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Reflections on STS in Mainland China: A Historical Review

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Abstract This article examines the historical development of the study of science, technology, and society (STS) in China in relation to the features of contemporary Chinese society and the influence of Marxism tradition, the opening-up of China, the system reform, and the evolving state of science and technology (S&T) and its history and cultural tradition. Marxism, especially natural dialectics, had a profound impact on China's STS knowledge system, research team, and disciplinary building. Since 1978, with the opening-up of China, Western theories about the sociology of science have been introduced into China and have formed an ever-changing relationship with Marxism (natural dialectics). The system reform in China not only raised questions for STS scholars but also provided an opportunity to rethink relevant STS issues and possibilities for participatory research. At the same time, the conditions of China as an evolving state in S&T—along with its history, cultural traditions, and the particularity of Chinese society—have raised additional intriguing questions for STS research. This article considers the relationship and the paradox between Marxism and Western academic tradition, the object and nature of STS study, as well as the significance of STS research in East Asia and China.

Keywords STS research, Marxism (natural dialectics), opening-up of China, system reform, history, cultural tradition

As a research field with interdisciplinary features that has developed since the 1960s, the study of science, technology, and society (STS) has explored the impacts of science

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and technology (S&T) on society, revealing the interactions among science, technology, and society and deepening the understanding of S&T from the perspectives of humanities and social sciences. This in turn has formed a research perspective and methodology that spans philosophy, history, sociology, anthropology, political science, economics, and other disciplines (Lu and Li 2015). From the standpoint of the sociology of scientific knowledge (SSK) and constructivism, the change of scientific knowledge and its production mode is closely related to the political, economic, cultural, and developmental history of a particular country. In particular, specific social factors, such as the social structure, cultural traditions, and stages of development, in any given country will influence the ideological resources, selection of problems, and structure of research teams in STS research there, thus affecting the field's development path both locally and globally.

We argue that the development history of STS in mainland China is unique. It has been deeply influenced by the tradition of Marxist ideology and is closely related to the development of dialectics of nature (*ziran bianzhengfa* 自然辩证法). Meanwhile, the introduction of various Western academic theories since the 1980s, as well as the new problems and challenges in China's reform and opening-up and relevant S&T system transitions, has continuously generated new theoretical ideas, research questions, and empirical resources for STS research.

Based on the case of mainland China, this article explores important characteristics of contemporary Chinese society and how they have affected the development of domestic STS research, and in doing so, how it reflects on related problems of STS research. Previous work by Liu (2011) provided background issues on the philosophy of science and STS studies (and the interaction of the two disciplines) in mainland China. Our work, on the other hand, extends from disciplinary comparison and history to discuss the fundamental impact of Marxism behind the close interaction of the two disciplines and pays attention to more contemporary phenomena and mechanisms in practice in Chinese society that have helped shape the unique paradigm of STS research in China. In adopting this approach, we summarize five important features of contemporary Chinese society: the dominant position of Marxism, the opening-up of the ideological environment, the system transition from planned economy to market economy, the "catching-up state" in which S&T finds itself, and the influence of oriental cultural traditions.

1 Historical Legacies: The Domination of Marxism and Its Impacts

With the Chinese Communist Party in power since 1949, the influence of Marxism cannot be ignored. Contemporary Chinese social science research emphasizes the guiding position of Marxism, presupposing the correct and scientific nature of Marxist ideology, making this the basic characteristic of domestic social sciences. However, how to best understand Marxism and the relationship between it and science has been controversial. In different historical periods, the guiding position of Marxism and its influence had different manifestations, which in general could be divided into two periods. First, between the founding of the People's Republic of China in 1949 and the early 1980s, its influence was mainly reflected in the ideological transformation and criticism of non-Marxist standpoints (including from the viewpoint of the proletariat),

reinforcing the ideological remolding of intellectuals. From Marxist philosophy, it criticized the theory of relativity, resonance, and Morgan genetics. Within the framework of the dialectics of nature, it discussed the philosophical issues in natural sciences and the road for development of S&T. During this period, the academic understanding of Marxism had a strong dogmatic tendency and had serious consequences. The second period is after the 1980s, when the ideological slogan "Emancipating the mind, seeking truth from facts" (*jiefang sixiang, shishi qiushi* 解放思想、实事求是) led to a rethinking of Marxism.

