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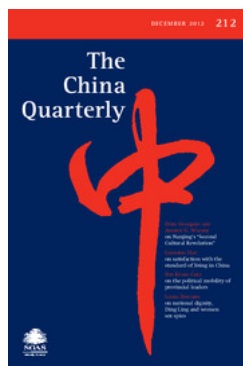
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## ***Cultures of Knowledge: Technology in Chinese History.* Edited by Dagmar Schäfer. Leiden and Boston: Brill, 2012. vii + 394 pp., €133.00; \$182.00. ISBN 978-90-04-21844-4**

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This excellent collection of essays introduces readers to the extraordinary diversity of historical writings and debates during the early decades of the 20th century. Thus, in 1902 Liang Qichao (1873–1929), an outspoken advocate of new learning and the application of Western ideas and theories in Chinese reforms, argued in *On the New History* (*Xin shixue*) that China's historians needed to create a new history as a vital contribution to saving the nation. It should be noted that he insisted on a new historiography that gave pride of place to “the people” rather than kings and heroes in the reconstruction of the national past. At the same time, some scholars during the last years of the Qing and the early Republic were attracted to the “Western origins” theory (Terrien de Lacouperie's Sino-Babylonianism). On the other hand, other emerging professional historians, such as the National Essence (*guocui*) faction of the late Qing, did not want to discard traditional historiography. While the creation of a new and modern China demanded a reimagining of the past, these scholars “believed this had to be done in a way that maintained the integrity of the inherited cultural traditions, because without those traditions there would be no community, no nation” (p. 10).

Indeed, as Liu Long-hsin's chapter indicates, while many of China's new historians employed Western methods to reinterpret China past, they were reluctant to discard traditional notions. While they were influenced by modern Western historiography, these scholars began to integrate this new knowledge with aspects of the inherited Chinese tradition. Moreover, as Axel Schneider notes in his contribution, there were also those who regarded the indigenous tradition superior to the new practices that came from abroad.

The archaeological discoveries of the late 1920s no doubt contributed to this trend. Whereas the new forms of disciplinary practice developed by iconoclastic scholars such as Gu Jiegang (1893–1980) had questioned the traditional dynastic chronology on account of inadequate sources, the excavations at the Shang capital at Anyang gradually restored to “history” what had been regarded by Gu and others as “myth.” By this time, a decidedly more nationalistic spirit had entered the Chinese historiographical discourse, reinforced by the rise of historical geography. In this connection, as Arif Dirlik shows, Marxist interpretations of Chinese history began to have a significant impact in the 1930s.

This collection of essays contributes significantly to our understanding of the lively debate in late Qing and early republican China that transformed imperial state-centred historiography into history as a modern academic discipline. The book will be of greatest relevance in graduate courses on modern Chinese history. Finally, although not the focus of this volume, we may ask how the contributors would have dealt with the changing role of history in the People's Republic of China.

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This is a volume in four parts: Internode; Imperial Court; Agora; and Scholarly Arts. Each part includes a review by an Europeanist who places the papers on China in comparative perspective. Terms such as “agora” (translated as “marketplaces”)

situate Chinese “technics” in European categories. The European commentators frame their analysis in four ways: technological transmission (Pamela Long); symbolic technology (Wolfgang Lefèvre); knowledge markets (Matteo Valleriani); and innovation (Marcus Popplow).

Curiously, the Europeanists are the “me toos” in this volume, a tactic usually monopolized by Sinologists seeking democracy, capitalism, science and civil society/public sphere in late imperial/early modern China. The narrative remains the same, however: “yes we had it too, but it was not the same” – in Europe! Popplow admits some Europeanist unease (p. 341) and writes that “giving up the yardstick of modern science” is “disconcerting when investigating early modern Chinese scientific practices.” Dagmar Schäfer’s Introduction is more sanguine: “European approaches to technology were peculiar and specific. The same holds true for what we frame as ‘China’.” The authors overall address the “history of technology and China” in light of communication, appropriation, aggregation and documentation.

