

**Buddhists, Dutchmen, and Visionaries:
Translators of Science in China and Japan (12th-19th Centuries)
Panel Organizer: Ya Zuo, Princeton University**

This panel will investigate the practice of “translation” in the realm of natural studies/science in China and Japan. It not only involves interlingual translation of scientific texts, but also intercultural transfers of scientific ideas, categories and epistemological systems. Moreover, the time period of the four papers spans the pre-modern to the modern period. The four examples will show that “translation” is a highly manipulative activity formulated in certain intellectual environments and in response to certain social or epistemological agendas. In the context of these papers, translation of science was tied to the ongoing development of indigenous traditions of natural studies/science in East Asia.

For Buddhist priest Ken I, “translation” was an integrating practice to assemble knowledge of minerals from Song Chinese natural studies and various other traditions, such as Esoteric Buddhism, Daoism, Confucianism both in China and Japan. For Ruan Yuan, “translation” was a process less of adopting wholesale Western astronomy than of assisting the construction of a new independent discipline: calendrical studies. For Motoki Ryôï, “translation” was a matter of drastically reducing the Dutch medical text to accessible objects and subjects of understanding buttressed by indigenous Japanese concepts. For John Fryer and Daniel Macgowan, translation is not only to introduce Western geology texts but also a world view on the supremacy of science and man against nature. This world view, however, was ultimately cast aside by the first generation of Chinese geologists/mining engineers who emphasized the practical applications of geology and a Darwinian view of mineral exploitation.

Among them, “translation” can be interpreted as a process of gain (in the first two examples) or a process of loss (in the latter two). This interpretation entails a series of further questions: should we assume there always existed a great Original? How did the perceptions of the originals affect the “translator” as a free agent? What new perspectives can we bring along into history of science in East Asia by inscribing “translation” within epistemological and social nexuses?

Individual Paper Abstracts

Assembling the Precious Bits:

Knowledge of Minerals in the Manuscript *Takarayôshô* 寶要抄

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The focal text *Takarayôshô* (Collection of Essential Points of Precious Minerals) in this study is a small-scale encyclopedia of minerals compiled by Ken I 兼意 (1072-1158?), a famous Buddhist priest in the late Heian. The compiler intended to construct an explanatory system of precious minerals for the purpose of esoteric Buddhist rituals. However, it is also a project to assemble and integrate knowledge of minerals from various sources: Chinese encyclopedias in the Song, treatises of Chinese medicine, Buddhist and Daoist sutras in China, historical records in Japan and possibly some Indian religious texts. The author developed the genre *yôshô* 要抄 (Collection of Essential Points) to highlight his concerns, such as the conception of “treasure” (*takara* 宝, precious minerals) in Esoteric Buddhism, an unique taxonomy of minerals, among others.

In this paper I will start with sorting out sources that Ken I utilized and then discuss the adjustments he made to incorporate the materials to form a system of his own. I will also discuss the readership of the text by contextualizing it with the development of Esoteric Buddhism in late Heian. Also, I will compare *Takarayôshô* to other similar texts he compiled, such as *Kayayôshô* 香要抄 (Collection of Essential Points of Spices), *Kusushushô* 藥種抄 (Collection of Essential Points of Medical Herbs), and *Kokuruishô* 穀類抄 (Collection of Essential Points of Cereals). From texts as such we are able to explore the intellectual connections that Ken I had with the field of natural studies in late Heian.

**Epistemological Construction of Identity:
The Concept *chouren* 疇人 in the treatise *Chouren zhuan* 疇人傳**

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Despite conventional options to translate *chouren* as astronomer, computist, mathematician or a fuzzy combination of them all, I propose to translate it as “calendrical experts” in *Chouren zhuan* (Biographies of Calendrical Experts). By composing the text Ruan Yuan 阮元 (1764-1894) intended to construct a purely epistemological identity of *chouren* as calendrical experts. Behind this effort lies his larger agenda to assemble both indigenous and Western, traditional and new sources of calendrical knowledge and build up an independent discipline. He intentionally avoided introducing any distinct social categories, such as professional computists hired by the government, literati scholars of natural studies, or missionaries and foreign scientists.

