civilization (KRISTaC) 한국과학문명학연구소, this book is the outcome of a vast project seeking to survey the history of civilization on the Korean Peninsula from the prehistoric era to the 20th century through agricultural technology. Upon consideration, when one seeks to survey the history of civilization on the peninsula from the prehistoric age to today, agriculture is the productive activity that must be most central. For this reason, there would be no room for disagreement that agricultural technology must be considered the key technology in describing the history of civilization on the Korean Peninsula. When this point is taken into consideration, this project in the SCK series is a very welcome fruit indeed notwithstanding its slight belatedness. Of course, this is not to say that the series lacked texts on agriculture before the publication of this volume. While Tae-Ho Kim’s 김태호 *A Social History of Rice in Modern and Contemporary Korea* 근현대 한국 쌀의 사회사 has been published as the tenth volume in the series, as demonstrated by its title, the work mainly addresses, out of contemporary Korean history, the rise and fall of the new program for breeding IR 667, known as the Tongil rice 통일벼 (“Unification rice”), implemented by the Park Chung-hee regime starting in the 1960s. However, the book reviewed here not only expands the objects of its description in being a diachronic history of civilization on the peninsula, with agricultural technology as the medium, but also is written in such a way that the description better corresponds to the comprehensive project goal of a history of civilization through the medium of agricultural technology. This fact in itself is enough to excite readers, including me, who yearn for research on the history of agriculture in Korea.¹

Even when limited to agricultural technology, it would be a nearly impossible task for an individual writer to describe civilization on the peninsula in its entirety. With this volume, Jeongsup Yeom has penned the period from the prehistoric era to the

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¹ As for book reviews of *A Social History of Rice in Modern and Contemporary Korea*, I have contributed one to the *Korean Journal for the History of Science* 41:3 (2019), 417-420.

Joseon Dynasty 조선 (1392-1910), and Soonyeol Soh has penned the period from the Japanese colonial era (1910-1945) to the 1990s, respectively. The former writer is an unparalleled researcher who has steadfastly studied the history of traditional agriculture in Korea, a field that has come to a de facto standstill since Yong Sop Kim 김용섭 passed away, and the latter is an authority who has studied the history of the development of modern agriculture in Korea since the colonial era from the perspective of agricultural economic history. In this respect, the description of diachronic history through collaboration between these two figures can be seen as the optimal combination. Above all, this book can be viewed as a unique achievement of Korean studies in recent years in attempting a diachronic description, which has become rare in South Korean historical circles, through the keywords of “agricultural technology” and “civilization.”

Nor do the virtues of this book stop at a challenging project goal itself. First, in terms of the research methodology, by actively referring to research on agricultural technology accumulated in diverse fields, the volume simultaneously overcomes limitations in the perspectives of existing studies on the history of traditional agriculture and expands the possibility of new interpretations. While such an accomplishment would be a result of the authors’ omnidirectional efforts to explore the civilizational history of agricultural technology on the Korean Peninsula, it is related to a situation where research on agricultural history has lost vibrancy in historiography. In the preface, pointing out “a situation where, in the field of Korean historiography, research on the history of agriculture in Korea has not proceeded actively for various internal and external reasons,” the authors state that they established the direction of their research as “synthesizing research related to agricultural technology in Korea and agricultural civilization in Korea accumulated in individual academic disciplines such as history, archeology, economics, history of science, folklore studies, and anthropology” by making use of the topography of the academia, which has shed light on the historical development of agriculture in Korea in diverse research fields of Korean studies instead (30).

