REVIEWS


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This book replaces the originally planned final volume of Joseph Needham’s epic *Science and Civilisation in China*. Copiously prefaced, it presents six essays on the key issues that shaped the series as a whole. An autobiographical conclusion lays out the historical development of the “Needham question” and its reception. Throughout the book science emerges as the convergence of many local traditions and as an ecumenical endeavour. Scientific knowledge production is situated in the context of its relation to society and language, and the tensions between tradition and modernity. The volume is an indispensable reflection on twentieth-century approaches to Chinese scientific and technological thinking, and a notable conclusion to the Needham series.

Volume 7, part 2 is essentially the skeletal remains of what Joseph Needham (1900-1995) and his collaborators in the early 1990s intended to be a fully-fleshed out four-part conclusion detailing: (1) the nature of Chinese society in a comparative perspective, (2) language and ancient societal traditions, (3) language and science, and (4) literati notions of time, history, religion, education and political organization (p. xxi). While Christoph Harbsmeier was persuaded to work on (2) (which eventually emerged as a volume on language and logic in 1998), work on the other themes did not fare as well. When warned that he would not live to see the conclusion of his work, Needham sat down to draft an introduction and conclusion to these final parts, and agreed that some of his own,
mostly previously published, articles on conceptual issues, all in various stages of revision, should form the closing bracket to his project. These essays are “Science and Society in East and West” (pp. 1-23), “The Roles of Europe and China in the Evolution of Ecumenical Science” (pp. 24-42) “History and Human Values: A Chinese Perspective for Science and Technology” (pp. 67-94) and an article with a list of “Chinese Inventions and Discoveries” (pp. 217-224), which is here subsumed into the “conclusions.” Furthermore the volume includes two co-authored contributions: “The Nature of Chinese Society: A Technical Interpretation” (pp. 43-66) with the economic and social historian Ray Huang (Huang Jen-yü), and “Literary Chinese as a Language for Science” (pp. 95-198) with Kenneth Girdwood Robinson. The volume opens and concludes with intimate personal testimonies paying tribute to Needham, the man, and the project’s, charismatic and beguiling power. Mark Elvin in “Vale atque ave” (pp. xxiv-xliii) revisits historical moments and predicts future research directions; Kenneth G. Robinson in a “soliloquy” (pp. 232-241) highlights forty years of conversation with Joseph Needham. Thus the volume ventures far beyond its original remit: it is at once an obituary and a “Festschrift,” a commemorative review of scholarship and a biographical memoir. It is an eclectic work, unique in composition and varied in meaning.

No scholar would deem the completion of a genius’ work easy. Such an awesome legacy is difficult to carry on and even harder to follow. It is, as scholarly reactions after Needham’s death have shown all too well, impossible to simply perpetuate. Many are the books, treatises and reviews in which scholars curse and praise, often in the same breath, the project’s continuation. Over the years, the tone has become somewhat milder, but while veneration has replaced indignation, it is also recognized that the focus of alternatives has shifted. With this final volume continuity has resumed. But not only that: by documenting rather than continuing a historical effort it also offers a feasible resolution to the initial disharmony.

Through the six essays delivered in this volume and their arrangement the contributors and editors make a valid argument for the enormous significance of Needham’s work. They reinforce the view that what came to be the “Needham project” had and will continue to have significance for future research on Chinese and European scientific endeavours as both a starting point and an important reference. I concentrate in this review on the progression of these essays, that is, I see the collection as a sequence that underlines the development and direction of Needham’s thought during the global changes of the 1960s to the late 1990s. Their order demonstrates how Needham stood up for his beliefs when he sim-
ultaneously negotiated with those generations who saw science as the sole caretaker and future paradigm, and those growing increasingly suspicious of a historical approach to science that was socially and politically disconnected. Aged 93, Needham took the opportunity to reprise the issues of a long and successful working life, the viewpoints that formed the bastion that scholars of the last century either built on or battled against as they approached scientific thinking and technological achievement within Chinese civilization.

