

Science and Civilisation in China. Vol. 6, Biology and Biological Technology. Part IV: Traditional Botany: An Ethnobotanical Approach. By Georges Métaillé. Translated by Janet Lloyd. 2015. Cambridge University Press, Cambridge, United Kingdom. 748 pp.

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Georges Métaillé's long-awaited monograph on the history of Chinese plant science is now available at last. I use the words 'plant science' because Métaillé's main point of theory herein is that China never had botanical science—that field has been peculiar to the western world since AD 1600, and, through expansion, the rest of the world since about AD 1800. Chinese plant knowledge before that date was very comparable to Europe's: it consisted of a great deal of empirical knowledge—factual or fantasy—recorded in long herbals that copied extensively from sources going back to ancient times (Theophrastus in Europe, Han Dynasty writers in China). After 1500, Europe began to move in a different direction, and after AD 1600 progressive innovations in thought, such as modern taxonomy, which began with Ray and others, not Linnaeus, and methodology/technique (e.g., microscopes), made western and later all world botany a fully modern science. Métaillé thus provides a history of Chinese herbals, continuing an earlier section on botany (Needham et al. 1986; see also Bray 1984) in this series. This makes the present work a bit difficult to use, since one must read that earlier section to get the full story.

In any case, Métaillé covers the Chinese and western literature on Chinese plants with incredible thoroughness and detail. This work is not only a vast and indispensable reference, it is an awe-inspiring masterpiece of scholarship. Métaillé's knowledge of Chinese herbals and western studies of Chinese plants is unexcelled, and his knowledge of Chinese plant life

and use was equaled only by the amazing Shiu-ying Hu, who recently passed away after a career of more than 80 years (she died in 2012 at the age of 102; see Hu 2005). Most of the book consists of summaries of the herbals, by topic, with their ideas on plant classification, sex, horticulture (as opposed to agriculture, covered in Bray 1984), growth, flowering, development, and other topics. Also treated is the arrival of plants from the rest of the world to China, and the European exploration and exploitation of China's plants. This, a superbly done history of European plant exploring from the Renaissance on, is my favorite part of the book.

The book is beautifully and copiously illustrated with the better plates from the classic Chinese herbals, as well as some early European works and Métaillé's own fine photographs. If you can afford it, it's worth the money just as a fine work of bookmaking.

Métaillé takes ethnobotany as a theoretical mark, but he does not mean quite what we usually mean in the Society of Ethnobiology. He references a few modern sources, but relies largely on Edward Lee Greene's history of botany, originally written in 1909, when only John Harshberger's original definition of the field was in play (Harshberger 1896). Métaillé has kept up with modern developments in plant classification and taxonomy, but does not appear to be current with other approaches in contemporary ethnobotany. Also, though he has much field experience in China, he does not draw significantly on that. He confines his attention to premodern China—



China before European botany reached and influenced it in the nineteenth century AD. The book is much more a work of traditional historical and philological scholarship. It is none the worse for that—we need thorough reviews of literature—but not a place to seek theoretical or field-driven advances in ethnobiological studies.

In its separation of traditional Chinese and modern western botany, this book breaks sharply, even dramatically, with the earlier work by Needham et al. (1986) in this series. Needham was, famously, a champion of the view that—as Métaillé quotes him—

there is only one unitary science of nature, approached more or less closely and built up more or less successfully and continuously, even if very slowly, by the several groups of mankind from age to age. This means that we could expect to trace an absolute continuity between the first beginnings of astronomy and medicine in ancient Babylonia or ancient Egypt...to the break-through of late Renaissance Europe...

