


Introduction: Needham's intellectual heritage

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Jianjun Mei

Needham Research Institute, UK

Joseph Needham,¹ born on 9 December 1900, was a Cambridge-trained biochemist in his early academic career but later became the greatest Western sinologist and one of the most original and creative historians of science of the 20th century. He is best known for his monumental series *Science and Civilisation in China (SCC)*, the successive parts of which have been published by Cambridge University Press since 1954. By the time of his death on 24 March 1995, Needham had been responsible for 13 separate books published in the series, while three had been produced independently by collaborators. Needham was elected Fellow of the Royal Society (FRS) in 1941 for his pioneering contributions to chemical embryology and Fellow of the British Academy (FBA) in 1971 for his pioneering achievements in researching the history of science, technology and medicine in China.

In this introduction, I first provide some background information regarding the organization of these two special issues on Joseph Needham's intellectual heritage, then give a brief introduction of the nine contributions published here, and finally make a few remarks on the relevance of Needham's intellectual heritage to current scholarship.

I. Background: the Needham Workshop in 2015

On 28 February 2019, at the invitation of Professors Martin Bauer and Ren Fujun, I attended a meeting held at the London School of Economics to discuss the development strategy for a new English-language

journal – *Cultures of Science* – which was established by the National Academy of Innovation Strategy (NAIS) in China in 2018. During the meeting, it was agreed that the journal would publish a special issue in 2020 on Joseph Needham's intellectual heritage to mark the 25th anniversary of his passing, and that I would act as a guest editor and be responsible for inviting scholars to contribute. I contacted a number of scholars and received many positive and encouraging responses. After a long process of discussion, reviewing and editing, the final results are now presented to readers: the two special issues of *Cultures of Science* under the title 'Needham's Intellectual Heritage'.

These two special issues include five essays, four research papers and one report written by Dr Needham himself. With the exception of the two contributions from Professor Sir Geoffrey Lloyd and Professor Fu Banghong, seven of the contributions are actually the essays and papers originally presented at the workshop ('Dr Joseph Needham's Intellectual Heritage: A workshop to commemorate the twentieth anniversary of the death of Dr Joseph Needham'), which was held at the Needham Research Institute (NRI) in July 2015. I wish, therefore, to give a brief introduction to this workshop so that readers can better understand the initiative that led to these special issues.

Corresponding author:

Jianjun Mei, Needham Research Institute, 8 Sylvester Road, Cambridge CB3 9AF, UK.

Email: jianjun.mei@nri.cam.ac.uk



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The initial idea to organize a workshop to commemorate the 20th anniversary of the death of Dr Joseph Needham came from Dr Peter Lee,² the then Honorary Secretary of the East Asian History of Science Foundation, Hong Kong (EAHSF- HK), now Chairman of the Joseph Needham Foundation for Science and Civilisation (JNFSC, formerly EAHSF), whom I met in Hong Kong for the first time in May 2013 when I was invited by the EAHSF to deliver the 8th Joseph Needham Memorial Lecture at the University of Hong Kong. After taking over the directorship of the NRI in January 2014, I consulted many colleagues and friends about the workshop initiative and it gradually developed into a solid plan. It was eventually decided that the workshop would be jointly organized by Professor Roel Sterckx, Joseph Needham Professor of Chinese History, Science and Civilization at the University of Cambridge, Professor Angela Ki Che Leung, Joseph Needham – Philip Mao Professor in Chinese History, Science and Civilization at the University of Hong Kong, and me, representing the NRI. The aims of the workshop were as follows: (1) to reflect on Dr Needham's intellectual heritage, its impact on understanding the world history of knowledge circulation, and its broad influence on generations of scholars and (2) to assess the role of Dr Needham's legacy and the institute he founded with a view to future research directions in the field of study he did so much to open up.

