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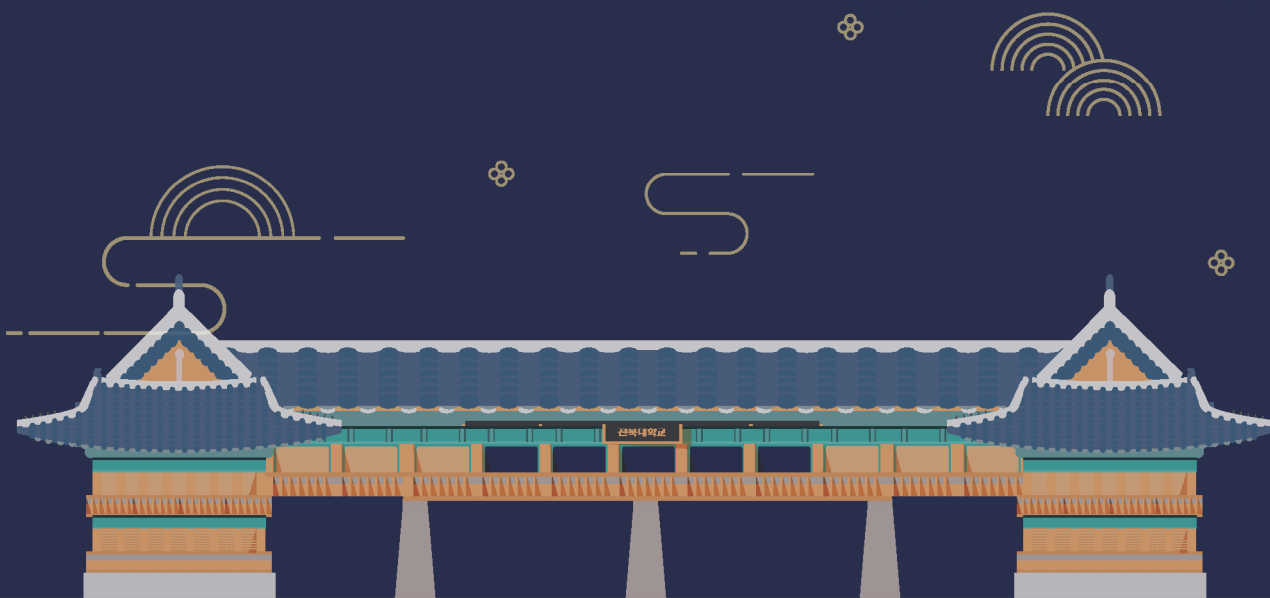
15TH INTERNATIONAL CONFERENCE ON THE HISTORY OF SCIENCE IN EAST ASIA

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AUGUST 19 (MON.) - AUGUST 23 (FRI.), 2019
CHONBUK NATIONAL UNIVERSITY
JEONJU, REPUBLIC OF KOREA



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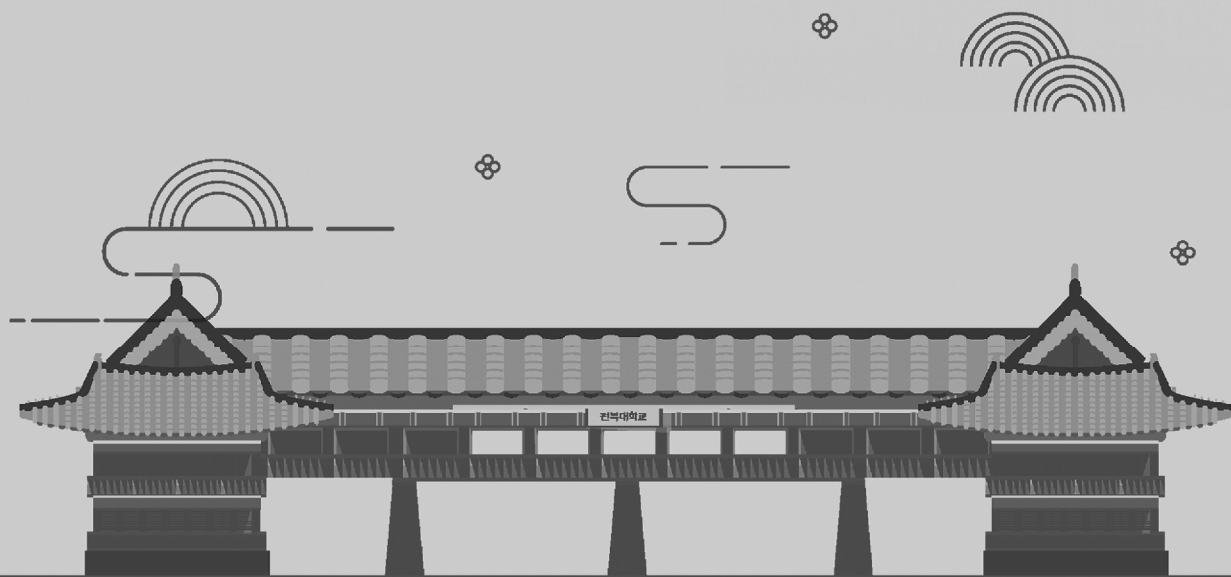
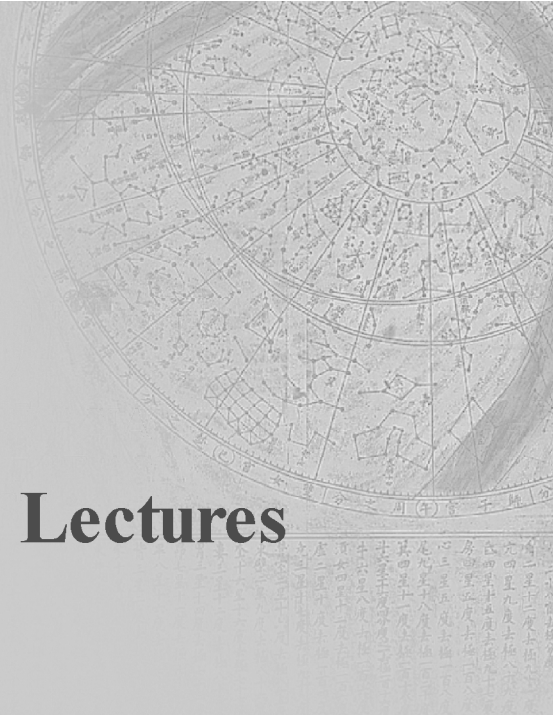
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Keynote & Plenary Lectures



Keynote Speech

**Physicians of Korean Medicine and Their Scholarly Activities
during the Modern and Contemporary Period in Korea**

Namil KIM

Department of Medical History, College of Korean Medicine, Kyung Hee University

Hello, everyone! Welcome to Korea!

I am professor Kim Namil of Kyung Hee University, College of Korean Medicine.

I am very honored to have the opportunity to speak about Korean traditional medicine in front of you. It is my dream that I was given the opportunity to give a lecture in front of so many scholars from all over the world on this subject. I do not think this opportunity will come again in the future, and thus, it seems to be an important moment in my life.

Today, let me talk about the characters of the modern and contemporary Korean medicine and their activities. It was a coincidence that it simply happened to me in terms of dealing with this topic. Since I was a young professor at the Kyung Hee University College of Korean Medicine in 1995, I thought it was necessary to sort out the history of Korean medicine.

I was one of the scholars who was interested in classical medical books, but I still did not have enough knowledge about the materials while I did not have enough data to compose the stories.

It was probably around 1999. Professor Hong Won-sik (1939-2004), who was my respected professor, showed me the research cards that he worked on in the past and reminded me of the true meaning. Professor Hong Won-shik told me that filing the cardboards was a warming-up activity to create the Korean Medicine Encyclopedia. I could easily notice that each cardboard was reflected with his deep thoughts. Nowadays, both the relevant cabinet box and the cardboards are now on display at Kyung Hee University Korean Medicine History Museum.

And Professor Hong asked me to sort out the history of Korean medicine by giving me some of the textbooks of Korean medicine which he had written in his youth. It was a very demanding request at the time. As a person who lacked a sense of challenge, I thought of it as a simple hobby, and expected that studying something unfamiliar with me might be ending up with big troubles.

In the meantime, some materials of professor Kim Jeong-jae, who served as the dean at Kyung Hee University of Korean Medicine, were donated. It occurred after his son Kim Rae-won died in an accident and after a few days, they were donated to the college. The donated materials included various Korean medical documents such as *Donguibogam*, *Bangyak-habpyon*, *Donguisooseibowon* during the modern and contemporary periods.

In the next year, 1999, many more documents were donated. Ambassador Kim Ki-soo, son of Dr. Kim Young-hoon, who had served as a court physician since the end of the Choson Dynasty, made this contribution to the Department of Medical History. In these 1600 pieces of documents, we could find Kim Young-hoon's writings, prescriptions, Korean-language academic journals published in the Japanese colonial period, various Korean medicine write-ups, and related materials.

These materials had been designated as modern and contemporary cultural assets by the government in 2012. In return for this, Ambassador Kim Ki-soo honorably donated 470,000 m² lands to Kyung Hee University. The current new building at Kyunghee University is named 'Cheonggang Hall', derived from the huge amounts of data and gratitude in conjunction with this priceless donation of land. In addition, many graduates have donated materials to the University. In May of 2019, Professor Roh Jung Woo's daughter donated materials from L.A. in the U.S. Professor Roh Jung Woo (1918-2008) was the first director of Kyung Hee University Korean Medicine Hospital. And obviously, this has enriched the magnitude of historical documents of the Korean Medicine.

It was around the year 2005 that I started to organize by looking at the materials of Korean medicine, especially the modern and contemporary figures. There was a request from *Minjokyeihak* Newspaper asking for an article to be written on the people for the modern and contemporary periods every month, and I began to



write a manuscript to arrange 12 people a year. A few years later, the number of manuscripts had been increased, and so far, 320 people have been summarized. While compiling the data, I published a book in the middle of 2011, entitled "*The Memoirs of Korean Medical Physicians during the Modern and Contemporary Periods (in Korean)*."

I have published this book by reading the characters of Korean medical physicians during the modern and contemporary periods in terms of ① the activities of court physicians for the time of last emperor Gojong and Soonjo of the Chosun Dynasty, ② the persons who worked to carry on the education of Korean medicine, ③ the persons who organized and acted as a Korean medicine group, ⑤ the persons who strived for institutionalization of Korean medicine, ⑥ the persons who strived for scientific promotion of Korean medicine, ⑦ the persons dedicated to independence movement, ⑧ the persons who had tried to broaden the scope of Korean medicine through the various activities, finally ⑨ the well-known Korean medicine doctors during the modern and contemporary periods. Even presently, I'm still maintaining this basic thoughts and collecting relevant documents. As I sort out the data, I've been honored by so many Korean medicine doctors since they have donated so much of their precious materials to me. The donated materials include medical treatment apparatus such as acupuncture, moxibustion, and cupping as well as medical instruments such as mortar and straw cutter. And there are also acupuncture points, hanging scroll, and some letters and portraits.

But most of all, it is very helpful to research Korean medical history based upon the donated materials of rare medical papers, scholarly journals, research papers, old notebooks, letters, prescriptions, and photo matters from the people around me in the academic area. Through this presentation, I would like to highlight those Korean medicine practitioners during the modern and contemporary periods.

Thank you very much for attention.

Plenary Lecture I**“Polycentric East Asia”:
From the Perspectives of Traditional Historiography and “Science and Empires”**

Togo TSUKAHARA
Kobe University

“Polycentric East Asia” is the concept for our International Conference on the History of Science in East Asia (ICHSEA) 2019. Our theme is “History of Science, Technology, and Medicine in Polycentric East Asia: Harmony in Diversity 和而不同”.

I will consider this concept in the context of East Asia’s encounter with modernity. In order to do so, I will examine traditional historiography in history of science. Two mainstream methodologies are those by “the diffusionist” (George Basalla) and “the convertionist” (Joseph Needham).

I will then discuss them in light of recent analysis given by the field of “Science and Empires”. My examination incorporates the viewpoints of hybridity in history and the so-called circulation historiography. The cases of Rangaku (Dutch studies), that highlights the acceptance of modern Western science in the 19th century Japan, will be discussed from that framework. Also my examination will extend to a bit wider perspective within East Asia. I will comment on the difference and similarity between the historiographies by Joseph Needham’s Science and Civilization in China (SCC) and the most recent version of it in Korea, the Science and Civilization in Korea (SCK).

1. East Asian history of science as a civilization issue

The history of science and technology in East Asia has been a civilization-oriented issue, the so-called “global history” kind of thing, from the very beginning.

This is “science” that the modernization of Western Europe has produced. Then the new operational practice of knowledge production was born around the 17th century, especially by the work of Galileo. About the origin, we can go back its upstream to the works by Copernicus and Kepler. This particular form of knowledge production was initiated by them into what is now called “Science.” It consisted of a series of intellectual movements that culminated in the so-called Scientific Revolution. It was accomplished by

Newton, and science has integrated with technology through the Industrial Revolution. Newton’s Empire has distributed this intellectual knowledge production system globally, that swept the world.

So why do we in East Asia accept this style of knowledge that was born in a limited historical context in Europe? How was it globalized? Why did it extend to East Asia? These are the questions historians of science in East Asia have long tried to answer.

Along with the expansion of European empires and the globalization of the world, science and technology was a direct form of violence. In other words, it gave the Imperialists the very “power” of European expansion itself. There is no doubt that techno-science was the most effective “tools of Empires” (Headrick, 1981). Some were obviously visible and mechanical, and some others were “The Invisible Weapon” (Headrick, 1991), like those of telecommunications.

Yet, those who were ruled by the empire were not merely submitted to the superiority of Western Europe. There were the “Partisans” type of freedom fighters who were desperately trying to apply and assimilate European science and technology to their own causes of resistance and independence. Sometimes, the results were double-sided and ironic. As evident in the case of Japan, where such efforts for self-help have become part of the country’s engagement in further imperialist competition. No need to mention that Japan’s success in assimilating Western science, technology and medicine had resulted in the subsequent expansion of its Empire, and Japan’s aggression on her neighbors.

2. East/West exchange through a closer look from science

There is also intellectual as well as technological interaction ever since the early exchange between



Europe and East Asia. For example, Jesuits sent to China conducted intellectual agency that resulted in exchange of knowledge between Europe and China. These exchanges gained an unusual fusion in such fields as Chinese mathematics in the Qing dynasty. (Jami 2014).

It was Oda Nobunaga who discovered guns that were brought by Portuguese sailors drifted to the shore of Tanegashima in 1543. Oda was a military genius, he made use of it, and organized an artillery unique to the world of military history at the time (Parker, 1996). It was an interesting example of technological bondage between Europe and East Asia.

From the viewpoint of the global history of science, we should note a curious fact that this year coincides with the year when Nicolaus Copernicus published his *De Revolutionibus Orbium Coelestium* (On the Revolutions of Heavenly Spheres) (1543) and Andreas Vesalius published *De Humani Corporis Fabrica* (On the Fabric of the Human Body) (1543). We should look for the reasons why this discovery of hypothetical universal heliocentrism and an inquiry into human body by anatomical intervention had occurred in the same year of this accidental event that marked global exchange of technological artefacts. Shall we thank for the drifted Portuguese sailors for Japan's military modernization, or should we blame them as they gave triggers to Japan's invasion of Korea by the Toyotomis?

In Japan, the consequence is rather interesting. After the warring states had been subdued by the Samurai leadership by Oda and Toyotomi, the Japanese administration of the Tokugawas rejected militarism. Christianity was banned strictly, and a major exchange with foreign powers were limited. Actually, it was a successful protectionism trade that rejected free trade and Western aggression, and avoided Japan being colonized by European super powers.

By those policies, the Tokugawa regime was known as one of the most successful cases of disarmament in early-modern history. In fact, as an irony in history, such disarmament and Japan's so-called seclusion policy were adopted in the aftermath of a failed military campaign to Korea by Toyotomi. This subject of Japanese disarmament in early modern Japanese

history was characterized as the "Japanese who abandoned the gun", and the regime of 260 years as "*Pax Tokugawana*" (Perrin, 1991). The *Pax Tokugawana* in early modern Japan was a successful disarmament that lasted for a bit more than two and half centuries. From this history, we can learn the lessons that the social management of technology is possible. Corresponding cases are found in the contemporary world, as such in the case of international management of nuclear power, self-regulation by the scientific community regarding human cloning and genome editing issues. History of science can tell a lot to current social problems caused by cutting-edge techno-science.

During this period of Japan's seclusion and disarmament, believers in modern economic growth denounce it as causing stagnation, they are busy advocating free and open global trade. However history gives insight that, against the assumption of lower and sometimes negative economic growth, no stagnation has been seen in this pre-modern economy in this peaceful Edo period. Also about culture and science, it was one of the most remarkable period in Japan's cultural history when we see most interesting development by its own. Various scholars from different social layers, also such as artisans, medical doctors, official translators, Samurai mathematicians, and amateur gentlemanly merchants, all people have explored nature and culture, actively engaged in different cultural activities and paid effort to progress any of engineering and technical skills. Most famously, mathematics during the period had a peculiar development and established a particular disciplinary paradigm under Wasan (Annick Horiuchi, 2010, K. Sato, 2005). Agriculture during the period steadily grew through the use of Japan's environment and progress in agricultural production of food and fabrics. (Tanaka, 2008). These developments were understood as indigenous endeavors that induced "endogenous" development (Tsurumi, 1996).

It was the Japanese Dutch scholars who explored European-style science under limited conditions during the limited foreign exchange and repression of Christianity. When Western astronomy was introduced in Japan, it was accepted on the basis of "the Chinese background" and made a "Western impact" (Nakayama, 1969). A book of Western anatomy "A

New Book of Anatomy (解体新書) was translated from Dutch and published in 1774, that caused a visual as well as intellectual shock in Japanese public (Screech, 1996, 1997). Introductions of basic sciences such as pharmacology, botany, and chemistry followed, while theories of matter like Lavoisierian elements and Daltonian atomism were accepted. In doing so, theories of chemical bonding in terms of chemical affinity were discussed. Most remarkably, a set of chemical technical terms in Japanese were also coined within the framework of Rangaku (Tsukahara, 1993).

However, traditional histories of Dutch Studies “Rangaku” have often been too romanticized, and considered as it guided most successful Japanese techno-science adaptations; accordingly Japan’s nation-building. This is typical modernist historiography, and failed to avoid triumphalism and enlightenment. We all know such modernist historiography has led Japan to be the self-claimed leader of Asia and entitled Japan as the Pan-Asian agent of enlightenment on the eve of WWII. This is a text-book case as Max Horkheimer and Theodor Adorno pointed out in their *Dialectic of Enlightenment* (1944).

Such self-sufficient nationalist historiography is masculine. This is a his-story of glories of Japan’s techno-science, that is already obsolete and outdated. These histories are still supporting vulgar nationalism and current populism. Rather, we should reconsider them with a viewpoint taken from a different angle and pay attention now to contemporary works in intellectual history.

We should not limit this introduction of techno-science from the West only to Japan. An effort toward technology absorption by the leaders of the Westernized Movement 洋務運動 in China can also be seen as a similar case. There are resemblances in philosophical and cultural attitude expressed in the slogans “Japanese soul, Western spirit” 和魂洋才 and “Chinese body, Western use” 中体西用.

We can observe multi-centered interaction occurring not only in those large centers of nation states but also at various peripheries and cultures. We can see it in places like Ryukyu Kingdom, now a part of Japan called the Okinawa archipelago; in the once tribunal

Kingdom of China; and at the subordinated district of Satsuma Feudal Domain. Mapmaking in Ryukyu Kingdom is an interesting example showing that Ryukyu is somewhere in between and a link in the circulation of knowledge. It was French methodology that surveyed their land because the Ryukyu Kingdom regularly sent their bureaucrats to China to learn how to measure the land (Asato, 2014). As we all know, Qing Dynasty Emperor Kangxi made a map of all of China (皇輿全覽圖) using the French style geodetic method (Han Qi, 2014; Mario Cams, 2019, 2015). Meanwhile, English mapmakers in India recruited local people and made use of their intellectual contributions in order to complete their task. Raj (2016) claims that success in British mapmaking was a result of a “circulation of knowledge.”

The Japanese adopted Western survey techniques from the Dutch that allowed all over Japan to be mapped by Ino Tadataka (伊能忠敬 1745-1818), who studied Dutch mathematics and astronomy under Takahashi Yoshitoki (高橋至時 1764-1804).

We see that the acceptance of science and technology in Asia occurred within the framework given by the competing European empires of Britain, France, and the Netherlands. Also we see that there was a multi-layered “local situation” in which Chinese, Japanese, and Ryukyu scholars and bureaucrats, lay-technicians and all actors involved, worked together.

3. How should we understand this in the context of global history? : Theories and models

To analyze the interactions of Western sciences in the East, several theories have been presented so far. When science is seen as being transferred from the West (the Center) to the East (non-Western peripheries), modern science is in a state of diffusion. This view is called diffusion theory. Technology transfer to the developing world and innovation theories for economic development are mostly based on this idea.

Conversion theory, on the contrary, tells us that the West has been accumulating cultural and natural ideas and intellectual achievements from the rest of the world. Through the process of global collection, the West absorbs only the useful and scientific elements, selecting objectives and positive subject matter. Science has abandoned superstition, eliminated religious belief, and classified knowledge to be examined



by scholars from other disciplines. Thus, the West has established science for its Western Civilization. This view is called conversion (or convergence) theory. We may easily see this pattern in the history of the formation of Linnean natural history (Nishimura, 1989); in Humboldtian sciences (Cannon, 1997); and in the formation of the global network of meteorology.

Diffusion theory that views science spreading from Europe to non-European regions has been advocated and championed by George Basalla (1961). Meanwhile, as is typically seen by Joseph Needham, modern science in Europe is an accumulation of all knowledge from human history by various cultures, converged as a gathering point of knowledge around natural phenomena. Needham's methodology is most representative among the conversionist approaches, and his is also called as the civilizationism.

Today, the story of the "global history" of science and technology is being discussed. Since the 1990s, the field of research called "Science and Empires" actively examined and criticized both diffusionists and conversionist approaches.

In short, against diffusionists, more emphasis should be paid to the "non-colonial" side, which rejects the one-sidedness of diffusionism. We need to understand not only "the donors" aspect of techno-science transfer but also why the "receivers" accepted and adopted Western techno-science. So-called modernization theory is much too simplified a view of globalization; we need to look at non-Western agency of positive acceptance.

Needham's civilizational approach has also been criticized and claimed to be another form of Western centrism. Even though Needham himself paid due respect to non-Western science and technology, his criteria to judge is based solely on those of modern Western sciences. A science from any culture is valued if those indigenous views of nature match current modern standards of rationality. He valued whatever was rationally interpreted by the scientific eyes, even those from the non-West, such as medieval mathematics from China, astronomy from Babylonia, and Japanese ethno-botany. In order to justify such yet-non-proven medical techniques as acupuncture and moxa-burning treatment, he had to resort it to his

original view of nature with fluid-theory of matter and bio-wholism with a feedback system.

These models have been studied in detail in recent years, and there are many such theories, including Kumar's emphasis on indigenous scholars (Kumar 1995); New Imperial History by Warboy and others; MacLead's "moving metropolis"; Pyenson's three-dimensional model; "circulation theory" by Raj; While others emphasize interaction and structure of "sub-satellite" with a view of complex empire rivalry and hierarchy (Tsukahara 2018).

The transition of models has been analyzed by several authors (Bennett & Hodge, 2011; Tsukahara, 2001, 2014). We are now in a state to deal with the East/West problems in the history of science using the following terms: network and hybrid, site and circulation, geography of science (Livingston, 2013), and actors of laboratories/fields (R. Grove 1995, 1997; Latour, 1989).

Hereafter, we pick up the model proposed by Raj (2007). He has criticized the basic understanding of the history of science derived from Western centralism. He states that the reason for the tendency toward centralism in Western Europe has its origins in the concept of "civilization" by Joseph Needham, namely his "civilizationism"; and the understanding of the "spanning" (diffusion) of Western science by George Basalla.

4. Needham and civilizationism in the history of science

Since Needham is a paradigm setter and a major scholar of our field, he deserves the name of "Grand Designer" of our International Society for History of East Asian Science, Technology and Medicine. We should give special attention to Needham's "civilizationism" discussed by Raj. We all know that most of us members in the scientific/research community still work on the basis given by Needham and his framework presented in SCC. Our problem-solving is done within the series, yet we need to be aware of some problems in keeping with SCC.

One of the problems intensively expressed is the so-called "Needham question" that asks us: "Why did

modern science stop developing in China after the 16th century?” In such a question, the West is implicitly presumed to be an integration of all the scientific achievements of various cultures. This “non-question” implies that European civilization is the Only Civilization to have created modern science, which China has “not” produced even if they were more advanced than in Europe before the 15th century.

5. *Science and Civilization in Korea (SCK), its difference from SCC.*

SCK is organized and led by Shin Dong-won, our conference organizer today. Most interestingly and varying from Needham’s grand question of civilization, the SCK is based on the nationalism/post-colonialism controversy in Korea, which has been discussed for many years in the history of Korean science (Im Jeontae, 2019; Miyagawa, 2018). The historiography has a double-sided in a way that puts the framework of “civilization” to one side and “science and culture” to the other side. To put this in a nutshell, SCK has a different framework different from SCC. Shin Dong-won’s project not only converted the model of Needham’s dualism of “Chinese” science and civilization but extended it to the Korean case. Shin and SCK organizers include Korea’s unique historical controversy and ideological context in their series. Those viewpoints are intended to shed new light on Korea’s geopolitical situatedness. Situatedness is a specific term derived from Sandra Harding (1998) originally coined to frame a feminist standpoint theory. But I think these words apply most appropriately to the analysis of the non-Western history of science.

The SCK series widely treats the circulation, encounters, and generation of knowledge in Korea. In the series, science, technology, and medicine in history are situated over the geographical and temporal space of Korea, and how those imported and acquired cultural elements resulted in a new mixture in this particular locality are presented. These elements occurred first under the domination and influence of China, then by Japanese colonial oppression and coercion, and most recently by American military intervention and aid/exploitation during the Cold War. This knowledge was inherited by the generations, and SCK describes the people’s endeavors, intellectual

conflicts, and even their boldness in detail. SCK is a great achievement, and I admire this.

In this case, we should not only regard Shin Dong-won as a Needham in present-day Korea, but we should inquire more. First of all, I emphasized its attention to “situatedness,” but how should this be understood in present-day Korea?

6. Nationalism/post-colonial controversy in Korean science history

Historical research includes positivistic and empirical studies along with an ideological and deductive examination related to historiography. As is often said, these are “two wheels” of historical research. Before we start the fact finding in historical materials and evidence, it is necessary to review the historiography. My humble examination is merely limited to one wheel of the two, an argument about historiography, not about empirical evidence, in SCK.

In considering the history of science in Korea today, the nationalism controversy was reportedly fairly intense. This controversy was between the late Jeon Sang-woon, Kim YungSik, Song Sang-yong, and Lim Jong-tae. Lim made a critical comment at our previous conference in Baltimore, and we still have fresh memories of how he was countered by Song. Also at the Japan-Korea Science History Workshop in Waseda, Tokyo, in November 2016, Song again provoked the topic in a strong tone. Such a nationalism controversy should be confirmed as a foreshadowing element in the history of Korean scientific history. I would like to take a liberty to mention about my memory with late Jeon Sang-woon, who mentioned about how he struggled to get out of humiliation made by Japanese colonial rule in writing history of science in Korea. To write history of Korea’s own techno- scientific heritage is, according to him, a process to recover own cultural pride once disgraced by colonialism.

Such a controversy should not be considered solely from the nationalism and post-colonialism in Korea but also from the important viewpoint of cultural history. When writing history, some particular cultures demand the status something defined as “civilization.” When mentioning civilization, it is almost always accompanied by a denouncement of the



opposite, as the uncivilized and barbarous. Therefore, to claim oneself as civilized (or the Civilization), it must be associated with superiority and conscious of a certain kind of hierarchical order. In that sense, Joseph Needham made use of his term Civilization quite strategically. In mid-20th-century Euro-American readers, only “European civilization” was assumed. Science was the knowledge that Europe monopolized. Based on that background, Needham proposed the concept of “Science in Chinese Civilization” and the monopoly of science was denied. China was thought to be deserved of the term Civilization, as well as Science.

Needham maintained that China was a carrier of Civilization, but a new generation of the Needham school criticized in the 1990s for being nationalistic/ethno-centric with different types of “cultural monopoly.” Consequently, the word in the name of the society changed from “China” to “East Asia” in 1999. The journal entitled *Chinese Science* is now called *East Asian Science, Technology and Medicine*.

What should be referenced is the trend in another part of scientific history research being done in Japan. Chinese scientific history is studied in Kyoto at the Yabuuti School, where, self-proclaimed civilization is seen sporadically. One exception is Yabuuti’s small book, *Chinese Scientific Civilization* (1970), in which we see the influence of Needham. On the contrary, the Kyoto style of the history of science explored with a strong focus on “culture”, that Japan shares with those of China.

Nomination of a “Japan’s Science and Civilization” was rather controversial and politicized. The concept of “Japanese civilization” has been attracting many problems ever since Japan’s claim of leading East Asian Civilization, which justified Japan’s invasion of its Asian neighbors that contributed to World War II. Even after the war, it was scholars from Tokyo, not Kyoto, who insisted that the Japanese should have a “Science and Civilization in Japan” (SCJ). For instance, Shuntaro Ito once asserted, “We Japanese should have SCJ, which matches Needham’s SCC.” His assertion was based on his reasoning that Japanese civilization had equivalent value to that of China (Ito, 1988). Such opinions were often seen when Japan’s economy was still very strong in the 1980s during the good old days of “Japan as Number One.” Through

this process, we notice that nomination of the designation “civilization” accompanies self-appointing connotations and the claim of one’s superiority over “Others.” At the same time, it has strategic meaning when culture is unjustified and ignored as a lesser position.

Self-claim of civilization is also considered a form of resistance against Euro-Centrism, historically appropriated by Needham. He dared to bring up “Chinese civilization” and succeeded in persuading European readers that another science and civilization existed in China. Needham succeeded in this with his SCC; hence, he rescued Chinese cultural pride by writing his SCC. It is considered to have satisfied a requirement of insisting on an independent cultural/civilizational entity. Yet, he later encountered the necessity to show the departure from nationalism, and avoid another form of ethno-cultural-centrism.

This problem is also seen in the SCK in different format, where the authors demonstrate that “Korea is not a part of China”, and each are paying effort to illustrate how “Korean civilization is unique.” To show the uniqueness of a certain culture requires specific academic and intellectual strategy within its situated boundaries.

One serious cultural issue for SCK is geopolitical and national boundaries. SCC and SCK both face to that problem. Moreover, SCK was published while the nation was seriously divided. How we consolidate them and unify the division must be the issue we hope and believe the next generation will solve.

7. Poly-centricity as a new concept

I will consider the concept of poly-centricity in reference to East Asia’s modernity. About poly-centricity, admittedly, China, South Korea, North Korea, and Japan are rightly assumed as the centers within the poly-centers in East Asia. However, we should go further. Historians always go beyond the borders of time and presumed boundaries of space. It is implied by historical insight that those multi-centers should not be defined by the established Modern Nation States, nor should they be exclusively occupied by the domination of the current holders of power. Yet in our intellectual analysis of the history of science, there is more we should consider.

The Center of China has actually consisted of the “moving metropolis” (MacLeod, 1989) of successive empires in history. China’s current territories were defined only recently in the long history of China (only in the 17th century) by the expansion of the Qing dynasty. History gives us insights that makes us easy to go beyond the current boundaries, so that the seemingly firmly established singular Center of China (literally, the Center Nation) was actually plural in history.

In the peripheries and sub-centers, we clearly see such pluralities. In Korea, there are now at least two centers-in the South and North. The much younger nation state of Japan (established in the mid-19th century) had indigenous cultural/intellectual centers in the Kingdoms of Ryukyu (Okinawa) and Ezo (Hokkaido, Ainu). There are even colonial sub-centers as for “the site of science” that were built under Japan’s Great East Asian Co-Prosperity Sphere in Taiwan, Seoul, Machu-Kuo, Hong Kong, and Singapore. And how shall we think about Tibet, Vietnam, and Mongolia as a place/site for scientific practice in history? We need to investigate more of their history of science.

In traditional historiography, Europe and China were supposedly the centers, even neither these terms of “Europe” nor “China” were vaguely defined. The former was rising and prosperous, while the latter was decaying and disappearing. Although there were two established centers, polarization and easy stereotype of “the West and the East” prevailed. We may call this dualism (East and West), typically seen in a Orientalist view in modern Oriental studies, and/or the Center-Periphery model. By all means, the mind-set was fixed and the Great Centers were presumably only those two, Euro-centrism and China the self-claimed Center-Nation.

In our new style historiography, such a simple view is not valid. We can admit that Europe was a center and had exercised its Imperialist power, but it was a plural, “moving metropolis” as MacLead claimed. We know now that it was not one Europe or a single Imperialism, but it was Imperialists from different European Empires who competed with each other. The British Empire seemed to be the strongest, they had skillfully taken over Dutch trade networks by piracy and conspiracy. The British were not even monolithic, consisting of England, Scotland, Wales, and Ireland,

and later incorporating the members of the Commonwealth nations. Its high time holds only for a short while, eventually, Britain was rivaled by the French Imperialists, and then challenged by the Germans, and later even taken over by the Americans and also kicked out from Asia by the Japanese. Currently it seems there are several centers, US and Russia, China, EU, Japan and others, but it is moving. History teaches us important fact that no modern ones lasted its hegemonic position more than a century or two. The European centers of Imperial Power has never been single-layered or monolithic. It has always been multi-centered, and those centers are shifting and transmitted, and as a matter of “inconvenient” fact, they are vulnerable and floating in the space of “virtual insanity”. Such hegemonies and empires from European modernity were more or less short-lived. None of them extended their prosperity longer than a century or two.

In Asia, the differences and similarities are about the same. We should not regard Asian Empires and Imperial States as entities of eternity, but as historically constructed. There is not a single and supreme Center Nation, but rather different cultures, nations, networks, and exchanges consisting of East Asian nation states.

8. Preliminary conclusion: There are three things to remark

(1) I will pose a question that is historiographical as well as geographical: Where are the poly-centers? This is more interesting to ask than to answer. We know that as historians of sciences we should not rush into and engage ourselves in a territorial dispute; our task is to look closer into historical facts and look for evidences on the subject.

(2) We started traditional understanding (diffusion and conversion theories) and gained Empire understanding. We see not only exchange with centers, but also interaction between such peripheries like Ryukyu. We may be able to use this to extend our understanding of colonial science and circulation of knowledge in East Asian poly-centers, that should include more layered structure in peripheries, as well as in the seemingly monolithic centers.

(3) How many civilizations are there in past? How



should historians of science answer this question? A preliminary answer is that there were many, and it should be plural. One thing we know that Needham discovered the great one outside Europe in East Asia. Now Shin Dong-won has established the second. As Japan failed to have established its own civilization by political enterprise in its dream of Great East Asian Co-Prosperity Sphere. The exact answer is probably “blown in the wind”, but most probably, it is relied on the shoulders of historians of science.

Plenary Lecture II**Uniformity and Diversity of Agricultural Machines in East Asia**

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East Asia is one of the important cradles of world civilization. China, Korea and Japan were and are neighbors separated by a strip of water, and have been constructing a multi-cultural circle. They were full of cultural harmony in regional diversity in the time of agricultural society. There existed obvious uniformity, similarity and diversity in their scientific knowledge, technology, and economy. The typical cases include such agricultural machines as water-lifting devices and the rotary-fan winnowing machine.

The Chinese square-pallet chain-pump (翻車, 龍骨車) was constructed by Bi Lan in 186 CE. After that, this kind of water-lifting device was improved and popularized in different areas. It could be driven by a man, or men, or an ox in Tang Dynasty (618-907 CE), and was further powered by the Chinese vertical-shaft windmill in the 12th century. The Chinese square-pallet chain-pump was introduced in writing to Japan in 829 CE. Finally, the chain-pump were transferred to Japan. This kind of device was painted in the later stage of Muromachi period (1336-1573), and became popular during the early stage of the Edo Era (1603-1868). The Japanese called the Chinese chain-pump “龍骨車(竜骨車)”.

In 1429, Park Seosaeng (朴瑞生), a Korean official in the Joseon Dynasty, proposed that the Japanese waterwheel should be constructed in his country. His description of the Japanese device indicates that it must be noria (筒車), which were used widely in Song China (960-1279). Choe Bu (崔溥), a Korean official in the early Joseon Dynasty, proposed to make copies of Chinese chain-pumps driven by men or ox. Such officials as Park and Choe were supported by Korean governors, but they did not obviously succeed in popularizing Japanese or Chinese water-lifting devices. In 1783, another Korean official tried to construct the Archimedean screw according to Xu Guangqi(徐光啟)'s *Nongzheng quanshu* (Complete treatise on agriculture, 1639). The Korean called the Chinese chain-pump “唐水車”, and called the Japanese

water-lifting device “倭水車”.

The Japanese not only reproduced the Chinese water-lifting devices, but also innovated agricultural technology. *Fumiguruma* (踏車) was invented by the Japanese in the period from 1661-1673, and widely used for field irrigations and hydraulic engineering in the middle of the Edo era. *Fumiguruma* is the man-powered waterwheel for low lift, namely the specific treadmill for pumping. Its structure is much simpler than the chain-pump, so that it is easy for craftsmen to construct it. A person treads it above to throw out a small stream. We cannot rule out the possibility that it was somewhat based on the so-called “stimulus diffusion” of the Chinese scoop-wheel (刮車) or hand-operated paddle-wheel lifting water. The Korean farmers seem to neglect the Chinese scoop-wheel, but indeed accepted the Japanese *Fumiguruma*.

In the Former Han period (206 BCE-24 CE), the Chinese invented the rotary-fan winnowing machine (颶扇, 扇車) to efficiently separate grain and husks after harvest. Its rotary-fan consists of four or more blades, is enclosed by a casing, and is operated by hand with the help of a crank. This kind of machine was not only introduced to Japan in the 17th century, but also transferred to Europe in the mid-18th century or even earlier. It was adopted by the Korean farmers before industrialization. The Japanese, the Korean and the European made winnowing machines localized to satisfy the need of agricultural production. In addition, they added two gear-wheels to the machine in order to make fans turn more quickly. The Japanese called the winnowing machine “唐箕” or “翼車”.

When we pay attention to the technical similarities and diversity, we can make a list of machines and tools in East Asia, including the plough, the swape, the trip-hammer, the mill, the sieve, and so on, which were shared and improved or innovated by different religions. Indeed, it will be quite worthwhile and very productive to make transregional studies of technology and scientific knowledge in cultural and social



contexts. The comparative studies will help us find the possible connections and diversity of knowledge among East Asian countries, so that we can have deeper and deeper understanding of harmony in diversity (화이부동, 和而不同).

Plenary Lecture III**Some Reflections on Needham's Intellectual Heritage**

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The Needham Research Institute

As a founder of the field of East Asian history of science, technology and medicine, Joseph Needham (1900-1995) left a distinct imprint on the field and his intellectual influence has been profound. As Leon A. Rocha has written recently, "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." The deep relevance of Needham's work to ongoing scholarship is eloquently encapsulated in this statement. In this presentation, I shall take two case studies, *paktong* and iron/steel technology, to show how research has moved on since Needham's work, and how that work still remains meaningful and relevant to current research in certain ways. I shall also argue that rather than see Needham's work as entirely outmoded, there is always something to be gained from revisiting it, albeit with a critical eye and attention towards newer developments.

About thirty-five years ago, when I began my master degree research at the Beijing University of Iron and Steel Technology, the thesis topic my supervisor Professor Tsun Ko chose for me was *paktong*, or "white copper," an alloy of copper and nickel or of copper, nickel, and zinc. The first major reference book was Joseph Needham's *Science and Civilisation in China*, Volume 5, part 2, published in 1974. Under the sub-title "Silver Uniform-Substrate Alloys," Needham took seventeen pages to present his detailed research on the history of *paktong*.

As a young scholar who had just entered the research field of the history of science and technology in the mid-1980s, I was deeply attracted and impressed by the history of *paktong*, but at the same time it seemed quite clear to me how difficult it would be to carry out further research that would go beyond Needham's work, since it appeared to present such a complete narrative of the history of *paktong* in China and its standing in world history. Professor Ko must have noticed my worries and thus pointed out to me that Needham's work was conducted mostly based on primary and secondary books and research papers, and what I needed to do was something different. He then guided me to consult geological investigation reports as well as the local histories of Yunnan and Sichuan provinces to look for clues to locate ancient mining and smelting sites for *paktong*. Field investigations of these sites then followed, as well as laboratory examinations of ancient mining and smelting samples collected from the production sites. Based on the new evidence gleaned from my field investigations and laboratory work, I completed my master thesis, which offered a new understanding of the *paktong* smelting process in ancient China.

In 1994 when I visited the Needham Research Institute (NRI) in Cambridge as a one-year visiting scholar, I was surprised to learn that a great number of eighteen-nineteenth century artifacts made of *paktong*, such as candlesticks and fire-grates, had survived in the UK, and that they had become collectable as they were considered quite rare and valuable. I immediately realized that research on *paktong* was far from complete and that much more could be learned from the surviving *paktong* pieces, which had not received sufficient attention in previous research. In 1995 I published my first paper in English summarizing the research results of my year-long visit to the UK, which focused on the export of *paktong* to Europe from the seventeenth through nineteenth centuries, and included a few results of the analysis of *paktong* artifacts from



both China (water-pipes) and the UK (candlesticks). I thought my interest in paktong would end there since I had decided to do my PhD research on early copper and bronze metallurgy at the University of Cambridge starting in 1995. However, fifteen years later, in 2011, when I was working as a professor at the University of Science and Technology Beijing, paktong reappeared on my research agenda because one of my PhD students seemed to have some potential to push this research forward once again. He did indeed do this, as evidenced by his thesis, published in English, "Research on Chinese Paktong and its Transmission to Europe during the 18th and 19th Centuries," which contributed new understanding to the history of paktong. When we set out this new paktong research project, one of the key objectives was to establish a case that would still glorify the Chinese contribution to the development of world civilization, and we did not yet realize that the circulation and localization of knowledge itself had already emerged as a central theme in the studies of the history of science and technology over the previous decade.

The reason why I have taken the time to reflect on my involvement with paktong research over the past three decades is to present a personal case highlighting the relationship between Needham's work and the growth of a tiny research field like the study of the history of paktong. As we can clearly see now, there have been some significant shifts in research paradigms over the past three decades.

The first obvious shift is the growing importance of artifacts or material heritage in studies of the history of technology. The last two decades have witnessed a steady increase in the study of archaeological artifacts and other remains, which has provided considerable evidence for reassessing the history of metallurgy in ancient China. Such an emphasis on archaeological finds and material remains among Chinese scholars was deeply related to a growing interest in substantiating China's own cultural heritage and thus also its scientific legacy.

The second significant shift is the research focus. For a long period, as is well known, Needham seemed to be preoccupied by questions of priorities (who did what first). To him, questions of priorities were important because they could suggest the transmission of a technology from one place to another. Until the early 1990s, probably due to the influence of Needham's

work, questions of priorities still occupied a central position in the research agenda of many Chinese scholars. For many scholars, it was taken for granted that the mission to research the history of science and technology in China was inextricably linked to listing China's great achievements, thus demonstrating the major contributions they made to the world. Such a patriotic or nationalistic approach as research motivation was quite predominant during the 1970s-80s and can be discerned easily in many publications of the time. It seems that over the past two decades, questions of priorities (who did things first) have gradually lost their central position and stimulating power. More and more Chinese scholars, especially from younger generations, now choose their research topics based on an academic perspective rather than patriotic considerations. For them, how China interacted with or was related to the Eurasian steppe or Central Asia seems more interesting and challenging. The third shift goes deeper and concerns what questions can be asked if questions of priorities are put aside. Needham's approach to comparative history had a distinct tendency towards establishing a chronological setting for all the important events of technological development. This was because he had a strong belief in, and sought to uncover, the connections between all the civilizations of the world. His approach was also heavily descriptive. Once all the facts were presented, his narrative also ended. His history of paktong was just such an example of this. To him, paktong was just another arch or pillar in the bridge connecting China to the outside world. That is all; case closed. But, is there anything missing? Yes, in this case Needham did miss something important, that is, the socio-economic context for paktong production and consumption. In China, paktong was just a common material and only used to produce objects for daily use - like water pipes, inkwells and basins - which were mostly consumed by ordinary people. Its importance in society was rather limited. However, after paktong was imported into Europe, it was considered rare and exotic there and thus was used to make expensive items such as candlesticks, fire-grates and domestic wares, designed to meet the needs of upper-class society. More significantly, the importation of paktong from China actually brought new knowledge of metals to Europe, subsequently stimulating chemical research and industrial manufacture there. A

deeper question we should then ask is why the destinies of paktong in China and Europe were so different. To answer it we would have to return to the original socioeconomic contexts, which must have played a crucial role in shaping the trajectory of the technological developments involved.

The two cases (*paktong* and iron and steel technology) presented above reveal a complex picture regarding the relevance of Needham to our current research field. It is quite clear that on many fronts, Needham has become or is becoming an out-of-date figure, because of the tremendous level of research progress that has been made over the last two decades since his death. We should admit that there are not so many people, especially among younger generations, reading Needham's work now. In the eyes of many people, he has gone, and rightly so. But nobody can deny that Needham left a distinct imprint on the field and his intellectual heritage is rich and diverse, reaching well beyond the so-called Needham Question, and will surely be worthy of revisiting and further systematic examination.

In my opinion, one of the most significant aspects of Needham's intellectual heritage is his broad view of the connections between technological developments across cultures and regions through the ages. Although in many cases he seems to have been more concerned with the immense debt Western civilization owed to China, the recent research carried out in China has actually revealed substantial evidence for the cultural and technological stimulation China received from neighboring regions over the centuries. Whatever the direction of movement of ideas and material cultures, from prehistory to the historical periods, China was undoubtedly a key player in the development of world civilization. In many ways, Needham can be seen as a pioneer in advocating the global circulation of knowledge and technology, as demonstrated by his ceaseless dedication to integrating China into world history. Needham's work remains deeply relevant to contemporary scholarship and still sets a marker for ongoing research in many respects. Needham's intellectual heritage is unique, substantial and multi-dimensional, and will surely continue to encourage and inspire new generations of inquisitive minds.



Plenary Lecture IV

Bian Que Dissatisfied ---- Current Debate over Key Issues of Chinese Medicine History

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My research work started by looking at the photo of the figurine excavated from Tian Hui Han tomb. The paper questions the possibility of the existence of the so-called Bian Que school, and, obliquely, the relationship between the school and the figurine, as well as texts found in Tian Hui Han tombs. It shows how diverse was the disjointed knowledge of medicine in early China. According to Italian historian, Carlo Ginzburg (1939-), 'The art connoisseur resembles the detective who discovers the perpetrator of a crime on the basis of evidence that is imperceptible to most people.' Like a detective, we too will need to look for marginal evidence that gives us more clues to understand the diverse medical knowledge of the time.

I will begin by examining the concept of colour diagnosis *se zhen* (色診) and particularly the *wu se zhen* 五色診, the five colour diagnosis, which is believed to be a fundamental technique of the so-called school of Bian Que, and which is represented in the Tian Hui finds. If the essence of Bian Que's medicine is colour diagnosis, how does one understand its specific characteristics?

Before the Qin dynasty (221-206 BCE), there were different notions of *Se* 色: It could refer to colours, women's appearance and sexuality, and one's attitude and expression, as well as one's moral bearing. However, we cannot make a correspondence between the Chinese *se* 'colour of the body' and the Western 'colour of flesh and muscle', because this fails to illuminate the concept of the early Chinese medical and/or 'acupuncture' body.

Huang Longxiang considers five colour diagnosis to be a unique technique belonging to the Bian Que school. He discovered many lost writings of Bian Que's five colour diagnosis between *juan 1* and *juan 6* of *Maijing* 脈經 The Pulse Classic. In this text, the five colours in Chinese Medicine relate mostly to the five

viscera. However, Keiji Yamada(1932-), who divided the content of *Neijing* into many different schools and stages, has made some creative analysis of the five colours. Opposing Huang Longxiang's view, Yamada believes that 'The five colour' chapter in chapter 8 of *Lingshu* should be considered as a text belonging to the school of the Yellow Emperor. He argues that five colour diagnosis is not a technique exclusive to the Bian Que school. There are many schools of colour diagnosis in the early period of Chinese medicine. Joseph Needham (1900-1995) in 1976 published a paper asserting that the most important technique of Bian Que was the long-term or future diagnosis. It is the ability to give a prognosis of likely outcomes over a period of few months or even longer. Do the excavated texts on five colour diagnosis include such prognoses?

Let me give you an example illustrating the difficulties of understanding colour diagnosis. Chunyuqi, a physician during the time of the Emperor Wen of the Han dynasty, had a patient called Song Jian who manifested 'colour dry' (*se gan* 色乾) of *Tai Yang*. The dryness here has something to do with the body fluids. But what is 'Tai Yang' and what does 'colour dry' mean? Takigawa Sukenobu (1865-1946) who wrote *Shijihui zhukaozheng* (史記會注考證 Textual Criticism of 'The Historical Records' with Commentary) follows Taki Motoyasu (1755-1810) in saying that the location of *Tai Yang* was not known. Even eminent scholars and physicians such as Takigawa Sukenobu and Taki Motoyasu did not know how to interpret 'colour dry' in this medical case, it is clearly not easy to understand its meaning in this context. All we can say is that the 'colour dry' is unlikely to refer to the patient's complexion?

Let us now focus on the figurine itself. With its round skull and square feet, the Laoshanguan figurine resembles a real person. There are characters on various parts of its body. For instance, on the exterior

of the collarbone the “盆” character is written (缺盆 *quepen*, empty basin). On the back of the figurine, in the centre, there are technical terms referring to the five organs - heart, lungs, liver, stomach, and kidneys. This statue of only 14 cm, with characters in several places on its body, has a practical function for medical treatment and at the same time throws light on how the body is viewed in Chinese medicine.

Why was *quepen* in particular highlighted on the whole body of 119 acupoints? If this figurine was used by a medical practitioner, what was the purpose of indicating this particular location? In the *Jiayijing* 甲乙經, the oldest surviving writing on acupuncture and moxibustion written in 3rd century CE, *quepen* does not have a fixed horizontal position. It says only that it is in the centre of the hollow on the shoulder. It is an approximate location. Most acupoints were envisaged in this way in traditional Chinese medicine. In the course of time, the idea of an ‘area’ of the body in Chinese Medicine became increasingly precise and standardised. Near *quepen*, in the armpit of the figurine, there are 2 characters that are easily overlooked. The name of this position is ‘armpit abyss’, *yi* 亦 meaning armpit. In this case, ‘abyss’ means a deep pool. In early periods, it was forbidden to apply needle or moxa to this location.

The Laoguan Shan figurine is not large, only 14cm tall, but on its body not only are there traces of channels and vessels, there are also up to 119 cavities. Furthermore, in this very limited space, there are many places carved with characters, as mentioned earlier. Who would have originally been looking at these characters? What are these lines on the body? This is the first time we see an excavated medical figurine with Chinese characters. Its value is beyond words.

This figurine has 119 acupoints, roughly the same as the total number of acupoints recorded in the current version of the Inner Canon, the *Neijing*. The idea that there are 365 acupoints in *Neijing*, in accordance with the number of days in a year, is incorrect. There are in fact just over a hundred acupoints named in *Neijing*. These 119 acupoints are not scattered irregularly but are concentrated in four large regions, namely: the neck, the torso, upper limbs and lower limbs. The history of the body in Chinese medicine does not start

with identifying fixed positions of channels and acupoints. Thus, we do not need to focus on individual acupoints but on the concentrated areas of the 119 acupoints. Between the two eyebrows of the figurine, there is an obvious hollow. At the navel there is also an unusually obvious hollow. The fact that these two places are made prominent causes us to be more vigilant about what they signify. The figurine suggests an inner vision of the human body. This archaeological object offers concrete evidence when considering actual conditions in the early Han period - specific material evidence which we can see without it being distorted by the lens of the mature system of Chinese medicine.

Although the Laoshanguan style of vessels has solid lines, they do not necessarily reflect any universal reality of that time, or any reality of the body itself. Huang Longxiang says that various types of vessels can only be an approximate interpretation, and that before the Han dynasty, anyone at any time could imagine any disorder manifestations occurring in different parts of the body as somehow connected through some basic medical principles of interconnectedness emerging at that time. This allowed speculation about the existence of new channels. It is possible that some of these ‘discovered’ channels did not survive, and there was a strong tendency towards consensus guided by authority. Yet channels were certainly emerging on the basis of the empirical experience of acupuncture or acumoxa gained at the time. Therefore, to compare the modern standardised chart of the ‘Acumoxa acupoints atlas’ to the acupoints of archaeological tomb finds is undoubtedly fruitless labour. The channels and the acupoints of the figurine are only approximations by the specific group of people engaged in the creation of the figurine at that time (perhaps physicians, carvers, those making the lacquer etc.) and can therefore be interpreted in a number of ways.

What is the history of Bian Que’s body? What is the history of the Yellow Emperor’s body? Huang Longxiang’s approach to the ‘*Huangdi Neijing*’ maintains that a majority of texts come from Bian Que school, and that the Yellow Emperor lineage was a corollary. I question this theory and can cite evidence proving the situation to be far more complex than that, and leading



us to doubt the existence, during the Han period, of single lines of knowledge transmission. Legends created during this time, and adopted in later times, attribute theories to Shen Nong, to Bian Que and to the Yellow Emperor, but to tease out a chronology would be problematic, since we can see the same techniques in a variety of different texts (the standard histories, in excavated manuscripts etc.), either attributed to these legendary figures, or non-attributed, all circulating during the course of the Han period.

According to *Zuo*zhuān 左傳 (Zuo's commentary on *Chunqiu*, ca 400 BCE) and *Shiji* 史記 (Records of the Historian, ca 100 BCE), there were physicians who were active in the Qin and Qi regions who attributed the source of their writings to both the Yellow Emperor and Bian Que. It was only later when people tried to organise these texts that they were placed into different categories.

Huang Longxiang went a step further by, while retaining the 'question and answer' format of the classical version of the *Neijing*, changing the protagonist from The Yellow Emperor to Bian Que. In effect, Huang was suggesting that it was in fact Bian Que in the original text of *Neijing* and that at an indeterminate point, the identity of the protagonist was changed to the Yellow Emperor. Huang maintained that he was simply reconstructing the original text. This was highly questionable, as there is no concrete evidence to suggest that these 30 *pian* should be attributed to Bian Que. In the *Shiji* account of Bian Que's medical records, Sima Qian did not mention Bian Que's ability to diagnose through pulse. This is because he wants to emphasise that Bian Que was not famous merely for pulse taking but has many other talents such as his ability to predict life or death, or to diagnose by observation.

What are the differences between the excavated finds, including the hand-written manuscripts, and the medical texts of received literature? To give an example, in the current version of *Neijing* there are more than 40 *pian* referring to *weiqi* 衛氣 (protective qi). However, there is nothing about *weiqi* found in any of the excavated manuscripts we have discovered so far. One of more than 40 *pian* which mentions *weiqi* is *Lingshu* 76 'Movement of the Protective Qi'.

According to Wang Yuchuan (1923-), this *pian* includes three types of theory on *weiqi* and points out that these sections originally came from three independent texts, which were later combined within one chapter, as they all relate to the same topic.

It seems that there was insufficient communication around the whole of the Chinese cultural area for us to expect to see uniformity in theory or to imagine a single school of thought. Therefore, is it more sensible to look for regional medical identities, and in this case for the Shu region? A modern Chinese scholar, Xie-Keqing, emphasises the local characteristics of medicine, stating, "In the Han dynasty, Sichuan was situated in a remote place, and there were not convenient links with the central plains, channels and so have local medical features of Ba Shu (巴蜀 two ancient states, i.e. Sichuan region)." Unfortunately, we have not accumulated sufficient material and data to illustrate regional differences, hence we are unable to argue convincingly that the Laoguanshan figurine carries a particular geographical feature. Instead of suggesting that this figurine reflects a Sichuan regional feature, perhaps it would be more accurate to suggest that it reflects the interests of the owner of the tomb.

'The Birth of the Codex', by Roberts, C.H. and Skeat, T.C., examines the origin of books which were not meant for circulation. In some cases, this is indicated by the book's design. They were intended for certain designated readers, who copied them in their exact format. Similarly, tomb objects, including texts, were not intended for circulation. Therefore, how should we understand these kinds of objects which were not meant for circulation? When something is not intended for circulation, much of its knowledge and/or techniques can easily be lost.

Zhang Ertian (1874-1945) asserts that books can be attributed to an authority, such as Bian Que, but learning of skills cannot. In ancient times, even though there were texts which came from more than one hand, they cannot be regarded as a single lineage of learning. Furthermore, Zhang Ertian maintains that it is not possible to forge manuscripts in antiquity. All documents surviving from antiquity, on a certain level, are genuine. 'Attribution to an authority' is not the same as deliberate forgery. The fact that Laoguanshan

medical books may not belong to Bian Que's school by no means decreases their scholarly value.

The history of early Chinese Medicine has been continuously rewritten, mainly because of these new excavated finds. Therefore, we should always remain cautious and continue to ask questions such as: Has the current version of Huangdi *Neijing* more than 30 *pian* belonging to the Bian Que school? Do the Tian Hui Chinese medical tomb finds have a Sichuan local flavour? At present, all medical tomb finds are concentrated in the first period of the Western Han (approx. 2nd century BCE). Is this by chance? Things in the past remain in the past and therefore it is impossible to say with certainty what was happening. Between what is seen and what is described, how was the body imagined? We should continue to investigate.

Plenary Lecture V

Technology Transfer against the Flow: Learning from China in the British-Indian Tea Industry, 1839-1890

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[W]hen the skill and science of the Europeans, aided by thermometers, &c, shall once be applied to the cultivation and preparation of tea in favourable situations, the Chinese tea will soon be excelled in quality and flavour.¹⁾

No comparison can be drawn between tea manufacture as followed out in China and India in this year 1881. The former is as crude as it was two or five hundred years ago; the latter ... is a striking illustration of the activity, the energy, the inventive genius of the Anglo-Saxon race.²⁾

Historians of technology have successfully challenged the concept of technology transfer as an unproblematic “transfer” or “diffusion” of modern technologies outward from the West to the less economically advanced and technologically privileged regions of the world, a ‘mere extension of steamships and railroads into the non-European sphere’. After pioneering the critique of technology transfer as a tool of imperialism, more recently historians of technology have highlighted and analysed the complex processes of adaptation, appropriation and co-production, of reconfiguration, hybridisation or creolisation that allow the successful implantation of an introduced artefact or technical system. As David Arnold notes in his manifesto for incorporating everyday technologies into the debate, the focus on “big” or “heroic” technologies like railways, dams or warships risks deflecting our attention from the arguably more profound practical and cultural impact of humbler technologies like bicycles or sewing-

machines. These more encompassing approaches to technologies on the move and settling in have stimulated a series of provocative and illuminating studies that are transforming our appreciation of material culture and its politics in East Asian history.

Almost invariably, however, the cases selected for these studies deal with just one direction of flow of knowledge, techniques and artefacts, that is to say a colonialist flow of “advanced” technologies introduced from Western industrial nations into non-Western, non-industrial countries. Here I present an unusual case of what we might call East-West technology transfer, the transplantation from China to British India of what was to the British a totally new and unknown industry: the manufacture of tea.

As the quotations above suggest, the British were convinced that their superior science and industrial ambitions would rapidly transform the Chinese handicraft-scale methods of tea processing which they had imported into Assam into a shiny, efficient, mechanised, science-based industry. This goal proved remarkably slow and difficult to achieve; indeed, even in the 1930s the Indian tea industry was still only partly mechanised and continued to depend heavily upon manual craft-skills. As I shall demonstrate, although rendered invisible by their very success, Chinese inputs and methods in multiple phases of tea production, from breeding the bushes to sorting the cured leaves, were absolutely integral to the creation, evolution and long-term success of the British-Indian tea industry. Unthinkable as it was to the lords of the British Empire to acknowledge any technological debt to “John Chinaman”, the thrusting new tea industry which they built up with huge investments of capital and effort was in fact a Chinese-Indian creole technology.

I developed this study as a contribution to Pamela

1) John Walker, *Memorandum*, in *The Measures Adopted for introducing the Cultivation of the Tea Plant within the British Possessions in India*. British Parliamentary Papers, 24 January 1834: 11.

2) I.L. Hauser, *Tea: its origin, cultivation, manufacture and use*. Chicago, Rand, McNally & Company, 1889: 11.

Smith's recently published project on technological entanglements, in which she calls upon historians to look afresh at modes of connection and registers of impact as people, ideas, materials, skills and products travel.³⁾ My method was to reconstitute as fully as possible the sequential phases of what archaeologists and anthropologists of technology call the *chaîne opératoire* or procedural sequence of tea cultivation and processing, in order to pinpoint and trace transfers, divergences, fusions, adaptations or transformations of the different stages and of the overall process of tea production. I drew on the records of the Assam Tea Company, which pioneered tea cultivation and manufacture in India; on other sources selected from the huge technical literature of the Indian tea-industry during the first century of its life; and on the detailed accounts of Chinese tea-producing techniques published in around 1850 by Samuel Ball, East India Company Inspector of Teas in Canton from 1804 to 1826, and Robert Fortune, plant-hunter extraordinary who smuggled tea-plants and tea-workers out of China to help set up the fledgling Assam experiment in tea-growing.

* * *

In the late 1830s the British began experimenting with tea-growing in their newly acquired territories in Assam to substitute for expensive imports from China. As no foreigners were allowed into China's interior before the Treaty of Nanjing in 1842, the processes for making the tea on which the British spent so much money remained unknown and mysterious, even to the agents of the East India Company who purchased the cured leaves from Chinese tea-brokers in Canton, the only Chinese port they were allowed to enter. Tea-making was, in effect, a "black box". But even British genius was not up to reverse-engineering a leaf of cured Bohea tea; myths circulated that the best leaves were gathered by monkeys, or that Chinese tea-makers rolled each leaf of the highest quality grades individually. So when the British government decided to build a rival tea-industry on its own territory in Assam, the only realistic way to begin was

to bring in plants and expert workers from China. Some tea experts like Ball and Bruce, the manager of the first experimental tea-gardens in Assam, had the highest respect for the technical skills and knowledge of Chinese producers, admiring the economy of a technical system that combined cheap and simple equipment with sophisticated craft to produce a wide range of products and working closely with them to learn their techniques. More typically, however, British tea entrepreneurs or experimenters were dazzled by the dream of a brave new world of machines and scientific instruments. To them the Chinese tea-craft was not a model to learn from, but a raw material to be reworked into a superior British product.

The British government, the East India Company and newly-formed companies like the Assam Tea Company (established in 1839) imported Chinese tea-plants and seeds, Chinese tea-coolies and various other forms of Chinese skill and expertise into Indian territory, attempting to adapt them to this alien natural and social environment through various processes of naturalization that notably included applying 'the skill and science of the Europeans'. In contrast to the decentralized, smallholder-based Chinese tea-industry from whose components it was initially constructed, the Indian tea-industry was conceived and developed from the outset as a large-scale, capital-intensive enterprise in which individual estates stretched over hundreds or sometimes thousands of acres. This model was drawn from the sugar-plantations of the West Indies, and also echoed the passion for scale-economies that was currently structuring the industrialisation of manufacturing and improved agricultural management models at home in the British Isles. Not surprisingly, the fit between Chinese technology and British ambitions was awkward from the start, but Chinese techniques proved sufficiently flexible to adapt to evolving British demands.

The establishment of the Assam tea-industry was initially an exercise in import substitution. The Chinese tea-men worked closely with Bruce and other pioneering British planters through the 1840s to establish a model for growing and manufacturing classic Chinese-style teas. The model they developed is interesting because it selected from a spectrum of

3) 'Translating the art of tea: naturalizing Chinese savoir faire in British Assam', in Pamela H. Smith (ed), *Entangled Itineraries: Materials, Practices, and Knowledge across Eurasia*, University of Pittsburgh Press, 2019: 99-137.



Chinese practices to assemble a tea-technology adapted to conditions in Assam. This tea-technology was already oriented towards streamlining and the reduction of skilled labour inputs: in other words, it was a version of Chinese tea-manufacture that adapted well to subsequent industrialisation. The other Chinese contribution was still more significant. Key elements of Chinese tea savoir-faire, in particular cutting-back and transplanting, were successfully applied to the domestication of a native tea species, the Assam plant, through the 1840s. Although these techniques were discarded as soon as a routine of growing from seed could be established, the initial domestication of the wild Assam tea-tree nevertheless constituted the foundation of the Assam-tea industry.

Chinese tea-bushes were prized for their delicacy, but they produced only small amounts of tea-leaves and could only be harvested three times a year. This was perceived as a severe limitation by British planters seeking to maximise profits from huge, sprawling estates. The problem was still more urgent because it was necessary to import large numbers of indentured labourers into the remote hills where the estates were located, to clear land, tend bushes and man the factories.

The Assam bushes solved this problem of matching scale of unit to productivity of the plant. The vigour of the Assam bush supported a progressive extension of the harvesting-period, culminating in year-round plucking. The large, sapid Assam leaves proved unsuited to Chinese processing methods, and their flavour developed more fully if they were broken instead of being kept whole. The characteristics of the Assam plant favored the dynamic of industrialization which British planters favoured. Although it took until the 1870s to develop machines for crushing the leaves, this mechanical treatment improved the quality of tea and increased the volume that could be processed, while an extended harvesting season and an extension of the acreage made such investment worthwhile. For the China bush, with its short season and its tougher leaves requiring more labor-intensive processing, the potential for mechanization was limited, and it is not surprising that the mechanization of the Indian tea-industry through the 1870s and 1880s coincided with the abandoning of the China bush. By then the British tea companies had fortunately succeeded in

persuading consumers to drink strong black teas in preference to aromatic green teas.

By the late 1880s the native Assam tea-stock had almost entirely replaced the original Chinese bushes, now disparaged as insipid and inferior, and the elaborate Chinese skills of tea-processing, initially learned with great pains, were likewise dismissed as inefficient. By now the thousand-acre estates were processing thousands of pounds of leaves each day, wherever possible with machinery. Nevertheless, if we look at how key operations including plucking, sorting, withering, fermenting and grading were carried out as late as the 1930s, we find that they still depended not on machines and scientific instruments, but on skilled workers using their hands and their senses.

So in what sense was the Indian tea-industry a hybrid? The British expected that applying 'the skill and science of the Europeans' would speedily transform these raw materials into an efficient, industrialised Western model of tea production. New plants were bred, new curing processes developed, campaigns were pursued to re-educate British tastes, science was invoked and engineers were engaged to design specialized machinery. After about thirty years, as the Assam bush steadily replaced the Chinese bush both on Indian estates and in the affections of the English tea drinker, British planters felt in a position to disparage and dismiss Chinese bushes as weeds and the Chinese contribution to their new technological system as crude, indeed an impediment to progress. But in fact it was a close collaboration between the early Chinese tea-men and attentive, sympathetic British planters like Bruce that produced the industry-compatible Assam bush and established the essential technical system for cultivating that plant and processing its leaves. In other words, to assess the full importance of the Chinese contribution to Indian tea, we have to retrieve and give due weight to a poorly-documented episode which lasted only a few years.

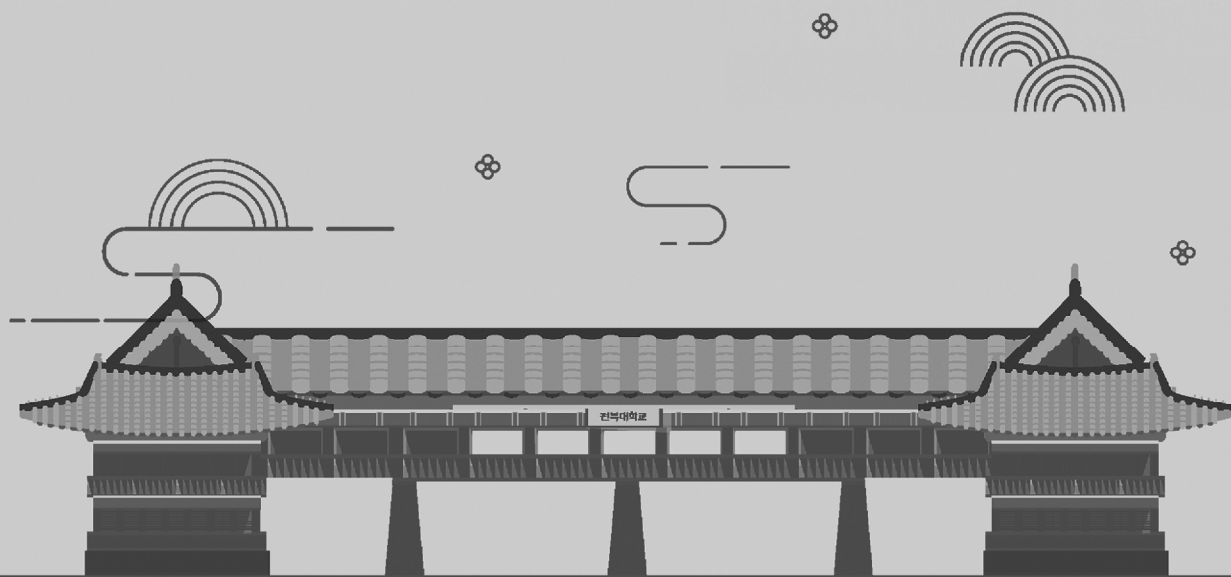
It was the characteristics of this newly developed Assam bush that paved the way for the partial mechanisation of processing that ensued, and the mechanised steps were always just part of a full procedural sequence many steps of which still deployed the manual techniques brought in by the Chinese tea-men and adapted by them to local conditions and to the new factory scale in the early experimental tea-gardens of

Assam. For historians it is an interesting challenge to think about this protracted hybridisation of an imported technology as a counter-intuitive case of technology transfer, not from West to East but from East to West.

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CHONBUK NATIONAL UNIVERSITY, JEONJU, REPUBLIC OF KOREA

MoA1

Books, Materials, and The History of Medical Knowledge

Organizer: Hyunkoo Kim (University of Oxford)

This panel deals with how medical knowledge was produced, circulated, and transformed in East Asia. To do this, papers focus on various agencies such as medical books and acupuncture materials.

Books, Materials, and The History of Medical Knowledge

MoA1-1

The Meaning of Acupuncture Materials Evacuated from Xiaoyingzi Tomb, Yanji and Neighbouring Region

Wung Seok Cha

College of Korean Medicine, Kyung Hee University

The Study of Acupuncture Materials Evacuated from Xiaoyingzi Tomb in 1938 was published in the Korean Journal of Medical History in 2017. Numerous bone needles, stone needles, and other medical devices were found in the Xiaoyingzi excavation. The stone needles from Xiaoyingzi can be categorized into three grades, based on length, of 8cm, 12-15cm, and 18cm. A set of round stones for massage were also discovered, along with obsidian blades. These relics were carefully stored in the middle of the body in the stone coffin. This article mainly focused on the archaeological point of the materials. This article carefully investigates that the relics have nothing to do with weaving textile or military use, eventually should be medical use. This recent studied acupuncture materials indicate a new point of the early stage of the meridian system.



Books, Materials, and The History of Medical Knowledge

MoA1-2

A Research for Eoyakwonbang Printed Versions thru History of Medical Exchange

Jichung Song
Daegu Haany University

Eoyakwonbang is a medical prescriptions book of Yuyaoyuan, an imperial medical bureau of China. While the first edition of this book does not exist at present, three versions printed in Korea and one version printed in Japan, which is well-known as Gyesasingan *Eoyakwonbang*, have been passed down. *Eoyakwonbang* is a meaningful text for the history of medical interchange between China, Japan and Korea. However, research on the versions and contents of *Eoyakwonbang* has been insufficient. There are three types of *Eoyakwonbang* printed in Korea; 2 Singanhyemin *Eoyakwonbang* and 1 Gyesasingan *Eoyakwonbang*. One of Singanhyemin *Eoyakwonbang* were printed with Eulheja type (so we call Eulheja *Eoyakwonbang*) and another that was found at Jeonggadang collection thru this research(so we call Jeonggadang *Eoyakwonbang*). Also, Gyesasingan *Eoyakwonbang* was printed with Gapjinja type (so we call Gapjinja *Eoyakwonbang*). Japan also printed different *Eoyakwonbang* at Gwanjeong period in Japan (so we call Gwanjeong *Eoyakwonbang*). Even if Eulheja *Eoyakwonbang* does not have full volume, contents and record way of prescriptions are well organized comparing to Gapjinja and Gwanjeong *Eoyakwonbang*. And Jeonggadang *Eoyakwonbang* is much same as Eulheja *Eoyakwonbang* comparing with full chapters of Eulheja. According to this comparing research, some conclusions were derived; 1. Gyesasingan *Eoyakwonbang* is estimated as the name of *Eoyakwonbang* when it flowed in Korea for the first time. 2. Eulheja *Eoyakwonbang* was printed in Korea with great efforts to make a fine edition based on Gyesasingan *Eoyakwonbang*. 3. Jeonggadang and Gapjinja *Eoyakwonbang* were also printed in Korea. 4. Jeonggadang was based on Eulheja and Gapjinja was based on Gyesasingan *Eoyakwonbang*. 5. Gwanjeong *Eoyakwonbang* was printed at in Japan based on Gapjinja *Eoyakwonbang*.

Books, Materials, and The History of Medical Knowledge

MoA1-3

A Research of Medical History on *Boyousinpyun*

Jeong-ah Lyu
Division of Humanities and Social Medicine, School of Korean Medicine, Pusan National University

Boyousinpyun (保幼新編) is a book on medicine specializing in pediatrics. It was written in the late Joseon period. The 1845's block book contains both a preface written by No Guangri (盧光履:1775~1856). He said that the author hid his name, and decided pen name to Moogi teacher. In the latest research, an opinion that the author of *Boyousinpyun* is *Sinman* (申旻:1620~1669) was brought up. The opinion is not sure yet, but the author of *Boyousinpyun* must be a Korean doctor in the late Joseon period not be a Chinese. Because the author referred to Korean Herb Medicine at introductory remarks.

This pediatric book remains a number of editions. The representative editions are 1845's block book, before 1845's manuscript, and 1909's edition published at Daegu (大邱) Jaejeondang (在田堂) printing house. There is an edition written in Korean. The 1909's edition was republished in 1913. Maybe there was another edition. These historical facts tell the *Boyousinpyun* was repeatedly copied or published from the late Joseon period through the opening port era and period of the empire of Korea until early Japanese occupation period, so was having a wide range of readership and were widely used to real pediatric clinics and infant care. It established clear medical logic and was consisted of all needed knowledge and skills for real pediatric clinic and infant care in one article.

Boyousinpyun (保幼新編) was a Korean representative pediatric medical book in the early modern period that were widely used to pediatric clinics and infant care because of its clarity and practicality.

Books, Materials, and The History of Medical Knowledge

MoA1-4
Medical Books on Smallpox in The Joseon Dynasty from The Mid 17th Century to Early 18th Century

Dong Ryul Kim
 Semyung University

In the early 17th century in Joseon, *Unhaedouchang-jipyo* (諺解痘瘡集要), a standard medical book for smallpox treatment, was published. But among the people, the dependence on shamanism in smallpox treatment was high. The *Duchanggyeongheombang* (痘瘡經驗方), a smallpox-specialized medical book published in the mid-17th century, illustrates this trend. Park Jin-hee (朴震禧) is the author of *Duchanggyeongheombang* and he wrote a book by adding his thoughts and experiences to it. Through this book, he strongly criticized smallpox shamanism rampant among the people.

Meanwhile, Yu Sang (柳璡) was a smallpox specialist who had been active in the Joseon royal court since the late 17th century, and was famous for successfully treating smallpox by three Joseon kings. In addition to Park Jin-hee's *Duchanggyeongheombang*, he wrote *Gogeumgyeongheomhwalyubang* (古今經驗活幼方) by combining various medical books and his experiences. Through this book, Yu Sang specifically left his know-how in treating smallpox developed in the Joseon royal court.