From a Marxist standpoint, when discussing the relationship of S&T with society, the philosophical issues in the natural sciences and the law of scientific development were mainly carried out under the framework of the original dialectics of nature under the banner of Marxism. Meanwhile, as a mandatory course for graduate students, the dialectics of nature was a main channel for disseminating Marxist ideological discipline. The three aspects discussed in the research and teaching content of the dialectics of nature covered many topics involved in STS research: the view of nature, methodology, and STS. After 1980, under the conditions of reform and opening-up (*gaige kaifang* 改革开放), more Western academic theories began to be introduced and formed a changing relationship with Marxist dialectics of nature. During this period, STS research institutes began to be constructed and the discipline began its institutionalization. In 1985, based on its research unit of the dialectics of nature, Tsinghua University established the first Institute of Science, Technology, and Society in mainland China. Since then, the establishment of STS institutes has mostly been associated with the study and teaching of natural dialectics.

With this historical background, the discipline and status of Marxist dialectics of nature has had a profound impact on the development of China's STS research. For a long time, most Chinese STS studies were carried out in the academic community of dialectics of nature. China's earliest STS research communities—the specialized STS committee established in 2001 (Kexue jishu yu shehui zhuanye weiyuanhui 科学技术与社会专业委员会) and S&T studies committee established in 2003 (Kexue jishuxue zhuanye weiyuanhui 科学技术学专业委员会)—were established in the Chinese Society for Dialectics of Nature (Zhongguo ziran bianzhengfa yanjiuhui 中国自然辨证法研究会). As a secondary-degree discipline of philosophy in the domestic disciplinary classification system,[1] the "philosophy of science and technology" (*kexue jishu zhexue* 科学技术哲学) was long known as the "dialectics of nature," which is also a compulsory course for graduate students. The hierarchical structure of the disciplines and subjects defined by the disciplinary classification system not only regulates student enrollment, courses offered, faculty settings, and government funding but also, most importantly, determines the power structure of this education system. Retaining its position in the disciplinary classification system endowed dialectics of nature with a certain legitimacy, which in turn enabled STS scholars to survive and develop under the dialectics of nature framework. This inclusiveness allowed dialectics of nature to

[1] Undergraduate and graduate education in mainland China is regulated by the disciplinary classification and grading system published by the Ministry of Education (Jiaoyubu 教育部) and the Academic Degree Commission of the State Council (Guowuyuan xueweiban 国务院学位办). The newest disciplinary classification standard issued in 2011 included eleven broad disciplines, which incorporate 110 first-degree subjects and 375 secondary-degree subjects.

become the arena for training and stabilizing STS research teams, and it developed as an important carrier for the development of STS research.

2 Introduction and Diversification of STS Approaches

As the opening-up policy was implemented throughout the 1980s, dialectics of nature was influenced by the non-Marxist academic traditions of the West, generating new challenges for the discipline. The introduction of Western non-Marxist traditions exposed academics to new research perspectives, theories, and methods, which expanded explanatory power and brought about a reconstruction of knowledge. In addition, the discipline deepened its research, and research teams became more diverse.

The process of introducing Western academic thought into China was deeply influenced by domestic political ideology. When searching journals published since 1915 in the CNKI Database (China Academic Journals Full-Text Database), we found that before 1980 there were fewer academic articles published with titles including terms such as "logical positivism," "logical empiricism," "falsificationism," "historicism," "sociology of science," and "STS" or mentioning Western scholars such as Karl Popper, Thomas Kuhn, and Robert Merton. It was not until the 1980s that these academic concepts were introduced to China and the works of certain relevant scholars were translated into Chinese. Since the early 1950s, STS had been incorporated under the framework of the dialectics of nature; however, it was only in the 1980s that Western STS research was introduced into China and developed into an independent research field. The earliest example of a Western STS article was "STS—A New Course in the British Schools" by Wang Juefei, published in 1982 in *Foreign Education Trends* (*Waiguo jiaoyu dongtai* 外国教育动态; renamed *International and Comparative Education* in 1992). As mentioned earlier, STS academic institutions in mainland China were also established, based on the STS teaching materials used in the study of dialectics of nature.