Ruan Yuan was well known for his generous patronage of literati, expertise in Chinese classics and a strong nativist attitude towards Western learning. His

compilation of *Chouren zhuan* initiated a textual tradition in which three sequels were subsequently composed by later scholars over time. The series lasts a century (1797-1898), however, Ruan's epistemological agenda gradually diminished. The genre that Ruan created for *Chouren zhuan* should rather be called "study of calendrical knowledge based on biographies of individual experts", which is totally knowledge-oriented. He highlighted historical significance of each figure's achievements, culled the points of knowledge and fit them into his system. Meanwhile he kept other biographical information to the minimum. His followers, however, showed a tendency to return to the traditional track of biography composition. Especially the last two sequels turned out to be simply "biographies of calendrical experts". By examining the textual transformation, I will discuss the correspondent changes in attitudes of some literati naturalists towards Western science during the century.

Western Scientific Texts in 18th Century Japan:

Questioning the Translation Paradigm

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Looking at various works on Western science in 18th century Japan, one frequently encounters the notion that Japanese scholars learned novel concepts by translating Western scientific texts. Nevertheless, it seems highly questionable that Japanese scholars could penetrate culturally situated Western concepts by simply matching them to their Japanese equivalents.

An examination of these scholars' studies of the Dutch language shows that their knowledge could hardly be counted as adequate for the purpose of translation. The "translated" texts display a connection with certain Western

treatises. However, there is no direct correspondence between them. The Japanese compilers combined the visual representations they found in Western treatises, practices they observed from Western physicians and submit them to the conceptual framework of Chinese natural studies. I will explicate the argument by exploring Motoki Ryōi and his investigation of Remmelin's *Pinax Microcosmographicus*.

The purpose of this paper is *not* to argue that these works were inadequate, but rather to point out that by calling them translations modern readers tend to deny the creativity of the compilers and reduce them to mere passive recipients of Western science. Moving beyond this approach would open our investigation to the rich array of cultural and social factors which made up the scholarly landscape of the Edo period, which shaped this rich process of cross-cultural transmission of knowledge.

Lost in Translation:

The Introduction of Western Geology to China (1860-1900)

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In the mid 19th century, in coastal cities like Guanzhou and Shanghai, Protestant missionaries adopted a strategy of using science to access the Chinese public. Like their Jesuit predecessors, they achieved limited success. As one of the fields they introduced to China, geology already had a problematic religious subtext. In the act of translation, the issues of creationism, geological time, and evolution became further entangled with the role of science in imperialism and the wealth and power of the West. While these early translations of geology texts

introduced the field to China, they lost all currency by the dawn of the 20th century, when the first generation of western trained Chinese mining engineers and geologists began to replace foreign hires.

By the mid 19th century, geology in the West had already developed beyond the purview of “gentlemen” scientists. Large-scale mines of the period provided field experience for graduates of mining academies. For translators like the British John Fryer (1839-1928) and the American Daniel Jerome Macgowan (1814-1893) and their Chinese collaborators, the technical requirements of these fields limited the utility of their textbooks. By the last decades of the Qing dynasty, a small number of Chinese mining engineers appeared on the scene, albeit in far too small numbers to fill the need for technical expertise in fledgling industries. For example, Wang Ruhuai 王汝淮 published in 1918 *A Comprehensive Record of Mining Sciences* 礦學真詮. Unlike the earlier translations by former missionaries such as John Fryer, Wang’s work contains detailed pictorial as well as written guides to the tools and methods then in common use in mines. His work reflected his background and extensive practical experience. The difficulties of translation and discrepancy between aim and reception, as well as, the role of science in the meeting place between China and the West, form the core of this paper.