MoB1
Negotiating Productivity for Multi-species: Asian Seascapes in Transitions in The Anthropocene

Organizer: Mayumi Fukunaga (University of Tokyo)

Dispersal of the development regime in East Asian countries has been producing modernized seascapes, characterized massive reclamations, grey-concrete, and linear designs. Despite they are conjugation of various historical and on-going taskscape (Ingold 1993) and their transition remains, such contexts and praxis among human and non-human beings has been written out of our contemporary visuals. Currently, a new engineering wave under green neoliberalism comes to the coast and reorganize the seascapes and non-human lives for climate resilient infrastructure, renewable energy, or industrialized aquaculture. What does such new-engineering the coast and non-human lives come to bring us? How does dominancy of the modernized seascapes interplay with this new wave? Moreover, what nature and wilderness come arise as the re-imagined and generated? Through unfolding historical transitions and un-transitions of taskscape in the dominant modernized seascapes, this session explores historical trajectories of human imaginations of socio-natures, especially focusing how we have negotiated with the concept of productivity. Productivity, one of the powerful tool concept used to legitimize political and economic development projects, has framed governmentality, codes, and objectives and technologies to engineer the coasts and non-human lives, mobile people with its imagination of future, and bind human perceptions of multi-species politics and ethics. Throughout the session, we will discuss how we can re-imagine socio-nature alternative to the modernized or neoliberalized imagination.

**Negotiating Productivity for Multi-species: Asian Seascapes in Transitions in The Anthropocene****MoB1-1****Conflicts among Stakeholders over the Use of the Coastal Seascape due to Discordance on the Issue of "Productivity": A Case Study of the Post-war Experience of the *Sakura Shrimp* (*Sergia Lucens*) Fishery in Suruga Bay, Japan**

Ryoto Tomita

Faculty of Agriculture, Shizuoka University

In Japan, a number of coastal seascapes have been modernized to increase productivity. Coastal development projects such as landfills and reclamation have modified the marine environment. Environmental pollution, such as hazardous substances and eutrophication as a result of industrialization and urbanization, have had adverse effects on human life and health, and the coastal ecosystem. Improvements in technology in fishery, marine product processing and the distribution system have resulted in the depletion of coastal natural resources through over use. Under these circumstances, local stakeholders, such as the fishers, fishery processors, and the factories that have been the source of pollution, have experienced conflict. All stakeholders share the common point that they are trying to increase productivity by using the coastal seascape. However, each stakeholder has different interests regarding the use of the seascape. In this paper, the post-war experience of the sakura shrimp fishery at Suruga Bay in central Japan is analyzed. Sakura shrimp fishers and fishery processors have struggled with environmental pollution. However, regarding the management of the sakura shrimp resource, there has been mutual distrust between the fishers and the processors, which is rooted in their social identities (Wynne 1996), although both parties agree that the "sustainable use of coastal ecosystem" is profitable. This mutual distrust has become a major impediment to sustainable sakura shrimp utilization. There are differences by stakeholder in the interpretation of the seascape, depending on each group's different knowledge of the environment and the technologies they use. The knowledge and techniques gained change according to how "productivity" is defined by elements and timescales in the seascape. Therefore, in order to have a sustainable use of the sakura shrimp resource, it is necessary to recognize the differences in these elements and timescales of "productivity" for each stakeholder and prevent simplified interpretations of the seascape.

Negotiating Productivity for Multi-species: Asian Seascapes in Transitions in The Anthropocene**MoB1-2****Aquaculturing The Coast in The Anthropocene: Beyond The Science-technological Imaginary of Marine Ranching in The Ruins**

Mayumi Fukunaga

University of Tokyo

Schools of diverse fishes swim amidst cultured seaweed forests in the sea, and shrimp and oysters grow in the artificial sea beds functionally compartmentalized. The shepherds, we humans, oversee these artificially-controlled habitats from the vegetation and plankton stocks to the top fish of the food chain. This science-technological imaginary of marine ranching, which appeared in the American sci-fi novel *The Deep Range* by Arthur C. Clarke (1957), inspired policy makers and fishers who had fought coastal social and ecological devastation in post-war Japan. This paper historically engages how the post-war Japanese coastal fisheries policies have cultivated the idea of culturing productivity in the aftermath ruins, especially focusing on the rise of 'stock-enhancement and marine ranching fishery' (Saibai-gyogyo). Coupling discourse analysis with ethnographic and archival materials clarifies these new fisheries, which embody the conceptual synthesis of historically continuous and interrelated development schemes. The one is the pre-war and wartime plantation-aquaculture and fishery development scheme in Japanese colonization. The second is the state-led economic development scheme which ideologically internalized developmentalism and legitimized production of the sacrificed and abandoned under neoliberal colonization within Japan. The post-war scientific-technological imaginary then underpinned these two different schemes, with assurance of an ever-increasing future under synthesized developmentalism. An analytical description highlights that the practices among local fishers and stock enhancement technologists led to a dialectic reorganization of this fishery, a new science-technological idea and skills of adaptive management, and their lived and local experiences in struggle with restoration of social and ecological capabilities to continue being fishers in the ruins. The paper concludes their efforts led them to re-conceptualize what is productivity, giving voice to their idea of generativity as a new ethical framing of aquaculturing the coasts in the Anthropocene.

Negotiating Productivity for Multi-species: Asian Seascapes in Transitions in The Anthropocene

MoB1-3

Clupea Pallasii: Techno-Herring, Stock Enhancement, and Cultivating Seascape in Hokkaido, Japan

Shingo Hamada
Osaka Shoin Women's University

This paper overviews the history of herring hatchery and stock enhancement programs in Hokkaido, Japan, to discuss how modernity and technology interfere with actors' relationships with fish and oceans. Pacific herring, which has a scientific name as *Clupea pallasii*, is a pelagic fish that is considered a keystone species in the marine food web. Domestic inshore and nearshore herring fisheries collapsed by the 1960s, and oversea herring fishing grounds were closed due to the implementation of the international Exclusive Economic Zone. National Fishery Research Agency and prefectural research institutes in Japan began the nationwide research and development for artificial propagation and hatchery operation for herring stocks in the 1980s. The productivity and success of herring hatchery and nurturing is measured with the survival rate of fry and juveniles in the tanks and the returning rate of released hatchery-bred herring in the yield by local fishing cooperatives. The hatchery-bred herring, which the author calls techno-herring, swim and navigate through an anthropogenic boundary between the natural and the cultural in modernized coastal seascapes, while blurring environmental responsibilities among actors. This paper argues that the particularity of techno-herring, which is scientifically alive and visible in digitalized numbers (Guyer et al. 2010; Verran 2010), enframes the works of translation by operating as a boundary object which enables heterogeneous actors to claim their collaborative conservation efforts.

MoC1

The Diversity of Mathematical Practices in East Asia, and Their Historiography (I)

Organizer: Karine Chemla (CNRS & University Paris Diderot)

Historiographies of mathematics in East Asia have often tacitly assumed that mathematical writings in China, Japan and Korea testified to a uniform tradition with respect to both knowledge and practice or, alternatively, to three different national traditions. This panel invites to explore the circumstances in which such representations took shape. It further invites contributors to bring to light the diversity of mathematical practices to which documents produced in this part of the world attest. In other words, this panel suggests to explore the diversity of mathematical practices not only in relation to the three different nations, but also with respect to different domains of activities. How can we distinguish between different types of mathematical practices in East Asia? What is the historicity of each of these practices? What are the relationships between the traditions to which they testify? How did practices emerge or how did they disappear? How did these different traditions of practice react when encountering mathematical knowledge and practices coming from the West after the 17th century? These are some of the questions that we intend to explore collectively.

**The Diversity of Mathematical Practices in East Asia, and Their Historiography (I)****MoC1-1****Numbers and Cosmic Sound: The Calculation and Uses of Tuning Standards (*lǜ* 律) During The Han and Xin Dynasties**

Noa Hegesh

Max Planck Institute for the History of Science

The Interrelation between Sound and Numbers in Early China Comes into View around The Mid Third Century BCE. From the second Century BCE, texts began defining and categorizing sound as a manifestation of numbers (*shu* 數), used to manage the affairs of man. Technically, the theoretical calculation of sound depended on a basic mathematical procedure for the generation of tuning standard (*lǜ* 律) ratios, and on the choice of a numerical value for the most important tuning standard: Yellow Bell (*Huangzhong* 黃鍾). Conceptually, numerical values and calculations were not merely led by acoustical concerns, but also by the way sound was thought to function in the cosmos, placing numbers, sound, and cosmology under the larger theory of cosmic synchronicity.

This presentation focuses on the use of sound between the second century BCE and the first century CE, during the Western Han and short-lived Xin dynasties. I argue that sound, in its numerical format, was perceived and utilized as a technology to detect, measure, and present synchronicity between cosmos and man. This is exemplified in two cases in the “Treatise on Tuning Standards and Mathematical Astronomy” (*Lǜli zhi* 律歷志), one in the *History of the Former Han*, and the other in the *History of the Later Han*. In these cases, sound is used outside of the realm of musical performance per se, in relation to the calendar, and to the standardization of weights and measures.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (I)**MoC1-2****The Diversity and Uniformity of The Practices of Multiplication in Mathematical Writings in The 15th and 16th Centuries**

Xiaohan Zhou

The Institute for the History of Natural Sciences, Chinese Academy of Sciences

Since the second century BCE, counting rods have been used as calculation devices in the practice of mathematics. According to extant historical materials, in the second half of the 16th century CE, the reproductions of the layout of abacus have appeared in mathematical writings, showing that during this period the abacus was used as one of the practitioner’s main calculation devices. In a 15th-century mathematical book, *Great Compendium of The Nine Chapters on Mathematical Methods with Analogies* (*Jiuzhang suanfa bilei daquan* 1450 CE), even though we could not find any direct reproduction of the layout of abacus, many clues demonstrate that the author of this book, Wu Jing (fl. 1450 CE), not only mastered the practices of using counting rods for calculation, but also grasped the core elements of practices of calculation which were found in mathematical books of using abacus written after the 15th century. Moreover, *Great Compendium* also includes the description of calculation using a device which was composed of nine magic squares (*hetu*) and that of calculation using a special form of table (*tu*) as a calculation device. In this book, the author used the relative dispositions of representations of counting rods for determining the order of magnitude of the digits of the result of calculation, moreover, this book includes an alternative method of using practitioners’ hand for the same aim. My research takes examples of multiplication in the first section of *Great Compendium* and in other 16th-century mathematical books to reveal the diversity of mathematical practices using different calculation devices. My analyses also point out that behind the diversity of mathematical practices, the operations bearing on the “position” and the concepts of “position” represented by multiplication possess some extent of uniformity, which might have been inherited from mathematical works of the previous period.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (I)

MoC1-3

**From “Suppose” to “Now One Has”:
The Transformation of The Meaning and Use of
Jinyou 今有 in Proportional Algorithms
Practices in China**

Shuyuan Pan

*Institute for History of Natural Sciences, Chinese
Academy of Sciences*

Jinyou 今有, commonly used with the meaning of “suppose” in ancient Chinese mathematical classics such as Mathematical Procedures in Nine Chapters (*Jiuzhang suanshu* 九章算术), was a formula with which the enunciation of a problem generally began. In this context, *jin* 今 meant “if” rather than “now”. This expression was also used to name the equivalent of the rule of three in Mathematical Procedures in Nine Chapters, in the phrase “‘suppose’ procedure” (*jinyou shu* 今有術). However, from the Yuan dynasty on (i.e., the late 13 century CE), the meaning and use of *jinyou* were changed. On one hand, expressions such as *ruoyou* 若有, *jiaru* 假如, and *sheru* 設如, were substituted to introduce hypothetical statements in problems. On the other hand, in order to distinguish terms of the same kind in a procedure of the type of the rule of three (where the three terms always are two things of the same kind and a different), different expressions were introduced, e.g., *jinyou* vs. *zhiyou* 只有 (“one only has”), *jinyou* vs. *jinzhiyou* 今只有 (*jin* “one only has”), *yuanyou* 原有 (“one originally had”) vs. *jinzhiyou* 今只有 (*jin* “one only has”), or *yuanyou* 原有 (“one originally had”) vs. *jinyou*. In these practices of the proportional algorithm, *jinyou* was transformed from a general formula for hypothesis into a special phrase indicating a condition by contrast to another one, and eventually, indicating the condition involved in a question, and its meaning was gradually changed to “now one has”. By this study, we will shed light on how Chinese practitioners shaped elements of the Chinese language to express meanings as accurately as possible in mathematical practice, and will get more understanding about the interaction between mathematical practice and its terminology.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (I)

MoC1-4

**Pre-modern Japanese Mathematics in East Asia:
Development of The Theory of Equations**

Tsukane Ogawa

*Faculty of Environmental and Information Sciences,
Yokkaichi University*

Seki Takakazu (?-1708) is said to be one of the founders of pre-modern Japanese mathematics. He was the first person in Japan who studied equations themselves. His works on equations are outstanding because people in those days thought equations were only instruments used for solving given problems. For example, he studied the method to solve simultaneous equations and wrote the *Kaifukudai no Hou* (*Methods of Solving Concealed Problems*), which deals with the determinant formed from coefficients. He also considered the number of solutions to a problem and sought conditions for changing it to obtain a unique solution. It is described in his *Byoudai Meichi no Hou* (*Methods for Restoring Defective Problems*).

The origin of his study on equations is Chinese books Sunxue Qimeng and Yang Hui Suanfa. He got hints from those books and from there developed a theory of equations. The history of the theory of equations in Japan clarifies the characteristics of pre-modern Japanese mathematics in East Asia. This will also characterize Chinese or Korean mathematics.

I will mainly introduce the *Byoudai Meichi no Hou* and prove his mathematical philosophy and then compare it with Chinese or Korean philosophies.

**MoE1****Environmental Science, Conservation Movement, and US Collaboration in Cold War South Korea**

Organizer: Jachwan Hyun (Max-Planck Institute for the History of Science)

The history of the rise of environmental science and conservation movement in South Korea has often been treated as a domestic incident or isolated case in the history of science. In this context, the Korean government-led nationalist mobilization of scientists and conservationists or the civic activists-led environmental movement in the 1960s and 1970s have been mainly spotlighted. This panel challenges such narratives of isolations and instead explores the ways in which environmentalism and its scientific backup have been connected and integrated into wider international scientific currents and networks. The papers in this panel particularly pay attention to the US biologists, conservationists, and policymakers initiated diverse cooperative environmental science programs in South Korea. It includes the establishment of the national commission of nature conservation (1963-1979) and national natural history museum (later national science museum, 1967-1969), and the initiation of the environmental impact study of the Seoul Special City (1969-1974). Like the postwar history of global environmentalism, these US-South Korea cooperative projects were not apolitical; rather, they were deeply linked to, produced by, and confined to the Cold War politics. Using unexamined archival materials from both Korea and the US, the panel provides opportunities to recognize the unmarked transnationalism and its Cold War nature in this country's early days of environmental science and nature conservation movement.

Environmental Science, Conservation Movement, and US Collaboration in Cold War South Korea**MoE1-1****International Museum Building:
The Korean-Smithsonian Project in The 1960s**

Jieun Shin
Smithsonian Institution

The international collaboration between Korea and the Smithsonian Institution to build a Korean National Science Museum in the 1960s reveals the contemporary understanding of diplomatic relationship between the two nations, national science policy in Korea, and interests of scientists and scientific institutions in both countries. As the U.S. foreign aid programs entered a new phase in both technical and financial development assistance for developing countries during the Kennedy Administration, South Korea, one of the recipients of U.S. economic assistance since the 1950s, arose as a valid diplomatic partner of the U.S. government. The museum experts and scientific staff of the Smithsonian Institution, who promoted its new program to assist museums both in the United States and abroad, was also involved. For Korean scientists, the international collaboration to build a national science museum seemed a great opportunity to establish science infrastructure by increasing public understanding of science. However, different interests of the two groups, Korean and the Smithsonian scientists, resulted in the nullification of the project. While the Smithsonian staff emphasized the themes of environment and preservation of Korean traditional culture, reflecting their new vision of the Secretary S. Dillon Ripley, Korean representatives were asked to promote the President's national agenda for "scientification" of the public by exhibiting the recent innovations in developed countries and technologies for the industrialization of modern Korea. My work will investigate in detail the Smithsonian's support to the Korean Science Museum project and its role in international politics and diplomacy in the 1960s. This project will contribute to the Smithsonian's Grand Challenges of Understanding the American Experience and Valuing World Culture.

Environmental Science, Conservation Movement, and US Collaboration in Cold War South Korea
MoE1-2
When Nature Goes “Public”: A Political Life of Nature Conservation in Cold War South Korea, 1963-1979

Sumin Myung
Johns Hopkins University

The postwar world encountered a surge of international institutions of nature conservation such as IUCN and WWF, mostly represented by Euro- American scientists. Ecologists and environmental scientists emerged as the new stewards of the planet Earth, depicted as a fragile system threatened by human species. These experts promoted a double helix of conservation movement across the globe: one strand was scientific knowledge that went increasingly quantified and abstracted, and the other one environmental consciousness that aimed to craft concerned publics. A group of natural scientists in South Korea, whom I explore in the paper, was not an exception from this transnational movement. However, they all knew that the world was unevenly made. This paper consists of three sections. The first section explores how this double helix model traveled to postcolonial nation-states by highlighting the roles of cosmopolitan scientists. The second section looks at the Korean Commission for Conservation of Nature and Natural Resources (KCCNNR), which was established by a group of scientists in 1963. This section spotlights their activities especially field survey with the support of US scientists and institutions between 1963 and 1973. The last section charts how this group went “public” from 1974 to 1979, when their homeland was haunted by a Cold War developmentalist spiritualism. Under the auspice of political leaders, they turned into a nationally-organized association that laid the foundation for the Nature Protection Movement (Jayeon-boho Undong) in the late 1970s. By illustrating these filaments in Cold War South Korea, I seek to reflect on the problematic figure of “public,” which still lurks behind the language of universalism in the global environmental governance but has been contested and negotiated in the vernacular webs of power relations.

Environmental Science, Conservation Movement, and US Collaboration in Cold War South Korea
MoE1-3
Environmental Science for National Development: The Seoul Environmental Assessment Project of The Smithsonian Institution, 1971-1975

Chuyoung Won
Seoul National University

This paper explores the US-Korea collaborative environmental assessment of Seoul, South Korea, in 1971-1975. With increasing global-scale pollution during the Cold War, environmental scientists and government officials of the U.S. recognized value of collecting environmental data. In this context, the U.S. Agency for International Development (USAID) established a plan to make guidelines for the environmental policy in developing countries in the late 1960s. As a part of this plan, the USAID implemented an environmental assessment project of Seoul through a contract with the Office of International and Environmental Programs (OIEP) of the Smithsonian Institution. The goal of the guideline plan was to collect data and to reduce the environmentally detrimental impact on cities in developing countries. Seoul, the capital of South Korea, was an ideal place for USAID officials because as a result of urban growth and population increase the city had gone through the most severe environmental pollution among cities in the developing world. Although Korean Scientists were eager to engage in the collaborative project as it funded their research, the authorities of Seoul feared the project's possible conclusion that would harm the nation's reputation. This paper analyzes how science on environmental data collection was made compatible with the national economic development of Korea by examining the relationship and tensions among OIEP, Korean Scientists, and governmental officials of Seoul. This paper illuminates that the Seoul project was essential to the construction of the idea of a “sustainable development” for developing countries.



Mobility and Countermobility of Diseases

MoF1-1

Schrödinger's Cat in Shanghai?: Bubonic Plague, Ecology, and Colonialism in The International Settlement, c. 1894-1924

Freddie Stephenson
University of Nottingham

In the early twentieth century, the Shanghai Municipal Council headlined the International Settlement's anti-plague program under the banner of "No Rats. No Plague." The phrase was widely employed in the Council's reports and discussions, whilst being displayed prominently on all government issued notices, pamphlets, and proclamations related to public health. Such materials, published in English and Chinese, were pedagogic, seeking to advise the population on how to sanitize their actions and surroundings. For Shanghai's Western medical authorities, a high priority was to encourage residents and business owners to keep cats. Felines, with their long history of domestication for pest control, were agents that introduced a state of protection against the plague. The Municipal Council carried the idea of a cat-owning house as a house safe from the plague directly into policy. Initially, buildings with a cat were considered sufficiently plague proof to the extent that they were exempted from medical inspections and cleansing. Problems gradually emerged, however, related to determining "the question of cat or no cat." Detailing the developments in this cat question, this paper elaborates the constitution of colonial medical logic in treaty port Shanghai, how it operated, and to what effect. The paper argues that the ideas underpinning Schrödinger's cat, such as multiple or ambiguous states of being, parallel and capture the racial notions of both people and places in the semi-colonial settlement. Moreover, the paper argues that such parallels, in a quotidian setting, serve as a reminder of the factors predicating meltdowns in moments of crisis, whilst also highlighting the persistent influence of human factors on the spreads of disease.

Mobility and Countermobility of Diseases

MoF1-2

The Triad that Brought Madras to South Korea: Infrastructure-Building for Tuberculosis Control in Post-Colonial South Korea

Kyuri Kim
Korea Advanced Institute of Science and Technology

This paper investigates the process of infrastructure-building for tuberculosis control in post-colonial South Korea. As the leading cause of death at the time, tuberculosis was a serious public health problem that sapped the vitality of the nation's workforce. However, the public health system established by the US Army Military Government and the priorities of the government at the time had the Korean National Tuberculosis Agency (KNTA), a voluntary organization established with US funding following the armistice, spearheading anti-tuberculosis activities instead of the government. National tuberculosis control was revamped in 1962 when Park Chung Hee's regime expanded the network of local health centers, and with close technical assistance from the World Health Organization (WHO). The government's resolve for building this backbone for healthcare delivery was critical for WHO, which strove to introduce in Korea a framework of 'modern' tuberculosis control measures that aimed to deliver services to rural populations. In its efforts to implement this framework, called the 'community approach' and formulated based on the outcomes of a series of studies carried out in Madras, India, WHO attempted to centralize the infrastructure for tuberculosis control around the government and its health center network, and distance KNTA from the national program. In response, KNTA adapted its functions and took on new roles that critically contributed to completing the infrastructure for the community approach. Contrary to WHO's initial expectations and intentions, KNTA became an invaluable partner to the national program. By bringing to light the contributions of each actor - the government, KNTA, and WHO - and how they worked in concert (or in contention) to build the infrastructure for tuberculosis control, this paper demonstrates that the devolved nature of public health in South Korea, forged under the strong influence of the US government, served as the foundation for centralizing tuberculosis control in the 1960s onwards.

Food, Technology, and Society (I)

MoG1-1

Localization of Bitter Melon in Lingnan Area since Ming Dynasty

Yan Duan

Nanjing Agricultural University

Bitter melon, originated from tropics of Asia and wide distributed in tropic, subtropic, temperate area, has a long history of cultivation in China, specially in Lingnan area. Early in the middle of Ming dynasty, Hainan local chronicles had recorded the character and edible methods of bitter melon. Guangdong cultivated different sorts of bitter melon and featured products in some counties in the Republic of China era. Meanwhile, eating bitter melon became a kind of convention in Dragon Boat Festival in Guangxi. This paper talks about the process of the localization, analyzing the effect by looking into three aspects: cultivation and production, edible methods, convention and mode of life. On account of the collection and sort of historical materials and local chronicles, we can conclude that the localization of bitter melon passed through three processes: terroir adoption, edible adoption, and culture adoption. Finally, the deep reason of adaption has been discussed, and the impact that the introduction and localization of bitter melon might have on the edible methods and culture of Lingnan area is the main point of discussion.

Food, Technology, and Society (I)

MoG1-2

***Haedong Nongsŏ* 海東農書 as An Unpublished Official Agronomic Manual**

Ji-Hyun Lee

Columbia University

There are about twenty to thirty known titles of surviving agronomic manuals from the Chosŏn period, which serves today as the most useful sources of history on Korean agricultural techniques. Studies on these books were often conducted with major focuses on the distinctive styles and values of Chosŏn agricultural techniques. My approach is that Chosŏn period agronomic manual could be understood not just in the scope of technology they describe and policies they propose, but also through the contexts of their compilation styles, background, and purposes. A sample subject of such approach presented here is *Haedong nongsŏ* 海東農書 (*Book of Agriculture for the East of the Sea*), a late eighteenth-century agronomic manual compiled by Sŏ Hosu 徐浩修 (1736-99), which has been recognized as a transitional achievement in the agronomic scholarship of Talsŏng 達城 Sŏ 徐 family. Understanding *Haedong nongsŏ* has been quite restricted not only by the incomplete forms of both surviving versions - a four-volume "working-manuscript" and two-volume "final manuscript" version almost ready for printing - but also by the relative lack of literary sources on the author. The current analysis focuses on the first four chapters of the two-volume "final manuscript" version of *Haedong nongsŏ*, to identify it as a possible mid-product of an official publication, promoted along with the screw-pump production of 1783. The aim of the book in both versions are overall concurrent with the agronomic policies promoted during the reign of King Chŏngjo. When located within the progresses of the Sŏ family's agronomy, however, the "final manuscript version" presents a concise compilation style that largely contrasts with the encyclopedic works of his father Sŏ Myŏnggŭng and his son Sŏ Yugu, largely due to the specific purposes that Sŏ Hosu intended to serve.



Food, Technology, and Society (I)

MoG1-3

Handling Medicinal Knowledge in *Imwon Gyeongje Ji* ; Joseon's Most Voluminous Encyclopedia for Practical Use

Jongwook Jeon

Chonbuk National University

ImwonGyeongjeji (林園經濟志) which was created by Seo Yu-gu (徐有渠) in the first half of the 19th century, is a encyclopedia of practical use in rural life. Seo Yu-gu as a government officer and confucius scholar, had compiled and edited Imwon Gyeongjeji during his life time. It consists of 113 volumes, 16 fields, and 2.52 million total characters. He didn't accept past knowledges as it was. Instead, he reorganized them in order to make more appropriate to the time. What was not immediately needed was drastically deleted and changed. Of these, the field of medicine(*Inje-ji* 仁濟志; Records of saving people with a compassionate heart, medical treatments.) comes 11th of the contents covering 28 volumes and 1.1 million characters. "Inje-ji" utilizing medical books in China and Korea even those of Japan, collected massively medical knowledge, new illness, herbs of local area, private prescription. Meanwhile Inje-ji modified the errors of the older medical books like Dongui Bogam or *Bencao Gangmu* (本草綱目), expressed its own subjective views about controversial topics. Its main features are as follows: i) prescriptions are directly linked to the diseases and symptoms, ii) greatly increased medicinal knowledge especially on infectious diseases or carbuncles, iii) detailed index easy to look up for prescription and iv) his 'own opinions'[an-seol] which can indicate relevant contents within the book and organically combines the whole knowledge in it. In summary "Inje-ji" can be the last general medical book which collected and edited almost all the medical knowledge of the period in the East Asia with its own editing format. In addition it is recognized that it pursued an evidence-based medicine and the practical medicine relieving the people, rather than medico-philosophical theories in oriental traditional medicine which was criticized by many intellectuals afterwards.

Food, Technology, and Society (I)

MoG1-4

From Agricultural Archaeology to Genetic Cloning: Decoding and Redirecting The Domestication of Rice in China

Chen Sun

Singapore University of Technology and Design

Domestication constitutes an essential step in the evolution of rice. From lying to standing, scattered ears to no scattered ears, red grains to white grains, rice has experienced a long history of evolution and domestication with the interaction with human beings and continues to evolve according to different environmental and social conditions. This research focuses on two contexts that study the origins and the domestication of rice in China. The excavation of several venues from the 1980s to 1990s, such as Chengtoushan in Hunan, led to a peak of interest of agricultural archaeology and attracted the attention of international scholars and projects. As the focus on agricultural archaeology has been redirected with the development of technology, the domestication of rice still draws scientific interests in labs with new techniques of genetic cloning and sequencing. Based on the interviews with the principal scientists participating in the excavation in the 1990s and participant observation in modern labs of rice research, this paper intends to discover how the social and cultural context, the orientation of disciplines and the development of technology contribute to the formation of the study of rice domestication. With a close engagement of a modern scientific institute, the paper will also uncover how rice domestication has become a realm for advanced crop studies and how the evolution and the genetic differences between wild rice and cultivated rice have become an essential reference for application in the future as germplasm. As domestication is still an ongoing process, the study will discuss how scientific studies and trans genetic technology nowadays will reframe the direction and the pace of domestication in an unprecedented way.

MoA2

Innovations in Korean Medicine

Organizer: Taewoo Kim (Kyung Hee University)

Studies of medical history in East Asia have illuminated changes in medical theories and practices, rejecting the dichotomy of the modern and the traditional, commonly associated with being progressive and being static. This panel attempts to provide detailed descriptions of how these changes have been taking place in East Asian medical tradition. Drawing on historical and anthropological studies of Korean medicine in South Korea, it explores the structure of medical innovations in East Asian tradition, juxtaposed by The Structure of Scientific Revolutions in the post-Enlightenment science, and investigates a genre of medical writing called ‘medical case (醫案),’ discussing how the genre works for efficacious clinical practices. This panel also examines changes of an acupuncture method called SAAM acupuncture originated from the late Joseon Dynasty, and describes variable interpretations of constitutional differentiations that have led to changes of Sasang medicine, proposed by Lee Je-ma, a scholar-physician in the 19th century. Capturing these moments of emerging diverse theories and practices, this panel will show the transformation of East Asian medicine contextualized by the changeability of East Asian medical knowledge.

Innovations in Korean Medicine

MoA2-1

The Structure of Medical Innovations in East Asian Tradition

Taewoo Kim
Kyung Hee University

Why are classical texts of East Asian medicine, hundreds of years old or sometimes thousands of years old, still actively used in contemporary clinical practices? How have, for example, *Huangdi Neijing* (Yellow Emperor’s Internal Medicine) or *Shanhanlun* (Treatise on Cold Damage), maintained their authority in the 21st century even in the absence of revisions? Is the paradigm shift, a core concept of *The Structure of Scientific Revolutions*, not applicable to the history of medicine in East Asia? This paper attempts to respond to these questions, drawing on anthropological fieldwork at “currents of tradition [학파 學派]” in South Korea, which follow specific medical theories and clinical practices of East Asian medicine. The multi-sited ethnographic investigations of three currents--those of *Huangdi Neijing*, *Donguibogam* (Treasured Mirror of Eastern Medicine), and Sa-am acupuncture (a representative acupuncture modality in South Korea)-- have revealed that each current of tradition derives a specific theory and practice from the vast reservoir of East Asian medical knowledge maintained by classical texts, and elaborates them for its clinical practices. While clinical practices applied for solving a contemporary clinical problem may be different from original practices recorded in classical texts, the underlying principles remain unchanged. A noticeable distance between the principles and specific practices forms a buffer zone that makes changes without the paradigm shift possible. Rather than shifting from one paradigm to another through revolutionary changes, East Asian medicine produces innovative clinical practices through cultivating the potential of the principles. This study will illustrate a mode of changes in East Asian medicine, that is divergent from that of the post-Enlightenment science.



Innovations in Korean Medicine

MoA2-2

Medical Cases in The History of Korean Medicine

Minseok Ku
Kyung Hee University

This study traces medical cases of Korean Medicine, introducing diverse medical books in Korea from the oldest, *Hyangyakgugeuphang* (鄉藥救急方), to the best Donguibogam (東醫寶鑑). This study also explores other diverse types of literature like royal records *Seungjeongwon Ilgi* (承政院 日記), *Joseon Tongsinsa* (朝鮮通信使) document, the record from Korean Embassies to Japan in Joseon dynasty, individual diaries, and modern papers if they deal with the clinical medical encounter. By doing so this study set a goal to achieve a diachronic view regarding medical cases in Korean Medicine. To examine the outward changes in medical cases is considered as one of the main topics of this study. Simultaneously, this study also raises several basic-critical questions as follows: How variously the authors of medical books utilized the authority of medical cases? What is the difference in recognizing medical cases between East Asian nations? How do we and ancient people differ in recognizing medical cases? What is the difference between *Eui'an* (醫案) and modern published paper so-called clinical case study? Rather than suggesting an instant answer, this study tries to show some interesting ambiguous examples of picking the medical cases out in the text of ancient books. After all, this study argues that it is valuable to reconsider and return to the basic questions; What are medical cases and what should we expect when we handle the topics of medical cases in Korean Medicine?

Innovations in Korean Medicine

MoA2-3

A Study on The Change of Differentiation Standard of SAAM Acupuncture: Focus on KIM Hong-Kyeong' SAAM Acupuncture

Yoo Ong Jung
Saam acupuncture Society

KIM Hong-Kyeong is a scholar who studies a traditional Korean acupuncture method called SAAM acupuncture. He has taught Korean traditional medicine students about SAAM acupuncture since 1984. He is ingeniously interpreting the meridians in order to understand SAAM acupuncture. He has broadened the meaning of meridian to the spiritualistic aspects by stating that 'the meridian is a pathway of consciousness and emotions. By referring to LEE Je-Ma' Four Constitutional medicine, which considered the human desires as physical, wealth, sexual and power desires, he has divided the meridians as follows: Tai Yin and Yang Ming meridians are related to the basic necessities of life (food, clothes and shelter), Shao Yin and Tai Yang meridians are related to the sexual desires, and Jue Yin and Shao Yang meridians are related to the desires of power. He has also devised Cheon-Bu acupuncture method, Sam-Bu acupuncture method, Sam-Tae-Keuk acupuncture method and Soon-Ki-Hwal-Hyeol acupuncture method by differentiating the basis of identifying the cause. This not only helps to understand the existing SAAM acupuncture method but also allows to study SAAM acupuncture from a new point of view.

Innovations in Korean Medicine

MoA2-4

Multifaceted Constitutions: Diverse Clinical Interpretations of Sasang Medicine in South Korea

Hyunkoo Kim
University of Oxford

This is preliminary research to investigate diverse practices of Sasang medicine (四象醫學) and its practitioner groups in contemporary South Korea. Since the publication of *Donguisusebowon (Longevity and Life Preservation in Eastern Medicine 東醫壽世保元)* in 1894 by Lee Je-ma (李濟馬), it has been the seminal text of Sasang medicine and at the same time, it has been interpreted in various ways by practitioners with different positionalities. Furthermore, those practitioners have formed scholarly groups or communities to share common understandings of Sasang medicine and to transmit their knowledge and practice to junior practitioners. The focus of this paper is on the main characteristics of each group and on how the different interpretation and practices have been done through these groups. Applying the classification methods of ‘currents of learning’ (學派) by Kim (2004) and Scheid (2007), this research examined the characteristic thoughts, the key people, and the seminal books of each group. For this, the data were collected from interviews with the key practitioners of each group and literature research on their works. By doing so, this research identifies groups of Sasang medicine as follows: a group of Sasang Constitutional Medicine in the standardized school system; a group of Nature-Principle practice (性理臨床); a group of Nature-Emotion Sasang (性情四象); a group of Sasang of Physique (體形四象); a group of eight-constitution medicine; a group of Ban-ryong (盤龍) medicine; a group of Sasang-Mind study (四象心學). In this way, this research aims to provide the vivid characteristics of Sasang medicine as a living tradition.

MoB2

Formal Approaches to Studies of Traditional Maps of East Asia (I)

Organizer: Vera Dorofeeva-Lichtmann (UMR 8173 China-Korea-Japan, CNRS-EHESS)

The special session on the theory of cartography at the last International Conference on the History of Cartography (2017) manifested the raising interest in methods of map studies. It made apparent the division between scholars who up to now have been proceeding without explaining their methodology and those who applied highly technical software, as for instance the Map Analyst <http://mapanalyst.org>, for cases of its application see <https://www.medeia-chart.org/>. As a consequence, a growing number of scholars started to reflect on the relevant methods to be used in the history of cartography studies, some of them are contributors to the proposed panel. Broad spectrum of questions related to algorithms used for analysis of maps and for visualization of the obtained results, as well as to spatial analysis and applications of GIS were discussed at workshops of computer scientists developing software for “old maps” - Exploring Old Maps (2016-2018), see <http://exploringoldmaps.informatik.uni-wuerzburg.de>. The Asian maps were also analysed with the help of quantitative methods, yet the studies of this kind remain less numerous; see, for instance, the study of the “Map of the tracks of Yu” *Yujitu* 禹跡圖 (1136) by Akin and Mumford (2012). However, one of the main methodological problems is posed by the analysis of relational maps, which do not rely on projection and scale and in a number of cases cannot be studied with the help of the geo-referencing approach. The proposed panel will bring together scholars working on the history of cartographical representation of East Asia interested in formal methods and techniques of map analysis. The aim is to discuss possible approaches to investigating maps of East Asia and share results of selected case studies.

**Formal Approaches to Studies of Traditional Maps of East Asia (I)****MoB2-1****Formal Approaches to Studies of Traditional Maps of East Asia: State of The Art and General Remarks**Vera Dorofeeva-Lichtmann¹ and Alexei Volkov²¹UMR 8173 China-Korea-Japan, CNRS-EHESS²National Tsing Hua University

The special session on the theory of cartography at the last International Conference on the History of Cartography (2017) manifested the raising interest in methods of map studies. It made apparent the division between scholars who up to now have been proceeding without explaining their methodology and those who applied highly technical software, as for instance the Map Analyst <http://mapanalyst.org>, for cases of its application see <https://www.medeachart.org/>. As a consequence, a growing number of scholars started to reflect on the relevant methods to be used in the history of cartography studies, some of them are contributors to the proposed panel.

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We shall call attention to the limits of geo-referencing on the example of East Asian maps and discuss methodological problems is posed by the analysis of relational maps, which do not rely on projection and scale and in a number of cases cannot be studied with the help of the geo-referencing approach.

Formal Approaches to Studies of Traditional Maps of East Asia (I)**MoB2-2****Assessing The Development of Western Hydrographical Knowledge of The China Seas, 1650-1850**

Stephen Davies

The University of Hong Kong

In this paper I shall outline a method for evaluating the changes in western charting of Asian waters over the three centuries 1650-1850, placing that in implicit contrast to East Asia's indigenous marine mapping traditions. To that end the paper will introduce a methodology focusing on key developmental categories relevant to the western charting tradition: representational accuracy, locational precision, improved bathymetry, appropriate use of scale, and increased navigationally useful data. The paper will describe the greater or lesser range of sub-categories in terms of which evaluation of development would ideally be made. As a worked example the paper will review the quantitative and qualitative change in western hydrographical understanding of the Pearl River between 1650 and 1850 illustrating how over the three centuries in question the development of marine charts introduced to Asian waters an entirely new way of conceptualizing maritime space.

Formal Approaches to Studies of Traditional Maps of East Asia (I)

MoB2-3

Tracking down The Secret of Colours: Asian Maps from The Museum am Rothenbaum in Hamburg seen with Respect to Colour Analysis

Diana Lange

Museum am Rothenbaum MARKK Hamburg

The German Federal Ministry of Education and Research (BMBF) supports the three-year joint project ‘Coloured Maps’ (2018-2021), involving the Centre for the Study of Manuscript Cultures and the Mineralogical Museum, University of Hamburg, the *Stiftung Hanseatisches Wirtschaftsarchiv* and the Museum am Rothenbaum in Hamburg. Applying methods from the material sciences and with art- and cultural-historical approaches, the group analyses hand-drawn and hand-coloured maps from European and East Asian areas, produced between the 15th and the 20th centuries. We hope that the analyses of the colours can provide information about the technological and economic exchange between Europe and Asia and within the respective regions. I conduct research on a set of Asian maps kept in the Museum am Rothenbaum, mainly from China, Korea and Japan. In my talk I am going to present first results of the colour analysis (to be conducted in early 2019) and discuss the potential of the use of methods from material sciences for the research of “old maps” in the history of cartography.

MoC2

The Diversity of Mathematical Practices in East Asia, and Their Historiography (II)

Organizer: Karine Chemla (CNRS & University Paris Diderot)

Historiographies of mathematics in East Asia have often tacitly assumed that mathematical writings in China, Japan and Korea testified to a uniform tradition with respect to both knowledge and practice or, alternatively, to three different national traditions. This panel invites to explore the circumstances in which such representations took shape. It further invites contributors to bring to light the diversity of mathematical practices to which documents produced in this part of the world attest. In other words, this panel suggests to explore the diversity of mathematical practices not only in relation to the three different nations, but also with respect to different domains of activities. How can we distinguish between different types of mathematical practices in East Asia? What is the historicity of each of these practices? What are the relationships between the traditions to which they testify? How did practices emerge or how did they disappear? How did these different traditions of practice react when encountering mathematical knowledge and practices coming from the West after the 17th century? These are some of the questions that we intend to explore collectively.

**The Diversity of Mathematical Practices in East Asia, and Their Historiography (II)****MoC2-1****Western Mathematics in Joseon Mathematics**

Sung Sa Hong
Sogang University

The government system of the Joseon dynasty (1392-1910) was completely devastated by Japanese invasion (1592-1598) and then by the later Jin (後金), later Qing dynasty, in 1627 and 1636. Studying the republication of *Suanxue Qimeng* (1299) in 1660 by Kim Si-jin (金始振, 1618-1667) and Yang Hui Suanfa, Joseon mathematicians including Hong Jeong-ha (洪正夏, 1684-1727) could revive and extend the traditional mathematics for the basic system, e.g., farmland tax system. The new calendar system Shixianli of the Qing dynasty based on the western mathematics and astronomy was brought into Joseon in 1645. Since then, western mathematics was streamed into Joseon along with astronomy books, e.g., *Xinfa Suanshu*, *Tianxue Chuhan*, *Shuli Jingyun*. We discuss the history of the influences to Joseon mathematics made by the western mathematics until the importation of the Commentary to *Siyuan Yujian* by Luo Shilin (羅士琳, 1784-1853).

The Diversity of Mathematical Practices in East Asia, and Their Historiography (II)**MoC2-2****Shanghai Bibliophilists of the Late Qing Dynasty in The Introduction of Western Learning to The East: The Publication of *Jihe Yuanben***

Jingbo Cao
Shanghai Jiaotong University

The first publication of the last nine books of the *Jihe Yuanben* (*Elements*) was funded by Shanghai Bibliophilist Han Yingbi in the late Qing Dynasty, with the help of the scholar groups which consisted of bibliophilists and mathematicians. Under special historical opportunity, they became a School of Bibliophilism for western learning. Han Yingbi's true motive for subsidizing publishing was related to his Confucian ideals, which was to be admitted by royal authority into the Qing government's national cultural undertakings. Although the turbulent situation eventually led to the fact that his aspirations were frustrated, the historical value and influence of *Jihe Yuanben* had an important cultural significance, and it also provided another opportunity for all the contributors and participators to be documented in history.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (II)

MoC2-3

Confucianism, *Book of Changes*, Mathematics and Calendric Computations: The Diversity of Mathematical Practices in Song Dynasty

Yiwen Zhu
Sun Yet-sen University

Previous studies have conveniently revealed that Chinese mathematics researched its peak in Song and Yuan periods. However, this point is mainly based on the study of mathematical writings: that is Qin Jiushao's (1208-1261) *Mathematical Book in Nine Chapters*, Li Ye's (1192-1792), Yang Hui's (13th century) and Zhu Shijie's (fl. early 14th century) mathematical writings. On the basis of my recent researches on mathematics in Confucian canonical literature, this talk will further study different mathematical practices in four domains in Song dynasty: that is Confucianism, *Book of Changes*, Mathematics and Calendric computations. Through carefully and detailedly analyzing Qin Jiushao's *Mathematical Book in Nine Chapters*, and Shao Yong's (1011-1077) and Zhu Xi's (1130-1200) writings about *Book of Changes* and ritual study, I will argue that there existed different mathematical practices in these four domains at that time, which could shape a more complex historical picture about Chinese mathematics in Song dynasty than we thought before.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (II)

MoC2-4

Division and Multiplication as Opposed Processes of Computation in Qin Jiushao's *Mathematical Writings in Nine Chapters*

Karine Chemla
CNRS & University Paris Diderot

In 656, Li Chunfeng and scholars working under his supervision presented to the throne *The Ten Canons of Mathematics*, a set of mathematical writings that, upon imperial order, they had selected and edited. Immediately after its completion, the anthology was used as textbook for the "School of mathematics," which, as Alexei Volkov has argued, provided training in the framework of two curricula. The first and most elementary curriculum began with the study of *Mathematical Canon by Master Sun*, a book completed in ca. 400. The third book taught, *The Nine Chapters on Mathematical Procedures*, probably from the first century CE, was the major piece of the curriculum. The fact that at the latest from 656, these canons, composed during different time periods, were taught in the same curricula shows that for 7th century actors they represented a coherent body of mathematical knowledge and practice. In my view, one of the key elements taught on this basis was a certain way of working with multiplication and division as opposed processes of computation. In subsequent centuries, imperial institutions regularly re-edited these canons, for instance, in 1084, and also between 1200 and 1213. In both cases, these projects were related to the aim of re-establishing an official education in mathematics. These remarks thus imply that features of this mathematical culture were handed down further. This conclusion likewise derives from references that books composed in the 13th century made to these canons, like Qin Jiushao's 1247 *Mathematical Writings in Nine Chapters*. This talk will focus on elements of continuity between *The Ten Canons and Mathematical Writings* with respect to both knowledge and practice of multiplication and division. I argue that this testifies to the shaping and development of an original form of algebra in China and of specific practices attached to it.

**MoE2****Knowledge Exchange and Practice of Chinese Modern Physics (I)**

Organizer: Degang Yi (Inner Mongolian Normal University)

Traditional speculative philosophy and applied technology gradually involved into the natural science which is based on logic and experiment. Since “Western learning spreading to the East”, Chinese people’s understanding and application of physical knowledge has undergone a process from study, exchange to innovation and development. Some ancient Chinese’s applied technological inventions related to physics still have utility up to now. As for the steps of study and introduction of the advanced modern physics into China are accelerated. Chinese modern physics gradually merging into the tide of international physics development through the combination of the native knowledge accumulation and worldwide academic exchange. Unfortunately, there are few studies of this long and tortuous course. Our group will focus on the physical content of Chinese traditional science and technology, as well as the introduction of the western physical knowledge and technology, make discussions from the following aspects, such as foreign physicist’s contribution and Chinese scholar’s achievements in the process of Chinese-Western exchange, Chinese people’s rejection of the fundamental ideology of western physical in specific social context. We try to analysis the representative historical phenomenon in the process of Chinese modern physics’ exchange and development from different perspectives and levels.

Knowledge Exchange and Practice of Chinese Modern Physics (I)**MoE2-1****Battery Knowledge and Technology Introduced to China**

Degang Yi and Ying Zhang
Inner Mongolia Normal University

At the end of the 19th century, batteries began to be introduced to China. Based on the previous studies, this paper examines the knowledge dissemination of batteries, the introduction of technology and the development of related industries during the late Qing Dynasty and the Republic of China, and then analyzes the introduction, spread and application of batteries to the life, culture and ethnicity of modern China. The impact of the battery industry and other aspects. First, this paper examines the process of introducing battery knowledge into China by collecting and sorting out texts related to battery knowledge, journals, newspapers, and physics translations during the late Qing Dynasty. The physics translation introduced the basic principles and usage of the battery, and promoted the understanding and recognition of the battery in the late Qing Dynasty. Second, this paper examines the process of introducing battery manufacturing technology into China during the late Qing Dynasty and the Republic of China by arranging historical archives and pictures related to battery manufacturing technology during the Republic of China. During this period, the introduction of battery manufacturing technology was mainly based on imported products, imitation of foreign goods and research and test. The battery industry’s start-up form has gone through two ways: private and official. Third, on the basis of the above investigations and studies, the impact of the introduction of batteries on modern Chinese society was analyzed and elaborated. This paper believes that the battery manufacturing industry has promoted the development of China’s power industry and electrical appliance manufacturing industry. The application of batteries has improved people’s living standards, which has extended the working hours of some industries and created more wealth and social capital. The technologies derived from batteries, such as electronics and electrical appliances, have added new content to people’s lives, causing many repercussions.

Knowledge Exchange and Practice of Chinese Modern Physics (I)

MoE2-2

Before and After The Discovery of Anti-Sigma Negative Hyperons

Zhaojun Ding

University of Science and Technology of China

As the construction of high-energy accelerator lagged behind, during the early stage of development, the discipline of particle physics in China could only “talk on paper” in theoretical research, and “depend on Heaven for food to eat” in cosmic ray research or “find shelter under other's roof” in international cooperation. The establishment of the Multinational Joint Nuclear Research Institute in Dubna had created a good opportunity for the development of high energy physics in China. The discovery of anti-sigma-negative hyperons had left a thick and colorful mark in the history of physics in China. The series of scientific achievements made by Chinese scholars in Dubna laid an important knowledge and talent foundation for the development of subatomic physics in China.

Knowledge Exchange and Practice of Chinese Modern Physics (I)

MoE2-3

Discussion on The Exchange of Science and Technology between China and Sweden in The 1960-1970s: A Case Study of Swedish Physicist Hannes Alfvén's Visiting China

Xiao Dong Yin and Shuo Zhang

Capital Normal University

In the early 1960s, China was in a difficult period of severing relations with the United States and deteriorating relations with the Soviet Union, and was passive in international academic exchanges. In the early 1970s, after experiencing the external closure of the "Cultural Revolution", China ushered in a new historical period of easing relations with the United States and opening up foreign exchanges. After the establishment of the New China, these two key historical nodes, the Swedish physicist Hannes Alfvén visited China twice in 1963 and 1972, which led to the opening and restart the scientific exchange between New China and Sweden. This paper combs and summarizes the details of visiting process and important influences of visiting China, and analyzes its social and historical background and significance. It demonstrates that the Nordic region, especially Denmark and Sweden, was an important channel for New China's scientific and technological exchanges before and after the outbreak of the "Cultural Revolution" from the early 1960s to 1967, and also an important window for China to restart exchanges of science and technology with the West in the early 1970s.

**MoF2****East Asian Women and Medicine, Science and Engineering (I)****Organizer: Hyunsook Lee (Yonsei University)**

This panel aims to reconstruct the stories of various women medical practitioners and socio-cultural and political discourses surrounding women's health particularly through pregnancy and childbirth in modern and contemporary China, Japan, and Korea. Traditionally East Asian women in medicine—either medical practitioners or patients—have been invisible and were rarely trained in formal educational institutions. The social reforms since the end of the nineteenth century gave more opportunities for women to undertake formal medical training and practice medicine. Three panelists—H. Lee, Kong, and Hung—discuss Korean female medical practitioners and their education related to childbirth from different perspectives. By relying on the narratives of ten midwives, H. Lee explores the stories of Korean midwives and their changing social status from the colonial period to the 1990s. Kong addresses a case study of a Korean female obstetrician, Il-Uk Joo, who is a typical example of the first generation of professional women in early-twentieth-century Korea, as she was initially educated under Japanese rule and re-trained in the United States. By using statistical approaches, Huang traces the formation and transformation of women's medical education in modern Korea. The other three panelists—Y. Lee, Sato, and You—discuss how various ways of understanding of women's health through pregnancy and childbirth were formed and transformed in China, Japan, and Korea. Y. Lee examines the characteristics of pharmaceutical drugs for women—mostly, for a healthy pregnancy—as described by Korean newspapers during the mid-twentieth century. Sato examines the legal, political, and hospital systems to transform maternity care, childbirth, and the role of midwives in Japan since World War II. By analyzing a wide range of propaganda, you investigates how painless childbirth became an indispensable medium for the transfer of the CCP's ruling order, socialism, and welfare of China in the 1950s.

East Asian Women and Medicine, Science and Engineering (I)**MoF2-1****Nurturing A Profession: Il-Uk Joo, One of Korea's Pioneering Obstetricians**

Hyejung Kong
Konyang University

This is a case study of Il-Uk Joo (1927-2017), one of the pioneering obstetricians in Korean history. Joo was the first Korean to be elected as the chairperson of the world women's society, leading the way to solving the problems of women health care practitioners around the world, including discrimination against women doctors. By primarily relying on interviews, newspapers, and oral history collections on Joo, this study reconstructs a women obstetrician from early Korean history. Joo's case is a typical example of the first generation of professional women in early-twentieth-century Korea, as she was initially educated under Japanese rule and re-trained in the United States. Born in 1927 in Seoul, Joo graduated from Seoul Women's Medical University in 1949 (currently Korea University College of Medicine). Right after the Korean War, she was trained at the University of Pennsylvania Medical Center Hamot at Erie, Pennsylvania for four years. From 1959 to 1961, she served as a full-time lecturer at Korea University College of Medicine and opened an obstetrician's practice. She was the chairman of the Korean Medical Women's Association (1978-1980), chairman of the Medical Women's International Association (1989-1992), and chairman of the Korean Society of Obstetrics and Gynecology (2003-2004). She was awarded the Korea Medical Association / Pfizer International Cooperation Award (2009) and the Seo Jae-hee Medical Prize (2013) for her efforts to improve the rights of female doctors in developing countries and to provide various support measures for the transfer of medical knowledge. In sum, Joo devoted herself to promote the status of Korean women health care practitioners as a dedicated, respected, even sacred member of the profession.

East Asian Women and Medicine, Science and Engineering (I)

MoF2-2

Midwives in 20th-century Korea

Hyunsook Lee
Yonsei University

In 21st-century Korea, midwives are disappearing, though there used to be many midwives, and to ask their support was popular during the post-Korean War baby boom. In 2017, I participated in a project that published "The Oral History of Elder Midwives" in the National Institute of Korean History. This paper introduces ten interviews of elderly Korean midwives and explores the changes in their social status and the meaning of their medical practice from the colonial period to the 1990s. As the interviews were conducted in 2007, many have already passed away. Most of them were proud of being midwives, because midwifery was one of the few professions that married women could do and be so-called "new women" in the early 20th century. In 1952, medical regulations on midwives were changed and prohibited them from using medical devices and medicines. In 1963, as medical law was again amended, only those who already had a nurse license were able to obtain a midwife license. In 1973, midwives were allowed to have their own clinics and use medicine under the supervision of physicians. Delivering in the hospital became popular in the 1980s, when public health insurance was set up. This brought the medicalization of pregnancy care and childbirth, and the number of caesarian-sections has since increased rapidly. While from the view of pregnant women, the cost of childbirth has increased, the duration of time it takes to see a medical practitioner has decreased. The Korean government's policies made the importance of midwives diminish and did not pay attention to pregnant women's demands for midwives.

East Asian Women and Medicine, Science and Engineering (I)

MoF2-3

The Medical Practice of Painless Childbirth in China in The 1950s

Yon Sil You
Chonnam National University

When the Communist Party of China promoted the painless childbirth method in 1952, it introduced the advanced medical science of the Soviet Union based on Pavlov's conditioned reflexology. This idea eliminated the pain of childbirth, defining said pain as a psychological reflection of language conditions. Thus, a new "symbolic" system was established for women who had "no pain at childbirth." The system included the amendment of the language medium for childbirth and pain and assisted midwifery exercises such as respiration and abdominal massage. Words reminding pregnant women of pain led them to scream during childbirth, which was an "abnormal" reflex. The "normal" condition reflected a "happy" childbirth. In this way, the Chinese Communist Party promoted the image of being a "liberator" that freed women from the pain of childbirth, generating images of "well-being" and taking good care of the female body and enabling women to establish a "grateful" identity. The word "pain" was referred to in the context of the construction of socialist countries and became an indispensable medium for the transfer to the CCP's ruling order, socialism, liberation, and welfare of the Chinese nation formerly led by the Kuomintang.



East Asian Women and Medicine, Science and Engineering (I)

MoF2-4

Becoming A Woman Scientist in The Japanese Occupation: Focusing on Kim Sam Soon

Sun You Jeong

Chonbuk National University

During the Japanese occupation, it was difficult for Korean women to receive modern higher education. Higher education for Korean women was experienced only when they had to overcome the double discrimination of women and colonized. A few women overcame this discrimination and received higher education, some of which received university education. One of them was “Kim Sam-soon”. She was the first and only graduate of Imperial University in Japan, and had a very established position as a Korean in the Japanese colonial period. In this presentation, I will look at the life that Kim Sam-soon lived in with her graduated schools (Kyung Sung Girls' Middle School, Tokyo Girls' High School, Hokkaido Imperial University). In this process, we can see her growing as a scientist in the institutional discrimination she experienced as a Korean and as a woman.

Food, Technology, and Society (II)

MoG2-1

Yoghurt and Kimchi: Reinterpretation of The "Korean Food" as The Source of "Probiotics"

Tae-Ho Kim

Chonbuk National University

This paper traces how Koreans have re-evaluated Kimchi, in relation to the reinterpretation of its nutritional benefit since the mid-1980s. Specifically, the author aims to show that the growth of the fermented milk industry in South Korea unexpectedly contributed to the rediscovery of Kimchi, as the source of lactobacillus. Historically Korea was an agrarian society, where milk and dairy products had never been integral parts of everyday diet. It was under The Japanese colonial rule (1910-1945) that Korean people began to be acquainted with milk and yoghurt, owing to the extensive research and commodification of yoghurt by Japanese scientists. Various lactobacillus products - the famous “Yakult,” for example - were introduced to Koreans, as well as Japanese, with the anticipation of physical growth and strength. The next phase, the appropriation or “naturalization” of probiotics discourse, began since the mid-1980s, specifically along with the reappraisal of Kimchi. For its distinctive smell and taste, Kimchi had been the root of both love and embarrassment for Koreans. Japanese colonialists developed prejudice against Kimchi, and some Koreans internalized it even after the liberation. Since the mid-80s, however, partly owing to the remarkable economic growth, some South Koreans began to positively reappraise Kimchi, specifically in that it is rich in lactobacillus and other probiotics. As Kimchi has been rediscovered as the source of probiotics, South Koreans could embrace probiotics as an essential part of Korean food culture based on fermentation. Scientific research on the nutritional value of Kimchi also has flourished. This case study would contribute to understand the sophisticated dynamics of food and national identity, by showing how scientific research and people’s recognition of a specific food have constructed each other.

Food, Technology, and Society (II)
MoG2-2
Variants of Colonial Science in British Malaya and Japanese-ruled Taiwan, 1900-1946

Wei Yi Leow

National University of Singapore

In colonies such as Malaya and Taiwan circa 1900, plant-based commodities came to be economically important and worthy of scientific improvement. In Malaya the focus was rubber, while in Taiwan it was rice. The early 20th Century was a period of colonial science characterised by institutional and epistemic shifts. Institutional shift took the form of bureaucratised research in fields such as the plant sciences. As a result the botanical gardens that had hitherto dominated plant sciences were supplanted by institutes directly under the state. The epistemic shift resulted from the ‘rediscovery’ of Gregor Mendel’s papers on heredity, stimulating the rise of the new genetics promoted by William Bateson. Although this basic model can be said to have operated in Malaya and Taiwan, divergences between the two tell us something about the essential differences between the British and Japanese Empires, respectively. In Malaya, the successes of domesticating rubber up to 1905 were followed by efforts to select and propagate high-yield trees. This second phase of rubber science was led by practitioners in the Dutch East Indies, and as a result by 1918 British scientists fretted that the lucrative rubber plantations of Malaya were under threat from other empires. Despite official efforts to chase competitors in Sumatra and Java, the British Malayan response to the challenge of selective breeding was spearheaded by private venturers in the form of Prang Besar Estate. The sluggish actions of government-led science in Malaya contrasts with the efforts of Eikichi Iso, a plant breeder in the service of the Japanese government-general of Taiwan. Under state auspices, by the 1920s Iso crossed Japanese round-grain rice with varieties that grew well in Taiwan. What factors account for the variations in developments between these two Asian colonies? A comparative understanding of colonial science transcends particular empire narratives.

Food, Technology, and Society (II)
MoG2-3
Famine Foods in Written Words: Producing, Transmitting and Consuming Knowledge on Edible Wild Plants in Early Modern East Asia

Mengxi Zhao

Cluster of Excellence “Asia and Europe in a Global Context”, Heidelberg University

How to generate, consolidate, preserve and convey knowledge on edible wild plants? Answers from the officials and herbalists from early modern East Asia: in written words and pictures. It begins with a Chinese book *Jiuhuang bencao* 救荒本草 (Materia Medica for the Relief of Famines), an illustrated manual of edible wild plants that can be consumed as food in times of famine, edited by Prince Zhu Su 朱橚 and published in Henan in 1406. In the following centuries, the title inspired a new book genre that flourished in China, and was introduced to Japan where it spawned myriad variations. Although those books all aim to, or claim to aim to help relieve famine by introducing edible wild plants, they differ in material and intellectual terms, including the selection of the plants, the gathering of information, and the ways of presenting and authorizing knowledge. They are further diversified in the modes of dissemination and display. The difference results from the various regional climate, canons of knowledge, personal interest, and target readers. This paper examines the various editions of Chinese and Japanese botanical manuals, written and printed in China and Japan, and reconstructs a transregional communication network. It highlights how particular agents have appropriated the botanical knowledge encoded in the texts and illustrations to cater for disparate needs. The research will therefore contribute to our understanding of the locality of knowledge and to the study of transcultural circulation of knowledge within East Asia.

**Food, Technology, and Society (II)****MoG2-4****Goodbye Maotai: Hello World: CAAC and Chinese State Ambitions, 1978-1988**

Jiakai Jeremy Chua

*University of Southern California Graduate History
Department & Spatial Sciences Institute*

The Civil Aviation Administration of China (CAAC) Airlines used to offer a bottle of Maotai to all its passengers on its international services. Not only was Maotai an extravagant gift for its time, the fiery spirit was an acquired taste and one that could have only been procured in China. By the end of 1978, Deng Xiaoping had promulgated Gaige Kaifang, an opening of the Chinese markets. As CAAC Airlines invested in more sophisticated aircraft and technology, the gratis Maotai amenities disappeared on CAAC flights. The historiography of transport in China has focused on the challenges in building its railway networks and what it meant for modern state-building, but the development of China's aviation industry and its significance to the country's political and economic destinies has remained untapped. This project is part of a larger study of Aviation and Technology in East Asia - and it delves into the period 1978-1988 when CAAC embarked on its spectacular turnaround, adopting competitive firm-like behavior as it expanded aggressively within and without China. Working with route maps, timetables, GIS analysis of competition and collaboration with foreign carriers, and even a language phrasebook for flight stewardesses, this project explores how CAAC Airlines was an integral component of Chinese state ambitions to project "Scientific Modernity" and a strong contemporary identity even as it attempted to rehabilitate a dismal world reputation to become a reliable and economically viable air carrier in the global marketplace. In addition, this project also underscores how the Chinese state leveraged CAAC to transcend space, time, displacement for its own social, political, and economic needs. With investment in infrastructure and technological assets, including the renewal of Beijing Airport and the procurement of Boeing 747s from the US, the Chinese State was able to engineer a harmonious spatially-connected and spiritually-borderless China.

MoJ2**Contemporary Arts as a Field of Experimentation in Scientific and Technological Culture: The Possibility of Photographic Documentation as a Path toward Knowledge Construction**

Organizer: Jinhee Yoo (Seoul National University)

This panel introduces artists who address issues of science and technology through images and their works. In so doing, it seeks after possibilities of 'photographic documentation' as a medium that constructs scientific and technological culture. Photographic documentation consists of a bundle of pictures which are likely to bear no substantial meanings in and of themselves. But once assembled in contexts, these photographs can be of a form of knowledge (Walter Benjamin). In these days contemporary artists, by using it, enjoy communicating and interacting with the world. They often consider exhibitions as laboratory that can deconstruct existing frameworks of knowledge or construct new forms of the same, where photographic documentation functions as excavated materials from realities. In this field of experiment, artists continuously put the world they believe into question through analyzing the materials, which they embody in their own artistic styles. If contemporary artists bring issues of science and technology into their experiments, what is the likely outcome? To what extent could this trend in contemporary art deal with issues through photographic documentation? In this session, three artists and one machine-critic will address these questions in detail. Within the context of their own fields, each of them has been using photographic documentation to address important issues in science and technology. The three artists pay specific attention to individuals and artifacts that have been marginalized or ignored from conventional historical descriptions of science and technology.

Contemporary Arts as a Field of Experimentation in Scientific and Technological Culture: The Possibility of Photographic Documentation as a Path toward Knowledge Construction

MoJ2-1

Sharing Memories on Micro-Monuments: Photographs as Image-Objects and Their Surface to Interface Individuals' Recollections

Takashi Arai
The National Museum of Ethnology

Since March 11 in 2011, the day of Great East Japan Earthquake delivered more than 19,000 individual deaths and created nuclear catastrophe, I've been contemplating the *raison d'être* of monuments as a catalyst for conveying our memories for long generations. The search for methodologies to distribute other people's experiences and the emotional realities on massive problems, such as large-scale natural disasters or human-made crisis around Fukushima, to individuals is an urgent issue. Essentially, the approach to the microscopic memories of individuals is equally important as macroscopic analysis or narrative of conventional history, and potentially more practical to encourage the radical changes in today's information-oriented society. This lecture elucidates different phases of historical and contemporary monuments, and reviews the alternative value of material-based photography that functions as micro-monuments.

Contemporary Arts as a Field of Experimentation in Scientific and Technological Culture: The Possibility of Photographic Documentation as a Path toward Knowledge Construction

MoJ2-2

Father's Shipyard, My Ship: Art as an Interdisciplinary Approach to Regenerate Local Identity through Site-specific Project in Kaohsiung Harbor

Chih-Chung Chang
independence scholar

This site-specific art project, through the opportunity of the artist-in-residence program in 2018 organized by "Pier-2 Art Center", Kaohsiung, Taiwan, tended to bring out a series of interdisciplinary artistic actions and researches based on artist's personal family history and a dialogue with his father who served his entire career in the harbor. It managed to unveil the modern developmental history of Kaohsiung harbor area which is nowadays little-known to public, as the entire generation of the golden era in the harbor perishing; and it focused on highlighting the harbor city's significance of the time and generating conversations with audience. Besides, through the practical process of active communication and negotiation, it tried to ease the contradictory complex in those former or current harbor bureau staffs that have faced the conflicts between harbor and city government for decades, and also to rise attention of ignorant citizens to the city's waterfront environment that's been blocked away by national policies for decades. This project, using geographically the iconic case of renewed shipping-terminal warehouses in "Pier-2 Art Center" as a meeting point for consensus and reconciliation, organized in 3 months several interviews, field researches and samplings, an open studio and a co-creation workshop, and come out with a personal artwork in public and an exhibition at the end of residency program, aiming for more interactions with local residents. This project is still ongoing and developing, including several in-depth interviews on Kaohsiung's old shipbreaking industry and old hardware settlements in Jan. 2019, for the quarterly publication of "Weiwuying National Kaohsiung Center for the Arts", and further study of the region that Kaohsiung Harbor is currently developing, on its conflicting issues in history.



Contemporary Arts as a Field of Experimentation in Scientific and Technological Culture: The Possibility of Photographic Documentation as a Path toward Knowledge Construction

MoJ2-3

The Tower of Our Age: Rethinking Landscape with Artifacts

Jinhee Yoo
Seoul National University

This paper addresses the ways in which a work of photographic documentation can reconstruct a perspective on landscape. It takes as its context a 2008 dispute over transmission towers in the Korean city of Milyang. At the center of this dispute lies a negative outlook toward industrial development and scientific technology, which tends toward a view that sees nature and the artificial world as two conflicting concepts. In point of fact, transmission towers did serve as a symbol of advancement in scientific technology in South Korea during the 1970s (perspectives on landscape, it should be clear, are not fixed but are reflecting of an age). Recalling these moments, this paper forgoes the dichotomous view and rethinks the relationship between the nature and the artificial. Might it not be the case that the nature vs. technology dichotomy is itself the origin of disapproving views of transmission towers, even as proponents of this view benefit from that same technology? Could it be that the idea of nature as primitive and untouched by human beings deliberately excludes artifacts from a field of vision where they have long existed? Posing these questions, my fieldwork for this paper has been based upon searches for radio wave artifacts hitherto alienated from public viewing. The catchment areas for photographic documentation included edges of land as well as outlying areas. As a whole, the collection pays special attention to artifacts that nestle within a landscape. Close-up shots of artifacts that take them out of context are studiously avoided, so as to ensure that the social and cultural dimensions remain clearly in view. As a result, the collection attempts to capture something of the interactions between human beings, as viewers, and machines and the natural world, as the objects of that view, through the photographic lens.

Contemporary Arts as a Field of Experimentation in Scientific and Technological Culture: The Possibility of Photographic Documentation as a Path toward Knowledge Construction

MoJ2-4

The Camera in The Age of Posthuman Vision

Young June Lee
Kaywon University of Art and Design

This research explores the diverse ways in which photographic technique is harnessed in various industrial and scientific measurements and researches in contemporary Korea. This research will claim that such tendencies do not just mean a broader usage of photographic hardware for science and technology but a total transformation of the ways in which knowledge and information get produced with the help of diverse intelligent means. These are not limited to all kinds of image processing softwares but also diverse discipline of knowledge and practice encompassing remote sensing, astronomy, medicine, mineralogy, botany and etc. It is about time that we could begin to define the intellectual level of photography as an amalgam of hardware, software of image production and disciplines of knowledge. This tendency brings about the transformation in the role of the human subject in recording and interpreting the images. As the methods and algorithms to analyze photographic imagery have developed to an extent to which human eyes cannot catch up, we can claim that photography used in science and technology in today's Korea has entered a truly posthuman era. With the advent of photography-science-technology combinations in contemporary world, photography is not a discipline that can stand on its own but a part of complex intellectual system. The claim for the posthuman vision implies this system radically displaces the human subjectivity in obtaining, analyzing and interpreting photographic imagery. This research will first list the areas of knowledge and practice of science and technology in which photographic imagery is actively used and examine any differences lying in the strategies of harnessing photography. It will finally enable us to see the mapping in which photography is posited within the complex, heterogeneous terrain of science, industry, technology and knowledge.

MoA3

History of Traditional Korean Medicine in Korea with Focus on Modern History: Harmony in Diversity (和而不同)

Organizer: Me-riong Kim (Jaseng Hospital of Korean Medicine)

The history of Traditional Korean medicine spans an expensive time period of over 2,000 years under the specific circumstances of Korea, which employs a dual medical system of conventional medicine and Korean medicine. The empirical knowledge and experience of Korean medicine has been accumulated over these thousands of years and is currently undergoing institutional reform to meet external and internal standards, strengthen its evidence base through research, and achieve higher availability, accessibility, acceptability, quality, and performance in healthcare. One area of significance that historians around the world are focusing on as of the late 20th century is the historical introspection of "modernism." Although Korean medicine holds a distinct and somewhat different color from the current institutional climate in policy and research, the history of Korean medicine has always been with, by, and for the Korean people and current times call for Harmony in Diversity through its adaptation and integration to the current trend, especially regarding institutionalization in modern history and its current and future role in national healthcare. This session mainly focuses on modern history with regard to the Modernization and Globalization of Korean medicine and its link from the past to the present and future. The first session discusses how traditional Korean medicine has contributed to Korean history through its role and participation in the Korean independence movement. The second session addresses the history and modernization process of herbal medicine with special focus on pharmacopuncture, and examines the work put into re-establishing herbal medicine in modernized and standardized format. The final session reviews the various globalization activities of Korean medicine focusing on Chuna manual therapy including a summary of the history and inclusion process of Chuna in Korean national health insurance coverage.

History of Traditional Korean Medicine in Korea with Focus on Modern History: Harmony in Diversity (和而不同)

MoA3-1

Involvement of Korean Medicine Doctors in Korean Independence Movement History as Army Doctors

Kyehyung Lee
Kookmin University

The first records of Korean army doctors (軍醫) appear in modern history. The first account is of the appointment of Hae-bang-a-mun (海防衙門, Naval Force Affairs Office for Gyeonggi, Hwanghe and Chungcheong Province) in July 1885. However, it was only in 1898 that military medicine was officially established through the introduction of public service (醫官) and army doctors. However, most lost their jobs after the Korean army was forcibly dispersed due to Japanese Imperialism in July 1907. Some of the dispersed soldiers joined guerilla troops (義兵) in their resistance against Japan, serving as army doctors. They had mostly operated Korean medicine pharmacies or practiced Korean medicine as a family business. Following Gyeongsul-Gukchi (庚戌國恥, the National humiliation of the year of Gyeongsul, Japan-Korea Treaty) in August 1910, guerrilla troops were converted to independence armies. Various records of army doctor activity in the independence armies can be found in the 1920s. Army doctors participated in fighting, treated wounded soldiers, and were involved in war fundraising. Of special note is an army doctor named Hong-Gyun Shin (申洪均) who led the Korean Independence Army to victory in the great battle of Daejeonja-ryeong (大甸子嶺, June 1933). It was since the 1930s that army doctors were reorganized into a single establishment, which was maintained in the Korean Liberation Army organized in September 1940 under direct government rule. At the time, few had studied conventional medicine, and most army doctors were Korean medicine doctors (KMDs). Their role was critical as treatment resources are limited on the battlefield. KMDs held the added advantage of use of herbs readily available in the countryside and acupuncture. This study sheds light on previously unknown activities of independent activist army doctors, and their significance is not limited to Korean medicine history, but can be expanded within the context of the Korean independence movement.

**History of Traditional Korean Medicine in Korea with Focus on Modern History: Harmony in Diversity (和而不同)****MoA3-2****History and Development Process of Korean Herbal Medicine and Related Policies**

Wonil Koh and Mihye Kim

Jaseng Hospital of Korean Medicine

Pharmacopuncture is a Korean medicine treatment that injects herbal medicine into tender points and acupuncture points based on the theory of meridians (經絡學說). The origin of Korean pharmacopuncture medicine can be traced back to 168 B.C. from the 15 ancient medical texts unearthed in China from 『Mawangdui-Hanmu (馬王堆漢墓)』, and especially from the concept of stimulating acupuncture points using bee venom in 『Yangsheng-Fang (養生方)』 and 『Zaliao-Fang (雜療方)』, and the method of applying crushed skin irritants to induce congestion or blistering from Tianjiu treatment (天灸療法). In 1998, through the Korean Ministry of Health and Welfare's (MoHW's) authoritative interpretation, pharmacopuncture was recognized as a Korean medicine practice. The Korean Pharmacopuncture Institute was established in 1990 and schools of Korean medicine have included pharmacopuncture education in their official curricula since 1995.

Pharmacopuncture was covered for medical care benefits under the National Health Insurance Act in 2001, but was converted to out-of-pocket payment as of 2006. At the core of the latest policy changes regarding pharmacopuncture is the MoHW's implementation of an accreditation system for pharmacopuncture dispensaries. The certification system evaluates and certifies not only overall facilities and management, but the entire preparation process from importing raw materials to storage, packaging and delivery. The MoHW applied assessment items equivalent to Korea Good Manufacturing Practice (KGMP) standards in certification of pharmacopuncture dispensaries, and Namyangju herbal dispensary, affiliated with Jaseng Hospital of Korean medicine, was the first facility to receive accreditation.

Efforts to further refine clinical research on the effects of pharmacopuncture are being made, and as its clinical use continues to increase, there is a need to establish standing management and standardization measures to safeguard public health. This points to the need for systematic institutional support for pharmacopuncture to enhance reliability and clinical utilization and ultimately contribute to ensuring freedom of choice in treatment and betterment of public health.

History of Traditional Korean Medicine in Korea with Focus on Modern History: Harmony in Diversity (和而不同)**MoA3-3****History and Globalization of Chuna Manual Medicine as Reviewed through The Inclusion Process of Chuna in Korean National Health Insurance**

Me-riong Kim and Mihye Kim

Jaseng Hospital of Korean Medicine

Chuna manual therapy is a Korean medicine treatment in which Korean medicine doctors adjust and treat joints, muscles and ligaments using hands or body parts to correct dysfunction and misalignment of anatomical structures to prevent and treat disease. Its main use is to treat pain from musculoskeletal disorders such as intervertebral disc herniation and spinal stenosis.