The significance of such research methodology on the part of the authors becomes even more pronounced with the inclusion of the prehistoric era, which takes up an important share in descriptions of the history of civilization, unlike in general historiography, among the periods covered by this volume. It is because, in determining agricultural technology in the prehistoric era, which has not left written records, reliance of the fruits of archeological research is absolute and inevitable. Chapter 1 of this book addresses agricultural technology in the Stone Age and the Bronze Age, and, undergoing these eras, agricultural civilization cultivated an increasing variety of crops and also developed farming tools that would effectively perform dry-field farming 밭농사. Together with the introduction of rice farming out of such technological developments, there arose township and village communities 읍락 공동체,

which were more advantageous to the expansion of irrigation facilities and communal farming. This series of processes has been determined based not on written historical records but on the excavation and exploration of relics in diverse places.

With the distribution of both iron farming tools and farming using oxen in the 4th-6th centuries CE, the ruling system of ancient states on the Korean Peninsula underwent a transformation. In Jeongsup Yeom's view, in this period, township and village communities from earlier disintegrated, to start changing into territorial nations where the state directly ruled areas. In other words, in this era, the development of agricultural productivity stemming from the spread of new agricultural technology brought fissures in self-governing systems based on small states and township and village communities, and the Three Kingdoms 삼국 began to establish the centralized ruling system of antiquity (109-110). Such an understanding of the formation of the ancient state system on the author's part is the first phase that reveals the relationship between changes to agricultural technology and the ruling system in the civilizational history of the Korean Peninsula to which he wishes to direct attention in this book.

Jeongsup Yeom's project of seeking to determine the civilizational history of agricultural technology in Korea within this technology's relationship with the ruling system is linked to fundamental problematics of endeavoring to reconfigure the theory of internal development 내재적 발전론, an age-old point of contention in Korean history, and, moreover, to capture the standard of periodization in Korean history in changes to the ruling system related to agricultural technology and productivity lying behind changes to the ruling order as represented by dynastic changes.² First, the author criticizes the theory of social formation 사회 구성체론 in periodization, which was the basis of the theory of internal development in the past, proposing alternative periodization. If the perspective of the earlier theory of internal development understood Joseon society as a feudal one and focused on the historical process of its transition and development into modern capitalism, the author seeks to interpret shifts in the agricultural system of this age more actively, defining the period as the early modern era (31). On an extension from such problematics, he attempts to periodize Korean history into the ancient, medieval, early modern, and modern eras on the basis of the relationship between agriculture and the ruling system.

² The author has summarized and published such problematics. Jeongsup Yeom, "How Can We Understand the Characteristics of Late Joseon Society: Indigenous Development Theory and Peasant Society Theory 조선 후기 사회 성격을 어떻게 이해할 것인가: 내재적 발전론과 소농 사회론," *Chiyeok kwa Yeoksa* 지역과 역사 38 (2016), 49-103; and Jeongsup Yeom, "1960s-70s Joseon Dynasty's Agricultural History Research and Intrinsic Development Theory, Early Modern Society Era Theory 1960-70년대 조선 시대 농업사 연구와 내재적 발전론, 근세 사회론," *Journal of Korean History* 한국사 연구 184 (2019), 1-42.

The medieval age as grasped by the author within this framework began with the Later Three Kingdoms 후삼국 and the Goryeo Dynasty 고려 (918-1392). If the ancient state system sought to exercise effective control over the people by shackling them to land through types of land management such as house farms endowed by monarchs 연수유 전답, the system of direct rule over people and households became merely nominal in a situation where, with an increase in vagrants from the age of the Later Three Kingdoms onward, society became extremely chaotic. Consequently, the system of direct control over people cum house 인호 collapsed and shifted to the system of control land by taxing on relative areas 결부법 on the basis of land fertility grades 전품. During the Goryeo Dynasty, the farmland and woodland ranking system 전시과, the official land distribution system, for the distribution of the right to collect land taxes 수조권 was implemented as a land distribution system that would acknowledge the vested interests of powerful clans 호족 in the provinces to a certain extent and exercise centralized control (142 and 166-168).