The volume starts out with a piece in which Needham notes Chinese traces in the historical development of European scientific endeavours, and points out that modern science is thus a dish blending many ingredients. Not only science, says Needham, but also the factors that affected it are the product of multiples: divergent societies are the result of multiple ethnicities, regions and convictions. And their geographies, ideologies and strategies, unique as they may appear, consequently may have common denominators. Needham asks if the resonances between the thought of the Song dynasty scholar Zhu Xi (1130-1200) and that of a Georg Wilhelm Friedrich Hegel (1770-1831) or the later Karl Heinrich Marx (1818-1883) could be mere coincidence, and proposed that the impact of cross-cultural fertilization should be considered in both directions: science came east, but ideas had also always moved westward. The notion of the hybrid characterizes many of Needham’s thoughts on scientific knowledge production, with the exception of his presentation of China’s claim to the cultural origin of those many inventions that his contemporaries deemed central to the West: printing, gunpowder, the principles of aircraft, steam-power or the use of electricity. The list of “Chinese” inventions and discoveries (pp. 217-224) that figures in the final pages of this final volume, flags how Needham’s concerns lead to a flourishing industry as legions of researchers carved out the “facts” of Chinese scientific endeavours, facts that European and world historians then used to fill their narratives with the “other” side of the story. Many then questioned these “facts,” their existence and the proofs thereof; how they were gained and why, their importance for the larger whole, the needs of such a larger whole and its actual configuration. Within this ebb and flow of facts and opinions Needham was a rock on which one could also rely materially. Apart from editing the series and managing the project, Needham published more than 385 titles.¹ Countless drafts, files and notations, of which the Needham Research Institute recently published an electronic catalogue, can be added to this number.² Together with the


² Details concerning access to Needham’s archives held at various sites can be found at http://www.nri.org.uk/Archives.html (accessed 22 November 2011).
library the repository can almost compete with that of Gottfried Wilhelm Leibniz (1646-1716), who left enough material to keep dozens of scholars busy for at least another two generations.

Picked from this bountiful harvest, the chosen essays embody not only the major themes of Needham’s efforts, but also the essential strengths of his writing. Considerate with details and lyrical about the whole, Needham juggles with virtuosity the literatures of the East and West, scientific concepts, and ethic principles. In the fourth essay in this volume, “History and Human Values: A Chinese Perspective for Science and Technology,” he concludes that with yin and yang, “the ewig Weibliche comes to us in Chinese dress, a Margaret-Gretchen, a Hsüan Nü, who can be the salvation of the world as she was of Faust himself” (p. 94). In this manner Needham also lays out the difficulties of using concepts such as “Asiatic mode of production” and “bureaucratic feudalism,” and yet ends by emphasizing their possible potential as concepts to think through the factors that effect scientific developments (pp. 12-13).

This volume is faithful also because it depicts Needham in his multiple roles. His thoughts on socio-historical development were, as many studies have emphasized, well informed by Marxist theory. He can be grouped with other British contemporaries, such as J. D. Bernal, Hyman Levy, Benjamin Farrington or J. B. S. Haldane. He was also a convinced scientist. Modern science consisted for him in “two things, the mathematisation of hypotheses about nature on the one hand, and on the other continuous and relentless experimentation” (p. 202). His writing style also reveals him to be a humanist who knew how to combine clarity in language with the aestheticism of Latin hymns and a seasoning of well-placed quotations. Particularly attractive in his writing is how obvious it is that Needham the scholar seems to have always been at one with Needham the person. Here, he passionately praises what he likes, such as “the brilliant account of the history of modern science in the West by Kenneth Robinson” (p. 203 fn), there he openly shares his amusement at Haldane’s humorous efforts to rhyme “scientific verses” (p. 104 fn). Furthermore, familial traits and personal experience run through Needham’s argumentation. Thus, he discounts ideas of the “serene superiority” of European medicine in the nineteenth century by pointing out that “in one single day in 1890 my father, himself a physician, lost both his first wife and beloved teenage daughter of diphtheria, no antitoxin being available, (…)” (p. 34). The chosen essays reflect the integrity of Needham’s character and work, and his diversity. He was a polymath, a complex man with elemental convictions. Analyzing these essays from the viewpoint of the sociology of science (a field that has recently produced some fine new insights into the making of modern science, but one that Needham would surely have considered utterly subversive to his cardinal ideals of world
science), we would have to admit that Needham did not simply aim at persuasion or the invocation of trust. His lavish referencing of past and present authors was designed to build arches that enabled the reader’s mind to link and think across cultures and disciplines.

