

## REVIEWS

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Yung Sik Kim, *Questioning Science in East Asian Contexts: Essays on Science, Confucianism and the Comparative History of Science*, 2014, Leiden: Brill, viii, 284 pp.

### Christopher Cullen

[Christopher Cullen is Emeritus Director of the Needham Research Institute, and an Emeritus Fellow of Darwin College, Cambridge. Recent publications include *Heavenly Numbers: Astronomy and Authority in Early Imperial China* (Oxford University Press, 2017), and (with Hiraoka Ryuji 平岡隆二) “The Geneva sphere: An astronomical model from 17th C. Japan,” *Technology and Culture* (2019) 60(1): 219-251. Contact: [christopher.cullen@nri.cam.ac.uk](mailto:christopher.cullen@nri.cam.ac.uk)]

Kim Yung Sik is a major figure in the history of science in East Asia, and in the history of world science. His leadership has been evident not only in a considerable number of perceptive and original publications, but also through his role in establishing a vibrant centre of research at Seoul National University, and in training a whole generation of scholars now working in Korea and elsewhere. This collection of twelve articles, originally published over a number of decades, gives us an opportunity to reflect on his accomplishment, and in the process to learn from the acute insights that many of them embody.

The book is divided into three sections: Science and Confucian scholars, Social and Cultural Contexts of Science in East Asia, and Comparative Problems in the History of Science in East Asia. The reader who is familiar with Kim's work will not be surprised to see that two of the four essays in the first section relate to Zhu Xi 朱熹 (1130-1200). The first essay of the four, 'Zhu Xi on nature and science' is as the author notes a presentation that reflects the conclusions that the author has set out at length in his wideranging book on Zhu Xi's thought (Kim, 2000). The second essay looks in detail at three important philosophical concepts in Zhu Xi's work, 'analogical extension' (*leitui* 類推), 'investigation of things' (*gewu* 格物) and 'extension of knowledge' (*zhizhi* 致知). Given the immense importance of Zhu Xi's writing in forming the consciousness of many of the literati of late imperial China, as well as of Korea, two articles out of 12 devoted to this great thinker seems a very fair allowance. The third essay is devoted to ideas about the role ascribed to Heaven in production techniques in Song Yingxing's 宋應星 'Heaven's Work in Opening Things' (1637), the author's translation of the title *Tian gong kai wu* 天工開物. Significantly, this essay was originally written as a contribution to a book in honour of Kim's teacher, Charles Gillispie (1918-2015), who, amongst

other things, worked on the natural historical aspects of French technical writings of the eighteenth century. Here Kim reveals to us an aspect of Song Yingxing's book that is easily forgotten if it is treated as no more than a quarry for information on technical practice in late Ming China: what did the author think was the role played by 'Heaven' (*tian* 天, the entity with whose name his title begins) in the many human activities he describes and analyses? The fourth essay deals with the topic 'Science and the Confucian tradition in Chǒng Yak-Yong's (丁若鏞 Jeong Yakyong, 1762-1836) work.' Jeong, a member of the yangban literati class in the later Joseon period, was an active official who also left us a great body of writing, from which scholars have been able to extract much material of interest relating to such technical topics as astronomy, harmonics, medicine and geography. He is also well-known for the construction of an efficient lifting machine that was used in the construction of fortifications. Despite this, Kim's careful examination of Jeong's writing taken as a whole set in the context of his official activity, does not as he points out reveal someone who can be said to have seen 'science and technology' as a distinct and important aspect of human activity. On the contrary, Jeong was only interested in such topics "when their practical utility appeared to him as something that would help solve the problems of the day or better understand the Confucian classics."

The second part of the book 'Social and cultural contexts of science in East Asia' opens with an article first published as long ago as 1982, on 'Problems in the study of the history of Chinese science.' This piece of writing mainly centres on the 'Why not' question—often phrased as "Why did the scientific revolution not take place in China?". Kim's careful examination of the problems posed by the way this question has been framed, and the ways that scholars have attempted to answer it is still valid today to a large extent. It is however notorious that the question continues to be asked today, although mostly by those who do not read the work of specialist scholars in the relevant fields. The second essay 'Confucian scholars and specialised scientific knowledge' underlines the fact that in pre-modern China, as in pre-modern Europe, the topics focused on by modern historians of science and technology were not seen as suitable for study by specialists alone, but formed part of the broad spectrum of knowledge that a truly educated person might be expected to master. After the short but wide-ranging essay on 'Science and religion in traditional China,' some of the questions raised in the preceding section are looked at in a new perspective in 'Science and bureaucracy in traditional China.' Rightly, this stresses the extent to which the bureaucratically structured forms of activity in which scholars engaged for large parts of their lives conditioned the way they developed and applied a wide range of competences.