The most important changes to agricultural technology during the transition from the medieval era to the early modern era can be found in the shifts from fallowing 휴한 농법 to repeated cultivation 연작 농법 in dry-field farming and from direct rice sowing 직파법 to rice seedling transplantation 이앙법 in paddy field farming, respectively (197-202).³ These processes developed gradually from the end of the Goryeo Dynasty to the beginning of the Joseon Dynasty, and the author explains the shift in dry-field farming through an analogy with the processes through which the West transitioned from the two-field system to the three-field system and then entered the stage of de facto monocropping through the four-field system that spread from Norfolk, England in the 17th century (Norfolk four-course system) (173-178). At this point, I inevitably must give more thought to the transition from agricultural civilization to industrial civilization commonly known in world history. With the broad expansion of the four-course system accompanied by a dramatic improvement in agricultural productivity, England came to form a material culture that would serve as the basis of industrialization. Since the 1960s, British agricultural historians have dubbed this “proto-industrialization” as well.⁴ Meanwhile, when the industrialization of England is explained, an element cited as importantly as an increase in surplus

³ Because the shift to rice seedling transplantation was an important technological leap for the improvement of agricultural productivity and its agricultural form depended to a considerable extent on delicately coordinated skills on the part of small-scale independent farmers, the questions of instructor farmers’ technological praxis and the provincial agricultural administration related to it would have been greatly highlighted. More research on this needs to be conducted in the future. Francesca Bray, *The Rice Economies: Technology and Development in Asian Societies* (Berkeley: University of California Press, 1994), 113-16.

⁴ As a representative scholar, Joan Thirsk analyzed the productive bases of rural areas, which would serve as foundations of industrialization, while studying the agricultural history of England per region. This became a model of discussions on proto-industrialization in England. Joan Thirsk,

goods stemming from the improvement of agricultural productivity is the invention of credit, which explosively expanded the liquidity of goods.⁵ In other words, paper currency, where the credit of the central bank was at work, emerged as a medium of transactions rather than commodity currencies (gold and silver coins, cereals, etc.), where the nominal value and the real value were identical in principle. Lying here was the flow of the market, especially of capitalism, which pursued a commodity economy such as colonial trade to an extreme degree. That is, capitalism, which maximizes profit on the basis of the credit system, served as an important basis for industrialization which is interlocked with economies of scale today.

Bearing that in mind, I would like to draw attention especially to the fact that the author cites, as another element characteristic of the early modern era, the activation of rural markets 장시 as a result of the improvement of productivity and an increase in surplus products brought about by important changes to agricultural technology. It is because the point would be linked also to the reconfiguration of the theory of internal development, on which the author especially places emphasis, as has been mentioned above. According to him, rural markets, which emerged during the latter half of the 15th century, firmly established themselves as important distribution structures in the peasant economy in the 16th century. While rural markets were useful as social mechanisms for the people's self-famine relief 구황 during disasters, speculative acts where profit was pursued through the use of regional differences in crop prices emerged at times as social problems, too (33 and 276-277). In such a situation, notwithstanding differences in degree, Confucian scholars of the Joseon Dynasty generally and earnestly pondered on the question of securing and redistributing resources that actively took into consideration the issue of famine relief due to frequent disasters and expressed concern about excessive acts of pursuing profit, which could not coexist with and was even highly likely to impede this question. In this respect, if scholars turn attention not only to the activation of the distribution of surplus resources along with the improvement of agricultural technology and productivity, which can be seen as linked to the development of modern capitalism, but also to the ways in which Confucian scholars sought to construct a new ethos according to such changes, then it may be possible to obtain a clue for understanding the early modern era in Korean civilization (i. e., Joseon Dynasty) differently from

"Industries in the Countryside," in F. J. Fisher, ed., *Essays in the Economic and Social History of Tudor and Stuart England in Honour of R. H. Tawney* (Cambridge: Cambridge University Press, 1961).