The use of hands in treating disease is one of the oldest known forms of medicine. The history of Chuna can roughly be divided into three periods: the traditional Chuna era (ancient times through to 1945), Chuna suppression era (1945 to 1980s), and modern Chuna era (1990s to present). Chuna originates from Do-in (導引) and massage (按) therapies introduced in Huangdi's Internal Classic (黃帝內經), a book thought to have been written in the Warring States Period (BC475 ~ BC221). During the modern Chuna era, Chuna was included in Korean national health insurance coverage as of April 8th 2019 to the aim of easing economic burden and further improving the quality of Korean medicine medical services following a nationwide pilot project, and its effective development can mainly be attributed to its strong academic basis, initial partial insurance coverage in automobile insurance, and the establishment of a Korean Chuna academic society, the Korean Society of Chuna Manual Medicine for Spine & Nerves (KSCMM).

KSCMM has worked continuously towards establishing a reliable evidence-based practice for Chuna by strengthening its research capacity through various clinical research efforts, providing standardized training and education for its instructors, and publishing periodical academic journals and textbooks. Chuna manual medicine has since focused on international exchange programs since 2013 after signing an MOU with Michigan State University, and a three-way MOU with the American Osteopathic Association (AOA), KSCMM and Jaseng Medical Foundation to the aim of expanding its treatment scope and insurance coverage.

MoB3

Formal Approaches to Studies of Traditional Maps of East Asia (II)

Organizer: Vera Dorofeeva-Lichtmann (UMR 8173 China-Korea-Japan, CNRS-EHESS)

The special session on the theory of cartography at the last International Conference on the History of Cartography (2017) manifested the raising interest in methods of map studies. It made apparent the division between scholars who up to now have been proceeding without explaining their methodology and those who applied highly technical software, as for instance the Map Analyst <http://mapanalyst.org>, for cases of its application see <https://www.medea-chart.org/>. As a consequence, a growing number of scholars started to reflect on the relevant methods to be used in the history of cartography studies, some of them are contributors to the proposed panel. Broad spectrum of questions related to algorithms used for analysis of maps and for visualization of the obtained results, as well as to spatial analysis and applications of GIS were discussed at workshops of computer scientists developing software for “old maps” - Exploring Old Maps (2016-2018), see <http://exploringoldmaps.informatik.uni-wuerzburg.de>. The Asian maps were also analysed with the help of quantitative methods, yet the studies of this kind remain less numerous; see, for instance, the study of the “Map of the tracks of Yu” Yujitu 禹跡圖 (1136) by Akin and Mumford (2012). However, one of the main methodological problems is posed by the analysis of relational maps, which do not rely on projection and scale and in a number of cases cannot be studied with the help of the geo-referencing approach. The proposed panel will bring together scholars working on the history of cartographical representation of East Asia interested in formal methods and techniques of map analysis. The aim is to discuss possible approaches to investigating maps of East Asia and share results of selected case studies.

Formal Approaches to Studies of Traditional Maps of East Asia (II)

MoB3-1

A Sixteenth Century Jesuit Composite Map of East Asia and Its Asian Sources

Marco Caboara

Hong Kong University of Science and Technology

At the Jesuit Archives in Rome there is a 1651 manuscript map of China and East Asia, provisionally titled “Sinarum Regnum” (Kingdom of China). The only information about its production and authorship is given in the long Latin text at the bottom of the map, stating that this is a faithful reduced version of a much larger manuscript map partly based on Chinese sources sent to the Jesuit General in Rome in 1593. A previously unknown 1642 printed map by the Italian cartographer Carlo Giangolini (Fano, 1598 - Messina, 1652) shares the same 1593 source.

Not only were the coastal contour and the general information on China of much higher precision than any printed or manuscript map available up to then in Europe but, especially as far as Korea is concerned, the amount and precision of cartographic knowledge displayed in the two related maps remained unmatched until the 18th century.

While the source for China is most likely the well-known geographical Atlas by Luo Hongxian 羅洪先 (1504-1564), the cartouche of the manuscript map attributes the depiction of Japan to the Portuguese cartographer Moreira and the Korean part is unattributed, but mention is made of the ongoing Japanese invasion of Korea, and the model should be a Korean or a Japanese map of Korea.

I plan to analyse the sources of the individual parts as well as their combination in an East Asian framework related to the European and specifically Jesuit vision of the area.

**Formal Approaches to Studies of Traditional Maps of East Asia (II)****MoB3-2****Map Genealogies in East Asia: Copying Maps from Ming to Qing**

Mario Cams
University of Macao

Before the 19th century, the production process of maps everywhere in the world often involved the (selective) copying of information or modes of representation from existing maps. Particularly in the literature dealing with East Asian cartography, the practice of copying from authoritative works of geography and cartography has given rise to methodological barriers for historians. As a result, provincial, state and world maps are often superficially explained as belonging to a certain style or tradition of representation without engaging in deeper analysis. This paper analyzes a series of six highly similar maps produced over a period of about two hundred years. Through a comprehensive analysis of data included on these maps, it identifies the different layers that comprise the material maps and reflects on how map genealogies came to be so dominant.

Formal Approaches to Studies of Traditional Maps of East Asia (II)**MoB3-3****A Tentative Formal Analysis of Japanese Buddhist World Maps of the 14th – 19th Centuries**

Wei-Ting Yang¹ and Chun Hao Chang²
¹*National Tsing Hua University*
²*Université Paris 1 Panthéon-Sorbonne*

In our paper we study the cartographic representations manifested in 17 Buddhist world maps made in Japan from 14th to 19th century. The maps show different cartographic styles and represent cartographic concepts of different periods. In our paper we shall attempt to build the relation network of the maps to explain the transformation of geographical representations employed in them.

The studied maps are subdivided into three groups: the first group is represented with the map “Go Tenjiku zu” 五天竺圖 of 1346, the second group includes maps showing similarity to the “Nansen Bushu Bankoku Shoka no zu” 南瞻部洲萬國掌葉之圖 produced in 1710, and the third group is represented with the map “Nan’enbudaishokokushuuran no zu” 南閩浮提諸國集覽之圖 produced after 1744. To build the relation network of maps, we introduce a methodology based on the formal approaches used in “textual analysis” and discuss its applicability for the study of cartography. More specifically, we shall discuss two methods. The first method is based on an analysis of the directions and distances of several points identified on the maps of the three abovementioned groups; the goal of this analysis is to find the effective “features” of maps for their further analysis. The second method involves a computer-aided procedure based on the so-called Phylogenetic method that is used to build a genealogical tree of maps in each group.

MoC3

The Diversity of Mathematical Practices in East Asia, and Their Historiography (III)

Organizer: Karine Chemla (CNRS & University Paris Diderot)

Historiographies of mathematics in East Asia have often tacitly assumed that mathematical writings in China, Japan and Korea testified to a uniform tradition with respect to both knowledge and practice or, alternatively, to three different national traditions. This panel invites to explore the circumstances in which such representations took shape. It further invites contributors to bring to light the diversity of mathematical practices to which documents produced in this part of the world attest. In other words, this panel suggests to explore the diversity of mathematical practices not only in relation to the three different nations, but also with respect to different domains of activities. How can we distinguish between different types of mathematical practices in East Asia? What is the historicity of each of these practices? What are the relationships between the traditions to which they testify? How did practices emerge or how did they disappear? How did these different traditions of practice react when encountering mathematical knowledge and practices coming from the West after the 17th century? These are some of the questions that we intend to explore collectively.

The Diversity of Mathematical Practices in East Asia, and Their Historiography (III)

MoC3-1

By Counting Rods or By Abacus? An Investigation of The Practices of Chinese Mathematicians' Computations of Multiplication and Division in The 13th-15th Century

Shirong Guo

Inner Mongolia Normal University

The counting rods were applied to computations in the ancient Chinese mathematics and a set of computation rules, procedures and expressions were formulated. In mathematical writings, however, the procedures were usually described by words, instead of using the expressions with counting rods. Since the 13th century, the expressions using counting rods became popular in mathematical writings, meanwhile, the computation using abacus developed rapidly. The abacus computation was impacted greatly by those of the rods counting. Mathematicians represented by Yang Hui of the 13th century designed various new calculation procedures, treated computation in new methods, or compiled calculation pithy formula, to improve the computing speed or simplify computing procedure. All these treatments of computations were helpful to the development of abacus techniques. There was a period of parallel calculation using both the computation tools. During the period, whether the computation was carried on by counting rods or by abacus, the process was still described in the terms and expressions using counting rods in writing mathematical works. It made it some difficult for historians to distinguish computations between the rods and the abacus.

Analyzing the computation procedures from the background of mathematical practice is helpful to solve the problem. Whether it is a rod calculation or an abacus calculation, when calculating multiplication and division, especially, applying the so-called 'addition' for multiplication and 'subtraction' for division, there will be cases that a number more than 10 appears in one digit. Analyzing how a mathematician treating those cases in his practice is important for us to understand his computation tool. In the present presentation, we will analyze the procedures and expressions of multiplications and divisions in several mathematical works arranged from the 13th to 15th centuries, so as to distinguish the computations between counting rods and abacus.



**The Diversity of Mathematical Practices in East Asia, and
Their Historiography (III)**

MoC3-2

**The Diversity of Mathematical Practice in The
Context of Evidential Scholarship in Eighteenth
and Early Nineteenth Century China**

Miao Tian

Chinese Academy of Sciences

Scholars of evidential scholarship in the 18th century made great contributions to the rediscovery and publication of early Chinese texts, including mathematical works. Even though they were highly regarded in the historical study, they were criticized by some modern historians for their conservative attitude toward European mathematics. Based on detailed analyses of a number of leading scholars' work, this paper shows that diversity existed in the mathematical practices of evidential scholars. I argue that such diversity shows the different understanding of the statute and nature of mathematics and the different stage of rediscovery of ancient texts.

**The Diversity of Mathematical Practices in East Asia, and
Their Historiography (III)**

MoC3-3

Geometry in The Second Half of Joseon Dynasty

Young Wook Kim

Korea University

Joseon government maintained two disciplines of mathematics, namely, in Hojo and Gwansang-gam. Both hired mathematicians but major subjects were different from each other. In the history of mathematics of Joseon much of the study centers around the theory of equations, of series and that of right triangles. But if one looks into the works of Gwansang-gam there seems to be more studies in geometry in addition to the gugosul (gougushu in Chinese). We try to see what kind of geometry was used in astronomy and calendars.

MoD3

Big Data of Medical Knowledge in The Past and in The Present: From Uibangyuchwi to CDSS (Clinical Decision Support System)

Organizer: Hyunkoo Kim (University of Oxford)

This panel explores medical knowledge as ‘big data’ in classical medical texts in Korea. Each paper analyzes medical texts with a different lens and sorts out the data on various topics: food therapy, consumptive disease, Shanghan, and clinical decision-making. Analyzing the contents of Korean medical classics, this panel attempts to discuss the characteristics of the medical encyclopedias in the past and their possibilities for knowledge discovery and clinical decision support in the present.

Big Data of Medical Knowledge in The Past and in The Present: From Uibangyuchwi to CDSS (Clinical Decision Support System)

MoD3-1

On Food Therapy Sections in The *Classified Collection of Medical Prescriptions*

Jaehyun Kim¹ and Sangwoo Ahn²

¹Wonkwang University

²Korea Institute of Oriental Medicine

This article is a review and discussion on Food Therapy (食治) sections in *the Classified Collection of Medical Prescriptions* (醫方類聚). *The Classified Collection* was first completed in 1445 and published in 1477 after thorough proofreading. *The Classified Collection* has 91 chapters, and they have Theory (理論), Prescription (方藥), Food Therapy (食治), Taboos (禁忌), Acupuncture and Moxibustion (鍼灸), and Guiding-pulling Exercises (導引) sections. Theory and Prescription sections are in every chapter, while the others are sometimes omitted depending on the subject.

Food Therapy sections are in 39 of 91 chapters in *the Classified Collection*. They have 695 prescriptions in total, but since *the Classified Collection* puts many similar prescriptions under the original prescription by noting each book’s changes with small size letter, there are actually 904 prescriptions considering that. In the discussion, we first examine possible mistranslation of the terms and its correction. We concluded that what can be commonly misunderstood as a wildcat and a fox (狐狸), a badger and a pig (獐猪), a puffer fish (鮑魚) and rice powder (粃米) is actually a wild cat, a badger, salted fish and nonglutinous rice respectively. Secondly, we look into the herb names and compare them with the ones in *the Treasured Mirror of Eastern Medicine* (東醫寶鑑). Some ancient herb names in *the Classified Collection* are mostly replaced by the new ones in *the Treasured Mirror*. For example, *The Classified Collection* uses ‘gugigeun’ (枸杞根) instead of ‘jigolpi’ (地骨皮), and ‘gyebichi’ (雞肫胗) instead of ‘gyenageum’ (雞內金). In *the Treasured Mirror*, the frequency is reversed, preferring the latter in most cases. We can see that *the Classified Collection* preserves some ancient herb names that were common before early Joseon, and that by the time of *the Treasured Mirror*, the names were settled as what are commonly used until now.



Big Data of Medical Knowledge in The Past and in The Present: From *Uibangyuchwi* to CDSS (Clinical Decision Support System)

MoD3-2

A Study on The Shang Han Section (傷寒門) of *Uibangyuchwi* (醫方類聚)

Jung Wuck Byun
Kyung Hee University

Uibangyuchwi (醫方類聚) is a medical encyclopedia, completed in Se-jong Joseon era. The Shang Han section (傷寒門) is one section in *Uibangyuchwi* and it has three special points. First, the Shang Han section occupies on the largest part in *Uibangyuchwi* and this characteristic appears only in *Uibangyuchwi* among the medical books of the Joseon Dynasty. Second, the Shang Han section included various diseases like Onbyeong(溫病), Sigi(時氣). Third, to include various diseases in the Shang Han section, *Uibangyuchwi*'s editors chose to transform when citing an application.

Big Data of Medical Knowledge in The Past and in The Present: From *Uibangyuchwi* to CDSS (Clinical Decision Support System)

MoD3-3

Changes of Perception about Consumptive Disease in East Asia

Jihun Jung
Sang Ji University

Containing almost all the East Asian medical knowledge developed before the fifteenth century, *Uibangyuchwi* is one of the most voluminous medical books in the history of East Asian Medicine. It introduces hundreds of therapies and prescriptions, some of which are dispersed, giving us the opportunity to find different concepts of diseases and new therapies to contribute to the promotion of people's health. To find useful medical knowledge about deficiency, this study concentrates on *Uibangyuchwi*'s Various Deficiency section, which describes deficiency-oriented diseases and introduces applicable prescriptions. In it, diverse and meaningful concepts such as Consumptive Disease (虛勞) and Fatigue Due to Overexertion (勞倦) are introduced to describe deficiency-oriented diseases. Moreover, this section introduces numerous applicable prescriptions by citing more than fifty other medical books. This study does not judge the effectiveness and historical contexts of these concepts and prescriptions; rather, it argues that medical information derived from *Uibangyuchwi* has the power to integrate with and cover our existing knowledge and needs to be reviewed through diverse approaches. This study proposes that medical knowledge derived from the All Deficiency section of *Uibangyuchwi* can be related to disease concepts from such as Chronic Fatigue Disease (CFD). Given the huge demand in Korean medicine for information about deficiency-oriented diseases, undertaking this study is urgent and important.

Big Data of Medical Knowledge in The Past and in The Present: From Uibangyuchwi to CDSS (Clinical Decision Support System)

MoD3-4

The Development of Common Data Model and Clinical Decision Support System in Korean Medicine Based on a Medical Text, *Donguibogam*

Taehyung Lee

Kyunghee Leetaehyung Korean Medicine Clinic

Since 2010, after having started using Korean Classification of Disease (KCD), which heavily relies on biomedical nosology, physicians of Korean medicine (KM) have faced epistemological confusion. Though many of KM physicians still treat patients in the traditional way, all KM physicians are now obliged to record biomedical disease names to get reimbursement. *In this research, apart to this change*, the traditional way of treating patients will be examined through two KM physicians. The first physician is Yi, Suki from the 18th century, and the other is Kim, Gongbin in the present. Despite the time gap, there is considerable similarity between the two as both of them are commonly influenced by the classical medical text *Donguibogam*. They both highly emphasized identifying the causes of disease rather than just observing symptoms when treating patients. *Then, is it possible to succeed* and share this traditional way of diagnosis and treatment in the present? This research suggests that establishing clinical data sharing system based on the common data model (CDM) and developing a clinical decision support system (CDSS) using *Donguibogam* nosology can be a possible solution. By collecting and comparing each other's medical records, KM physicians can verify their own medical treatment based on *Donguibogam* and have more chance to make traditional medicine actively working still in the present.

MoE3

Knowledge Exchange and Practice of Chinese Modern Physics (II)

Organizer: Degang Yi (Inner Mongolia Normal University)

Traditional speculative philosophy and applied technology gradually involved into the natural science which is based on logic and experiment. Since “Western learning spreading to the East”, Chinese people's understanding and application of physical knowledge has undergone a process from study, exchange to innovation and development. Some ancient Chinese's applied technological inventions related to physics still have utility up to now. As for the steps of study and introduction of the advanced modern physics into China are accelerated. Chinese modern physics gradually merging into the tide of international physics development through the combination of the native knowledge accumulation and worldwide academic exchange. Unfortunately, there are few studies of this long and tortuous course. Our group will focus on the physical content of Chinese traditional science and technology, as well as the introduction of the western physical knowledge and technology, make discussions from the following aspects, such as foreign physicist's contribution and Chinese scholar's achievements in the process of Chinese-Western exchange, Chinese people's rejection of the fundamental ideology of western physical in specific social context. We try to analysis the representative historical phenomenon in the process of Chinese modern physics' exchange and development from different perspectives and levels.

**Knowledge Exchange and Practice of Chinese Modern Physics (II)****MoE3-1****S. Sakata's influence in China during The 1950s and 1960s**

Jinyan Liu

Institute for the History of Natural Sciences, Chinese Academy of Sciences

Shoichi Sakata (1911-1970) was an eminent Japanese theoretical physicist who studied nuclear physics and particle physics. He was also famous for his combination of his scientific research with the materialist dialectics. His proposition that even elementary particles were composed of constituent particle in 1956 was resonant with Mao Zedong's thought that matter could be divided infinitely. Mao's appreciation of Sakata's work drew unusually enthusiastic responses from Chinese academics and finally promoted Chinese particle physicist proposed the Straton Model--a structure model of hadrons in 1966. In addition, Sakata dedicated himself to pushing forward the scientific communications between China and Japan. He visited China in 1956 and 1964. Based on archives preserved in Chinese Academy of Sciences and other historical materials, this talk makes a special inquiry into the relationship between Sakata and China during the 1950s and 1960s.

Knowledge Exchange and Practice of Chinese Modern Physics (II)**MoE3-2****The Evolution of Acoustics Technology in Ancient Chinese Stage**

Yang Yang

Shanxi University

The Chinese Stage is an acoustics building which combines science and art. The change of shape and structure is essentially the evolution of acoustic technology. On the basis of the Song Dynasty terrace, the ancient people successively added roof, gable wall, and improved the stylobate in order to increase sound quality. There are Chinese stages have urns or caves at the bottom, others have caves on gable wall. All these settings are intentional act that ancient Chinese people hoped hearing clear voice from stages by changing volume and quality.

Knowledge Exchange and Practice of Chinese Modern Physics (II)

MoE3-3

Criticism of Thermodynamics from The 1950s to The 1970s in China

Huakai Hu

University of Science and Technology of China

From the 1950s to the 1970s, influenced by the ultra-Left trend of thought, China carried out the critical activity of natural science. It criticized *bourgeois ideology* such as the so-called *idealism* and metaphysics and so on. The critical areas involved in mathematics, physics, chemistry, biology, astronomy, geography, etc. This activity had a great negative impact on the development of modern science. As an example, this paper discusses the critical situation of thermodynamics. *In the 1950s, the academic circle* criticized not only the theory of heat death, which had long been criticized by Engels, but also *the lecture on thermodynamics* by Professor Wang Zhuxi, Peking University and *the lecture on statistical physics* by Professor Zhang Chengxiu, Wuhan University. During the *Cultural Revolution*, all three laws of thermodynamics were criticized. As one of the "gang of four", Yao Wenyuan not only supported such activities, but also personally reviewed some critical articles. Criticism of the first law of thermodynamics, or the law of conservation of energy, led some people in the late *Cultural Revolution* to be enthusiastic about making perpetual motion machines, which was also supported by the gang of four. The criticism of thermodynamics not only gives rise to wrong ideas and hinders people's correct understanding of this basic theory of physics, but also causes a certain waste of human and material resources.

MoF3

East Asian Women and Medicine, Science and Engineering (II)

Organizer: Hyunsook Lee (Yonsei University)

This panel aims to reconstruct the stories of various women medical practitioners and socio-cultural and political discourses surrounding women's health particularly through pregnancy and childbirth in modern and contemporary China, Japan, and Korea. Traditionally East Asian women in medicine—either medical practitioners or patients—have been invisible and were rarely trained in formal educational institutions. The social reforms since the end of the nineteenth century gave more opportunities for women to undertake formal medical training and practice medicine. Three panelists—H. Lee, Kong, and Hung—discuss Korean female medical practitioners and their education related to childbirth from different perspectives. By relying on the narratives of ten midwives, H. Lee explores the stories of Korean midwives and their changing social status from the colonial period to the 1990s. Kong addresses a case study of a Korean female obstetrician, Il-Uk Joo, who is a typical example of the first generation of professional women in early-twentieth-century Korea, as she was initially educated under Japanese rule and re-trained in the United States. By using statistical approaches, Huang traces the formation and transformation of women's medical education in modern Korea. The other three panelists—Y. Lee, Sato, and You—discuss how various ways of understanding of women's health through pregnancy and childbirth were formed and transformed in China, Japan, and Korea. Y. Lee examines the characteristics of pharmaceutical drugs for women—mostly, for a healthy pregnancy—as described by Korean newspapers during the mid-twentieth century. Sato examines the legal, political, and hospital systems to transform maternity care, childbirth, and the role of midwives in Japan since World War II. By analyzing a wide range of propaganda, you investigates how painless childbirth became an indispensable medium for the transfer of the CCP's ruling order, socialism, and welfare of China in the 1950s.



East Asian Women and Medicine, Science and Engineering (II)

MoF3-1

The Development of Midwifery and Changing Childbirth Practices in Modern Japan

Noriko Sato

Pukyong National University

This paper examines how the following three issues have facilitated changes in maternity care, childbirth, and the role of a midwife. They are the amendment of the Japanese law on midwife licenses in 1948, the changes in their education system, and Japanese medical policy. In Japan, obstetricians have not been the absolute authority on pregnancy, childbirth, the care of pregnant women, and their labor, as Japanese midwives had discretion over normal pregnancy and delivery. This was different than the case in the U.S., in which obstetricians did not acknowledge midwives as medical experts, as they were considered to be “backward,” without definitive knowledge of maternity. When observing the changes in childbirth in Japan since the 1960s, it is apparent that the advances in medical technology and the establishment of a medical management system have made pregnant women “patients.” As many midwives have come to work in hospitals, they have to acknowledge obstetricians as those who have the authoritative knowledge of pregnancy and childbirth and exercise medical practices. Under such a system, a midwife is unable to take care of expectant mothers independently by utilizing their expert knowledge and experiences. Thus, the legal, political, and hospital management systems facilitate medical doctors to exercise power and authority over both pregnant women and midwives. However, pregnant women do not unconditionally accept medical intervention during their childbirth. Active birth empowers women to choose how and where they deliver their baby. It is a midwife who communicates with such a woman during her pregnancy, advises her on how to trust in her body’s natural ability to give birth, and helps find a way to make her labor more comfortable.

East Asian Women and Medicine, Science and Engineering (II)

MoF3-2

A Study of Pharmaceuticals for Female Health in Mid-20th-century Korean Newspaper Advertisements

Young Nam Lee

Chungbuk National University

Advertising reflects the desires of society. In this sense, this paper will explore the perceptions of how to look after women's health and use drugs appearing in mid-20th-century Korean newspaper ads. Reading newspapers was a symbol of intellectualism and middle-class status, and advertising medicines in newspapers was expensive and effective in the 1930s~40s. There were several small pharmaceutical companies that had adopted Japanese technologies and systems based on Korean traditional medication. There were a few advertisements of pills for improving women's health conditions, such as Bo-ik-whan (補益丸, supplements for energy), for warming women's bodies during the time of their pregnancy. During the Korean War, there was no advertisement targeted at women, but there were advertisements for a contusion therapeutic agent and painkillers. In the 1960s, Western pharmaceutical companies established Korean branches and started to advertise their products. One of the most popular advertisements was Bayer's Saridon, a women's menstrual painkiller, and another was Hemoglobin for treating anemia during pregnancy.

The study reveals that in the middle of the 20th century, the primary concern of Korean society was reproduction and pregnancy.

East Asian Women and Medicine, Science and Engineering (II)

MoF3-3

Making Women Scientists and Engineers Visible in Korea: Early History of KWSE

Eunkyoung Lee

Chonbuk National University

The government policy for women in STEM(science, technology, engineering, math) has been institutionalized and extended in Korea since the early 2000s. The Act for Fostering and Supporting Women in STEM was enacted in 2003. And by the Act, a master plan to support and promote women in STEM should be made every 5 years, covering K-12 education to research grants to returner programs after career break. It was unusual in science policy in Korea, where S&T is considered to be a merit system, regardless of age and gender. It was a result of a combination of socio-cultural and political circumstance and the organized efforts of women in S&T. In the social context of political democratization and economic growth during 1980s and 1990s, more women received the tertiary education and their gender equality awareness was increased. As the result, some measures for gender equality were introduced in many areas such as the Equal Employment Opportunity Act(enacted in 1987, enforced in 1998) However, S&T was not included in the new wave because S&T was considered meritocratic, therefore gender-free. Women scientists and engineers collectively discussed about their problems to form an organization, KWSE (the Association of Korean Woman Scientists and Engineers) in 1993. KWSE raised the necessity of support system for more women into S&T from the beginning. And KWSE was deeply involved in the shaping of the early measures and programs to support women in S&T. This paper studies the formation process of KWSE and its activities to make women in S&T visible and their voice heard. Research focus is on major actors of KWSE, its strategies, its achievements and limitations and its implication for gender politics of S&T in Korea.

Food, Technology, and Society (III)

MoG3-1

Of Sweet Potatoes, Locusts, Ducks and Ditches: Biological Pest Control in Late Imperial and Modern China

Yubin Shen

Max Planck Institute for the History of Science

Based on a relatively-unknown agricultural treatise *Zhihuang chuanxilu* (*A Legacy of Locust Control*) published in 1776, as well as many other primary and secondary sources, this paper traces the origin and development of mobilizing ducks to control locusts, from the late sixteenth to the twentieth century. Initially as an unexpected by-product in promoting sweet potatoes cultivation during Wanli period (1572-1620) of the Ming dynasty, it had been developed as a sophisticated technology of systematically managing locusts, raising ducks and digging ditches by the late eighteenth and nineteen centuries in Qing China. Ever since the spread of western applied entomology in early twentieth century, it has been still practiced and promoted as an effective organic antidote to toxic chemical pest controls. By exploring how ducks were used as technology and how relations of humans, plants, animals and the environment were shaped by traditional Chinese natural history/agronomy and modern applied entomology, the present paper helps better understand this particular Chinese innovation of biological pest control.

**Food, Technology, and Society (III)****MoG3-2****Institutionalization of Tea Science in The Period of The Republic of China**

Huichuan Fan

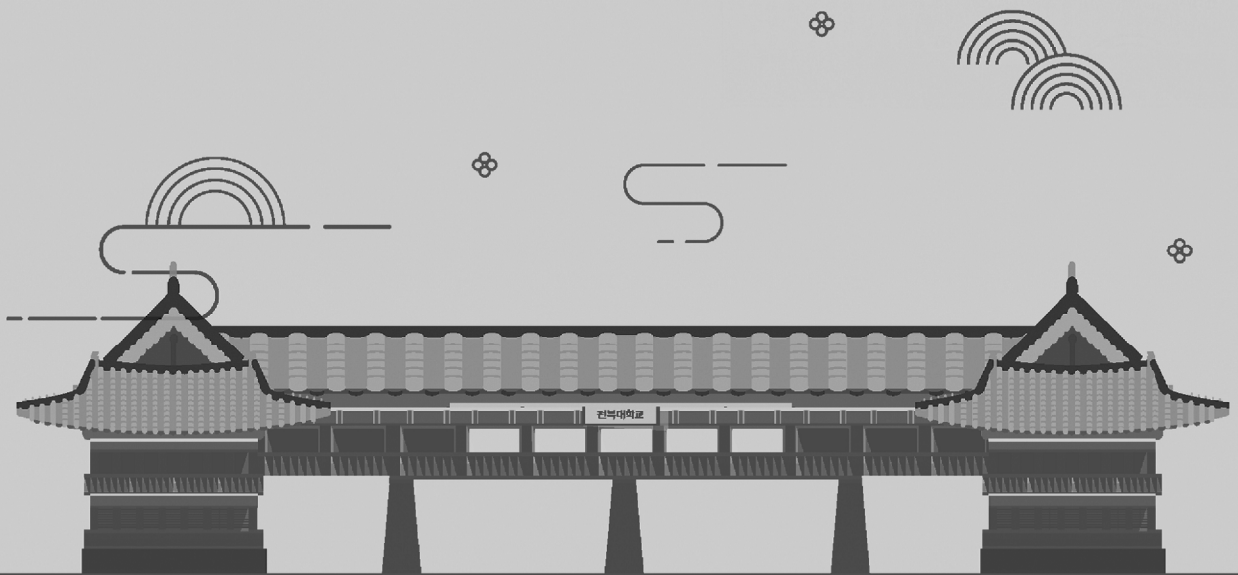
University of Science and Technology of China

The institutionalization of tea science is an important part of the modernization of the China tea industry in the late Qing Dynasty and the Republic of China. It was gradually completed in the first half of the 20th century along with the continuous perfection of the improvement of tea industry, mainly reflected in four aspects: the demonstration institutions such as the Tea Experiment Station that balanced production and scientific research have gradually developed into professional tea research institutes; based on the tea improvement and scientific research, more than ten types of tea science journals have been established where a great number of tea research results have been published, thus popularizing the knowledge of modern tea science; the cultivation of professional talents, from the initial training institutes and vocational schools to the university departments, provided academic and applied talents for the tea industry modernization; going through the tea industry research society and the tea business society with the characteristics of academic society to a greater or lesser degree, the tea society has matured gradually. In addition to the National Tea Society, some provincial branches have also been established. The completion of the institutionalization of tea science marks tea science as an independent discipline in China, which has played a significant role in promoting the development of the Chinese tea industry.

ICHSEA 2019

15TH INTERNATIONAL CONFERENCE
ON THE HISTORY OF SCIENCE IN EAST ASIA

August 20 (Tue.)



August 20 (Tue.)

Making Sense of Non-sensical World

TuA1-1

The Many Meanings of Mental Illness in Republican China, 1912-49

Yuk Lum Jennifer Yip

University of Pennsylvania, History Department

This paper explores how foreign conceptions of mental health and illness permeated the Chinese public domain in the first half of the twentieth century. With the introduction of the Western disciplines of psychotherapy and psychiatry, neologisms such as *jing-shenbing* (精神病) and *shenjingbing* (神經病) filtered into everyday Chinese language and the quotidian imagination, expanding beyond their medical definitions to take on various social meanings and functions. While Chinese practitioners of both Chinese and Western medical traditions debated methods of treatment, layman social actors contemplated the legal and social repercussions of a diagnosis. Mental illness found its way into the lives of students, housewives, sons and daughters-as a personal experience, as a newly established part of colloquial language, or as a way of interpreting social behavior. Could the mentally ill be legally married? Was there a relationship between mental illness and theft? Why might listening to piano music cure mental illnesses? Was mental illness the price of genius? Through the widespread dissemination of Western-inspired concepts and vocabularies, madness came to be seen through new lens, and spoken of in new terms-but never wholly in the image of the West. At the same time, the nuances of these historical attitudes toward mental illness bear resemblance to those in both present-day China and the West: for instance, the refusal among some to recognize that mental illnesses are diagnosable medical conditions rather than manifestations of personal shortcomings. This paper also addresses the dearth of scholarship on mental health and illness during the Second Sino-Japanese War (1937-45). In this period, “mental health” took on yet another meaning: the fortification of one’s mind against the psychological blows meted out by war. Inspired by-but not dependent on-psychological theories crafted by their American counterparts, researchers in Chongqing conducted studies of shellshock among soldiers and trauma among refugee children.

Making Sense of Non-sensical World

TuA1-2

The Specter of Objectivity: Making Paranormal Knowledge in Early Post-Mao China

Chuan Xu

Columbia University

This paper presents a history of objectivity through the lens of paranormal research in early post-Mao China. In 1979, newspapers and popular journals published reports on qigong masters who could use their “vital energy” (qi) to perform telekinesis and children who could see images through their ears, hands, and armpits. Though initially dismissed as fraudulent, these reports quickly gave rise to a thriving field of paranormal research, as people ranging from journalists to nuclear scientists organized experiments to corroborate these alleged abilities. Qian Xuesen, along with many renowned scientists who supported this new field of research, celebrated the findings of these experiments as “omens of an imminent scientific revolution” that would overthrow modern science. At the center of this impending “revolution” were radical changes in how people produced and contested scientific knowledge. Researchers of paranormal phenomena, eager to establish their credentials, strove to cultivate a scientific persona characterized by an unwavering ethical commitment to objectivity. This commitment, which grew out of the early post-Mao campaign to critique political dogmatism, obliged people to crusade against all forms of subjective beliefs, including common-sense and established scientific knowledge. Drawing from newspapers, journals, memoirs, and unpublished lab notes, this paper shows how this ethics of objectivity manifested in both rhetoric and practice. The paper also presents the ironic story of how paranormal researchers, in their efforts to eliminate subjective corruption, substituted human observers with self-registering machines, only to realize in their experiments that machines could be as subjective as human beings. Though paranormal researchers never attained the objectivity they claimed, their efforts had long-lasting consequences. By striving to eliminate human subjectivity from scientific research, paranormal researchers had overthrown the political and epistemological foundations of Maoist mass science. Paranormal science, far from a phenomenon on the fringe, was critical to the making of post-Mao China.



Making Sense of Non-sensical World

TuA1-3

**Ritualizing Camera, Scientizing Spirits:
Morality of Light in Early Republican China**

Menglan Chen
Harvard University

In this paper I conduct an archeology of the use of photography in *lingxue*, the study of spirit (ling) or previously translated as spiritualism, in early 20th century China. Challenging *lingxue*'s contemporary scholars as well as later scholarship's opposition of *lingxue* with "real science," I treat *lingxue* as one of the most vibrant sites where the Western scientific paradigm remained multiple, obscure, and still under constant negotiation as it was introduced into China via Japan. My analysis focuses on Shanghai *Lingxue* Society's (SLS) transformation of Western spiritualism and spirit photography through incorporating them into Daoist divinatory rituals "Fuji," or planchette writing. Inventing what SLS calls "immortal spirit photography," this particular group of Chinese *lingxue* scholars reformulated photography as a mechanism through which light's physical qualities and its moral qualities become mutually translatable. I then situate such imperative of proposing a technologized morality in a longer trajectory of modern Chinese intellectuals' attempt to forge a mutualistic connectivity between, and eventually beyond, Chinese metaphysics and modern science and technology. However, SLS's attempt to moralize the photographic technology also risks the technologization of the moral, not only subjecting itself to accusation from reformers belonging to the strictly materialist camp, but also depriving "immortal spirit photography" of its aura due to the scientific demand of repeatability and the technical reproducibility of photography. Instead of attesting to the objective existence of the soul, these photographs eventually embody the fallen out efforts to forge a moral ground of intersubjectivity that would have guided alternative moral, epistemological and political regimes in early 20th century China.

Making Sense of Non-sensical World

TuA1-4

**Self-Cultivation and Mind-Body Therapy:
Chinese Quiet-Sitting and Its Japanese
Inspiration, 1900-1920**

Hsiu-fen Chen
Department of History, National Chengchi University

This paper is aimed to explore the techniques of 'quiet-sitting' for self-cultivation and mind-body therapy during 1900 and 1920. It will be focused on Jiang Weiqiao's (1873-1958) methods for quiet-sitting. When working for the Shanghai Commercial Press, Jiang had helped to introduce Fujita Reisai (1868-1957) and Okada Torajirō's (1872-1920) works on quiet-sitting from Japan into China. For self-therapy and self-strengthening, Jiang also promoted his own methods for quiet-sitting, partly inspired by Chinese Daoist and Buddhist cultivation techniques, and partly revised from Okada's methods. His book *Master Yinshizi's Methods for Quiet-sitting* (1914) soon became the best seller. It is said that his quiet-sitting methods were widely practiced through the nation until 1920s. Hence, it seems important to explore the questions as below: Firstly, how did Jiang Weiqiao appropriate Japanese quiet-sitting methods into his own and how they eventually differed from each other? Secondly, why could Jiang's methods for quiet-sitting attract so many followers, just like his predecessors Fujita and Okada had done in Japan? Last but not least, how did the enthusiasm towards quiet-sitting practices characterise the social and spiritual milieus in early twentieth-century China and Japan? By these questions, I will not only explore quiet-sitting as an approach for self-cultivation and mind-body therapy during 1900-1920, but also reveal its complicated and sophisticated relations to religions, medicine, science, and nationalism in broader historical contexts.

TuB1

Religion and Science: Adaptation of Western Astronomy into East Asia in The 16th-19th Centuries

Organizer: Sukjoo Kim (Presbyterian University and Theological Seminary)

This panel attempts to compare and connect the relationship between religion and science by highlighting the adaptation of Western astronomy in East Asia from the end of the 16th century to the 19th century. In addition, since cultural exchanges in East Asia, especially the exchange of astronomical theories, were carried out through missionaries, this panel clarifies commonalities and differences within their astronomical theories and observations in East Asia. To this end, this panel, through collaboration of researchers whose special areas consist in astronomy, church history, Chinese history, civilizational exchange, Korean studies, deals with three detailed topics. The first paper explores Western astronomical theories introduced and adapted in the Jesuit Chinese writings in the period between Ruggieri and Verbiest (1584-1688). By examining major astronomical texts of Ricci, Diaz, Furtado, Rho, Terrenz, Schall von Bell, and Verbiest, it demonstrates which astronomical concepts and theories were actually transmitted into China amidst the controversy over geocentricism and as well as various theoretical orientations. The second paper focuses on the transmission of the Copernican theory into 17th-19th China and the extent of its influence in China and in East Asia. This paper demonstrates that the beginning of the 19th century was marked by intense study of the heliocentric theory of Copernicus, mostly due to the work of American and English missionaries, both Catholics and Protestants, such as Benjamin Hobson, Alexander Wylie, Joseph Edkins, and John Fryer. The third and last paper reveals the process of establishing 'East Asian skies' through advancement in astronomical observations in East Asia during the 17th-19th centuries. It investigates technological developments introduced into East Asia through

the agency of Western missionaries, paying special attention to star maps, such as Ming Dynasty General Star Map, Qing Dynasty General Star Map, and Korean Star Map Cube, and assesses how precise they were. This panel aims to highlight the multiplicity of the relationship between religion and science as well as the limitation of East-West cultural exchanges in 16th-19th century East Asia.

**Religion and Science: Adaptation of Western Astronomy into East Asia in The 16th-19th Centuries****TuB1-1****Between Geocentrism and Heliocentrism: Western Astronomical Theories in Jesuit Chinese Writings between Ruggieri and Verbiest (1584-1688)**Wonmo Suh¹ and Jeong Yeon Choi²¹Presbyterian University and Theological Seminary²Chonbuk National University

This study is designed to explore Western astronomical theories introduced and adapted in the Jesuit Chinese writings in the period between Ruggieri and Verbiest (1584-1688). Jesuit missionaries in the 16th and 17th centuries saw the utility of scientific knowledge for transmitting their Christian faith into China. While Ruggieri first mentioned the ten spheres in his exposition of the six days of creation in his 1584 catechism entitled *Xinbian Xizhu guo Tianzhu shilu* 新編西竺國天主實錄, Matteo Ricci and other missionaries produced astronomical books, and Schall von Bell and Verbiest became Jesuit directors of the Beijing observatory. Ricci's *Qiankun ti yi* 乾坤體義 depended on Clavius' commentary on Joannes de Sacrobosco's *De Spheara*, which presented the account of the Ptolemaic geocentric universe. When Jesuits began to transmit Western astronomical knowledge into China, Galileo's heliocentric theory won an academic recognition among scientists in Europe, and his theory was mentioned in Diaz's *Tian wen lue* 天問略 and a telescope was dedicated to the Chinese emperor. After the Galilean system was condemned by the Inquisition, however, Jesuit missionaries could not openly teach it. On the other hand, Furtado wrote *Huan you quan* 寰有詮 adapted from the commentary on Aristotle's *De caelo*, which demonstrated diverse theoretical orientations among Jesuit missionaries in China. This study identifies Western astronomical concepts and theories present in Jesuit Chinese works on astronomy written between Ruggieri and Verbiest. It will examine major astronomical texts of Ricci, Diaz, Furtado, Rho, Terrenz, Schall von Bell, and Verbiest to demonstrate which astronomical concepts and theories were actually transmitted into China amidst the controversy over geocentrism and heliocentrism as well as over theoretical orientations of Aristotle, Ptolemy, Copernicus, Tycho Brahe, and Galileo.

Religion and Science: Adaptation of Western Astronomy into East Asia in The 16th-19th Centuries**TuB1-2****Catholic and Protestant Missionaries and The Transmission of The Copernican Theory into 17th-19th China**Sukjoo Kim¹ and Miwon Cho²¹Presbyterian University and Theological Seminary²Yonsei University

The Copernican theory had similar difficulties in being accepted in China as it had in Europe. Even though Jesuits such as Wenceslas Pantaleon Kirwitzer (1588-1626) and Jan Mikolaj Smogulecki (1610-1656) were in favor of introducing the Copernican solar system in the middle of the 17th century, most Jesuit missionaries to China held the conservative views of the Catholic Church against Earth's rotation. The beginning of the 19th century was marked by intense study of the heliocentric theory of Copernicus in China, mostly due to the work of American and English missionaries, both Catholics and Protestants, such as Benjamin Hobson (合信, 1816-1873), Alexander Wylie (偉烈亞力, 1815-1887), Joseph Edkins (艾約瑟, 1823-1905), and John Fryer (傅蘭雅, 1839-1928). Hobson published a popular digest of modern European astronomy with the title *Tianwen lue* 天文略論 or *The Introduction to Astronomy* in 1849. Wylie translated F. W. Herschel's *The Outlines of Astronomy* as *Hou shi lei* 候失勒 in 1852 and republished it under a different title (*Tiantian* 談天) in collaboration with Li Shanlan (李善蘭, 1810-1882) in 1859. Fryer, as the director of the famous Jiangnan Arsenal (江南製造局) after 1868, encouraged, helped, and gathered together many Chinese students of science. He started a monthly publication known as *Gezhi huibian* 格致彙編 or *The Chinese Scientific and Industrial Magazine* in 1876. In the meantime, there seems to be no doubt that Catholic missionaries, including Jesuits, in China, recognized and accepted the Copernican views, though they did not proclaim it openly. This paper, therefore, explores the transmission of the Copernican theory into 17th-19th century China and the extent of its influence in China and in East Asia from the historical viewpoint.

Religion and Science: Adaptation of Western Astronomy into East Asia in The 16th-19th Centuries

TuB1-3

Establishing 'East Asian Skies': An Analytical Study on Astronomical Observations in East Asia, 17th-19th Centuries

Seung-Urn Choe¹ and Moonseok Kwak²

¹*Seoul National University*

²*Presbyterian University and Theological Seminary*

This study reveals the process of establishing 'East Asian skies' through advancement in astronomical observations in East Asia, especially China and Korea, during the 17th-19th centuries as a result of East-West cultural exchanges.

It begins with comparisons of astronomical observations before and after Jesuit missionaries' activity in China. At that time several Western astronomical instruments were introduced to China. For example, Manuel Dias, Jr. mentioned the telescope for the first time in his *Tian Wen Lüe* 天問略 in 1615, Adam Schall von Bell published the Chinese treatise *Yuan jing shuo* 遠鏡說 on the telescope in 1634, and finally the Chongzhen emperor (崇禎帝) acquired the telescope of Johannes Terrentius in 1634.

Then, it introduces and compares 'Orthographic projection', including 'Polar aspect orthographic projection' and 'Oblique orthographic projection', 'Gnomonic projection', and 'Stereographic projection.' *Korean Star Map Cube* (方星圖) was drawn by the method of 'Gnomonic projection.'

Lastly, it investigates technological developments introduced into East Asia through the agency of Western missionaries, paying special attention to star maps, such as the *Ming Dynasty General Star Map* (赤道南北兩總星圖), drawn by Adam Schall von Bell and Xu Gyangqi (徐光啟) in 1634; the *Qing Dynasty General Star Map*, (皇道南北兩總星圖) devised in 1744 and completed in 1757 by Ignaz Kögler and Yun Lu (允祿); and the *Korean Star Map Cube* (方星圖), originally by Philippus Maria Grimardi in the early 18th century, and assesses to what extent they succeeded in constituting East Asian skies from the perspective of astronomical science.

It concludes that although Jesuit missionaries in the 17th-18th centuries brought Western astronomy, then undergoing its own revolution, to China and via Jesuit missionaries' gifts to Korea, the impact on Chinese and Korean astronomy was limited.

TuC1

A Comparative Study of Science and Technology in The Four Asian Tigers

Organizer: Manyong Moon (Chonbuk National University)

Four newly industrializing economies (NIEs) that had achieved swift industrialization in the 1970s, South Korea, Taiwan, Singapore, and Hong Kong were dubbed the "Four Asian Tigers" or the "Four Asian Dragons" and received attention during the 1980s-90s. These four NIEs share not only the history of rule by imperial powers in the past and the accomplishment of dramatic economic growth and prosperity following liberation but also the cultural experiences of Confucianism and authoritarianism. When such epithets first arose, the four NIEs received attention as cases good demonstrations of compressed growth worldwide from the economic perspective, but scarce was research on science and technology behind such economic growth. The present panel seeks to shed light on the question of science and technology in each of the NIEs or the region itself that allowed these economies to emerge. Through multiple perspectives encompassing science and technology policies, specific science and engineering fields, scientists and engineers, research systems, and educational systems in the 1980s, when these four economies grew dramatically, the present panel intends to go beyond simple and outward economic indices and to explore the "Four Asian Tigers" potentials and how they were manifested or distorted subsequently. This panel seeks to discuss at one sitting science and technology in the four NIEs. Though it will be difficult to apply a single topic or perspective because the four economies have accumulated disparate research on the history of science, the present panel seeks to create the starting point for full-fledged comparative research in the future by addressing together issues related to science and technology in these NIEs during the 1980s-90s or the 1970s, its prehistory.

**A Comparative Study of Science and Technology in The Four Asian Tigers****TuC1-1****Seoul Olympics and Korea's Science and Technology**

Hyangsuk Shin and Manyong Moon
Chonbuk National University

Events that appear to be somewhat unrelated to science and technology often serve as a catalyst for technological growth. The international sports event represented by the Olympics is a stage that shows the diplomatic, cultural and social development of the host country, and is directly linked to science and technology, as it is called a test site for high-tech science and technology. The Olympics not only provided infrastructure directly related to the Olympics but also science and technology, which is equivalent to social overhead capital, quickly. The 1988 Seoul Olympic Games were considered as a "scientific Olympics where advanced science and technology became the main focus," and the reason for this was that they described the Olympic Games as a successful example of the country's computerization, doping testing, and weather forecast. This study closely analyzes the various aspects of each case and analyzes the effectiveness of the Olympics as a catalyst for Korea's technological change. By doing so, we will examine the direct and indirect impact of the Seoul Olympics on the development of Korean science and technology, and discuss the limitations and problems of the change in science and technology policies, and events. In addition, I would like to examine the purpose or effect that politicians, scientists and citizens who participated in the process wanted to pursue, and how the Olympics were used.

A Comparative Study of Science and Technology in The Four Asian Tigers**TuC1-2****Taiwanese High-tech Engineers and Economic Growth: 1970-2000**

Kuo-Hui Chang
National Taiwan University

After the KMT fled to Taiwan in 1949, it left local Taiwanese engineers few job opportunities in both of the government and state owned enterprises, which preferred to hire mainlander engineers. Most of the local went to serve in the private sector. This paper finds that there were some changes from 1970 to 2000. First, a few number of the Taiwanese engineers from the U.S. would like to return working with mainlander engineers. They became a critical actor facilitating KMT's industrial policy in the 1970s. Second, the KMT began to produce many more engineers on the island. Although many of them, especially for those educated in elite universities, went to the U.S. to pursue a further degree, a certain number of them chose to come back building their own business in the 1980s. Third, less and less of these Taiwanese engineers identified their foremost career goal to serve for the state but more and more for the global market. For those who especially worked in the high-tech industry, many of them became self-made entrepreneurs.

A Comparative Study of Science and Technology in The Four Asian Tigers
TuC1-3
Politics of Recognising Asbestos-related Diseases in Hong Kong and Taiwan

Harry Yi-Jui Wu
The University of Hong Kong

This paper compares the recognition of asbestos-related health issues in Hong Kong and Taiwan. It attempts to analyze the intricate agenda of disease recognition in the two Chinese-speaking former colonies and post-colonial health entities as a response to their industrial and economic development followed by growing concerns in environmental issues. Correlation between asbestos exposure and asbestos-related diseases has already been established in Anglo-American context; however, authorities in Asia in the second half of the 20th Century have been unable to effectively regulate the extensive application of asbestos in various light industries that support economic growth since the 1960s. In Hong Kong, large amount of residential properties that used asbestos-containing materials were built in recent decades to accommodate millions of immigrants flocking from Mainland China. Since the number of new cases of ARDs diagnosed has increased year by year since 1990's, the remarkable increase of incidences had drawn the attention of the public and most importantly the HK government. It became one of the trigger points leading to asbestos ban in HK history. Whilst in Taiwan, despite the long history of asbestos mining and manufacturing since the Japanese colonial period, attempts to understand the impact of asbestos on the health of the population and to control its use did not emerge until the early 1980s. Using the conceptual framework, *genba*, that explores the sites "where knowledge of exposure to pollutants and their effects is not just produced but contested", developed recently by Onaga and Wu (2018), I look at the interactions between environment and health, and the inter-dynamics of biological and social ecologies. By reviewing available public sources and scientific journal articles, this paper attempts to examine the pulling and pushing forces in governmental sectors, NGOs and the health-care professions that determined the recognition of asbestos-related diseases that lead to asbestos ban in two contexts.

A Comparative Study of Science and Technology in The Four Asian Tigers
TuC1-4
Taken for "Grounded": Engineering for Slope Stability in Hong Kong

Stephen Chung-On Ng
The University of Hong Kong

Mountainous terrains dominate the landscape of Hong Kong. This landscape, under the influence of a humid tropical climate, is prone to a high degree of weathering and erosion, which gives rise to mass movement of surface material. The occurrence of these landslides is particularly likely after heavy rainfall, and often intensified during the wet and stormy season. Due to a shortage of flat land for urban development, historically most buildings in the urban areas of Hong Kong Island and Kowloon have been located on or close to steep slopes, and are thus immediately vulnerable to land slippage. Surges of refugees from across the border with China have arrived in the territory during the post-war period. These refugees built squatter settlement on the hillsides, disturbing the slopes, as they often lacked proper engineering standards. This led to further susceptibility of the urban areas to landslide hazards, often resulting in loss of life. Well-conceived slope engineering only became a higher priority when a number of fatal slope failures occurred in the 1970s, the most notable of which include two landslides occurring on the same day at Po Shan Road and Sau Mau Ping. This paper aims to describe the socio-historical development of slope stability engineering in Hong Kong, particularly before and after the establishment of the Geotechnical Control Office and the implementation of landslip preventive measures, in an attempt to provide a background for future responses in the face of increasing extreme climatic conditions and potential further urbanisation in the New Territories.



TuD1

East Asian Scientific Community: Late Imperial to Cold War, 1930s-1970s**Organizer: John P. DiMoia (Seoul National University)**

The scientific impulse within East Asia has long been informed by the regional rise of empire (late 19th century-1945), so much so that it is both challenging and useful to recall the ways in which this rubric does, and equally, does not, affect the forms of exchange taking place between partners. This panel offers four papers concurrent with, and following, the period, taking up Japanese and Korean approaches to the biomedical and human (or mind) sciences, while also bringing in related actors (Manchuria, the United States, Vietnam), as networks shifted with the end of formal empire to fit emerging Cold War circumstances. How have these East Asian countries handled their respective approaches to the body and the mind, grappling with their own domestic traditions, new forms of knowledge derived from China, and later, the encounter with Western science? How does the demise of Japanese empire function as an explanatory tool, and what becomes new with the period following 1945? Sookyeong Hong's paper looks at how Teruoka Gitō's science of labor (*rōdō kagaku*) project engaged in colonial collaboration, by analyzing rural survey reports conducted in Japan, Korea and Manchuria. Kaori Iida's paper considers the ABCC (Atomic Bomb Casualty Commission) in the postwar Japanese context, and suggests that interests of ABCC scientific staff and Japanese medical scientists converged on promoting radioisotope research to advance their different goals. Hyunjung Chi's paper examines the role of postwar psychiatry in South Korea, especially as South Korea, at least nominally, disavowed the field in the Park Chung Hee period, and yet, "domesticated" the field to fit the needs of the South Korean context. John Di Moia's paper looks at the formative ambitions of South Korean medical doctors and public health experts in the early 1960s, motivated primarily by the pursuit of domestic ambitions, while also beginning to reach out regionally, especially to Southeast Asia.

East Asian Scientific Community: Late Imperial to Cold War, 1930s-1970s**TuD1-1****Science for Life and Labor: Teruoka Gitō's Rural Hygiene Surveys in Korea, Manchuria and Japan, 1936-1955**

Sookyeong Hong
Tsuda University

Teruoka Gitō (暉峻義等, 1889-1966) is known as the founder of the science of labor (*rōdō kagaku*) in prewar Japan. Having trained in physiology at Tokyo Imperial University Medical College, Teruoka started his lifetime career at the Kurashiki Institute for Science of Labor (*f.1921*). The Institute pioneered in what Teruoka and his colleagues termed the science of labor by integrating methodologies in medicine and psychology together with social scientific approaches such as economics and sociology. Its research agenda covered a wide array of labor-related issues ranging from industrial psychology and physiology, household budget, nutrition, urban social hygiene, female labor and reproduction to work efficiency.

This presentation particularly focuses on Teruoka's surveys on working and living conditions in rural communities to investigate how agricultural labor and general living conditions were viewed from the perspective of the science of labor. Apparently, Teruoka team's surveys were in line with the authorities' concurrent measures to alleviate the 1930s rural depression such as the Rural Revitalization Program. However, their surveys went far beyond the scope of domestic rural issues. From the late 1930s onward, Teruoka and his colleagues conducted a series of rural surveys in colonial Korea and Manchuria. By analyzing their rural survey reports, this presentation asks: in what ways did the surveys on different ethnic groups of Koreans and Russian enclaves affect the Institute's theoretical and empirical research on the science of labor? What are the implications of such collaborative survey trips at the Empire level, especially in the postcolonial and Cold War context in East Asia? Ultimately, this presentation aims to contribute to discussions surrounding the continuities and ruptures of pre/post-war scientific endeavors as an imperial enterprise.

East Asian Scientific Community: Late Imperial to Cold War,
1930s-1970s

TuD1-2

Radioisotopes as Shared Resources for The Atomic Bomb Casualty Commission and The Japanese Scientific Community in The 1950s

Kaori Iida

SOKENDAI (The Graduate University for Advanced Studies)

In this paper, I discuss how interests of the Atomic Bomb Casualty Commission (ABCC) and the Japanese scientific/medical community converged and resulted in the promotion of radioisotope research in Japan in the mid-1950s. The ABCC was funded by the U.S. AEC, which promoted both the military and civilian use of atoms, but little has been known how the ABCC was involved in promoting the peaceful aspect of atoms in Japan. In analyzing this, I pay attention to interactions between the ABCC and the Japanese community and show how both sides utilized each other to advance their scientific and socio-political goals. Seeing radioisotopes as resources to improve public relations in Japan, the ABCC established an Isotope Laboratory at its facility in Hiroshima in 1955. This was much welcomed by Japanese scientists who needed better access to isotopes. Because public response was a concern, however, the ABCC began recruiting Japanese scientists at its higher level and planning a permanent atoms-for-peace exhibit at the Hiroshima Peace Memorial Museum. I show that this collaborative promotion of isotope research resulted in the increased use of radioisotopes in Japanese human subjects.

East Asian Scientific Community: Late Imperial to Cold War,
1930s-1970s

TuD1-3

Vaccination and Neonatal Care: Interrogating South Korean Developmentalism through Medical Interventions, Early 1960s-mid 1970s

John P. DiMoia

Seoul National University

During the Vietnam War, the South Korean army undertook numerous “civic actions” as part of its outreach to Vietnamese villages, with these activities including free haircuts, anti - parasite campaigns, and a combination of vaccinations and neonatal care. These forms of intervention took place within a formative context in which the nation was simultaneously reaching out to its own village communities with renewed enthusiasm.

While abroad, this public health engagement limited the spread of disease in areas in close proximity to ROKA troops, thereby ensuring the relative safety of the surrounding environment. Moreover, the goodwill earned during these campaigns also helped to shape a more favorable impression among the local population, a helpful gesture at a time when this was not always the case. The Korean military typically preceded these actions with its presence, meaning that Vietnamese experienced the troops first, and the medical / soft power only later. At home, the diverse forms of care reached villages through a variety of mobilizations, including family planning (1966-) and anti-parasite (1969-) efforts.

Within this nexus of affect, material assistance, and outreach lay an ambitious attempt by South Korea to undertake these actions as part of its desire to build upon its own recent developmental experience (1954-1961), having been the recipient of aid during the Korean War (1950-1953) a decade prior. Now a country in “take-off” mode, according to Walt Rostow’s language, South Korea aimed to return the favor, and would soon begin sending its doctors on overseas missions as early as 1968, in this case, to newly decolonized nations in Africa.

**Human and Environment: Understanding, Interaction, and Representation****TuE1-1****The Lore of Winter Solstice Folk Ritual: Stories about Observing Nature and Creating Fantasy**

Fumihiko Kobayashi

International Society of Folk Narrative Research

People have long engaged in the methodical observation of nature and, just as often, woven their findings into fantastic stories. Regarding this, we have a good example that ancient peoples used to determine the winter solstice by observing the length of days or the sun's position. Evidence of such practices exists with us today in the form of winter solstice folk-ritual lore. For example, the peoples of China, Korea, and Japan have all celebrated a quaint form of festival on the day of the winter solstice around the custom of cooking red-bean porridge - *hongdou zhou* 紅豆粥 in Chinese, *patjuk* 팔죽 in Korean, or *azukigayu* 小豆粥 in Japanese. This custom stemmed from the hope people shared for protection from smallpox and other deadly infectious diseases. Thus, the people in these countries developed a common lore from the belief that red-bean porridge had the preventative power to guard them from epidemic demons and other wicked spirits. Nowadays, this kind of folklore easily invites laughter, but at the time people took it seriously enough to begin precisely observing the sun's movement to determine the proper time to consume red-bean porridge, namely, the winter solstice. With this in mind, this paper argues that the red-bean porridge custom did not simply spring from the human imagination without reason, but arose from an observation of nature motivated by a desire to develop measures that prevented the onset of epidemic disease, an ever-present and never-ending threat to ancient societies. In conclusion, we realize that science and fantasy are not always incompatible and indeed sometimes work together, leaving their trace in folklore and folk ritual customs.

Human and Environment: Understanding, Interaction, and Representation**TuE1-2****War Epidemics: Environmental Reactions to Humans, 1592-1637**

Duan Baihui

Yonsei University

Neither humans nor the environment could stay unscratched from wars. This paper is going to take the representative examples of Imjin War and Qing Invasion of Chosŏn in 1636 (*Byeongja Horan*) to address their mutual relations. To begin with, wars as human catastrophes can lead to deforestation, pollution in water and soil, and massive losses of animals. Because of fires and artillery, they left scars on landscapes lasting even over a century. A large number of trees were cut to be variously used to make weapons, bridges, and boats. Due to wars, corpses and animals' dead bodies were everywhere, poisoning the water and soil, and upsetting the ecological balance. Animals, for example, thousands of horses were recorded to have died of exhaustion and battlefields while rinderpest was infectious all around the peninsula and no livestock alive for farming in 1636. In return, this extreme and fragile environment can affect humans by war epidemics. This part specializes the outbreaks of epidemics including categories, etiology, treatment, and influences in the late Chosŏn from 1592 to 1637. Confronted with wars and starvation, residents had to head for more suitable places to survive, forming the huge mobility and population aggregation. These extreme conditions bred bacteria and decreased humans' immunity against *On Yeok* (infectious disease 瘟疫) and dysentery, infecting both soldiers and ordinary people. Other transnational reasons also functioned. For example, the epidemics were said to have spread from Qing to Chosŏn and reached Japan during the early Qing Invasion of Chosŏn. Policies, medical books, and transnational assist made joint efforts to treat the epidemics. Overall, this paper tries to illustrate the history of Chosŏn war epidemics within the discourse of transnational wars and gets to know the catastrophic chain reaction between humans and the environment. While humans damaged the environment by wars, reversely, humans as one element of the environment were more likely to suffer from fatal infectious diseases.

Human and Environment: Understanding, Interaction, and Representation

TuE1-3

Fishermen, Scientists and Museum: Cultural History of Dugong in Taiwan

Li-jung Cheng

National Chengchi University

Dugong was designated as natural monument of Taiwan in 1933 during the Japanese rule period. There are two taxidermy dugongs kept in national Taiwan Museum today. Scientists cherish these stuffed animals for scientific research purposes. Meanwhile, there are other records about dugong, telling about dugong's legend, people's attitude towards it, and the actual encounters of fishermen with them. This paper aims to explore the story of dugong in Taiwan from the perspective of animal cultural history, and it is also the story of the interaction between humans and animals.

Materials of Medicine(s)

TuF1-1

Worms, Snails, and Swellings: Disease and Medicine in Jiangnan in The Qing Dynasty

Yuan-ling Chao

Middle Tennessee State University

Mao Zedong wrote “Farewell to the Plague God” (*songwenshen* 送瘟神) to celebrate the success of the campaign to eradicate schistosomiasis (*xue xi chong bing* 血吸蟲病) in Yujiang county. This was an important campaign not only because of its significance to public health, but it was also vital to eliminating the negative impact on agriculture. Although research shows that the broader campaign was not there sounding success that the communist party claimed it to be, it was nevertheless hailed as a key effort in controlling an incapacitating disease that held China back from modernity. But by identifying the disease as schistosomiasis, the discourse privileged modern biological disease categories. The diagnosis and treatments by classical physicians who had treated the disease faded into obscurity and irrelevance. The parasite that caused schistosomiasis was present in China as early as the Han dynasty in the Mawangdui tombs, and the disease was endemic especially in the lower Yangzi region. Attempting to understand pre-modern disease concepts through modern categories creates misconceptions and misinterpretations, and ignores the fact that social, cultural, and economic environments are critical to the construction of disease concepts, diagnosis, and treatment. Thus, in this paper, I move past modern disease categories to examine how Qing physicians categorized, diagnosed, and treated illnesses that closely resembled the symptoms of schistosomiasis under the categories such as *gudu* 蟲毒 (poisonous worms), *shuizhong* 水腫 (swelling due to fluids), *guzhang* 臃脹 (swelling and distension). Since this region during the Qing was also the center of the *wenbing* 溫病 (warm factor) school in medicine, I will explore connections between disease diagnosis, treatment, and medical theories. In setting aside modern disease categories, we strive to understand how physicians and patients in late imperial Jiangnan experienced these symptoms.



Materials of Medicine(s)

TuF1-2

Dingzi Drug 錠子藥 as Gift: Its Medical Knowledge and Political Uses in the Early Qing Dynasty

Shih-Hsun Liu
National Palace Museum

During the Qing dynasty, Manchurian rulers often awarded civil and military ministers of all levels with pharmaceutical drugs such as ginseng, sheyao (Drugs for treating snakebites, carbuncles and sores), deriyaka (theriac), dingzi medicine (Drugs for preventing sun stroke and avoiding infection), ren-ma ping-an-san (Powder for treating both men and horses), etc. These pharmaceutical drugs, which could be used to treat diseases or be given as gifts by emperors to ministers, present both medical and political implications. Among all the Qing dynasty emperors, Emperor *Yongzheng* 雍正 (r.1723-1735) was renowned for his use of Machiavellianism to manage his subordinates, and pharmaceutical drugs played a critical role in the management process. Therefore, this study attempts to investigate the pharmaceutical drugs awarded by Emperor Yongzheng to his ministers and answer the following questions: As gifts, what kind of power did pharmaceutical drugs have in the court society? How did these pharmaceutical drugs connect the Emperor and his ministers? As gifts, pharmaceutical drugs were pivots that linked the acts of offering gifts, receiving gifts, and returning favors. Thus, what were the Emperor and his ministers' rights and obligations symbolized by the offering and receiving of these pharmaceutical drugs? What political interests did these exchanges reflect? By exploring above issues, this study tries to conduct an in-depth analysis on how Emperor Yongzheng presented his technique of controlling his courtiers by giving drugs, as well as the emperor-minister interaction and the interpersonal network in the Qing court reflected by these acts, so as to further understand the relationship between medicine and politics.

Materials of Medicine(s)

TuF1-3

Of Ginseng and Chips: An Interdisciplinary Gathering for The Brain in South Korea, 1970s-1990s

Youjung Shin
Korea Advanced Institute of Science and Technology

It was no coincidence that Chan-Woong Park (1935-2014), the first president of the Korean Society for Neuroscience (KSN), was a pharmacologist studying ginseng's medical effects in the 1970s. This paper shows how a Korean ginseng played a distinctive role as a research material in South Korea, which ultimately led to the formation of the first Korean neuroscientists' group, the KSN, in the early 1990s. At that time, ginseng was not only a promising exportable item but also an unusual research subject for neuroscience. Through analyzing a wide intellectual and social network of Park, this paper reveals an intermingling of seemingly unrelated artifacts, such as ginseng, neuron, brain, mind, and computer chip, in the late 20th century in South Korea. It examines a conceptual and material setting at which a particular interdisciplinary gathering of brain researchers was formed and shaped. By doing so, this paper pays attention to differences and discrepancies of research cultures, for example, between biological science vs medical science, basic research vs industrial research, and computer science vs cognitive science in South Korea. It ultimately shed light on the nature of interdisciplinarity in a developing country and its implications on plurality in science and technology.

Materials of Medicine(s)

TuF1-4

**Regulatory Convergence and Divergence:
Developing Herbal Cures for East Asia and
Beyond**

Wen-Hua Kuo

National Yang-Ming University

My study revolves around medicinal herbs and herbal formulas, following their circulation in and outside of East Asia on their way toward modernization. In particular, it pays attention to regulation and the role it plays in the manufacturing, marketing and utilization of herbal medicines as they travel beyond the communities where they are conventionally recognized as drugs. Moving beyond the conceptual boundary between natural products and synthetic drugs, with regard to herbal medicine, this study takes a regulatory approach, looking at the shifting identity of herbal formulas in their global circulation. Departing from an over-simplified interpretation of biomedicalization, it argues that while some traditional formulas may lose their privilege as recognized drugs, herbs derived or formulas modified from them will obtain new identities in the process of drug development. Three East Asian medical products Tien-Hsien Liquid, Selected Vegetables, and Diao Xin Xue Kang--are selected to illuminate this argument. The research materials include documents from regulatory authorities and companies, scientific papers, and reports from mass media. The investigator also conducts interviews with scientists, drug company people, governmental officials, and regulators

History of Science and the World History

TuG1-1

**Across the Historiographic Divide: The
Institutionalisation of Modern Science in Asia in
Comparative Context**

Dhruv Raina

Jawaharlal Nehru University

History is often torn between the social sciences and the humanities. This dual belonging plays itself out in comparative history in a variety of ways, the one premised on an over determinationist metanarrative where departures from a canonised pathway are to be explained contextually. The other underdeterminationist, wherein the departure from the norm is the essence of historical evolution. What does that make of the comparative method? Within the framework of science and empires, attention has often focussed upon the similar and distinct trajectories of technological development in India, China and Japan. Historians of science have done little to extend their comparative gaze upon the comparative history of the institutionalization of science and higher education in the three contexts. This paper while focusing upon India, throws up some questions about comparative history across the historiographic divide alluded to above.



History of Science and the World History

TuG1-2

Reframing Ownership and Subjectivity in The Genomic Era: Science and Law in Comparative PerspectiveChul Choi¹ and Buhm Soon Park²¹*Hankuk University of Foreign Studies*²*Korea Advanced Institute of Science and Technology*

This paper explores the interplay between science and law in the genomic era, by analyzing institutional structures - legal and governmental - in Korea and in the U.S. The rise of genomic technology in the 21st century has enabled individuals to gain new insights into their own unique genetic makeup, and this raises the ethical and legal questions regarding the principles of ownership and subjectivity. People can demand the genetic information of their own as “consumer subjects,” not necessarily “experimental subjects,” using direct-to-consumer (DTC) genetic testing. Genetic testing service companies, such as 23andMe, then take a customer’s genetic information and resell it to pharmaceutical companies. In this way, human genetic information can be commodified. This paper aims to show how a new biotechnology can lead to the economic and conceptual separation of genetic information from human biological materials, such as cells and tissues, and how this situation has posed different kind of contentious issues concerning the individual’s ownership and control over themselves than He La Cell raised in the previous century. From the comparative standpoint, this paper examines the statutes implemented in Korea relating to human biological materials, such as the Bioethics and Safety Act, the Biotechnology Support Act, and regulations on DTC genetic test, as well as relevant US cases, including *Moore v. Regents of the University of California* (1990) and other regulations. The analysis of cases and relevant legislation, this paper argues, will offer a window to look into the mutually constitutive interaction between science and law.

History of Science and the World History

TuG1-3

History of Science and Future World Governance

Orun Kim

A workshop was held in Beijing in June 2018 by Berggruen Institute China Center on “What is Tian-xia?”. 13 papers were presented there, opening with philosopher Zhao Ting-yang's “What is Tian-xia, after all?” and closing with political scientist Daniel Bell's “Tian-xia in the Modern World: Towards an Asian Regional Order Led by China and India”. Berggruen Institute is a think tank devoted to the pursuit of “future governance”. The aim of the workshop is obvious. “Can we find anything in the East Asian Tian-xia thought that can be utilized for the future governance of the World?” East Asian tradition has been neglected in the Modern World because it did not seem to have the potential to contribute to the future of the World. It was even considered a hindrance to the development of human civilization because it was in many ways out of line with the modern (enlightenment) value system. Now that people are increasingly worried about the failure of the modern world system, they are turning to East Asian tradition, among others, for renewed lessons. They are beginning to wonder if older traditions were equipped with principles that made them more durable. In the last workshop most of the discussions centered on principles of human relationships. But some scholars made suggestions to widen the view to other relationships as well, including man's relationships with non-human beings, or with the nature. The second “Tian-xia” workshop is scheduled for May 2019 in Qingdao, and probably a conference will follow in 2020. I expect the discussions there to develop into East Asian traditional views of the Nature. The failure of modern politics is urging people to reconsider not only relationships among humans but other relationships as well.

History of Science and the World History

TuG1-4

Artificial Intelligence and Human Liberty

Hyeonju Son

Chonbuk National University

The Artificial Intelligence(AI) is shaping the future of society in the digital revolution. AI begins to take definite shape in human decision making in everyday life with the rise of data science and the development of algorithms. If you ask Siri to read text messages and emails to you, find the nearest restaurant or call your friend for you. Even current weather forecasting systems, spam filtering programs, and Google's search engine are supported by AI. Automated data processing techniques, such as algorithms, are increasingly used in decision-making processes, that were previously entirely in the remit of human beings. Algorithms may be used to prepare human decisions. In fact, boundaries between human and automated decision-making are often blurred, resulting in the notion of quasi- or semi-automated decision-making. Eventually, humans would be a part of AI in everyday life. The main research question is the following one: How can AI re-design the process of human decision making and what are the impacts of AI on human liberty in South Korea? In this context, this research discusses what are the roles of AI in the decision-making and how AI will change human liberty in South Korea. In order to obtain the purpose of the research, focus group interview method will be used in gathering the public and professional's opinions regarding AI-related products. It appears that AI has major positive and negative impacts on human liberty. First of all, AI will have positive effects on extension of human liberty through increasing civilian engagement of politics, extending digital freedom, and making human enhancement. On the other hand, AI will undermine civil liberties as a profound threat to our mind, intuition, free will, and autonomy by the quantified self, algorithm displacing human dignity, and deployment of robots for human jobs. In addition, this research highlights how a deep understanding of AI in the decision-making process in the everyday life. We should not let data make many decisions for ourselves and take more authority over our lives.

TuA2

Body and Mind in Wartime: Historical Perspectives from Japan and China

Organizer: Ken Daimaru (Aix-Marseille University), Reut Harari (Tel Aviv University)

Our panelists present an array of studies addressing how war affects the way the body and the mind have been treated and interpreted, in Japan and China. They will explore the maintenance of soldiers' health as an object of medical knowledge, sanitary interventions, professional practices, and political and social regulations over the course of a century; it will start with the Boshin War (1868-69) and end in the Post-World War II era. Combining our different works, the panel will propose three areas of reflection: - the history of the relationship between war and medicine: the panel will explore the unusual exchanges arising from the urgency of military action and its specificity and probe how they affect the nature of warfare and medicine. It will ask, for instance, how the exigencies of war alter the role of medical care providers and how they are perceived by different publics. - the evolution of the concern for the health of soldiers, as it became an object of research and a framework for practice in the field of "military medicine": the panel will argue that one of the main characteristics of military medicine is plurality; most medical practitioners who embodied the field were mobilized military soldiers or volunteer civilians in uniform. The types of activities in the medico-military sphere also reveal a world of specialties which involved the development of various facilities and supplies. Finally, the panel will explore how in certain conditions military medicine extended from soldiers to civilian populations, expanding its role from health maintenance to "pacification". - the extension of care to rehabilitation in the post-war period: the panel will discuss how physically and emotionally injured soldiers and mobilized workers dealt with their afflictions on the one hand, and how the treatment of wartime afflictions changed civilian medicine following war on the other.

**Body and Mind in Wartime: Historical Perspectives from Japan and China****TuA2-1****Notes from A Field Hospital: Doctors in The Boshin War**

Ellen Nakamura
The University of Auckland

The Boshin civil war (1868-1869), which accompanied the overthrow of the Tokugawa Shogunate and the Restoration of Imperial rule to Japan, is not usually considered to be a modern war. Moreover, compared to other revolutions around the world, it is believed to have been relatively bloodless. From the perspective of Japanese medical doctors who participated in it, however, it was both bloody and permeated with new challenges. The violence of the civil war created not only new forms of gunshot wounds requiring specialised equipment and unfamiliar surgical techniques, but also raised huge questions over how to establish, supply, and run a field hospital, how to recruit and pay medical staff, and when and if a doctor's own political affiliations and ambitions should come into play. This paper examines the role of doctors in the Boshin war through the lens of diaries and other sources. Of central interest is the detailed account of treatments related to the fighting in Aizu left by Seki Kansai (1830-1912). Seki was appointed director of the Ōu Field Hospital for the Imperial army forces from the sixth until the twelfth month of Keio 4 (1868-69). The paper will consider the wide assortment of medical, practical, and ethical problems he faced in this demanding new role. It proposes that from the perspective of medical history the Boshin war was an important first step towards the medicalization of war, the militarization of medicine, and the establishment of humanitarian organisations which followed not long thereafter.

Body and Mind in Wartime: Historical Perspectives from Japan and China**TuA2-2****Visual Imagery and Medicine in The Russo-Japanese War**

Ken Daimaru
Aix-Marseille University

The history of the Russo-Japanese War (1904-1905) has attracted considerable scholarly attention over the last two decades. It was the first major international conflict of the twentieth century. The Japanese military and society displayed a number of significant features, bringing it attention as the most modern conflict of its time as revealed by the experiences of contemporary observers. Wartime Japanese society came to cope with large-scale mobilization of soldiers, as well as diseases and injuries. These circumstances gave a unique role to medical doctors in an attempt to "regulate" the violence meted out to the soldiers.