The first publication in China to discuss SSK was Liu Junjun's 刘珺珺 article "From SSK to Sociology of Science," published in the *Journal of Dialectics of Nature* in 1986. Soon after, in the 1990s, SSK was systematically introduced and researched. The introduction of S&T studies to China began later, around 2000, when articles such as the 2003 "Toward Science and Technology Studies," by Zeng Guoping 曾国屏 of Tsinghua University 清华大学 made a great impact.

Table 1 compares the decades in which key Western theories were first put forward with the decades of their systematic introduction. We have found a relatively complex relationship between these Western academic ideas and China's dialectics of nature. The introduction of theories and ideas in the 1980s was partly incorporated into the curriculum and teaching materials of dialectics of nature, but the introduction of SSK and STS from the 1990s onward gradually departed from the category of dialectics of nature and instead formed new and diversified approaches.

The diversified research paths can be understood by looking at the differentiation of STS research communities in China. On the one hand, the introduction of Western academic thought aided the reconstruction of Chinese knowledge systems. Disciplines such as philosophy, political science, sociology, history, and anthropology gradually claimed independence from the framework of dialectics of nature. Social science

Table 1 Decades in which Western theories were raised in and introduced to China

Western theory	Decade when first raised	Decade when systematically introduced to China	Relation to dialectics of nature
Logical positivism	1920s	1980s	Part of the curriculum
Popper's falsificationism	1930s	1980s	and teaching materials
Kuhn's theory of scientific revolution	1960s	1980s	of the dialectics of nature
Merton's sociology of science	1930s	Late 1980s	
Science, technology, and society (STS)	1960s	Late 1980s	
Sociology of scientific knowledge (SSK)	1960s	1990s	Gradually formed
Science and technology (S&T) studies	1980s	2000s	into separate discourses

scholars who had originally been working under the discipline of dialectics of nature returned to their original disciplines. On the other hand, the perspectives of other disciplines in studying the theory and methods of STS gradually developed, and a number of STS scholars formed a relatively independent academic community. For instance, in 2012 a specialized committee of the sociology of science was established in the research forum of the Chinese Association for Science of Science and S&T Policy (Zhongguo kexuexue yu keji zhengce yanjiuhui 中国科学学与科技政策研究会). In 2013, a sociology of science forum was set up at the annual meeting of the Chinese Sociological Association (Zhongguo shehui xuehui 中国社会学会), cosponsored by the Institute of Science, Technology, and Society of Tsinghua University, the Department of Sociology at Nankai University 南开大学, and the Chinese Academy for the Strategic Development of Science and Technology (Zhongguo kexue jishu fazhan zhanlüe yanjiuyuan 中国科学技术发展战略研究院). In 2015, a specialized committee of the sociology of science was formally established at the Chinese Sociological Association.

The diversification of STS research approaches reflects the inherent interdisciplinary nature of this research field. A close examination of the case of China supports the observation that a diversity of research approaches presents specific characteristics in different countries and therefore affects the research and development of STS in each.

3 System Reform and Participatory Research in STS

As the most important feature of contemporary China, socialist reform has been accompanied by a transformation of the social system, thereby profoundly influencing the problems and approaches of STS research. The key element of this reform has been that of moving from a planned economy to a market economy: first there was the process of reconstructing the planned economy system in the 1980s, then clarifying the market-economy development path in the 1990s, and most recently establishing and improving the socialist market economy system in the twenty-first century. Each stage of the transition has had a profound impact on China's S&T system, which in turn has generated many new STS research questions.