Thanks to generous financial support from the EAHSF-HK, about 30 invited scholars attended the workshop held on 4 July 2015 at the NRI (Figure 1). It was organized into four sessions, chaired respectively by Geoffrey Lloyd, Roel Sterckx, Angela Leung and Mei Jianjun. The theme of Session 1 was 'Working with Dr Needham and the SCC project: reflections and reminiscences', with seven presentations being given by Francesca Bray, Donald Wagner, Rose Kerr, Robin Yates, Georges Métailié, Gregory Blue and Christopher Cullen. Sessions 2 and 3 were focused on 'Needham's intellectual heritage and future directions in the field of the history of science, technology and medicine in East Asia', with 13 papers being presented by Liu Dun, Vivienne Lo, Togo Tsukahara, Chu Pingyi, Dagmar Schäfer, Sun Xiaochun, Tony Butler, Arun Bala, Shi Yunli, Jongtae



Figure 1. The group photo of the delegates who attended the Needham Workshop.

Lim, Kam-Wing Fung, Wang Siming and Bridie Andrews. Session 4 involved a round table discussion about the NRI and the development of studies of the history of science, technology and medicine in East Asia, exploring ways in which the NRI could continue to play a central role in promoting cutting-edge research and cross-cultural interaction with the wider academic community (Wu, 2015).

Subsequently, the idea of publishing a workshop proceedings was discussed briefly, but then put aside for a variety of reasons. I always believed, however, that the papers were worthy of formal publication, and so was especially delighted when my suggestion to publish a special issue on 'Needham's Intellectual Heritage' was accepted by the Editorial Board of the newly established journal *Cultures of Science* in February 2019. I promptly wrote to a number of scholars who had attended the 2015 workshop to ask them whether they would consider publishing their presentations in *Cultures of Science*. I was very much encouraged by the mostly positive responses I received, though I also learned that a few scholars were already committed to publishing their papers in other journals. Those included Chu Pingyi's paper on 'Needham in Taiwan: An unexpected turn to STS', and Jongtae Lim's on 'Joseph Needham in Korea, and Korea's position in the history of East Asian science', both which will be published in *East Asian Science, Technology and Society: An International Journal* in late 2020, together with a commentary piece titled 'Putting Joseph Needham in East Asian context: Commentaries on papers on the reception of

Needham's works in Korea and Taiwan' written by Professor Togo Tsukahara and me.³

2. The nine contributions

The nine contributions published in these two special issues on Needham's intellectual heritage can be roughly divided into two groups. The first group includes five essays offered by Geoffrey Lloyd, Christopher Cullen, Donald Wagner, Gregory Blue and Vivienne Lo, while the second group includes four research papers contributed by Arun Bala, Shi Yunli, Wang Siming and Fu Banghong. Here, I would like to give a brief introduction to these contributions and their authors.

Geoffrey Lloyd's essay titled 'After Joseph Needham: The legacy reviewed, the agenda revised – some personal reflections' is based on the text of his First Needham Memorial Lecture delivered in the University of Cambridge on 28 October 2016.⁴ Professor Lloyd was a Trustee of the NRI from 1991 to 2019 and Chair of the Trust from 1992 to 2002. As a key figure steering the NRI through choppy waters in the 1990s and the most eminent scholar in residence at the institute, his personal reflections on Joseph Needham and his legacy are unique, far-sighted and full of wisdom. While pointing out that the famous Needham question is simplistic, his essay emphasizes that 'differing experience of ancient societies can provide lessons that may still be relevant today'.

As general editor of Joseph Needham's *SCC* series for nearly two decades (1992–2013), in his essay entitled 'My farewell to *Science and Civilisation in China*' Professor Cullen provides us with vivid observations on the growth of the *SCC* project since the 1950s, as well as a firsthand description of his involvement in coordinating and supporting the production of some of the *SCC* volumes, such as those on ceramics, ferrous metallurgy and (ethno)botany. It is worth noting that Professor Cullen has seen 10 volumes through the press to date. His reflections on the experience of this intimate involvement with the *SCC* series are truly precious for a deep understanding of Needham's intellectual heritage.

In his article titled 'Brass tacks on iron: Ferrous metallurgy in *Science and Civilisation in China*', Dr

Donald Wagner shares with us a personal account of his experience in preparing the *SCC* volume on ferrous metallurgy. He first reflects on the theoretical framework of the volume, including Whig history, the social construction of technology, the evolution of technology, and technology in economic history, then briefly discusses the style and structure of the volume, and finally presents a few case studies to demonstrate the importance of checking the basic data in technical studies. The NRI is, in his eyes, 'the bricks-and-mortar aspect of Joseph Needham's intellectual heritage'.

