

## **[JS102-1] Modern mapping process of East Asian countries: from imperial cartography to GIS (1)**

[ Tuesday 06 August 14:00-15:30 Room554B ] Chair(s): Shigeru Kobayashi (Osaka Univ.)

### **1) Imperial Cartography in East Asia during the 19th and Early 20th Century: An Overview**

Shigeru Kobayashi (Osaka University)

In order to review the modern mapping process of East Asia, a survey of cartographic works by Western countries is necessary as well as the study of those by the native societies. The former expanded their mapping to ports opened for trade and strategic areas, while the latter rapidly changed their way of map making from traditional land measurement to modern surveying.

It is remarkable that Western countries' mapping was expanded with military conflict. The first and second Opium Wars and French and American Expeditions to Korea accompanied surveying of areas concerned. This kind of wartime survey became later one of the most important processes of mapping in East Asia.

Concessions and colonies acquired after military conflicts were also mapped for administration. In contrast to the wartime survey, triangulation was applied commonly in order to fix survey stations.

Japanese mapping in overseas was similar to these works of Western countries, though native in this area. It extended mapping area extensively at wartimes, and made cadastral maps along with topographical maps in its colonies.

Unfortunately, the cartographic information accumulated through these processes is succeeded only partially by the countries mapped, because of the drastically changed international relations. In order to rescue this kind of information, international cooperation is necessary not only in the study of the mapping process but also in the search of maps buried in many institutions.

### **2) Nautical Cartography of Japan in the Latter Half of the 19th Century**

Katsunori Kawamura (Yamaguchi Municipal Ouchi Junior High School)

The aim of this study is to review the nautical cartography of Japan in the latter half of the 19th century.

The Japanese Hydrographic Department, which was established in 1871, published less than 200 nautical charts in 1887 but that number increased to over 700 in 1911. It produced charts of the coasts of other countries such as China, Korea, and Russia in addition to those of its own coasts. Some of them were based on its hydrographical surveys; however, many were translations (republications) of charts produced by Western countries.

Until the latter half of the 19th century, Western countries expanded hydrographical survey area exerting military pressure on the countries of East Asia including Japan.

Japan belatedly participated in this kind of survey and concluded a treaty with Korea (the Japan-Korea Treaty of Amity) in 1876, which contained a provision allowing Japan to survey the coast of Korea, after the Ganghwa Incident in 1875.

Accurate geographic coordinates are essential in nautical cartography. A difference of six minutes was found in the longitude between the nautical charts made by Russia and those made by the U.K. concerning Korean coast. Striving for accurate longitude, Western countries repeated surveys between Europe and East Asia.

In the study of nautical charts of Japan, it is also necessary to gather and analyze nautical charts created by Western countries.

### **3) Maritime Imagination and Governing Taiwan : Marine Image on the Maps of Qing Taiwan, 1683-1895**

Liming Hsia (Eastern Taiwan Studies Association)

This research aims include: to describe the features of seascape on Chinese maps of Qing Taiwan, to illustrate various meanings behind different patterns of seascape on maps, to analyze historical change in each pattern of seascape on maps, to explain the relationship between Qing's policy to Taiwan and maritime image on maps. Furthermore, this research employs 24 pieces of Taiwan-in-full map as objects to analyze the historical change of four patterns of seascape of Qing's Taiwan map.

As a result, in general, Qing's policy of governing Taiwan and its change were key factors influencing the mapping for Taiwan as well as the patterns of seascape on Taiwan map.

---

## **[JS102-2] Modern mapping process of East Asian countries: from imperial cartography to GIS (2)**

[ Tuesday 06 August 16:00-17:30 Room554B ] Chair(s): Shigeru Kobayashi (Osaka Univ.)

### **1) Japanese Modernization and the Cadastre System (1872-1890)**

Daiju Koseki (Kyoto Women's University)

After the Meiji Restoration, the new government of Japan started to reform old land system of the Tokugawa Era, in which private landownership had not been fully realized and the obsolete system had compelled people to pay land tax in kind. The first reform was planned to establish the private landownership issuing land certificates (Chiken) to the owners since 1872. Although the first cadastral maps (Jinshin Chiken Jibiki Ezu) were produced at this reform, another new maps (Chiso Kaisei Jibiki Ezu) were prepared since 1873 for the Land Tax Reform (Chiso Kaisei), in which the tax was imposed according to the price of land concerned.