Prior to the 1980s, China's S&T system was greatly influenced by the former Soviet Union. At the same time it also demonstrated its own indigenous characteristics, such

as the "planning model" of allocating and organizing S&T resources on the basis of the successful practice of S&T planning. This model was mainly embodied in the nationwide planned economy—that is, comprehensively incorporating scientific activities into the socialist system and thus allowing them to be managed through state intervention. This highly centralized S&T system maximized the mobilization of national resources to promote the modernization of China's S&T system, but it also exposed various problems, such as the dislocation of S&T with the economy, as well as the complexities inherent in the relationship between state intervention and scientific autonomy.

During the reform and opening-up process of the 1980s, China faced the new wave of global technological revolution and the expanding domestic demands brought by economic development. With these accelerated changes, the state clarified its strategic objectives to emphasize economic development, using S&T to stimulate economic growth. In 1985, the Chinese Communist Party's Central Committee (Zhonggong zhongyang 中共中央) issued its Decision on the Reform of the Science and Technology System (Guanyu kexue jishu tizhi gaige de jueding 关于科学技术体制改革的决定), marking the full expansion of the reform of the S&T system. To solve the problem of the serious disjunction between S&T and the economy in the planned economy period, the reform of the S&T system mainly aimed at establishing a fundamental linkage between S&T and the economy, which was achieved by introducing competitive mechanisms into scientific research organizations. In 1995, the state implemented a strategy of Invigorating the Country through Science, Technology and Education (Kejiao xingguo 科教兴国) and combined the reform of the S&T system with the establishment of a socialist market economy system. In 2006, the state formulated the first Long-Term Scientific and Technological Development Plan (Changqi keji fazhan jihua 长期科技发展计划), in which an Innovative Country Development Strategy (Guojia chuangxin yu fazhan zhanlve 国家创新与发展战略) was further proposed.

Having started in the 1980s, reform of China's S&T system is still ongoing. Although it has mainly focused on integrating S&T and the economy, it has also paid attention to the extensive problems of the S&T system itself, including how to understand the characteristics of S&T, and many other aspects of STS, all of which have had a significant impact on China's STS research. On the one hand, reform of the S&T system has raised serious questions for STS scholars, for example, how to understand the relationships among science, technology, and society; how to interpret and learn from the experiences of other countries; what new forms of knowledge and experience are emerging from the practice of S&T reform; how to design new models of S&T systems; and what roles there are for experts and for public participation in S&T planning and policy formulation. On the other hand, both top-down state design and bottom-up spontaneous exploration have interacted with each other during this reform period, providing the opportunity not only to rethink relevant STS issues but also to create new possibilities for participatory research. For instance, STS scholars were widely involved in the research and formulation of the National Medium- and Long-Term Program for the Development of Science and Technology (2006–20), and in research teams such as that for S&T System Reform and the National Innovation System, for Innovation Culture and Science Popularization, and for Construction of S&T Talent. Historians of science such as Jin Wulun 金吾伦, Yuan Jiangyang 袁江洋, and Wu Guosheng 吴国盛, for example, have participated in research for the Innovation Culture and Science Popularization project. Fan Chunliang 樊春良 has participated in

research projects such as Scientific Human Resources. Li Zhengfeng 李正风, a member of the drafting team and an expert within the secretarial group, participated in drafting the Medium- and Long-Term Program for the Development of Science and Technology. Between 2003 and 2005, Zeng Guoping 曾国屏, Ren Dingcheng 任定成, Li Zhengfeng, and Yuan Jiangyang participated in the research and formulation of the National Action Plan for Scientific Literacy (Quanmin kexue suzhi xingdong jihua 全民科学素质行动计划). A number of STS scholars have participated in research and consulted for the Ministry of Science and Technology (Kejibu 科技部), the Natural Science Foundation of China (Guojia ziran kexue jijin weiyuanhui 国家自然科学基金委员会), the Chinese Academy of Sciences (Zhongguo kexueyuan 中国科学院), and the Chinese Association for Science and Technology (Zhongguo kexue jishu xiehui 中国科学技术协会). Through such activities, these scholars have also formulated system reform programs. For example, Fan Chunliang and Li Zhengfeng participated in revising the Science and Technology Progress Law of the People's Republic of China (Zhonghua renmin gongheguo keji jinbufa 中华人民共和国科技进步法).