The late 1970s and 1980s were a crucial period for the development of the NRI, or the East Asian History of Science Library (EAHSL), as it was then known. As a research associate of the NRI during the period from 1977 to 1990, Professor Gregory Blue was a key witness to many events and crucial changes of the period. His essay titled 'The East Asian History of Science Library/Needham Research Institute as an intellectual hub in the late 1970s and the 1980s' is thus both fascinating and of great historical value, because it presents his personal recollections of Joseph Needham, Lu Gwei-Djen⁵ and many other scholars and their activities at the NRI/EAHSL. Through his account, readers can gradually gain a clear picture of how and why the NRI/EAHSL could act as an intellectual hub, attracting so many researchers of diverse academic backgrounds during that time.

In her short essay on Joseph Needham's sense of a world community, Dr Vivienne Lo, senior lecturer and convenor of the UCL China Centre for Health and Humanity, points out that the attraction of Joseph Needham's vision is not just its de-centring of the Eurocentric narrative of the history of science, but also his quest for a better world. One important aspect of Needham's legacy is his compelling vision of 'All under Heaven as One Community',⁶ which, in her opinion, was 'grounded in socialist, Christian and 20th-century scientific utopian belief'.

An important aspect of Needham's intellectual heritage is his use of 'organic materialism' to characterize the philosophy of Chinese science. In his paper titled 'Chinese organic materialism and modern science studies: Rethinking Joseph Needham's legacy', Professor Arun Bala, the author of *The Dialogue of Civilizations in the Birth of Modern Science* (Bala,

2006), offers a detailed discussion of the conception of Chinese organic materialism and its wider impact. He argues that ‘Chinese organic materialism not only nurtured Chinese science in the past, and hindered the emergence of modern science in China, but can also be part of a synthesis of late modern science transcending early Western science’.

How do we appreciate, review and even criticize Needham’s work in the light of recent scholarship? Professor Shi Yunli, Head of the Department of the History of Science and Scientific Archaeology, University of Science and Technology of China, offers an excellent example in his paper titled ‘Chinese astronomy in the time of the Jesuits: Studies following *Science and Civilisation in China*’. In contrast to Needham’s overall claim about the role and results of Jesuit activities in the development of astronomy in China, Professor Shi argues that

What happened to Chinese astronomy in the time of the Jesuits cannot be understood as a gradual integration of Chinese astronomy into modern science, but rather as an integration of early modern science into the traditional framework of native Chinese astronomy.

This new perspective is significant for a better understanding of early modern scientific exchanges between Europe and China.

What inspiration did Joseph Needham and *SCC* bring about in China to stimulate research into the agricultural history of China? Professor Wang Siming, Director of the Institution of Chinese Agricultural Civilization, Nanjing Agricultural University, examines this issue in great detail in his paper titled ‘Joseph Needham’s inspiration for research on agricultural history in China’. It not only highlights extensive interactions between Needham and a group of Chinese historians of agriculture, such as Shi Shenghan, Wan Guoding, Hu Daojing, Wang Yuhu and Liang Jiamian, but also demonstrates that Needham’s work has had far-reaching influence on research into the Chinese history of agriculture, especially with regard to institutionalization and the transition from a technical narrative to a concept of ‘comprehensive agriculture’, taking ancient Chinese agriculture as an organic combination of cropping, forestry, husbandry, fishing and sideline production.

The last paper I would like to introduce here is the one contributed by Professor Fu Banghong of the Department of the History of Science and Scientific Archaeology, University of Science and Technology of China. This paper is a specially invited contribution, because it focuses on a secret report written by Joseph Needham in 1945 to Chiang Kai-shek, the then national leader of the Republic of China. Needham’s report was titled *Report to His Excellency President and Generalissimo Chiang Kai-Shek on the Position and Prospects of Science and Technology in China*. It has been known about among a small group of scholars for some time and was translated into Chinese by Professor Fu a few years ago (see Li, 2008), but its original English text has never been previously published. When I began to think about a special publication to commemorate the 25th anniversary of Needham’s passing, I came up with the idea of publishing his original report, because some observations made by him 80 years ago are still relevant to the development of science and education in present-day China. I also felt that a research paper on Needham’s report would be useful for readers to gain a better understanding of its background, motivation and impact during the late 1940s and beyond.