This presentation explores the confluence of war, medicine and photography in early-twentieth century Japan. Investigating 34 photographic albums produced by the Japanese Imperial Army Medical Services during the Russo-Japanese war, the presentation elucidates the relationship between visual representation and medical sciences.

By documenting the variety of war casualties as well as different stages of their treatment, medical doctors attempted to standardize and systematize visual record-keeping both on the military fronts and on the home fronts. The large number of visual records were used as pedagogic instruments in medical training, and thus contributed to the professionalization of Japanese army doctors and their bureaucratization. This contribution was so great, the presentation will argue, that it even surpassed that of the development of therapeutic competence. Additionally, some of these medical images were brought up for public debate and circulated through international channels as a mean to foster positive images of Japan as a belligerent state. This presentation will argue that the growing importance of visual documentary techniques had thus a medical, political and strategic role that stemmed from the unique circumstances of the Russo-Japanese War.

Body and Mind in Wartime: Historical Perspectives from Japan and China

TuA2-3

Technological Crossover between Military and Civilian Medicine: The Case of Limb Reattachment Surgery in Twentieth-Century China

Nicole Barnes
Duke University

In the early decades of the People's Republic, China received international acclaim for its high degree of skill and success in the surgical reattachment of severed limbs. One man in particular, Dr. Chen Zhongwei 陈中伟, is held as the founder of this practice based on an operation he performed in the civilian No. 6 People's Hospital in Shanghai, and then reported in the journal *People's Military Medicine* (*Renmin junyi* 人民军医) in November 1963. While Dr. Chen certainly honed his surgical skill, brought it to the public's attention, and trained a number of protégés in the 1960s and 70s, a closer look at historical sources shows that physicians and researchers began making important discoveries in the early 1930s.

This paper contends that damage to the limbs (arms, legs, feet and hands) of soldiers during China's many wars of the early twentieth century served as the most important impetus to this medical research and experimentation. It furthermore posits that wounded soldiers provided the medical community with invaluable research and practice material, and that physicians working for the military had the greatest access thereto. Though this difficult procedure gained prominence in a rapidly industrializing society wherein civilian workplace injuries were quite common, the degree of surgical precision in the reattachment of severed limbs that Dr. Chen and his colleagues achieved would not have been possible without earlier advancements in military medicine and their crossover into civilian medicine. The surgical reattachment of severed limbs therefore serves as an instructive case study in the analysis of technological crossover between two medical communities that were often at odds with one another. Since the surgical skills originally used in this procedure are now employed in plastic surgery, it furthermore illustrates the contemporary relevance of early twentieth-century military medicine.

Body and Mind in Wartime: Historical Perspectives from Japan and China

TuA2-4

Imperial Medical Encounters: Medical Pacification during The War in China

Reut Harari
Tel Aviv University

From the early Meiji period, the Japanese military developed a medical system to care for its soldiers. Concomitantly, the Japanese empire began expanding, coming into interaction with different populations, environments and diseases. Expansion was quickly accompanied by the creation of public health and medical facilities.

As the Japanese army expanded into China from the 1930s, and particularly from 1937, circumstances changed. China was not a colony, but an occupied territory where its forces were fighting a long, bloody and violent war of attrition. When it came to the Chinese countryside, the tentative grasp of the Japanese military did not allow much space for the creation of a system of public health as it did in other places, including urban areas in China itself.

However, the movement of the Japanese military in the deep countryside brought its men into interaction with the local population. This interaction was often of a violent nature. However, it also included mundane daily interaction, as members of the local population attempted to continue their daily lives and survive the harsh circumstances of the war. Within this context, medicine came to play a unique role through planned campaigns and spontaneous interactions, whereby military and affiliated personnel provided rudimentary care to the local population.

This paper will investigate these often-overlooked medical encounters and their dynamics by focusing on testimonies of two very different groups: Japanese military medics and military affiliated "pacification agents". Members of both groups were not doctors. Yet, their differing skills and the wartime circumstances made them so for all intents and purposes. The paper will argue that by providing treatment, these circumstantial doctors created small moments of humanity in a violent environment. But, they also helped maintain the occupation by attempting to gain the patient's trust through the hands of medical care providers.

**Body and Mind in Wartime: Historical Perspectives from Japan and China****TuA2-5****The Silence and Voices of Mentally Disabled Veterans in Postwar Japan**

Eri Nakamura
Keio University

Scholars have investigated the forgotten history of Japanese soldiers who were afflicted with psychological injuries for several decades. Nevertheless, they paid less attention to the lives of mentally wounded veterans after the war. The only exception was research on “*Mifukuin* 未復員” (lit. veterans who were not yet demobilized); men who couldn’t return to their homes and consequently continued receiving long term care at national convalescent hospitals, which used to serve as military sanatoria during the war. However, Dr. Meguro Katsumi’s Postwar follow-up study of those who were admitted to military hospitals and categorized as war neurosis patients, indicated that there were mentally disabled veterans who returned home and tried to rebuild their lives, while still facing mental health problems.

Although many Japanese veterans wrote and published war memoirs after the war, there are surprisingly few memoirs written by mentally disabled veterans. The main reason for their silence was their strong feelings of shame as Dr. Meguro’s survey showed. Most veterans were unwilling to speak up about their mental breakdown because there was a taboo on the subject during and even after the war.

This paper explores two historical resources to reveal the lives of mentally wounded veterans outside the national sanatoria after the war. One is official applications for pension claims. Some veterans didn’t stay silent and required war disabled pensions because they thought their psychological injuries were caused by the war. Official documents reveal their hardships after the war as well as their sufferings during the war. The other is oral histories of those who were responsible for the care of mentally disabled veterans, such as medical workers and veterans’ family members. Paying attention to several voices, this paper highlights real sufferings of mentally disabled veterans and their families in Postwar Japan and their coping mechanisms.

TuB2**East Asian Natural Study in Diagrams**

Organizer: Borum Kim (The Academy of Korean Studies)

The presentations offer new perspectives on how East Asian natural philosophy was projected and transmitted into diagrams. As Neo-Confucian cosmology figured prominently in the “Diagram of the Great Ultimate”, diagrams played important roles on the East Asian natural study. Understanding any philosophical diagram requires an extensive context to see how distinct concepts and images connect together and arrange in a way that is coherent and justifiable. Lee Dae-Seung will discuss on the relation between the *Chantong qi* 參同契’s *Yi xue* 易學 (the Learning of the Changes) and *Xiantian tu* 先天圖 (The Before Heaven Diagram). Analyzing the philosophical structure of *Diagram of the Heavenly Mandate* 天命圖說, Kim Borum will establish the Neo-confucian worldview in the 16th century Joseon. In comparison with Bae Sangyoel’s “*Cheonji manmul johwa jido*” 天地萬物造化之圖 and Wang Bai’s *Tiandi wanwu zaohua lun* 天地萬物造化論, Lee Yeonjoo will deal with the characteristics of natural philosophy of a Korean Neo-Confucianist in the 18th Century.

East Asian Natural Study in Diagrams

TuB2-1

The Transition of *Yixue* 易學's Cosmology through Diagrams: The *Chantong qi* 參同契's *Yixue* and The *Fuxi bagua fangwei tu* 伏羲八卦方位圖

Daeseung Lee
The Academy of Korean Studies

The purpose of this article is to establish the relationship between the *Chantong qi* 參同契's *Yixue* 易學 (Learning of the Changes) and the *Fuxi bagua fangwei tu* 伏羲八卦方位圖 (Fuxi's Diagram of the Direction of the Eight Trigrams). In the *Chantong qi*, the *Yueti najia shuo* 月體納甲說 explains the fire phasing (*huohou* 火候) of the month through the *bagua* 八卦 and is regarded as the unique *Yixue* of the *Chantong qi*. The *Bagua najia tu* 八卦納甲圖 (Inserted *jia* 甲 Diagram of the Eight Trigrams), which depicts the *Yueti najia shuo*, descended from the Dang Dynasty to the Song Dynasty in the tradition of Yi diagrams 易圖. In the process, the *Bagua najia tu* was gradually transformed from a theory that emphasizes the direction of the appearing and disappearing of the moon to a theory that values the change in the moon's phase. Moreover, the new form of *Bagua najia tu* was derived by combining the theory of *qian-kun-kan-li* 乾坤坎離 of the *Chantong qi*, which is the same as the Shao Yong 邵雍's *Fuxi bagua fangwei tu*. In conclusion, through a series of diagrams related to *Bagua najia tu*, the *Fuxi bagua fangwei tu*, which suggests the cosmology of *Yixue*, was formed in the process of changing the analytical view of *Bagua najia tu*. In other words, the *Yixue* of *Chantong qi* is closely related to the *Fuxi bagua fangwei tu*.

East Asian Natural Study in Diagrams

TuB2-2

The Neo-confucian Worldview in The 16th Century Joseon: Focusing on *Diagram of The Heavenly Mandate Explained*

Borum Kim
The Academy of Korean Studies

Diagram of the Heavenly Mandate Explained 天命圖說 was originally written by Jeong Ji-un 鄭之雲 (1509-1561) to help his young brother understand the essence of Neo-confucianism, and then revised under the advice of Yi Hwang 李滉 (1501-1570). Because it became the trigger of Four-seven Debate between Yi Hwang and Gi Daeseung, the most famous controversy in the history of Korean philosophy, a few philological approaches were made before. However a philosophical analysis on the structural significance of the diagram has still yet to be attained.

In this diagram, "Diagram of the Great Ultimate" 太極圖, Diagram of Human Mind and Moral Mind" 人心道心圖, and "Diagram of the Unity of Heaven, Human, Mind, and Nature" 天人心性合一之圖 were compressed into one. The problematic here is not only the origins of the key concepts of liqi cosmology and the theory of human mind but also the way of positioning of them in the diagram. During this presentation, the structure of the diagram will be analyzed into three conceptual layers; 1) the heavenly circle of perfect harmony, 2) the earthly square of all things, 3) human being with nature and feelings. And the structural analogy among the layers will be examined to establish the neo-confucian understanding of the world.



East Asian Natural Study in Diagrams

TuB2-3

A Study on The Natural Philosophy of a Korean Neo-Confucianist in The 18th Century: Focusing on Wang Bai's *Tiandi wanwu zaohua lun* (天地萬物造化論) and Bae Sangyoel's "*Cheonji manmul johwa jido*" (天地萬物造化之圖)

Yoenjoo Lee

The Academy of Korean Studies

This paper deals with the natural philosophy of Bae Sangyoel (裴相說, 1759-1789), who was a late 18th-century scholar in Yeongnam (嶺南) area. In order to know the characteristics of his natural philosophy, it is necessary to understand the general structure of Confucian natural philosophy. For this reason, we analyzed Bae Sangyoel's *Cheonji manmul johwa jido*, focusing mainly on Wang Bai's *Tiandi wanwu zaohua lun*. Wang Bai is an orthodox Neo-Confucian scholar who is known as the successor the academic line of 'Zhu Xi (朱熹, 1130-1200) - Huang Gan (黃幹, 1152-1221) - Ha Ji (何基, 1197-1274)'. His writings had a lot of influence across borders throughout Joseon. Among them in *Tiandi wanwu zaohua lun*, Wang Bai describes the formation of the universe and the myriad things in it within the framework of Confucian natural philosophy. This book was widely circulated in Joseon since the 16th century as an introductory text of Confucian natural philosophy, and it has had a considerable influence on Joseon intellectuals. Therefore, it is reasonable to take the structure of *Tiandi wanwu zaohua lun* as a criterion in order to identify Bae Sangyoel's natural philosophy.

Bae Sangyoel's representative writing is "*Dohak yukdo*" (道學六圖), which explains the essence of Neo-Confucianism with Six Explanatory Diagrams, within which Bae Sangyoel explains the principles of the universe and all things.

In "*Cheonji manmul johwa jido*", he explains the mechanisms that exist between the sky and the earth such as the formation of the universe, the movements of heavenly bodies, the structure of heaven and earth, seasonal changes, meteorological phenomena, the changes of tide and so on, with the concepts of *Liqi* (理氣) and *Wuxing* (五行). Bae Sangyoel attempted to synthesize the whole of natural philosophy by expressing a wide range of theories covering the universe and human beings in only six explanatory diagrams.

East Asian Natural Study in Diagrams

TuB2-4

The Scientific Elements in *Fengshuishi* (風水術) in Ancient China

Hanguang Zhou

ECNU(East China Normal University) (Retired)

Fengshuishi is a long-standing skill which had great influences in Chinese history. Mystical and even superstitious as it seems to be, it still contains some truth of the nature including some scientific elements. It had great contribution to the development of ancient Chinese architectural ecology, the accumulation of the knowledge of ancient geography and hydrology, and the invention and dissemination of the compass. (i) The basic theory of *Fengshuishi* and its five major steps of procedure: The core theory of *Fengshuishi* is "to gather *Qi* to get fortunes". The five major steps of procedure are: *Milong*, searching for the mountain; *Chasha*, investigating the hill; *Guanshui*, observing the river; *Dingxiang*, determining the direction; *Dianxue*, specifying the position. (ii) The knowledge of architectural site-selection in *Fengshuishi*: In many aspects, the five major steps of procedure accord with the geographical environment, meteorological characteristics and other laws of nature. It puts forward the ecological environment requirement and scientific standard of architectural site-selection. (iii) The knowledge of geography and hydrology in *Fengshuishi*: *Fengshuishi* scholars gave the initial investigation and description of the terrain, location and trend of major mountains in China, and the initial cognition of the rule of riverbed changes in curved rivers. Their long-term exploration and activities originated the geography and hydrology in ancient China. (iv) From Luopan to invention of compass: The prototype and some types of compass recorded in ancient China come from the Luopan, an important tool of *Fengshuishi* scholars. The scholars also made a contribution to be reckoned in the invention of artificial magnetization technology and the discovery of geomagnetic deflection angle. In short, while criticizing the mysticism in the *Fengshuishi*, we should also note the elements in line with scientific principles contained therein, and evaluate correctly their status and value in the history of science and technology.

Science, Technology, and Medicine in Industrialized Asia

TuC2-1

A New Model for Development: USAID and Republic of Korea in The Late 1960s and Early 1970s

Kichun Kang
Seoul National University

This paper examines the NASA-AID pilot project to illustrate the shifting American viewpoints on foreign aid in the early 1970s, as well as the South Korean responses to it. Particular emphasis will be placed on the role played by key South Korean actors, such as Lee Hahn Been, a public administration scholar, and Choi Hyung Seop, the Minister of Science and Technology, in shaping South Korea into a model case for developing nations. While the Americans wished to raise KIST, the first government-funded research institute in Korea, up as a model institution, which could be replicated in other developing countries, the Koreans wished to showcase their own achievements. The AID-NASA project was a product of the two parties dealing with a period of transition: the end of the 1960s - dubbed the "decade of development." The disenchantment toward modernization theory and the mounting budgetary pressure on foreign assistant programs, exerted in the years of Nixon Doctrine, led American policy makers and development experts to devise alternative frameworks to lower America's financial cost but still win the "hearts and minds" of the developing world. Arranging a new relationship between America and the developing countries required a plausible model case to follow. The U.S. Agency for International Development (AID) in the early 1970s actively pursued this policy by adding consultation into and reducing direct assistance from the aid program, and South Korea emerged as a critical juncture in the restructuring of Cold War development in Asia. The pilot project to transfer NASA-developed technologies to South Korea started in 1970 was an attempt to investigate and portray how the new model would operate. In the project's concluding workshop, AID organizers invited a group of technology policy leaders from seven Asian countries as an effort to announce alleged success of the project and spread the lessons learned.

Science, Technology, and Medicine in Industrialized Asia

TuC2-2

Reimagining Ageing in Singapore: 1960-2001

Queenie Ng
Nanyang Technological University

For a substantial portion of Singapore's relatively short history, diseases that afflicted the aged were simply regarded as a natural part of the ageing process. Yet, the introduction of gerontology marked a paradigm shift in attitudes towards diseases, where the contraction of diseases was no longer viewed as normal, but rather perceived as something to be feared and prevented. Scrutinizing the period between 1960 to 2001, this paper attempts to trace the emergence of gerontology and chart the course of gerontological developments in Singapore. By drawing upon the scientific discourse on ageing and mental illnesses from North America, this paper argues that the intensification of pre-existing fears within the aged could be attributed to the emergence of gerontology. In particular, these fears amongst the aged were developed (and exacerbated) against the backdrop of Singapore's economic restructuring, urbanization and social policies, and was subsequently catalyzed by the increased public engagement and awareness brought forth by the Gerontological Society of Singapore, geriatricians, gerontologists and affiliated non-profit organizations. On a broader perspective, the paper suggests that with the emergence of gerontology, the imagination of ageing and the aged have altered, and along with the shift in views of old age, the Singapore society and the behaviours of the elderly have been influenced and reshaped.



Science, Technology, and Medicine in Industrialized Asia

TuC2-3

Making 'Industrial Medicine' in Korea: Controversy over Criteria for Occupational Disease Recognition in Wonjin Rayon Incident, 1988-1993

Kyoryen Hwang
Seoul National University

The suffering body can change not only its surrounding environment and biological, medical knowledge, but also the answer to who can be called as an expert and to how the authority of state is to be acknowledged. Unlike the western countries that have experienced and studied the workers' health problems for more than a century, in Korea, since the late 1980s, pan-national collective action for democracy and workers' rights, unfamiliar hazards and diseases, and multiple groups of doctors who struggled for recognition at policy making or their profession has appeared simultaneously. The 'Wonjin Rayon Incident', which shocked Korean society with the birth of more than 900 victims, shows how the network of powers and materials changed along a dynamic trajectory by various actors' interests. The spinning machines originally imported by the 60s' state-led economic development plan at a low price in Japan threatened the workers' bodies through carbon disulfide (CS₂) gas. The workers who suffered for a long time gave a strong counterattack to the legitimacy of the nation through the atmosphere of the democratic uprising. Since then, the government has attempted to achieve state-making through knowledge production, but doctors with diverse backgrounds, both politically and educationally, have tried to find a way to gain authority and financial resources by recognizing their expertise in participating in knowledge production. Process of establishing criteria for the recognition of occupational disease revealed their slightly different goals, and the control of carbon disulfide and the continuation of rayon production, which were not important to them, were easily abandoned. This case shows that the democratization of Korean society, power and knowledge of the expert group, and material environment were co-produced through the Korea's unique political culture and historical context.

Exchanges of Technological Knowledge, Practice, and Artefacts (I)

TuD2-1

Two Century's Journey from Diyār Bakr to Seoul: Al-Jazarī and Jang Yeong-Sil Met in The Striking Palace Clepsydra

Moon-hyon Nam
Konkuk University

In 1433, the first ware/ball-operated automata (jack-work) clock Striking Palace Clock *Jagyeok-gungnu* (自擊宮漏) emerged in the capital Hanyang (漢陽, now Seoul) of Joseon dynasty (朝鮮王朝, 1392- 1910). It was invented by Chief Court Engineer Jang Yeong-Sil (蔣英實) under the commission of Sejong the Great (世宗大王), and it was adopted as standard timekeeper from 1434. The clock made use of exceptional float indicating-rod water-clock for basic dual-timekeeping, while small and larger balls were used by falling to operate the twelve double-hours (十二時: a full day) and five night-watches (五更: a night) time-announcing mechanisms. In this paper, we elucidated that the origins of the ball-operated power transmission techniques of the Striking Palace Clock came from Diyār Bakr Artuklu Palace Muslim engineer Al-Jazarī's Book of Knowledges of Ingenious Mechanical Devices (1206 C.E.). Through there construction of the Striking Palace Clock at National Palace Museum of Korea (國立古宮博物館) in Seoul, we investigated the use of falling balls to transmit power in comparison with the Candle-, Castle- and Elephant-clock described by Al-Jazarī's. It is validated that the ball-operated time-announcing jackwork mechanisms of Jang Yeong-Sil was inspired by Al-Jazarī's 1206 clocks, which were not copied but in contrast were innovated to fit dual-timekeeping system of early Joseon. Also, we traced a plausible route of transmission of Al-Jazarī's clock from Diyār Bakr to Seoul. On his way from Maraghah Observatory to Yuan, Muslim astronomer Jamalal-Din (札馬魯丁) brought hundreds of Arab/Islamic classics in 1267, and those were kept at Muslim Observatory (回回司天臺) and Secretarial Bureau (秘書監) at Shangdu (上都). Among the books, 《造渾天儀香漏》(*Construction of Instruments*) and 《造香漏并諸般機巧》(*Ingenious Devices*) are probably written by Al-Jazarī and Banu Musa of Baghdad, respectively. At Da Ming Pavilion (大明殿), there were Lantern Clepsydra (燈漏) which was similar to the Castle-clock, and Goblet and Peacock-clock described by Al-Jazarī. In 1430, Jang Yeong-Sil was sent to Ming to collect information on the Palace Clepsydra (宮漏) of Shun Di (順帝), but instead he was likely to collect technical information on the Al-Jazarī's clock. Our findings are discussed other researches.

Exchanges of Technological Knowledge, Practice, and
 Artefacts (I)

TuD2-2

**How Did Ancient Chinese Use Body to Measure
 Time like A Clepsydra? Cases from Some
 Military Books**

Xiaohu Wang

*School of Public Administration, South China Normal
 University*

Clepsydra (漏刻) was the most important time measurement device in ancient China. Besides clepsydra, ancient Chinese also developed many methods for time measurement. In this paper, two cases in military books are introduced: pace-counting (數步) and bead-counting (數珠). The pace-counting was first recorded in military books of Tang dynasty. It assumed that the operator could walk 200 *li* (里) constantly in a whole day, which contained 100 *ke* (刻) in ancient China. So his walking speed was 2 *li* per *ke*. The bead-counting was first mentioned in military books of Song dynasty, and recorded in Ming dynasty. It also assumed a whole day to be 100 *ke*, and the operator shifted a very long string of beads at a uniform speed while walking. While one had been walking a pace, he shifted a beads by the finger. Military books also offered the night length of some different days. In fact, pace-counting and bead-counting were the simulating of Chinese clepsydra. Walking and shifting beads were relatively simple and the time measurement activity could be operated easily. The human body's movement in a uniform speed were just like the water flowing of clepsydra. By these methods, we could have a new perspective on the understanding of ancient Chinese about time measurement.

 Exchanges of Technological Knowledge, Practice, and
 Artefacts (I)

TuD2-3

**Study on The Source Characteristics of Ancient
 White Pottery by Using Strontium Isotope
 Method**

Xiaoke Lu

*Shanghai Institute of Ceramics, Chinese Academy of
 Sciences*

White pottery is a special kind of pottery in ancient China, and archaeologists believe that its technology diffusion follow a certain route. In this study, the Sr isotope ratios of 43 pieces of white pottery unearthed from Taosi site in Xiangfen, Shanxi province, Wadian site in Yuzhou, Henan province, Tonglin site in Linzi, Shandong province, Liangchengzhen site in Rizhao, Shandong province, Erlitou site in Yanshi, Henan province, and Nanwa site in Dengfeng, Henan province were measured by high precision TIMS, and then the source characteristics research of white pottery in different regions was carried out, hoping to provide basis for the source tracing of white pottery in the Yellow River basin. The results show that the samples can be divided into three groups by Sr content and $^{87}\text{Sr}/^{86}\text{Sr}$ value. The white pottery samples from Liangchengzhen site, Wadian site and part samples from Erlitou site are in the first group, characterized by $^{87}\text{Sr}/^{86}\text{Sr}$ value less than 0.7225. The white pottery samples from Tonglin site are in the second group, characterized by $^{87}\text{Sr}/^{86}\text{Sr}$ value greater than 0.7225, and relatively high Sr content. The white pottery samples from Nanwa site and part samples from Erlitou site are in the third group, characterized by $^{87}\text{Sr}/^{86}\text{Sr}$ value greater than 0.7225, but relatively low Sr content.

**Exchanges of Technological Knowledge, Practice, and Artefacts (I)****TuD2-4****Mystery of The Black-Glazed Tea Bowls from The Jian Kiln Site of China**

Weidong Li

Shanghai Institute of Ceramics, Chinese Academy of Sciences

The Jian kiln, located in present-day Jianyang county of Fujian province of China, mainly produced black-glazed tea bowls. Jian tea bowl was used as a utensil for tea tasting and was greatly appreciated by emperor Huizong of the Northern Song dynasty. The black glaze of Jian bowl was sometimes marked with streaks or spots, usually called “hare’s fur” or “oil spot”, which are the crystalline markings of iron oxide precipitated during firing in the dragon kiln. In this study, black-glazed Jian bowl sherds excavated from Luhaping and Daluhoumen kiln sites of the Song dynasty were adopted as test samples. Based on the physico-chemical foundation for the formation of glaze microstructure, the correlation among composition, microstructure, and visual appearance has been investigated by means of energy-dispersive X-ray fluorescence, X-ray diffraction, and field emission electron microscopy. For the first time, the study provides realizing proofs for two kinds of microstructural forming mechanics, namely local phase separation in glaze surface neighboring area followed by crystallization of iron oxide, and crystallization of anorthite accompanied by inter-crystal phase separation and the succedent crystallization of iron oxide. The “hare’s fur” and “oil spot” patterns were also analyzed by using optical microscopy, electron microscopy, Raman spectroscopy, and synchrotron x-ray techniques. In studying the chemical composition and crystalline structure of the Jian glaze, we identified a small amount of highly metastable epsilon-phase iron oxide mixed with hematite in the hare’s fur patterns and a much larger presence with the magnetite in the oil spots. This is a breakthrough in understanding the source of the aesthetic streaks and spots above Jian glaze surface. The making techniques of Jian bowl will undoubtedly offer positive reference for the present-day optimization synthesis of epsilon-Fe₂O₃, which is the contribution from the ancients of 1000 years ago.

History of East Asian Medicines (1): Text, Material, Practice and Nation**TuE2-1****Historical Usage of Tiger Parts in Traditional Chinese Medicine (TCM)**

Zhihong Cao

University of Chinese Academy of Sciences (UCAS)

By analysis of 2996 records of tiger parts using in TCM and 2884 prescriptions extracted from 1156 historical medicinal literatures, the paper gave the using details of tiger parts and drew out the outline of its historical process. The earliest record of basic medicinal knowledge of different tiger parts was written in the TCM book *Doctor’s Record (Mingyi Biehu, 名医别录)* during late Han Dynasty. Among all the tiger parts, tiger bone is the largest amount of parts that used in TCM followed by tiger eyes, which led to the major treatment is for anemogenous disease and the largest records number of perception is “tiger eyes pill”. The major form of tiger perception is pills followed by powders. And the processing of tiger drugs is majorly roasting followed by stir-frying with wine. According to present historical records, the earliest tiger perception was written in Han or East Jin Dynasty, through the little improving in Tang Dynasty, the quantity of tiger perceptions got to the first peak in Song Dynasty. Then after sharply decrease in Jin-Yuan Periods, it got to the historical highest peak in Ming Dynasty. Then after decline in Qing and Republic of China Periods, the medicinal using of tiger parts was totally forbidden in 1993.

History of East Asian Medicines (1): Text, Material, Practice and Nation
TuE2-2
National Reconstruction and National Health Systems in Post-WWII Asia

Liping Bu
Alma College

The end of World War II ushered in a new era of national reconstruction and transformation when Asian countries fought off colonial rule and foreign dominance to start the process of independent nation-building and modernization. For many countries, public health became an important major component of the postwar programs of national development for a prosperous unified nation. Healthy people were deemed a prerequisite to the building of a strong and modern nation. However, the newly sovereign nations lacked financial resources, trained health personnel and facilities, and the latest scientific knowledge and technologies to combat the diseases when they tried to construct a viable healthcare system to control and eradicate the most common epidemics. Moreover, challenges of national reconstruction were further exacerbated by wartime devastation, widespread poverty, and ethnic conflicts domestically; and programs of nation-building were complicated by the superpowers' rivalry for dominance internationally. Nonetheless, the post-colonial nations which had little interest in making alliance with either of the two superpowers formed the Non-Alliance Movement, even as they welcomed international aids. Their openness to foreign assistance inevitably made their political neutrality vulnerable and unsustainable in face of the pressure of the superpowers. The post-war national health movements became negotiations between the priorities of independent nation-building and the international politics of the Cold War. The reconstruction of national health systems constituted one of the most important developments that intertwined with the political and social and economic transformations. Drawing on archival data, this paper studies the various types of national health systems being built in this post-war context, as demonstrated in China, India, North and South Korea, and others.

History of East Asian Medicines (1): Text, Material, Practice and Nation
TuE2-3
Contemporary Korean *Ki Suryŏn* (氣修練) Practices as An Offshoot of East Asian Medicine

Victoria (Yeonhwa) Ten (Jeon)
Leiden University

This paper studies contemporary re-invented Korean practices of *ki suryŏn* (氣修練 mind-body cultivation by using ki-lifeenergy) as medical practices directed at achieving health, from the point of view of history of ideas. I analyze *GiCheon* (氣天), one of these practices, through the interviews with the trainees and review of *GiCheon* texts. *GiCheon* is a set of training forms characterized as internal alchemy (*naedan* 內丹). Adepts of internal alchemy formulate their final goal as achievement of immortality, which in East Asian context means becoming similar to mountain immortals (*sŏn* 仙). Health of mind-body is considered to be one step on the road toward immortality. East Asian alchemy views an individual adept as a microcosm. A mountain can be a medium through which a microcosm-macrocosm continuum is articulated in ancient alchemic texts and diagrams, and visualized on sacred pictures. In a picture the mountain represents simultaneously a human body and a cosmic body, serving as a bridge between the human and the cosmic. The environmental well-being of a mountain, or nature, would include for example the hydrologic cycle, the food chain, the rock cycle. In the interviews *GiCheon* practitioners describe human health in terms of natural cycles: food and liquids to be absorbed easily, sweat and excrement leave the body comfortably, thoughts and emotions to be perceived and realized efficiently, words to be said and actions to be performed with greater straightforwardness and simplicity. These functionality and efficiency are conceptualized as health of the body-mind that Seoul urbanites strive to achieve in the spaces of family and workplace. Retreats to the 'pure mountains' by leaving behind the polluted Seoul are considered constructive for achieving this purpose. This constitutes *kisuryŏn* as a medical practice and a method of survival under the pressures of modernity, reformulating old ideas in a new way.

**History of East Asian Medicines (1): Text, Material, Practice and Nation****TuE2-4****Discourses of Race and Ethnicity in Modern China: An Analysis of 20th Century Textbooks**

Xiang Lu

New York University

The 19th and 20th centuries witnessed the spread of many western concepts and thoughts, such as race, racism and nation, to other parts of the world such as East Asia. How did countries receiving these foreign ideas interpret them and reconstruct them in the local social context? This article analyzes 31 junior high school geography and history textbooks published in China during the 20th century and shows how classification and discourses of race and ethnicity changed between three historical periods: the late Qing Dynasty, the Republic of China (R.O.C.), and the People's Republic of China (P.R.C.). I have three main findings. Firstly, textbooks in all the three periods emphasize differences in culture and lineage between ethnic groups (or *minzu*) in China, whereas they emphasize physical differences between races in the world. Secondly, Anti-Imperialism and Social Darwinism had significant impacts on how textbooks in the R.O.C. era interpreted both racial relations in the world and ethnic relations in China. Thirdly, the P.R.C. textbooks replaced the assimilationist ideology in R.O.C. textbooks with a pluralist ideology on ethnic minorities and used the issue of ethnic inequality to attack the R.O.C. regime and praise the communist regime. These findings indicate that influential ideologies, indigenous understandings and power struggle all had impacts on how Chinese cultural elites localized the concepts of race and ethnicity, and the discourses of race and ethnicity can be used to serve political goals under certain circumstances.

Traveling Medical Knowledge and Artefacts**TuF2-1****From *al-Qānūn fī al-Ṭibb (kitāb al-Tibb)* to *Perubatan Melayu*, a Study on the Receptions of Arabic Medical Canon in Malay World**

Yu-Cheng Lin

Ludwig-Maximilians-Universität München

Since the completion of *The Canon of Medicine* (القانون في الطب *al-Qānūn fī al-Ṭibb*) by the Persian physician-philosopher Avicenna (Ibn Sina) and completed in 1025, it was heralded as the canon for medieval canon of medicine. Copies have been translated into various languages and adopted as textbooks been instructed at the Universities. The essay attempt to focus at the reception of *kitāb al-Tibb*, particularly in the Islamic Southeast Asia, in particular, the Malay speaking regions as the scope of content analysis. As Ricci (2011) noted [1], one of the main nuisances regarding the studying of Malay sources, is the lacking of colophons. In addition, the earliest of reliable Malay writings could only be predating to 14th. Meanwhile, these sources are transcribed, integrating the linguistic wordiness of Indic and Jawi scripts. Instead, numerous codices that were written within the Islamic Southeast Asia, mostly gathered and studied by Dutch and British scholars after 16-17th, containing writings could be referencing Arabic materials till 12th. [Winstead (1996), Proudfoot (1996), Hooker (1996) & Harun (2006)]. Since the publication of *Warisan Perubatan Melayu* (2005), studying of Malay healing medicine and its origin, with references to *kitāb al-Tibb Melayu*, the Malay translation of *al-Qānūn fī al-Ṭibb*, have been studied extensively [Ahmad, Daud & Hashim (2006)]. Hence, this paper intend to discuss the works of the abovementioned scholars, hoping to establish possible route(s) of knowledge transmission.

Traveling Medical Knowledge and Artefacts

TuF2-2

Locating The Chinese *Materia Medica* in Modern Science: Making of Ginseng Knowledge in The 19th Century Britain

 Sooyoung An
Fudan University

This article takes ginseng as an object whose knowledge was performed at the interface of the two distanced spaces, and investigates the western debates surrounding it. It has its primary attention to the shaping of knowledge and dynamics of understandings on ginseng during the nineteenth century, as depicted in a various range of materials - having its majority from, but not confining to, the academic literature of such fields as Botany, Natural History, Medicine, Pharmacy, Geography and *Materia Medica* in Britain. While much uncertainty allowed a space for much misunderstandings, prejudice and imagination regarding the knowledge of ginseng, the preceding tradition of Natural History, which was inherently multidisciplinary and thus functioned as a primary channel in the introduction of ginseng knowledge into Europe, lost its firm ground within the changing topography of professionalizing disciplines and compartmentalization of knowledge. During the first half of the nineteenth century, the preceding mode of seeking the *Materia Medica* knowledge was quickly falling apart. Meanwhile, the demarcating lines to what should be properly regarded as “drug” were shaped along with the growing favor and faith in chemical basis that could be experimented and proved. A closer look into the eclectic, and often discursive, knowledge-making process surrounding ginseng reveals peculiar dynamics of East-West communication that worked within the western context where the definition of “scientific knowledge” were ambiguous and evolving. What is observed from the nineteenth-century Western writings on ginseng is a complicated process of negotiation between two intellectual cultures in which the self-making process of the western “modern science” defined the frame of making others. Thus, what we see is not the nurturing an interactive set of knowledge, but displacement of the oriental matter of ginseng from the disciplines of modern drug knowledge that resulted from the course of inter-cultural exchanges.

Traveling Medical Knowledge and Artefacts

TuF2-3

Collecting, Displaying and Interpreting Chinese Objects of Science, Technology and Medicine in UK in The 19th and 20th Century

 Jing Zhu
Humboldt-Universität zu Berlin

Historians of science have increasingly realized the significance of scientific instruments and technical objects for the understanding the practices of science and scientific knowledge production, as has been argued in the concept of “thick things” by Ken Alder (2007). However the materiality pertaining to Chinese science, technology and medicine still remains a hardly explored area. Meanwhile, in the well-established scholarship of British collection history of Chinese material cultures, scientific objects are scantily considered. However, there are Chinese traditional scientific objects, including compasses, scales, celestial globes, star maps, mathematical instruments, herbal medicine samples and acupuncture models in several British museums. During a recent research fellowship at the Science Museum, I was tasked with tracing, documenting and analyzing such holdings. This paper explores how Chinese scientific objects were collected, preserved and displayed in the UK. Drawing on the China collections at Science Museum, London, Pitt Rivers Museum, Oxford, National Maritime Museum, Greenwich, and British Museum, it asks which particular scientific objects attracted British interests since 19th century and traces their provenances and biography. Apart from collection, this paper also examines the exhibition history of Chinese scientific objects in UK. My current research finds four major exhibitions: China section at the International Health Exhibition in London (1884); The “Maze Collection” of Chinese Junk Models in the Science Museum in London (1938); Chinese Medicine: an exhibition illustrating the traditional medicine of China, at the Wellcome Historical Medical Museum and Library (1966); and the exhibition of China ancient traditional technology in Birmingham (1995). By examining how these exhibitions were designed, curated and engaged with audiences, it enriches our understanding of the material experiences and spatial representations of Chinese ancient science, technology and medicine in UK.



Traveling Medical Knowledge and Artefacts

TuF2-4

A Beautiful Gift: Gendered Bloodshed and Blood Donation in South Korea's 1960 April Uprising

Inga Diederich

University of California, San Diego

This paper examines the ways in which women's blood was materially and symbolically mobilized during the South Korean April 1960 Uprising, which drove Syngman Rhee, the first president of South Korea, from office. In contrast to histories that celebrate male bloodshed in modern Korean history, women's blood is largely occluded by what Seungsook Moon calls the "androcentric discourse" of South Korean national history. Despite this erasure, women's blood was pivotal to the development of a scientific blood management industry in South Korea, both in terms of physical input to blood banks and because early advocacy framed blood donation in terms of gendered responsibility to the nation. South Korea's blood industry relied disproportionately on women to provide the physical substance and administrative support that allowed it to develop from its early reliance on foreign aid to a self-sufficient and nationalistic regime for regulating and optimizing Korean blood. The April Uprising, in particular, originated a movement to encourage a culture of blood donation in South Korea, in response to the medical blood crisis precipitated by Rhee's violent response to civilian protestors. By looking at women's participation in the anti-regime protests and in blood collection campaigns, it is possible to address the intertwined socio-political and scientific processes that simultaneously mobilized and regulated women's bodies. This paper, which is part of a larger dissertation project on medico-scientific treatments of blood in Cold War South Korea, considers how women's blood was simultaneously solicited for medical purposes and subjected to reproductive regulations against the backdrop of South Korea's struggle to establish a stable medical blood supply in the decade immediately after the Korean War. It surveys the socio-political tides that shaped early efforts to inculcate a culture of voluntary blood donation in South Korea, and illuminates the movement's reliance on women in its inceptive years.

TuG2

Grafting Science: Examples from The History of Agricultural Knowledge in China**Organizer: Francesca Bray (University of Edinburgh)**

This panel proposes grafting as a helpful metaphor for historians of science to analyse the processes whereby external knowledge is implanted into a local knowledge system. Grafting involves inserting a slip or bud (scion) cut from one living plant into the stem of another, already firmly rooted in the soil (rootstock). Grafting can regenerate ageing stock, enhance the vigour and improve the quality of fruits or flowers, and adapt imported plants to local conditions. Chinese texts say that for the graft (*jie* 接, join or connection) to take successfully, the scion should respond to the *qi* of both the rootstock and the local environment. For historians of science, the grafting analogy also emphasizes intentionality, care and temporality, and acknowledges the equally essential contributions of local rootstock and imported scion in the production of sustainable new forms of locally-adapted knowledge. Here we take agricultural knowledge in China to illustrate the potential of this approach for the history of science. First, proposing and developing the metaphor of the graft, Yongsik YI traces the overlapping or conflicting agendas literally grafted into the Sichuan honey nectar peach during the Republican and Maoist eras. Next, DU Xinhao discusses the incorporation of *zhanhou* 占候 (weather prognostication) techniques into farming repertoires during the Little Ice Age. Yubin SHEN then discusses the implications of grafting modern entomological science onto a long-standing indigenous system of using ducks for locust control. Finally, SONG Yuanming analyses pioneering agrologist F.H. King's efforts to adapt and combine principles from the soil sciences of Chinese "traditional" farming and American agronomy. Together the four papers offer cross-cutting perspectives, along a continuum from pre-modern to modern, on how scions of external knowledge, some indigenous, some transnational, were grafted onto a root stock of continuously evolving local agricultural expertise.

Grafting Science: Examples from The History of Agricultural Knowledge in China

TuG2-1

Scions and Rootstocks: The Chinese Honey Nectar Peach and The Grafting of Science, 1922-1965

Jongsik Christian Yi
Harvard University

The knowledge of why people should eat fruit and how fruit should be grown and utilized has historically varied. Focusing on such questions, this paper examines the history of the “hometown of Chinese honey nectar peach,” Longquanyi district of the city of Chengdu. In the Republican era, new varieties of honey nectar peaches were grafted on Longquanyi soil as a result of transnational exchanges of knowledge among missionaries, Western and Chinese elite scientists, and local landlords. In the Maoist years, the state imposed particular ways of knowing and doing upon local peasants in the name of the building of socialism, while the peasants tried to adjust to fruit farming as subsistence agriculture on their own. Based on the case of Longquanyi peach, this paper suggests adding the metaphor of “grafting” to the vocabulary list of global history of science. Features of grafting techniques, namely the dependency of a scion of imported variety on a local rootstock and the visibility of artificial attempts to integrate existing differences, help us emphasize power dynamics of knowledge encounters as well as local actors’ adaptive agency. The metaphor of grafting does not essentialize the binaries of Western, modern epistemologies and those of indigenous, traditional by understanding the relationship of scion and rootstock as relative. The global flow of scientific knowledge can be imagined as a vast orchard filled with grafted trees plastered with bandages, rather than something indistinguishably “hybridized” or “entangled.”

Grafting Science: Examples from The History of Agricultural Knowledge in China

TuG2-2

Knowledge of *Zhanhou* 占候 (Weather Prognostication) in Late-Ming Daily Use Encyclopedias

Xinhao Du
Institute for the History of Natural Sciences, Chinese Academy of Sciences

Zhanhou were series of auguries prognosticated from weather observations. In pre-modern China, people used *zhanhou* to organise farming activities so as to seek benefits and avoid hazards, and hoping to get a bumper harvest. Under the threat of the Little Ice Age, people of late Ming turned to any device to help them guard against the capricious climate. Responding to the demand for divinatory techniques in popular society, the daily use encyclopedias published at that period contain copious prognostications. This paper examines the knowledge of *zhanhou* contained in late Ming household encyclopedias from the perspective of social history, examining the background that motivates them, tracing the original sources of such knowledge, and asking why the booksellers of household encyclopedias included extracts from these sources in their books. Finally, I discuss who the target audience for this knowledge was.

**Grafting Science: Examples from The History of Agricultural Knowledge in China****TuG2-3****Of Sweet Potatoes, Locusts, Ducks and Ditches: Biological Pest Control in Late Imperial and Modern China**

Yubin Shen

Max Planck Institute for the History of Science

Based on a relatively-unknown agricultural treatise *Zhihuang chuanxilu* (A Legacy of Locust Control) published in 1776, as well as many other primary and secondary sources, this paper traces the origin and development of mobilizing ducks to control locusts in China, from the late sixteenth to the twentieth century. Initially as an unexpected by-product in promoting sweet potatoes cultivation during *Wanli* period (1572-1620) of the Ming dynasty, it had been developed as a sophisticated technology of systematically managing locusts, raising ducks and digging ditches by the late eighteenth and nineteenth centuries in Qing China. Ever since the spread of western applied entomology in early twentieth century, it has been still practiced and promoted as an effective organic antidote to toxic chemical pest controls. By exploring how ducks were used as technology and how relations of humans, plants, animals and the environment were shaped by traditional Chinese natural history/agronomy and modern applied entomology, the present paper helps better understand this particular Chinese innovation of biological pest control.

Grafting Science: Examples from The History of Agricultural Knowledge in China**TuG2-4****Exchanges of Agricultural Knowledge between America and China - The Case Study of Franklin Hiram King and His Works**

Yuanming Song

Institute of Cultural Heritage and History of Science and Technology University of Science and Technology Beijing

Western agrology (the branch of soil science dealing with the production of crops) was introduced into China systematically after the Sino-Japanese War of 1894-1895. Franklin Hiram King (1848-1911), a famous American agronomist, played an important role in the Exchanges of Agricultural Knowledge between America and China. He is the author of *NongWu TuZhi Lun*, the first Chinese translation of American agrology. After his visit of China to study agricultural knowledge in 1909, he wrote a book entitled *Farmers of Forty Centuries*, which had a great influence on the field of agronomy in Western countries. This paper analyzes the content, translation background and features of *NongWu TuZhi Lun*, examines the Chinese traditional soil and fertilizer knowledge King acquired during his travels in China and finally reveals his important impact on the exchanges of agrology between America and China.

TuA3

Chemical and Nuclear Crossings: People, Health, and Safety in Japan

Organizer: Yeonsil Kang (The Catholic University of Korea)

This session examines the interactions of the environment, technology, and politics from a transnational perspective. As Japan and Korea became industrialized in the second half of the twentieth century, numerous challenges to the conditions of human health emerged. Atomic bombs irreversibly changed not only Japanese but also Korean bodies who resided in Hiroshima and Nagasaki area. Increased exchanges of capitals, industries, and consumer products gave rise to new concerns about safety. New chemicals originally crafted to enhance the comfort and convenience proved to damage worker's health and devastate people's daily lives. The presenters collectively raise questions about safety, responsibility, and inclusivity. In doing so, we pay attention to how people, knowledge, and objects cross borders between countries, experts and lay people, memories and official records. For instance, while Yeonsil Kang examines the transnational shaping of the asbestos industry and complexities of locating responsibilities of workers' health in South Korea, Eun Jeong Oh follows the path of Korean atomic bomb survivors in their journey to receive Japanese Hibakusha Techō based on their memories, not official documents. This panel also highlights the role of activism in the making of nuclear, chemical, and environmental policy using case studies from Korea and Japan. Nozomi Mizushima, for instance, examines citizens' radiation measurement movement in Japan after the Chernobyl disaster that has affected post-Fukushima situation. While Jongmin Lee examines the emergence of "people's experts" after the tragic death of workers at the rayon factory as a "trading zone" between advocacy and professionalization in the 1980s Korea, Ito Kenji analyzes the dispute between the nuclear physicists and the locals over the establishment of the

Institute of Nuclear Study with large accelerators in the mid-1950s in Japan. By understanding how different groups perceive health, safety, and prosperity, this panel aims to build bridges connecting the histories of chemical and nuclear hazards, sociopolitical movements, and intergovernmental governance.

**Chemical and Nuclear Crossings: People, Health, and Safety in Japan****TuA3-1****Writing out Memories on Temporal-Spatial Coordinates of Atomic Bombs: A Korean Atomic Bomb Survivor's Movement in The Post-Colonial Korea**

Eunjeong Oh
Hallym University

Identification of a Hiroshima and Nagasaki hibakusha in Japan is far from biological diagnosis unlike the case of Chernobyl or Fukushima. Since the Medical Care Act was enacted in Japan in 1958, the screening process relied on administrative records (victim certificates) that proved the person's presence in the bombed area, written and verbal verifications from government institutions and officials, as well as personal testimonies. While these methods underwent minor changes over time, documenting official records and witnesses, as well as their own memories of experience, remained the most fundamental aspect of the process. The scientific diagnosis was insufficient at that time because of the uncertainties regarding the impact of radiation exposure. Unless the person had visible, physical injuries, it was impossible to provide biologically or medically meaningful standards to classify a hibakusha. In that sense, the ruling of Nagasaki District Court in September 2012 was symbolic by ordering the government to grant plaintiff Chang Yöng-jun, who lived in South Korea, a Hibakusha Techō based solely on his own testimonies - despite the fact that he was unable to provide official records or witnesses. This ruling, ordered sixty-eight years after the atomic bomb attacks, illustrates how the issuing of Hibakusha Techō had been constrained by bureaucratic red tape. This red tape consisted of the victim's need to fulfill the necessary requirements - finding domestically-produced official records and the witnesses who had access to those records, as well as documenting and proving these experiences. In this presentation, I critically examine the political aspects of the readjusting and reordering memories on the temporal-spatial coordinates of the Hiroshima and Nagasaki atomic bomb and its meaning in the history of Korean atomic bomb survivors' movement in the post-colonial and cold-war Korea.

Chemical and Nuclear Crossings: People, Health, and Safety in Japan**TuA3-2****Transnational Hazard: A History of Asbestos Industry and Responsibility in South Korea**

Yeonsil Kang
The Catholic University of Korea

This paper examines transnational shaping of the asbestos in South Korea. While the material is imported and exported, and while the industry is transferred from one to another, the concerted efforts to tackle its hazardous effects cross national borders, too. A lawsuit raised in Korea in 2008 was one of such. Plaintiffs, family members of former asbestos textile factory workers who died of mesothelioma, pointed out the negligence of the Korean government and deceit of the Japanese company who exported production facilities. While the lawsuit focuses on the connection with Japanese asbestos industry, the asbestos industry in Korea was in fact shaped by much diverse national and global actors for a longer period. Based on archival sources, this paper traces the history of Korea's asbestos industry, especially its connections with the U.N.'s reconstruction program after the Korean War and Korea's foreign investment policy in the 1970s. It reveals that not only the developmental state but also global economic and political forces contributed to the introduction and growth of the asbestos industry. Manufacturing machines, engineers, technical knowledge, and raw asbestos crossed borders to be shipped in and out of South Korea. So were the activism, regulations, and lawsuits to find who is responsible for the health of the former workers. By using a court case as a lens to look into the history of the asbestos industry, this paper discusses the complexities and difficulties of locating responsibilities for people's health especially with the transnational hazards.

Chemical and Nuclear Crossings: People, Health, and Safety in Japan
TuA3-3
Who Should Pay for This Contamination? Citizen's Radiation Measurement Movement and Politics of Risk Regulation in Post-Chernobyl Japan

Nozomi Mizushima

SOKENDAI (The Graduate University for Advanced Studies)

After the Fukushima Daiichi nuclear disaster in 2011, a lot of citizen-run radiation measurement stations were established not only in Fukushima but also throughout the country, from Okinawa to Hokkaido. They have measured radiation in food and various environmental samples, such as soil. It is known as a successful case of citizen science. However, this is not the first time Japanese citizens have measured radiation.

Radiation contamination in imported foods from the European region was reported early in the year following the Chernobyl nuclear disaster. Public concern grew immediately, but the Japanese government disclosed limited and insufficient data. Hence, several citizen groups started to measure radiation by themselves to determine the extent of contamination in imported and domestic foods. The first equipment installed by the NGO was a NaI scintillation detector in the Citizens' Nuclear Information Center (CNIC) in Tokyo in September 1987. Following the CNIC's example, other citizens' groups also established measurement centers. A unique characteristic of this movement was that they called for their local governments to construct official centers to measure radiation among the public. By the late 1990s, at least nine radiation measurement centers funded by local government and managed by citizens' groups and five centers funded and managed by citizens had been established. Some of them were still making measurements at the time of the Fukushima nuclear incident.

During negotiations with the local government, a collaboration between the government and citizens was created. They discussed the appropriate way to measure, conduct sampling, and disclose data. I will focus on the various forms of management by citizens collaborating with local government and discuss the politics of risk regulation of radiation contamination in the late 1980s and 1990s compared to practices in the post-Fukushima situation.

Chemical and Nuclear Crossings: People, Health, and Safety in Japan
TuA3-4
Hospital for Learning: Students' and Activists' Experiences in Workplace Poisoning Cases around 1988 Korea

Jongmin Lee

University of Science and Technology

Moon Song-myeon, a 15 years old boy, had been working for an electric appliance factory for approximately two years. He recognized that his symptoms might have come from his work, and quit his job, but died soon after quitting his job. Even though Seoul National University Hospital doctors diagnosed him of suffering from mercury and organic solvent poisoning, his claim of occupational illness was not accepted by either the company or the local office of the Ministry of Labor. Moon passed away before any treatment or compensation. Moon's death coincided with bigger changes in Korean society. When student and labor activists created positive response from the general public about the change toward democracy, labor safety and health movement found a similar opportunity to make the occupational disease as one of the urgent issues that rapid industrialization of Korea have left unsolved. When the media reported Moon's death, victims of carbon disulfide poisoning in Wonjin rayon company met with doctors and medical students who wanted to show the correlation between work and suffering. After many years of protests and negotiations, the story ended with big compensation funds, the establishment of dedicated hospitals for victims, and the exportation of machines to China. In this paper, I focus on two changes that made possible the success and remaining tasks. First, I will highlight how doctors accessed and applied information about workplace poisoning and safety from Japanese and international experts into Korean context. Second, I will suggest that a new concept of "people's experts" with which medical student-activists established a new "trading zone" between advocacy and professionalization. Students and activists not only created Wonjin green hospital for victims and residents. They also became people's experts who became all versed with language of the victims and that of the bureaucracy.

**Chemical and Nuclear Crossings: People, Health, and Safety in Japan****TuA3-5****Physicists versus Locals in Tanashi: The Dispute over The Establishment of The Institute for Nuclear Study**

Kenji Ito

SOKENDAI (The Graduate University for Advanced Studies)

This paper examines an early case of dialogues in Japan between scientists and citizens to resolve a socio-scientific dispute. It shows how some physicists in the 1950s started to realize inadequacy of their own understanding of the dispute, which science studies scholars would now call the deficit model. The University of Tokyo's Institute for Nuclear Study (INS) was Japan's early nuclear physics research laboratory. It housed a 1.3 GeV electron synchrotron and prepared high energy physics in Japan. At the news of its planned construction in their town in 1954, the residents of the town of Tanashi in Tokyo opposed it. To resolve the dispute, Japan's leading nuclear physicists, including the future Nobel laureate Tomonaga Sin-itiro, visited Tanashi and held meetings to talk directly with the locals. Initially, physicists assumed that people in Tanashi were opposed to the plan because of the local people's misunderstanding of nuclear physics, in particular their confusion with nuclear physics with nuclear weapons. They therefore prepared elaborate explanation of nuclear physics to be conducted at the new institute. Through the dialogues, however, physicists realized that their assumption was wrong. They found that citizens' opposition came, for example, from their concern about the potential diversion of nuclear physics to military purposes, a concern that many physicists shared. The paper places this incident within the socio-cultural context of the Cold War in Japan. It further studies how the dispute was resolved and discusses how this incident affected some physicists.

TuB3**Historical Astronomy**

Organizer: Hong-Jin Yang (Korea Astronomy and Space Science Institute)

In this panel, we would like to present and discuss academic research related to 'Historical Astronomy and History of Astronomy'. Through this, we will exchange recent research results and make it an opportunity for academic development.

Historical Astronomy

TuB3-1

Mural Constellations Found on The Ceiling of The 5C Ara-Gaya Tomb of Korean

Hong-Jin Yang

Korea Astronomy and Space Science Institute

In this talk, we would like to report about the constellations of the recently discovered late 5th century tomb in Korean peninsula. In December 2018, a constellation-shaped groove was newly reported on the ceiling of the late 5th-century tomb of the Ara-Gaya (42-532 CE.) polity, which was located in southern Korea and later annexed by Silla Dynasty. Grooves were found in one of the slabs of the grave cover (160 * 80 ~ 60cm). Each groove has a diameter of 1.5 to 4.0 cm and is 125 in all. The grooves were made by pecking or grinding. As a result of the first identification of these grooves, we have found five traditional oriental constellations, which correspond to the modern constellations such as Scorpio and Sagittarius with the Milky Way.

This is the first constellation relic found in Ara-Gaya Tomb. On the other hand, the area where the tomb was found is one of the largest remaining constellation-like dolmens in Korea. Therefore, we think that this grave constellation plays an important role in understanding the convergence process between the dolmen constellation and the traditional constellation derived from China.

Historical Astronomy

TuB3-2

Lunar Motion in The *Xuanming* Calendar

Mitsuru Soma

National Astronomical Observatory of Japan

Xuanming calendar was a Chinese lunisolar calendar. It was implemented in 822 and was used until 892 in China, but in Japan it was used for more than 800 years from 862 to 1684 under the name of Senmyō-Reki with almost the same Chinese characters. In the calendar the non-uniform motions of the Sun and the Moon were taken into account and the corrections to the times of the new moons due to them were given by tables. Mistakes were found in the tables and I discussed the mistakes in the table for the Sun's motion at ICOA-8 in 2014. Here I will discuss the mistakes existed in the table for the Moon's motion. The table is given in 2 parts, one for the 14 days from Moon's apogee passage and the other for the 14 days from Moon's perigee passage. The angles between the directions to the true Moon and the mean Moon change on the 7th day from increase to decrease and it is found that the values given for such days are in error. I will clarify how such errors occurred in the calendar.

**Historical Astronomy****TuB3-3****The Planets Observed in Japan during 7th and 10th Centuries**

Kiyotaka Tanikawa

National Astronomical Observatory of Japan

The Japanese observational astronomy began in the seventh century AD. Evidence for this is provided. For the seventh, eighth, ninth, and tenth centuries, the motions of the Moon and Planets were recorded in the Japanese history books. Our calculations show that these records are based on observations. We talk about 'The moon and planets/stars', 'Approach of planets to other planets and constellations', and 'planets seen in the daytime.' The number of records increase much as time goes on. So we will talk about elsewhere the planets after the 10th century.

Historical Astronomy**TuB3-4****A Reconsideration of Celestial Phenomenon in Ancient China**

Geng Li

National Astronomical Observatories, Chinese Academy of Sciences

China has maintained the longest continuous records in the world of astronomical phenomena. It is well recognized that these records are of great value in modern scientific research. Some major developments in the 20th century astrophysics have been benefited from these records. The representative work was New Catalogue of Ancient Nova by Xi Zezong, which was published half century ago and stimulated thousands of research articles on supernovae and cosmology published in leading astronomical journals. On the basis of new observational data in the past decades, it is necessary to build a database on ancient Chinese records of celestial phenomena that is based on thorough and systematic historical investigation the celestial phenomena and quantified analysis of their scientific parameters. Besides, several application studies can be concerned, including "guest stars" and "resplendent stars", sunspots and solar cycles, as well as the impact of celestial phenomena on the earth environment, including climate change and change of geological characters of the earth etc. These approaches will fully bring out the scientific value of the unique treasury of ancient Chinese records of astronomical phenomena.

Historical Astronomy

TuB3-5

Influence on late Joseon astronomy by the projection method of the old star map Bangsung-do

Yong Bok Lee

Seoul National University of Education

We studied on projection method of the old star map Bangsung-do(方星圖) which were used in late Joseon Dynasty. It was made by Western Missionary, Philippus Maria Grimardi (1639~1712) who lived in China. It was a unique star map that were come from China to late Joseon Dynasty around in 1764.

The star map is that whole stars in the heaven were depicted by stereo projection method on separate six sheets. It gave a important role on geometrical projection method to Joseon scholars, especially mathematician. It gave great influence widely to Joseon scholars who were interested in the field of geometrical projection. It was applied to depict several kinds of star maps using star catalogues and make horizontal sundials. At last one of mathematicians designed Western astrolabe, who was Yu Geum. He would contribute the area of geometry and astronomy in late Joseon Dynasty.

TuC3

Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices
Organizer: Hsiao-wen Cheng (University of Pennsylvania)

This panel represents a preliminary attempt to rethink East Asian medical literature by reconsidering the divide of knowledge between those derived from occult sources and those from empirical practices. By bringing together research from different regions in early modern East Asia, we seek to show how questions related to the “supernatural” - ghosts, gods, and divine forces - were often at the center of medical diagnosis and treatment. Through comparing sources of various genres and origins, each panelist will uncover a previously overlooked aspect of healing practice and knowledge construction in their respective fields. Margaret Ng’s presentation will situate the historical usage of Frankincense in Tang-Song China and the Red Sea region to consider how it was used often to both appease the gods and alleviate labor pains during childbirth. He Bian will then investigate how certain formulas in Ming China became associated with the divine through networks of knowledge glimpsed through various media. Hsiao-wen Cheng, comparing medical treatises, formularies, and anecdotes about “ghost fetus” during the Song, reveals the dilemma in treatments of potential false pregnancy and reconsiders the correlation between diagnosis of “ghost fetus” and the patient’s sexuality. Janet Y. Lee’s presentation then examines an encyclopedia of women’s daily life in relation to late Chosŏn period household manuals and explores how Chosŏn female intellectuals used occult elements within the everyday medical and practical knowledge. Clarence I-Zhuen Lee will then analyze mid-Edo period texts that speak to both the medical discourse and supernatural literary traditions to elucidate how these ghostly writings were often central to understanding the changes in medical discourse. Together, through focusing on the dialogue between these “popular beliefs” and medical practice, this panel proposes a reconsideration of the boundaries of Sinitic medical knowledge in early modern East Asia.

**Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices****TuC3-1****Scent for The Gods and Medicine for The Parturient**

Margaret Ng
College of Wooster

Frankincense, an expensive aromatic imported from the Red Sea region (mainly Hadramaut or Somaliland) to China in the middle period (Tang to Song), appeared only sporadically in pre-Song medical works as a main ingredient in medical formularies. However, as frankincense became a key state monopoly in the Song dynasty's Indian Ocean trade, its uses started to expand. Its emergence as an important part of the Chinese *materia medica* suggests multiple interpretative possibilities. Besides being a lucrative government monopoly and a profitable sales item for the Imperial Pharmacy, its use in formularies for difficult and painful birthing complications, such as in *juan 17, channan* (Difficult Birth) in Chen Ziming's *Furen daquan liangfang*, points to uses associated with religious and divine forces from its place of origins. Frankincense was offered as incense to gods in Arabia and also in purification rites at funerals. It was also mixed with other spices to embalm corpses. Yemenite Jews used frankincense to hasten and alleviate the hardships of a woman giving birth, and again after childbirth for purification. This paper examines how frankincense appeased the divine in the ritually polluting act of childbirth and alleviated the pain of childbirth, and how cultural practices transform in different contexts.

Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices**TuC3-2****The Idea of "Divine Formula (*xianfang*)" in Ming China: Between Medical Practice and Textual Transmission**

He Bian
Princeton University

The trope that efficacious medical formulas originated from the divine realm has a long presence in Chinese medical history. While most previous scholarly attention considers the repeated efforts that aimed at rationalizing therapeutic culture, the persistence of "divine formula" in medical texts is a phenomenon that merits better understanding. Could the invocation of divine power have been used to blur the boundary between the healer and the priest? Or, when deployed by laypersons, did those supernatural remedies in fact allow them to bypass, or even negate, expert opinions? In other words, who were the gods helping by offering a formula - the healer, or the patient? This paper explores the impact of print culture on the transmission and deployment of "divine formulas" in Ming China, especially during the sixteenth century. First, I seek to better understand Ming actors' agency in transmitting and transforming earlier formulaic collections formed in the earlier Song-Yuan period. Secondly, I use the example of medical formulas newly displayed in front of the Yaozhou Medicine King's Cave (*yaowangdong*) during the Wanli reign. A set of preserved steles recorded stories of how visitors prayed to the Tang physician, Sun Simiao "the perfected," for deliverance from their sufferings, and how local authorities took advantage of the site to promote medical formulas in a variety of medium, including stone inscriptions, woodblock printing, and living memory. Lastly, I offer some preliminary thoughts on how late Ming trends may have shaped the multi-faceted appropriation of printed formulaic texts in Qing China.

Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices

TuC3-3

Ghost Fetuses, Monstrous Births, and Female Sexuality in Song Medical and Anecdotal Accounts

Hsiao-wen Cheng
University of Pennsylvania

There has been an abundance of records about anomalous pregnancies and monstrous births in various contexts since ancient China. The Sui physician Chao Yuanfang in his *Zhu bing yuan hou lun* (*On the Origins and Symptoms of Various Illnesses*, 610) uses the term “ghost fetus” (*guitai*) to explain spirit-inflicted pregnancies and emphasizes the internal causes. Ghost fetus has since then become a common category of illness in Chinese medical texts, many of which begin their discussion by quoting Chao’s passage. In Song medical texts, ghost fetus becomes an umbrella term for a wider variety of false pregnancies, especially those accompanied by obvious symptoms during gestation or labor. In Song anecdotal accounts, however, the descriptions of ghost fetus cases are quite different - there is usually no obvious symptom during gestation, and oftentimes the case is only identified as one of a ghost fetus when the woman has already given birth to a monstrous baby (or lump) or when the pregnancy is significantly prolonged. Scholars have examined the parameters of medical uncertainty that cases of ghost fetus revealed, as well as the shift in focus on female emotions and desire as the cause of this illness in late imperial medicine. This presentation will compare records of ghost fetuses in medical texts and those in Song anecdotal writings (specifically in Hong Mai’s *Record of the Listener*) and focus on the difficulty and dilemma that physicians faced in diagnosing ghost fetuses and dealing with potential cases of false pregnancy. I will propose a different reading of the correlation between ghost fetuses and female sexuality as seen in some Song medical texts.

Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices

TuC3-4

Positioning The Supernatural in Medical Texts of 18th Century Edo Japan

I-Zhuen Lee
University of Colorado Boulder

Scholars in the field of early modern Japanese medical history often characterized the 18th century as a transitional period between (1) early Edo period Sinitic medical discourses anchored in the Zhu Xi confucianism (*lixue*), and (2) that of later medical thought calling for a return to more “empirical” methods of treatment found in purportedly older and more authoritative texts such as the *Shang han za bing lun*. Utilizing this broad narrative as a backdrop, while at the same time recognizing its teleological and overdetermined nature, my presentation proposes a co-reading of medical texts that also speak to an alternative form of writing: those of “supernatural” literature. By grounding my analysis first with a text that was published both as a glossary of medical ailments (*Kishitsu Benran*) and later as an anthology of supernatural tales (*Kaiyō Koji dan*), this presentation will then look at various other sources that “speak” to both “traditions”. By bringing texts of both “kinds” together, I argue that the gradual “empirical” nature of medical thought in Early Modern Japan can only be understood within the context of the equally maturing field of supernatural literature.

**Rethinking The Occult and The Empirical in Early Modern East Asian Healing Practices****TuC3-5****Women's Magic and Medicine: Household Manuals in The Late 19th to Early 20th Century Korea**

Janet Yoon-sun Lee
Keimyung University

The discourse on medicine has been produced and appropriated in diverse ways in accordance with different agents, time periods, and contexts in history. Discussions on topics deemed as “medicine” extended beyond mere depictions of systematic studies on the human body and the world. Rather, they were often shaped by diverse subjectivities, needs, and contexts. This research examines *Kyuhap ch'ongsŏ* (Encyclopedia for Women's Daily Life) by Yi Pinghŏgak (1759-1824) and *kajŏng pogam* (household manuals) produced in early twentieth century in Korea to see how women's experiences and reflections at home enabled them to combine divination and empiricism to produce medical knowledge. Particularly, the two medical-related chapters (“Chŏngnanggyŏl” 靑囊訣 and “Sulsuryak” 術數略) of Yi's encyclopedia reveal that how Chosŏn female intellectuals regarded divination as an important element of medical knowledge. While weaving supernatural elements and practical learning, these texts set up a dialogue between subjective experience and objective knowledge. The accounts of medicine by and for women give us new insights into the role women have played in making a human link between orthodox culture and folk customs, constituting the knowledge of medicine. Conclusively, the paper seeks to expose the diverse ways “medicine” was constructed and also to reconsider its ramifications - such as deeming what is acceptable, authoritative, and “rational” forms of knowledge and unacceptable and “irrational” and “superstitious” forms of knowledge - in modern era, since Western medicine became the dominant form of medical theory and system in the late nineteenth century.

Exchanges of Technological Knowledge, Practice, and Artefacts (II)**TuD3-1****Sea-Route Experiences in Tang China: Wonder and Terror in Narratives of Maritime Travel**

Linda Feng
University of Toronto, Dept of East Asian Studies

During the Tang dynasty (618 - 907 CE), trans regional exchanges of commodities and concepts were maritime as well as overland. Indian and Persian merchants traveled across the Indian Ocean basin to dock at the port of Panyu (Guangzhou) as Chinese mariners took to Nanhai (the South China Sea), and emissaries and pilgrims regularly undertook sea journeys from Silla and Japan. These crossings left their imprint not only in official records but also as narrative representations in a corpus of informal literature that flourished in the second half of the Tang. These writings both exoticize the plenitude of foreign commodities as well as represent dangers of the sea as (in many cases) the only route connecting China with far-flung places. In order to examine how the ocean was understood in the late Tang simultaneously as a route, frontier as well as the limit of knowledge and/or social order, this paper selects and analyzes three ninth-century narratives that construct, each in its own way, maritime travel route and its geographical and epistemological implications. The first is an extended Tang tale with fantastical elements in which the protagonist, guided esoteric knowledge dispensed by a group of visitors from Nanyue, undertakes with them an oceanic treasure hunt that culminates a significant windfall. Another, shorter anecdote from the collection *Records of the Unusual from Lingnan* (嶺表錄異) describes one sea-bound merchant's terror at his first encounter with a whale (海鯨). These two tales of contrasting attitudes toward the sea are contextualized against the travel diaries of the Japanese Buddhist monk Ennin (794-868), whose pilgrimage journey from Japan to China included a range of experiences aboard sea-going ships both Japanese and Korean. Taken together, these three sources offer a case study in late-Tang China in which narratives of experience are transformed at the interface between knowledge and imagination.

Exchanges of Technological Knowledge, Practice, and Artefacts (II)

TuD3-2

Analysis on Real State of Japanese Accommodation of Science, Technology Culture of Ancient Korea - Focused on Huang Zunxian's Research

Noh Yongpil
Research insititute for Korea History

Huang Zunxian, a Chinese diplomat, was much interested in history and culture of Japan since he took office in Japan in 1877 and so acquired some 200 Japanese books and analyzed them precisely through the help of Japanese intellectuals. Then, he poured his effort to write about the history of Japan based on those information and wrote, published Poems about Various Things in Japan (first edition in 1879; second in 1898) and Treatises on Japan (completed in 1887, published in 1890). As a result of careful examination of those books, the study found that, while describing in detail regarding Japanese cultural development reflecting the technological contents of Japanese books during the Restoration of Meiji, he poured his great effort to render detailed and objective historical research related with Japanese accommodation of science, technology culture of ancient Korea. In the first place, in regard to the real state of Japanese accommodation of science culture of ancient Korea, he mentioned real names and positions held, as often as possible, of the figures found in Japanese literature not merely in the fields of calender and astronomy but in the fields of medicine, pharmacy, arithmetic and geography. He nevertheless didn't neglect the contents of technological culture, and integrated analysis of this study found he suggested very precisely the types of the related technical posts, each functionality and personal details of living persons with the relevant techniques in the nine fields of architecture, metal, textile, leather industry, stationery, painting, ceramics, clothing and cooking. It is quite worthwhile to attract our attention. Such rigid historical research as shown in his books must be crucially important for us to completely comprehend the real state of Japanese accommodation of science, technology culture of ancient Korea in an objective way and investigate truth of history correctly.

Exchanges of Technological Knowledge, Practice, and Artefacts (II)

TuD3-3

The Qiantang River in Needham's Dairy

Haijing Li
Zhejiang University of Water Resource and Electric Power

Needham's diary is the important first-hand material for studying Dr. Needham, his academic ideology, methods, research contents and SCC writing process. Taking Needham's diary as the research content, the paper analyses and explores the purpose and main itinerary of Needham's China trip in 1964, and focuses on the related contents of Qiantang River in order to provide a new research perspective for Needham's research and Qiantang River research. In addition, through analysis, comparison of the diary and relevant contents in SCC, the paper are trying to detect and understand his work and research details, and how to transformation from a biomedical scientist to a Chinese historian of science and technology, so as to provide academic experiences for future generations.

**TuE3****Mathematics in East, Southeast, and South Asia:
Issues of Comparisons and Transmissions****Organizer: Jia-Ming Ying (National Taipei
University of Education)**

Mathematics in East, Southeast, and South Asia have served as examples of “non-Western” mathematics and have been studied in this manner by historians of science for a long time. However, as cultural enterprises in civilisations in these areas, issues of comparisons and transmissions among or within mathematics in East, Southeast, and South Asia are less studied topics. In this panel we would like to present some of our research related to those issues. Our first paper is about how to compare of Indian and Chinese sources. Many comparisons faced problems of neutrality in reducing the concept of culture to nation or civilisation. This paper will give a survey of primary texts and materials that were used in the process of comparison of pre-modern Chinese and Indian sources, to understand how comparisons were constructed, how topics of comparison were selected and interpreted. The second paper touches transmission issues for mathematics in East and Southeast Asia and argues with examples that the concept of “didactical variable” widely used in modern studies on mathematical didactics can be used to analyse the variation of numerical parameters in series of problems found in several pre-modern Chinese and Vietnamese treatises. The third paper also discusses “didactical” or education aspects of East-Asian mathematics. The author shall use social and textual examples of Chungin mathematicians in 17th- to 19th-century Korea to show how mathematical knowledge was passed down within their clans. Finally, the fourth paper will discuss a rarely studied topic of mathematics in Minnan, a local language spoken in Southeast China and in Taiwan. The author shall present a text written in Minnan by an English missionary and how that text could be used to teach pen calculation in late 19th or early-20th centuries.

**Mathematics in East, Southeast, and South Asia: Issues of
Comparisons and Transmissions****TuE3-1****A Short Story on Comparison of Indian and
Chinese Sources****Charlotte Pollet***National Chiao-tung University*

There is a long history of comparisons in history of sciences. However, despite this history, to compare Chinese and Indian mathematical texts is a less known enterprise. Similarities between Chinese and Indian algebraic results and procedures, numeration system or astronomy have long been noticed. Many comparisons faced problems of neutrality in reducing the concept of culture to nation or civilisation. As mathematical texts are written in classical Chinese and Sanskrit, corpuses became representative of so-called ‘Chinese mathematics’ or ‘Indian mathematics’. It is an interesting question for historiography. The purpose of this presentation is to give a survey of primary texts and materials that were used in the process of comparison of Chinese and Indian sources, to understand how comparisons were constructed, how topics of comparison were selected and interpreted.

Mathematics in East, Southeast, and South Asia: Issues of Comparisons and Transmissions

TuE3-2

A Study of Numerical Parameters in Pre-modern Chinese and Vietnamese Mathematical Texts

Alexei Volkov

Center for General Education, National Tsing Hua University

Interpretations of pre-modern East- and Southeast Asian mathematical texts offered by modern historians of science are often based on implicit assumptions concerning the ways in which they were used. It can be argued that a considerable number of the extant Chinese mathematical texts compiled prior to the mid-second millennium AD were originally designed, or adapted later, for mathematical instruction. The mathematical traditions that existed in other countries of pre-modern Eastern and Southeastern Asia originated from the Chinese one, and there are strong reasons to believe that the majority of extant Japanese, Korean, and Vietnamese mathematical treatises were also compiled and used primarily for educational purposes. Even when the information about the use of a given text is insufficient or unavailable, its very structure, and, in some cases, the numerical parameters of the problems, may provide sufficient materials for a sensible reconstruction of at least a hypothetical use of the text in educational context. *A considerable number of pre-modern mathematical texts* belonging to the aforementioned traditions contained groups of problems supposed to be solved with one and the same algorithm (or with generic algorithms apparently perceived by the compilers as modifications of one algorithm). I argue that the concept of “didactical variable” widely used in modern studies on mathematical didactics can be used to analyse the variation of numerical parameters in series of problems found in several pre-modern Chinese and Vietnamese treatises. My analysis shows that these parameters may have been especially selected by the authors in order to introduce general algorithms for solution of problems. In the present paper I will offer a discussion of series of problems on pondered distribution found in Chinese and Vietnamese mathematical treatises and will especially focus on approaches that may be used for analysis of their numerical parameters.