4 The Challenges of Being in a State That Is "Catching Up" in S&T, and New Perspectives of STS

Not only has systemic reform brought new problems for STS research, but "catching-up"[2] S&T faces unique STS issues related to changes in the STS perspective and the repositioning of relevant research topics. The 2015 "We Have Never Been Latecomers!?" special issues of *East Asian Science, Technology and Society* (vol. 9, nos. 2 and 4) demonstrated the distinctiveness of the locality, context, and situation embodied by non-Western sites such as those in East Asia. China, in this sense, is no exception.

As a field developing in the specific historical, social, and knowledge contexts of the West, STS's topics and perspectives have been asymmetrical in emphasizing the national characteristics and exemplary roles of scientifically advanced countries. Even in studying those "catching-up" states, the position and perspective of Western countries have usually been presumed, wherein the selection and transition of scientific knowledge production and new explorations of the catching-up states outside the "mainstream" have been easily ignored. Lin and Law (2015) have argued that the repertoires of "developing countries," "fast followers," and "latecomers" tend to produce linear and homogeneous expectations in describing and prescribing the transformation of S&T in non-Western contexts. In this article, we use the term *catching up* to describe not only the stage of technoscience development of non-Western countries but also the active role they have taken in the catching-up process. We also believe that, in addition to the local specialties and theories generated from the standpoint of a catching-up state, an abundance of new research topics could also flourish.

There are important questions that are difficult to answer if we rely solely on the STS research perspectives of the West; these are worthy of serious research by STS scholars in catching-up states. For instance, how should we study the catching-up process from

[2] The term *catching-up state* describes developing countries such as China in their efforts to "catch up" to advanced industrial economies, especially in their S&T capacities.

the perspective of STS? How are we to understand the STS problems and challenges faced by catching-up states at different stages of technological transformation, economic development, industrial upgrading, and social change? And what are the characteristics of and relationships among science, technology, and society in the catching-up process and social transition? It is also noteworthy that in this process we should avoid bringing the nation-state identity into STS research. In studying the experience of the catching-up state outside the mainstream, and in conducting asymmetric interpretation of local and nonlocal knowledge (as mainly seen from the perspective of the West), we should be cautious to avoid letting local STS research fall into the trap of narrow nationalism.

From the 1950s on, China's S&T development goal has been to catch up with advanced countries and, ultimately, to leapfrog them. Different catch-up stages provided different research priorities for STS. From the 1950s to the 1970s, during the planned economy period, STS was focused on the social process of key projects related to selection in S&T planning, the social mobilization and organization of scientific and technological forces, and how to view the institutional advantages of socialism. After the 1980s, the transformation of economic and technological systems has led to new problems, such as how to fairly and efficiently allocate resources in the process of catching up, how to effectively learn from the experiences and models of advanced S&T countries, how to measure and evaluate the state's S&T level and capacity, and how to incorporate and evaluate international evaluation criteria.

Overall, China has moved from studying the former Soviet Union to learning the Western model and then to exploring its own development model in the process of catching up. In improving research capacity and escalating the level of research, China is now confronting the frontier of STS problems along with countries advanced in S&T. These frontier problems include emerging ethical and legal issues in the field of S&T, such as ethical research in transgenic, stem cell, and gene editing technologies. There are also important new matters relating to the social governance of S&T, such as environmental and energy issues. Reviewing this process, many questions still need to be further explored in studying China's practice as a catching-up state in S&T—studies that will be valuable for the formation of STS theories and issues based on the perspectives of catching-up states.