To that end, I contacted Professor Fu, a specialist in the history of science and technology and scientific policy in modern China who had devoted considerable time to the study of Needham’s report, and invited her to make a contribution. She was delighted to accept my invitation and subsequently contributed the paper titled ‘Science, society and planning: Joseph Needham’s report to Chiang Kai-shek in 1946’. In it, Professor Fu first highlights the historical context in which the report was produced, then examines its main content, features and essentials, and finally discusses its impact and significance. She suggests that ‘Needham’s report has universal significance for the development of science – not only in China at the time, but even globally today’.

3. Needham’s intellectual heritage

In 2019, as a joint initiative, two top journals in the field of the history of science and technology, *Isis* and *Technology and Culture*, published eight articles

in the form of a forum titled ‘A Second Look at Joseph Needham’.⁷ Why should a second look be necessary now? H Floris Cohen (2019), the editor of *Isis*, states in his editor’s introduction that

One of the most impressive enterprises ever undertaken since the scholarly investigation of the history of science came of age is surely Joseph Needham’s multivolume *Science and Civilisation in China* (SCC) . . . It is the goal of the reflections that follow to honor the lasting achievement of one of the great historians of science of the twentieth century by exploring what his work still means for us today. (pp. 91–92)

This sense of a clear need to revisit Needham’s work is shared by Florence Hsia and Dagmar Schäfer (2019), the forum organizers, who believed that the Second Look forum could probe ‘the contributions that Needham’s work can still make to ongoing debates’ (p. 94).

The joint forum publications on Joseph Needham by *Isis* and *Technology and Culture* are not an isolated phenomenon. Over the past two-and-a-half decades since his death, scholarly interest in Joseph Needham and his work has never died away. As Florence Hsia and Dagmar Schäfer (2019) observe:

While some researchers continue to wrestle with the perennial ‘Needham question’—Why did modern science develop in Renaissance Europe, and not elsewhere?—others refute its counterfactual, comparativist, or civilizational premises in order to launch alternative approaches to writing global histories of science. (pp. 94–95)

In their introduction to the Second Look forum, they list a dozen major research publications relating to Needham’s work or the ‘Needham question’, mostly emerging after 1995 (Hsia and Schäfer, 2019: 95).

It is understandable that, in the eyes of some scholars, Joseph Needham has become or is becoming an out-of-date figure, because of the amount of new research work that has been carried out since 1995. In 1998, in a special issue of *Osiris* titled ‘Beyond Joseph Needham: Science, technology and medicine in East and Southeast Asia’, the editor, Morris Low, suggested that we think beyond Needham and a unitary

science and break out of the framework imposed by studies of modernization (Low, 1998: 4). Mark Elvin (2004: xxiv) also reminded readers in his introduction to Volume VII, Part 2 of *SCC*, published in 2004, that

As scholarship has advanced, not everything that Needham wrote, forty or more years ago, on the social and economic history of China now seems as solidly based as the greater part of his reconstructions of Chinese technical practice and scientific theory. The reader needs to exercise a certain caution here, searching at times less for information than for inspiration. (p. xxiv)

What inspiration, then, can contemporary scholars search for in Needham’s work? Or what intellectual heritage can current scholarship inherit from Joseph Needham and his collaborators? Worth noting in connection with these questions is that raised by Francesca Bray (2019):

How did Needham’s *Science and Civilisation in China* . . . project relate to the radical critiques that were then and have remained the *raison d’être* of STS, encouraging it to speak truth to power, sustaining its reflexivity, and keeping it ‘open-ended and never-at-rest-with-itself’? (p. 317)

In his long paper titled ‘How deep is love? The engagement with India in Joseph Needham’s historiography of China’, Leon A Rocha (2016) has eloquently encapsulated the deep relevance of Needham’s work to ongoing scholarship:

There is a political vision, a spirit of openness, an ethical imperative embedded in Needham’s idea of ‘oecumenism’ that may be worth inheriting: that modern science and medicine (as we currently know them) are not a complete and settled project; that they may not have a monopoly on ‘truth’; that there is still the possibility that non-Western cultures can revise our ways of knowing and seeing; that doing the history of science and medicine in those non-Western cultures (China, India . . .) may help towards building a pluralistic science in the future that fully acknowledges the complexity of nature and reality and that encompasses the partial perspectives from different classes, genders, ethnicities and cultures. (p. 39)