Sometimes Needham succeeds in this aim, although he may not have always liked the consequences, such as the fact that many European historians used his findings to elevate European endeavours. Indubitably, his work stimulated a thorough rethinking of the historical paradigms that informed views of the Chinese world. His notion that Chinese civilization was most efficient in gaining natural knowledge between the first and fifteenth century stimulated a whole generation of scholars to inquire more deeply into the creative drive that marks the Song dynasty, while others, such as Michael Lackner and Benjamin Elman, took up the cause for the proliferation of late Ming and early Qing intellectual and scientific endeavours. Studies countered the notion of progress and accumulation by delineating the decay caused by war, and the dynamics of dynastic change, stagnation and loss. Others demonstrated that Daoists were as much the “scientists of the East,” as Needham had suggested, as Galileo Galilei (1564-1642) could be equated with a twentieth-century physicist in a globalized world (p. 25). Our knowledge has grown immensely through the manifold studies testing Needham’s grand theory and the many responses he made, some of which are reiterated in the essays presented in this volume.

Continuity and contingency were major keywords for Needham in the analysis of Chinese cultural and scientific endeavours, facets well reflected by the integration of the two co-authored essays. Following a Western trajectory of scientific development, particularly on the technical level, Needham and Ray Huang identify, somewhat obsessively, deficiencies and inadequacies, concluding that Chinese centralized power and an underdeveloped monetary economy hindered a type of development in China that came to characterize modern Europe. Provocative theses such as this one can be a great stimulus to world history studies and inquiries into early modern globalization. Kenneth Pomeranz and R. Bin Wong, for instance, have drawn attention to China’s regional diversity and interregional exchange, Timothy Brook has effectively demonstrated seventeenth-century trends of commercialization and commodification, while Jack Goldstone has showed the Ming’s strong relation to world flows of silver.3

The fifth essay is of a different kind. Originally planned to go into part 3 of volume 7, Kenneth Robinson takes up a baton that has proved to be a major point of discussion throughout the course of this project. “Literary Chinese as a Language for Science”, is a fresh and insightful view of the topic. In my first year in Chinese studies, I was directly confronted with this question when I became fascinated with computers. When I revealed my major to the class teacher he scoffed at the thought of the Chinese language in the computer age and predicted its early death. Not only did this judgment, shared by many of his time, speak of his linguistic naiveté and his underestimation of human inventiveness, it also spoke of his lack of trust in the function of language itself: not language, but its use determines its capabilities. Only a few weeks later I would learn that language also had been a crucial argument within discussions on Chinese scientific developments, and had given the Needham project a dramatic new turn (p. xx) in the 1970s, since the conflict between Needham and Derk Bodde was part of the project’s history. More than twenty years later, Robinson, instead of solely looking at linguistic and structural features, fruitfully draws attention to rhetoric, arguing for a closer analysis of the many ways in which Chinese intellectuals actually employed their language to convey what the modern world deems to be fields of scientific knowing. His article discusses how Chinese intellectuals specified terminology in botany and generalized when necessary. He emphasizes “in scientific writing more than any other it is the context which gives precision to the term.” (p. 96) A fruitful side effect of such closer analysis is hopefully a replacement of the formula “concept-needs- (European) word” (i.e. words of Greek and Latin antecedence) that has done a great deal of harm to the identification of historical Chinese scientific understanding.

Bidding farewell to Needham, Mark Elvin’s preface addresses the incompletion of the project, and identifies three promising domains for future research: studies on probabilistic thinking (illustrated with the example of coin-gaming), micro-studies elucidating conceptual and content-wise shifts on a closer study of how practical action fed into theoretical approaches, and Chinese perceptions of their natural environment (pp. xxxvii-xxxviii). The “unfinished nature” of the project is possibly the reason why Needham’s issues and the question of how to proceed with the project have occasionally received more attention than the study of Chinese scientific thought and technological achievement itself. Letting the documents speak for themselves, this volume is a substantial source

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*4 Derk Bodde, Chinese Thought, Society, and Science, Hawaii 1991, p. x indicates that his work was intended to be placed in the final volume of the Needham series.*
for inquiries into the history and historiography of science and technology, both in China and elsewhere. Venerating a historical effort, the editors of Volume 7, part 2 have hence delivered a judicious and fitting contribution. By laying bare the ideals and ideas of Joseph Needham, and carefully abstaining from completing the volume as originally conceived, the editors have, however, achieved more than an indispensable aid towards understanding the thoughts that drove its creator and the attraction this offered his collaborators. They have produced a feasible alternative: a contribution that completes and delineates the series, firming up and defining its outline, not merely adding decorative embellishments. Franz Schubert’s symphony in B minor demonstrates the great charm and creative stimulus that can accompany the “Unvollendete”. Volume 7, part 2 substantiates that an unfinished project has its own integrity.