The third and final section of the book 'Comparative problems in the history of science in East Asia' contains four essays. The first of these 'The

'why not' question of Chinese science: the scientific revolution and traditional Chinese science,' is in some ways a new look, two decades later, at some of the questions raised in the first essay of the second section of this book. Much of it is an acute dissection, with concrete historical comparisons, of what, if anything, such questions might be taken to mean. On the positive side, it is certainly true that the search for answers to the questions posed has led to the careful examination of many social, intellectual and historical aspects of pre-modern China that might otherwise not have drawn so much attention. On the pessimistic side, Kim points out that we may get answers that amounts to no more than saying "The scientific revolution did not occur in China because China was different from the West." After considering such large and sometimes problematic issues, the reader may be refreshed by two more specific historical studies. The first, on 'Ideas of the earth's rotation in seventeenth and eighteenth century East Asia' is an examination of the historical evidence drawing on material from China, but also from two Korean thinkers, and examines the eventual acceptance of this notion, generally assumed to have been imported from the West, in the light of evidence for the previous existence of related ideas in East Asian traditions. The next essay is a short but illuminating consideration of what general conclusions can be drawn from the exceptional nature of what took place in Meiji Japan in the wholesale and rapid adoption of what was perceived as western science and industrialisation. As Kim points out, the events that took place serve as a strong warning against any facile lumping together of everything 'Eastern' against everything 'Western.' Appropriately, we conclude with an essay that brings new insight into the 'why not' question by considering the case of Korea, and its relation to the broad cultural context of East Asia as a whole—a relation which, as Kim points out, has not always been treated by Korean scholars in the history of science as of central importance.

The title of the book is *Questioning Science in East Asian Contexts*. The reader of this book will, as I hope I have indicated, gain much from sharing the thoughts on this topic expressed by such an acute and experienced scholar as Kim. But like any really interesting piece of writing, this book provokes further questionings, of which this is one: since the contexts in which the 'questioning of science' occurs are all (except for the penultimate essay) firmly located in pre-modern East Asia, may we not ask what entity present in the consciousness of people thinking, acting and writing in pre-modern China, Korea and Japan is being questioned here?

The problem I am trying to indicate was brought out very clearly in another context by Geoffrey Lloyd in the preface to his early textbook (Lloyd, 1970: Preface, n.p.), where he wrote:

The subject of this study is Greek science ... Science is a modern category, not an ancient one: there is no one term

that is exactly equivalent to our 'science' in [ancient] Greek ... 'Greek science' is here used, then, merely as a shorthand expression to refer to certain ideas and theories in the ancient writers, and it does not presuppose any particular view concerning the status of those ideas and theories on the part of the ancient writers themselves.

Approaching the same problem from a different direction, Joseph Needham stressed a distinction between 'modern science,' which he saw as a universal and culture-independent possession of the whole of mankind, developing from the beginnings of "the application of mathematical hypotheses to nature and the use of the experimental method ..." in late pre-modern Europe, and the radically different and culture-bound forms of knowledge which preceded it, whether in pre-modern Europe, East Asia, or elsewhere (Needham, 1969, pp. 14-15).

The issue was set out in its strongest terms a quarter of a century ago, when Andrew Cunningham and Perry Williams carefully analysed the mode of emergence of the word 'science' in its modern sense, a process they located as late as the period of the European 'Age of Revolutions' (1760-1848) (Cunningham and Williams, 1993). It was also in that period that they located the birth of the idea that the origins of this new 'science' were to be found variously in periods in which the French *philosophes* and the German Romantics located their own intellectual origins – seventeenth century Europe and ancient Greece respectively. As Cunningham and Williams pointed out, much later works such as that of Herbert Butterfield on *The origins of modern science* (Butterfield, 1949, new edn. 1957) essentially continued this view, and it is works such as these that have been foundational to the institutional construction of the academic discipline of 'the history of science' as embodied in the departmental structures and channels of publication within which many of us have chosen to work, or have simply found ourselves working, and which have, for better or for worse, inevitably shaped our research and teaching agendas throughout our working lives.

As 'historians of science' looking at the pre-modern world, it is not easy to talk about our work without expressing ourselves in terms that suggest that there was something we can call 'science' in (say) second-century Alexandria or twelfth-century China, despite the fact that (as in the quotation from Lloyd above) we have to acknowledge that no activity, institution or explicitly recognised concept in those times and places corresponded to 'science' as we now use the word. Needham's universalist Marxism saw a whole variety of very disparate pre-modern traditions from all over the world as being in some way ancestral or contributory to science as it eventually emerged in (for Needham) early modern Europe, but even the adoption of that framework does not seem to justify us in projecting

'science' backwards beyond a certain point in time. So what is it that what are we are justified in studying?

One intriguing way to escape from this historiographical trap would be to follow the advice of Martin Rudwick, whom Cunningham and Williams quote thus (Cunningham and Williams, 1993, pp. 419-420):

'A non-retrospective narrative of any episode in the history of science should be couched in terms that the historical actors themselves could have recognised and appreciated with only minor cultural translation [to help the modern reader understand it].' – and this respecting of actors' categories should not be limited to the moment when the historian is making his or her historical exposition, but should apply also to the categories within which the historian conducts his or her researches as well.

What would this mean in terms of reframing (for instance) a discussion of Zhu Xi and 'science' into terms that Zhu Xi might have recognised?<sup>1</sup> To ask this question should not be seen as a criticism of the book that Kim has given us: it is, rather, a recognition of the great possibilities that open before us thanks to his perceptive writing in the essays reviewed here.

### References

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<sup>1</sup> I have attempted to follow this agenda in, for example, my discussion of *suān* 算 in Cullen (2009).