Schäfer focuses on sericulture as an industry that drew state attention during the Chinese Ming and Manchu Qing dynasties. Sketches, models, tools and documentation changed as court interests influencing the silk industry evolved. Dynastic efforts to control sericulture via enforced artisanal migration to the capital in Beijing proved fruitless, but the upshot of this for both silk and porcelain production (Anne Gerritsen’s focus) was increased commercialization of the industry. Both sericulture and porcelain were supervised from the top but remained intact at the bottom. The social mobility of artisanal families via sons qualifying for examination system quotas remained important motivationally despite literati opposition.

Gerritsen shows how rulers and producers channelled information for technical and design issues. A local production centre for porcelain, Jingdezhen, was embedded in networks of global, dynasty-wide and local circuits. Since the Song dynasty, its industrialization was mediated by imperial taste and regional/global markets. Technologies tended to gather in local markets, as in the case of the resources and infrastructures for temple manufactures described by Susan Naquin. “Outsiders” were a significant part of the social mix. Expert kilns represented a storehouse of technical knowledge, which included experiments in imperial workshops using new materials, which permitted on-going innovation (more on this point later). Cobalt via Islam was blended to produce “blue and white” porcelain, while enamelling emerged in the 18th century via collaboration with Europeans.

Naquin’s essay links temples, technology and material culture in Shouzhou, a middle-level town on the Huai river and north China plain with a history of brick making. Artisanal technologies turned temple premises into urban public spaces for family and group activities. As technologies, the crafts were aestheticized through religious designs and correlated with local material culture and the wider world. Managers and patrons coordinated the technologies and raw materials. Like porcelain-making in Jingdezhen, temple craftsmen gathered where their materials were. Valleriani comments that Venice and Florence were agoras for building and landscape architecture, including arsenals for military engineering. Italian city-states in were centres for the accumulation of knowledge for building cathedrals at Florence, ships at the Venetian Arsenal, and glass production at Murano.

Liu Heping contends that Northern Song emperors validated their central power by patronizing Song depictions of flood control and hydraulic engineering in court paintings. Such Song efforts remind us of Qing images of the Kangxi emperor porting

around a European telescope to map out his empire with Jesuit help. Liu's argument that Ming and Qing emperors withdrew from such technological activism may be overstated. Luo Wenhua describes how the Qianlong emperor sought know-how for casting technologies from all his empire. He invited six Nepalese artisans expert in Tibetan carpentry, sculpture and painting to Beijing to transmit the details of their skills in jade carving and sculpting bronze figures. Lefèvre summarizes these essays in light of "symbolic technology politics." He too quickly stresses the social chasm between aristocrats and artisans in Europe when compared to the idealized China Liu describes.

Joachim Kurtz explains how and why the Jesuits in China used science to frame European technology. Justifying Western values and religion, they prepared prefaces, introductions and epilogues that also emulated Chinese argumentative practices. Such ecumenical rhetorical packaging, however, cuts against the grain of Kurtz's earlier work on Jesuit sectarian appeals to Western logic as the superior form of reasoning. Milder arguments conveying the "Chinese origins of Western learning" represented one side of the Jesuit dilemma to impress the Chinese. Their militant side emerged when Jesuit rhetoric unilaterally favoured the syllogism.

Martina Siebert and Martin Hoffman show that Chinese accounts of technology tended to valorize human inventiveness but not inventions. For Siebert, encyclopaedias on the "origins of all things" (*Wuyuan*) presented practical learning as worth emulating, but no interest in loom machines and their production was evident. According to Hoffmann, biographers of craftsmen emphasized technical skill, but more often they stressed the craftsman's moral superiority and service to society. Local gazetteers similarly attributed unique, practical skills to valorize craftsman, not the skill itself. When we rely solely on sources that "mystify" the artisan, using François Sigaut's term, we never see the technological operations themselves. Operational innovations in producing silk and porcelain, for instance, are never visible in such sources. Agriculture, however, gives us a better case to work with.