5 STS Research in the Context of Chinese History and Cultural Traditions

In the process of forming a modern S&T system, any country must inevitably deal with the impact of its own historical traditions and existing cultural resources. The study of the influence of historical and cultural traditions should be an important aspect of STS research, in that it not only provides new fields, contexts, and issues but also reshapes the field of vision and theory of STS research while providing the possibility of conducting comparative studies and encouraging cross-regional cooperation. From China's historical process of interactions between S&T, its STS research must confront the influence of its own historical and cultural traditions and thus reflect some local characteristics. This effect manifests in two important aspects.

The first question that bridges STS and Chinese culture is how one should view the relationship between local knowledge and modern science. Traditional Chinese

medicine (TCM; Zhongyi, 中医) is an important representative of local cultural traditions and intellectual resources. During China's S&T development process, it has been debated whether TCM is even scientific. For example, the work of Farquhar and Lai (2014) has shown how the Zhuang nationality's medicine (the Zhuang 壮族 are a recognized Chinese ethnic minority) has been "salvaged" and "sorted" into data while being incorporated into the dynamic emergence of new knowledge. The debate is closely related to the evaluation of the nature and value of long-existing empirical knowledge and thus also related to the question of what science is, as well as the relationship of scientific knowledge and local knowledge to other issues. All of these debates are closely engaged with policy issues such as that of the allocation of S&T resources. Similarly, in the 1980s the ongoing research and debate on the exceptional function of the human body involved discussions on the relationship between science and the traditional cultural resources of Chinese qigong 气功. Studies of these problems have provided the possibility for rethinking science and local knowledge, which has also endowed STS research with certain local characteristics. One example of this is the introductory work by Hsu (2008), which highlighted how TCM evolved from the 1950s, during a period of nationalism marked by idealism and pride in China's ancient philosophies and cultural heritage, into a tradition of medicine that is thriving in the neoliberal climate of the contemporary global health market. Leaving aside nationalist inclinations, the local tendency of STS research is rich in possibilities for comparative studies and new spaces for topic selection.

The second question of STS and Chinese culture relates to the relationship between *guanxi* and scientific development under specific cultural traditions. The *guanxi* network (关系), based on the exchange of favors between friends and relatives, is an important social network form that penetrates all aspects of social life in Chinese society (Lin 1999). Due to the centrality of *guanxi* and trust, the classical social network theories rooted in the Western liberal economy and individualistic culture were found to be not especially effective in understanding the professional networks of Chinese academics. Lu and McInerney (2016) have showed that the Chinese academic labor market is based on a closed, strong network of small circles for career attainment and promotion. As a *guanxi*-based society, what effect does this social phenomenon have on S&T activities? What is its impact on ways of dealing with the relationships among science, technology, and society? What is the impact on the autonomy of the scientific community? These questions need to be answered through more in-depth empirical studies, suggesting important possibilities for future STS research in China.

6 Locating STS Research in China

We recognize that both international and domestic academics acknowledge the complexity of STS, the diversity of its theories and methods, and the hopes and challenges of multidisciplinary and interdisciplinary development. Compared to Western academia, China's STS research has a shorter history of development and was initially dependent on a single disciplinary support and general philosophical method, especially in its lack of the disciplines of sociology and political science. Such a historical path and social characteristics need to be treated directly. Using the case of China's STS research and development, we reflect on three important issues in the field: the

relationship between the Marxist academic tradition and non-Marxist Western academic traditions; the object and nature of STS study; and the significance of STS research in East Asia and China.

In the emergence and development of SSK and the sociology of science, Marxist historical materialism had played an extremely important role in opening a new perspective in studying science as a historical and social phenomenon (Li 2005). From Boris Hessen (who analyzed Newtonian classical mechanics from the theoretical perspective of Marxist historical materialism) to those British scientists known as the "leftists" (including Bernard, Soddy, Hogg) and others who began to challenge the concept of science as independently existing and who instead emphasized its social function (Graham 1985), we can see the apparent influence of Marxism. In reviewing the institutionalization of sociology of science, Merton (1938) noted that Marxism had had a fundamental effect on the general way of constructing the interaction of social and scientific ideas.