⁵ Strictly speaking, in the West, currency based on a credit system was used earlier by the Dutch rather than the English. However, through the Glorious Revolution, England took over not only the trade networks but also the credit system of the Netherlands.

the early modern era in the West and examining the ways in which it extended to subsequent Korean civilization.⁶

In the case of the West, new values and ethos accompanying the immense current of capitalism-industrialization began to rise along with the new knowledge system of modern science. For example, Adam Smith's argument that the market, an intricate and transparent system activated by the law of supply and demand, could produce commonwealth out of acts of transactions based on individuals' desires was a facet of Newtonian optimism of the 18th century that both nature and society were operated by intricate laws. In my view, the new ethos of the Joseon Dynasty that was searched for in accordance with changes to agricultural technology and the activation of the market can be found in agricultural texts, on which the author himself places weight as well. Agricultural texts, which began to emerge during the Joseon Dynasty, cannot be viewed solely as a part of the state's project to promote agriculture or as historical materials synthesizing contemporary agricultural technology. In particular, the task of shedding light on new forms of pursuing knowledge in agricultural texts penned by Confucian scholars who distanced themselves from the bureaucracy and the accompanying moral codes surely is an important task for the history of science and technology and the history of ideas during the latter half of the Joseon Dynasty, and it is very regrettable that this book should have been published with such research not yet conducted.⁷

⁶ Rural markets as a key point of early modern period in Korean Peninsula history may give important insight to understand transition from early modern to modern by expanding concepts of resource beyond agricultural products. Through a book review of *A Social History of Rice in Modern and Contemporary Korea* (see note 1), I have surveyed the possibility of determining the continuity and tradition and modern/contemporary history with a focus on agriculture. This book is very encouraging in being the first such attempt.

⁷ Man-seon Hong 홍만선 penned *Management of Mountains and Forests* 산림 경제 (1718) for Confucian scholars who did not enter the bureaucracy, and Yu-gu Seo 서유구 compiled *Treatises on the Management of Forests and Gardens* 임원 경제지 (1845), a voluminous expansion of the earlier work. Much research has yet to be conducted on the level of the reliability, universality, and interchangeability of knowledge pursued in these works and the new values and ideologies entailed. The perspective generally accepted in the academia has evaluated these issues merely as constituting simple pragmatism or practical utility and economic enrichment 이용 후생학. However, it must be admitted that such an evaluation has been able neither to reconfigure nor to discard the theory of internal development. Bray has published a tentative study that sets up the descriptive modes and knowledge system construction strategies of Chinese agricultural texts from the premodern era as objects of research in science and technology studies (STS), and it is necessary to expand such attempts further and to make use of them in analyzing the agricultural texts of Joseon. Francesca Bray, "Science, Technique, Technology: Passages between Matter and Knowledge in Imperial Chinese Agriculture," *British Journal for the History of Science* 41:3 (2008), 319-344. Unlike Chinese agricultural literature, Joseon's agricultural texts include in-house resource making and procuring activities. In this sense, these texts can be taken as recipe books.

From the dawn of the modern era, Western ideas and objects were one-sidedly transplanted to Korea under Japanese domination. Nor could agricultural technology be an exception from such a current. According to Soonyeol Soh, a co-author of this volume, agriculture on the Korean Peninsula came to be dominated by capital-intensive, labor-intensive reformed farming methods (Fukuoka methods) from the Japanese colonial era and onward as traditional farming methods, which possessed ecological rationality, especially dry-field farming, went into a decline at the hands of the Japanese authorities. Reformed farming methods demanded a series of technological systems that would buttress meticulous cultivation management such as superior cultivars, fertilizers, and irrigation, and resistance to and confusion due to these methods continued. Nevertheless, the Japanese authorities transplanted them through coercive administrative power (400-407). Within a larger framework, coercive agricultural administration by the Japanese authorities continued, to a certain extent, into the Green Revolution through the development and dissemination of new varieties continued under the initiative of the South Korean government after the period of chaos following both liberation from colonial rule (1945) and the Korean War (1950-53) had been assuaged somewhat, and such changes can be understood as the introduction of modern agricultural technology as a means of farming from the perspective of agricultural economics. Establishing the spread of the capitalist system in Korea from the modern era and onward and a situation where its technological significance is highlighted on the level of business administration/economics as “sociality of technology,” based on this, the author summarizes technologies related to the improvement of productivity in modern agriculture (36).⁸