Mathematics in East, Southeast, and South Asia: Issues of Comparisons and Transmissions

TuE3-3

Transmission of Mathematical Knowledge within Korean Chungin Clans in Late Chosŏn Period

Jia-Ming Ying

Department of Mathematics and Information Education, National Taipei University of Education

The Chungin in Korea's Chosŏn Dynasty was a social class of technical bureaucrats such as astronomers, medical practitioners, translators, and mathematicians. Although government posts were not inherited but were awarded to those individuals who passed the state examinations, this paper will use the examples about the clans of three chungin mathematicians in late Chosŏn period - KyŏngSŏn-Jing 慶善徵 (1616-1690), Hong Chŏng-Ha 洪正夏 (1684-1727) and Yi Sang-Hyŏk 李尙嫻 (1810-1883?) - to argue that, in fact, certain clans monopolised certain types of technical posts. Moreover, contents of one of Hong Chŏng-Ha's mathematical treatises - the *Kuiljip* 九一集 - will be discussed to show how a chungin mathematician passed down his mathematical knowledge within his clan in order to possibly maintain the advantages of the clan's competitiveness in state examinations.

**Mathematics in East, Southeast, and South Asia: Issues of Comparisons and Transmissions****TuE3-4****Learning Pen Calculation in Local Chinese Language: A Case Study of *Pit-Soan E Chho-hak***

Wann-Sheng Horng

National Taiwan Normal University

This talk will be devoted to a preliminary study of Rev. William Macgregor's (倪維霖牧師) *Pit-Soan E Chho-hak* (筆算个初學, A Beginner's Guide of Pen Calculation). Rev. Macgregor was an English Presbyterian who served first at Xiamen (廈門) in Fujian then at Tainan (臺南) in Taiwan. In addition to editing Bible in Minnan language (閩南語), Rev Macgregor also wrote the book -- in two volumes, published in 1897 and 1900 respectively -- apparently for the purpose to teach local people skill of pen calculation. The Minnan language was the popular one among the local people of southern Fujian province and majority population in Taiwan. No wonder Rev. Macgregor would use the language medium to circulate both the gospel and arithmetic. The talk will try to explain how Rev. Macgregor promoted the pen calculation by means of the text under study given that local people, just as the Chinese in other area, were used to manipulate their calculation on abacus (*Suan pan* 算盤).

Medicine and Hygiene in Social Contexts**TuF3-1****Who Are Doctors of Korean Medicine?: An Exploration of A Medical Identity in The Making**

Seonsam Na

University of Oxford

Despite the recent surge in social science research on Korean medicine, there is a dearth of work on the professional identity of its practitioners, or Doctors of Korean Medicine (KMD). It is because scholars have accepted, rather uncritically, the assumption that Korean medicine is a simple extension of traditional East Asian medicine and hence, its practitioners retain the same professional consciousness as their predecessors. This paper refutes these assumptions. It will argue that KMDs' professional identity has been transformed so much, exhibiting now the unique blend of biomedical and traditional elements, that the task of providing an unequivocal statement on their identity is difficult due to its indeterminate nature. This transformation is attributable, the paper argues, to the country's biomedicine-based health system to which the KMDs, as mainstream practitioners, have been subjected since the beginning of the country's modern healthcare governance. To put their presence in context, I will firstly compare KMDs with American osteopathic physicians, the other medical profession with similar trajectory of professionalization. I will then offer a tentative characterization of their identity by backing it up with empirical data I, as a KMD myself, have collected during an immersive fieldwork. To provide more concrete picture regarding the ways in which they deliberate on clinical matters, I will present next a set of additional ethnographic vignettes constructed out of the fieldwork data. I will finally conclude the paper by providing a reading of the country's healthcare politics under the pressure of which KMDs' identity is being constantly refashioned.

Medicine and Hygiene in Social Contexts

TuF3-2

The Selective Adoption of Public Bath System in Colonial Korea

Yunjae Park
Kyung Hee University

In medieval Korea, taking a bath was a way of treatment of skin diseases. After the opening harbor to foreign countries in 1876, a new idea on bath was introduced to Korea. It was sanitation. For modern reformers public bath was a main facilities they should establish for sanitation. The rule of Japan started in 1910 introduced an organized public bath system in Korea. In 1912, colonial government issued a decree on building of public bath which regulated size of bath, operating times, public order in bath, so on. Taking a bath was a traditional custom to Japanese residents and Korean sometimes visited Japanese area to go to public bath. A Korean accustomed to taking a bath began to construct public bath in Korean area. The ways of using public bath, however, was different between Japanese and Korean. To Japanese public bath was not only a place to take a bath but also a kind of bar to enjoy. Japanese public bath provided customer with a meal and drink. But, that kind of service was not offered in public bath built for Korean, which means Korean only adopted the sanitary aspect of public bath enjoyed by colonial Japanese. Selective adoption of public bath in colonial Korea shows an example of colonial modernity.

Medicine and Hygiene in Social Contexts

TuF3-3

Choice and Growth of A Scientist's Research Subjects in Korea: Focusing on Kim Chung-Yong's Research on Hepatitis B

Miyoung Shin
Chonbuk National University

Independent researchers are interpreted to mean that they know how to use various activities necessary for research. This means that they have the ability to plan for the entire course of research, such as designing what and how they will deal with, what experimental equipment they need, or securing the resources necessary for research, such as funds and others. This is not achieved overnight, nor by itself alone. Choosing which topic to study among scientists' activities can be a new way of studying a scientist's growth context. There are network by various factors in the scientist's research process. In this network, there are not only human and physical networks but also intangible elements. One of them could be a choice of research topics. When a scientist chooses a research topic, his personal interest or intellectual curiosity can also work greatly. But this is possible after academic growth. For beginner scientists who have just started scientific research, help from the periphery is an important in determining the subject of the study. Through this process, they gradually grow into a scientist. In the article, I will examine Kim Chung-yong's the growth process of a scientist who developed a hepatitis b vaccine in Korea. I'm going to divide the course of his choice of research subjects into three stages. In the first phase, I will deal with him going to graduate school at Seoul National University Medical School and starting medical research. In the second phase, I will deal with him expanding his research categories after receiving his doctorate degree. In the third phase, I will show he conducting independent research based on his experiences in the U.S. after returning to Korea



Medicine and Hygiene in Social Contexts

TuF3-4

The Identity of A New Profession in Canada: Examining The Aegis of Traditional Chinese Medicine

Brenda Le

MacEwan University

Background: In recent decades, Traditional Chinese Medicine (TCM) has become a legislated health profession in some parts of Canada. Despite the growing popularity of TCM across the country, there is a lack of discussion surrounding its origins and the basis for establishing competency standards within the profession. TCM is generally considered to be a comprehensive representation of the medical theories and practices developed over thousands of years in East Asia. However, it is unclear whether modern TCM is inclusive of this diversity, and how this imported system of medicine is adapting to the Canadian setting. This article investigates the history and definition of TCM, its strengths and limitations, and its suitability to meet the healthcare needs of 21st-century Canada.

Methods: Using a qualitative descriptive design, semi-structured interviews were conducted with 12 key informants, including historians, sinologists, translators, policy-makers and practitioners of East Asian medicine in the United States, Canada and China. Interviews were recorded, transcribed, and analyzed by using thematic analysis.

Results: Six themes emerged from the data: (a) creation of TCM during the mid-twentieth century in China; (b) TCM as a systematized and scientized model of East Asian medicine; (c) TCM as an herbology-centric framework; (d) classic texts as the foundation of East Asian medicine; (e) TCM as an attempt to integrate traditional and modern, East and West; and (f) TCM as a key stage in the evolution of East Asian medicine.

Conclusion: These findings are explored in the context of TCM as a new health profession in Canada. The article concludes with a discussion of the study implications for the education and regulation of acupuncture and Chinese herbal medicine in a modern western society.

TuG3

The Mongols' Role and Contributions in The Global History of Distilled Liquors**Organizer:** Hyunhee Park (City University of New York)

The present panel brings together four experts from the United States, Korea, Mongolia, and France to discuss the Mongols' role and contributions in the history of distillation, in terms of its raw materials and technology, and how the technology of distillation spread and was adapted by others. The Buell paper looks at the key role of the Mongols in taking a pre-existing Chinese technology, improving on it in large part by producing easily portable apparatuses, and not only widely disseminating this improved technology, but creating an environment in which a variety of cultures could produce their own distilled liquors using what was locally available. Hyunhee Park demonstrates how distilled *shaofiu* 燒酒, "roasted liquor" (soju in Korean) arrived in Korea from China during the Koryŏ period, and developed in scale, and in a technological sophistication well-adapted to local conditions throughout the subsequent Chosŏn period (1392-1897). Its production spread quickly thanks in large part to the simple Mongolian-style distillation techniques employed. Alexandr Gorokhovskiy investigates Mongol influence on the development of Russian vodka. This is the first study that examines the possibility that the relevant distillation technology may have been acquired from the East, during the Mongol period, rather than from the West as previously thought. Finally, Batjargal Batdorj, a biologist, returns us to the basics in her paper. It focuses on the fermented beverage that was, and is, the primary root of Mongolian distillation efforts, kumiss or *airag*, as it is known in Mongolian, *i.e.*, fermented mare's milk, and its distilled variant. In Mongolian, any hard liquor can be called *ariki* or *arkhi*. Although this term is now applied to various distilled liquors, it was initially applied to the distilled form of koumiss first made in the late thirteenth or early fourteenth century, and the subject of analysis here.

The Mongols' Role and Contributions in The Global History of Distilled Liquors

TuG3-1

Mongols as Brokers of Cultural Exchange: Role in the Popularization of Distilled Beverages and Spread of Distillation Technology

Paul Buell

University of North Georgia/Salzburg University

The Mongols created the greatest land empire in history and encouraged unprecedented exchanges of people and ideas, along a “great Mongol information super highway” (Anderson). Among things moving from one end of the Old World to the other were medical traditions, Arabic Medicine, for example, to China, and Chinese Medicine to Iran, gunpowder, other military technology, and even strategy, including Mongol strategy used by the Portuguese against Castillians at Aljubarrota in 1385, and sundry things such the Mongol word for a share of the booty, *saughat*, soon meaning bribe as far afield as China and Medieval Portugal. The present paper looks at one aspect of these exchanges, namely Mongol popularization of distilled beverages and distillation technology, resulting, for the first time, in true mass production and mass popularization. The Mongols did not invent distillation. They even used a borrowed word, *arkhi*, from Arabic, first appearing in 1330, to designate the main kind of distilled beverage, made from fermented mare’s milk, but were nonetheless key in the popularization of distilled beverages. These were mostly made from things other than mare’s milk, by many other cultures imitating the Mongols, but using the same word to designate them. The paper will look in particular at the importance of alcoholic beverages, including fermented mare’s milk, at Mongol courts, and the great political need for leaders to preserve fermented mare’s milk for consumption by followers all year round, as the great culture food of the Mongols, and extend seasonal availability, including by distillation. To which end a variety of existing technologies were adapted by the Mongols, mostly Chinese, to produce a portable technology, still used today in Mongolia where the present author sampled the result, but even by Icelandic bootleggers, and, thanks to the Manila Galleon, by Mexican Indians to produce mescal.

The Mongols' Role and Contributions in The Global History of Distilled Liquors

TuG3-2

The Mongols' Influence on The Development of Soju in Korea during The Chosŏn Dynasty (1392-1897)

Hyunhee Park

City University of New York, John Jay College and the Graduate Center

Soju distillation technology was introduced from China to Korea during its Mongol period (early 13th to late 14th century), when soju became one of Korea’s national drinks. It spread rapidly and became widely popular during Korea’s last dynasty, the Chosŏn (1392-1897). The present paper explores Mongol influence in the rich and dynamic development of soju as a popular type of liquor during the Chosŏn period. Frequent references to soju in official histories, and in other kinds of literary works, help us understand soju’s Chosŏn-era growth in popularity over the entire Korean Peninsula, going alongside growth in popularity of other kinds of alcoholic drinks such as strained and turbid wines. The paper will particularly focus on a technological aspect of the development of soju in Korea: the evolution of stills. Some sources hint that the most popular kind of still used to distill soju during early the Chosŏn era was a simplified one that resembles the simple Mongolian type that Needham characterized as primitive, with its suspended catch bowl, instead of more sophisticated Chinese-type still described in the household encyclopedia *Jujia biyong shilei* 居家必用事類, “Things That Must be Used in the Household.” It uses a tube to conduct the distillate from the still boiler. This suggests that, at the end of the Koryŏ period, the Mongols spread portable still technology to Korea where it became popular as a simple method for distilling liquor. The paper argues that, because a simple Mongolian-style still was introduced to Korea by the Mongols, soju was able to diffuse across the Korean Peninsula more speedily.

**The Mongols' Role and Contributions in The Global History of Distilled Liquors****TuG3-3****The Mongols' Influence on The Development of Russian Vodka**

Alexandr Gorokhovskiy
Independent Researcher

The present paper aims to fill in the existing gaps in our knowledge as regards the origins of Russian vodka by investigating at what moment, and under which circumstances, did the Russians first apply distillation to a fermented mash of grains with an aim of producing potable spirit. Whereas it is commonly believed that distilled liquors were introduced to Muscovy from Europe, there exists a possibility that this technology may have been acquired from the East rather than from the West. It is argued by the author that this could have taken place as a direct result of Batu Khan's invasion of 1237-1240, when most of the Rus' territories were incorporated into the Golden Horde as vassal states, and the intensification of cross-cultural contacts between local population and Turko-Mongol nomads that followed. Such transfer is all the more likely since, by the 13th century, Mongols already possessed simple and portable distillation techniques which could have been easily replicated by the conquered nations, and it is known that similar technological exchanges were in fact taking place elsewhere in the world at precisely the same period (for example, in Korea).

The Mongols' Role and Contributions in The Global History of Distilled Liquors**TuG3-4****Distilled Alcohol in Modern Mongolia**

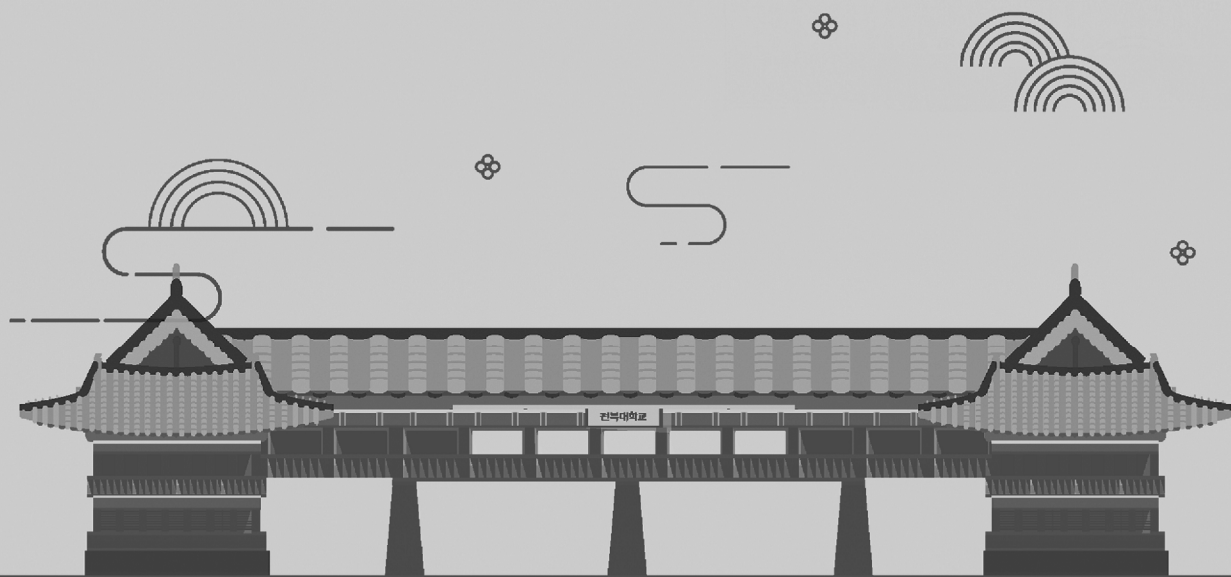
Batjargal Batdorj
*Department of Biology, School of Arts and Sciences,
National University of Mongolia*

In Mongolian, hard liquor is called ariki/arkhi, a term initially applied to the distilled form of koumiss first made in the late thirteenth or early fourteenth century. Its name derives from the Arabic 'araq, "sweat" or "steam," by extension the "inner essence" of any substance extracted by distillation. The alcohol derived from distillation of fermented dairy products such as yogurt, khoormog, and airag is either called distilled alcohol, distilled liquor, or milk vodka. Alcohol distillate can be made from the milks of all five kinds of livestock herded by the Mongols, but which animal produces the milk for fermentation and distillation determines the consequent properties of the product. Distillate produced from fermented mare's milk or airag yields the highest proof of alcohol, i.e., ethanol. It is possible also to re-distill the product multiple times, to obtain an even higher proof of alcohol. The twice distilled form is named arz, and the further distilled form is called khorz. Distillation of 100 liters of airag yields 16 liters of distillate, with alcohol content of the distillate between 10% and 14%. The typical chemical content of the distillate is 0.4-12% alcohol, 1-5% dry matter, 0.05-0.6 mg/l aldehyde, 10-14 mg/l fat, 0.1-2 mg/l ether, and 200-500 mg/l vitamin C. Flammable substances such as propanol, butanol, and methanol can be also produced. While Mongols have generally regarded distilled liquor as a respected beverage, there are also various legal documents with regulations enforced in regards to the appropriate usage of alcoholic beverages. The Laws of the Ikh Zasag, "Imperial Regulations," from The Great Mongolian Empire period, are the earliest legal documents imposing such rules. The 17th century, Khalkh Zhuram, "Khalkha Code," of 17th century is another example.

ICHSEA 2019

15TH INTERNATIONAL CONFERENCE
ON THE HISTORY OF SCIENCE IN EAST ASIA

August 21 (Wed.)



August 21 (Wed.)

WeA1

Toward A Comparative History of Tuberculosis Control in East Asia

Organizer: Hidekazu Sensui (Kanagawa University)

Tuberculosis, once the leading killer in East Asia, was brought under control by the 1970s in Japan, Korea, Okinawa, Taiwan, and Hong Kong. However, the ways of controlling the disease were different in these regions. The papers of this panel address the question of how those differences came about. In treatment, anti-tuberculosis drugs greatly contributed a rapid decline in morbidity in the 1950s and 1960s, but that drugs became available did not imply those drugs reached patients. A subsidy scheme had to be set up to ensure that those who could not afford drugs receive medication. Also, a system of drug distribution and patient management had to be established. A variety of networks of health centers and the deployment of tuberculosis workers depended on the national budget allocation, and degrees of involvement of private sector was a function of the usability of the existing medical institution. In prevention, mass BCG vaccination survived repeated criticism of its efficacy and remained long after chemotherapy had been adopted. Procurement of vaccine rested on the availability of international assistance, which was affected by concurrent international relations. In these senses, the success of tuberculosis control depended not simply on technological advancement but on welfare policy, public health institutions and political consideration. This panel draws together case studies from Japan, Korea, Okinawa, Taiwan and Hong Kong and explore through comparison socio-economic and political factors that caused differences in measures for tuberculosis control.

Toward A Comparative History of Tuberculosis Control in East Asia

WeA1-1

Tuberculosis Control in The Post-Second World War Japan

Lisa Kawatsu and Kazuhiro Uchimura
Japan Anti-Tuberculosis Association

Tuberculosis (TB) was once feared as the “boukoku byou” - literally meaning a “disease which could bring a nation to ruins”. Indeed, just after the Second World War, TB mortality rate was as high as 187 per 100,000 population, approximately 100 times higher and TB notification 698.4 per 100,000, 50 times higher than that of today. Yet in just three decades or so, Japan has succeeded in bringing down both the mortality and notification rates at dramatic rates. The so-called “10% reduction”, which is the rate at which notification rate decreased between 1965 and 1978, has been heralded as a great success, and was possibly brought about by a combination of a comprehensive TB control programs and the more general socio-economic interventions which aimed at improving the overall livelihood of the people in the post-war-devastated Japan. It must also be noted that TB control in the post-war Japan was a part and parcel of a bigger movement towards establishing the universal health coverage-the national health insurance in 1961. In this case study, we hope to draw together the historical experiences of both TB specific activities (the vaccines, the drugs, the mass miniature radiography TB screening, the surveillance etc.), and the more general socio-economic interventions (improving the lives and welfare of farmers and women, the nutritional status of children, the health literacy of the community in general etc.), to understand how TB was combatted in Japan in the post-war period. There were also marked differences with our neighboring regions, including Okinawa which had been under the U.S. military government until 1972, and we wish to contribute to discussing how and why the differences came about.

**Toward A Comparative History of Tuberculosis Control in East Asia****WeA1-2****Tuberculosis Policy as A Case of Competition and Harmonization between Public and Private from Korean History**

Hongjo Choi

The Korean Institute of Tuberculosis

After Korean War, tuberculosis mortality was drastically increased up to 300 to 400 per 100,000 persons. In 1962, National tuberculosis program launched and the first national tuberculosis prevalence survey was conducted in 1965. The Korean Institute of Tuberculosis was established in 1973 and took a position as an authority of national tuberculosis policy. Until 1995, the national prevalence survey conducted with 5year interval and the prevalence continuously decreased. During this marked decline of tuberculosis burden, private sector was enlarged and the coverage of national health insurance was also enlarged. Originally, tuberculosis diagnosis and treatment was free in public sectors only, but after the establishment of national health insurance in 1980, the proportion of TB patients in public sector was steadily increased. In 2000, almost half of TB patients treated in private sectors. This change of patients' preference stimulated to launch public-private mix program in South Korea. In the meantime, there was a competition between public health perspectives and biomedical perspective within national tuberculosis policy. The competition could influence national TB policy as well in particular the debate of outpatient treatment and hospitalization for all TB patients. Those two distinctive competitions was encompassed current Korean TB policy. At this panel discussion, Korean could be considered as one of cases who tried to manage broad private sectors within national TB programs.

Toward A Comparative History of Tuberculosis Control in East Asia**WeA1-3****Tuberculosis Control in Okinawa under The American Administration: Why Not Vaccination but Home Care?**

Hidekazu Sensui

Kanagawa University

The United States Civil Administration of the Ryukyu Islands (USCAR) disregarded BCG and directed its efforts to develop a home care system. This contrasted with TB control in mainland Japan, where mass BCG vaccination was enforced, and TB hospitals were expanded. The fact that the disease was brought under control in Okinawa raises a question among historians whether vaccination and hospitals would have been unnecessary in Japan too, and some go even further to praise the TB control in Okinawa as a predecessor of present-day Directly Observed Treatment. However, if we locate USCAR's TB control in the actual context of the early 1950s, the evaluation that the United States introduced advanced measures into Okinawa will need to be modified. First, mass BCG vaccination was a then globally adopted measure for TB control, as evidenced by the UNICEF funded International Tuberculosis Campaign. The disuse of the vaccine in the United States was peculiarly American and was embedded in American middle-class program of social reform. Secondly, BCG trials conducted by the Federal Government did not deny the efficacy of the vaccine but its effectiveness or usefulness among the mainstream population. It was not denied that BCG would be effective and useful elsewhere. Thirdly, the Far East Command promoted mass BCG vaccination in Korea. American surgeons regarded vaccination as the only possible countermeasure in the war-devastated country. It would have been reasonable to take the same measures in Okinawa, where medical facilities and personnel were also scarce due to war losses. It was a decision made by G. Pesquera, a TB consultant of USCAR, to leave Okinawa free from BCG. He wanted thereby to ascertain the universal effectiveness of the American style home care system versus a system of TB control primarily based on prevention by BCG.

Toward A Comparative History of Tuberculosis Control in East Asia

WeA1-4

The World Health Organization, The Development of Anti-tuberculosis drugs, and The Management of Tuberculosis Patients in Taiwan, 1950-1971

Shu-ching Chang
Chang Gung University

Before Taiwan withdrew from the United Nations (UN) in 1971, a subsidiary organization of the UN - the World Health Organization (WHO) - participated in tuberculosis (TB) control projects in Taiwan. When the WHO was founded, controlling contagious diseases was emphasized. In addition, medical operators were trained and educated. During the 1940s and 1950s, the release of anti-tuberculosis drugs such as streptomycin (SM), isoniazid (INH), and 4-aminosalicylic acid (PAS) provided hope to TB patients, the government, and public health researchers. Before anti-tuberculosis drugs were available, TB patients were sent to sanatoriums without medical assistance. As public health improved, the practice of placing TB patients in sanatoriums became uncommon. Simply administering medicine to TB patients prevents people from contracting *Mycobacterium tuberculosis*. However, soon after this problem was solved, the public was forced to consider the following question: Should TB patients be required to go to a hospital for drug therapy, or be permitted to stay at home and be responsible for taking the TB medicine on time? To answer this question, the number of hospital beds required, the rules for taking the medicine, and the management of TB patients were considered. This question also influenced the standard of treatment by the WHO.

Toward A Comparative History of Tuberculosis Control in East Asia

WeA1-5

Anti-Tuberculosis Measures in Hong Kong, 1950s-1970s

Yuen Han Law
Department of History, Hong Kong Baptist University

Tuberculosis was one of the principal causes of death in Hong Kong during 1950s-1970s. The rapid increase in population and overcrowded, poor living conditions for the majority of the population had been acknowledged as the main causes of tuberculosis. The government was determined to reestablish Hong Kong's economic and control of communicable diseases to protect the reputation of healthy international port. Several anti-tuberculosis measures were implemented under the supervisory of government and the co-operation of non-government organizations. For example, BCG vaccination campaign was carried out that targeted newborns with the assistance of World Health Organization and United Nations Children's Fund. Also, government developed the chest service and established additional chest clinics. As well as, the Hong Kong Anti-Tuberculosis Association played a significant role in providing treatment of the tuberculosis especially hospital care. This paper discusses the widespread of tuberculosis in Hong Kong, thereby focusing not only on the difficulties of establishing sanitation and public health systems, but also examining the political complexities of social order which affects and shapes various factors in disease transmission.

**WeB****Western Learning in East Asia: Changing Historiographies**

Organizer: Catherine Jami (Centre National de la Recherche Scientifique)

The past forty years have seen major developments in the study of the circulation, reception and appropriation of the knowledge introduced into East Asia by the Jesuits as part of their missionary enterprise. At this stage it is worth reflecting collectively on where we have come from, and how our narratives have changed. This necessarily involves an examination of the historiography in both East Asian and European languages. Fifty years ago, the dominant view was that the Jesuits brought ‘modern science’ to China, and that for some reason (the Jesuits’ own religious agenda, the ‘conservatism’ of Chinese literati, the Manchu conquest...) China then missed a great opportunity to enter ‘scientific modernity.’ In Western historiography, there was a long-term focus on the Jesuits as ‘men of science,’ while the roles of East Asian actors were neglected or reduced to relative passivity. In the wake of Jacques Gernet’s *China and the Christian impact* (1982) however, more attention has been devoted to the latter. Today sources in all languages are more systematically used together; while taking on board the perspective of social history, recent work revisits the technical contents of these sources. Moreover, regional, local and individual specificities are now under close scrutiny. These and other trends deserve to be reviewed, with a view to better understanding the new, complex ‘big picture’ of Western learning in East Asia that recent research has been sketching.

Western Learning in East Asia: Changing Historiographies**WeB1-1****From Universal Science to Local Knowledge? The Studies of Western Learning in Local Contexts**

Huiyi Wu
Needham Research Institute

For a long time, the story of Western learning in China has been told as the encounter between the universality of modern science and the whole of Chinese tradition. However, during the last few decades, this narrative has undergone a twofold localisation. On the one hand, Jesuit-mediated Western learning has been increasingly seen as representing a specific corporate culture; and on the other hand, the dissemination of Western learning in China has been increasingly studied in regional contexts, highlighting the role of specific interlocutors, their personal networks, lineages and local communities. In this paper, I will review some of the most illuminating works, drawing parallel with two connected historiographic shifts: the growing use of microhistory in the study of early modern Western science to probe how seemingly universal science originated in local settings; and the increasing tendency in religious history to study Christianity in China as a local, rather than global religion. Comparing these locally situated studies of Western learning with studies of local agencies in adjacent fields, such as the history of book trade, I will also discuss how they may contribute to a more general mapping of the spatial dynamics of knowledge in Ming-Qing China.

Western Learning in East Asia: Changing Historiographies

WeB1-2

The Historiography of The Jesuits and Western Science in Japan

Ryuji Hiraoka
Kyoto University

This presentation focuses on how historical narratives on the Jesuits and the first introduction of Western science in 16th to 17th century Japan have been established, developed and changed in the modern historiography. It also discusses the social background behind them, as well as the current status and issues in this field.

Western Learning in East Asia: Changing Historiographies

WeB1-3

The Changing Historiography of A victory: The Letters of Gabriel de Magalhães, and The End of The ‘Calendar Case’

Christopher Cullen
Needham Research Institute

The conflict that modern scholars call the calendar case (*li yu* 曆獄) was marked by the condemnation of the practitioners of European astronomy in 1665, and their return to favour in 1669. The main outlines of this story have already been discussed by a number of scholars. There are however significant aspects of the second phase of the calendar case that have not so far been given the attention they deserve. This talk uses a careful reading of contemporary letters by the Jesuit Gabriel de Magalhães, combined with Chinese sources, to show that the story is more complex, and more interesting, than it has appeared to be so far.



Western Learning in East Asia: Changing Historiographies

WeB1-4

**Is 'Western Learning in China' Unique?
Empires and The Circulation of Knowledge**

Catherine Jami

Centre National de la Recherche Scientifique

Looking at the history of Western learning in China in the context of early modern European overseas expansion, China indeed appears as a remarkable, if not unique case, in which the reception and appropriation of Western learning took place within a society that was beyond the reach of European imperialism. This contrasts with the situation in South Asia, or Latin America. Looking at it from East Asia, however, one may ask how unique the case of European knowledge was in the history of the Chinese appropriation of scientific knowledge from other cultures. This paper will review recent work that reveals the variety of sources drawn on by both scholars and the state in order to construct knowledge in the late Ming and early to mid-Qing periods.

Western Learning in East Asia: Changing Historiographies

WeB1-5

**From Circulation to Displacement:
Commonplace Maps between Europe and Asia**

Mario Cams

University of Macao

From the late 16th through to the 18th century, Jesuit missionaries in Ming and Qing China initiated or were involved in the production of both cosmographical world maps and regional atlases of East Asia. In the literature, these maps and atlases are often identified as 'Jesuit cartography'. Until at least the 1960s, prominent maps (such as Ricci's world map) were understood as having contributed greatly to the scientific development of East Asia, with missionary-heroes transmitting scientific maps and mapping techniques from Europe. After the publication of Needham's *Science and Civilisation in China*, scholars started looking at the exchange of maps and atlases from the point of view of East Asia, noting that these cultures had their own ways of understanding the world and thus also of representing it. Particularly in Area Studies, these 'Jesuit' maps were seen as marginal phenomena not worthy of much attention, since they neither belonged to, nor greatly impacted, 'Chinese cartography'. Overall, this China-centered perspective still seems dominant in the literature today, and also in East Asia. Along with recent scholarly efforts to decentralize Asian Studies while continuing to decolonize it, this paper proposes a new way of looking at these maps and atlases by arguing that they were part of a gradual converging and entanglement of cartographic representations and mapping techniques, which closely followed the dynamics of physical displacement.

WeC1

Shaping Landscapes in 20th Century East Asia: Theory, Data, Expertise and The Rationalization of Infrastructure

Organizer: Juyoung Lee (Johns Hopkins University)

This panel examines how rationality provided means to control, manipulate and alter landscapes through infrastructure construction projects in 20th century East Asia. What was the basis of rationality and justification for these projects? Who contributed to the construction of rationality and whose interest did the rationality serve? How did the transformed landscapes reinforce or weaken existing sociopolitical hierarchy? By drawing examples from China, Japan and Korea and from the development of theoretical methodology to the actual practice of infrastructure building, this panel argues that the process of shaping landscapes in 20th century East Asia was an arena of competing rationalities, politics and economics. Ying Jia Tan discusses how Japanese and various groups of Chinese responded to the contingencies of wartime economy and rearranged China's electric power network which continued to characterize industrial structure of Communist China. Juyoung Lee explores how a mathematical approach of understanding spatial dynamics was developed in Japan within the transnational exchanges of experts during the Cold War. Seohyun Park examines how Han River basin survey project in 1960s and 1970s transformed river into a national resource by tracing the negotiations between the postcolonial legacies, Cold War power and local practices in Korea. Chamee Yang traces the development of mobility infrastructures in South Korea and how it served the globalization projects of the government. As these papers argue, today's landscapes in East Asia and the rationalities to comprehend it were shaped within multilayered context of war, (post) colonialism, (post)modernity and/or transnationality. Continuous construction and reconstruction of the landscapes throughout the 20th century wrestled with tensions and harmonies between nature, infrastructure, theories, data and expertise.

Shaping Landscapes in 20th Century East Asia: Theory, Data, Expertise and The Rationalization of Infrastructure

WeC1-1

War and The Reconfiguration of China's Energy Geography, 1937-1945

Ying Jia Tan
Wesleyan University

This paper demonstrates how wartime exigencies not only forced China and Japan to nationalize the electrical industries to better serve their military objectives, but also pushed China towards a carbon-intensive developmental trajectory. The attributes of modularity, scalability, and calculability made coal an ideal fuel for China's wartime economy. After the second Sino-Japanese War broke out on July 1937, the Japanese established two macro-regional power companies, one in North China and one in the lower Yangtze, to coordinate the redeployment of power assets across the occupied territories. As economic historians have pointed out, China's coal deposits in North China were too far from major industrial centers in the lower Yangtze. The Japanese in their bid to rationalize energy cost reconfigured China's energy geography. They seized generators from the Chinese Merchants' Electric Company in Shanghai and transferred them to Beijing and Boshan. The North China Electric Corporation also developed the Beijing-Tangshan-Tianjin regional network to realize the vision of transforming North China into the center for heavy industries. At the same time, Nationalist forces that retreated to Southwest China integrated coal mining with power generation, which facilitated the budgeting of energy to Chinese defense industries. The reconfiguration of China's energy geography had lasting consequences beyond the war. The Communists exploited weaknesses in the Beijing-Tangshan-Tianjin power network during the civil war between 1946 and 1949. Japanese attempts at stifling industrial activity in the lower Yangtze destabilized the economic base of the Nationalist regime, which ultimately led to its defeat in 1949. The wartime energy infrastructure in North and Southwest China paved the way for the growth of heavy industries under Communist rule.

**Shaping Landscapes in 20th Century East Asia: Theory, Data, Expertise and The Rationalization of Infrastructure****WeC1-2****Reading Space through Numbers: Global Network of Experts and The Emergence of Regional Science in Japan during The Cold War**

Juyoung Lee
Johns Hopkins University

This paper examines how transnational cooperation over regional science influenced a group of Japanese economists to adopt quantitative methods to analyze space as a system. Founded by Walter Isard at the University of Pennsylvania, regional science, a nascent field within spatial economics, endeavored to institutionalize its “scientific” approaches to understand physical planning. Regional scientists appropriated the methodology of systems analysis and attempted to understand space as a quantifiable system comprising components like population, transportation, housing, industry and resources. These economists and planners, not just from the United States and its allies but also from the Soviet Union and the Eastern Bloc, had heated discussions through extensive correspondences and met at international conferences to introduce systems analysis in spatial economics during the Cold War. It was within this cooperative atmosphere that Japanese economists were first introduced to the field of regional science.

In this paper, I will follow the works of two Japanese economists, Genpachiro Konno and Tatsuhiko Kawashima to trace global dynamics and its role in the development of regional science in Japan. As the first president of the Japanese Section of the Regional Science Association International (RSAI) from 1963 to 1972 and later as the president of RSAI from 1974 to 1975, Konno, promoted the role of Japan within the global cooperation of regional science. Kawashima, earning his doctorate degree in regional science from the University of Pennsylvania in 1971, conducted research in the International Institute for Applied Systems Analysis which functioned as a “bridge between East and West” from 1977 to 1979. By exploring these interactions of Japanese scholars over “the Iron Curtain”, I will argue that the broader context of the Cold War shaped the rise of regional science in Japan.

Shaping Landscapes in 20th Century East Asia: Theory, Data, Expertise and The Rationalization of Infrastructure**WeC1-3****Merging Colonial Infrastructure and Cold War Geopolitics: The Han River Basin Development in Korea during The 1960s and 1970s**

Seohyun Park
Virginia Tech

This paper explores the trajectory of the Han River Basin development in Korea during the 1960s and 1970s, focusing on how the postcolonial Korean regime’s aspirations to build the “modernized” nation amid the tension between colonial legacies and a Cold War geopolitical order were embedded in the river development practices. During the mid-1960s, the Park Chunghee (1917-79) regime began to survey major river basins in the territory to transform the rivers into manageable national resources. To start, the Han River Basin Joint Survey Team was organized with the aid of the U.S. Geological Survey and the U.S. Bureau of Reclamation. The essential work of the survey was to calculate the amount of river water, to set a specific water supply plan based on future economic growth, and to rationalize the rush of dam constructions. This river basin survey project was part of the U.S. agencies’ Cold War international water resources program, which intended to use economic development as a bulwark against the global expansion of communism. However, a lack of data on local environments posed challenges to the river engineering projects. The survey teams collected hydrological data produced during the Japanese colonial era (1910-45) to set a dam construction plan, but the data were incomplete. Engineers thus speculated the quantity of river water by manipulating the existing data. The projects also encountered other problems, including how to reconcile the new water management system with remaining water infrastructure generated during Japanese colonialism. By paying attention to the water development projects, I argue that the national “modernization” project was not a story of the miraculous economic growth achieved with advanced science and technology, but one full of contingencies arising from the lack of data on local environments, reconciliation between colonial infrastructure and new technologies, and conflict with the local water management practices.

Shaping Landscapes in 20th Century East Asia: Theory, Data, Expertise and The Rationalization of Infrastructure

WeC1-4

**From A Transit City to A Global City:
A Genealogy of Mobility Regime in Songdo,
South Korea**

Chamee Yang

University of Illinois at Urbana-Champaign

This paper traces a genealogy of mobility regime in South Korea. As a key thematic thread of this chapter, mobility is theorized as a governing technology and as a central field of government, in a sense that mobility has become a “reason of and for the government,” so much so that government itself is governed by mobility. This paper is part of a larger project that examines the political, economic, technological, and cultural dimensions of the formation of a smart city in South Korea (Songdo). The paper addresses how early forms of logistics infrastructure - telecommunication and transportation networks - of South Korea shaped the later possibilities for national and transnational mobility that have driven the government and the cities to go global. The paper will demonstrate how, in a broader context of the South Korean modernization, techniques and technologies of managing mobility have been an essential aspect of the government’s project of unifying the nation, in which the issues of economy and security were closely brought together. Based on this broad history, I show how in the present day context of globalization, the infrastructures of physical and informational mobility (airport and the Internet) instigate and are inspired by reinventing Songdo and Incheon from a “transit city” to a “global city.” My aim for this paper builds upon the attempt to “articulate technical rationality in urban (diagrammatic) forms,” as I attempt to make visible the interdependency of media technology, the discursive formation, and the affective landscape of progress and development.

History of East Asian Medicines (2): Technique, Image and Trans-national Discourses

WeD1-1

**Guk-chi(局治)-Revealing The Most Natural, yet
Vaguely Known Diagnostic Technique**

Sae Young Hong

Kyunghee-Wooso Hong Korean Med. Clinic

Bianzheng, pattern differentiation, is a characteristic diagnostic method of East Asian Medicine. It had been transformed into a certain structure in TCM during mid 20th century in China, and infiltrated into Korea as well, enabling swift institutionalization of Korean medicine after Korean war. In China, along with integration with Western medicine, pattern differentiation seems to be evolving itself, yet still unsatisfactory for its users. Although it has served as an efficient set of tool in both countries for many years, it also inevitably blurred fundamental and primary technique of East Asian medicine, permitting clinicians to ignore crucial steps in diagnostic procedure, therefore often failing to respond to more sophisticated clinical context. This study will focus on technical process of clinical diagnosis, naming it as guk-chi. This clinical approach is bringing sequence into bianzheng. It is a common knowledge that “understanding a person’s disease must proceed from a consideration of the person as a whole.” However, in order to fulfill this purpose, one should not only just try to “consider a person as a whole”, but have a step by step master plan according to the structure of the condition revealed by bianzheng. The diagnostic process of Guk-chi was passed down by teachers of Uihakipmun stream from Goksung province, south of Korean peninsula, since 19th century. It is probable that it had also been passed down before. But it never had a chance to be recorded in medical textbook, nor had any trace of oral transmission, assumingly because of specific atmosphere of Joseon dynasty in which middle class practitioners were excluded from academic accomplishment. In this study, bianzheng lunchi, guk-chi, and the recent trend of standardization will be assessed in general. And the advantage of guk-chi will be described in detail. Clinical cases will also be presented to highlight comparison.

**History of East Asian Medicines (2): Technique, Image and Trans-national Discourses****WeD1-2****Culturo-spatial Dynamics and Processes of Locality and Identity Formation in East Asian Medicine: the Case of the Discourses “Hyangyak 鄉藥” and “Tongüi 東醫”**

Kiebok Yi

Chonbuk National University

One of the commonly asked questions for historians of East Asian medicine is “How was and is Korean or Japanese medicine different from that of China?” Queries of this sort often invite us to such medical discourses as “Hyangyak (鄉藥, Local Medicinals)” and “Tongüi (東醫, Eastern Medicine),” which were presented in pre-modern Korea. Scholars with a nationalist bent have asserted that the emergence of those discourses showcased the historical process of having built up Korean specificity in East Asian medicine, getting away from the medicine of China. By contrast, those with a diffusionist bent countered that those discourses were in effect about a historical course of having accommodated or adjusted the advanced medical knowledge, originating from China (the center), to Korea (the local). Both of these standpoints are, in essence, based upon the so-called center-periphery frame - surely an imperialist as well as modernist architecture - within which medical knowledge unidirectionally flows from the center to the local. Historical sources, however, point to rather a different landscape - dynamic East Asian medicines as a family of trans-locally related practices, with styles of practice diverse across the regions and times. From this perspective, I will look more closely into the agenda, tools, strategies, and solutions of the historical actors involved, as well as into how their cultural identities formed and medical projects operated in their sociocultural yet geopolitical contexts. Arguably, it was not parochial indigenism but cultural (mostly Confucian) universalism that Korean doctors and scholars had sought by employing the geopolitical terms Hyangyak and Tongüi. More specifically, the discourses Hyangyak and Tongüi could be better understood in terms of the shaping process of an ethical identity of the literati, government decision dynamics on medical welfare, appropriation of the epistemological center, and cultural rearrangement of what medical tradition is all about.

History of East Asian Medicines (2): Technique, Image and Trans-national Discourses**WeD1-3****Fabricating Similarity, Shaping Commensurability: Seventeenth-century European Accounts of Taking The Pulse in China**

Yijie Huang

Department of History and Philosophy of Science, University of Cambridge

Recent studies of the English physician John Floyer's digestion of Chinese pulse diagnostics in his eminent treatise *The Physician's Pulse-Watch* (1707 and 1710) have unveiled his “creative misunderstandings” by identifying the real authorship of his major reference *Specimen Medicinae Sinicae* (1682) and its interconnection with ancient Chinese pulse canons (Cook 2007; Cook 2014). In this paper I reconsider Floyer's imperfect comprehension of the commensurability of Chinese and Western pulse taking through a different, more foundational perspective. Given Floyer's relatively late access to *Specimen* in his development of thinking about pulse, my focus is on the fragmentary but vivid descriptions of Chinese pulse taking in popular travel writings that informed Floyer's work from the outset. I argue that emphasising the similarity of haptic practices constituted the most essential pillar to buttress seventeenth-century Europeans' epistemology of Chinese pulse taking, which revealed various connotations at different stages of this westbound transmission of medical ideas. I first examine the potential encounters in which Europeans, especially those without ecclesiastical identities, took notice of pulse taking during their itineraries in China. Their seemingly neutral depictions indicating Chinese pulse examination similar to European practices, I suggest, bely the influence of the intellectual agendas of the Jesuits in shaping their understanding of China, which further conveyed a distorted image to their European readers like Floyer. Second, I consider discussions of Chinese pulse diagnostics in contemporary Jesuit literature. I suggest that underscoring the similarity of Chinese and European pulse taking was not merely the outcome of superficial observations; rather, it implies how influential scholarly Jesuits as advocates of “superior” Western sciences recognised Chinese intellectual achievements within the context of the accommodation policy. Accordingly, the view of harmonious manual gestures was predicated on their delicate fabrication of a version of Chinese pulse medicine with considerable expertise but inferior ingenuity.

History of East Asian Medicines (2): Technique, Image and Trans-national Discourses

WeD1-4

Uses of Images in Early Modern Japanese Medical Books

Mathias Vigouroux
Nishogakusha

The expansion of publishing from the late seventeenth century gave rise to a wide range of illustrated medical books intended for aspiring or established practitioners, and for common people interested in daily self care. Scholarship on the diffusion of Western medicine has shown how confrontation of old Chinese medical texts and Western anatomy textbooks with a dissected corpse helped Japanese doctors to change their view of seeing the human body. However, very little critical attention has been paid to the role images played in the diffusion and standardization of Sino-Japanese medical knowledge, particularly how these images may have been used and interpreted by the early modern viewers, and how they may have facilitated clinical practice. This paper seeks to address these issues focusing on two types of images: the acu-moxa charts, and two popular illustrations of the inner body (*yōjō kagami*) published in the late Tokugawa period (1603-1868). Contextualizing these images, I will question the limits of such images in disseminating medical knowledge

Western Science(s) in China

WeE1-1

The Introduction of Western Electromagnetism in East Asia - from the Perspective of Western Missionaries' Translations

Wang Mo
University of Science and Technology of China

The second half of the 19th century is a critical period in East Asia. During this time, Western science was widely introduced into this area, including electromagnetism. Its main mode of dissemination is through the translations of missionaries. According to the study of several important translations of electromagnetism, this paper explores the general process of the introduction of electromagnetism to East Asia represented by China and Korea, and discusses the role of western missionaries in this process.



Western Science(s) in China

WeE1-2

The Reception of The Idea of Expanding Universe in China between The 1930s and The 1940s

Huijuan Zhu
Capital Normal University, Beijing

At the end of the 1920s the idea of expanding universe became part of the scientific consciousness, geometrical and dynamical aspects of expanding universe were extensively explored between the 1930s and the 1940s. Since the beginning of the 1930s, the idea of expanding universe had been introduced to China by Chinese astronomers through journal articles and books. By their own writings and translations of foreign publications, the astronomers illustrated modern cosmological knowledge to the public, mostly in a popular manner. In fact, in the national research institute of astronomy of Academia Sinica and the major observatories of China, the study of modern cosmological theory was never the focus of work. Only few Chinese physicists had treated the problem regarding the models of the universe. However, Chinese astronomers showed avid interest in understanding the expanding universe, and this understanding underwent a change as intense debates on different models of cosmology were held since the mid 1930s. They learned about Willem de Sitter's model of the universe, the one of Alexander Friedman's and the one of Georges Lemaitre's in the 1930s, mostly through the popular cosmological works of British astronomers Arthur Eddington and James Jean.

Western Science(s) in China

WeE1-3

Chinese Physicist Ta-You Wu's Understanding of Foundation of Quantum Mechanics

Pei Yin
Capital Normal University

Ta-You Wu was a famous theoretical physicist in China. He received his PH.D. from the University of Michigan, USA in 1934. Then he had been teaching and researching for many years in Nankai University, Peking University, The National South West Associated University, and many universities in the United States. He had made great achievements in theoretical physics, and because of his learning and research experiences, he also had a deep understanding of the philosophical foundation of quantum mechanics, which was reflected in his own monographs and articles. His research in this area had significance for the history of science and philosophy of science.

Western Science(s) in China

WeE1-4
When East Met East: Scientific Cooperation between China and Czechoslovakia in 1950s and 60s

Jiří Hudeček

Charles University, Faculty of Arts, Institute of East Asian Studies

When China started “Learning from the Soviet Union” in the 1950s, Soviet satellite regimes in Eastern Europe also offered various forms of scientific and technical assistance and, to a lesser extent, explored opportunities for their experts in China. Czechoslovakia closely followed Soviet policy and made contacts with China a priority of the Czechoslovak Academy of Sciences after ca. 1955. This paper shows, using mainly Czech archival material, some of the most developed areas of subsequent cooperation as well as ideas which for various reasons did not bring the expected benefit or failed to materialize at all. China’s goals in the relationship were domestic: it used Czechoslovakia as a base for training experts in engineering and applied chemistry, sometimes so directly focused on practical knowledge that it caused suspicion and stonewalling among the Czechoslovak authorities. Czechoslovakia’s goals, on the other hand, were outward-looking: Czechoslovak students and scholars hoped to tap China’s unique natural and cultural resources to create knowledge marketable in the wider world, or access recent scientific developments from the West from which they were cut off by the Iron Curtain, in areas such as design of scientific instruments, chemistry of plant steroids and control theory.

WeF1
Workshop: Getting Your First Book Published

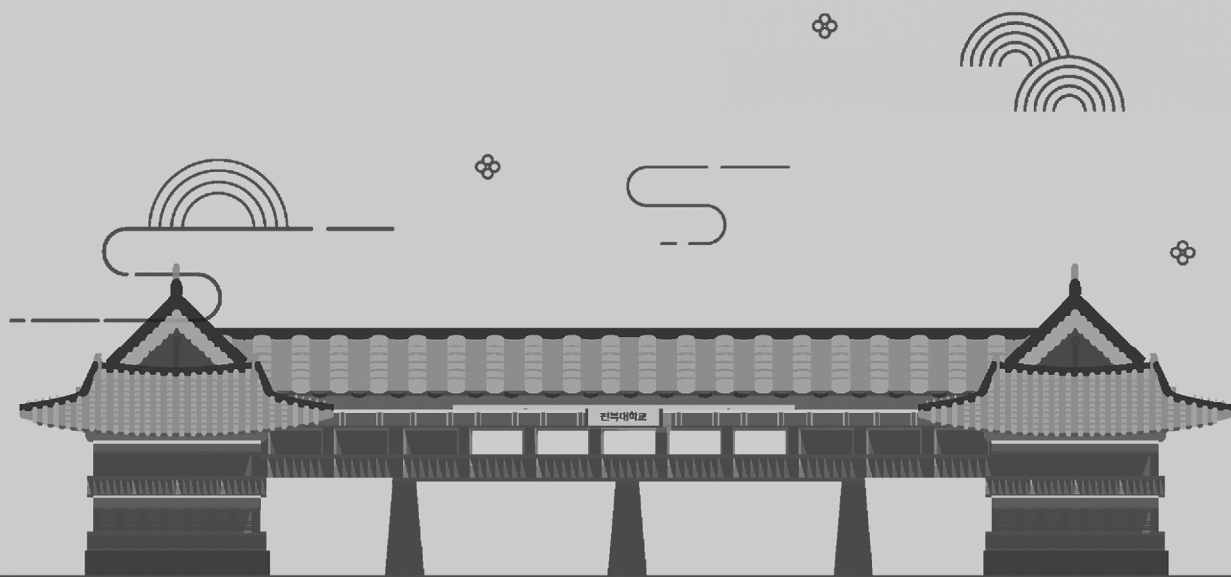
 John DiMoia¹, Yulia Frumer², Andy Schonebaum³,
 Marta Hanson²
¹*Seoul National University,*
²*Johns Hopkins University,*
³*University of Maryland*

The First Book Workshop focuses on the logistics of publishing a book. First-time authors are often taken by surprise by the various stages of the book-publishing process, which repeatedly require them to drop everything and attend to yet another urgent request. Whereas some editors offer guidance as to what to prepare for, many others only provide a broad overview, or nothing at all. Based on their recent experiences publishing books as a first-time authors, John. P. DiMoia and Yulia Frumer will walk the participants through the stages of the process, warn of potential pitfalls, point out possible resources and solutions, and discuss the intricacies of communication with editors. Participants will be guided through the book prospectus template and get a chance to workshop their titles as well as practice writing emails inquiring about long-overdue reviews.

ICHSEA 2019

15TH INTERNATIONAL CONFERENCE
ON THE HISTORY OF SCIENCE IN EAST ASIA

August 22 (Thu.)



August 22 (Thu.)

ThA1

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (I) Part 1. The Heaven (天)
Organizer: Togo Tsukahara (Kobe University)

This is a first part of two series of sessions (1) Heaven, Earth, Human and (2) Industry, we explore historical legacy of Japan's colonial sciences in East Asia. We investigate history of East Asian Science in the last century from broader perspective. Our panel encompasses several case studies of history of sciences, colonial technology and development projects, its encounter and conflicts with indigenous medicine and knowledge system. It will be investigated from the viewpoint of different disciplines and practical contexts. We examine them from the several angles of different subjects/objects, and actual societal/political endeavors and enterprises in and around, and before and after, Japan's self-claimed "Great East Asian Co-Prosperity Sphere". In doing so, our challenge is to contextualize East Asian specific features. Colonial sciences are used to have been analyzed in terms of such frameworks as Center-Periphery model, racial dominance, Hegemony-Subordinate relationship, technology-determinism, Local-Cosmopolitan matrix, and circulation of knowledge. But in this occasion of our 15th ICHSEA, we regard East Asia as poly-centric entity. As this poly-centricity is a general key conception for our conference, that we try to examine this in our series of sessions: How we see East Asia as poly-centric in colonial sciences; we try to show where, when, and what were the historical events and thoughts that different centric forces functioned, which they might have pulled different factors together and/or they fall each factors apart. As session (1), we examine Japan's colonial sciences related to Heaven and Earth, (pure physics, typhoon observation, and air monitoring for the first three speakers), and Human (mainly on the knowledge about life and medical practices for the last three speakers).

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (I) Part 1. The Heaven (天)
ThA1-1
Realigning Typhoon Network: Ryukyu Islands and Typhoon in Early Cold War Period

 Takuya Miyagawa
Hiroshima Shudo University

Soon after the US force overwhelmed Japan's resistance in Ryukyu (Okinawa) islands May 1945, they started atmospheric observation at Kadena air base for the support of bombing operations to mainland Japan and for the protection of their fleets and landing force from typhoon attacks around Ryukyu islands. The US authorities became quite aware of the necessity of constructing disaster prevention system as soon as possible, since the US fleet had experienced severe typhoon attack in July 1945 and they witnessed tropical storms annually caused a huge number of casualty and economic damage during the ruling period of Ryukyu. Building the Pacific meteorological network emerged as a crucial issue for the occupying authorities to reconstruct the double suffered Ryukyu that was ravaged by the war and natural disasters, and to establish the Western Pacific strategy in the early stage of the postwar world. It was one of the reasons why they established Ryukyu Weather Bureau in 1950 to let the Ryukyuan conduct daily observation and weather forecast. The Ryukyuan meteorologists who sought to rejoin to the mainland Japanese network were expected to play a mediating role for predicting and sharing typhoon information as the in-between actors of the US and Japan. This paper examines the meteorological project in the postwar Ryukyu in which three positions were entangled. How did typhoons influence the US policy on Ryukyu? What significance did the reorganized typhoon network have in the US Pacific strategy? And what roles did the Ryukyuan play in resetting up weather service in their hometown and in building the typhoon network in postwar East Asia? This paper investigates the rebuilding process of Ryukyu observational system in the relations with American, Japanese, and Ryukyuan strategy and policy in the early Cold War regime.



Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (I) Part 1. The Heaven (天)

ThA1-2

Factories, Automobiles, and Lungs: Development of The Air Monitoring in Japan

Akihisa Setoguchi
Kyoto University

This presentation examines the history of air monitoring in Japan and discusses the relationship between the human body and environment in a technoscience society. In Japan, technology that monitors the air began to be developed in the 1920s. Physiologists at the Institute for Science of Labor, which was established in 1921, developed instruments that measure the air in factories. In addition, chemical engineers in the 1950s established safety engineering as a new discipline and developed methods to measure air that affects human health. Their methods became prevalent in closed spaces such as chemical factories with harmful gases and coal mining where explosive accidents deprived numerous lives. These technologies spread far beyond factories to the outdoor after the 1960s, when automobiles became popular in Japanese society. In automobile society, every person could be either cause or victim of pollution and accidents. Former physiologists began to study the atmosphere, which had been polluted by automobile exhaust gas. In streets, the air in drivers' lungs was also monitored because drunk driving accidents became a serious problem. This presentation explores the role of monitoring in a society in which humans and machines constitute a large technological complex.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (I) Part 1. The Heaven (天)

ThA1-3

Environmental Factors in Modernized Empire: Japan's Agricultural Meteorology in Early 20th Century, A Controversy and its Ecological Context

Togo Tsukahara
Kobe University

In this paper, I would like to discuss connection between histories of meteorology, agriculture and environment of Japan, especially on a controversy in agricultural meteorology.

It was a series of poor harvest years by cold weather in the North-East Japan that became serious problem in 1900s. Tasks to agricultural meteorologists are assumed as the prediction of cold summer.

There are struggles and controversy among them. Some have inferred it as caused by cold ocean stream (Seki, 1907), while others insisted there is a certain "periodicity" of cold weather (Tamari, 1911). Long remaining Siberian High Pressure was supposed to be the reason of Japan's cold summer (Tsukiji 1914). Ando (1914) argued that cold summer was caused by sea-ice floating ashore from Sea of Okhotsk. Also in 1914, Okada discussed this with then newly proposed papers by Gilbert Walker and other European theorists. Despite those efforts, it was not easily solved, and a series of bad harvest actually was exacerbated around the time of Great Depression in the end of 1920s. The solution Japan has chosen was not scientific but Imperial: seeking a new "Lebensraum", acquisition of new sphere of environment. Hantingtonian geography of eugenics became popular in 1930s, and research in colonial agriculture both in Northern and Southern territories mushroomed, such as sugar cultivation in Taiwan, and advanced and mechanized agriculture in Manchuria. I re-examine this controversy and its consequences, and point out different elements: rice as the Japanese farmer's "identity crops" and changing style of modern agriculture (especially introduction of US method in Northern Japan); colonial demand of new agronomy in new territories; shift of agricultural diversity in traditional farming to higher productivity by modern colonial monoculture.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (I) Part 1. The Heaven (天)

ThA1-4

"Beat Those Yattya Bottya People": Nurturing Pure Science in Prewar Japan, The Case of Nuclear Physics

Takuji Okamoto

Department of History and Philosophy of Science, The University of Tokyo

Main concerns of the Japanese Government right after the Meiji Restoration were understood to be transforming the country into an independent nation-state and strengthening its industry and military for that purpose. It considered introducing and assimilating Western science and technology as a crucial step for accomplishing its national goal. Though the effort in this practical line brought tremendous success, the field in which Japanese scientists enjoyed distinguished international praise (e.g., a Nobel Prize) for the first time was theoretical nuclear physics: a field remote from technological application.

Apart from national concerns, scientists in this country kept nurturing "pure science" and established it as their tradition. The physicist Hantaro Nagaoka (1865-1950) recognized science as an arena for universal intellectual fight and challenged the Westerners in this field by publishing his atomic model in 1903. Though younger physicists did not always share this competitive view of science, Nagaoka's way of accepting science as a set of rules for expressing intellectual pride led to his encouragement and support for challenges by the Japanese scientists in the newly emerging fields, such as electron theory, relativity theory, or quantum physics. Hideki Yukawa lived up to Nagaoka's expectations by enjoying worldwide attention to his meson theory published in 1934, while Yoshio Nishina managed to construct a 60-inch cyclotron as a step toward verifying "Japanese theory" by "Japanese experiments." Yukawa's Nobel Prize in 1949 may not be regarded as a fruit of the Japanese research tradition, but as a result of the Japanese morale tradition, which at the same time showed that non-Westerners' intellectual challenge could win a worldwide intellectual game, and that science, especially pure science, could function as an arena for such a game.

ThB1

Transcultural *Materia Medica* : The Entanglement of Pharmaceutical Knowledge and Matters in The East Asian World, 1780s-1940s

Organizer: Xiaomeng Liu (The University of Hong Kong)

Historians of medicine used to believe the East Asia shared one medical tradition and similar pharmaceutical materials that were first developed in China and then transmitted to other countries. However, recent studies on the local reinvention and appropriation of knowledge had put this claim into question. Knowledge not only moved across borders, but also constituted and reconfigured during the movement. By inquiring into the transcultural processes, this panel emphasizes the production and transmission of natural and pharmaceutical knowledge in the movement of people, materials, and practices. We consider the East Asian World neither as a cultural homogenous area nor a simple colligation of several geographically tied countries, but a fluid entity constituted by dynamic and constant transcultural exchange of human experiences and material connections. The *materia medica*, as an exceptional commodity bearing economic, therapeutic, and cultural values, is the lens through which we are trying to observe this dynamic process. This panel brings together four papers focusing on interrelated topics on the pharmaceutical knowledge and practices in East Asia. The first two papers probe into the question that how certain objects and their understanding was shaped and transfigured in the transcultural exchange. Xiaomeng Liu's paper explores the making of a exceptional illustrated work of *materia medica* through the informal ties between Qing China and Tokugawa Japan. Xin Xing uses the assimilation of *Ikkaku* in early modern Japan to showcase the exchange of knowledge between the east and the west. The other two papers locate their exploration in the (post)colonial context. Meng Zhang's study sheds light on a neglected project, the pharmacopoeia of Manchukuo, in the



history of Japanese colonial botany. Wuyutong Yao investigates the encounter of foreign and domestic explorers with local vernacular knowledge in the Southwest China. Altogether, this panel emphasizes the fluidity of materials, knowledges, practices, and culture values within the East Asian world.

Transcultural Materia Medica: The Entanglement of Pharmaceutical Knowledge and Matters in The East Asian World, 1780s-1940s

ThB1-1

Epistemic Image and The Transcultural Exchange of Pharmaceutical Knowledge: The Making of *Zhiwen Bencao* in The Late-Eighteenth-Century Sino-Japanese Context

Xiaomeng Liu
The University of Hong Kong

The *Zhiwen bencao* (Inquiries on *materia medica*) compiled in the late eighteenth century was an exceptional text both in terms of its high-quality illustrations and its compiling strategy that exemplified the dynamics of Sino-Japanese interactions. In the disguise of a Ryukyuan scholar, the lord of Satsuma Domain in Tokugawa Japan initiated the project by taking the advantage of the Qing-Ryukyu tributary system for information collecting. Botanical illustration and specimens were brought to China by Ryukyuan students for verification and identification. Through a close examination of different editions of this text, I could not only show the details about the book project, but also the strategies and techniques of identifying plants employed by the Chinese informants. This paper will put the botanical illustrations in the center stage. Drawing on the concept of “epistemic image” coined by Lorraine Daston, which refers to the images that were selected and designed to represent the universal “truth” in scientific practice, I argue that the image in *Zhiwen bencao*, were the result, rather than the agent, of the transcultural exchange in the book project. Chinese *bencaoxue* and Japanese *honzo-gaku* had developed very different ideas and usage of botanical illustrations at eighteenth century. The illustrations, along with the short para-texts, were designed to have epistemic virtues, that is to say, to represent all the traits that mattered in determining its identity. After further information from China were collected, some of the illustrations were re-painted to incorporate more credible details that were offered from the Chinese specialists.

Transcultural Materia Medica: The Entanglement of Pharmaceutical Knowledge and Matters in The East Asian World, 1780s-1940s

ThB1-2

Wonder from The North Sea: Dutch Learning and The Assimilation of *Ikkaku* in The Early Modern Japanese Medicine

Xin Xing

Sun Yat-sen University Zhuhai Campus

The narwhal living in the North Sea was considered as sea unicorn in early modern Europe, while questions and suspects concerning the identity and medicinal efficacy of its tusk facilitated continuous inquiring among natural philosophers and scientists since the eighteenth century. This paper takes the assimilation of *Ikkaku* (narwhal tusk) in early modern *kampo* medicine as an example to showcase the dynamics of cultural and material exchange between the east and the west. *Ikkaku* was first introduced to Japan as a tribute from the Dutch merchants in the seventeenth century. Since then, the mysterious origin of the wondrous object had drawn the attention of Japanese scholars. I will argue that the assimilation of *ikkaku* in early modern Japan had underwent a dual process. On the first hand, *rangaku* (Dutch learning) scholars contributed to the disenchantment of the object by determining the real identity of the tusk from Dutch works. On the other hand, family recipes and medical practices still valued *ikkaku* as a cure-all with wondrous medical virtues.

Transcultural Materia Medica: The Entanglement of Pharmaceutical Knowledge and Matters in The East Asian World, 1780s-1940s

ThB1-3

Japanese Colonial Botany in Manchuria and The Birth of Manchukuo's Pharmacopoeia for Traditional Chinese Medicine

Meng Zhang

Peking University

Japanese medical research and its war-time crimes in Manchuria during World War II has been extensively examined by historians. Few scholars however have considered the rise of Chinese *materia medica* (*Bencaoxue* or *Honzogaku*) in the 1930s and the role it played in providing colonial drug supply for Manchukuo. This article traces the origin of Japanese colonial botany in Manchuria in the twentieth century by giving detailed examples of how Japanese pharmacologists in Manchurian Medical University became interested in recovering Chinese old tradition of *materia medica*. It examines the personnel connections and medical knowledge exchange between Manchuria, Korea and Shanghai which led to a shared positive attitude towards Chinese *materia medica* and by extension, the traditional Chinese medicine. By attaching their studies of Chinese drugs to the practical need of Manchukuo, the Japanese physicians in the colonies not only challenged their colleagues in metropolitan Japan who still held a stubborn view passed from Meiji period that usually downplayed the value of traditional Chinese medicine, but also managed to persuade the puppet government to support their plan to legalize the usage of Chinese drugs in Manchukuo as well. Although Korea is Japan's only colony that had published a special pharmacopoeia for herbal drugs during the war, the article attempts to prove that Manchukuo had prepared, though never being able to implement, a much more comprehensive pharmacopoeia for Chinese herbal, animal and mineral drugs than Korea during the Japanese colonial period. This case shows the botanical practice was deeply embedded in the enterprise of colonial governance by contributing to both the realistic (maintaining Manchukuo's drug supply) and ideological ends (fulfilling Japan's Pan-Asia dream).



Transcultural Materia Medica: The Entanglement of Pharmaceutical Knowledge and Matters in The East Asian World, 1780s-1940s

ThB1-4

Being Transcultural while Remaining Local: The Transformation of Chinese Pharmaceutical Knowledge in Southwest China in The Early Twentieth Century

Wuyutong Yao

The Chinese University of Hong Kong

Since the late nineteenth century, Southwest China attracted a number of foreign explorers, botanists, scientists, and missionaries because of its key geographical location as the intersection between Tibet and China interior, its polyethnic demographic composition, and its variety in plants and minerals. Meanwhile, the area was also a tantalizing and venturesome land for Chinese domestic ethnographers who were interested in ethnicity, warlords and merchants who were interested in rich natural resources, and bankers who were looking for investment opportunities. Among these various actors, some of them were particularly interested in Chinese *materia medica* -- the herbs, minerals, and animal parts -- that could be used as ingredients for manufacturing drugs. This research will specifically focus on the local knowledge in this transcultural land. How did people with scientific background interact with the local plants - the materials as well as the vernacular knowledge? How and why did the "local" still matter in the pursuit for more "accurate" and "universal" scientific truth? Drawing upon archives, explorers' travelogues and diaries, social surveys, and institution-supported investigation reports produced from the 1920s to the 1940s, this paper looks at the dynamics of knowledge production in this resourceful land and how people with different knowledge system interacted and negotiated in the field research.

ThC1

The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China

Organizer: Weixing Niu (University of Science and Technology of China)

This panel focuses on the astronomical knowledge circulating among ancient Korea, Japan and China. The panel contains five speakers, who will present five topics respectively on, 'Fragments of the Two Han Astrolabes from Lelang of Korean', 'Communication and Transformation: The Celestial Images in East Asia Mural Tombs During the 3rd to the 5th Century', 'Indian Nakṣatra Dating in the Japanese National Treasure Mido kanpakuki', 'Two Horoscopes in Japanese Literatures from late Heian Period and early Kamakura Period', and 'The Introduction and Acceptance of the European Geocentric Armillary Sphere in China and Korea in the 16th and 17th Centuries'. From Han to Qing dynasties, from astronomical instruments to Nakṣatra Dating system, and from celestial images in mural tombs to the calculation of planetary position in Japanese horoscopes, the time span of the topics is relatively large, the content of the topics shows a little more variety, while the subject of the discussion will focus closely on the transmission and comparison of astronomical knowledge among ancient Korea, Japan and China. The five reports will provide evidences separately on the circulation of astronomy in Northeast Asia in different time and in different aspects of astronomy, which also shows a detailed example of ancient Northeast Asian cultural exchanges. In addition to this, an in-depth discussion of the topics will also reveal that some astronomical knowledge can be furtherly traced back to more distant sources, e.g. Indian and Greek Astronomy.

The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China

ThC1-1

Fragments of The Two Han Astrolabes from Lelang of Korean

Shenmi Song

Shanghai University of Traditional Chinese Medicine

Some fragments of two astrolabes of Han dynasties were excavated from Lelang tombs in North Korean. The astrolabe from Wangxu(王盱) tomb was restored by Tazawa Kingo with many problems. The two astrolabes were different from the other Han astrolabes and the later ones in the form and contents. Both of them have the names of twelve gods, each with two characters, which is very remarkable. The report will analyze the two astrolabes in combination with the research about the tombs and the owners. The sites which the Han astrolabes excavated from in different areas of China and North Korean will also be discussed.

The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China

ThC1-2

Communication and Transformation: The Celestial Images in East Asia Mural Tombs during The 3rd to The 5th Century

HuiChih Chuang

Tainan National University of the Arts

Celestial images in mural tombs are the characteristics of some areas in ancient East Asia. The earliest celestial images in mural tomb was discovered from a Han dynasty tomb. Due to some reasons such as wars, in the 3rd century, the main distribution area was transferred from China central part to North-east Asia (including the Liaodong peninsula and the north of Korean peninsula) and the Hexi area (河西地區) of China. These images even spread to Japan in the 8th century. All these images had the same origin in East Asia, but they had the different features. Therefore, this topic integrates with archaeology, astronomy history and art history has very important meanings about the communications and transformations during the different cultures.

This study combed the celestial images in mural tombs in the East Asia during the 3rd to the 5th century. It divided the area into 4 regions: North west China, North China, North east Asia and others, and divided the images into 3 types: mythological type, natural starry type and simplified type. It would also discuss about the relationships between eras, regions and types, and clarify the meanings of these images in the funeral rituals and the social classes.

**The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China****ThC1-3****Indian Nakṣatra Dating in The Japanese National Treasure *Mido kanpakuki***

Liqun Zhou

School of Asian and African Studies, Beijing Foreign Studies University, Beijing

The Japanese National Treasure, *Mido Kanpakuki* (御堂関白記 998-1020), a diary of Fujiwara no Michinaga (藤原道長 966-1027), maintains quite a few records of Onyodo especially Sukuyodo during Heian period (794-1192). In the manuscript of his own writing, besides of planet day reckoning, some lunar mansions mark the top of pages, such as 24th day, Lunar Mansion Zōu, Saturn (二四日, 斗, 土); the 25th day, Lunar mansion Nǚ, sun (二五日, 女, 日), etc. The missing of Lunar Mansion Niú (牛) shift the ascription of this record from Chinese 28 Xiǔ Dating to Indian 27 Nakṣatra Dating. Though the system is an exotic one, 27 Nakṣatra Dating plays an important role in the day reckoning of Tang dynasty and adjoining period, China. Buddhist Canon like *Śāṇḍilakarṇāvadāna*, *Mahāvaiṣṇava-mahāsammipāta-sūtra*, and some excavated Chinese mundane manuscript like Turfan 27 Nakṣatra-Divination Texts, show the transmission of Indian Nakṣatra Dating toward China. While renowned *Xiuyao jing*, *Mido Kanpakuki* reflect the Eastward transmission from China to Japan. In all, the Japanese national treasure *Mido Kanpakuki* is indeed a special segment on the link chain of Indian day reckoning eastward transmission through desert silk road, today's Central Asia and Xinjiang, China.

The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China**ThC1-4****Two Horoscopes in Japanese Literatures from Late Heian Period and Early Kamakura Period**

Weixing Niu

University of Science and Technology of China

Two horoscopes with outcomes of fortune-telling are preserved in the Japanese literatures. One titled *A Xiuyao Yunming Kanlu* (宿曜运命勘录, *Notes on Fate Divined by Stars and Planets*) is collected in Vol. 908 of *Xu Qunshu Leicon* (续群书类丛, *A Continued Supplements of All the Books*). The other titled *Xiuyao Yuyunlu* (宿曜御运录, *Notes on Fates Driven by Stars and Planets*) is included in *Liutiao Youkang's Collection* (东京都六条有康氏所藏文书) of the University of Tokyo. The two horoscopes both contains a natal chart and several chapters of divination outcomes. The birthday of the two natives are respectively the 25th of the 12th month, the first day of solar term Major Cold, the 3rd year of Tianyong (天永) reign (Jan. 14, 1113AD), and the 26th day of the 6th month, the 7th day of solar term Start of Autumn, the 5th year of Wen Yong (文永) reign (Aug. 6, 1268AD). The two horoscopes could be compared from form to content with their Chinese counterparts of early Song Dynasty. The epoch date of the accumulated days provided at the beginning of the two horoscopes are exactly the epoch of *Futian Li* (符天历, *Futian Calendrical System*), which was created by a diviner named Cao Shiwei (曹士蒔) in Jianzhong (建中) reign (780-783AD) of Tang Dynasty. More evidences of the exchange of astronomical knowledge between ancient China and Japan can be revealed from the two Japanese horoscopes.

The Circulation of Astronomical Knowledge among Ancient Korea, Japan and China

ThC1-5

The Introduction and Acceptance of The European Geocentric Armillary Sphere in China and Korea in The 16th and 17th Centuries

Nan Zhang

Department of the history of science, Tsinghua University

The European Ptolemy "geocentric armillary sphere" spread throughout Europe during 13th to 17th century. The instrument was firstly introduced to China by Jesuit Matteo Ricci through the world map, which Ricci draw the instrument structure on and attach a text description in 1584. This instrument can visually demonstrate the relationship between the heaven and the earth. Its main structure includes the meridian ring, the north-south return ring, the equatorial ring, the north and south poles, the zodiac ring and a globe, and the zodiac is marked on the ecliptic. This paper will discuss the process of the introduction and acceptance of geocentric armillary sphere from Europe to China and Korea, and trying to refactor its possible path to Korea.

ThD1

Beyond The Vaccination of East Asia: Ideal and Reality

Organizer: Kyuhwan Sihm (Yonsei University)

Although the smallpox is considered the only infectious disease that has been wiped out by mankind, until the mid-20th century, the human society was living in the fear of the smallpox. Along with the opening, the Jenner vaccine was quickly introduced to East Asia, and the cowpox vaccination formed an important axis of modern state construction. This panel aims to explain the development process and medical effect of the Chinese-style variolation and the cowpox vaccination from East Asian countries, the role of the vaccination in the construction of modern countries, the genealogy of modern medical knowledge and the relationship of power, and the spread of smallpox via international travelers.

**Beyond The Vaccination of East Asia: Ideal and Reality****ThD1-1****From Variolation to Cowpox Vaccine:
The Modernity of The Vaccination in Korea**

Kyuhwan Sihm
Yonsei University

The Modernity of the Vaccination in Korea has been a major issue in academia. With the introduction of Western medicine, the cowpox vaccination has been regarded as a sign of the beginning of modern medicine. The Chinese-style variolation, on the other hand, was considered outdated, dangerous, and useless with the introduction of the cowpox vaccination. In other words, the cowpox vaccination became a symbol of modern medicine, and the Chinese-style variolation, along with traditional medicine, was transformed into an obsolete relic to disappear. While previous studies have attempted to revive the modernity and historicity of the Chinese-style variolation, such research poses a risk of exaggerating the effects of the Chinese-style variolation. This study aims to not only objectively compare the effectiveness of the Chinese-style variolation and the cowpox vaccination, but also to remind the importance of the customs and the social system in which it operates.

