

## **MODERNIZATION EFFORTS OF JAPAN MEIJI RESTORATION GOVERNMENT AND FRENCH CONTRIBUTION TO JAPANESE TOPOGRAPHIC MAPPING IN 1870S**

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### **ABSTRACT**

In Japan, Meiji Restoration government was established in 1868 and began to modernize the country.

In the books on the modern history of cartography in Japan, the names “Jourdan” and “Bieiya” are found as the first French engineer officers who introduced and instructed French modern topographic mapping in the army in 1870s. But the details were lost and unknown, while French type maps were drawn in 1880s in Japan.

I looked for them in the documents of the Archive of Army Historical Service in Paris. Also I tried to obtain related information in other various organizations in Japan and France.

Investigating the documents in the Archive, I found that “Jourdan” and “Bieiya” are Jourdan, Albert and Vieillard, Ernest respectively with several maps relative to their activities, and that they were engineer captains and came to Japan as members of the second French Military Mission to Japan which was invited by the Meiji Restoration Government to modernize Japan Army of all kinds including engineer corps.

Jourdan, A. stayed in Japan from 1872 to 1878. He was to work flexibly in the places designated by the chief of the Mission, and concerning the mapping, in 1873 he checked a booklet “Map Color Manual” edited by Kosuge Tomohiro and others based on a French textbook. In 1874 - 76, he visited many important places to defend as a member of the Defense Commission of the Army with the chief of the Mission and artillery captain Lebon and with Japanese members including Hayakawa Masayoshi to make defense plans with battery planning maps.

Vieillard, E. had been associate professor at the Military School at Saint Cyr from 1871. He stayed in Japan from 1873 to 1876 and was to work at the Army Study School to make the curricula of the newly founded Military School in type of Saint Cyr, developed from the Army Study School. He instructed topography and directed topographic mapping exercises in the field camp near Tokyo in 1875. Kosuge T. and Seki Sadateru participated in this field camp.

In 1880s, Rapid Topographic Maps without triangulation network were drawn by Army soldiers and surveyors, following the “Military Survey Manual” edited by Seki S. and others based on a French textbook, at scale 1/20,000 in color with contour lines of 5 meters interval for Kanto area including Tokyo in 921 sheets of sheet size 31 cm x 39 cm with landscape sketches on the sides, and said in Japan to be drawn in French type.

Thus, the engineer members of the second French Military Mission to Japan contributed to the Japanese topographic mapping as instructors and some of the Japanese officers who worked with them became top leaders of national mapping in Japan, such as Kosuge T., founder and director of the Army Land Survey ( Geographical Survey Institute from 1945 ) in 1888, Seki S., chief of its Topography Division and Hayakawa M., chief of its Drawing Division.

### **1 INTRODUCTION**

#### ***1-1 Meiji Restoration***

In 1603, Tokugawa Ieyasu was appointed by the emperor to the Shogun ( General ) who formed Bakufu ( Shogun government ) which was substantial feudalistic ruling organization of Japan under the nominal ruler, emperor. This position was occupied by his descendants, Tokugawa family, after that until its collapse in 1867. The Tokugawa Shogun government closed Japan to the outside world except the governments of the Netherlands and Korea and Chinese merchants in early 17. century, and after the closure of more than two hundred years, opened the gate to the outside world gradually from 1854.

After Tokugawa Shogun government collapsed, a new government was established in 1868 under the Emperor Meiji : Meiji Restoration. This Meiji Restoration government introduced culture, science and technology largely from the western world.

The Meiji Restoration government had several ministries. To modernize the nation, each ministries made various efforts. For examples, the Ministry of Education arranged the national education system, such as schools for primary, secondary and higher educations, sent students to the western countries and invited professors for higher education from the western countries. The Ministry of Public Works hired more than

two hundred professionals from the western countries to develop railways, mining, iron industry, telegraphic communication, etc. The Navy Ministry adopted British model and invited a navy mission headed by lieutenant colonel Douglas from the United Kingdoms in 1873.

The Army Ministry adopted French model and invited the second military mission from France composed of 16 members headed by lieutenant colonel Marquerie for the modernization of the Army of all kinds including engineer corps.

### ***1-2 Brief antecedent history of cartography in Japan***

The history of mapping in Japan may be traced back to the age of the “Gyouki Map” which was originally drawn more than 1,200 years ago.

Tokugawa Shogun government ordered the feudal lords to present the provincial maps of their ruling areas several times in 17-18 centuries.