However, if changes to agriculture are key to modern agricultural technological civilization from the perspective of business management, then the author’s stance is closer to the launching of modern Korean civilization through the introduction of foreign ideas and objects than to the reconfiguration of the theory of internal development proposed as the problematics running through the entire book, and this would contribute to the strengthening of the age-old concept of a rupture between tradition and modernity. Here, if the sociality of technology is considered not on the level of economic farming but on anthropological and sociological levels in relation to the peasant cultivation mode expanded from the latter half of the Joseon Dynasty

⁸ In traditional agricultural civilization, certain aspects of the “praxis of peasant farming” made it difficult to be included in agriculture in the modern sense, and its continuity can be found in diverse traditional agricultural civilizations that have embraced modern agriculture. Discussions on this have been developed by Dutch agricultural sociologist Jan Douwe van der Ploeg, who has newly constructed the theory of Alexander V. Chayanov, a Russian agriculturalist in the early 20th century. Jan Douwe van der Ploeg, *Peasants and the Art of Farming* (Warwickshire, UK: Practical Action Publishing, 2013). In particular, as for the optimization mechanisms of disparate agricultural production pursued by modern capitalist agricultural management and peasant cultivation, see Chapter 5.

and onward, would it not be possible to capture the continuity of internal development better? In relation to this, it is necessary to turn attention to the acts of transaction at rural markets mentioned above. At rural markets, commodity money such as cotton cloths and, increasingly, cereals rather than nominal money on which credit from the center was at work, or coins, functioned at the main medium of transactions (278-279).⁹ As peasant cultivation expanded and communal peasant labor increased in such a situation, with what form of moral economy would acts of transaction in the market combined? How would the special form of credit that was at work here fused with modern agriculture's modes of praxis and new industries? If, before economies of scale that are operated by the capitalist credit system so familiar to South Korean society today, there existed a mode of production where the commodity-based market led cycles of the commercialization of resources, of the re-resourcification or recommercialization of products, then the continuity of the theory of internal development could be newly captured at this point, and it would be linked to the important significance of Silhak 실학 ("Practical Learning"), or a project of constructing knowledge and technology encompassing new moral codes that emerged together with the expansion of peasant farming during the latter half of the early modern era.¹⁰

⁹ During the latter half of the Joseon Dynasty, the use of coins increased in comparison with the early years, and, in large-scale commercial transactions, credit transactions such as money orders 환 and bills (securities) 어음 increased rather than coins, which were inconvenient for circulation. Nevertheless, it is unreasonable to argue, through such cases, that the credit transaction system overwhelmed the cash transaction system.

¹⁰ A mode of production shrewdly combining the market and small factories can be found in petty workshops at the early stage of South Korea's industrialization. Representative cases of it would be the Cheonggyecheon electronics market and the Pyoung Hwa Fashion Plaza (Pyoung Hwa Market) along the stream of Cheonggyecheon in Seoul. In particular, the Cheonggyecheon electronics market variously altered and used parts resources in electronic goods introduced from abroad to produce and distribute products, and actively performed was the task of withdrawing products whose commercial value had fallen, appropriately reprocessing them, and recommercializing them through other sales channels. I have learned fascinating stories about this through a personal conversation with Drs. Dongwon Jo 조동원 and Sangwoon Yoo 유상운. Dongwon Jo is preparing an essay "C-M-C, or from Circulation to Maintenance to Circulation: of Arcade Video Games in 1990s South Korea" (forthcoming), *ROMchip: A Journal of Game Histories*.