Beyond The Vaccination of East Asia: Ideal and Reality**ThD1-2****Native Doctors and The Spread of Smallpox
Vaccine in China and Modern East Asia**

Jeongeun Jo
Kyung Hee University

In East Asia, Smallpox was a highly contagious disease caused by the smallpox virus. It causes death in up to 30%. Chinese doctors in ancient times developed the technique of variolation(人痘法) against smallpox using live smallpox virus. But as compared to the Chinese-style variolation, the cowpox vaccination(牛痘法) was safer and had the more reliable effect. In modern times, therefore, the western doctors including medical missionaries dedicated to spreading the cowpox vaccine, instead of Chinese-style variolation. In other words, they tried to show the native people the superiority of modern medicine by introducing the cowpox vaccine. Native doctors also played an important role in informing the cowpox vaccine in China. Taking Huang Chun-fu(黄春甫) as an example, he tried to inoculate cowpox vaccine to his own people. He was a Chinese doctor at Renji hospital(仁濟醫院), the first Western-style hospital in Shanghai founded by Dr. William Lockhart. The reason why Dr. Huang to take this job was because the Chinese believed the Chinese doctor was more reliable than the foreign doctor. But some Chinese doctors tried to understand that cowpox vaccine with traditional Chinese medicine. And the Chinese-style variolation was still actively used after that.

In Japan, on the other hand, native doctors were relatively tolerant of cowpox vaccine acceptance. It was because the acceptance of Rangaku(蘭學) has made it less resistant to Western medicine. Unlike China, the influence of Western doctors and medical missionaries was not significant. Japanese native doctors had well-established networks, and they were able to spread the cowpox vaccine throughout Japan.

Beyond The Vaccination of East Asia: Ideal and Reality

ThD1-3

The Role of Ranpoi in The Smallpox Control of The Mid-nineteenth Century Japan

Youngsoo Kim
Yonsei University

In the mid-nineteenth century, cowpox vaccination (牛痘法) started to be introduced in Japan. The vaccine was spread rapidly throughout the country because the knowledge of the cowpox vaccination spread first and the vaccines were finally introduced half a century later after several failures to bring the vaccine into Japan.

To implement vaccination, vaccinators (種痘醫) were trained and vaccination institutions (種痘所) were founded. Doctors and vaccinators at this time were Ranpoi (蘭方醫) who studied western medicine by means of the Dutch language. With the spread of vaccination, the role of doctors has also increased. However, they have weakened their position in the medical field as the Meiji government implemented German medicine. However, one of the institutions led to the medical school of the University of Tokyo, which is referred to as the origin of Japanese modern medicine. Smallpox epidemics and cowpox vaccination will provide clues the continuity and discontinuity of western medicine in modern Japan.

Beyond The Vaccination of East Asia: Ideal and Reality

ThD1-4

Smallpox on The USS Korea Maru: Travel, Infectious Disease Control, and Cowpox Vaccination in The Early Twentieth Century World

Hyon Ju Lee
Ewha Womans University

My presentation explores the case of the smallpox outbreak on the USS Korea Maru, a transpacific carrier. My research delves into the early twentieth century transpacific world that connected East Asia, Honolulu, and San Francisco, focusing on the spread of smallpox via international travelers, the public health system that developed to contain smallpox infection on international ships, and the application of cowpox vaccination as a method for infectious disease control.

Various transpacific carriers were making runs between East Asia and the United States, and the two worlds were connected to a degree that no one had ever imagined. Honolulu, Hawaii, was the most important US territory, serving as a waypoint from East Asia to San Francisco on the mainland. As numbers of people traveled by sea, various microbes were communicated across the Pacific. One of the significant infectious diseases that international tourists traveling between East Asia and the United States were alerted to was smallpox.

The story of the USS Korea Maru serves as an interesting lens through which to study undiscovered aspects of the transpacific communication of smallpox and deepen our understanding of the possibilities, challenges, and limits of diagnosing, controlling, and vaccinating against smallpox on board a vessel.

**ThE1****The Body and Divination in Chinese History**

Organizer: Marta Hanson (Johns Hopkins University)

Much work has been done on the history of the body and the history of divination in China. But rarely have scholars examined the historical phenomenon of the two fields together. The three papers in this panel use case studies from three distinct periods in Chinese civilization - the Shang, the Ming, and the Qing - to examine the relationship between the body and divination. They are analytically united in their concern for when embodiment mattered in divination practices and in which ways. In the first paper "Needling and Binding: Shang Healing Techniques Reconsidered," Connie Cook examines the turtle plastron in ancient divination practices as a proxy body for the body of the afflicted royal. In the second paper, "Embodying Time & Divining the Future: 'Hand Mnemonics and Divination in Ming Almanacs & Encyclopedias,'" Marta Hanson examines how temporal concepts were embodied on the hand and used to divine possible answers to medical questions. In the third paper, "The Solo Spirit-Writing Method: Peng Dingqiu's Challenge to Collective Prophecy Verification in 17th Century Yangzi Delta", Daniel Burton-Rose examines how a method of spirit-writing - having the deity descend into a person, rather than through a planchette - entered more broadly into elite practice. The panel together proposes applying a spectrum of processes that goes through the following steps of embodiment to external instrumentalization to disembodiment. The three-fold steps along this heuristic spectrum are the following: from 1) embodied (priest, healer, diviner, etc.) to 2) ritual instruments (i.e., turtle plastrons, ritual seals, planchettes, etc, what we refer to here as "proxy-bodies") to 3) disembodied (i.e., the material products of ritual instruments such as talismans). Many divinatory techniques as well as ritual healing practices encompass movement back and forth along this embodied- proxy-bodied-disembodied spectrum.

The Body and Divination in Chinese History**ThE1-1****Needling and Binding: Shang Healing Techniques Reconsidered**

Constance Cook

Lehigh University

King Wu Ding and his sons provided us with an invaluable if cryptic record of bodily affliction and healing techniques dating to the late 13th early 12th centuries BCE. Notably, the majority - if not all - of the records concerning royal affliction required searing specific points of turtle plastrons with hot pokers. Scholars have long connected this divination process conceptually with the later practice of acupuncture. The metaphor of spirit turtle body as a proxy for the afflicted royal will be pursued in this paper as will the use of specific vocabulary for healing afflictions found on these inscribed turtle records. The author will suggest further conceptual links with 3rd century BCE practices attested in recently discovered bamboo manuscripts.

The Body and Divination in Chinese History

ThE1-2

**Embodying Time & Divining The Future:
Hand Mnemonics and Divination in Ming
Almanacs & Encyclopedias**

Marta Hanson

*Johns Hopkins University, School of Medicine,
Department of the History of Medicine*

Chinese hand mnemonics (*zhangjue*, 掌訣) allow one to enter both the minds of those who likely used them and the social world in which the knowledge summarized on the hand was valued enough to memorize. After the fifteenth-century publishing boon, these bodily arts of memory bridged esoteric and vernacular domains of knowledge, particularly in astrological prediction and medical prognostication. Hand mnemonics in Ming almanacs, encyclopedias, and medical texts illustrate not only comparable techniques to memorize medical and mantic numerology but also important connections between medicine and astrology in late imperial China. This paper focuses on the relationship of the body and divination through the algorithms (or set of rules followed in calculations) that emerge from a study of illustrations of hand mnemonics used for “dactylomancy” (*qiazhi jisuan*, 掐指記算, calculating with the fingers a prediction) that circulated in the Ming. The sources include the *Shilin guangji* 事林廣記 (1325 ed.), *Leibian lifa tongshu daquan* 類編歷法通書大全 (ca 1470s), and the *Miaojin wanbao quanshu* 妙錦萬寶全書 (1612 ed.). The paper argues that both the spatial orientation of the characters projected onto the palm’s divisions and the corporeal movement of the fingers in these hand mnemonics facilitated memorization, calculation, and fate prediction. Furthermore, the range of rules for moving through the established forms of ‘chronomancy’ in the palm of the hand allowed the astrologer great flexibility in making fate predictions appropriate for the time, place, and individual.

The Body and Divination in Chinese History

ThE1-3

**The Solo Spirit-Writing Method: Peng Dingqiu’s
Challenge to Collective Prophecy Verification in
17th-Century Yangzi Delta**

Daniel Burton-Rose

Northern Arizona University, Department of History

In 1674, two years before obtaining the two-fold optimum degree (*er yuan* 二元) at the apex of the civil examination system, Peng Dingqiu 彭定求 (1645-1719) received a visit from an emissary of the deity Wenchang prophesizing this occurrence. Dingqiu was a young man at the time; the older, established spirit-altar supervisors in Suzhou rejected the prophecy on the grounds that Dingqiu was possessed. Their concern about the credibility of Dingqiu’s claim of divine communication stemmed from an acute illness from which he had been suffering and the absence of other mortal participants to validate Dingqiu’s revelation. By communicating with a spirit while physically and mentally unbalanced and outside of the supervision of elite men, Dingqiu was behaving more like the mediums called into the houses of elites than the scion of an upstanding Classicist patriline. This paper examines the complex of illness, civil examination prophecy, and homosocial elite organization in order to appreciate the complexity of prophecy validation in the early Qing Yangzi Delta. Although the form of Dingqiu’s prophecy claim upset his elders, by fulfilling the prophecy Dingqiu became a celebrity throughout the Qing Empire. As a result his solo method of spirit-writing - having the deity descend into him, rather than through a planchette - came to be practiced by other elites. By combining the insights of scholars of Qing spirit-writing Vincent Goossaert, Wang Chien-ch’uan 王見川 and Hu Jiechen 胡劫辰 with those of Science and Technology Studies figures Steve Shapiro, Bruno Latour, and Ian Hacking, I seek to provide an analysis of spirit-writing as a technique of communication with the divine subject to clear yet dynamic standards of communal verification.

**The Body and Divination in Chinese History****ThE1-4****A Tibetan Diagram on Astrology and Divination**

Petra Maurer

Bavarian Academy of Sciences and Humanities

Divination was widely applied in Tibet and Tibetan cultural areas such as Ladakh. The divinatory techniques were multiple. Tibetan religious leaders recognized the significance for Tibetan's daily life and therefore included these techniques to predict the future into Tibetan Buddhism. Simple techniques that were easily to perform are divination with a rosary ('phreng ba), with arrows, pebbles, dice or predictions by reading the surface of a clear lake or the sky and so on. Another method for prediction is the so-called Chinese divination (nag rtsis), a complex system of calculation that has to be studied for a long time. It still and was a major issue in Tibetan societies and was applied to calculate a person's future either in a more general sense or with regard to special events like marriage(bag rtsis), diseases (nad rtsis) or choosing the right place for construction (*sa dpyad*). The entities and dimension the diviner (rtsispa) calculated are of Chinese origin and traditionally said to have been introduced by the Chinese princess Wencheng. In the 7th century, when she was on her way to Lhasa in order to marry King Songtsen Gampo, she brought a diagram, a so-called gab rtse. Her diagram is said to have shown the main elements of Chinese divination used to calculate the right places for the construction of buildings (*sa dpyad*). These thangkas seem quite rare. Their shape and illustrations vary, and the diagrams and images are hard to read. This thangka from Ladakh combines divinatory dimensions with astrological elements. In my paper, I would like to present a thangka that belonged to the late diviner Tashi from Nyemo in Ladakh.

Diverse and Trans-local History of East Asian Medicines**ThF1-1****Finding Harmony in The Ancients:
Uniform Diversity in Medieval Medicine**

Mujeeb Khan

University of Tokyo

This paper investigates the nature of diversity in the medieval medical cultures of Eurasia, with a focus on the Islamicate and Japanese medical literary traditions. Modern medicine is described in different ways, the majority of which incorporate a comparative framework to premise modern, scientific, or other positivist attribute as inherent to this particular form of medicine. For example, in spite of the fact that the intellectual break between modern and pre-modern European medicine largely occurred in the late 19th century, comparative studies of European traditions with their non-European counterparts continue to situate the European traditions as modern. This methodological contouring inevitably distorts the possible conclusions of any such study. The arbitrary designation of the medieval period as between the ancient search for rationality and its early modern application in proto-science and science further problematizes efforts to examine developments in Asian medicine. By foregoing a linear trajectory towards the early modern world, it is, therefore, possible to investigate the diversity of medieval medical cultures. To do so, this paper takes the Islamicate world and Japan as case studies of diversity in medieval medicine. In particular, it will explore the sources of Abū Bakr al-Rāzī's (d. ca. 925)

Ḥāwīfī al-Ṭibb (Comprehensive Book on Medicine) and Tanba no Yasuyori's 丹波康頼 (d. 995) *Ishinpō* 醫心方 to identify the diversity of sources compiled by each author. In the case of the former, it will consider the Greco-Roman, Syriac, Sanskrit, and local sources of al-Rāzī and, in that of the latter, the Chinese/Korean medical, Daoist, Buddhist, and philosophical sources of Yasuyori. Through these sources, it will demonstrate how disparate ancient sources found harmony in the hands of medieval medical writers. In the process, it will also shed light on invisible changes in the development of these traditions.

Diverse and Trans-local History of East Asian Medicines

ThF1-2

Wang Gui 王珪 (1264-1354) and The History of Chinese Phlegm (tan 痰)

Natalie Koehle
Hong Kong Baptist University

My presentation looks at chapter fourteen of Wang Gui's *Taiding Yangsheng Zhulun* 泰定養生主論. Although a little known work, this chapter is a key text in the history of phlegm (tan 痰) in Chinese medicine. I situate the text in the history of Chinese phlegm and show that it contains a notable innovation: the diagnosis of phlegm from sight, smell, taste, and touch of bodily excreta. This method of phlegm diagnosis is unprecedented in earlier Chinese treatises and contrasts sharply with earlier diagnostic methods, that perceive phlegm exclusively from within body (through listening or palpation) and from patients' subjective account of symptoms. I argue that the practice of examining phlegm in excrement and sputa along with its theoretical underpinnings - which ascribes meaning to different hues and textures of bodily discharge - bears remarkable resemblance to Byzantine and Islamic traditions of coproscopy and the theory of coction that informs them, and suggest why this is the case.

Diverse and Trans-local History of East Asian Medicines

ThF1-3

Framing Diagnosis in A Dunhuang Medical Manuscript

Sarah Zanolini
Johns Hopkins Medical Institute

The Dunhuang medical manuscript the Treatise on the Five Viscera (Wu zang lun) blends medical theory derived from systematic correspondence and pharmacotherapy together in an implicitly Buddhist frame. Apart from briefly introducing the basics of systematic correspondence theory, however, diagnosis in this text actually centers on empirical conditions as diverse as joint pain, dry skin, and illnesses caused by the dead. Only in the Brief Outline of Balancing the Pulses (Pingmai lueli), a text that immediately follows the Treatise on two different manuscripts found at Dunhuang (P.2115 and S.5614), is a diagnostic frame rooted in five viscera presented systematically, allowing readers to connect some of the miscellaneous symptoms the Treatise associates with medicinals to conditions of the five viscera. These herbal prescriptions comprise a full half of the Treatise, and while many of the listed herbal functions overlap with reconstructed entries in Tao Hongjing's *Shennong bencaojing jizhu*, the origin of many other remedies remains a mystery. In my paper, I employ newly-launched data-mining techniques to read the herbal prescriptions presented in the Treatise against the Buddhist and Daoist canons, seeking out earlier medieval antecedents for these remedies. By mapping out these references, and comparing their distribution to other, frequent, allusions made by the author to now canonical texts such as the *Neijing*, *Nanjing*, and *Shennong bencao*, I will highlight the plural foundations from which the manuscript author formed his diagnostic framework, thus using the manuscript P.2115 as a case study in the impacts of the "religio-medical marketplace" of early Tang China on manuscript composition.



Diverse and Trans-local History of East Asian Medicines

ThF1-4

Reviving Science on The Periphery of The Late 19th Century Korea: The Case of Sasang Medicine 四象醫學

Joong-Yang Moon
Seoul National University

In the late 19th century Korea, Western science came to forcibly take the central position that the traditional knowledge on the natural world had occupied until then. This change had been understood as an establishment of the scientific ‘modern science’ in Korean society. However, Confucian thought and the classical knowledge kept their intellectual authority and cultural influence in the peripheral regions, although Western Science came to be ‘Unique Science’ notably in the center of the political and intellectual power. The local intellectuals who had been in the lower hierarchy of the knowledge sometimes tried to construct an intellectual superstructure aspiring toward the Confucian universalism. Sasang medicine could be also considered to be the intellectual product achieved in the ‘local’ intellectual and cultural context which was distinct from the ‘central’ region of the late 19th century Korea. After Chejungwon(濟衆院) was established in 1885, Western medicine and medical institution began to substitute for the main position and function Korean ones did until then. The preceding medical tradition, however, came to revive by the local intellectual doctor, Yi Chema(李濟馬, 1837-1900), who lived on medical exercise in the rural area, so far away from central Seoul of Korea. Although one recent research argued that Yi Chema changed the medical paradigm through Sasang Medicine, I want to pay attention to the point that he reconstructed Sasang Medicine in terms of Sasang Typology 四象論 definitely depending on Yijing-based epistemological system 象數學 prevailing among local intellectuals in the late 19th century Korea. Sasang Medicine could be an interesting case to show that the intellectual Neo-Confucian tradition had been reviving, and sometimes happened to reconstruct ‘New Science’ on the periphery of the late 19th Korea.

ThG1

Pedagogy of Nuclear Technology: Cold War Civilizing Missions and Their Consequences in Asia

Organizer: Yuka Tsuchiya (Kyoto University)

During the second half of the twentieth century, the United States, the Soviet Union, and United Kingdom tried to introduce nuclear technology to Asia for various strategic reasons. Their activities resembled “civilizing missions” to uplift Asians to fit in the modern, Cold War world order. The Asian “pupils,” however, had their own agendas and ambitions, often working at cross-purposes with their Western “instructors.” Using newly available archival sources, four papers presented on this panel showcase different examples of the pedagogy of nuclear technology. Tomotsugu discusses the British nuclear technological aid programs toward the Commonwealth nations during the 1950s, as he also pays attention to technological cooperation among the Commonwealth nations and also to Japan's desire to play an important role in it. Ichikawa examines the Soviet Union's nuclear assistance to the People's Republic of China (PRC) in the 1950s. He challenges the existing thesis that the Soviet aid was incomplete and insufficient, and emphasizes a key role that the Soviet Union played in the PRC's nuclear programs. Higuchi focuses on the visits of U.S. nuclear vessels to Japan during the 1960s as a strategic and cultural mission to combat growing legal restrictions on and popular resistance to the use of U.S. bases in Japan. He argues that the U.S. efforts backfired, catalyzing a new form of anti-nuclear activism. Tsuchiya explores the roles played by the U.S. Argonne International School of Nuclear Science and Engineering in nurturing “nuclear elites” in Asian countries. Her study reveals the motivations of both “instructors” and “pupils” in nuclear technological education. As a whole, the panel will demonstrate the key role that nuclear technology played in Cold War Asia, and highlight its pedagogical nature that transformed both the providers and recipients of technological aid.

Pedagogy of Nuclear Technology: Cold War Civilizing Missions and Their Consequences in Asia

ThG1-1

**Reconsidering "Eternal Brotherhood":
On The Transfer of Nuclear Technology from
The Former Soviet Union to People's Republic
of China in 1950's**

Hiroshi Ichikawa
Hiroshima University

It has been insisted in an authorized historiography in People's China that due to incompleteness and insufficiency of the technological aids from the side of the Soviet Union, the early days nuclear weapon development in People's Republic of China had to be conducted by Chinese scientists and engineers through their "single-handed efforts." Such a view was widely accepted today not only in China but also in Japan or other countries. However, as seen in Volume No.6 of Igor Kurchatov's Selected Works published in the autumn of 2014, Kurchatov, the top scientist in the Soviet nuclear development, and Svyatoslav Maryshev, the top manager of the nuclear industry sent two letters with their joint signs to the Soviet political leadership, then Premier, Georgii Malenkov to recommend more active exportation of nuclear technology to People's China. This paper is a trial to reexamine and reevaluate the Soviet aids toward People's China in this field on the basis of those letters, the memoirs of the related Soviet scientists, such as Evgenii Onegin, and Chinese historiography.

Pedagogy of Nuclear Technology: Cold War Civilizing Missions and Their Consequences in Asia

ThG1-2

**Another Black Ship: Nuclear Vessels and
America's Civilizing Mission in Japan,
1959-1968**

Toshihiro Higuchi
Georgetown University

On November 12, 1964, a U.S. nuclear submarine, Seadragon, entered the port of Sasebo in southwest Japan, becoming the first nuclear vessel that ever visited Japan. Over the next few years, several more attempted to call in Japan, with varying degrees of success. This was part of a conscious effort by the United States to push back against growing legal restrictions on and popular resistance to the use of U.S. bases in Japan following the revision of the U.S.-Japan Security Treaty in 1960. The military's logistic needs, however, were not the only reason for the sudden arrival of nuclear vessels in Japan. Convinced that the atomic bombings of Hiroshima and Nagasaki, followed by the nationwide scare over radioactive fallout in the 1950s, made the Japanese fearful about anything nuclear, U.S. officials viewed routine visits by nuclear ships and submarines as the best cure to Japan's "nuclear allergy." The mission of the U.S. nuclear fleet was thus both strategic and cultural, strikingly resembling that of Commodore Perry's steam-driven frigates that sailed into Tokyo Bay a hundred years earlier. Building upon the works of Michael Adas and others who have underlined the cultural role of the Black Ships in the opening of Japan, this paper will examine the visits of U.S. nuclear vessels to Japan during the 1960s as another "civilizing mission" staged at a critical moment of U.S.-Japan relations. Based on U.S. and Japanese government records as well as documents relating to citizen protest in Japan, the paper will explain how the entry of nuclear vessels ultimately backfired, catalyzing a new form of anti-nuclear activism and also forcing the Japanese government to declare its opposition to the transit of ships and aircrafts carrying nuclear weapons-a position which contradicted the secret understanding reached at the time of the Security Treaty revision.

**Pedagogy of Nuclear Technology: Cold War Civilizing Missions and Their Consequences in Asia****ThG1-3****Rivalry and Cooperation:
The UK/Commonwealth Atoms for Peace in Asia**

Shinsuke Tomotsugu
Hiroshima University

The UK fostered the Atoms for Peace cooperation overseas in an attempt to maintain its ties with the former British colonies and the Commonwealth countries. As such, the British supported the American plan of establishing the Asian Nuclear Center in 1955 for preventing infiltration of communism into Asia, although this initiative was abandoned in 1959. The center was preliminarily (and confidentially) planned to be built in Ceylon, one of the Commonwealth members and former British colonies. Yet within the Eisenhower Administration, the group backing the Philippines for the site for the center - with a sense of rivalry against the Commonwealth in the light of peaceful use of nuclear power - tactically changed this policy within a very short period of time. The UK voiced strong dissatisfaction with this policy change. Under such circumstances, in December 1955, the U.K. concluded an agreement with India on the cooperation for the peaceful uses of atomic energy. Based on the agreement, the British engineers assisted the opening of the Indian first research reactor in Trombay in January 1957. In addition, the UK got involved into the exploration of radioactive minerals in Burma in 1956. The UK, moreover, hosted the Meeting of Commonwealth Atomic Scientists in the Autumn of 1958, while showing these scientists around the British major nuclear facilities. At around the same time, the former British colonies and other non-aligned countries sought the mutual assistance among them. India, for instance, hosted the five-country nuclear conference in Bombay with Burma, Indonesia, Ceylon, and Egypt in July 1956. The initiatives from such have-not countries, the UK and the U.S. inspired Japan to seek its own nuclear cooperation toward Asia. Japan feared that it might not be able to ride on the Asian “bus” to a bright future filled with the benefits of nuclear energy.

Pedagogy of Nuclear Technology: Cold War Civilizing Missions and Their Consequences in Asia**ThG1-4****Nurturing Asian “Nuclear Elites”: The Argonne International School of Nuclear Science and Engineering (ISNSE), 1955-1960**

Yuka Tsuchiya
Kyoto University

In 1955, the International School of Nuclear Science and Engineering (ISNSE) was established in the Argonne National Laboratory, a successor to the former Manhattan Project laboratory within the University of Chicago. The ISNSE provided state-of-the-art nuclear technological education focused on the practical training in the operation of nuclear reactors. By 1959, three hundred twenty-five engineers from forty countries received training there, forming a cohort of “nuclear elites” in participating countries. ISNSE, however, was not just an ordinary “school.” It was a brainchild of the U.S. Department of State, the Atomic Energy Commission (AEC), and the Operation Coordination Board (OCB), a top-level government organization to coordinate psychological operations. The goal of the school, according to the International Cooperation Agency (ICA), was “to provide a cohort of qualified reactor engineers for the countries receiving US research reactors” and that foreign engineers and engineers from US companies “work together and learn from each other.” In short, the ISNSE was, on the one hand, a vehicle through which to spread U.S. technological knowledge and capitalist system all over the world, and on the other, it was a psychological program to “win the hearts and minds” of foreign engineers. Trainees from Asian countries, however, had their own agenda and ambitions, and were never passive “agents” of U.S. science diplomacy. They were young elites who would later shoulder nuclear policies of their native countries. My paper explores the motivations and experiences of both “instructors” and “pupils” in nuclear technological education at ISNSE, and long-term influences of such education on both its providers and recipients.

Th11

Similitude and Difference: A Comparative Study of Transmission and Interpretation of Medical Traditions

Organizer: Chuan-hui Mau (National Tsing Hua University)

The phenomenon of transmission of medical and scientific traditions and their impacts on Asian societies have been studied by a large number of historians. However, a number of interesting and revealing cases arguably remains un- or under-explored. The proposed panel includes four papers authored by professors of University Paris-Diderot-CNRS (Paris, France) and of National Tsing-Hua University (Hsinchu, Taiwan) as well as two graduate students of the latter institution discussing examples of transmission of medical expertise not only between East and West but within China and Asia that took place prior to the 20th century. The paper authored by Florence BRETELLE-ESTABLET, focuses on the medical traditions of southernmost part of the Qing Empire. She proposes to analyze a corpus of more than 11,000 medical texts written from 1600 onwards and will examine what it meant for these authors to write medical texts, and to think and write about health, diseases, and medicine. Tzu-Jung Wang focuses on the Japanese medical text *Utsushō Yōjōron* written by Koishi Genshun, a Japanese Rangakudoctor of the Edo Period. She suggests to analyze the text then to compare Koishi's concept of *utsushō* with the theory of *yu* by Zhu Danxi. Alan Huang proposes to explore the relationship between anesthesia inventions and their influence on the changing sensation of pain. Although these "drugs" were novel to Chinese, the concept of "anesthesia" was not totally new in Chinese medical traditions. He discusses differences of views on anesthesia in Western and Chinese medical traditions, and proposes to demonstrate the difference of the concepts of pain of the two cultures. The paper authored by Mau Chuan-Hui, instead of the human diseases deals with those of silkworms

while dealing with the concept of prevention. She proposes to explore how Chinese scholars and practitioners incorporated the knowledge that they obtained from their observations of practices of silkworms rearing into their concepts of disease prevention, and vice-versa.

**Similitude and Difference: A Comparative Study of
Transmission and Interpretation of Medical Traditions****Th11-1****What Accounted For The Diversity in The
Writing about Health, Disease, and Medicine in
Late Imperial China?**

Florence Bretelle-Establet
Sphere, CNRS & Université Paris Diderot

It is a well-known fact that being involved in medicine in late imperial China often resulted in the willing to convey in written texts medical knowledge and experience. The number of medical texts written and identified in local gazetteers all over the empire during the Qing dynasty (1644-1911) was more than twice the number of medical texts written before. Who were the actors more and more eager to write medical texts in late imperial China? In what did these medical writings consist? What kinds of differences we may find in this growing literature, in terms of knowledge, of clinical practices, and in terms of writing strategies? What accounted for these differences?

With more than 11,129 medical texts written from 1600 onwards and preserved today in the biggest libraries of PRC, I found it interesting to look at these issues by following a micro-historical approach. By limiting the field of research to a particular geographical framework, the southernmost part of the Qing Empire, including the present provinces of Yunnan, Guangxi and Guangdong, I could identify the different kinds of people who were known to be involved in medicine, at the same time and place, and examine, side by side, the medical texts they wrote. The chosen geographical framework, while relatively far from the cultural centers of the day, Jiangnan and the Qing capital, offers sharp contrasts with regard to its geographical configuration and its social physiognomy. Guangdong was far more urbanized and more closely connected to the rest of the empire than the provinces of Guangxi and of Yunnan.

In this talk, I will examine what it meant for these authors, living in either rural or urban areas, to write medical texts, and to think and write about health, diseases, and medicine.

**Similitude and Difference: A Comparative Study of
Transmission and Interpretation of Medical Traditions****Th11-2****Introduction of The *Utsushō Yōjōron* - A
Perspective and Study by a Rangaku Doctor of
The Edo Period**

Tzu-Jung Wang
*The Institute of History, National Tsing Hua
University*

In the traditional Japanese medical system, *utsushō* (鬱証 / 鬱症 / 鬱症) is a complicated concept of illness throughout the history of *Kampo medicine* (漢方醫學). The medical text *Utsushō Yōjōron* (鬱症養生論), written by Koishi Genshun (小石元俊, 1743-1808), a Rangakudoctor of the Edo Period (1603 - 1868), might be the earliest Japanese document discussing the causes and symptoms of *utsushō*. Based on his extensive clinical experiences, Koishi argued that *mushishaku* (虫積), *shokunindoku* (食飢毒), *kabidoku* (癰毒) and overwork might be the causes of *utsushō*. Otherwise, he emphasized that the essential for recovering from *utsushō* did not only inquire the patients to aware their conditions of body and health, but also to follow the prescription and instruction given by their doctors. Moreover, he appealed doctors to establish and value the relationship between doctor and patient.

Although *Utsushō Yōjōron* is more likely a general introduction of *utsushō* than an academic book, I have identified that Koishi mentioned some ideas such as “*ki* 氣, *ketsu* 痰, *tan* 血, *utsu* 鬱” which corresponded with the Chinese theory of *yu* (郁 / 鬱, literally “gloom”) developed by Zhu Danxi 朱丹溪 (1281-1358), a Chinese doctor of the Yuan dynasty (1279-1368). This paper aims to analyze Koishi Genshun’s *Utsushō Yōjōron* and then to compare Koishi’s concept of *utsushō* with the theory of *yu* by Zhu Danxi.

Similitude and Difference: A Comparative Study of Transmission and Interpretation of Medical Traditions

Th11-3

Traveling Anesthesia in The Nineteenth Century China

Alan Huang

Institute of History, National Tsing Hua University

It is undeniable that anesthesia should be one of the most important breakthroughs in the development of medicine. Not only did the anesthetics facilitate the process of surgery and extend the possibility of longer operation, but also change the attitude and sense patients toward the surgery. In the nineteenth century, as many missionaries came to China, surgery became a way to demonstrate the power of God and to induce Chinese patients to religion. Pain could be constructed and essential at the same time, as well as the attitude to the operation and the anesthesia. By comparing two periods, before and after the introduction of anesthetics in China, the study aims to illustrate the traveling trajectory of anesthesia knowledge in China from 1834, when the Medical Missionary Society in China was founded, to 1915, at the end of the debate on the use of ether and chloroform. The emergence of anesthetics in China changed not only the face of surgical treatment but also the attitude of Chinese people towards operation, surgeons and the feeling of pain. First, although the anesthetics, such as ether, chloroform, or nitrous oxide, were novel to Chinese, the concept of anesthesia was not totally new in the context of Chinese medicine. The Western concept of anesthesia had been grafted onto the original Chinese one. Second, from the different perspectives of western medicine and Chinese medicine toward anesthesia, one can demonstrate the nuance between the two cultures on the concept of pain. Third, the specific technique not only made the complex operations possible, but also created a new doctor-patient relationship. The slippery concept of pain, as a shared body experience, plays a critical role in Chinese medical social history in the nineteenth century.

Similitude and Difference: A Comparative Study of Transmission and Interpretation of Medical Traditions

Th11-4

The Concept of “Prevention” in Ancient China - Through The *Grainage Cellulaire* Invented by Louis Pasteur

Chuan-hui Mau

Institute of History, National Tsing Hua University

In 1868, Louis Pasteur was requested by French government to investigate the cause of silkworm disease which almost devastated French as well as European sericulture industry around the mid-nineteenth century. With the help of microscope, he found that the *pébrine* or pepper disease constituted the principal cause of the epidemic and invented a method for stopping the scourge, named *grainage cellulaire*. More specifically, by means of microscope, one selected healthy eggs of silkworms for reproduction. However, when a silkworm was found affected by the illness, it would not be curable. That means the prevention was crucial for silkworm rearing; this very concept matched with that of traditional Chinese medicine which favored the prevention. In some traditional texts on sericulture, one can read some arguments borrowed from traditional medicine, such as to compare silkworm rearing with the raise of children. During the long history of practice of sericulture in China, it seemed that Chinese sericulture did not meet a disaster similar to that which happened in France, and it thrived, especially during the Song-Yuan era. During the period from the mid-eighteenth to the mid-nineteenth century, Chinese books of sericulture were translated into French and studied by those interested in the subject. Under these circumstances it remains unclear why and how silkworm epidemic disease broke out in France but not in China? This paper focuses on the “preventive” measures used in Chinese sericulture and provides a textual analyze of the relevant sericulture handbooks and medical texts. The goal of this study is to understand how Chinese scholars and practitioners obtained knowledge from their practice of sericulture, how they incorporated the knowledge obtained into their concepts of disease prevention, and vice-versa. Using the concept of the method invented by Pasteur, I will examine the preventive measures practiced in traditional Chinese sericulture.

**ThA2****Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (II) Part 2. The Earth (地)****Organizer: Togo Tsukahara (Kobe University)**

This is a second part of two series of sessions (1) Heaven, Earth, Human and (2) Industry, we explore historical legacy of Japan's colonial sciences in East Asia. In order to investigate history of East Asian Science in the last century from broader perspective, we examine industrial aspects of history of science. In doing so, our challenge is to take a closer look into the East Asian specific features. As the first part of our session discussed, in this occasion of our 15th ICHSEA, we consider East Asia as poly-centric entity. As this poly-centricity is a general key conception for our conference, that we try to examine this in our series of sessions: How we see East Asia as poly-centric in colonial sciences; we try to show where, when, and what were the historical events and thoughts that different centric forces functioned, which they might have pulled different factors together and/or they fall each factors apart. We think it is able to stipulate this conception, when we analyze Japan's Imperial expansion, because it was one of the most peculiar historical events have shown diversified (thus poly-centric) aspects of East Asia to us. We are able to show some cases, that even seemingly centric Empire, Japan's Imperialism was in some cases much diversified and segmented, sometimes in inside they are conflicting to each other and contested within itself. In this session (2), we examine Japan's colonial sciences related to different branches of industries. The first two speakers, Fujihara and Tsukahara will discuss about agricultural science and technology, and its industrial connotation. Moore discusses about Korean development in Park Era, while Erikson examines patent law and industrial right. Boumsoung Kim analyses transpacific scientific research, and its transformation.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (II) Part 2. The Earth (地)**ThA2-1****American Chickens Versus Japanese Silkworms: A Transformation of Scientific Research Across The Pacific****Boumsoung Kim***Hiroshima Institute of Technology*

In this presentation, I will explore how new scientific knowledge is relocated into local contexts. As William Boyd pointed out, in the United States in the early twentieth-century, indoor poultry farming for the purposes of the mass production of meat created the side effect of mass-produced indoor-grown chickens developing weakened legs. Research scientists found, in fact, that this disease was not caused by germs (as originally thought), but by other factors - and in the process discovered the beneficial effects of vitamin D and ultraviolet light on chicken health. It was in the 1920s, despite the age of racism that this new scientific knowledge swiftly traveled across the Pacific Ocean and appeared in a Japanese poultry-business magazine.

Intriguingly, Japanese interests in invisible ultraviolet rays were transformed in another way, putting a spotlight on silkworms. During the golden age of the raw silk industry in Japan when the silkworm was regarded as "one of the most important animals in Japan," sericulture experts in the Japanese Empire of the time (including Ung Sang Kye, who would become a scientific icon in North Korea), hoping for beneficial effects, studied the impact of ultraviolet light exposure on silkworms, which was ultimately found to be impractical.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (II) Part 2. The Earth (地)

ThA2-2

Rereading Japanese History Through The Lens of School Lunches

Tatsushi Fujihara
Kyoto University

My presentation aims at explaining three key points of history of school lunches, namely:

First, the history of the Japanese school lunch is a process involving struggles and measures to help fight hunger and poverty among children. From the birth of the school lunch to the present, it has been a fundamental programme that has shaped children, education, and the country from the viewpoints of nutritional science. As with many modern nation states, in the case of Japan, widespread elementary education began in the early 20th century, and providing school lunches has been an important element in ensuring that all children, regardless of financial status, have access to education.

Second, school lunches are a measure to recover from disasters, for example, the Kanto Earthquake (関東大震災), cold weather (冷害), typhoons and the like. Saiki Tadasu, who was one of the first scholars of dietetics (栄養学) in the world and the director of the Institute of Nutrition, advised the governor of Tokyo to introduce a school lunch system in the city for the relief of children who had lost their parents and houses. And third, after the Second World War, the GHQ (General Headquarters), which was led by Douglas MacArthur, tried to institute school lunch programmes all over the Japanese archipelago. The goal was to prevent hungry citizens from engaging in food riots, such as the Rice Riots during the Taisho period and the food riots during the First World War in Russia and Germany. Thus, for the GHQ, school lunches were a way of both saving children from the nutritious point of view and maintaining peace in Japanese society after the war.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (II) Part 2. The Earth (地)

ThA2-3

Colonialism Reconfigured: Militarized Development and The Construction of South Korea's Power Infrastructure During The Park Chung-hee Era

Aaron Moore
Arizona State University

Until now, the "miracle of the Han" has been the narrative that has framed work on Korean industrialization during the Park Chung-hee era. Such a narrative privileges the nation as the primary unit of economic development. Largely missing from these accounts is an analysis of the transnational flows of capital, ideas, people, goods, and technology that formed the basis for post-war Korean development and the new international power relationships that were formed within these flows. These flows emerged out of entangled histories of Japanese colonial rule and the rise of the US Cold War order in East Asia.

This paper focuses on the Soyanggang Multi-Purpose Dam project (1967-1973), a prominent symbol of Park Chung-hee's development policies in South Korea. The project's supervisor, Nippon Kōei, was established by colonial engineers who had formerly worked in Korea under Japanese rule. These same engineers were contracted by Park's government to supervise the construction of South Korea's hydro-power infrastructure, including Soyanggang.

By focusing on Soyanggang, I examine how the Park government's exchanges with Japanese experts and their ideas reshaped Japanese planning conceptions and earlier colonial policies into militarized development at large-scale infrastructure projects. I examine some key Japanese colonial institutions and policies that were reintroduced through this project such as forced labor and the resettlement of nomadic farmers. Moreover, I analyze the local effects and responses to Park's reconfigured form of colonial development.

**Coming to Terms with the Western Science: three East Asian Nations****ThB2-1****‘Not to Be Left Behind’: Einstein and Theory of Relativity in Korea under Japanese Occupation**

Zae-young Ghim

Korea Advanced Institute of Science and Technology

I discuss the public understanding of Albert Einstein and the theory of relativity (henceforth E-TR) in Korea during the Japanese Forced Occupation and the influence of E-TR on the science culture before the Liberation in 1945. The name of Einstein was first introduced, along with the story of Arthur Eddington's eclipse expedition to confirm the theory of relativity in 1919, in a journal called *Gong-Wu* in 1920. The journal was published by *Gongwugurakbu*, a society established for the purpose of cultural development by the advancement of industry. E-TR became a recurring topic in Korean newspapers and journals ever since. Inspired by the news of Einstein's visit to Japan in 1922, Korea Education Association tried to invite Einstein to Korea in promoting the Movement for Establishment of Civic College, only in vain. But a series of public lectures on the theory of relativity followed. For instance, Ch'oe Yun-Sik, a Korean mathematics-physics student at Tokyo Imperial University, delivered public lectures on the theory of relativity in Seoul. Those lectures were a part of the culture movement for Reconstruction (*Gaejo*). In order to contextualize the movement and lectures, I analyze articles in specialized journals: Shin Tae-Ak's in *Sin-Saeng-Whal*, Yi Gwang-su's in *Dong-Kwang*, and Do Sang-Rok's in *Cho-Kwang*, to name a few. I explore (1) the cultural significance of the scientific lectures, (2) the implication of E-TR to the Korean publics, (3) the relation between E-TR and Korea's culture movement during the Japanese Occupation, (4) the influence of E-TR to the Korean scientific culture afterwards, and (5) the implication to the independence movement against the Japanese colonialism in the wider context.

Coming to Terms with the Western Science: three East Asian Nations**ThB2-2****Heisenberg and Dirac's Visit to Kyoto in 1929**

Daisuke Konagaya

Ryukoku University

In 1929, W. K. Heisenberg (1901-1976) and P. A. M. Dirac (1902-1984) traveled from Europe to the United States and then came to Japan at the invitation of Japanese physicists' community. Two of European founders of quantum mechanics had been "greeted as heroes" with the VIP treatment in Japan. Where they visited and what lectures they delivered at Japan have been explained, for example, in Dong-Won Kim's *Yoshio Nishina: Father of Modern Physics in Japan* (2007) and Graham Farmelo's *The Strangest Man: The Hidden Life of Paul Dirac, Quantum Genius* (2009). The two leading physicists gave several impressive lectures on quantum theory at Institute of Physical and Chemical Research (RIKEN) and Tokyo Imperial University (UTokyo) in Tokyo. It was well-known that their lectures had "stimulated the minds of young Japanese physicists" at that time. This paper will treat Heisenberg and Dirac's visit to Kyoto in September 1929. Their visit to Kyoto and lectures at Kyoto Imperial University were not noted in the related historical study, since the event was much smaller than Tokyo's and their lectures were simply selected from the lectures delivered at RIKEN and UTokyo. However, young physicists including Hideki Yukawa (1907-1981) attended the event and had a chance to take notice of each decisive theoretical topic through the Kyoto lectures. This paper will show the details of Heisenberg and Dirac's stay and lectures at Kyoto, and its stimulation to Japanese scientific future generations.

ThC2

Science and Society in Late Imperial and Republican China (I)

Organizer: Iwo Amelung (Goethe-University)

Research into the development of science in late Imperial and Republican China has become a rather hot topic and especially the question of the reception and appropriation of Western scientific knowledge - including especially the question of terminology - has become a very prominent issue for historians of science. Up to now, however, the question of how scientific knowledge was embedded into the society, and especially how the Chinese society during the period in question dealt with Western knowledge, influenced the appropriation of scientific knowledge and was influenced by it, has not played the role in the academic discourse, which it would deserve. The proposed panel will provide new findings on the relationship between science and society during a period, which was crucial for China's modern development. It on one hand aims to fill glaring lacunae in recent historiographical debates, such as the "Great divergence" debate, in which science (and technology) is largely ignored. It on the other hand will show, to what extent science actually was a part of social life during the period in question. The papers presented within the panel also will contribute to close the gap between general historiography and history of science and technology. The panel will offer new perspectives on questions such as the political function of science and the "polilticalisation" of science, the popularisation of scientific knowledge, the application of scientific ideas in everyday life as well as different forms of publication of scientific texts. We are also interested into the question of "hybrid" practices - hybrid here not only understood as an amalgam of Chinese and Western scientific knowledge, but also as a knowledge, which transgresses - and in this way transforms - different registers of knowledge production and application.

Science and Society in Late Imperial and Republican China (I)

ThC2-1

Meteorology and Sovereignty in Republican China

Iwo Amelung

Goethe-University, Frankfurt am Main

In the early 1920s Zhu Kezhen, a Harvard-trained meteorologist, published a number of popular articles, in which he postulated a direct link between meteorological knowledge and China's national independence. He in thus way stressed that it was the obligation of the Chinese society to foster scientific progress in order to strengthen the sovereignty of China. While the relationship between science and national strength is one of the stock phrases of the May Fourth-movement, the actual relationship between mobilization with the help of propaganda and the building of scientific institutions (including weather stations etc.) has been rarely studied in greater detail. In this paper I will suggest that the case of meteorology helps us a great deal to understand the mechanisms between politics, science and institutionalized science. It suggests that the aspects of popularization and localization of science play a crucial role in this relationship and need to be taken into account, when one wants to understand the development of the sciences in the first half of 20th century China.



Science and Society in Late Imperial and Republican China (I)

ThC2-2

The Internalization of Geology in China: V. K. Ting and His Early Years at The Geological Survey of China

Qi Han

Institute for the History of Natural Sciences, Chinese Academy of Sciences

The Geological Survey of China (GSC), founded in 1913, was the most influential scientific institution in the Republican China. As the founder of this institution, V. K. Ting played an important role in the development of geological research through his active involvement in the international cooperation. Based on newly found letters, I would like to discuss how Ting established close relationship with Swedish, French and American paleontologists and geologists with help of the Swedish geologist J. G. Andersson. In addition I will explain how Ting devoted his efforts to collecting books in order to build up the library of GSC whenever he visited America in 1919 or wrote to foreign friends. Ting's hard work laid the solid foundation for the further development of geology in China.

Science and Society in Late Imperial and Republican China (I)

ThC2-3

Between Industry and Science: Sohtsu Gee King's Patronage of Science in Republican China

Chengsheng Sun

Institute for the History of Natural Sciences, Chinese Academy of Sciences

Personal patronage of science had played a more and more important role in Chinese society since 1912, partly due to the active promotion of modern science and education in China by Western individuals and Chinese practitioners. A leading figure in this story was Sohtsu Gee King (金绍基, 1886-1949), who was born in a wealthy family in Huzhou (湖州). King went to the UK in 1902 to pursue advanced study. He returned to China in 1905 and gradually became a very successful businessman as a comprador and later an industrialist. Meanwhile, he trained himself as a prominent conchologist and provided the funds for the founding of Peking Society of Natural History, Fuel Laboratory of Geological Survey of China, and Sohtsu G. King Collection of Conchology, among others, which greatly promoted the science development at the time. In addition, he was very active in the Science Society of China, China Foundation for the Promotion of Education and Culture, Peking Union Medical College, Peking Rotary Club, and Peking Scottish Rite, either as a trustee or as president. This paper will investigate how King dedicated himself to the pursuit and patronage of science while maintaining a successful career as an industrialist.

ThD2

Populations, Demographic Sciences and The Japanese Nation-State-Empire

Organizer: Sujin Lee (University of Victoria)

Historical studies on demography in recent years have demonstrated that the growth of the scientific field went in tandem with a development of modern sovereign states and empires. They also claim that Japanese nation-state-empire was one of the central subjects in the international population debate. Yet, we know little about population practices that occurred within the Japanese Empire or what impact they had on the international discussion on world population. We address the gap in historiography by analysing discourses on population and demographic sciences in Japan and in Korea under Japanese rule. We cover the period of 1910-45, which not only corresponds to Japan's rule in Korea but also to a quick growth in demographic science worldwide. Sujin Lee, with "The Dawn of Total War Governmentality: Population Discourses in Japan, 1920s-40s," explores how wartime policies reflect continuities with the interwar blueprints for governing the population. Lee also analyzes how interwar population discourses were subsumed into total war governmentality - whereby welfare and warfare were inseparable - to be fully consummated. Aya Homei presents "Land, blood and the populations of East Asia: Population sciences for the Japanese wartime empire." Homei examines wartime population research linked to the "national land planning" policy, and depicts how scientists and technocrats debated over population distribution in relation to the Greater East Asia Co-prosperity Sphere. Finally, Jin-kyung Park presents on "Japanese Colonialism and the Geopolitics of Population, Race, and Nation in the Korean Imagination." Park brings into light the "population problem" in Korea and the Japanese Empire by examining how it was envisioned by Korean physicians, scientists, and other scholars. The panel aim to complicate the existing literature by depicting a polycentric landscape of demographic discourses within East Asia that developed under the aegis of, and in relation to, Japan as a nation state and a colonial empire.

Populations, Demographic Sciences and The Japanese Nation-State-Empire

ThD2-1

The Dawn of Total War Governmentality: Population Discourses in Japan, 1920s-40s

Sujin Lee
University of Victoria

This presentation explores the continuities in population discourses deployed by the Japanese government between interwar and wartime periods. Since the late 1920s, the government intellectuals took the leading role in institutionalizing population studies and promoting scientific and colonialist approaches to overpopulation. The wartime policies reflect continuities with the interwar blueprints for governing the population, particularly the state's responsibility for welfare and the scientific approach to administering the population under the banner of 'healthy soldiers and healthy citizens (*kenpei kenmin*).' The irony was that the interwar discourses on population - whose primary aim was to allow people to live well - had to be subsumed into total war governmentality - whereby the power of life and the power of death, or welfare and warfare, were inseparable - in order to be consummated.

**Populations, Demographic Sciences and The Japanese Nation-State-Empire****ThD2-2****Land, Blood and The Populations of East Asia: Population Sciences for The Japanese Wartime Empire**

Aya Homei
University of Manchester

This presentation examines the scientific investigation into the demography of the Japanese wartime empire, which was conducted in the 1940s in order to establish the policy of ‘national land planning’. It shows how the scientists and technocrats unanimously perceived the populations as representing the lebensraum of the Greater East Asia Co-prosperity Sphere, but they were split against the question of how the populations should be ‘deployed’ (*jinkō haichi*) for the policy. The difference in opinion, I argue, comes from the distinctive disciplinary traditions that were shaped through Japan’s relation to the region of East Asia, as well as to the rest of the world.

Populations, Demographic Sciences and The Japanese Nation-State-Empire**ThD2-3****Japanese Colonialism and The Geopolitics of Population, Race, and Nation in The Korean Imagination**

Jin-kyung Park
Hankuk University of Foreign Studies

This paper examines the discourse of population, nation, and race in Korea under Japanese rule. The population problem is one of the most frequently Japanese words that appeared in the publications of Government-General of Korea, medical journals, scholarly books, general magazines, newspapers, and so on. Not only GGK employees, state-commissioned researchers, scholars, and physicians on the colony but also politicians, colonial theorists, and journalists on the metropole of the Japanese Empire actively participated in the production of colonial discourse of the “population problem” on the Korean Peninsula. As imperial Japan approached the colony to cope with the problem of “overpopulation” in the metropole and to mobilize the Korean population as the crucial human resources of the empire, Korea occupied a central space in Japan’s project of population management in its empire building. How did the colonized envision the “population problem” (*ingu munje*, 人口問題) of the Korean Peninsula and the empire? How did Korean physicians, scientists, and other scholars partake in the research on the population problem? In what ways, was the discourse of population interconnected with that of the Korean race and nation (*minjok*)? How did the Koreans respond to the governor-general’s call to end the global struggle over the land, territory, and natural resources under the domination of the white population and race? By reflecting on these questions, this paper will bring into light the geopolitics and biopolitics of the population in Korea and the Japanese Empire.

ThF2

Cartographic Encounter: Korean Maps Meet Western Maps

Organizer: Don Baker (University of British Columbia)

Koreans have been drawing maps for well over a millennium. They developed enough cartographic skill by 1402 to draw a world map, the oldest extant world map from an East Asian perspective. Koreans have also been open for centuries to useful knowledge from beyond their own borders. That 1402 map drew on both Chinese and Arab geographical knowledge. Therefore, when Koreans first encountered Western cartography in the early 17th century, it was not the first time Koreans had an opportunity to see the world through non-Korean eyes. However, this encounter was one between two sophisticated cartographic traditions based on very different assumptions. In the three papers in this panel, we will show how Korean adopted information and techniques from the Western maps they obtained via China to enhance their own mapmaking to serve their own ends. Koreans learned from Western maps much more than they had known previously about kingdoms and peoples in other parts of the world. However, Don Baker will show that they continued to draw maps of the Korean peninsula that emphasized the geomantic features of the peninsula, as well as world maps that emphasized the Confucian realm as the centre of the civilized world. Jeanhyoung Soh will show, in an examination of Korea's unique wheel maps as well as the 18th-century novel *Taewonje*, how Koreans used their expanded knowledge of states and peoples beyond East Asia to imagine a utopia on the other side of the ocean. And Seonhee Kim will show that by the 18th and 19th centuries knowledge of Western maps has begun to stimulate changes in the way Koreans defined knowledge, the purposes it should serve, and how it could be acquired.

Cartographic Encounter: Korean Maps Meet Western Maps

ThF2-1

Where Are We? The Self-identity of Koreans Revealed in Maps

Don Baker
University of British Columbia

Copies of those maps European missionaries had brought to China reached Korea in the early 17th century. Koreans were intrigued by the new information they contained. However, though Koreans used much of that new geographic knowledge in their own mapmaking, at first it did not change the basic assumptions behind the way Koreans drew their own maps. Western maps tried to provide accurate geographic knowledge. In their world maps, Koreans were more concerned with showing that Korea was in the civilized part of the world, with civilization identified with Confucianism. That is why in their regional or world maps Koreans would place China at the centre and then would draw Korea as much larger than its actual size, presenting it as larger than the less-Confucian Japan and, of course, larger than the various countries in the West. Koreans used such maps to identify themselves as proud members of the civilized, i.e., Confucian, world. Identifying themselves as civilized, as they defined civilization, was more important to them to representing Korea's size accurately on world maps. When Koreans drew maps of Korea alone, however, they were concerned with geographic accuracy. However, they also wanted to show on those maps of Korea where *qi* (K. ki), which energized the landscape, was strongest. Even as they acquired the ability to accurately reproduce in maps the shape of the peninsula and its various parts, they made sure that those maps indicated Korea's geomantic features as well. Koreans wanted to know where they were in relationship of strong *qi*, and those maps were supposed to help them do that. Where they were had to be defined not just geographically but also ideologically and geomantically as well. They drew maps to help them do that.



Cartographic Encounter: Korean Maps Meet Western Maps

ThF2-2

Another Utopia: Fantasy of Circular World Maps (*Cheonhado* 天下圖) and Classic Novel *Taewonji* (太原誌) in the Late Chosŏn Dynasty

Jeanhyoung Soh
Seoul National University

The purpose of this study is to examine how the influence of Western geographical knowledge stimulated Korean intellectuals to imagine the fantastic world and utopia. Circular world maps (*Cheonhado*) produced only in Korea shows the entangled ideas borrowed from Western world map, East Asian cosmology and mythical imagination from *Shanhaijing*. The noteworthy features of the maps were imaginary nations and islands in the ocean, outside of the Asian Continent. The existing researches claims that these maps were a reflection of the Sinocentric worldview, Taoist immortality, and still imply the concept of round sky and square earth although they were produced under the influence of Jesuit World Map such as *Kunyu Wanguo Quantu*. However, this claim cannot explain the way of reception of Western geographical knowledge. Why did intellectuals produce the illusionary maps instead of learning the scientific knowledge? What kind of fantasy they got after they saw the Western maps? The imaginary world of *Cheonhado* has its own narrative. Its relationship with Western and Eastern sources cannot be denied. Nevertheless, these maps were the result of rearrangement of existing knowledge and fantasy. This rearrangement was not reduced to the Sinocentric world view or diminished as a mixture of sources. As Lucian Boia said, the world of imagination is the compensation for people who face crisis. With imagination, they pursue Utopia and bring meaning to their lives.

To explain their fantasy, I will compare the maps with the heroic novel *Taewonji* also appeared in the eighteenth century Korea. *Taewonji* started with main characters' ocean adventure, whose goal was to recover China from the barbarian domination. After the battles with monsters, heroes went to the West and found Utopia i.e. *Taewon*. With *Taewonji*, I will reconstruct the Fantasy of *Cheonhado* and show how Western geographic knowledge made Korean intellectual dream their own Utopia.

Cartographic Encounter: Korean Maps Meet Western Maps

ThF2-3

Changes in The Knowledge and Technology Accreditation Scheme: The Jesuits' Introduction of Cartography and Geography in The Late Choson Period

Seonhee Kim
Ewha Institute for the Humanities

Maps and geographical information provided by Jesuit missionaries such as Matteo Ricci forced the intellectuals of China and Choson to realize that the topology of civilization and barbarism could be different from their traditional perception of it. However, the status of civilization and barbarism was not something that could be immediately changed by the vast area outside China on the map itself and the explanation of it. In other words, for any knowledge to be approved and certified, ideological accreditation to comprehensively manage and control micro-information was needed.

For intellectuals of the Choson dynasty, the introduction of maps and geographical information was not merely a matter of quantitative expansion of knowledge or its development in detail. It was intimately related to the question of "what kinds of knowledge is accredited by what kinds of standard"; i.e., "changes in the knowledge and technology accreditation system." In Choson, Neo-Confucianism was the frame of reference even in the fields of the natural sciences and technology. The world map drawn by Jesuit missionaries collided with the Confucian literati's ideology over the requirements of civilization and its constituting principles, and by extension, produced changes in the criteria of acceptance and application of knowledge. This essay will explore the 18th to 19th-century Choson dynasty's Confucian literati's reaction to Western maps and geology as well as their intellectual accreditation process. Thereby, this essay will look into how the intellectual topology of the superordinate concepts, e.g. *dao* (道, the Way) and *xue* (學, learning), and the subordinate concepts, e.g. *yi* (藝, art) and *shu* (術, technology) were reshaped.

Th12

A Historical Overview of Traditional Medicine Education in Asian Countries

Organizer: Yeonseok Kang (Wonkwang University)

Asian countries have a heritage of traditional systems of medicine. Over recent decades, education system in traditional medicine have increasingly transformed into the trend of standardization in parallel with conventional medicine education. This panel focuses on 1) historical overview of traditional medicine education in modern Asian countries, 2) issues what traditional medicine education confront in contemporary Asian countries. As a platform for a comparative approach and perspective on traditional medicine education, we aims to draw out and analyze contemporary trends and issues in order to shed light on the phenomenon as a whole. The questions to discuss in this panel will be: 1. Historical overview since modern times 2. Results focused on recent issues what traditional medicine confront.

A Historical Overview of Traditional Medicine Education in Asian Countries

Th12-1

A Historical Overview of Traditional Medicine Education in Korea

Jiseong Hong¹ and Yeonseok Kang²

¹*Korea Institute of Oriental Medicine,*

²*Wonkwang University*

Since the trend of universalization, globalization, and standardization of higher education and medical care, traditional Korean medicine (TKM) has tried to establish a competent educational system in parallel with Western medicine.

This study reviews the history of TKM after the Japanese colonial era (1910-1945), from the establishment of Dongyang-Daehakwan (Institute of Oriental Medicine, 東洋大學館), which is regarded as the beginning of modernized TKM education, to the present. The exploration of trends and issues in TKM education through a historical review can elucidate the development direction and tasks of TKM education.

In 1948, Dongyang-Daehakwan, the forerunner of Kyunghee University, was established. With the amendment of the Medical Law in 1951, traditional and Western medicine have functioned under a dual system; education has also developed as the outline of medical education. In 1965, Kyunghee University introduced 6 years of TKM education, and in 1972, Wonkwang University followed; as of 2019, 11 private universities and 1 national university offer Korean medicine curriculum.

In recent years, there have been rather active movements to improve TKM education, in line with the worldwide trend of quality assurance in higher education. In 2005, to advance the level of TKM education, the Institute of Korean Medicine Education and Evaluation (IKMEE) was established; it has invested diverse efforts in creating a learner-centered educational environment.

In 2016, a competency model for TKM doctors was developed, following which standard efforts to set educational goals, modify curriculum and adjust assessment and evaluation methodologies are underway. There is a growing interest in education that helps acquire social competencies, which emphasize the professionalism to perform social roles, and clinical competencies firmly rooted on biomedical sciences. Integrating humanistic elements to the curriculum, affective domain is somewhat emphasized for teaching rather than transferring factual knowledge and skills



which have been dominant

A Historical Overview of Traditional Medicine Education in Asian Countries

Th12-2

A Historical Overview of Traditional Medicine Education in Thailand

Manmas Vannabhum and Pravitt Akarasereenont
Mahidol University

In the beginning, passing down knowledge of Thai traditional medicine (TTM) from generation to generation has been made to conserve the heritage of Thai wisdom. Later, traditional practitioners in the reign of King Rama III were learned not only from expertise practitioners but also several learning sources such as textbooks, herbal medicine recipes on marble tablets, and hermit body contortion statues.

In 1888, after the first hospital in Thailand, Siriraj Hospital, was established, TTM was a part of the patient's health care and medicine curriculum. Meanwhile, the medical curriculum was revised and emphasized on scientific courses and practice, traditional medicine was removed from the curriculum and was not in the educational system. However, the use of TTM has still a role to treat a variety of ailments and has continuously evolved.

In 1982, the Ayurved School was established by Professor Dr. Ouay Katusinh, who believed that the practitioners should have an education of general sciences and basic medical sciences as western medicine practitioners. This created a three-year program of Applied TTM for a High Vocational Certificate-level that made them different from conventional TTM. In 2003, the school was incorporated to the Center of Applied Thai Traditional Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University. The program was developed to a four-year program of Applied TTM for a Bachelor-level. Therefore, there were three ways of TTM education i) traditional training ii) TTM training iii) Applied TTM training. At the end of the study, the trainees or university graduates have to take licensing examinations to become licensed TTM or Applied TTM practitioners. In 2014 and 2016, the first Master and Doctor of Philosophy programs of Applied TTM were developed, respectively.

The educational concept is moving forward to evidence-based medicine and precision medicine that focus on treatment following scripture with the scientific frame-

work

A Historical Overview of Traditional Medicine Education in Asian Countries

Th12-3

A Historical Overview of Traditional Chinese Medicine Education in Singapore

Yan Yang
National University of Singapore

Chinese medicine in Singapore undergoes unique modernization which is different from TCM in China. This paper is to explore the development of Chinese medicine education in Singapore's context, from the colonial period to the present days.

The teaching of Chinese medicine in Singapore transformed from diverse acquisition methods to one standard modern college teaching system gradually. The non-governmental professional organizations such as the Singapore Chinese Physicians' Association and Thong Chai Medical Institution, initiated the bottom-up approach, via innovation and reform, to cope with own needs, and selectively learnt from others such as Western medicine teaching in Singapore and Chinese medicine teaching in China.

Later after the legislation of TCM in Singapore in 2000, these organizations cooperated with the government to improve and integrate the TCM teaching into the official system. On the other hand, the Singapore government adjusted the Chinese Medicine education to imitate the training system of Western Medicine Doctors in Singapore. The government's actions include the introduction of Continuing Education Program and the start of double degree program (TCM and Biomedical Science) at public universities.

The paper also discusses about the special features of Chinese medicine education in Singapore due to the unique local context. The teaching including the syllabus, the entry requirement and the job outlook for graduates are all different from those in China. The complicated process of localization sheds light on the transmission and development of Chinese medicine Overseas.

ThA3
Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (III) Part 3. Human (人)

Organizer: Chang-Geon Shin (Tokyo University of Science)

We investigate history of East Asian Science in the last century from broader perspective. Our serial panels encompasses several case studies of history of sciences, colonial technology and development projects, its encounter and conflicts with indigenous medicine and knowledge system. It will be investigated from the viewpoint of different disciplines and practical contexts. We examine them from the several angles of different subjects/objects, and actual societal/political endeavors and enterprises in and around, and before and after, Japan's self-claimed "Great East Asian Co-Prosperity Sphere." In doing so, our challenge is to contextualize East Asian specific features. Colonial sciences are used to have been analyzed in terms of such frameworks as Center-Periphery model, racial dominance, Hegemony-Subordinate relationship, technology-determinism, Local-Cosmopolitan matrix, and circulation of knowledge. But in this occasion of our 15th ICHSEA, we regard East Asia as poly-centric entity. As this poly-centricity is a general key conception for our conference, that we try to examine this in our series of sessions: How we see East Asia as poly-centric in colonial sciences; we try to show where, when, and what were the historical events and thoughts that different centric forces functioned, which they might have pulled different factors together and/or they fall each factors apart. We think it is able to stipulate this conception, when we analyze Japan's Imperial expansion, because it was one of the most peculiar historical events have shown diversified (thus poly-centric) aspects of East Asia to us. We are able to show some cases, that even seemingly centric Empire, Japan's Imperialism was in some cases much diversified and segmented, sometimes in inside they are conflicting to each other and contested within itself.

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (III) Part 3. Human (人)

ThA3-1
Reshaping The Empire's Laborers into Cold War's Primitive Bodies: Haenyeo and Ama Studies in Korea and Japan, 1932-1975

Jaehwan Hyun

Max-Planck Institute for the History of Science

The female diver communities (海女, *Haenyeo* in Korean and Ama in Japanese) have been spotlighted as living cultural heritages of humanity, which are valuable but endangered. The idea of endangered *Haenyeo* and Ama originated in anthropological studies of the Japanese Empire and was taken over by U.S.-led physiological research after World War II. This paper explores how the colonial research in *Haenyeo* and Ama studies was revitalized in the new political, social, and scientific context during the Cold War period. At the outset, in the 1930s, physical anthropologists and medical physiologists were keenly interested in studying the biological properties of "nature's daughters" (die Töchter der Natur) to improve the productivity of fishery labor at the dawn of the total national mobilization regime. Two decades after the Pacific War (1941-1945) ended, the US Navy became interested in the diving capability of the women diver groups for military purposes and to support research projects on this subject. At the time, American human biologists also started promoting diverse international cooperative projects to collect biological data on the world's vanishing people. In the shadow of possible nuclear devastation, the belief that "primitive" people and their survival traits for adapting to harsh environments were in danger due to rapid modernization in post-colonial nations was a driving force in global scientific initiatives. In this context, *Haenyeo* and Ama studies newly flourished from the 1960s onward. Examining two American-Japanese-Korean cooperative projects initiated by Hermann Rahn (1912-1990), Suk-Ki Hong (1928-1997), and Syōiti Kobayasi (1919-1983), this paper illuminates how these scientists studied *Haenyeo* and Ama's physiological traits to aid human survival in a future environmental crisis even while they strengthened the idea of the primitiveness of these women's bodies.



Polycentric East Asia: Japan's Colonial Science Legacy in its
"Heaven, Earth, Human (天地人)" and Industry (III) Part 3.
Human (人)

ThA3-2

**Bacteriological Practices and Debates at The
Time of Cholera Outbreaks in The Japanese
Empire in The 1890s**

Shiori Nosaka

École des Hautes Études en Sciences Sociales

Outbreaks of cholera disease in the second half of the nineteenth century in Japan brought not only a social impact of epidemics upon the society but also a concern of the new state over disease controls at the maritime border as well as within the territory. The government attempted to improve the health security with hygiene practices and public actions such as disinfection and isolation. In the 1890s the rise of bacteriological thoughts and its specific research methods, focusing on microbes and knowledge produced in the laboratory, resulted in a reorganization of hygiene regulations, introducing especially bacteriological diagnosis, experimental use of serum, and specific disinfection methods. However, this account focuses only on the outcome of control measures and thus dismisses two historical dynamics of this period: the debates on these measures, provoked by various medical actors, such as kanpō physicians, private practitioners trained in Western-styled medical schools, health inspectors of police, bureaucrats, and military physicians; and the co-evolution between the formation of bacteriology as a discipline and the expansion of the Japanese Empire, especially the first Sino-Japanese War and colonization of Taiwan. By following cholera control measures, epidemiological and bacteriological research, and debates on cholera outbreaks in the Japanese Empire, this paper will show how medical practitioners acted in the time of transition of medical authorities during cholera outbreaks, and on what the government conceived bacteriological methods as effective measures against cholera. It aims to describe a political and intellectual history of Japanese medical bacteriology, of which historians have often focused on its institutional aspect. It will help to rethink a framework of the early Japanese bacteriology within a landscape of the Japanese Empire.

Polycentric East Asia: Japan's Colonial Science Legacy in its
"Heaven, Earth, Human (天地人)" and Industry (III) Part 3.
Human (人)

ThA3-3

**Industrial Aquaculture's Imperial Moment: The
Rise and Fall of Gokasho Pearl Farm,
1920s-1930s**

Kjell Ericson

Kyoto university Graduate School of Letters

The early twentieth century was a pivotal time for ideas of industrial agriculture. Fordist and Taylorist models of factory production took form not just on the shopfloor, but also in the field. Elsewhere in the imperial world, plantation cultivation proved durable as an ideology of centralized governance, even in the face of smallholder challenges. This paper argues that early twentieth century ideas of industrial cultivation extended deep into saltwater. A trans-imperial focal point of this line of thinking was in coastal Japan: the Mikimoto company's Gokasho Bay pearl farm, easily the largest facility for the surgical manipulation and raising of pearl-bearing shellfish in the interwar world. Amid global controversy over the naturalness of "Japanese cultured" pearls, various colonial officials and entrepreneurs saw in Gokasho an industrial model for export cultivation along other shores. The cultivation of pearls appealed most to fisheries officials and other boosters in France and America, respectively the world's largest entrepôt and largest consumer market for pearls. In the interwar French and American imperiums, Gokasho was an example of Japanese saltwater improvement that might be improved further if transferred to waters in Polynesia or Hawaii. Visions of industrial pearl cultivation proved to be short-lived; dreams of recreating Gokasho, along with the farm itself, have faded from view. Yet in another sense, Gokasho's imperial moment emerged from a common ferment of industrial ideas that were shaping both land and sea--and which persist along cultivated coastlines in our current age of "Blue Revolution."

Polycentric East Asia: Japan's Colonial Science Legacy in its "Heaven, Earth, Human (天地人)" and Industry (III) Part 3. Human (人)

ThA3-4

Forming A United Front Against Western Medicine: Medical Scientists and Kampo Doctors in Japan's Wartime

Chang-Geon Shin

Tokyo Institute of Technology

In this presentation, I would like to discuss about presenting a united front between western medical scientists and Kampo doctors in Japan's wartime. The outline of my questions is as follows: (1) Why and how did they form a joint front against western medicine to construct "Japanese Medicine (Nippon-Igaku 日本醫學)"? (2) What was the newness of this collaboration? (3) Who were the leading figures of the "Japanese Medicine" movement? and (4) What is the difference between the insider and the outsider Kampo doctors of this movement?

To consider these problems, this presentation focuses on the Research Society for Japanese Medicine (日本醫學研究會), established in 1935. It is the first active society to be established by western medical scientists and Kampo doctors in Japan, in which famous university professors and western medical clinicians took part. Until now, the close relationship between pharmacology and traditional medicine have been pointed out. In addition to famous pharmacologists and Kampo doctors, it is remarkable that some physiologists, physicians and radiologists played important roles in this society.

This presentation examines a physiologist Kunihiko Hashida (橋田邦彦) and a physician Takeshi Itakura (板倉武), who both belonged to the School of Medicine at Tokyo Imperial University. Almost pharmacologists, who participated in "Japanese Medicine" movement, appreciated the usefulness of Kampo drugs. But Hashida and Itakura were different from them. I would like to discuss about the relationship between Hashida's physiology and "Japanese" medicine, and the relationship between Itakura's therapeutics and Kampo art.

Technology as a System: Cases from Modern Japan and Korea

ThB3-1

From The One-side Records to The Two-sides Records and The Consequences for The Early Japan Recording Industry

Caroline Boissier

Aoi Bunka

During the 19th century in Europe and the New World, scientific research on sound recording and phonography (the means of recording a voice as fast as people can speak) created rivalries and competitions between Thomas Edison (1847-1931) developing his phonograph (using cylinders), and Emile Berliner (1851-1929) developing his gramophone (using records). As a result of these developments, the companies of the newly created music industry quickly developed in the world, especially in Russia, Canada and Asia (China, Singapore and Japan). In 1896, an American trader, Frederic Whitney Horn (1868-date of death unknown) arrived in Japan and opened a retail business. Interested in gramophones, he went into partnership with Matsumoto Takeichirō (1865-1907) who had opened the first record shop in Japan. Their aim was to found a recording company in Japan to produce and record the work of Japanese artists, instead of introducing records from western artists. Horn contacted Yuchi Keigo (birth/death dates unknown), a young man who had a passion for gramophones. His job was to create and develop the first Japanese gramophones (Nippon phone) and the first one-side records. The long and difficult manufacturing process to create one-sided records, at the very beginning, from cardboard and imitation leather, and the consequences (robberies, illegal copies sales), lead Horn and Matsumoto's firm to strive to develop a new kind of record: two-side records (made from shellac and laminated materials). These developments led the pair to obtain the first set of protections under what was then newly established copyright law for musicians in Japan.



Technology as a System: Cases from Modern Japan and Korea

ThB3-2

Constructing through Systems: Modelling and Simulation by Japanese Engineers from 1930s to 1960s

Yize Hu

Johns Hopkins University

Following the use of electronic computers and the introduction of cybernetic theory, modelling and computer simulation emerged across different disciplines including civil engineering and urban planning in Japan in the 1950s and 60s. Japanese scientists and engineers described simulation and modelling as a process of studying a real world “system”(kei or shisutemu) by building a “model” (*moderu*) or “equivalent system” (*tōka kei*) which would give the same response as the real system if the same input was given to both. By tracing the history of these key concepts in the related fields of civil engineering and urban planning, I argue that the idea of thinking physical objects and construction projects as systems appeared in prewar period and became the basic conceptual framework for modelling and computer simulation in these two fields in postwar period. Specifically, when working on the planning and construction of transportation infrastructure, urban areas, and industrial complexes in Japan and its colonies in the 1930s and 40s, civil engineers like Hirayama Fukujirō and Yokota Shuhei started to perceive their engineering targets as systems and build models for them as the first step of solving real world problems. After the World War II, this mode of thinking met with cybernetic theory and electronic computer to form the conceptual framework of modelling and simulation in these two fields. This article shows how Japanese engineers developed and used the concept of “system” by examining their academic activities within the material, institutional and social contexts.

Technology as a System: Cases from Modern Japan and Korea

ThB3-3

Politics on The Radio - The Campaign of Sending Radios to Rural Villages of Park Chung Hee Regime's in The 1960s

Hisuk Kim

Chonbuk National University

The most dominant medium of mass communication in South Korean society during the 1960s was the radio. The radio set infiltrated all corners of the country, cities and villages alike, and the entire populace listened in on radio broadcasts. This trend was in fact strongly influenced by a social program for sending radios to fishing and farming villages, initiated by the Park Chung Hee regime. Why had the radios been selected for distribution? And how were radio sets disseminated to these villages? In order to answer these questions, this research investigated the backdrop to the radio distribution program, the process in which the initiative transformed into a nation-wide movement, the method of radio set distribution, and the effects observed in its aftermath. The results showed that the radio distribution program had been prompted in order to effectively communicate the Park regime's official statements, and it can be seen that the plan for disseminating free radios was a movement of a hierarchical nature in which the entire populace was mobilized. Furthermore, the dissemination of radios had the effect of differentiating lifestyles - whereas the city enjoyed the radio as a form of entertainment, it was a medium for education and learning in the rural areas. Lastly, the radio dissemination movement prevented the domestic electronics industry from idling, and provided it with a survival opportunity.

ThC3

Science and Society in Late Imperial and Republican China (II)

Organizer: Iwo Amelung (Goethe-University)

Research into the development of science in late Imperial and Republican China has become a rather hot topic and especially the question of the reception and appropriation of Western scientific knowledge - including especially the question of terminology - has become a very prominent issue for historians of science. Up to now, however, the question of how scientific knowledge was embedded into the society, and especially how the Chinese society during the period in question dealt with Western knowledge, influenced the appropriation of scientific knowledge and was influenced by it, has not played the role in the academic discourse, which it would deserve. The proposed panel will provide new findings on the relationship between science and society during a period, which was crucial for China's modern development. It on one hand aims to fill glaring lacunae in recent historiographical debates, such as the "Great divergence" debate, in which science (and technology) is largely ignored. It on the other hand will show, to what extent science actually was a part of social life during the period in question. The papers presented within the panel also will contribute to close the gap between general historiography and history of science and technology. The panel will offer new perspectives on questions such as the political function of science and the "polilticalisation" of science, the popularisation of scientific knowledge, the application of scientific ideas in everyday life as well as different forms of publication of scientific texts. We are also interested into the question of "hybrid" practices - hybrid here not only understood as an amalgam of Chinese and Western scientific knowledge, but also as a knowledge, which transgresses - and in this way transforms - different registers of knowledge production and application.

Science and Society in Late Imperial and Republican China (II)

ThC3-1

Relationship between Ministry of Education and Academia Sinica in Republican China

Banghong fu

University of Science and Technology of China

During the republic of China, education and S & T in China were transformed from traditional to modern. Meanwhile, the Ministry of Education played an important role as the general pivot of academic and education undertakings. In 1927, the Academia Sinica was founded. In its organizational law, it is defined as the highest academic research institution of the Republic of China which directly under the national government, and is responsible for carrying out scientific research and directing and rewarding academic research. Since then, the Academia Sinica and the Ministry of Education had become the key institutions influencing the academic progress of modern China. How did these two institutions deal with their relationship in the more than 20 years of coexistence? What are the factors that affected the cooperation or constraints between them? What impact had it done on the academic progress of China? This article intends to make a preliminary study on these aspects.