However more effort was required to establish the modern land system. In 1887, land

registration system was introduced and finally in 1889, the preparation of land register (cadastre) was institutionalized. During this reform, the necessity of precise cadastral maps was felt, because previous maps were inconsistent in land classification and erroneous because of insufficient survey. Therefore, a new land survey was promoted. In some areas, the final fair copies of new maps (Kosei Chizu) were prepared, whereas in the other areas, the drafts maps (Jioshi Chosa) were utilized for the land registration.

Although the Ministry of Finance led these two investigations, the Department of the Interior also ordered local public body to carry out another land investigation for accurate land boundary and consistent land classification. However, this investigation was not completed.

## **2) The Japan military cartography in Taiwan before the colonial period: Re-examining the vicinity map of Taipei Prefecture in 1894**

Hsiung-Ming Liao (Academia Sinica)

The Japanese military attack of the indigenous tribes of Southern Taiwan during the 1874 Expedition was the first military action since the Meiji Restoration. This was also the first major diplomatic incident involving the Qing Empire and the Japan, consequently leading to changes in policies of Japan military cartography. The Japanese General Staff Headquarters devised a series of actions to patrol and survey clandestinely, collecting geographic data through all kinds of means. Many maps of Taiwan had already been issued just after the First Sino-Japanese War, and before the Japanese Colony, fully demonstrating how Japanese military had accumulated rich results in geographic investigation.

While looking back on the process of these secret survey maps of Taiwan before the Japanese colonial period, this study also focuses on the 'The Secret Survey Map of Northern Taiwan in 1888' made by Ozawa Tokuhei and the 'The Vicinity Map of Taipei Prefecture in 1894' made by the Japanese Military Survey Bureau, and along with other maps made by the English and the French to make a comparative analysis using GIS. The sources and accuracy of the geographic data from these different regions will be used to understand the process of making these secret survey maps made by the Japanese. The study concludes with a case study of the 'The Vicinity Map of Taipei Prefecture in 1894' to portray the research issues of the old military maps. We hope to initiate the attention of these colonial maps in the relative academic realms.

## **3) A Historical Geography Research of Peking-Mukden Railway under the Vision of Modernization(1881-1912)**

Chingchi Huang (Loyola Map Workshop), Xibo Chen

The 9-kilometer Tangshan-Hsukochuang Railway, which was completed in 1881, marked the actually first railway in China and later enlarged to the 840-kilometer Peking-Mukden Railway(now it is called Beijing- Shenyang Railway) in subsequent 31

years. The construction of Peking-Mukden Railway was influenced jointly by the geographical environment and China's early modernization movement.

During the modernization of China, the conservative force was very strong and fiercely opposed to constructing railways. Peking-Mukden Railway was unavoidably influenced by many factors such as geomantic omen, economy, geography and military.

In this research, we will overlay and analyze related old topographic maps(including Japanese mapping up to 1945) to retrieve the geographic information of the old railway lines, canals, settlements, royal cemetery and hunting ground by GIS. This research will try to solve the following historical and geographical problems:

1. Why Peking-Mukden Railway can be allowed to build?
2. Discuss the extension of Peking-Mukden Railway by stages and analyze the factors influencing the design of this line.
3. Why the railway was so tortuous from Beijing to Tianjin?

Topographic maps were used by modern countries for national spatial planning. In the past, obtaining large scale topographic maps of China was difficult. This article is not only expected to clarify the historical and geographical problems of transportation modernization in late Qing China, but also deepen the interdisciplinary approaches of historical geography research.

Keywords: Modernization, Northern China, Peking-Mukden Railway, railway history, Topographic maps

---

## **[JS102-3] Modern mapping process of East Asian countries: from imperial cartography to GIS (3)**

[ Tuesday 06 August 17:30-19:00 Room554B ] Chair(s): Shigeru Kobayashi (Osaka Univ.)