Several papers address agricultural technology transfers via officials and merchants. William Rowe describes how statecraft-oriented scholar-officials in China, and their counterparts in Europe, associated technical with political knowledge. Rowe also shows that guilds in China did not prevent the commodification of technical knowledge (Long: neither did they in Europe). But what new agricultural practices transmitted via officials and merchants are comparable to the expansion of early-ripening rice and New World crops before 1600 (p. 26)? Rowe concludes there were useful but essentially non-innovative agricultural developments after 1600. Unable to access the processes of production and reproduction of technical skills within the Chinese social units that embodied such skilled practices, however, how would we know if they were innovative or not?

Francesca Bray shows that technical content was transmitted via technological texts and illustrations depicting the sequences of agrarian production. The best agricultural treatises did not paper over agrarian practices: they included the "small innovations" that "contributed to a steady increase in the productivity of Chinese agriculture," which was "due to peasant as much as landlord ingenuity." Operational instructions for producing more and better cotton included new technologies for the careful selection of the right soil. Technical plans for processing equipment for long-fibre materials were reiterated widely by the late Ming when everyone wore cotton clothing. Those who followed up on the operational stages of the cotton cultivation process introduced "differences" (that is, innovations) that increased with time.

Popplow attacks the problem in light of invention, ingenuity and agricultural innovation. He contends technology was “an issue of scholarly arts” in Europe but not in China. He also cites Schäfer’s findings on Ming sericulture that Chinese technology included craft skills and technical devices. He contends contra Bray that technical drawing required advanced geometrical knowledge, which emerged only in Europe. It contributed to the “recognition of technical practice in pre-industrial scholarly cultures” and touched off an intense competition among experts, whom European courts patronized for their ingenuity and invention.

Popplow concludes that “more pragmatic discourse on technical invention and inventiveness” was missing in China. On the other hand, he admits that Europe had no equivalent to the administrative agrarian treatises common to imperial China. Only in the 19th century “the fostering of agricultural innovation” became “an essential technique of government.” In the end, Popplow follows Rowe. Qing officials spread existing technical knowledge but made no effort to foster invention and innovation.

Why such differences between Rowe and Bray? Scholars of statecraft read into the encyclopaedias the face value story of technical operations in light of the agency of a few sages and worthies, which hides the operational story. Siebert and Hoffmann show us that the concern for the “historicity of culture and technology” reduced the technological constituents of state and society to the “moment when they were invented or introduced” by the sages. If we search for technical sources that can help us demystify the history of technology, as Schäfer, Bray, Gerritsen and Naquin try to do, we can unravel the technology and see how it was used.

Roger Hart (*The Chinese Roots of Linear Algebra*, Johns Hopkins University Press, 2011) shows that complex equations were solved by artisanal mathematicians who systematically cross-multiplied numbers using counting rods to execute matrix operations similar to determinants. They thereby visually solved problems algorithmically on the counting board. Over time, literati translated such precocious procedures into an artless form of mathematical equations (*fangcheng*) written in classical Chinese, which no longer captured the visual power of an operationally practiced mathematics. In addition to unravelling such mystifications, we need to know the exact operational skills needed to innovate. Elite invention of the sages to explain human agency cleverly separated lowly artisans rhetorically from their skills.

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*The Asian Mediterranean: Port Cities and Trading Networks in China, Japan and Southeast Asia, 13th–21st Century*

FRANÇOIS GIPOULOUX

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This sweeping survey of maritime trading networks connecting China, North-East Asia and South-East Asia carries the reader from the 13th century to the present. As a French economist writing a book on history, the author’s approach to the region and its economic history invokes Fernand Braudel and his classic study of the Mediterranean in the age of Philip II. But unlike Braudel, for whom the Mediterranean was a historically coherent and significant space for a particular