Science and Society in Late Imperial and Republican China (II)

ThC3-2

The Popularity of The Mechanistic View of Body in The Republican China

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In the Chinese traditional wisdom, the body is an integration of its physical form and mind of human being. The body indeed equals to the human being himself. However, in the Republican China period, this organic view had been gradually replaced by the mechanistic view of body that emerged from the modern Western societies. The popular newspapers and periodicals in this period had introduced massive new knowledge and images of body in three main aspects. The first is to present and introduce the body's structure (including muscles, bones, internal organs) and related knowledge to the public. The second is to consider the body as an entity composed of substances including water, proteins, and trace elements. The last one is to describe the body as a delicate machine or a running factory. The knowledge, discourse and images of body in these mass media indicate that a new conception of body which was different from the Chinese traditional one emerged and became popular in the public during this period. This new concept of body is visual, material, reductive, measurable, and machined. The emergence of this view is inseparable from the introduction of modern Western science especially physiology and medicine. Meanwhile, it also facilitated the acceptance of the theory and the clinical practice of Western medicine by Chinese people.

Science and Society in Late Imperial and Republican China (II)

ThC3-3

Teaching a New Style of Reasoning: Logic Textbooks in Late Qing China

Joachim Kurtz

Heidelberg University

Textbooks played a decisive role in the transformation of knowledge in the final decade of the Qing dynasty. Spurred by the curricular reforms promulgated from 1902 onward, newly established publishing houses competed to supply introductions to the new disciplines to be taught in educational institutions throughout the empire. In hopes of obtaining endorsements by the state bureaucracy, and thus securing a potentially lucrative market, editors initiated a veritable "textbook revolution." The textbooks contributing to this revolution helped to draw new disciplinary boundaries, stabilize new languages of scholarship, and propagate new ways of teaching, learning, and reasoning. The effects of this revolution are not yet well understood. We have no reliable data on the exact number of textbooks thrown onto the Chinese print market between 1895 and 1911. Nor do we have a precise understanding of the impact of these works in different disciplinary contexts. This paper will address these two problems in the limited realm of logic, one of the new subjects embraced by late Qing educational reformers. Following a brief review of the Chinese discovery of European logic as the basis of a presumably more potent style of reasoning, I will trace the subject's integration in the new educational curricula that incited the production of logic textbooks during the Xinzheng decade. In the main part of my paper, I will then try to sketch two competing images of the new discipline arising from twenty-two of these textbooks translated from Japanese. I will pay particular attention to the ways in which these works taught logical operations and which part they played in the stabilization of a specialized vocabulary. In conclusion, I will assess what, if anything, they contributed to the new style of reasoning by which early propagators of logic hoped to reshape Chinese discursive practices.

Guns, Arms, and Steel in East Asia

ThD3-1

Metallurgical Analysis of Forged Iron Cannon in Late Ming Dynasty

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In the history of cannon technology in China, literatures shows that fabrication technology of cannon was shifted from casting to forging in Ming dynasty called as She Zhu Wu Duan (舍鑄務鍛) which means giving up casting and taking forging technology. A number of forging cannon had been used in Korean War in the years of Wanli. The main objective of this study is to evaluate the forging technology in Ming Dynasty by an examination of microstructures and chemical composition of a forged cannon which was fabricated in Shangxi (山西), China in 16 century. The suggested forging technology based upon the metallurgical analysis is compared with that described in the ancient document Shen Qi Pu (神器譜) and ZhuRong Zuo Li (祝融佐理), where eutectic complex oxides with a low melting point seems to play an important role in forging process. A possible forging technology transfer and technology similarity among China, Japan and Korea in 16 century will be discussed from the view of material analysis.

Guns, Arms, and Steel in East Asia

ThD3-2

The Reverberatory Cupellation Furnace of Southwest China in The 17th-19th Centuries

Nanny Kim
Heidelberg University

Cupellation technologies in China are scarcely documented and insufficiently known. In the existing research, which covers the period from the second to the thirteenth century, the basic technology in use from roughly the tenth century is reconstructed as employing ceramic cupels with an ash lining and ventilation. It is expected to have been largely similar to the (also in detail unknown) silver separation in Korea and to the well documented haifuki process in Japan. This paper presents research that approaches the problem by working backwards in time. Based on remains still onsite in mines that were abandoned about 1850 and on nineteenth century records, a reverberatory furnace can be clearly identified for southwestern China before the beginnings of modernization. Scattered records, especially Tiangong kaiwu of the early seventeenth century, allow tracing the evolution of the process. Results show a transformation that realized a major gain in fuel and labour efficiency and discusses structural differences with the reverberatory furnace in late medieval and early modern Europe.



Guns, Arms, and Steel in East Asia

ThD3-3

Circulating Guns: On The International Arms Trade Market and Japan in The Middle of The Nineteenth Century

Sungkeon Kim

Chonnam National University

This study attempts to understand the specificity of Japan's military modernization through the concept of international gun circulating market formed in the middle of 19th century. Gun manufacturing technology made two dramatic shifts in the mid-19th century. First, the traditional guns were replaced by modern guns with some new technology such as breech-loading rifles and detonators. Second, traditional gun manufacturing technology, which was largely dependent on craftsmanship, shifted to American compatible parts production system. The international advancement of these weapon technologies was very rapid and explosive in the middle of the 19th century. The rapid evolution of such a gun dramatically shortened the cycle of guns on battlefields. In other words, when the new guns are identified for their outstanding performance on battlefields, previous guns were recognized as old fashioned weapons that can no longer function as modern weapons. As a result of that, the old guns were discarded or flowed into the international trade market in search of new battlefields that needed the guns. In the middle of the 19th century, open ports in Japan, such as Yokohama and Nagasaki, emerged as centers for such second hand guns. A large number of Western-style guns were imported to Japan by so-called death merchants. It was, of course, entirely due to the influence of the Civil War between the Shogunate and the local powers called Han in 1860s. This study will examine the specificity of Japanese military modernization in East Asia in relation to the international arms trade market.

Guns, Arms, and Steel in East Asia

ThD3-4

The Introduction of Western Metallurgy into Late Qing

Hao Chang

I-Shou University

This paper aims to explore the problems faced by the Qing government in having Western texts translated into Chinese, how these problems were dealt with, and what practical achievements were accomplished in the areas of Chinese metallurgy. A noteworthy issue here would be whether or not the decision to imitate, or at least refer to, the successful development of Western countries proved to be an effective learning experience for the Chinese. Did the Manchu government, for example, pay any attention to the historical context in which Western metallurgy took place? This is a significant point worthy of further study. In brief, the paper will focus on three main aspects: (1) what new scientific theories and knowledge were introduced into China during that time; (2) what problems the government faced in translating Western scientific texts into Chinese; and (3) what texts were particularly prized by the Chinese in their pursuit of self-strengthening through industrial and military development.

Meteorological Knowledges and Practices in Premodern and Modern East Asia

ThE3-1

Yi Ik's Classification of Portents and Its Rational Reconstruction in Eighteenth-century Korea

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University*

This article examines the theory of portents [災異論] proposed by Yi Ik in the 18th century Joseon, and focuses on how he recognized and classified portents in his collection of jottings, titled the *Fragmented Essays of Master Seongho* [Seongho saseol, 星湖僿說]. Yi Ik's theory of portents shows how the world-view of the 18th century intellectuals changed due to the influx of Western science and how they adjusted the existing theory to a new world-view. While previous research has aimed to measure the degree of Western modernity found in Yi's discussion of portents, this paper questions what role Western science played in it. People of the 18th century no longer believed in the existing theory of portents that posited a one-to-one correspondence between natural phenomena and human affairs. However, Yi believed that the correspondence between human affairs and natural phenomena was evident, but the mechanism of one-to-one relations caused people's distrust. Thus, he tried to reconstruct a rational theory of portents with the new mechanism and to complete this project through Western astronomy and geography. First, Yi classified astronomical portents that could be observed globally as portents of heaven. He then proposed an elaborated scheme of Field Allocation [分野] by which to measure the degree of correspondence between heavenly portents and localities on the globe. On the other hand, what Yi classified as portents of earth could be observable only in a certain locality and thus, corresponded to only that place. He argued that some of the phenomena that had so far been known to occur in heaven, were in fact local phenomena produced by qi of the earth. As a result of the classification, Yi could constitute a rational theory of portents suitable for the expanded world-view after the influx of Western science.

Meteorological Knowledges and Practices in Premodern and Modern East Asia

ThE3-2

The Formation, Dissemination and Its Backgrounds of The Supposed Theory "The Climatic Aridity in Northern China and The Encroachment of The Desert" (1870-1949)

Liang Liu

The Institute for the History of Natural Sciences, CAS

Since the modern times, the supposed theory "the Climatic Aridity in northern China and the encroachment of the desert" proposed by some western scholars in China aroused widespread concern and strong resonance in the country, and got spread by scholars of various professional backgrounds. Through sorting a large number of the original English literature in the form of chronology, this paper fully demonstrates the formation process and dissemination of the theory, and does as far as possible in-depth analysis on the interaction between the scholars. And then this paper makes a comprehensive explanation for the formation and communication of the theory from aspects of the geographical differences between the Occident and China, the history of learning geographical environment of China by the Occident, national conditions and upsurge of the ethos "to save the nation with science" since modern times, the related conclusions by research on historical climate and environmental changes, and makes objective evaluation on the rationality.

**Meteorological Knowledges and Practices in Premodern and Modern East Asia****ThE3-3****Aviation Meteorological Observation of The Japanese Empire and Its Colonies (1925-1945)**

Kam-Wing Fung
The University of Hong Kong

The Japanese government modified the duties of the Central Meteorological Observatory in July 1925 and added “the observation, investigation and forecast of aviation meteorology” to the list. Since then, professional meteorologists of aviation meteorology were assigned to meteorological stations in Japan, Korea, Manchuria and Taiwan. Aviation meteorological observation for military purposes became increasingly important with the emergence of Japanese meteorological institutions, including the establishment of the Meteorological Department of the Japanese Army in 1938, the expansion of the Department of Hydrography of the Japanese Navy in 1936 and 1941, the founding of the Meteorological Department of the Kwantung Army in 1938 and the creation of meteorological stations under the Territorial Government of the South Seas (since 1939). Using archival materials of aviation meteorology and related observational instruments, this paper will look into the drawing of aviation meteorological charts by professional meteorologists at meteorological stations of the Japanese Empire and its colonies, as well as their study of cloud physics and other related scientific activities.

Meteorological Knowledges and Practices in Premodern and Modern East Asia**ThE3-4****The Secrets of The Cheugugi Standards**

Hyein Kim
Chonbuk National University

The standard of the Cheugugi(測雨器, Rain Gauge) is highly regarded based on modern science in that it does not differ much from the standard of the modern rain gauge. In this paper, the modern scientific evaluation surrounding the Cheugugi is deconstructed by closely analyzing the three articles in the Annals of the Joseon Dynasty, which are considered records related to the Cheugugi. The standard of the Cheugugi is related to people's perception of rainfall and the system of measuring rain gauges, especially the change of standards in 1442 is related to politico-ritual function.

Medicine and Society in the Japanese Empire

ThF3-1

Prison Health Care and The Empire of Japan

Cheng Yu Lin

Law School, Kyoto University

The one of purpose of modern prisons is to create a sanitized and civilized prison environment to promote there habilitation of prisoners. Therefore, the establishment of prison health- relative institutions and knowledge, as well as how to practice become important issues for governing prison and prisoners. Meanwhile, we should notice that health care and punishment are essentially in conflict with each other. This paper wants to explore how the Japanese Empire introduced prison health-relative institutions, knowledge, discourses and how the empire governed prisoners' health? In addition to mainland Japan, the scope of this paper also includes the prisons in the colonial Taiwan and Korea. I use the public documents and statistics, the journals about prison, public health, and the records left by the inmates to analyze the conditions of prison health under Japanese rule. I will discuss the process of penal change and establishment of prison health in the empire of Japan, how the Japanese Empire introduced relative prison health knowledge, and what effect it did. Therefore, in addition to find that Japanese Empire how to establish prison health institutions, I want to investigate about what kind of diseases were among prisoners? How was prisoners' health status? What measures did the Empire take for these? Based on this empirical research, I will examine whether or not prison health of the Japanese Empire suited the values and standards of the civilized. Through such an investigation, I will point out that the Japanese Empire brought limited prison health reform in East Asia. Besides, through comparing the prison health conditions among three regions, I want to clarify if the colonial prison was civilized or not, in response to the theory of colonial modernity.

Medicine and Society in the Japanese Empire

ThF3-2

Same Bed, Different Dreams: The Biometrical Studies of Korean Children in Colonial Korea during 1930s

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Program in History and Philosophy of Science at Seoul National University

This paper investigates the biometrical survey on Korean children by Korean medical researchers who trained for the vital statistics at the Keijo Imperial University 京城帝国大学, which was established in colonial Korea by Japanese Government. Contrary to the previous studies that regarded the survey as a mere means for Japan to legitimize the colonization of Korea, this study focuses on the motives of the Korean medical researchers and their interaction with the colonial government, revealing the tension between them. The survey had been run for Koreans aged three to eighteen years old during 1930s supported by the colonial government providing the statistical data and the administrative convenience to the survey researchers. Analyzing their motives and survey results, this study reveals three characteristics regarding the survey as follows. First, the Korean medical researchers expected that their survey would help the liberation of Korea from Japanese rule by improving the Korean Children's health as the potential power for the future independent movement. The Colonial government, however, regarded the survey as one of the most effective way to evaluate the health condition of Korean young generations as the workforce for the colonial rule. Second, the Korean survey researchers wanted to highlight the academic contribution of the survey in the medical field. Third, in this context, the Korean survey researchers tried to make the standard pattern of the growth of Korean Children, rarely considering its practical use from the view of colonial government. In conclusion, this paper will argue that the scientific knowledge through the biometrical survey on Korean Children in colonial Korea was produced by the interaction between two groups which have different purposes from one another.

**Medicine and Society in the Japanese Empire****ThF3-3****Modernized Domestic Care Dictates in Public Health Nursing Practice in Taiwan 1895-1970**

Zxyyann Lu

National Yang-Ming University

This historical study explores the characteristics of knowledge paradigm in nursing professional development in Taiwan during 1895-1970. The period of 1895-1970 has been chosen due to Japanese colonization of Taiwan 1895-1945 and followed by the international aids to Taiwan during 1945-1970. How has the biomedical nursing been adopted as one of the health care professions and as professional caregivers in Taiwan have not been studied. Based on the feminist postcolonial perspective, the study analyzes the locality and modernity embedded in the power relations of nursing knowledge production. Archival records from ABMAC at the Columbia University, Rockefeller Archive Center as well as Taiwan Historica have been used. In addition, oral histories of practiced nurses were collected. The nursing knowledge paradigm may be characterized to be, 1. Initiates nursing manpower to care for the wounded and the sick by military conflicts and international collaboration of the control of communicable diseases. 2. The patriotic call for joining nursing workforce while emphasizes on scientific basis of public health nursing. 3. Transformation of domestic family care within the local social context professionalizes public health nursing. Scientific public health nursing knowledge accordingly based training programs to prepare the manpower for "preventive health" to ensure modernized society. The result also shows that nursing as one of the few occupations opened to women who not only practiced modern biomedical nursing to better the lives of local residents but also viewed nursing as a way to advance social status for their own family. Effective public health nursing practice embedded in intimately interacting with local residents, while scientific health education embedded in the mass education movement represents progression. The studying of Taiwan public health nursing should be valued and relocated in the international nursing circle on gender, science and colonialism.

Medicine and Society in the Japanese Empire**ThF3-4****Historical Analysis of The Japanese Psychiatric Beds Supply - Social Defense, Treatment, and Social Welfare**

Motoyuki Goto

Keio University

Past 40 years, community-based psychiatry has become the most preferable way for the mental health care in the world. However, the number of the psychiatric beds per capita in Japan is the highest, and average length of the hospital stay is also the longest. Most of the previous studies explained it by emphasizing the role of social defense of psychiatry in Japanese society and commercialism of private hospitals which owned more than 80% of the psychiatric beds nationwide. However, these explanations has ignored 1) the very high rate of welfare recipients in mental hospitals in the latter half of the 20th century, 2) more than half of the psychiatric hospitalizations, including the welfare recipients, were consistently covered by the public fund, throughout the 20th century, and 3) the widespread poverty of the patient's households. In my presentation, I will first classify the psychiatric hospitalization into three functions which are social defense, treatment and social welfare. Next, I will explain the historical transition of these functions using statistics which are uniquely accumulated from the viewpoint of the medical fee. Through these analysis, I elaborate how Japan made such rapid expansion of psychiatric beds, and raise the new framework to understand the meaning of the history of expansion of psychiatric beds as the one role of social welfare in Japan.

Diversity of Mathematics in East Asia

ThG3-1

Confucianism, Book of Changes, Mathematics and Calendric Computations: The Diversity of Mathematical Practices in Song Dynasty

Yiwen Zhu
Sun Yat-sen University

Previous studies have conveniently revealed that Chinese mathematics researched its peak in Song and Yuan periods. However, this point is mainly based on the study of mathematical writings: that is Qin Jiushao's (1208-1261) Mathematical Book in Nine Chapters, Li Ye's (1192-1792), Yang Hui's (13th century) and Zhu Shijie's (fl. early 14th century) mathematical writings. On the basis of my recent researches on mathematics in Confucian canonical literature, this talk will further study different mathematical practices in four domains in Song dynasty: that is Confucianism, Book of Changes, Mathematics and Calendric computations. Through carefully and detailedly analyzing Qin Jiushao's Mathematical Book in Nine Chapters, and Shao Yong's (1011-1077) and Zhu Xi's (1130-1200) writings about Book of Changes and ritual study, I will argue that there existed different mathematical practices in these four domains at that time, which could shape a more complex historical picture about Chinese mathematics in Song dynasty than we thought before.

Diversity of Mathematics in East Asia

ThG3-2

The Organization of *Chuhae Suyong* 籌解需用 and The Reason Why Hong Taeyong 洪大容 Wrote It

Yujin Hong
Seoul National University

Hong Taeyong (1731-1783) is famous for his cosmological ideas in his work, titled the Dialogues on Mt. Yi (豎山問答), but his only book about mathematics, the Manual of Calculations for Practical Uses (籌解需用), has not been studied enough. Rather, the level of mathematics in this book was evaluated lower than other books, and this book was also considered to have failed in introducing Western mathematics. By examining Hong's book, this paper seeks to reveal the structure of his book and his purpose of writing this book. In the preface of this book, Hong emphasized multiplication and division as the key of his book. Multiplication and division were important for him because the two constituted the rule of three. He divided the measurement problems into Kugo 句股 and trigonometry measurement, and uses the rule of three to solve both of them. Furthermore, he was able to incorporate astronomical measurements into the field of mathematics, by actively applying the rule of three to those problems. Based on this idea, this paper argues that the organized structure of Hong's mathematical texts, from basic operations such as multiplication and division to more complex and difficult problems such as astronomical measurement, reflects his perception of the merits of the Western learning, about which Hong summarized as following: "taking arithmetic as its foundation while complementing it with instrumentation." Through this structure, this paper also argues that with this book Hong finally aimed at understanding the physical structure of heaven and earth by measuring the celestial bodies, and that his book mainly consisted of the mathematical knowledge that were to serve this purpose. Lastly, this paper suggests that the insights that Hong acquired from solving the astronomical measurement problems gave a solid foundation to Hong's critique of astrology expounded in his other book, *Dialogues on Mt. Yi*.



Diversity of Mathematics in East Asia

ThG3-3

The Diversity of Mathematical Practice of Evidential Scholarship in Eighteenth and Early Nineteenth Century China

Miao Tian

Institute for the History of Natural Sciences, Chinese Academy of Sciences

Scholars of evidential scholarship in 18th century made great contribution to the rediscovery and publication of early Chinese text, including mathematical works. Even they were highly regarded in the historical study; they were criticized by some modern historians for their conservative attitude toward European mathematics. Based on detailed analyze of a number of leading scholars' work, this paper shows that diversity exists in mathematical practice of evidential scholarship. And I argue that such diversity shows the different understanding of the statute and nature of mathematics and the different stage of rediscovery of ancient texts.

Diversity of Mathematics in East Asia

ThG3-4

Mathematical Society in Edo Period - Based on The Illustrations in Wasan Books

Xu Zelin

College of Humanities, Donghua University

In the Edo period (1603-1867), one of the major features of the wasan books was the abundance of illustrations, which became an important part of the mathematical texts. According to their purposes, these illustrations can be divided into decorative, representational, organizational and explanatory illustrations. According to the content, it can be divided into (1) illustrations of pure mathematics (including the conceptual diagram of mathematical knowledge described in the text narration, the problem structure diagram, the diagram showing the quantitative relationship, the mathematical problem situation diagram, the diagram of explaining algorithm, etc.); (II) illustrations of life (including common life production, work skills, customs, architecture, painting, art, etc.); According to the mathematical knowledge involved, it can be divided into: (1) the intuitionistic diagram of the basic concepts of mathematics, (2) the schematic diagram of interesting mathematical problems (such as Josephus problem (繼子立), Program mouses (鼠算, Nezumizan), rabbit, etc.); (3) Graphics of algebraic geometric problems, (4) geometric figures in circular calculations, (5) other graphics. The main functions of these illustrations include: (1) intuitionism to help understand mathematical concepts; (2) interest to stimulate mathematics learning interest; (3) organic integrity to construct mathematical problems from graphics. On the basis of the classification and analysis of the illustrations of the book, the author considers that there are two kinds of mathematical cultural traditions, one is the practical arithmetic tradition, the other is the pure mathematical tradition of skill with algebra and infinitesimal algorithm as the core. The former tradition comes from the Chinese Ming Dynasty, the latter tradition comes from the Song and Yuan dynasties. Illustrations about the basic knowledge of arithmetic, illustrations of life and interesting mathematics are mostly found in the first kind of wasan books, the graphics of algebraic geometric problems and the graphics of Enri problems are mostly found in the latter kind of wasan books. A large number of illustrations appeared in the books because of the popularity of education in the Edo period and the prosperity of the plebeian culture. These illustrations not only reflected the social and spiritual life of the Edo period, but also reflected the popularization and application of mathematical knowledge in different social classes in Edo period and the understanding of mathematical value in traditional society of East Asia.

Materiality of Scientific and Technological Knowledge

ThH3-1

Science and Technology in Late Ming and Early Qing Dynasty

Yaxuan Liu

Henan University of Animal Husbandry and Economy

In late Ming Dynasty, China's science and technology was very developed. There were many world-level works that predicted the transformation of Chinese traditional science into modern science, such as Li Shizhen's *Compendium of Materia Medica*, Zhu Zaiyu's New Theory of Music, Pan Jixun's List of River Defense and so on. In such a short period, there were so many outstanding scientific monographs. The high frequency and wide range of subjects were unprecedented in Chinese history. The cultural exchanges between China and the West in late Ming Dynasty were frequent. Not only did many officials and scholars actively participate in cultural exchanges, such as Xu Guangqi, Li Zhizao, Wang Zheng, Sun Yuanhua, etc., but also many advanced western science and technology and related theories were introduced to China. In early Qing Dynasty, few scholars were involved in the cultural exchanges between China and the West. The introduction of advanced western science and technology was very limited. The technology introduced from the West was deeply locked in the palace. The general civilians had no chance to see it, and it could not play a role in promoting the development of Chinese society. In early Qing Dynasty, the cultural exchanges between China and the West were confined to the court. The majority of scholars were not encouraged to participate in the exchanges. The Academy of Science was not established. The development of science and technology in China was restricted. The Chinese scientific and technological talents were not valued or were obliterated. No people were sent to study abroad. There was no promotion of western advanced science and technology in Chinese society. It was difficult to make a breakthrough in the exchanges between Chinese and Western culture and the introduction of western science and technology.

Materiality of Scientific and Technological Knowledge

ThH3-2

Tacit Factionalism: Exclusion of Rooted Practice in Late Chosŏn Studies of Papermaking

Jung Lee

Ewha Institute for the Humanities, Ewha Womans University

Papermaking was an unusually well-regarded and -rewarded artisanal practice in Chosŏn Korea. Chosŏn paper was an appreciated tributary gift and trade item to China and Japan, and many Chosŏn scholars took pride in its quality of whiteness and durability and its international fame. However, some highly revered reform scholars in late eighteenth century Chosŏn, dubbed the "Northern Learning" faction for their call to learn practical knowledge from northern neighbor Qing China, chose to condemn this pride in Chosŏn paper. Whiteness and durability were not the most important qualities of paper, they said, quoting a seemingly discerning criticism on Chosŏn paper by a famous Chinese literati. This paper examines the makings of this condemnation on Chosŏn papermaking, raised and reproduced by Northern learning scholars. While it can be easily explained away as an expression of their strong agenda of reforming Chosŏn by learning from China, the makings of their condemnation offers a good chance to analyze and reflect on tacit operation of factionalism in knowledge practice. Above all, they made curious errors in extracting Chinese sources and saved their avowed empiricism by excluding local knowledge and practices in their knowledge on papermaking. It was uncharacteristic of their aversion to slipshod scholarship and commitment to concrete knowledge practice and social reform empowering producing classes. Neither their fidelity as a scholar nor their reform agenda guided their scholarship in producing and reproducing their errors and reasoning condemning Chosŏn paper artisanship. Unacknowledged, it seems largely their need to keep their factional camaraderie that guided their knowledge practice. While social history of scientific knowledge has noted such social needs, a deeper understanding of its operation may help our capacity to reflect on its various intellectual impact.



Materiality of Scientific and Technological Knowledge

ThH3-3

Transition and Settlement of Printing Institutions during Early Period of The Joseon Dynasty

Hwaseon Kim

Chonbuk National University

The purpose of this study is to investigate how a government printing institution was established and changed during the early period of the Joseon Dynasty. Various institutions took charge of printing work for about 100 years between the founding of the dynasty and proclamation of Joseon Dynasty Law code(經國大典) in 1485. They included Seojeokwon (書籍院), Jujaso (鑄字所), Jeongeumcheong (正音廳), Chaekbang (冊房), and Gangyeongdogam (刊經都監). Institutions such as Gyoseogam (校書監) and Gyoseogwan (校書館) also oversaw affairs related to books, in addition to studying letters and writing ritual prayers for national ceremonies. These two types of institutions shared an overlapping subject of books, but their tasks were divided as a 'manufacturer' and 'manager' of books. With time, these institutions were either shut down or consolidated. Particularly, Jujaso (鑄字所) and Gyoseogwan (校書館) are notable, which respectively took charge of printing and maintenance of books. The former brought about dramatic innovation to printing technology during the reign of King Sejong, and was relocated to Gyeongbok Palace for its significance. Around the same time, the latter took over management of woodblocks from Jujaso and began woodblock printing. Many institutions were installed during the reign of King Sejong for letter printing, but after the king passed away, these institutions faced turbulent times as they were consolidated or shut down. Further, during the reign of King Sejo, their official status was demoted from pum three to pum five. By the time of King Seongjong's reign, Gyoseogwan (校書館) became the country's exclusive printing institution that integrated all functions of other related institutions.

Materiality of Scientific and Technological Knowledge

ThH3-4

Textual Knowledge as Translation of Practice: Kobaen and The Chinese Artisanship of Inksticks in The Eighteenth Century

Wilson Chan

The University of Hong Kong

Similar to the antithesis of 'Chinese style' (*Karayo* 唐樣) and 'Japanese style' (*Wayo* 和樣) in calligraphy and in architecture, Japanese inksticks encompassed two genres of designs with Chinese origin apart from the local. Japanese inkstick makers duplicated Chinese designs and inscribed with its name to claim the root of the recipe. In late eighteenth century, they further looked into the secret of the trade, i.e., the inkstick recipe used by Chinese inkstick makers. The Japanese inkstick maker Kobaen 古梅園 (established in 1577) explored the Chinese artisanship through communicating with Chinese travellers to Nagasaki who were not artisans but acquired the knowledge through written texts. Drawing upon written texts produced by Kobaen on the communication, this paper explores the role of textual knowledge in the reproduction of artisanship across locales. It will look into the series of translation between texts and artisanal practice to reveal the conjunction of actors building up a network which connected locales across distance and forged a relation between nationalities.

Th13

The 731 Unit: Unfinished tasks in East Asian Medical History and Medical Ethics

Organizer: Ock-Joo Kim (Seoul National University)

Medical atrocities committed by the 731 Unit and Ishii Shiro's network during the Second World War have not been fully understood, even after more than 70 years. Not only thorough destruction of material evidence of the crime by Ishii at the end of the WWII but also failure to bring the perpetrators to Tokyo International Trial after the War hampered from getting historical truth. The United States granted immunity to Ishii and his network and covered up their medical war crime in exchange for the getting data from human experimentation and biological warfare for the sake of national security in the Cold War Era. This makes stark contrast to the post-war treatment of Nazi doctors' human experimentation at the Nuremberg Trial. So far, Japanese government did not acknowledge, repay and apologize for the victims, nor the United States.

This session aims at illuminating unfinished nature of history itself and historical studies on the 731 Unit. By comparing the war crime trials at Nuremberg, Tokyo, and Khabarovsk, the first paper raises how the unfulfilled justice about 731 Unit's medical atrocities had the negative impact on the development of medical ethics in East Asia. Two presentations from Japan - one having studied on the 731 Unit since 1989 as a reporter, and the other lawyer in charge of lawsuit for the victims of bacteriological warfare by the 731 Unit - show the current state of research and lawsuit regarding the 731 Unit in Japan. The last paper proposing a historical thesis on imperial Japanese biowar in 1940s explores a possibility of historical research with remaining archives and documents.

The 731 Unit: Unfinished tasks in East Asian Medical History and Medical Ethics

Th13-1

Unfulfilled Justice and Medical Ethics at War Crime Trials: Nuremberg, Tokyo, and Khabarovsk

Ock-Joo Kim¹, Junho Jung¹, Kyujin Choi²

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²*Inha University School of Medicine, Department of Medical Education and Humanities*

'Doctors' Trial' in Nuremberg International Military Tribunal became the cornerstone of contemporary medical ethics in the Western society. Japanese doctors' war crime during the World War II, no less extensive atrocities than the Nazi doctors', has not made much impact on the Eastern society. It is because Japanese medical war crimes were never brought to the Tokyo trial due to America's cover-up to get the military medical information from Ishii Shiro and his network in the name of national security. While Tokyo trial was in progress, biological warfare scientists sent from US Intelligence gathered information from Ishii and his associates. Silence about medical war crime at Tokyo trial went with active collection of information from US intelligence.

This study aims to provide historical comparative analysis between war crime trials in Nuremberg, Tokyo, and Khabarovsk, focusing on differences in approach to information about human experimentation and biological warfare. During the trials of Nuremberg, Tokyo and Khabarovsk, information related to human experimentation and biological weapons were collected, but the way of dealing with the information showed a great difference during each trial. By focusing on the ways in which the information dealt with, against socio-geopolitical backdrop, this study investigates transitional ethical perception towards human experiment and biological warfare that rooted in during each trial.

**The 731 Unit: Unfinished tasks in East Asian Medical History and Medical Ethics****ThI3-2****Engagement of Medical Science in the Unit 731 and Biological Warfare**

Shoji Kondo

NPO Unit 731/BW Information Center

The network of biological warfare was systematically extended to the Chinese continent by Japanese military-academic complex. The military could manipulate the medical scientists for the hierarchical culture of the Japanese academia, as well as the lack of peer criticism. Kyoto University became the center of the biological warfare research, to undertake experiments on biological weapons and vaccines, on human physiology under extreme conditions, and on vivisections of living humans.

These atrocities were justified for several excuses: patriotism; in the name of progress of science and medicine; discrimination against other Asian ethnic groups; the ignorance of the international laws for POWs; and the authoritarian culture within the Japanese military. Although the wartime atrocities by the Japanese military were investigated by the US military, the GHQ Bureau of Judicial Affairs, and the Tokyo Trial, the biological warfare research was covered up by the state, because it was classified as a military secret and the US wanted to utilize the outcome of the research.

This presentation will show how the Japanese medical science was engaged in the biological warfare research, and how it was covered up even after the end of the WWII, by comparing Tokyo Trial with the Nuremberg Trial, and by critically reviewing the Khabarovsk Trial. The wrongdoings of the Unit 731 left without judgement, compared with those by Nazi Germany, owing to the postwar domestic and international politics.

The 731 Unit: Unfinished tasks in East Asian Medical History and Medical Ethics**ThI3-3****The Key to the Unit 731 Issue: Request for Releasing Imoto Kumao's Memoir**

Keiichiro Ichinose

NPO Unit 731/BW Information Center

In 1993, Professor Yoshiaki Yoshimi made the memoir of Imoto Kumao's public. Before and after that, some materials related to the biological warfare research by the Japanese military medicine were released. Two Supreme Court trials in May 2007, one by the survivors of human experimentation, and another by the bereaved family of victims of bacterial warfare, were significant in the factual recognition of the Unit 731. In response to the questions at the Diet, from December 1997 to April 1998, the Japanese government acknowledged the followings: (1) the Unit 731 existed; (2) the details of the mission of the Unit 731 is unclear, due to the lack of the records; (3) it is difficult to investigate because it has already passed and is an old fact; (4) if further evidences showing the activities of the Unit 731 are discovered in the future, they will be taken seriously; but (5) the government did not mention Kumao Imoto's memoir.

This presentation introduces the Imoto Memoir, which was acquired through the NPO's interview with Imoto Kumao. The Memoir is the best proof of the atrocities by the Unit 731 and can reveal the greatest weakness of concealment by the Japanese state. I will also introduce plans for new activities based on it, including a future exhibition in China, publication of the Imoto Memoir, and further requests to the government for information disclosure, to eventually make the Japanese government acknowledge that the Unit 731 operated as a bacterial warfare unit, conducting human experiments and bacterial operations.

Th13-4**A Thesis of Imperial-Japanese Biowar as
"Imprudent" War from Reviewing Experimental
Data of Vaccine Development**

Yi-Jong SUH

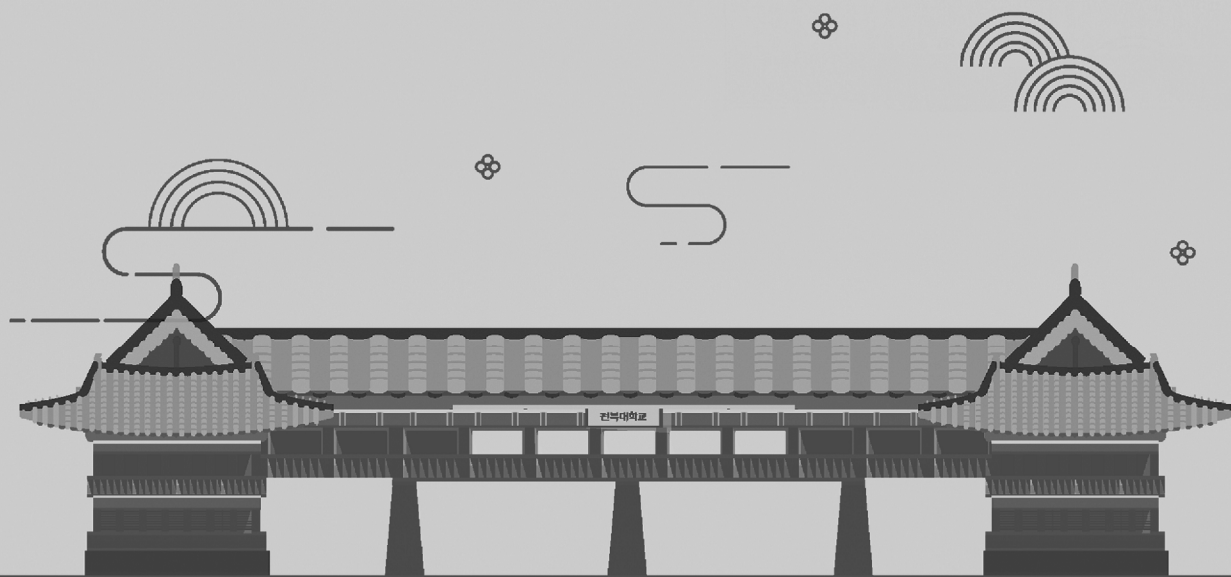
Seoul National University, Department of Sociology

This paper proposes new historical thesis that imperial Japanese biowar in 1940s would have been imprudent without effect vaccine against bacteria. Until now there dominated a thesis that it would have been brutal biowar with effective bioweapon and vaccine. But it remains a crucial question of why no more use of that biowar was commanded by its Headquarter at least in January 1945 and clearly in July 1945 which was before end of the Second World War. In this paper I review results of vaccine experiment at that time and find out its ineffectiveness of that vaccine especially against plague bacillus. On this basis biowar would have given birth not only to massive victims among Chinese people, but also to a notable loss of fighting will among imperial-Japanese soldiers. In terms of that, imperial-Japanese Headquarter at that time could not have helped ordering no more realization of biological warfare using plague germ.

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CHONBUK NATIONAL UNIVERSITY, JEONJU, REPUBLIC OF KOREA

FrA1

Nuclear History in Asia & Pacific (I)

Organizer: Hongjin Liu (Tsinghua University)

Without doubt, the nuclear history of East Asia including the development of nuclear technology, nuclear weapons and the evolution of nuclear energy policies in China, Korea and Japan, and the transnational exchanges and influences in the grander area of Asia & Pacific is a significant topic in the research of contemporary science and technology. The panel themes include but not limited to: 1. The advances of nuclear sciences and the technology transfer in the relevant areas; 2. The work of a particular nuclear scientist or a research team; and their involvements with governmental and social funding resources; 3. The local responses to nuclear construction and disasters, e.g. in STS perspective; 4. The ecological, social and philosophical backgrounds of nuclear-related research and practices - that can be interpreted through governmental policies or publication orientation.

Nuclear History in Asia & Pacific (I)

FrA1-1

Victims No Victims: The Political Struggle of Women in Context of Nuclear Colonization

Monica Emond

School of Political Studies, University of Ottawa

After 30 years of French nuclear testing in her French Polynesian colony and following the example sets by the United States compensation program regarding the Marshallese people (Bussanich 2007), former male Polynesian workers on nuclear test sites and their widows were organized into advocacy associations to address the French government with formal demands of recognition respectively as victims and "ayant-droit" to be compensate accordingly. The information about the sanitary effects and consequences of nuclear testing revealed in dribs and drabs through selective archives declassification process in 2012 and 2013 (Barrillot 2016) forced France to take a step back from her long-standing culture of silence in this matter. Indeed, in 2014, the President issued a recognition decree along with a limited list of radio-induced illnesses setting foot for compensation (Valls 2014). Despite the effort made to begin acknowledging responsibility of nuclear testing consequences, there is still many people, especially women, left behind in the legal process and there is intimate suffering that might never be recognized as such. How can we address the experience of Polynesian women and womanhood in context of nuclear colonization?

This communication proposes to confront the culture of silence that prevailed in French Polynesia under the French CEP (Experimentation Center of the Pacific) military regime from the perspective of women experience. For years, the CEP ordered Polynesian workers to prevent their wives to ask any questions about their husbands work and the risks associated with the tests. As a result, Polynesian women living on the Tuamotu and Gambier archipelagos where most of the workers originated from have suffered in silence of shame, anxiety, infertility, child defects, miscarriages, and psychological traumas. In order to comprehend the scope of the damage done by French nuclear testing, we have to examine the intimacy of women experience and hear their voices.



Nuclear History in Asia & Pacific (I)

FrA1-2

DPRK's Nuclear Program Development - History of UN Security Council's Sanctions against It

Margarita Kichukova
The Academy of Korean Studies

The United Nations is an universal platform for solving conflicts and international issues, as well as the sole instrument for preventing armed conflicts worldwide by implementing an international security system of rules. The most important among them is the proliferation of weapons of mass destruction (WMD), particularly nuclear weapons. After the end of the Cold War, international relations between nuclear powers changed massively and so did interactions between nuclear and non-nuclear states. This was due to dramatic shifts in technological progress and the fact that the barriers preventing non-nuclear states from obtaining nuclear weapons have weakened. The non-proliferation system of today faced the threat of so-called "nuclear outsiders", also known as "rogue states". The most crucial issues of this kind are the nuclear programs of North Korea and Iran. The UN Security Council is the very institution that represents international community and international law that is to defend existing non-proliferation system. It is supposed to achieve this goal by means of sanctions imposed on any state that violates the non-proliferation regime, but in case of North Korea these measures fail to work. So, the main goal of the current report is to analyze whether UN's approach has been effective or not, as well as the reasons for that. Furthermore, the paper gives a short description of the positions of the main permanent members of the UN Security Council - USA, Russia and China, on the North Korean nuclear issue. In addition, the study tries to compare existing cases of the use of UN sanction regime for non-proliferation purposes, whether these cases can be compared with current situation with North Korean nuclear program or not and why.

Nuclear History in Asia & Pacific (I)

FrA1-3

Why the Denuclearization of North Korea was Failed in 2008?

Ho Jye Kang
Eberhard Karls Universität Tübingen

According to the agreements of 9.19, 2.13, North Korea had to submit the Daily Records and Declaration of Nuclear Activities. It was the second of the third stages for incapacibilities of North Korean Nuclear. On the agreements, USA did not need the conditions of CVID. They changed the condition to CC, that is, Complete and Correct. The Conditions were not for the material but for the documents. North Korea submitted the Daily Records of Nuclear Activities, more than 19,000 pages, on May 2018. The Declaration of Nuclear Activities, about 50 pages, was submitted at that time. In the documents, North Korea declare the amount of Pt, extracted and burned by the First test. The amount of extracted Pt was the highest and the amount of burned Pt was the lowest.

Just After the Documents were submitted, USA said that they were so correct and complete. It means that North Korea kept their words. But after 1 or 2 months later, USA changed the estimation for the documents. They start arguing that the documents were not correct and complete and that the special inquiry was needed. Finally the agreements were failed.

After analysis of the documents, USA might have a conclusion that stopping nuclear activities of North Korea at that time was meaningless and that breaking the agreements was better.

Nuclear History in Asia & Pacific (I)

FrA1-4

Deliberation on Shin-kori 5 and 6 as a Socio-technical System for Establishing Value-neutral Facts

Hyomin Kim

Ulsan National Institute of Science and Technology

The public deliberation held in 2017 was a historical moment in Korean nuclear governance through which lay public was invited to make final decisions on a controversial technology. We interviewed seven participants in the public deliberation on shin-kori 5,6 nuclear reactors in 2017 and 40 people who experienced a similarly designed process. We examined how interviewees' self-narratives do the boundary work to separate facts that are supposed to be the basis of reasoned opinion from sentiments, propaganda, or bias. We aimed to understand how interviewees associated the necessary selection of salient facts for forming reasoned opinion and subsequent public decision-making not with their value-ladenness but with apoliticality. Detailed self-narratives were collected and analyzed with an attention to circulation of a socio-technical imaginary, a collectively imagined form of social order reflected in the design and fulfillment of nation-specific technological projects-construction and operation of industrial nuclear reactors, in particular.

FrB1

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (I)

Organizer: Longfei Chu (University of Science and Technology of China)

In the late Ming dynasty, the Jesuits used science as an aid to their religious mission in China and introduced scientific knowledge from Europe into this country. The year 1629 marks the first climax of their efforts, because it was in this year that the Ming government decided to reform its long outdated system of calendrical astronomy through an systematic introduction of European astronomy and thus inaugurated an official project for the compilation of the Chóngzhēnlìshū 崇禎曆書 (CZLS), the Chongzhen-Reign Treaties on Calendrical Astronomy, an encyclopedic series of treatises on European mathematical astronomy. This was the first time for European science to climb onto the official stage in China, which has also become a landmark in the history of Sino-European relationship. As Confucianism was the predominate ideology in China of the time, the introduction and dissemination of European sciences through a work like the CZLS not only exerted strong impact on Chinese men of science, it also triggered a complex process of conflict and dialogue between the so-called *Xīxué* 西學, Western Learning, and Confucianism. This makes the interaction and accommodation between science, Western Learning and Confucianism an important cultural phenomenon in history. Studies of this phenomenon is a key to our understanding of this special period, whereas an exploration of the relationship between science and Confucianism in all related historical periods is also pertinent and necessary in enhance this understanding in both depth and width. The year 2019 is the 390th anniversaries of the compilation of the CZLS. As a way to commemorate such a historic event, this panel will present a group of papers on the cultural and scientific contexts, compiling process, contents, and dissemination and influence of the CZLS that are based on new materials and new analyses.

**The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (I)****FrB1-1****The Emperor's Celestial Map: The Drawing of *Chidao Nanbei Liangzong Xingtu* and The Reform of Calendrical Astronomy in The Chongzhen Reign Period**

Liang Li

Institute for the History of Natural Sciences, Chinese Academy of Sciences

The Chi Dao Nan Bei Liang Zong Xing Tu (General Star Atlas of the Southern and Northern Hemispheres Separated by the Equator), finished by Jesuit astronomer Johann Adam Schall von Bell (1591-1666) and submitted to Chongzhen Emperor in 1634, is a new type of star map integrated Chinese and western astronomical knowledge. This paper introduces the contents and features of this star map and discusses the impact of the western science and culture on its compilation. How to adjust the Chinese decimal system and the western sexagesimal in scale? How to do with the new constellations discovered near the South Pole. How to reconcile the differences between Chinese and western systems of constellations. These questions have caused a lot of controversies and lead to a dilemma situation for the astronomical reform activities.

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (I)**FrB1-2****The Impact of Western Astronomy on Annual Almanacs in China during The 17th and 18th Century**

Guangchao Wang

University of Chinese Academy of Sciences

In the 17th century, Western astronomy was introduced into China and had a great impact on Chinese astronomy. Western astronomy influenced not only the method and handy tables to predict the celestial phenomenon, but also the annual almanacs which were civil calendars and usually issued every year. The obvious differences between traditional annual almanacs and the new one was the computation of 24 solar terms. In the annual almanacs of Qing period, the time of solar terms was computed according to the apparent sun enters one of the twelve stations. While Chinese traditional calendar divided one year into 24 equal periods. We made some error analysis of the data recorded in some of the annual almanacs in the 17th and 18th century and suggest that there were two different sorts of errors, the systematic error, and the accidental one. The former might due to the equation of center and the latter due to calendar official's miscalculation. In fact, the computation of 24 solar terms was not only a matter of computation but involved the cultural and cosmological consideration. All of these factors make the change complicate and directly lead to the controversy between Jesuits and traditional literati.

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (I)

FrB1-3

The Integration of Chinese and Foreign Sky of Stars in The Ming Dynasty: From *Huihui Lifa* to *Chongzhen Lishu*

Yunmeng Su and Yunli Shi
University of Science and Technology of China

Just as Ding Min et al. and Li Liang have pointed out, the star catalogue and maps produced during the compilation of the *Chongzhen lishu* (崇禎曆書, *Chongzhen reign treatises on calendrical astronomy*) show an interesting hybridity of Chinese and European knowledge of the fixed stars. In fact, this type of hybrid already appeared in the *Huihui lifa* (回回曆法, *the Chinese-Islamic System of Calendrical Astronomy*), a compilation of calendrical astronomy by a group of Muslim and Chinese scholars in the early Ming Dynasty, translating an Arabic or Persian *Zij* to China. The star catalogue and atlases contained in the book represent an earlier stage of the collision and integration between Chinese and foreign knowledge of the fixed stars. This is very clear through a detailed analysis of the features in composition, naming methods, selection standards, star atlases cartography, origin of astronomic coordinates as well Chinese and western correspondence of stars. It is also obvious, *Chongzhen lishu* made the use of this legacy, but its compilers also pushed their way further forward to make their works more Chinese, although the European basis in these work are not easy to cover up.

FrC1

Sciences and Technologies of North Korea

Organizer: Robert Winstanley-Chesters
(University of Leeds)

While the Miracle on the Han, the extraordinary growth of Chaebol such as Samsung and Hyundai and domination of international measures of internet and mobile connectivity have generated a sense that South Korea is amongst the technological and scientific global elite, North Korea is considered an outlier and as such, remains largely unexplored by Science Studies. Difficult ideology, complicated geo-political position, paucity of conventional economic development and environmental/topographic challenges have meant North Korean science and technology is disregarded by academic analysis and political, media or public interest except where it intersects with military or nuclear capacity. This panel takes a wider view of North Korean science and technologies considering examples which underpin development, consumption and knowledge. These examples are neither offensive or defensive but are demonstrative of more conventional aspects of North Korean governmentality, institutional capabilities and interests, in ways which are rarely encountered. The panel's examples are both historical and contemporary, yet can also be thought of as contributing to potential North Korean futures. Grounded in politics and ideology, Byun Hakmoon considers conflict between scientists and North Korea's science and technology policy articulated by Kim Il Sung during the 1960s. Benoit Berthelier offers a critical take on the concept of technology transfer through the analysis of the development of North Korean computing technology during the Cold War. Robert Winstanley-Chesters explores histories, spaces and places of North Korean fishing technology and fishing science. Through these North Korea had hopes to become a global player in the deep sea. Finally Kayla Iacovino recounts an extraordinary interaction with North Korean practical science as a Volcanologist modelling the historical explo-



sive potential of Paektusan/Baekdusan with the Volcanology Department of Kim Il Sung University. Together this panel and papers provide a rare opportunity to consider non-fissile, explosive or aggressive science and technologies in North Korea.

Sciences and Technologies of North Korea

FrC1-1

The Conflict over Science and Technology Policy between Kim Il Sung and Scientists in The 1960s in North Korea

Hakmoon Byun

Research Center of North Korean Science & Technology

In the early 1960s, Kim Il Sung sought to achieve economic growth by promoting technical innovation through cooperation between industry and scientists. He wanted scientists to focus on researches contributing directly to the economy, not their preferred research topic. But from the scientist's perspective, this was to limit their research autonomy.

In 1962, North Korea's security environment deteriorated sharply. Kim's regime began to devote more money and manpower to its defense than originally planned, resulting in reduced investment in the economy and science and technology. Kim hoped scientists would be more committed to research for economic development to overcome the difficulties of the country. For scientists, reduced funding available for their research as well as limiting their autonomy was a state science and technology policy which most disliked. Until the mid-1960s, scientists' research results and overall national innovation performance did not meet the expectations of Kim Il Sung. He pointed out scientists' objections to the state's policy as one of the reasons for the sluggishness of innovation, and judged that scientists were against the policy because they still had bourgeois ideas. This paper considers Kim's emphasis at this point of the ideological revolution, more precisely the ideological remolding of intellectuals. The paper explores the fact that from 1967, North Korea's regime engaged in frequent and extensive ideological inspections of scientists over two years. The paper suggests that this didn't mean that Kim Il Sung chose ideology over science and technology. Instead the goal of the ideological remolding and inspections was to eliminate the scientists' disagreement over state policy and to mobilize their research capacity to realize it.

Sciences and Technologies of North Korea

FrC1-2

Technology Transfer or Technology Acquisition? Scientific Policy, Reverse Engineering and Export Controls Circumvention in The Development of North Korean Computing.

Benoit Berthelier
Universite Paris Diderot

This paper offers a critical inquiry into the concept of “technology transfer” through the study of the historical development of computer science in North Korea during the Cold War. The diffusionist model of the history of science has recently become an object of renewed critical debate and led to the exploration and re-evaluation of the process of adapting and domesticating foreign technologies. Yet, while these new perspectives restore the agency to people on the “receiving end” of technology transfers, they nonetheless still cast the diffusion of technology as a unilateral movement from the center to the periphery. In turn, they overlook the labor that goes into the acquisition of said technology, such as, for instance, identifying the technologies to import or scouting and convincing potential scientific partners through legal, paralegal or illegal means. The present paper illustrates the need for a new understanding of technology transfers, or rather, technology acquisition through the example of the development of the field of computer science in the Democratic People’s Republic of Korea. Placed under the restrictions the COCOM framework and increasingly distant from its socialist allies, North Korea was hardly a destination of choice for technology transfers throughout the Cold War. Yet, the country developed a number of strategies to overcome its isolation, identifying private and public partners that could be convinced to bypass export controls and share or sell technology for their own benefit. Using economic and political rivalries, the DPRK played companies and states against one another, in order to secure the acquisition of technological knowledge and hardware.

Sciences and Technologies of North Korea

FrC1-3

North Korean Fishing Technologies: Science, Politics and Subterfuge

Robert Winstanley-Chesters
University of Leeds

North Korea’s topographies have long been harnessed in support of its political and developmental sciences. While the nation’s coastlines have been by their nature more liminal than its monolithic urban/political terrains, North Korean maritime infrastructures and spaces have historically served its politico-developmental narratives, forging new ‘socialist’ fishing landscapes and global connections across oceans. North Korea has long sought to be player in the oceans of the globe, in competition with South Korea which emerged to be one of the world’s deep-sea fishing nations, along with Japan, the United States and the Soviet Union/Russia. These landscapes and histories of North Korean fishing development and science have seldom been considered in analysis of its technological or scientific development or more widely in North Korean studies. This paper therefore considers the histories of North Korean fisheries and fishing science. The paper explores the development of North Korea n fishing boat technology and ship building. Kim Il Sung frequently called for the construction and planning of larger fishing boats to complete with new industrial fishing enterprises in the deep sea, and the reconfiguration of North Korea’s boat yards at Chongjin. Much of this appears in common with other North Korean scientific sectors to have been in vain, as Pyongyang still calls for similar technical and scientific development today. The paper also unveils North Korea’s efforts towards scientific connection and collaboration at sea with the Soviet Union the late 1960s and 1970s, specifically in the Sea of Okhotsk. These interactions promised much, yet frequently collapsed in dispute, acrimony and subterfuge as North Korea sought to obtain Soviet technology, experience and expertise by means other than had been agreed. North Korea’s histories of fishing science and technology this paper concludes are ultimately as marked by ideological narrative and geo-political problematics as other elements of developmental policy.



Sciences and Technologies of North Korea

FrC1-4

Science Diplomacy at Korea's Active Volcano

Kayla Iacovino

NASA Johnson Space Center

The geopolitical landscape of a region is often strongly influenced by the natural topographies that help define its borders. East Asia has been physically and ideologically shaped by active volcanoes, often taken as symbols of the Earth's power to give and take life. Magmas formed in this region have the potential to fuel large, explosive volcanic eruptions. Such eruptions have had global consequences in the past, and modern-day events have the capacity to disrupt regional air traffic, trade, communication, and, ultimately, local and global economies. Paektu Mountain (Mt. Paektu) is an iconic Korean landmark; a spiritual and political landscape whose importance is shared both by the Koreans and the People's Republic of China. In DPRK, Paektu has been used as a focus of Kimist authority and legitimacy built on the historical foundations of anti-Japanese liberation narratives. Unbeknownst to many, however, is that Paektu is an active volcano known that produced one of the largest volcanic eruptions in human history (the Millennium Eruption). Due to nontrivial geopolitical considerations involved in studying Paektu, information about the geology of this behemoth remains scarce. Over the last decade, an international team of scientists from the USA, UK, and China have worked with those from DPRK in order to establish a partnership toward understanding Paektu's history and ongoing activity. The project's aims include not only a greater understanding of the volcano's geology and the creation of future hazard scenarios, but also the establishment of diplomatic relations with DPRK through science. This paper will reveal what it means to do science in DPRK in the context of a mythical icon with real destructive potential. On the smallest scale, Paektu has the capacity to change the physical and political landscape of Korea, while on the grandest scale it could affect life on Earth on a global scale.

FrD1

Looking at Animals to Understand The World: Taxonomic Imagination in China

Organizer: Andrew Schonebaum (University of Maryland)

In looking at animals, we look at ourselves. Whether they are wild or civilized, envisioned or imagined, mundane or magical, the ways in which we categorize and classify animals, broadly conceived, at once organizes our world and delimits our possible places in it. While much has been said about human-animal relationships in recent years (see Sterckx, Siebert and Schafer, eds. *Animals through Chinese History*, OUP, 2019), the papers in the panel all seek to understand the formation of natural science, in Early and Early Modern China, vis-à-vis animals as constitutive of "nature" and simultaneously as a classificatory problem. The first paper, "Curiosity, Common Sense and Dragons: Middlebrow Views of *Long* 龍 in Early Modern China," considers the dragon as an object of investigation for early natural scientists, encyclopedia, and local gazetteers while it was simultaneously losing traction as anything other than motif and metaphor in other contemporary texts. The second contribution, Federico Valenti's "Representing *chong* 蟲: Two's a Company, Three's a Crowd" examines the semantic and taxonomic challenge presented by early concepts of *chong*, which was both a marker for "animals" generally, and specifically for animals which lacked that notable characteristic of most animals - legs. Thirdly, Jia Yu's paper, "Rethinking *Bowu* and the Study of Nature in Late Imperial China" traces the evolution of *bowu* ("natural studies," "natural science," etc.) from its earliest textual in carnations, through a defining contradistinction with *gewu* (investigation of things/texts) to the early modern idea of natural science focused on animals, plants and minerals. Taken together, these papers all grapple with heuristic problems, whether they are empirical, lexical or taxonomic. They all consider, in one way or another, how to account for absence, lack or disappearance in a classificatory scheme, and what might take its place.

Looking at Animals to Understand The World: Taxonomic Imagination in China

FrD1-1

 Curiosity, Common Sense and Dragons: Middlebrow Views of *Long* 龍 in Early Modern China

 Andrew Schonebaum
 University of Maryland

Readers in the premodern period can be forgiven if they confused fact and fantasy. The seventeenth and eighteenth-century novels considered to be “master-works,” written by and for the most educated members of Chinese society, display an overwhelming degree of intertextuality. In referencing, borrowing from, and incorporating all manner of texts, the Chinese novel is virtually unparalleled in its complexity. The hybrid, polygeneric nature of *xiaoshuo* and the many other texts in these texts shows that literati authors of fiction and their presumed readers read everything. But many kinds of readers consumed novels, and they did so using a great range of approaches. My paper on dragons is a fragment for a history of curiosity and fantasy, and, requires a wide range of approaches - the imaginative and sympathetic reading of a variety of texts, paratexts and intertexts, including newspapers, *biji* (miscellaneous jottings), encyclopedia, almanacs, materia medica, history, fiction and travel guides. My paper investigates all these kinds of texts to try to understand what the variety of readers might have thought about “dragons” *long* 龍. They were metaphors and motifs, to be sure, and in gazetteers they were harbingers of change in the weather and at court, but they (or their bodies) were also natural objects, related to tortoises and snakes, as well as analogs of humans with conscious thought, subject to the workings of retribution. Attendant upon the dissemination of new, western, scientific knowledge and in the face of modernization and millenarian rebellion, it seems, was a loss of wonder, magic and fantasy in China. My paper seeks to understand not just how dragons were understood but uses them as a bellwether of this loss of magic in the eighteenth and nineteenth centuries, and how, paradoxically, works of early modern “natural science” (*bencao*, *riyong leishu*, etc.) and other middlebrow texts were much more imaginative and credulous than fiction was, at least when it came to dragons.

Looking at Animals to Understand The World: Taxonomic Imagination in China

FrD1-2

 Representing *chong* 蟲: Two’s a Company, Three’s a Crowd

 Federico Valenti
 Needham Research Institute

The present paper problematizes the ambiguous zoological category of *chong* 蟲, tentatively translated as “insects”, “invertebrates”, “petty creatures” and so on. It focuses in particular on its definition in the earliest Chinese synonymicon (or dictionary of words *cidian* 詞典), the *Erya* 爾雅 (attested III century BCE) as well as the first dictionary of characters (*zidian* 字典) *Shuowen jiezi* 說文解字 and other lexicographic sources. In order to define what the category *chong* encompasses, it is necessary to outline the history of this character and the range of its use during the development of Early Chinese lexicography (Fèvre, 1993). Firstly, it is fundamental to summarize the different graphical variants that are related to the concept of *chong*, as there are at least two ways to represent the same lexeme, being a single *chong* character and a trebled *chong* one (虫 versus 蟲). Secondly, it will be necessary to underline that the graph and the word *chong* underwent semantic shifts that established the polysemy of this character. Finally, I shall discuss a “lexicographic companion” of the character *chong*, the so-called “legless invertebrate” *zhi* 多, which also shares a polysemic background. Moreover, this paper aims at introducing the concept of “non-inclusive” taxonomy as a fruitful operational category in the Early Chinese context: it refers to a method of classification that does not classify entities based on the features they have, but rather on those they lack. As a case study, the paper will discuss the use of the character *chong* both as an all-encompassing marker for “animals” in general and as category marker for animals that cannot be classified into other categories of existence.

**Looking at Animals to Understand The World: Taxonomic Imagination in China****FrD1-3****Rethinking *Bowu* and the Study of Nature in Late Imperial China**

Jia Yu

Cambridge HPS

Scholars have studied *bowu* 博物 as a term that literally means “broad learning.” In the late nineteenth and early twentieth centuries, this term was commonly seen as part of the compound words like *bowu xue* 博物學 or *bowu yanjiu* 博物研究, which were usually rendered into English as “natural history” or “natural studies.” In recent years, scholars have examined this term through its relationship with *gewu* 格物 (investigating of things / scientia). By tracing the term’s earliest records, some also suggested the term’s original understandings were derived from a third-century Chinese text, the *Bowu zhi* 博物志.

In this paper, based on further examinations of the above mentioned two angles, I engage in explaining how we may gain new understandings of the term *bowu* by thinking with questions such as What was (and is) *bowu*, if we abstain from thinking it through its modern association with “natural history,” and refrain from trying to use it as evidence for the existence of a “traditional” or “Chinese” natural history? This leads to two observations: the term did not identify itself in close association with *gewu* until late imperial period; the received text *Bowu zhi* as the semantical or seminal source to identify the connotations of *bowu* is problematic. I propose we can find the term has a longer history than the dating of *Bowu zhi*, and the term’s various applications in early Chinese literary materials will be enumerated. I suggest there are three basic layers of meanings can be discerned from this searching, and emphasize that the term’s association with “natural studies” requires further examinations. Most importantly, on the basis of this historical review, I argue that the connection between *bowu* and the *Classics of Poetry* 诗经 first appeared in a reference book, *Outstanding models from the storehouse of literature* 冊府元龜, which was compiled at the beginning of the eleventh century of the northern Song period.

FrE1**The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (I)****Organizer: Shu-ching Chang (Chang Gung University)**

The modern history of nursing and midwifery in China and Taiwan is dramatic and complex. There were different forces which include nursing ideas and practices, nursing education, missionary organizations and international foundations to shape the modern nursing and midwifery in China and Taiwan. Western missionary introduced modern nursing in China and laid the preliminary foundation for its development, while the upgrading of nursing education from training to higher learning was a contribution made by the School of Nursing of Peking Union Medical College (PUMC), supported by the China Medical Board. There are six papers in this panel. All of these papers attend to the development and impact of the School of Nursing of PUMC: its education model, the high standard and the initiatives in public health nursing, and the heroic and patriotic military nursing created by the PUMC’s outstanding graduates breeding the leaders in nursing education and profession in China. Furthermore, transnational flow of nursing personnel was an important aspect of internationalization of nursing in the twentieth century China and Taiwan. The Principals were Americans in the beginning of the nursing school of PUMC. However, later on, the Principals were changed to Chinese because of the political situation. The graduates of the School of Nursing of PUMC were mostly elites in the nursing professions in China and Taiwan. Summarily speaking, the School of Nursing of PUMC can be a showcase to demonstrate the developmental process of modern nursing profession in China and the cross-border flow of nursing knowledge among the United States, China and Taiwan.

The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (I)

FrE1-1

Shaping Nursing Education in China Before 1951

Yuhong Jiang
Peking Union Medical College

Nursing becoming a respectable, decent profession for educated Chinese women was a challenging undertaking. The early advancement of nursing in China was a collective effort of the missionary medicine, the private foundations, and the endurance, dedication and hardworking of the Chinese as well as foreign nurses. Western missionary introduced modern nursing in China and laid the preliminary foundation for its development, while the upgrading of nursing education from training to higher learning was a contribution by the School of Nursing Peking Union Medical College (PUMC), envisioned and supported by the China Medical Board. Its state-of-the-art and visionary education model, the high standard and the initiatives in public health nursing, and the heroic and patriotic military nursing created by the PUMC's outstanding graduates produced a cohort of leaders in nursing education and profession in China before 1949. All these efforts acting together shaped the modern nursing in China, leaving a great heritage to nursing education and practice to New China.

The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (I)

FrE1-2

Realizing Dreams in China: Anna D. Wolf and PUMC Nursing School

Cheng Zhen
Center for the History of Medicine

As a new branch of medicine, modern nursing was transplanted to China by missionaries through church-established medical schools and hospitals. As western medicine spread in China, the career of nursing took root, pullulated and bloomed. During this process, the School of Nursing at Peking Union Medical College (PUMC) played a crucial role since it started higher nursing education in China. Anna D. Wolf (1890-1985) was the first dean of the PUMC School of Nursing. It is very significant to carry out research on Wolf's work in Peking in order to understand the establishment of higher nursing education in China. According to the situation in China, Anna D. Wolf put forward the viewpoint that nurses training should be separated from the hospitals. She also formulated the enrollment scale and principles, set the school system of nursing and curriculum planning. With her efforts, she achieved the successful registration at New York State University, made PUMC Nursing School as a reference for western higher nursing education, and made a model for Rockefeller Foundation supporting nursing education in the world. While working in China, her efforts had been fruitful. After returning to the United States in 1925, Anna D. Wolf completed nursing reforms at the Albert Bilings Hospital of University of Chicago and the New York-Cornell Medical Center. From 1940 to 1955, she succeeded in serving as the director of Nursing School of Johns Hopkins Hospital, making herself as one of the most outstanding nursing graduates of Johns Hopkins University.

**FrF1****Shaking East Asian Cosmology with Western Science?**

Organizer: Pingyi Chu (Institute of History and Philology)

In his famous work entitled *The Development and Decline of Chinese Cosmology*, John Henderson argues that there was a declining trend of Chinese Cosmology especially after Chinese and European scientific traditions met in the seventeen century. This panel aims at reexamines this thesis from a comparative perspective. We will add Korean and Japanese case to argue that cosmological concerns remained to be important even when European science was transmitted into East Asian countries and transformed the intellectual landscape in this area. Through these cases presented in this panel, we would argue that cosmological concerns were not in decline in East Asia. Instead, European science, whether its astronomy or evolutionism, was reshaped to reshape the cosmological outlook while adding new elements to it and gradually changed its appearance.

Shaking East Asian Cosmology with Western Science?**FrF1-1****Cosmological Concerns in Late Ming Calendrical Reform**

Pingyi Chu
Institute of History and Philology

This essay studies the cosmological concerns of the proposals of calendrical reform and ventures to suggest that failing to address these concerns and treating the heaven as an object probably have led to the objections to the European astronomy transmitted into China in this period. I will use An Shifeng to make the case. An was amateur astronomer who acquired his *jinshi* degree in 1583. He published his opinion regarding calendrical reform in 1612, the same year when both Xing Yunlu and Xu Guangqi were recommended to the court for reforming the calendar early in that year. In his proposal, An denied that calendar-making was a mere technical inquiry and suggested that an understanding of the metaphysical significance of the heaven and earth would make one a better astronomer. Starting from this point, he drafted a complicated blueprint for reforming the calendar. We do not know the influence of An's book, and An does not seem to know the math to reify his calendar. We, however, do see that many other more technically oriented proposals in the late Ming share his concerns of retaining the cosmological meaning the heaven (*tian*) which was at the center of dispute regarding calendrical reform between the Jesuit and Chinese astronomers.

Shaking East Asian Cosmology with Western Science?

FrF1-2

A Mathematician's Travels through An Infinite Universe: Hong Taeyong's Mathematics and Cosmology in Mid-eighteenth-century Korea

Jongtae Lim
Seoul National University

Mid-eighteenth-century Korea witnessed the emergence of a group of literati-mathematicians who promoted mathematical art as a legitimate intellectual pursuit of Confucian literati. Consequently, mathematics, having thus far been regarded as a minor art of the lower functionaries, took on new cultural meanings that were increasingly relevant to the philosophical and political endeavors of literati elites. Taking Hong Taeyong 洪大容 (1731-1783), a leading literati-mathematician of the period, as an example, this paper explores how a literati carved out a position for mathematics in the Confucian elite culture. Emphasis will be placed on the ways in which Hong forged a connection between his radical cosmology of an infinite universe and the seemingly mundane art of calculation and surveying in his later years after his Beijing journey in 1765-66. Hong forged that connection, this paper argues, not simply because he found some internal relationship between mathematics and cosmology. A fundamental motive behind this connection came from what might be called the political and cultural-Hong's trouble with Chosŏn society, which was ever deepened after his return from Beijing. By associating it with his radical cosmology, Hong Taeyong radicalized mathematics to use it as a means for his socio-cultural criticism.

Shaking East Asian Cosmology with Western Science?

FrF1-3

A Science without Nature: Heaven (*Tian*), Morality and Competition from Yan Fu to May 4th

Sean Hsiang-lin Lei
Institute of Modern History, Academia Sinica

An intriguing, but little noticed, puzzle exists in the historiography of science in modern China: While *Tianyanlun* (On Heavenly Evolution), the Chinese translation of Thomas Huxley's *Evolution and Ethics*, is widely celebrated as THE most influential book in modern Chinese intellectual history, it received little credit in the history of science.

Taking this puzzle as a clue, this paper argues that the publication of *Tianyanlun* by Yan Fu in 1898 was a watershed event since it popularized a distinctively novel vision of Western science. As indicated by the Chinese title, On Heavenly Evolution, *Tianyanlun* addressed the key concerns of Chinese literati, showing that the Chinese have failed to comprehend the "Way of Heaven (*Tian*)," namely, competition. In order to connect science with Tian, the "cosmic basis of morality," Yan Fu strategically downplayed the Western notion of "nature" throughout his book, even though its central thesis was based on Darwinian "natural selection."

When the May-4th intellectuals in the 1910s endeavored to replace Yan Fu's "science without nature" with a more radical, modernist vision of science, they strove to "naturalize" the notion of *Tian*. Following their lead, historians thereafter have dismissed *Tianyanlun* as not truly a work of "natural" science but merely "social" Darwinism. By way of situating this foundational text/event in the context of science, this paper shows how the history of science can offer insightful and fresh perspectives on issues crucial to modern Chinese cultural and political history, such as the emergence of "the natural" and "the social" (as actors' categories), the transformation of Tian, and the contentious relationship between science and morality.



Shaking East Asian Cosmology with Western Science?

FrF1-4

Nishikawa Joken and The Celestial Sciences: An Early Modern Japanese Scholar's Understanding of Astronomical Phenomena

Daniel Said Monteiro
Paris Diderot University

The turn of the 17th to the 18th century is often regarded as a transitional period in the history of Japanese astronomy. Shibukawa Harumi 澁川春海 (1639-1715) is able to successfully push for a calendrical reform, and the practice of “empirical” astronomy seems to be on the rise. Among those who theorize on the importance of this type of astronomy, the name of the Confucian scholar from Nagasaki Nishikawa Joken 西川如見 (1648-1724) is one of the first to be mentioned.

Joken draws a fundamental distinction between two meanings for the word heaven (*ten* 天): the physical heaven (*keiki no ten* 形氣の天) and the metaphysical heaven (*meiri no ten* 命理の天). He posits that knowledge about the metaphysical heaven, which is immaterial and inscrutable, was only accessible to ancient sages; while the physical heaven can still be observed, and therefore understood, by contemporary astronomers. This particular approach appears to shift the object of astronomy from the speculative realm of prognostication to more concrete concerns such as the verification of astronomical phenomena for calendar-making.

In this paper, I will analyze Joken's main astronomical work *Ryōgi shūsetsu* 兩儀集説 in the context of his other non-astronomical writings. I intend to present a holistic view of his conceptualization of celestial sciences (*tengaku* 天學) within the framework of other moral and social concerns. The purpose of this paper is to provide a picture of how early modern Japanese scholars such as Joken understood the significance of astronomical inquiry, and thereby assimilated or rejected cosmological knowledge from abroad.

Exchanges of Astronomy in Asia (I)

FrG1-1

The Mongol Impact and The Astronomy Policy of Korea

Eonheai Sur
Seoul National University

It is well known phenomenon that Chosŏn adopted Chinese astronomy and tried to make same calendar with China. In this paper, I will discuss about the origin of such propensity.

Since 1260 when Koryŏ decided to accept the sovereignty of the Mongol empire, Koryŏ and the Mongol had formed a quite peculiar relationship for a hundred year. The king of Koryŏ won three different status from the Mongol emperor, a sovereign of realm with a political independence, an imperial son-in-law, and a governor of the Mongol province. Accordingly, Koryŏ became a vassal state and province of the Mongol empire, however, remained as an independent realm concurrently. Through the unique relation between Koryŏ and the Mongol, Koryŏ could maintain its own astronomical bureau, while the policy on astronomy of the Mongol empire made a direct impact on Koryŏ. There are two significant events which affected Koryŏ. First is the astronomical reform of the Mongol empire. In 1280, the ‘Season Granting System’ (授時曆) became official throughout the empire, of course including Koryŏ. Second, Mongol began to confer calendars to Koryŏ every year. From 1261, the king of Koryŏ received a calendar from the Mongol emperor as a present every year. However, from 1280 when the king of Koryŏ held a governor of the Mongol province, the Mongol conferred calendars to Koryŏ like other provinces of the Mongol. Koryŏ responded to such changes of the Mongol astronomy. The first remarkable astronomical reform of Korea was held in 1308. Koryŏ began to compile calendars with ‘Season Granting System’ and verified accuracy of calendars by comparing them with calendars conferred by the Mongol. Finally, it was a birth of a concept of same astronomical system, same calendar.

Exchanges of Astronomy in Asia (I)

FrG1-2

Knowledge of Family: Assimilation of Imported Knowledge and Formation of Jungin Family Lineage in The Late Joseon Period

Kwonsoo Park
Chungbuk National University

In this article, I will examine the change process of the organization and activities of the *Gwansang'gam* (the Office for Observation of Natural Phenomenon), which was the science agency of the Joseon Dynasty, in the late Joseon period. I especially pay attention to the change of bureaucratic structure of astronomy division in the *Gwansanggam* which was responsible for administrating tasks associated with astronomical observation and calendar making, etc. During the long period of assimilation of *Shixian-li* method originated in Western astronomical knowledge and making annual calendars with new method, bureaucratic structure of the *Gwansanggam* was changed gradually. The number of officer was increased, as well the text of civil examination for the *Gwansanggam* officers was newly designated, and the selection process of young candidates for officers was enacted. With these changes of *Gwansanggam*, expanded opportunity for *Gwansanggam* offices became the exclusive properties of some family. Some family did succeed to supply their members officers of *Gwansanggam* with the civil examination from generation to generation. I insist that the appearance of the *Joung'in* (Middle class) families of *Gwansanggam* in the late Joseon period can be understood as the result of exclusive knowledge possession by the new families. I will exam this thesis with analysis of family lineages on the Registration books of *Gwansanggam* such as *Register of Recommended and Permitted to Entrance for Gwansanggam*, *Register of the Passed Civil Examination*, and *Register of Astronomer Teachers of Gwansanggam*.

Exchanges of Astronomy in Asia (I)

FrG1-3

Two Versions of Chinese-islamic Calendar, Chinese *Huihui-lifa* 回回曆法 and Korean *Chiljeongsan Oepyeon* 七政算外篇

Eun Hee Lee
Institute of Natural Science, Yonsei University

In the early Ming 明 China, the Chinese version of Islamic calendar, *Huihui-lifa* 回回曆法 originated from the Persian Zij of Yuan 元 dynasty was compiled by the co-operation of Chinese and Muslim court astronomers. It was introduced to Joseon 朝鮮 Korea during the King Sejong period (1418-1450) with the Chinese and Islamic calendrical sources. At that time, however, Korean astronomers noticed that there were serious errors and omissions in the Chinese *Huihui-lifa*. In 1444, it was newly compiled as a Korean version of Chinese-Islamic calendar, *Chiljeongsan Oepyeon* 七政算外篇 through the correction and revision. Thus far, there have been many questions of what are the differences between these two versions of calendars. In this study, we discuss about 1) What is the crucial mistake by the Chinese astronomers? 2) How Korean astronomers find and solve the problems of errors in the Chinese *Huihui-lifa*? 3) Finally what are the main differences between Chinese *Huihui-lifa* and Korean *Chiljeongsan Oepyeon*?