### **1) Japanese Mapping of East Asia in Relation with Nautical Charts Produced by Western Countries during the 19th Century**

Kunitada Narumi (Konan University), Shigeru Kobayashi

During the 19th century, Western countries created many charts of East Asian waters along with the development of trade relations with this area. After the Opium War, this process of mapping was accelerated exerting frequently military pressure upon countries concerned.

The Japanese Navy and Army, which entered belatedly this arena of map making, drew up maps of the coastal areas in East Asia by reference to Western charts. Of those, the General Charts of Pei-Ho (“北河總圖”) published in 1875 are a typical case. Their figures were drawn duplicating those of four British Admiralty charts (Nos.2653, 2654, 257 and 258), which were produced on the basis of the works of French, American and British surveyors during the Arrow War, in combination with transliterating the place-names and notes into kanji and kana. Japanese military updated their maps

and charts of East Asia by importing the new charts and sea pilots from Western countries. Compiling maps of coastal areas of China and Korea, Western charts were utilized also as the frame of longitude and latitude.

However, Japan gradually surveyed the surrounding areas of East Asia independently and became one of contributors of geographical information subsequently. This process of changing information sharing deserves greater attention in the historical study of modern cartography of frontier areas in East Asia.

## **2) The military cartography in WWII: A comparative study of the 1/50,000 topographic mapping between the U.S. and Japanese army in Taiwan, 1944-1945**

Chun-Lin Kuo (National Dong-Hwa University), Hsiung-Ming Liao

After the outbreak of the WWII, the topographic mapping in colonial Taiwan was once suspended, but a large number of the later colonial period's 1/50,000 topographic maps were reproduced by Japanese army in 1944 and 1945. This urgent military mapping not only filled the unmeasured mountain areas, but also renewed several flatlands with the latest aerial survey techniques. At the same time, the U.S. army, going into the final battle with Japan, had produced a set of 1/50,000 color topographic map for the whole island without landing Taiwan. The former set of 1/50,000 topographic map was the most completed large-scale topographic map in colonial Taiwan; the later colorful one was continuing used and revised by KMT government after the War. Both of them thus became valuable spatial information recording the geographic changes of Taiwan in the middle of 20 century.

This study aims to investigate these two 1/50,000 topographic map sets produced by U.S. and Japanese military for their differences of mapping contents and survey methods in Taiwan. Furthermore, with the usage of GIS and the comparison of other pivotal historical materials, these maps could be used for representing the geospatial landscape of Taiwan before and after the war. Since the related digital archives of historical maps and aerial photos are gradually released in recent years, we will also highlight the two 1/50,000 cartographic map sets' research value -the key reference for the aerial photos taking by the U.S. army during the WWII- among the digital archives' map collections.

## **3) A Database of Early Japanese Military Maps of China and Korea**

Shigeru Kobayashi (Osaka University), Kumiko Yamachika, Rie Watanabe, Kenta Yamamoto, Akihiko Namie

A series of manuscript maps of China and Korea drawn by Japanese army officers in 1880s were found at the Geography and Map Division, the Library of Congress, Washington, D.C. in 2008. These maps, which had been originally garnered at the Japanese Land Survey, were confiscated by U. S. Army Map Service after WWII and

transferred to the Library of Congress.

Scrutinizing them, it became clear that they are important materials for the study of historical cartography of East Asia, where modern surveying was applied belatedly. Young Japanese army officers made a traverse survey of main routes of China and Korea, taking bearings with compasses and measuring distance by pace. Most of the maps are middle scale (1: 100,000 or 1: 200,000) and describe roads and waterways that connect central places. Just before the start of the Sino-Japanese War, they were compiled into a collection of 131 sheets on a 1: 200,000 scale covering area from Korea to environs to Peking. The longitude and latitude and coastline shown in them were derived from nautical charts made by Western Countries.

Utilizing the photos of these maps taken at the Library of Congress, the authors constructed a database of these maps, which show the early stage of Japanese collection of geographical intelligence and its relation to cartographical development in East Asia.