and onward (Métaillé 2015:7, quoting Needham 1978:110). Needham was famous for his lifelong and militant view that science was one. Modern historians of science, however, are just as militant in defending the view that it is not, and that every scientific tradition and subtradition is “incommensurable” (Kuhn 1962) with every other. This view has already caused friction within Volume 6 of this series; Nathan Sivin, in his posthumous edition of Needham's work on Chinese medicine (Needham et al. 2000), has taken Needham to task even more sharply than Métaillé does. Needham saw science as the accumulation of empirically correct knowledge about the world, tied together with ever more refined and tested ideas and theories. Modern historians of science, exemplified by Kuhn, Sivin, and Métaillé, see science as a set of essentially different theoretical paradigms. Scientists may use empirical knowledge as substrates, or they may not (they may invent cycles and mermaids). But they are using clearly and sharply demarcated and separate theories. Métaillé can justify this in the Chinese case by showing that rather little *theoretical* knowledge crossed to China on the Silk Roads, however many actual plants did. Western botany influenced China a small amount with the Jesuit missionaries in the seventeenth century AD, but basically did not come to or influence China until the mid-nineteenth century AD. It should be noted,

however—and here Métaillé is surprisingly quiet, in contrast to his thoroughness in other parts of the book—that a tremendous amount of empirical knowledge of plants did travel by the Silk Roads (Anderson 2014).

To me, and this is a personal view, the truth is somewhere in between, but closer to Needham's. Science seems to be basically a matter of collecting empirical knowledge and understanding it according to theories and hypotheses that are inevitably tentative and that change with time. Both the knowledge and the theories travel widely, change with time, blend and merge, develop according to new data. Science simply does not consist of a set of steel-walled towers that have nothing to do with each other and no possibility of mutual influence. (Nor did Kuhn say so. I believe Sivin and Métaillé would agree with this if challenged—but they write as if it were the case, though Sivin is more extreme than Métaillé on the point.) The whole question is similar to current discussions of ‘culture,’ in which anthropologists see culture as a vast braided river, while cultural-studies scholars often see ‘cultures’ as steel-walled spheres that can bounce off each other but cannot interact except through exploitation or colonialism.

On the other hand, Métaillé is obviously right that there was a huge Foucaultian ‘rupture’ around AD 1600, when European scholars began to subject botanical knowledge to the combination of aggressive knowledge-seeking and aggressive, self-conscious theory-building that were beginning to make profound changes in astronomy and medicine. By AD 1700, botany in Europe most certainly looked different from plant knowledge in China. Europe had the beginnings of the formal, rigorous binomial classification system (Ray and Willoughby were doing it well before Linnaeus). Botanists had microscopes, herbaria, dissecting kits, serious theories of plant ‘natures,’ and research gardens. (Many of us remember going through the oldest surviving research garden, at Montpellier, France, when we went to the International Society of Ethnobiology meetings there.) What my former colleague Randall Collins calls “rapid discovery science” (Collins 1998) had come. As Métaillé says, it did not really reach China till the nineteenth century AD.

While it was very different from Chinese plant knowledge, I feel more comfortable than does Métaillé about calling the latter ‘botany’ (at least we can agree on ‘ethnobotany’). Métaillé does show that

the Chinese had a set of theories (rather more than he discusses, but that is another story). He shows they had systematic accurate knowledge of plants, that they recorded it, and that they subjected it to theoretical interpretation and discussion. The theories were wrong, by our standards, but they were no worse than the theories guiding European botany in AD 1500. In fact, they were often similar theories, since transmission over the Silk Roads did in fact occur. One recalls that the changes that brought about the Scientific Revolution after AD 1600 had a long history, and that history included a gradual development from ideas and projects much like China's. I doubt if John Parkinson and John Ray in the seventeenth century AD thought they were constructing a totally new world 'incommensurable' with that of Theophrastus and Dioscorides (see e.g. Morton 1981 on the history of botany).

In short, I see 'science' as including anything people do that involves the orderly, theory-based collection and ordering of empirical knowledge, whether or not the theory is correct by our standards. I do, however, see modern international science as sharply different from the traditional sciences. It is defined by some really different things: high technology (from microscopes to atom-smashers), mathematical or quasi-mathematical modeling, and self-conscious theory-testing through replication and falsification. It developed slowly between AD 1600 and 1800, or even later. It is an international enterprise; it was never 'western' science, since even in AD 1600 it drew heavily on Near Eastern science. Modern international science is a new and specialized way of learning, but it is not all of 'science.'

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