While Marxism had a profound influence on the rise and development of the sociology of science and SSK in the West, studies in the sociology of science in China were mostly set within two fields: science of science, and STS. This dynamic generated questions such as why the sociology of science developed with such difficulty in China and the Soviet Union—where Marxism was the guiding ideology—and what were the profound historical and social mechanisms behind it. How to reinterpret Marxist thought under new historical conditions, how to view Marx's thought and his contribution objectively and historically, and how to fully excavate Marx's ideas on STS are major challenges that need to be confronted.

In terms of the object of the subject, as it were, when turning our perspective to more contemporary developments in the field, and with the role of S&T in the development of modern society and economy becoming increasingly salient, STS research is not only concerned with the general social impact of S&T but also has shifted to more diverse themes embracing wider empirical research, including environmental and sustainable environmental development, social studies of emerging technologies, health care, technological learning and innovation, and social governance under new technical conditions. These research tasks have become more complex in understanding the breadth of the subject, and corresponding problems are engendered by that wide breadth.

When reflecting on its nature, STS research is often considered to be problem-oriented, interdisciplinary, or multidisciplinary. With the continuous expansion of the field of practice, STS's interdisciplinary trend is becoming increasingly evident and broadly covers the perspectives and research methods of disciplines such as the history of science, philosophy of science, sociology, management, policy, anthropology, and ethnography. STS has become a platform for multidisciplinary communication, which also calls for efforts to reconcile the conflict between problem-oriented research and discipline-oriented research.

In his preface to Bernard Barber's *Science and the Social Order* (1952), Merton noted that, due to the disjunction of theoretical and empirical research, it is difficult to form consistent research topics and a fruitful research model in the sociology of science, which has in turn hampered the development of the field. We must admit that the study of STS in China seems itself to have reflected Merton's notion of hampered growth. The lack of long-term empirical data, in-depth and detailed case studies, and a

theoretical framework to explain scientific system transformation in complex social transition, for instance, might be causes of this situation. In this context, we call for more empirical studies of disciplinary development and shift, examining how Western-based STS research could be reformed, changed, and localized in China so as to achieve its own self-reflection.

To conclude, the increasing participation of East Asian STS scholars and the rise of regional STS have provided new topics, perspectives, and approaches for research. The first East Asian STS Network Conference was held in Beijing in 2000, with twelve further conferences held in mainland China, Japan, South Korea, and Taiwan, all greatly promoting the formation of an East Asian STS academic network and communication platform. *East Asian Science, Technology and Society: An International Journal*, sponsored by the Taiwanese Ministry of Science and Technology, also brings together East Asian and Western scholars from the fields of STS and promotes research on the interaction among science, technology, society, and culture.

From the ongoing cooperation and exchanges within the emerging community, we have noticed that the distinctive geographical environment, political space, and economic development model of East Asia have rendered its STS research unique. With the different stages of social development in the regions and countries of East Asia (such as Japan, Korea, China, and Taiwan), the relationships of science, technology, and society tend to embody each location's own characteristics and particular issues. East Asia's STS scholars need to pay attention not only to the situational characteristics that are due to the unique geographical environment and political space of East Asia but also to equal cooperation among academic communities in each region in building a common theoretical framework, so as to avoid the risk of fragmentation and narrow nationalism. With STS becoming an internationally open and inclusive community, we argue that a macrovision of STS research must be reestablished, so as to improve the modern S&T system through STS research. Once examined from the perspective of the evolutionary history of human civilization, and as one of the most important social inventions of mankind, the modern S&T system belongs to neither West nor East but to the world. The concepts and connotations of the modern S&T system are constantly changing, and its governance mode needs to evolve correspondingly. Continuously reviewing and improving this system depends on global contributions. We expect that STS research might prove to be regarded as a "repairman" for this system, not only to develop new methods for examining problems but also to find new tools to improve it. We believe that the significance of East Asia's and China's STS research is its ability to seek new possibilities and to make new contributions to the improvement of this global system.

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