While acknowledging the value of Needham's work, Florence Hsia and Dagmar Schäfer (2019), however, also observe the need for departing from it and seeing and doing things differently:

Yet there are clear parallels between current debates in the history of science, technology, and medicine (HSTM) and the themes, methods, and approaches that Needham took seriously and, in many cases, pioneered, although clearly his terms are not ours: against Needham's vision of traditional and culturally specific sciences converging into modern world science stand our diverse perspectives on a globalizing HSTM; his historical materialism has turned into our 'materiality'; inherent within our practice/theory debates are the lines he tried to draw between technology and science. (p. 95)

Even today, 25 years since he passed away, the presence of Joseph Needham and his legacy, like a mountain standing in the field of the history of science and technology, cannot be lightly brushed aside. Rather than simply ignore or skirt around it, the best way to deal with the mountain is to climb up and appreciate its grand vistas and fascinating details. As Du Fu, the Tang poet wrote, 'When shall I reach the top and hold, all mountains in a single glance'.⁸ It is my belief that 'Needham's intellectual heritage is unique, substantial, and multidimensional, and it will surely continue to encourage and inspire new generations of inquisitive minds' (Mei, 2019: 603).

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Notes

1. 李约瑟.
2. 李励生.
3. I would like to thank Dr Kuo Wen-Hua, editor of *East Asian Science, Technology and Society: An International Journal*, for sharing the information concerning the publication of Professors Chu Pingyi and Jongtae Lim's papers. I would also like to thank Professor Togo Tsukahara for his support.
4. Professor Lloyd's Needham Lecture text has already been translated by Dr Fu Yang into Chinese and published in Taiwan. Please see Luo (2019).
5. 鲁桂珍.
6. 天下大同.
7. Please see *Isis*, volume 110, number 1, 2019, pp. 91–136 and *Technology and Culture*, volume 60, number 2, 2019, pp. 553–624.
8. 会当凌绝顶，一览众山小.

References

- Bala A (2006) *The Dialogue of Civilizations in the Birth of Modern Science*. New York: Palgrave Macmillan.
- Bray F (2019) From Needham to EASTS, or why history matters. *East Asian Science, Technology and Society: An International Journal* 13: 317–321.
- Cohen F (2019) Editor's introduction. *Isis* 110(1): 91–93.
- Elvin M (2004) Vale atque ave. In: Robinson KG (ed.) *Science and Civilisation in China*, vol. 7, part 2. Cambridge: Cambridge University Press, pp. xxiv–xliii.
- Hsia F and Schäfer D (2019) History of science, technology, and medicine: A second look at Joseph Needham. *Isis* 110(1): 94–99.
- Li Y (2008) (Joseph Needham) The position and prospects of science and technology in China, translated by Fu Banghong. *Science & Culture Review* 5(5): 5–29.

- Low M (1998) Beyond Joseph Needham: Science, technology, and medicine in East and Southeast Asia. *Osiris* 13: 1–8.
- Luo J (2019) (Geoffrey Lloyd) After Joseph Needham: The legacy reviewed, the agenda revised—Some personal reflections, translated by Fu Yang. *Newsletter for Research in Chinese Studies* 38(3): 1–9 (in Chinese).
- Mei J (2019) Some reflections on Joseph Needham’s intellectual heritage. *Technology and Culture* 60(2): 594–603.
- Rocha L (2016) How deep is love? The engagement with India in Joseph Needham’s historiography of China. *British Journal for the History of Science, Themes* 1: 13–41.
- Wu H (2015) Brief report on the workshop on Needham’s intellectual heritage. *Chinese Journal for the History of Science and Technology* 36(4): 509–513 (in Chinese).

Author biography

Jianjun Mei is a professor at the University of Science and Technology Beijing and Director of the Needham Research Institute, Cambridge. He is also a Fellow of Churchill College, University of Cambridge. His current research focuses on non-ferrous metallurgy in ancient China as well as the history of technological exchange and interactions between the East and the West.