Reproduction Technologies in Modern East Asia

FrH1-1

The Ogino Method and Religion in Japan

Miwa Yokoyama
Ochanomizu University

This presentation examines the relationship between religion and the contraceptive technique known as the Ogino method (*Ogino shiki hinin hō*) in Japan. Contraception is often religious issue. For example, the Catholic Church prohibits most forms of contraception. In 1924, however, the discovery of the timing of ovulation changed the situation. The Japanese gynecologist Kyusaku Ogino presented his theory on the timing of ovulation and the conception period in Japan, and again in 1930, in Germany. Hermann Knaus, of Austria, presented a similar theory in 1929. The theory is called the Ogino theory in Japan, and the Ogino-Knaus theory elsewhere. This was immediately applied as a contraceptive method called the Ogino method, the Ogino-Knaus method, or Rhythm method. Pope Pius XI permitted this new method's use in 1930, and his encyclical attracted tremendous interest in many countries. In Japan, however, religious concerns rarely seem to be an issue. Japanese laypeople also paid a great deal of attention to the Ogino theory, which was promoted through women's magazines, but their interest was not religion-based. My research found only one small article in the three major national newspapers of the 1930s about the relationship between Catholics and the Ogino theory. One major reason for this lack of attention was the small number of Catholics in Japan. After that, a few articles dealt with the story and depicted the issue as a foreign matter. Some said Japan was a "free country" when it came to contraception. In 1968, Pope Paul VI also permitted the use of the Ogino-Knaus method, and popular magazines seemed to belatedly realize that the Ogino method was an anchor to Catholics. They depicted Ogino as a hero for Catholics. The Pope's permission was regarded as an indication of the greatness of this Japanese medical researcher.

Reproduction Technologies in Modern East Asia

FrH1-2

International Assistances of U.S. and Family Planning in South Korea, 1960-1970s

Se-Kwon Jeong
Sookmyung Women's University

This paper will examine the relationships between various types of international assistance projects of the United States and family planning in South Korea, 1960-1970s, and suggest that the characters of each project, that is personal, civil, and governmental etc., had had different effects on the ideas and practices of public health and family planning in the South Korea. On November 3, 1961, the U.S. government launched a single international assistance agency, USAID responsible for administrating aid to foreign countries to promote social and economic development. USAID and its predecessor, the International Cooperation Administrations had facilitated there construction of Korea's medical education, research and infrastructures after the Korean War and influenced public health policies and family planning in South Korea from the late 1950s. However, there had been non-governmental types of U.S. assistance projects for South Korea from the early 20th century, such as international medical programs of Rockefeller Foundation, and their legacies remained in the business of USAID with different ways. As primary aims of USAID changed from technical, capital assistance for social, economic developments in 1960s to 'basic human needs' such as food/nutrition or health, population planning in 1970s, public health program and family planning in South Korea, especially under Park's presidency, developed apparently in accordance with USAID but demonstrated diverse characters dissimilar to USAID.

Reproduction Technologies in Modern East Asia

FrH1-3

Changes in Menstrual Technologies and The New Perception of The Menstrual Body in South Korea, 1960s-1980s

Youngju Lee
Seoul National University

Korea saw a rapid transformation of main menstrual technology from the 1960s to the 1980s, as disposable sanitary pads replaced handmade cloth pads. But sanitary pads were not the only menstrual technologies that were newly introduced in that period. Tampons, another kind of disposable menstrual product, were also introduced in that period, only to be disregarded by Korean women. Why did they prefer to choose sanitary pads to tampons? Although some feminist researchers argue that Korean women's suspicion of tampon came from their concern about the possible damage to the hymen, this paper argues that Korean women's choice was conditioned by a new perception of the menstrual body emerged in the 1970s-1980s. The perception was shaped by knowledge about menstruation suggested by medical and educational experts, and manufacturers of disposable menstrual products. According to these experts, the menstrual body is both normal and vulnerable and thus it needs not medical care but management. This new perception discouraged Korean women, who were educated in the 1970s-1980s, from doing strenuous exercise during the menstruation period. They believed that tampons could be harmful if they were inserted into the vulnerable vagina during their period and assumed that tampons were only for athletes. Korean women chose sanitary napkins rather than tampons as their main technology for menstrual management. This accelerated the diversification and sophistication of sanitary napkins, but slowed the advancement of tampon technology. This case illustrates an interaction between technologies and women, who were frequently portrayed as passive users in history of technology, choose menstrual technology based on their own knowledge of the menstrual body and their choice of the menstrual technology influences the development of that technology at the same time.

Reproduction Technologies in Modern East Asia

FrH1-4

Building The Seoul-type Transportation Assemblage: A Case Study of The Plan of Seoul Metropolitan Subway in The Early 1970s

Sung Won Kim
Chey Institute for Advanced Studies

This study examines how the plan of Seoul Metropolitan Subway in the early 1970s could be transformed from the imitation for the Tokyo Metropolitan Subway to one of the most important actors of Seoul-type transportation assemblage. In this paper, I'll argue two main points. First, I'll show that the transportation assemblage, which is composed of the alliance of the subway and the automobiles, was originally the imitation for the transportation assemblage of Tokyo. The first comprehensive plan of the Seoul Metropolitan Subway in the early 1970s was constructed in the aid of experts of the Japanese Railway Technical Service (JARTS). 80 million dollars loan from the Japanese Government to the Seoul Metropolitan Government and the Korean National Railroad, the technology aid and transfer from JARTS to the Seoul Metropolitan Subway showed strong influence from Japan. The type of route map of the Seoul Metropolitan Subway was also similar to that of Tokyo. Second, I'll illuminate how first comprehensive plan of the Seoul Metropolitan Subway in the early 1970s was changed in the context of the construction of transportation assemblage in Seoul. I'll show that the development of Gangnam Area affected the transformation of the plan of Seoul Metropolitan Subway. The change of route map of the Seoul Metropolitan Subway line number 2 in 1975 was the starting point from imitation to new transportation innovation in Seoul. At the end, Seoul has their original transportation assemblage in the Co-construction of Gangnam Area and the Seoul Metropolitan Subway after the middle of 1970s.

**Fr11****(Roundtable) Historiographies of Science, Technology, and Medicine in East Asia: Do We still Need (more) Monumental Series?**

Dong Won Shin¹, Yong Hoon Jeon², Wen-Hua Kuo³, Morris Low⁴

¹Chonbuk National University, ²Academy of Korean Studies, ³National Yang Ming University, ⁴University of Queensland

Since the first volume surprised the Western intellectual world in 1954, the *Science and Civilisation in China* series by Joseph Needham had evolved into a monumental 27-book (7-volume) series by 2008. The SCC provided benchmarks to scholars interested in the history of science, technology, medicine, and eventually the civilization in China, and accordingly kindled numerous attempts in East Asian countries to weave comprehensive narratives of the East Asian history of science, technology, and medicine on their own terms. Publications of those monumental series reflect the remarkable growth of the East Asian HSTM community and the accumulation of its scholarship in the past decades.

The changing academic environment, however, also mounts twofold challenges to the EAHSTM scholars. How could we keep motivate the scholars, who are exposed to growing institutional pressure to publish peer-reviewed articles and monographs, especially in a quantifiable manner, to engage themselves into a longstanding, multi-volume endeavor? On the other hand, how could we respond to growing readers' demands for comprehensible guides to the myriad of scholarly work on the EAHSTM?

In this vein, this roundtable invite the panels and the audience to discuss the following issues together. What were the contributions and limitation of the previous series? Is the idea of a "monumental series" still relevant? How could we initiate, realize, and improve such projects? Where should we aim at for the future series? Specifically, this roundtable also invites the key figures engaged in the *Science and Civilization in Korea* project by Chonbuk National University, which is supposed to publish 30 volumes in Korean and 10 volumes in English, to listen to their insights from the experience.

FrA2**Nuclear History in Asia & Pacific (II)**

Organizer: Hongjin Liu (Tsinghua University)

Without doubt, the nuclear history of East Asia including the development of nuclear technology, nuclear weapons and the evolution of nuclear energy policies in China, Korea and Japan, and the transnational exchanges and influences in the grander area of Asia & Pacific is a significant topic in the research of contemporary science and technology. The panel themes include but not limited to: 1. The advances of nuclear sciences and the technology transfer in the relevant areas; 2. The work of a particular nuclear scientist or a research team; and their involvements with governmental and social funding resources; 3. The local responses to nuclear construction and disasters, e.g. in STS perspective; 4. The ecological, social and philosophical backgrounds of nuclear-related research and practices - that can be interpreted through governmental policies or publication orientation.

Nuclear History in Asia & Pacific (II)

FrA2-1

The Ethos and Social Role of The Chinese 'Bombs and One Satellite' Scientists Group

 Anbo Ren¹ and Fan Xiaojuan²
¹*University of Science and Technology of China*
²*Inner Mongolia Normal University*

The term 'Bombs and One Satellite' used in China Defense Science and Technology refers to the atomic bomb, the hydrogen bomb and the artificial satellite. The 'Bombs and One Satellite' Scientists Group is a special scientists group in the New China. Most literatures refer to 'Bombs and One Satellite' Scientists Group are propaganda pieces. Some research literatures are based on the perspective of mentoring relationship and educational background of the group. However, the systematic studies of the group from the perspective of scientific institution and social culture are in the ascendant. This study is based on the collective biography compiled from the personal biographies, memoirs, archives, interviews and other related materials of the 'Bombs and One Satellite' Scientists Group and summarizes the ethos and social characteristics of the group. The 'Bombs and One Satellite' Scientists Group plays a social role that combines professionalism and national sentiment. The degree of social recognition of their social prestige and technical achievements is always in relation to the international status of China. The demonstration effect of the ethos of 'Bombs and One Satellite' Scientists Group in contemporary China is manifested in their national sentiment, dedication, professionalism and the pursuit of immortal prestige.

Nuclear History in Asia & Pacific (II)

FrA2-2

On the Sino-European Spent Fuel Trade and Its Influences in The 1980s

Pei Liu

University of Science and Technology of China

Spent fuel reprocessing is the key link of the closed nuclear fuel cycle. China had successfully mastered the military reprocessing technology even early in the 1960s, but the research and development of commercial reprocessing technology was slow, restricting the sustainable development of nuclear power seriously. Yet little attention was paid to that the Sino-European spent fuel trade in the 1980s which provided a rare opportunity for the development of China's commercial reprocessing industry. Unfortunately, the trade was aborted eventually due to some non-professional factors and the reasons are worthy to research. Through the relevant literature review and interview of witness, this paper makes an in-depth discussion on the origin and development of the whole incident. This paper states that the trade belonged to normal commercial operations, and the relevant provisions and international environment benefited China greatly; the opposition of overseas Chinese and the resulting delay in negotiations are the main reasons for the final abortion of trade; as a result, the development of commercial reprocessing was falling into decay, becoming the weak point of the whole nuclear fuel cycle. It finally points out the abortion of the Sino-European spent fuel trade shows that it is a very complicated task to improve public recognition of nuclear energy development and China should learn from the successful experience of developed countries that how to popularize nuclear energy knowledge effectively.



Nuclear History in Asia & Pacific (II)

FrA2-3

Teng Teng and China's Nuclear-fuel-reprocessing Project in 1960s

Hongjin Liu
Tsinghua University

On 15th January, 1955, Chairman Mao decided to launch China's atomic project. As part of the project, higher education of nuclear subjects was soon constructed in China's universities and institutes, including Tsinghua University. In 1956, the Department of Engineering Physics was established, accommodating the first and only nuclear-fuel-reprocessing major in China. The department and the major at Tsinghua was responsible for China's first nuclear-fuel-reprocessing project in 1960s. As the team leader of the project, Teng Teng was sent to Soviet Union to study nuclear reprocessing technique and process. At that time the prevalent method in Soviet Union was still precipitation - not far different from how Marie Curie got Radium. While, in the contemporary U.S., a new method, Purex, was invented by using TBP (Tributyl phosphate) as extractant. Teng brought this method back to Tsinghua and persuaded his colleagues to practice the technical process of Purex. From 1959 onwards, the research of the whole department centered on nuclear-fuel-reprocessing - learning and practicing Purex. Why the whole department and its hundreds of members can work for one subject? What difficulties were encountered in conducting the research? When Chinese government decided to use Purex to replace the precipitation method that had been recommended by Soviet specialists, who played the major role? These questions will be answered in by exploring the history of Tsinghua's nuclear departments, with special attention on the nuclear-fuel-reprocessing project and its team leader, Teng Teng.

Nuclear History in Asia & Pacific (II)

FrA2-4

A Cross-comparative and Multi-disciplinary Study on Nuclear Energy Policies in China, Japan and Korea: Past, Present and Future

Monir Hossain Moni
Asia Pacific Institute for Global Studies APIGS

This individual paper tries its best not only to give the involved stakeholders (including government, business and civil society) a historical account of such extraordinarily enthralling event as nuclear energy experienced by China, Japan and South Korea located in East Asia (also called Northeast Asia), but also to tell them about a concurrent course of actions adopted as well as succeeding set of principles proposed for the nuclear power plant developments by these neighboring countries. In any case, this comparative study arguably evinces 'why' Japan and Korea are taking their important positions respectively on nuclear power generation in entire Asia as the world's largest and most populous region where the nuclear energy growth is currently heating up in contrast to North America and Western Europe, and particularly 'how' China that has already become the greatest country in this region where electricity generating capacity are increasing remarkably could be a constructive 'role model' for other nations around and beyond Asia in terms of production of nuclear energy and transfer of this technology. In conclusion, this original piece of academic pursuits optimistically but realistically suggests that just because nuclear energy as a clean (due to zero greenhouse gas emissions) energy resource offers numerous 'sustainability' (environmental, social and economic) advantages and opportunities contrary to its disadvantages and challenges (for example, Japan's Fukushima Daiichi nuclear disaster as one of the globe's most dangerous energy accidents triggered by the tsunami following the Tōhoku earthquake on 11 March 2011), this mechanical/electrical energy as an invisible device will meaningfully power and propel our way of day-to-day societal life for the years to come. To achieve its goals, the interdisciplinary research will convincingly synthesize the inevitable concepts of 'nuclear energy', 'nuclear power', 'international political economy', etc., and will intrinsically be based on the secondary data sources available online.

FrB2

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (II)

Organizer: Longfei Chu (University of Science and Technology of China)

In the late Ming dynasty, the Jesuits used science as an aid to their religious mission in China and introduced scientific knowledge from Europe into this country. The year 1629 marks the first climax of their efforts, because it was in this year that the Ming government decided to reform its long outdated system of calendrical astronomy through an systematic introduction of European astronomy and thus inaugurated an official project for the compilation of the *Chongzhen-Reign Treaties on Calendrical Astronomy*, an encyclopedic series of treatises on European mathematical astronomy. This was the first time for European science to climb onto the official stage in China, which has also become a landmark in the history of Sino-European relationship. As Confucianism was the predominate ideology in China of the time, the introduction and dissemination of European sciences through a work like the *CZLS* not only exerted strong impact on Chinese men of science, it also triggered a complex process of conflict and dialogue between the so-called *Xixué* 西學, Western Learning, and Confucianism. This makes the interaction and accommodation between science, Western Learning and Confucianism an important cultural phenomenon in history. Studies of this phenomenon is a key to our understanding of this special period, whereas an exploration of the relationship between science and Confucianism in all related historical periods is also pertinent and necessary in enhance this understanding in both depth and width. The year 2019 is the 390th anniversaries of the compilation of the *CZLS*. As a way to commemorate such a historic event, this panel will present a group of papers on the cultural and scientific contexts, compiling process, contents, and dissemination and influence of the *CZLS* that are based on new materials and new analyses.

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (II)

FrB2-1

How did The *Chongzhen lishu* Change The Metaphysical Basis of The Calendar Learning in The Ming-Qing Period?

Haohao Zhu

University of Science and Technology of China

In ancient world, different kinds of important civilizations developed their own different “sciences”, which focus on understanding natural phenomenon systematically. Just as ancient philosophy in different civilizations, these “sciences” usually not only include the knowledge on the experiential level, but also try to found experiential knowledge on a metaphysical basis in order to construct an independent and self-sufficient system. Even the metaphysical catalogues could be more important than the experiential knowledge. In ancient China, “calendar learning” (曆學, Lixue) was an important “science” which aims to calculate the apparent motion of the sun, the moon and five planets and so on. Before the late Ming dynasty, some astronomers such as Liuxin 劉歆, Yixing 一行, Xing Yunlu 邢雲路 tried to combine the metaphysical basis of calendar learning with the catalogues in Yi-ology (易學, Yixue), a key component of traditional Chinese thought. However, this tradition was changed by the *Chongzhen lishu* 崇禎曆書 (*Chongzhen reign treatises on Calendrical Astronomy*), which was compiled on the basis of European astronomy in the late Ming dynasty and adopted as the basis of official astronomy in the beginning of Qing dynasty. This paper will try to reveal this phenomenon preliminarily.

**The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (II)****FrB2-2****A Primary Research on The Calculating Method of The Lunar Eclipses in The Chongzhen-Reign Treaties on Calendrical Astronomy**

Longfei Chu and Chen Ji
University of Science and Technology of China

In the late Ming dynasty, European astronomy was introduced into China. During an astronomical reform launched in 1629, the *Chóngzhēn lìshū* 崇禎曆書 (*Chongzhen-Reign Treaties on Calendrical Astronomy, CZLS*), an encyclopedic series of treatises on European mathematical astronomy, was compiled. However, the eclipse theory in *CZLS* was not clear and complete enough, which was an important part of Chinese astronomy. Not only was the method for calculating the astronomical tables not explained in the part of the theoretical fundamentals, but also it failed to provide a detailed procedure for calculating a solar or lunar eclipse by using the tables. In this paper, through analyzing the astronomical works connected to European eclipse theory in the late Ming and early Qing era, we will try to reconstruct the exact and complete methods for calculating a lunar eclipse by using geometric models and the astronomical tables in the *CZLS*. Moreover, a comparison between the calculating results based on our reconstructed method and the predictions of lunar eclipses in the Chongzhen reign period recorded in the historical materials will be presented.

The Chongzhen-Reign Treaties on Calendrical Astronomy and Beyond (II)**FrB2-3****Datong Calendar Reformed in The Chongzhen Reign: Coping with The *Shixian* Calendar in Chosŏn**

Yung Sik Kim
Seoul National University

This paper discusses various different ways Chosŏn -- scholars, government, and kings -- coped with the *Shixian* Calendar based on the Chongzhen calendar reform. When Qing adopted the *Shixian* Calendar, Chosŏn had no alternative other than adopting it. But they had to justify their acceptance of the new calendar based on the barbarian Western astronomy and promulgated by a barbarian Manchu emperor. Some claimed that it preserved the frame of the Datong Calendar of Ming while incorporating Western astronomical knowledge and methods. Some emphasized that it was really the work of the Ming in the Chongzhen Reign, which was adopted by the Qing. Many pointed out that calendars needed reforms once in a while because of the accumulation of errors, and that it was time for another reform anyhow since the current calendar had been in use for 300 years. The feeling of emotional ties and loyalty to the Datong Calendar and the Chongzhen Reign continued alongside these.

FrC2
Reexamining The History of The Heavy and Chemical Industries in South Korea, 1950s-1980s

Organizer: Hyungsub Choi (Seoul National University of Science and Technology)

Within modern Korean history, the Heavy and Chemical Industries (HCI) is commonly associated with the 1970s. In January 1973, then President Park Chung Hee announced the new focus on HCI's as the central arena for government promotion. Scholars have interpreted the HCI policy in connection to Park's interest in "independent defense capabilities." In other words, the government promoted HCI's to accumulate technical and industrial capabilities that could be converted to defense capabilities in times of emergency. The Nixon Doctrine and the aggressive posture of North Korea since the late 1960s served as important backdrops for this decision. In this session, however, we aim to deviate from the standard interpretation, and take a broader perspective on the history of HCI's in South Korea. The common feature of the four papers is that it refuses to take the Korean government as the key actor. Choi examines the cement industry, a sector typically not recognized as standard HCI, emphasizing the role of U.S. and international aid agencies in the beginning of cement production in South Korea. Hong focuses on the automobile industry, and the shifting notions of "national" cars in the 1970s. Kim looks at the petrochemical industry, focusing on air quality regulations and changes in corporate behavior on the issue. Finally, Gimm takes the geographical locale of Geoje, as it went through profound transformation as the shipbuilding industry took form. On a methodological level, the three papers take a social history approach to the history of HCI, examining not only how each sector was promoted by the government, but also how its products (cement and cars) and byproducts (SO₂ emission) affected the everyday lives of the Korean people.

Reexamining The History of The Heavy and Chemical Industries in South Korea, 1950s-1980s
FrC2-1
Cementing Reconstruction: The Cement Industry and Everyday Life in South Korea

Hyungsub Choi

Seoul National University of Science and Technology

Cement (or concrete) was the single most important item required for reconstruction after the Korean War. At the time in South Korea, there was only one cement factory, which had been built during the colonial period. Thus, it is not surprising that the UN Korea Reconstruction Agency (UNKRA) considered cement production among its top priorities in planning postwar reconstruction. This paper will trace UNKRA's efforts to revamp the South Korean cement industry, focusing on technology transfer from the abroad. Then, it will follow the South Korean efforts to boost cement production in the 1960s, which took off alongside the economic development plans. Finally, this paper will examine how cement changed the everyday lives of the South Korean people, throughout the postwar decades.

**Reexamining The History of The Heavy and Chemical Industries in South Korea, 1950s-1980s****FrC2-2****People's Car, The Original Model, and 'My Car': Competing Ideals of The New National Car During The Park Chung Hee Era**

Sungook Hong
Seoul National University

Since 1961, the Park Chung Hee government's automobile industry policy was characterized by a series of confusions. In the early 1960s, several automobile companies in Korea were competing to produce cars with foreign components, and the government set up a policy to standardize them by unifying these companies or by "localizing" foreign components, but such policy had little effect on actual production sites. At that time, the concept of "localization rate" of components was the important concept for policy makers and manufacturers alike. For example, in 1969, the government announced that it would raise the localization rate of the automobile industry to 67% in 1972 and 100% in 1976. Another policy trend was to prohibit changes in the structure of cars. In 1972, measures were taken to shut down all the small assembly plants in South Korea. However, in 1970, Dr. Kim Zae Quan of KIST developed an idea of the "unique model" automobile and insisted that the government should lead the auto industry as a public service. His idea of the unique model was given little attention by policy makers, but since Dr. Kim was appointed as Assistant Secretary of Commerce and Industry in 1973, a position that supervised Park's policy over the promotion of the heavy & chemical industry, the idea became powerful policy. On the other hand, consumers began to be fascinated by the idea of family cars, or "my cars," which were supposed to come out cheaply through competition among the automotive manufacturers. This paper will discuss how these different ideals of the national car competed with each other during the late 1960s and the early 1970s, and what the result was.

Reexamining The History of The Heavy and Chemical Industries in South Korea, 1950s-1980s**FrC2-3****Desulfurization, Deregulation and Democratization: Air Pollution Controls in The Private Sector in South Korea in The 1970s-1990s**

JooHui Kim
Program in History and Philosophy of Science, Seoul National University

As the Korean petrochemical industry was established and promoted in line with the Heavy and Chemical Industry Plan (HCIP) of the Park Chung-Hee regime, air pollution caused by SO₂ emission got worse and worse, reaching its peak in 1980. South Korea, however, witnessed a dramatic decrease in SO₂ pollution afterwards, which was frequently attributed to the environmental regulatory measures of the Chun Doo-Hwan government. This paper examines how desulfurization technologies were discussed and introduced in South Korea in the 1970s-1990s, focusing primarily on the controversies over constructing desulfurization facilities in oil refineries. Departing from the government-centered explanation which emphasizes the different roles and concerns of each regime, this paper analyzes how various actors in the private sector, who once strenuously refused to take responsibility for SO₂ emission, came to wholly embrace the notion of desulfurization, claiming to advocate democracy and corporate social responsibility.

Reexamining The History of The Heavy and Chemical Industries in South Korea, 1950s-1980s

FrC2-4

How have Heavy Industry Cities been Built?: The Shipbuilding Industry and Geoje

Dong-Wan Gimm and Seunghoon Yang
Kyungnam University

Geoje is the city of immigrants. Many shipyards, including the Okpo Shipyard, were built on Geoje Island, and many people from all over the country gathered in Geoje. As workers gathered more and more, houses and amusement facilities had been created. After that, as workers began to marry and build up their families, various cultural facilities and educational institutions became active. This newly placed industrial space rapidly reassembled the existing urban fabric of Geoje. Notably, the shipbuilding industry is a heavy industry but a labor-intensive industry. The city, where the shipyard is established, is bound to experience unprecedented population inflows. Besides, it is an industry where workers are differentiated according to their proficiency in labor. It provides a large number of regular jobs, but also offers an even more significant number of irregular, temporal jobs. There are a rapidly changing population fluctuations beneath the superficial trend of the population increasing. Interestingly, this volatility is affected by factors on local, regional, national, and global scales. The city responds and adapts to multiscale population flows. At the end of this paper, we examine the urban form which this volatility has historically shaped in Geoje.

FrD2

Critical Histories of Sericultural Science in 19th and 20th Century East Asia

Organizer: Lisa Onaga (Max Planck Institute for the History of Science)

The history of science of sericulture, the cultivation of the silk cocoons spun by *Bombyx mori*, has received diffuse attention from scholars of nineteenth and twentieth century East Asia. This panel focuses attention upon how sericultural experiments took place and contributed to new knowledge production in different localities of East Asia, ranging from the Korean peninsula, China, colonial Taiwan, and Japan. The making and movement of students, sericulturists, and scientists in and among regions, climates, laboratories, and social spaces illuminate how particular knowledge about sericulture or silkworms developed. These papers lay the ground for further research and discussion about the rootedness of sericulture or the challenges of re-rooting sericulture. The paper presented by Lisa Onaga examines the climatic, biotic, and social frustrations that Japanese sericultural engineers faced as they tried to establish sericulture in recently colonized Taiwan. The impact of border-crossing on silkworm research is demonstrated by Geun Bae Kim, whose paper examines the social transfigurations of Kye Eung-Sang, a Korean Japan-educated silkworm geneticist who worked increasingly on the varietal breeding and improvement of silkworms as he moved to China, colonial era Chosun, and post liberation North Korea. Scientific research on silkworms and sericulture is scrutinized by Ni Genjin, whose paper on the research career of Gui Ying-xiang (Chinese pronunciation of Kye Eung-Sang) in Guangzhou shows silkworm research as an expression of Sino-Korean cooperation throughout the 1930s. Together, these three papers show how the mobility of sericulture scientists is a useful lens for extending a critical analysis of the practicalities of working with biological materials in relation to scientific knowledge created in differently located sericultural



systems. These papers productively reframe the history of sericulture in East Asia by critically revealing how tensions, borne from colonial and other sociocultural or political relationships like patronage or cooperation, generated distinct research motivations and capacities.

Critical Histories of Sericultural Science in 19th and 20th Century East Asia

FrD2-1

The Trouble with Translocating Silkworms in Colonial Taiwan

Lisa Onaga

Max Planck Institute for the History of Science

Japanese sericultural experiments conducted in colonial Taiwan exemplify a failed attempt to establish silk culture. This forgettable chapter in the history of Japanese colonialism provides interdisciplinary historians with a useful setting for considering the role of translocated insect bodies in history. This paper focuses upon the manipulation of domesticated silkworms in order to elucidate how bio-technical practices dealing with nonhumans may contribute to understandings of translation and transplantation processes. Making silk and sovereignty points to an entomological corpus that came into definition through the sustained work of breeding female and male silk moths, addressing disease, evaluating silk cocoons, and measuring the environment of silkworm rearing. Most important, the insect provided a proxy for disciplining human bodies. Resilient silkworms were not always already waiting to be deployed in the early twentieth century. Rather, analyses of Japanese-produced scientific records in colonial Taiwan show how local human bodies were resistant bodies disinclined to participate in the translation or sustained biomaterial translocation of silkworm stocks. The iterative processes of reading silkworms in this experimental period would provide an inspirational example for using sericulture in diplomatic strategies of maintaining sovereignty in Southeast Asia.

Critical Histories of Sericultural Science in 19th and 20th Century East Asia

FrD2-2

‘Crossing The Borders’: The Transfiguration of A Korean Silkworm Geneticist

Geun Bae Kim

Chonbuk National University

In Colonial Chosun, there were a number of Koreans who were interested in silkworms, which had been considered important traditionally. However, among them almost no one became a renowned scientist because it was extremely difficult to pass many gateways necessary to grow as a scientist. A Korean silkworm geneticist named Kye Eung-Sang (1893-1967) illustrates this point very well. At that time, since there was no opportunity for higher education in Chosun, Kye needed to study abroad. He entered the college of agriculture of Kyushu Imperial University after many complications solely with the help from his family and relatives. He stayed in the lab after graduation and conducted research but was assigned minor research topics in Japan. When he crossed over to China, he started to handle genetics required for silkworm improvement in earnest through the support of an influential benefactor in Guangzhou. After liberation, in North Korea, he took the lead in the breeding of superior varieties of silkworms, which was demanded socially, in the full support of the country. Kye Eung-Sang’s scientific life changed by crossing the borders. His activity space changed several times from Japan to China to South Korea to North Korea. This was to endlessly overcome various kinds of obstacles that were placed in the ways to become a scientist. During this time, Kye also changed his research field from silkworm physiology to genetics to breeding studies in order to increase the academic and social values of scientific research in different times. The transfiguration of a scientist in this period was realized as it was interlocked with the border crossing of regions, scholarship, and patronage.

Critical Histories of Sericultural Science in 19th and 20th Century East Asia

FrD2-3

On The 8-Year-Research (1930-1938) of Gui Yingxiang, The Famous Korean Sericulturist, in Guangdong - According to Chinese References

Genjin Ni

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Agricultural University*

The Korean sericulturist Gui Yingxiang moved to Guangzhou, China in April 1930, when he was hired as professor of sericulture of the Agriculture Faculty of Sun Yat-sen University and Engineer-in-chief of Zhongkai Agriculture & Engineering Institute. Based on research and analysis of scientific publications in China such as *Zhejiang Sericultural Progress* and archival records, this paper reconstructs the history of Gui’s eight-year career in China and its legacy. While the details of his patronage have been a matter of debate, this project shows how Gui notably brought the silkworm genetics from Japan to China and cooperated with Chinese colleagues in sericulture research in ways that improved the development of the sericulture of Guangdong and China. His work, involving the anatomy, physiology, genetics and breeding, was appreciated by the Chinese academy and made him famous in China. Gui’s research attests to a history of exchange and cooperation between China and Korea mediated through science.

**FrE2****The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (II)**

Organizer: Shu-ching Chang (Chang Gung University)

The modern history of nursing and midwifery in China and Taiwan is dramatic and complex. There were different forces which include nursing ideas and practices, nursing education, missionary organizations and international foundations to shape the modern nursing and midwifery in China and Taiwan. Western missionary introduced modern nursing in China and laid the preliminary foundation for its development, while the upgrading of nursing education from training to higher learning was a contribution made by the School of Nursing of Peking Union Medical College (PUMC), supported by the China Medical Board. There are six papers in this panel. All of these papers attend to the development and impact of the School of Nursing of PUMC: its education model, the high standard and the initiatives in public health nursing, and the heroic and patriotic military nursing created by the PUMC's outstanding graduates breeding the leaders in nursing education and profession in China. Furthermore, transnational flow of nursing personnel was an important aspect of internationalization of nursing in the twentieth century China and Taiwan. The Principals were Americans in the beginning of the nursing school of PUMC. However, later on, the Principals were changed to Chinese because of the political situation. The graduates of the School of Nursing of PUMC were mostly elites in the nursing professions in China and Taiwan. Summarily speaking, the School of Nursing of PUMC can be a showcase to demonstrate the developmental process of modern nursing profession in China and the cross-border flow of nursing knowledge among the United States, China and Taiwan.

The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (II)**FrE2-1****Nursing Knowledge Transfer: A Case Study based on Chow, Meiyu's Nursing Expertise in Taiwan, 1949~1970s**

Shu-ching Chang
Chang Gung University

Peking Union Medical College (PUMC) is the first university-level nursing school in China. This nursing school adopted an elite education method and only accepted a very small number of students each year. One of the key figures was Chow Meiyu, a graduate of PUMC, who was in charge of the Department of Nursing at National Defense Medical College (NDMC) since 1947. In this paper I focus on knowledge transfer, particularly how Chow Meiyu utilized her PUMC social network and her experiences with Sino-Japanese War to build up military nursing in Taiwan.

As a director of nursing department of NDMC, Chow networked actively with international organizations, including American Board of Medical Aid to China (ABMAC) and Rockefeller Foundation (RF). These organizations, which offer funds, books, periodicals, and scholarships, were important in the training of military nurses. Moreover, some of professors who taught in PUMC were key members in these organizations. Chow also played a key role in Taiwan Nursing Association during 1950~60s. Drawing on primary sources from ABMAC and RF archive and interviews with Chow's students, this paper examines how Chow established her military nursing expertise and expanded care work to civil society.

The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (II)

FrE2-2

A Case Study of Nieh, Vera Yu-Chan: The Native Pioneer of Nursing Higher Education in China

Chou Chuan Chiang Yao
Chang Jung Christian University

Aim of study: to understand Nieh, Vera Yu-Chan's growth and training experience as well as the influences of traditional Chinese culture and Christianity on her perception of nursing and leadership style.

Rationale and significance: Modern nursing was introduced by Christian missionaries to China in the late 19th century. The missionaries established hospital nursing system for the purpose of saving people's life and spirit. Nursing in China has been impacted by Christianity deeply before the native nursing leaders took over. This article examined the early career of Nieh, Vera Yu-chan (1903-1949) to trace how her growth experience and training at the School of Nursing, Peking Union Medical College (PUMC) and years spent from a nurse to the first native Dean of the PUMC Nursing School shaped her perception of nursing as well as her leadership style. Although some studies described Nieh as the native pioneer of nursing higher education in China, very few discussions from Nieh's growth experience, especially on the influences of Chinese tradition and Christianity on her perception of nursing and leadership.

Methodology: Archival and published sources review as well as interview were used. Content analysis was performed on the information collected.

Findings: Content analysis was categorized into four main themes: 1. Living like a Christian but never preaching gospel. 2. Self-esteem and self-confidence coming from extensive knowledge. 3. Setting higher self-expectation to exceed those foreigner leaders. 4. Full of sense of humor and a very versatile performer.

The Flow of Knowledge and Personnel: The Developmental Process of Modern Nursing Profession in China and Taiwan (II)

FrE2-3

Midwifery in Peking PUMC

Yuntian Hu
The School of Health Humanities, Peking University

At the beginning of the 20th century, China's midwifery career began to develop rapidly. Marian Yang, graduated from the Peking Union Medical College, worked for many years in the Department of Obstetrics and Gynecology of the Union Hospital, and was devoted to reducing the mortality rate of puerpera and infants in China. In 1927, Marian Yang hosted the first midwifery school in Peking---the First National Midwifery School in Peking. The school was affiliated to Peking Union Medical College and has received assistant from PUMC. PUMC has selected excellent nurses and doctors to teach at the National First Midwifery School. At the same time, Marian Yang proposed to train traditional midwife to meet the lack of professional delivery personnel. PUMC founded the maternity training class under the appeal of Marian Yang. In addition, in September 1925, under the joint efforts of the PUMC, John Black Grant and the Jingshi Police Department, the Peking First Demonstration Health Station was established in Dongcheng District. This health demonstration station has also become the main location for students of public health nurses in PUMC. An important job of public health nurses trained by PUMC was maternal and child health care, family delivery demonstration and infant care. Marian Yang who graduated from Union Medical College and PUMC, played a leading and promoting role in Peking's midwifery business during this period, laying the foundation for the future development of China's maternal and child health.

**FrF2****The Mutual Observation of The Nineteenth Century Science between China and The West**

Organizer: Zhihui Chen (Inner Mongolia Normal University)

The nineteenth century is an age with lots of scientific achievements emerging. At that time, science were playing more and more important role in the daily lives of common people, especially in the source of the scientific revolution - Europe. Although China was not the origin of this round of scientific revolution, sciences in China had also been deeply attracted by the Europeans. One of the two focuses of this symposium is how the nineteenth century Western people present and evaluate the sciences / history of science in China, and what is the logic behind this narrative. As for this facet, we can observe from several cases: the introduction of an observatory in China by the French scientific popular magazine *La Nature*, the compilation of tea knowledge in the article in the British encyclopaedia the *Penny Cyclopaedia*, and the Chinese astronomical instruments exhibition in the large scientific show of the World Expo 1889 Paris.

The Mutual Observation of The Nineteenth Century Science between China and The West**FrF2-1****The Observatory of Zi-Ka-Wei on La Nature: A Case of Science as The Benefit for People and The Honour of Country**

Yan Wu

Institute for History of Science and Technology, Inner Mongolia Normal University

The Observatory of Zi-Ka-Wei was founded by Jesuits in Shanghai 1873. It was one of the important scientific institutes established overseas by the French at the time. As a popular science magazine, *La Nature* published some articles introducing this observatory and its researches. These articles emphasized that it was just through the scientific works by the institute like Zi-Ka-Wei that the benefit of science was spread all over the world and these scientific works also manifested the honour of French. This attitude was typical among the west journals at the time and also reflected the understanding of science. Based on the same understanding of science, the attitude to the Observatory of Zi-Ka-Wei by Chinese researchers was more complex.

**The Mutual Observation of The Nineteenth Century Science
between China and The West**

FrF2-2

**The Dissemination of The Chinese Botanical
Knowledge in The 19th Century Britain:
Focusing on The Penny Cyclopaedia**

Ding Cheng Hui
Inner Mongolia Normal University

Taking the Chinese botanical knowledge in the Penny Cyclopaedia as the research object, this paper chooses several highly correlative botanical terms to analyse. It can be found that the compiler paid more attention to species diversity and cultural diversity. Through the term of "Thea" (Tea), this paper makes an analysis of the content, source and interpretation of Chinese tea knowledge, and then concludes that the spread of Chinese botanical knowledge in the Penny Cyclopaedia in the 19th century Britain is closely related to the collection of knowledge abroad in Britain. British businessmen, missionaries and scholars in China played an important role in the formation of knowledge. At the same time, the Penny Cyclopaedia adopts the encyclopaedic writing method to present botanical knowledge.

**The Mutual Observation of The Nineteenth Century Science
between China and The West**

FrF2-3

**The Chinese Astronomical Instruments in The
World Expo 1889 Paris**

Zhihui Chen
*Institute for the history of science and technology,
Inner Mongolia Normal University*

In 1887, the Contre Amiral A.-E.-B. Mouchez (1821-1892), who was the director of the Observatory of Paris at that time, requested some photographs of the instruments in the Ancient Observatory of Beijing from G. Lemaire (1839-1907), the French minister to China, for the astronomical museum established by Mouchez at the Observatory of Paris. These photographs of astronomical instruments at the Ancient Observatory including the related history were not only presented in the scientific magazine *La Nature* by Wilfrid de Fonvielle (1824-1914), a popular science writer, but also exhibited to the public at the Paris World Exposition afterwards in 1889. Through the introduction and promotion by these European scholars, Astronomical Instruments at the Ancient Observatory of Beijing had been presented before the European people with an image of high level scientific instruments and exquisite arts in the history of science. Different from the sinologists' concentration on the tradition of the instrument in ancient China, the Exposition focused on the Europe-type instruments constructed by the help of Jesuits, in order to show the achievement of the European modern science in the Eastern world.

**The Mutual Observation of The Nineteenth Century Science between China and The West****FrF2-4****A Comparative Research on The Measurement Unit Systems between China and The West in The Late Qing Dynasty**

Zengqiang Liu

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Inner Mongolia Normal University*

Based on the historical data, this paper focuses on several tables of measurement units in the late Qing Dynasty. It compares measurement units systems from Europe with the Chinese Revenue and Population Minister weighing system (kuping zhi 庫平制) in this period. Several features of translation of foreign measures in the late Qing Dynasty are described, and a detailed account of the source of the data is made, which reveals the chaos of the system of weighing, the necessity of measuring tables and the trend of gradual unification. The use and the spread of the tables are also discussed. It is considered that the use of tables in the late Qing Dynasty had become a basis for the transfer to the metric system in the Republic of China.

Exchanges of Astronomy in Asia (II)**FrG2-1****Reconsidering of Some Characteristics in The East Asian Astronomy**

Moon Kyu Yi

Chonbuk National University

Many outstanding historians of science have published good researches on traditional astronomy in East Asia. As a result, we have known some important characteristics of traditional astronomy in East Asia. However, some of these characteristics need to be reconsidered. Firstly, the East Asian astronomy has been regarded as the science of the sovereign. So many scholars put great emphasis on the political color of astronomy with a focus on the King or the Emperor. Moreover astronomy was regarded as both a right and an obligation for the King. Then, was astronomy only of and for the king? Secondly, the idea of 'Reformation based on the Heavenly Mandate(受命改制)' should be reconsidered. This idea means that a new King or Emperor should reform every institution including calendar system because he thought to be received his mandate from Heaven. How did this idea affect the development of the East Asian astronomy? Thirdly, there is a questions about the interpretation of celestial phenomena in East Asia. As we all know, there were lots of records of astronomical phenomena in East Asia and it was said that these phenomena were interpreted astrologically. Had the most parts of these celestial phenomenon been really interpreted astrologically in East Asia? Lastly, it is about the cosmology of East Asia. What is the role of cosmology in East Asian astronomy? There had been many discussions on the structure of heaven in East Asia. How did these cosmological discussions affect East Asian astronomy?

Exchanges of Astronomy in Asia (II)

FrG2-2

How did Chinese Scholars Discover The Hijrah Epoch of Islamic Calendar?

Pan Yue

Shanghai Jiao Tong University

The Chinese-Islamic calendar, namely *Huihui Lifa* (《回回历法》), had made a misunderstanding on the Islamic epoch at first. Instead of the correct epoch A.D.622, it took A.D.599 as its epoch. This misunderstanding was caused by the confusion on the lunar and solar calendar. Newly found materials prove that this misunderstanding occurred not long after the translation of *Huihui Lifa* at the early period of Ming Dynasty. The calendar *Weidu Taiyang Tongjing* (《纬度太阳通径》), which was compiled by Yuan Tong (元统), shows the influence of the misunderstanding on the calculation of Chinese astronomers. During the late period of Ming Dynasty, Chinese scholars had also been aware of the problem on the epoch, and they used an algorithm called *jiacifa* (加次法) to make some kind of correction. In Qing Dynasty, the problem on the epoch of *Huihui Lifa* was reinterpreted by Chinese scholars including Mei Wending (梅文鼎) and Li Rui (李锐), who said there were two different epochs for Islamic calendar. This study shows that how Chinese scholars discovered the epoch of *Huihui Lifa* from the misunderstanding.

Exchanges of Astronomy in Asia (II)

FrG2-3

A Study on The Influence of Ryukyu's Calendar by The Change of Dynasty from Ming to Qing

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As one of the vassal states of late Imperial China, Ryukyu was influenced by China in various aspects such as politics, economy, culture, science, technology and so on. Being a symbol of the vassal state, Ryukyu usually pursued the calendar of late Imperial China. The calendar was influenced by the change of Chinese Dynasty. Focusing on the influence on Ryukyu's work of astronomy and calendar during the change of dynasty from Ming to Qing, it explores what changes of calendar in Ryukyu with the change of dynasty? How Ming State (明政权), Late Ming State (晚明政权), Qing State (清政权) promulgated calendar to Ryukyu? How Ryukyu dealt with the complicated situation by technology? The paper draws a conclusion that it was political driving that caused the spreading condition of science and technology from China to Ryukyu. Calendar indeed was a symbol of the vassal state. With the spread of science and technology, Ryukyu's work of astronomy and calendar developed steadily.



Exchanges of Astronomy in Asia (II)

FrG2-4

The Qing's Diplomatic Documents as New Criteria for Chosŏn's Computations of Solar and Lunar Eclipses in The Mid-Eighteenth Century

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This presentation examines Chosŏn astronomers' efforts to enhance their capability to calculate eclipses in the mid-eighteenth century. In the 1750s, Chosŏn's astronomers finally acquired the ability to compute eclipses, and this paper suggests the reasons may be related to the diplomatic documents concerning solar and lunar eclipses sent from the Qing's Board of Rites to the Chosŏn kings, beginning from the first year of King Kyŏngjong's reign (1721). These documents contained predictions for an eclipse set to take place in Chosŏn as calculated by Qing astronomers, without addendum except for a request that the Chosŏn King perform a ritual ceremony during the eclipse. Chosŏn astronomers had presumed that the Qing had wanted to check the accuracy of their new astronomical system, *Lixiang kaocheng* 曆象考成. Interestingly, these documents created an unexpected problem for the Chosŏn astronomers. The eclipse calculations performed by the Qing astronomers set a higher standard for their Chosŏn counterparts; They were pressed to produce the same results in their predictions. Chosŏn's measurements were now judged against the specific figures in the Qing documents rather than by mere appearances of eclipses in the sky. Prior to the 1720s, the primary task of the Chosŏn astronomers was to learn the Shixian li system so as to produce the same astronomical almanacs as that of the Qing. After receiving the Qing's eclipse documents, however, their focus shifted to learning the Qing's methods for eclipse calculations. The Chosŏn government thenceforth dispatched official astronomers to Beijing more frequently than in previous years, until the 1750s when Chosŏn astronomers' computation of eclipses grew to show fairly good correspondence with the results of Qing's calculations.

FrH2

Women and Technology in Korean History**Organizer: Young-hee Kim (Korea Advanced Institute of Science and Technology)**

As a part of the Science and Civilization in Korea (SCK) project based at the Korean Research Institute of Science, Technology and Civilization, Chonbuk National University, Korea, the "gender and technology" group have worked for a more comprehensive and balanced view of Korean technological history addressing the gender bias embedded in the dominant concept of technology. In analyzing the social terrain and manifestations of technology in pre-modern Korea and how they changed with the advent of modernity, special emphasis has been placed on the intersection of sexual division of labor and technological practices. In this series of presentations, we shall foreground the dual gender implications of both traditional and modern technologies, each a deeply gendered system in its own way. In pre-modern Joseon where most of the technological practices were indissolubly interlocked with the matrix of everyday household life, women were mobilized as important technological agents but were excluded from the public recognition system with a very small exception. The advent of modernity with its dichotomy of technological and living practices was also ambivalent with respect to women's agency as "technicians." It began to open part of the modern "public" realm to women but also encroached upon or made invisible the technological practices women continued to do in their households. Our historical reappraisal of women's everyday practices as technological practices also demands theoretical rethinking of some basic concepts. With modernity, technology is reconstructed as a modern, public, and male practice in opposition to (not in continuum with) the traditional, private, and female activities. This new conception leaves out a large part of practices that women perform as part of everyday life. Exposing the singularity of modern technology both as an idea and as a practice and working for a more expanded and historicized conceptualization will be part of our agenda.

Women and Technology in Korean History

FrH2-1

Cross between The Pre-Modern and Modern in East Asian Nations: *Gajeong Bogam* (家庭寶鑑 Household Treasure) in The Early 20th Century

Jung-Ok Ha

National Museum of Korean Contemporary History

This paper examines *Gajeong Bogam*, a book so highly-valued it was considered a must-read for every household. First appearing in Korea during the colonial period, the book was published in various editions in 1910 and continued to be published through the period of Korea's gaining of independence from Japan up until the 2000s.

From the fact that *Gajeong Bogam* presented information necessary for daily life and continued to be distributed and sold, it could be inferred that even one's daily existence in Korea began to require a standardized form of knowledge. The knowledge required, however, was not just 'modern' but was, more accurately, a cross between pre-modernity and modernity, or between traditional and contemporary knowledge. The book was rigorously designed to meet the needs of contemporary readers; it refrained from orienting them towards 'modern' knowledge and offered them instead a more 'traditional' form of morality. The book also reflects the fact that the operators and managers of daily knowledge and lifestyles had changed in terms of the gender-based division of labor.

While the title and some of the content of *Gajeong Bogam* are a reflection of the books published in China and Japan in the 19th and early 20th centuries, some parts that were published in colonial Joseon were cited in other publications in Japan as late as the late 1920s. This suggests that there was an interaction of knowledge between East Asian countries as well as between the Japanese empire and her colonies.

Women and Technology in Korean History

FrH2-2

Korean Women's Advances into Medical Professions in the Early Modern Era: Cases of a Gendered Division of Labor and a Gender Hierarchy

Ggodme Yi

Sangji University

As Korea witnessed the professionalization and centralization of medicine based on Western science in the early part of its modern age (1876-1945), numerous women entered medical professions. Reflecting the situation in the country, however, a gendered division of labor and a gender hierarchy were clearly established. Korean women advanced into and were acknowledged by the state for largely the following five medical professions: certified vaccinators 種痘認許員/種痘醫, nurses 看護婦, midwives 產婆, traditional Korean physicians 醫生/醫員/韓醫士, and Western-style physicians 醫師.

The background of the rise of each occupation was as follows: 1. Women vaccinators 女子種痘醫: As a solution to the problem of women refusing to receive vaccination from male vaccinators during the Korean government's expansion of smallpox vaccination, women were trained and deployed. 2. Nurses: The education of nurses to prepare a work force that would aid foreign physicians by performing duties including interpretation for Korean patients at Western-style hospitals was initiated. Following the country's colonization by Japan (1910-45), licenses were granted only to women. 3. Midwives: Education was implemented because of a necessity for midwives based on both Koreans' thinking that their nation would become wealthy and strong when women produced and reared healthy children and the Japanese imperialists' predicament that the increasing settlement of Japanese people in the colony must be assisted. Following the colonization of the nation, licenses were granted only to women. 4. Women traditional medical practitioners 醫生: In a colonial Korea deficient in physicians, the Government-General of Korea 朝鮮總督府, or the Japanese colonial government, officially acknowledged traditional Korean physicians 醫員 in order to use them as a medical work force. Because there was no gender restriction, a number of women received licenses and were active after opening private practices. 5. Women Western-style physicians: Because women were prohibited from entering medical schools 醫學校 in Korea, women physicians either graduated from women's medical schools abroad or received private education within the country and then obtained licenses after passing qualification examinations 檢定考試.



Women and Technology in Korean History

FrH2-3

Writing as a Gendered and Engendering Technology: A Case Study of *Hangeul* in Pre-modern Korea

Young-hee Kim

Korea Advanced Institute of Science and Technology

As a way of reflecting on writing as a technology and its relationship with gender hierarchy, this paper focuses on *Hangeul* and its usages by women in pre-modern Korea, Joseon. As an alphabet newly invented for the linguistic minorities such as the commoners and women who had been denied access to the official writing system using Hanja (Chinese characters), *Hangeul* is both singular and typical. As an invention, it is unique but at the same time foregrounds the technological nature of writing usually hidden in “natural” writing systems. In terms of social hierarchies inscribed in writing systems, *Hangeul* is also ambivalent in its implications. It was a form of linguistic segregation in that its primary users were excluded from the linguistic community of Hanja, which remained the official writing system of Joseon. It was, however, also unique being a new empowering technology for the majority of the Joseon population who were able to use a writing system for the first time in Korean history. These people grasped the new writing opportunities offered by the new alphabet and developed it into an independent full-fledged writing system. As *Hangeul* was often called a “female alphabet,” women were a crucial group among its main users. This paper examines what *Hangeul* meant to women and what women did for the construction of a new linguistic technology in its dual aspects of writing and calligraphy.

Women and Technology in Korean History

FrH2-4

***Tongchima* and Hybrid Modernity : Women’s Traditional Dress Reform in Early Twentieth Century Korea**

Soojin Kim

National Museum of Korean Contemporary History

This study examines processes of women’s traditional dress reform in early twentieth century Korea and discusses changing ideas around civilization and modernity through an analysis of paper disputes among writers about Tongchi-ma (reformed skirt) and women’s reformed dress. Since a missionary teacher and Korean pupils at a missionary school devised some elements of women’s clothes in order to increase activity while maintaining the original silhouette, women’s reformed dresses became popular for young women and an object to discuss about westernization/modernization and nobility/feminine virtue. I argue that the dress reform was a unique array of inventions and practices of hybridization performed by women themselves in non-western colonial society.

Women and Technology in Korean History

FrH2-5

**"The General Assembly of Family Management"
 Written by a Female Intellectual Lee Binghugak
 in Joseon Dynasty**

Soongu Lee

National Institute of Korean History

Lee (李憑虛閣: 1759-1824)'s book, "Guyhabchongsuh (The General Assembly of Family Management)," is a book of life sciences from the Joseon Dynasty that sought rationality and efficiency in life. This book is written by experimenting with Lee's own experiences or other books in family management, such as food, clothing, shelter and childcare. This book could be called the "Life Science Book" in that it pursued rationality and logic and conducted data research and experimentation.

 Production and Circulation of Medical Information:
 Examination, Reporting, and Treatment

FrI2-1

**Technology of "Washing Injustice Away":
 Forensic Inquest as A Socio-technical System in
 Late-Qing Shanghai Settlement**

Zhongxian Xiao

The University of Hong Kong

Since 1860s, Municipal Council and western assessors in Mixed Court, had constantly been intervening Qing's lawful district magistrate's jurisdiction over Chinese subject and treaty-unrepresented foreigners in Shanghai settlement. Foucauldian techniques, especially death registration and anatomy-based forensic medicine, were central to the western govern mentality and extraterritoriality in 19th-century Shanghai settlement. Scientific modernity constituted a sense of West superiority over China's criminal justice and forensic inquest-standardized external postmortem examination guided by Washing Away of Wrongs since 13th century. Indeed, the western physician and coroner kept demanding to take over crucial inquests in settlement for alleged public health and judiciary efficiency consideration till 1900s. The 19th-century English beleaguered coronership in home, however, Qing and British flexible multi-ethics governances, must complicate our understanding of the Western forensic modernity in Shanghai settlement. Most importantly, despite western physician had proven the strengthen of autopsy in detecting pathological cause of unnatural death-revealing "fact" to Qing officials. However, the efficacy of inquest lied more in exhibiting the "truth" and leading to "justice", than scientific "fact" alien to indigenous knowledge in modern China. Truth and justice were not only linked to measurement of penalty by Qing Code, but also history-rooted and locally perceived ideas requiring consensus among participants in litigation. Only with interrogating relatives of death, and prestigious members in local communities, and referring to body evidence stipulated in official diagram of inquest, the manslaughter litigation can be adjudicated with less appeal. Traditional inquest was by no means a single "technique", but a set of "technology" embedded in sociotechnical system which was hard to accommodate a radically different forensic medicine. In fact, modern forensic medicine had never prevailed over traditional practices in Shanghai until 1920s.

By middle 1930s, Shanghai's laboratories and modern mortuary isolating furious public and relatives of deceased, China's new criminal justice aiming for abolishing extra-territoriality, and social discourse pursuing scientific fact, largely transformed the landscape of Washing-Injustice-Away technology.

**Production and Circulation of Medical Information:
Examination, Reporting, and Treatment****FrI2-2****Unexpected Sites, Unexpected Science:
Forgotten Flows of Medical Thinking in East
Asia, c. 1880s to 1910s**

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University of Hong Kong

Port Hamilton, now better known under its Korean name as Geomun-do, served for a short while as a crumb of the British Empire in East Asia. Located in the Jeju Strait, it served as a Royal Navy station for two years between 1885 and 1887. Too short a time to have left much of an impact on world history, it lasted just long enough to leave traces in the historical archive: most interestingly, a report on the abnormal lymphangitis of sailors stationed there. The swollen glands of mariners on a now forgotten toehold of the British Empire possess more significance than might immediately be guessed. It is the argument of my proposed paper that Port Hamilton hints at a reframing of the manner in which the history of ‘colonial science’ is written in East Asia. As a site, Port Hamilton might usefully be brought into relationship with Hong Kong. The naval report on lymphangitis was employed in medical debates in Hong Kong regarding bubonic plague. This relationship suggests a shared circuit of persons and ideas, and gives shape to the British Empire in East Asia as an archipelagic collection of sites, rather than the dyad of ‘formal’ and ‘informal’ empire. Port Hamilton and Hong Kong sit with Swatow, Newchwang, and Pakhoi, along with other sites since occluded from view. These places, now forgotten, often held more significance for contemporary doctors, medical researchers, and administrators than London, Bombay, or Paris. These sites hosted ‘circulations’ and, indeed, ‘blockages’ and local twists of circulations, in ways that allow critical exploration of the Chinese, Japanese, and Western ‘coproduction’ of science, as well as pointing to a new geography of ‘colonial science’ in East Asia.

**Production and Circulation of Medical Information:
Examination, Reporting, and Treatment****FrI2-3****A Discussion of Medical Body and The
Technology of Physical Examination in Modern
China**

Yaohua Wang and Meifang Zhang
University of Science and Technology Beijing

During the late 19th and early 20th century, modern western technology and system of physical examination began to appear in China society. In 1929, national government issued The Rules on the Students’ Health Examination, which marked the official recognition of the importance of physical examination. It is considered that physical examination was an important technical means to detect whether the body deviated from scientific diagnostic criteria through the analysis of the introduction of physical examination in Modern China, anatomical body in physical examination, concept of metrics and the technology of body image, and so on. In this process, the body experienced a data-driven abstraction of technology, and the new presentation of diseases and the logic of medical discourse gradually dominated people’s cognition and practice of the body. Consequently, the body of the detected had become the object of being studied under the empirical gaze of various detection instruments and doctors.

**Production and Circulation of Medical Information:
Examination, Reporting, and Treatment**

Fr12-4

**Trachoma Control in Taiwan and International
Cooperation during 1950-60s**

Shih-Ming Jung

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Trachoma was highly endemic in Taiwan in the 1950s. It was estimated that about 5 million of the population suffered from trachoma in Taiwan in 1950. WHO sent an ophthalmologist consultant, Dr. Vincent Tabone (President of the Republic of Malta, 1989-1994) to Taiwan in September 1952. At the recommendation of Dr. Tabone, this led to the implementation of a pilot project and subsequent trachoma control project in Taiwan, supported by UNICEF (United Nations Children's Fund) and World Health Organization (WHO). The trachoma control project in Taiwan was one of the largest campaigns in the world against trachoma. This paper will examine the ways in which trachoma control programs had been carried out in Taiwan, the standardization of trachoma classification in the local medical society and public health, clinical trials of antibiotics ointments, the response to Taiwan's local public health system and school health education, the effectiveness of the project and the factors of success or failure. U.S. Naval Medical Research Unit-2 (NAMRU-2) at Taipei also conducted research on trachoma and development and clinical trials of trachoma vaccine in Taiwan during 1960s. At that time, there were only a few advanced teams in the world to develop trachoma vaccines, and the NAMRU-2 in Taiwan was one of them. In Taiwan, NAMRU-2 worked with local scientists, medical and public health team, and international fellows from Korea and India. These cooperative effects, the scientific practice, and clinical trials of trachoma vaccination promoted the mobility and linking the local and global of scientific knowledge, laboratory materials, and researchers. The biomedical research in Taiwan became global network of trachoma vaccine research. Based on this special historical experience of modern East Asia, the project expects to enhance understanding of Taiwan's modernization and international health issues.

**Author Index**

Ahn, Sangwoo	MoD3-1	63	Chuang, HuiChih	ThC1-2	145
Akarasereenont, Pravitt	ThI2-2	170	Cook, Constance	ThE1-1	150
Amelung, Iwo	ThC2-1	163	Cullen, Christopher	WeB-3	127
An, Sooyoung	TuF2-2	99			
Arai, Takashi	MoJ2-1	55	Daimaru, Ken	TuA2-2	88
			Davies, Stephen	MoB2-2	44
Baihui, Duan	TuE1-2	82	Diederich, Inga	TuF2-4	100
Baker, Don	ThF2-1	167	DiMoia, John P.	TuD1-3	81
Barnes, Nicole	TuA2-3	89	DiMoia, John	WeF1	135
Batdorj, Batjargal	TuG3-4	120	Ding, Zhaojun	MoE2-2	49
Bertheliet, Benoit	FrC1-2	199	Dorofeeva-Lichtmann, Vera	MoB2-1	44
Bian, He	TuC3-2	110	Du, Xinhao	TuG2-2	101
Boissier, Caroline	ThB3-1	173	Duan, Yan	MoG1-1	39
Bretelle-Estabet, Florence	ThI1-1	158			
Bu, Liping	TuE2-2	97	Emond, Monica	FrA1-1	193
Buell, Paul	TuG3-1	119	Ericson, Kjell	ThA3-3	172
Burton-Rose, Daniel	ThE1-3	151			
Byun, Hakmoon	FrC1-1	198	Fan, Huichuan	MoG3-2	70
Byun, Jung Wuck	MoD3-2	64	Feng, Linda	TuD3-1	112
			Fruer, Yulia	WeF1	135
Caboara, Marco	MoB3-1	59	Fu, Banghong	ThC3-1	175
Cams, Mario	MoB3-2	60	Fujihara, Tatsushi	ThA2-2	161
Cams, Mario	WeB-5	128	Fukunaga, Mayumi	MoB1-2	32
Cao, Jingbo	MoC2-2	46	Fung, Kam-Wing	ThE3-3	180
Cao, Zhihong	TuE2-1	96			
Cha, Wung Seok	MoA1-1	29	Ghim, Zae-young	ThB2-1	162
Chan, Wilson	ThH3-4	186	Gimm, Dong-Wan	FrC2-4	217
Chang, Chih-Chung	MoJ2-2	55	Gorokhovskiy, Alexandr	TuG3-3	120
Chang, Chun Hao	MoB3-3	60	Goto, Motoyuki	ThF3-4	182
Chang, Hao	ThD3-4	178	Greatrex, Jack	FrI2-2	230
Chang, Kuo-Hui	TuC1-2	78	Guo, Shirong	MoC3-1	61
Chang, Shu-ching	FrE2-1	220			
Chang, Shu-ching	WeA1-4	125	Ha, Jung-Ok	FrH2-1	227
Chao, Yuan-ling	TuF1-1	83	Hamada, Shingo	MoB1-3	33
Chemla, Karine	MoC2-4	47	Han, Qi	ThC2-2	164
Chen, Hsiu-fen	TuA1-4	74	Hanson, Marta	ThE1-2	151
Chen, Menglan	TuA1-3	74	Hanson, Marta	WeF1	135
Chen, Zhihui	FrF2-3	223	Harari, Reut	TuA2-4	89
Cheng, Hsiao-wen	TuC3-3	111	Hegesh, Noa	MoC1-1	34
Cheng, Li-jung	TuE1-3	83	Higuchi, Toshihiro	ThG1-2	155
Cho, Miwon	TuB1-2	76	Hiraoka, Ryuji	WeB-2	127
Choe, Seung-Urn	TuB1-3	77	Homei, Aya	ThD2-2	166
Choi, Chul	TuG1-2	86	Hong, Sae Young	WeD1-1	131
Choi, Hongjo	WeA1-2	124	Hong, Sookyeong	TuD1-1	80
Choi, Hyungsub	FrC2-1	215	Hong, Sung Sa	MoC2-1	46
Choi, Jeong Yeon	TuB1-1	76	Hong, Sungook	FrC2-2	216
Choi, Kyujin	ThI3-1	187	Hong, Yujin	ThG3-2	183
Chu, Jongfei	FrB2-2	214	Horng, Wann-Sheng	TuF3-4	116
Chu, Pingyi	FrF1-1	204	Hu, Huakai	MoE3-3	67
Chua, Jiakai Jeremy	MoG2-4	54	Hu, Yize	ThB3-2	174

Hu, Yuntian	FrE2-3	221	Kim, Ock-Joo	ThI3-1	187
Huang, Alan	ThI1-3	159	Kim, Orun	TuG1-3	86
Huang, Yijie	WeD1-3	132	Kim, Seulki	FrG2-4	226
Hudeček, Jiří	WeE1-4	135	Kim, Soojin	FrH2-4	228
Hui, Ding Cheng	FrF2-2	223	Kim, Sukjoo	TuB1-2	76
Hwang, Kyoryen	TuC2-3	94	Kim, Sung Won	FrH1-4	209
Hyun, Jaehwan	ThA3-1	171	Kim, Sungkeon	ThD3-3	178
Iacovino, Kayla	FrC1-4	200	Kim, Tae-Ho	MoG2-1	52
Ichikawa, Hiroshi	ThG1-1	155	Kim, Taewoo	MoA2-1	41
Ichinose, Keiichiro	ThI3-3	188	Kim, Young Wook	MoC3-3	62
Iida, Kaori	TuD1-2	81	Kim, Young-hee	FrH2-3	228
Ito, Kenji	TuA3-5	106	Kim, Youngsoo	ThD1-3	149
Jami, Catherine	WeB-4	128	Kim, Yung Sik	FrB2-3	214
Jeon, Jongwook	MoG1-3	40	Kobayashi, Fumihiko	TuF1-1	82
Jeon, Yong Hoon	FrI1	210	Koehle, Natalie	ThF1-2	153
Jeong, Se-Kwon	FrH1-2	208	Koh, Wonil	MoA3-2	58
Jeong, Sun You	MoF2-4	52	Konagaya, Daisuke	ThB2-2	162
Ji, Chen	FrB2-2	214	Kondo, Shoji	ThI3-2	188
Jiang, Yuhong	FrE1-1	203	Kong, Hyejung	MoF2-1	50
Jiseong, Hong	ThI2-1	169	Ku, Minseok	MoA2-2	42
Jo, Jeongeun	ThD1-2	148	Kuo, Wen-Hua	FrI1	210
Jung, Jihun	MoD3-3	64	Kuo, Wen-Hua	TuF1-4	85
Jung, Junho	ThI3-1	187	Kurtz, Joachim	ThC3-3	176
Jung, Shih-Ming	FrI2-4	231	Kwak, Moonseok	TuB1-3	77
Jung, Yoo Ong	MoA2-3	42	Lange, Diana	MoB2-3	45
Kang, Ho Jye	FrA1-3	194	Law, Yuen Han	WeA1-5	125
Kang, Kichun	TuC2-1	93	Le, Brenda	TuF3-4	118
Kang, Yeonsil	TuA3-2	104	Lee, Daeseung	TuB2-1	91
Kawatsu, Lisa	WeA1-1	123	Lee, Eun Hee	FrG1-3	207
Khan, Mujeeb	ThF1-1	152	Lee, Funkyoung	MoF3-3	69
Kichukova, Margarita	FrA1-2	194	Lee, Hyon Ju	ThD1-4	149
Kim, Borum	TuB2-2	91	Lee, Hyunsook	MoF2-2	51
Kim, Boumsoung	ThA2-1	160	Lee, I-Zhuen	TuC3-3	111
Kim, Dong Ryul	MoA1-4	31	Lee, Janet Yoon-sun	TuC3-5	112
Kim, Geun Bae	FrD2-2	219	Lee, Ji-Hyun	MoG1-2	39
Kim, Hisuk	ThB3-3	174	Lee, Jongmin	TuA3-4	105
Kim, Hwaseon	ThH3-3	186	Lee, Jung	ThH3-2	185
Kim, Hyein	ThE3-4	180	Lee, Juyoung	WeC1-2	130
Kim, Hyomin	FrA1-4	195	Lee, Kyehyung	MoA3-1	57
Kim, Hyunkoo	MoA2-4	43	Lee, Soongu	FrH2-5	229
Kim, Jaehyun	MoD3-1	63	Lee, Sujin	ThD2-1	165
Kim, JooHui	FrC2-3	216	Lee, Taehyung	MoD3-4	65
Kim, Kyuri	MoF1-2	38	Lee, Yoenjoo	TuB2-3	92
Kim, Me-riong	MoA3-3	58	Lee, Yong Bok	TuB3-5	109
Kim, Mihye	MoA3-2	58	Lee, Young June	MoJ2-4	56
Kim, Mihye	MoA3-3	58	Lee, Young Nam	MoF3-2	68
Kim, Nanny	ThD3-2	177	Lee, Youngju	FrH1-3	209
			Lei, Sean Hsiang-lin	FrF1-3	205
			Leow, Wei Yi	MoG2-2	53



Li, Geng	TuB3-4	108	Park, Buhm Soon	TuG1-2	86
Li, Haijing	TuD3-3	113	Park, Hyunhee	TuG3-2	119
Li, Liang	FrB1-1	196	Park, Jin-kyung	ThD2-3	166
Li, Weidong	TuD2-4	96	Park, Ji-young	ThF3-2	181
Lim, Jongtae	FrF1-2	205	Park, Kwonsoo	FrG1-2	207
Lin, Cheng Yu	ThF3-1	181	Park, Seohyun	WeC1-3	130
Lin, Yu-Cheng	TuF2-1	98	Park, Yunjae	TuF3-2	117
Liu, Hongjin	FrA2-3	212	Pollet, Charlotte	TuE3-1	114
Liu, Jinyan	MoE3-1	66			
Liu, Liang	ThE3-2	179	Raina, Dhruv	TuG1-1	85
Liu, Pei	FrA2-2	211	Ren, Anbo	FrA2-1	211
Liu, Shih-Hsun	TuF1-2	84			
Liu, Xiaomeng	ThB1-1	142	Sato, Noriko	MoF3-1	68
Liu, Yaxuan	ThH3-1	185	Schonebaum, Andrew	FrD1-1	201
Liu, Zengqiang	FrF2-4	224	Schonebaum, Andy	WeF1	135
Low, Morris	FrI1	210	Sensui, Hidekazu	WeA1-3	124
Lu, Xiang	TuE2-4	98	Seonhee, Kim	ThF2-3	168
Lu, Xiaoke	TuD2-3	95	Setoguchi, Akihisa	ThA1-2	140
Lu, Zxyyann	ThF3-3	182	Shen, Yubin	MoG3-1	69
Lyu, Jeong-ah	MoA1-3	30	Shen, Yubin	TuG2-3	102
			Shi, Yunli	FrB1-3	197
Mau, Chuan-hui	ThI1-4	159	Shin, Chang-Geon	ThA3-4	173
Maurer, Petra	ThE1-4	152	Shin, Dong Won	FrI1	210
Miyagawa, Takuya	ThA1-1	139	Shin, Hyangsuk	TuC1-1	78
Mizushima, Nozomi	TuA3-3	105	Shin, Jieun	MoE1-1	36
Mo, Wang	WeE1-1	113	Shin, Miyoung	TuF3-3	117
Moni, Monir Hossain	FrA2-4	212	Shin, Youjung	TuF1-3	84
Monteiro, Daniel Said	FrF1-4	206	Shoji, Tetsuo	ThD3-1	177
Moon, Joong-Yang	ThF1-4	154	Sihn, Kyuhwan	ThD1-1	148
Moon, Manyong	TuC1-1	78	Soh, Jeanhyoung	ThF2-2	168
Moore, Aaron	ThA2-3	161	Soma, Mitsuru	TuB3-2	107
Myung, Sumin	MoE1-2	37	Son, Hyeonju	TuG1-4	87
			Song, Jichung	MoA1-2	30
Na, Seonsam	TuF3-1	116	Song, Shenmi	ThC1-1	145
Nakamura, Ellen	TuA2-1	88	Song, Yuanming	TuG2-4	102
Nakamura, Eri	TuA2-5	90	Stephenson, Freddie	MoF1-1	38
Nam, Moon-hyon	TuD2-1	94	Su, Yunmeng	FrB1-3	197
Ng, Margaret	TuC3-1	110	Suh, Wonmo	TuB1-1	76
Ng, Queenie	TuC2-2	93	SUH, Yi-Jong	ThI3-4	189
Ng, Stephen Chung-On	TuC1-4	79	Sun, Chen	MoG1-4	40
Ni, Genjin	FrD2-3	219	Sun, Chengsheng	ThC2-3	164
Niu, Weixing	ThC1-4	146	Sur, Eonheai	FrG1-1	206
Nosaka, Shiori	ThA3-2	172			
			Tan, Ying Jia	WeC1-1	129
Ogawa, Tsukane	MoC1-4	35	Tanikawa, Kiyotaka	TuB3-3	108
Oh, Eunjeong	TuA3-1	104	Ten (Jeon), Victoria (Yeonhwa)	TuE2-3	97
Okamoto, Takuji	ThA1-4	141	Tian, Miao	MoC3-2	62
Onaga, Lisa	FrD2-1	218	Tian, Miao	ThG3-3	184
			Tomita, Ryoto	MoB1-1	32
Pan, Shuyuan	MoC1-3	35	Tomotsugu, Shinsuke	ThG1-3	156

Tsuchiya, Yuka	ThG1-4	156	Yue, Pan	FrG2-2	225
Tsukahara, Togo	ThA1-3	140	Yuyu, Dong	FrG2-3	225
Uchimura, Kazuhiro	WeA1-1	123	Zanolini, Sarah	ThF1-3	153
Valenti, Federico	FrD1-2	201	Zelin, Xu	ThG3-4	184
Vannabhum, Manmas	ThI2-2	170	Zhang, Jian Hua	ThD3-1	177
Vigouroux, Mathias	WeD1-4	113	Zhang, Meifang	FrI2-3	230
Volkov, Alexei	MoB2-1	44	Zhang, Meifang	ThC3-2	176
Volkov, Alexei	TuE3-2	115	Zhang, Meng	ThB1-3	143
Wang, Guangchao	FrB1-2	196	Zhang, Nan	ThC1-5	147
Wang, Tzu-Jung	ThI1-2	158	Zhang, Shuo	MoE2-3	49
Wang, Xiaohu	TuJ2-2	95	Zhang, Ying	MoE2-1	48
Wang, Yaohua	FrI2-3	230	Zhao, Mengxi	MoG2-3	53
Winstanley-Chesters, Robert	FrC1-3	199	Zhen, Cheng	FrF1-2	203
Won, Chuyoung	MoE1-3	37	Zheng, WeiWei	ThD3-1	177
Wu, Harry Yi-Jui	TuC1-3	79	Zhou, Hanguang	TuB2-4	92
Wu, Huiyi	WeB-1	126	Zhou, Liqun	ThC1-3	146
Wu, Yan	FrF2-1	222	Zhou, Xiaohan	MoC1-2	34
Xiao, Zhongxian	FrI2-1	229	Zhu, Haohao	FrB2-1	213
Xiaojuan, Fan	FrA2-1	211	Zhu, Huijuan	WeE1-2	134
Xing, Xin	ThB1-2	143	Zhu, Jing	TuF2-3	99
Xu, Chuan	TuA1-2	73	Zhu, Yiwen	MoC2-3	47
			Zhu, Yiwen	ThG3-1	183
Yang, Chamee	WeC1-4	131			
Yang, Hong-Jin	TuB3-1	107			
Yang, Seunghoon	FrC2-4	217			
Yang, Wei-Ting	MoB3-3	60			
Yang, Yan	ThI2-3	170			
Yang, Yang	MoE3-2	66			
Yao, Chou Chuan Chiang	FrE2-2	221			
Yao, Wuyutong	ThB1-4	144			
Yeonseok, Kang	ThI2-1	169			
Yi, Degang	MoE2-1	48			
Yi, Ggodme	FrH2-2	227			
Yi, Jeongrim	ThE3-1	179			
Yi, Jongsik Christian	TuG2-1	101			
Yi, Kiebok	WeD1-2	132			
Yi, Moon Kyu	FrG2-1	224			
Yin, Pei	WeE1-3	134			
Yin, Xiao Dong	MoE2-3	49			
Ying, Jia-Ming	TuE3-3	115			
Yip, Yuk Lum Jennifer	TuA1-1	73			
Yokoyama, Miwa	FrH1-1	208			
Yongpil, Noh	TuD3-2	113			
Yoo, Jinhee	MoJ2-3	56			
You, Yon Sil	MoF2-3	51			
Yu, Jia	FrD1-3	202			



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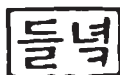


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