The first national official and scientific map series which covered Japan was completed in 1821 by the group of Ino Tadataka as the results of topographic and astronomic survey in the field. They were drawn by hand in three scales, 1/36,000 (Large Map series), 1/218,000 (Middle Map series), and 1/436,000 (Small Map series).

The modern systematic survey work in Japan was started in 1869, just after the Meiji Restoration, with the establishment of the Geography Division in the Ministry of Civil Services. This work started with the collection of existing topographic and cadastral maps and regional geographic maps. The Geography Division was transferred to the Ministry of Interior in 1874.

On the other hand, in 1871, the Intelligence Corps was created in the Bureau of Staff, the War Ministry. This corps was responsible of the reconnaissance of geography and map compilation and it was transferred to the Bureau of Staff, Army Ministry in 1872 where two mapping divisions were set: the Fifth Division mainly for map compilation and the Sixth Division mainly for surveying in the field.

Therefore, at the time 1874, the government surveying and mapping were carried out mainly in two organizations : Bureau of Geography, Ministry of Interior and Bureau of Staff, Army Ministry.

In the Ministry of Interior, the maps of all the country and provincial maps were published for administration, as well as urban maps for large cities, such as Tokyo, Osaka, Yokohama, Kobe etc. And the triangulation survey for all over the country was planned.

In the Bureau of Staff, according to “History of Army Land Survey”, the Fifth Division started to reproduce “Ino’s Large Maps” drawing by hand in 1876 and the Sixth Division completed the drawing of the local maps of Hakodate, Niigata, Nanao, Tsuruga, Nasuno etc.

### ***1-3 The first French instructors of French modern cartography***

In the documents on the modern history of survey and mapping in Japan, the names “Jorudan” and “Bieiya” are seen as the first French engineer officers who introduced and taught French modern topographic survey and mapping in the Ministry of Army. In “Short History of Map and Survey in Japan”, the author described that Japan invited French army officer Jorudan, and that under his direction Kosuge Tomohiro ( later the director of Army Land Survey) and others studied French map manual and published a booklet “Map Color Manual” in copper plate and colored by hand. Sekiguchi described about the topographic map of “Narashinohara and its Surroundings” drawn by lieutenant Seki Sadateru and his subordinate soldiers and checked by Bieiya.

However, the background of their activities were scarcely known in Japan, though the “Rapid Topographic maps” drawn in 1880s were said to be in French map type. The relation between them and the French type maps was not remarked.

## **2 APPROACH**

I had a chance of studying in France in summer 2004, and tried to obtain information on “Jorudan” and “Bieiya” in the Institut Géographique National and in the Bibliothèque National de France, for I supposed them to be members of the government mapping organization, Dépôt de la Guerre. Being recommended, I looked for them in the documents of the Archives Service Historique de l’Armée de Terre in Paris, and I visited these organizations a few times later.

Also I tried to obtain information on them in several organizations in Japan: the Geographical Survey Institute, the National Diet Library, the National Archive, the Library of the Ministry of National Defense, the Historiographical Institute of the Tokyo University and so on.

## **3 RESULTS**

Investigating the official documents in the Archive of Army Historical Service, I found that “Jourdan” and “Bieiya” are Jourdan and Vieillard respectively, and that they participated in the second French Military Mission invited by Japan Meiji Restoration government.

### ***3-1 The second French Military Mission to Japan***

Before the second French Military Mission, the first French Military Mission to Japan arrived in January 1867 in Japan, invited by Tokugawa Shogun government that intended to strengthen its forces, and new special troops were organized and trained by them. But as the Tokugawa Shogun government collapsed in December 1867, most of the mission members left Japan in 1868.

In 1870, the Meiji Restoration government decided the adoption of French army system, and requested to the French minister to Japan to dispatch a military mission to Japan again.

The second French Military Mission to Japan arrived in Japan in 1872. The members were composed of Lt. colonel Marquerie, five officers, engineer captain Jourdan, infantryman captain Echemann, infantryman lieutenant Percin, cavalier captain Descharmes, artilleryman captain Lebon, and ten noncommissioned officers including engineer sergeant Joquel. In 1873, engineer captain Vieillard was added for working at the Army Study School.

### ***3-2 Jourdan, Albert***

Jourdan was born in 1840 at Lyon. He studied at the Ecole Polytechnique and the Ecole d' Application d' Artillerie et de Génie.

He participated in the first French Military Mission to Japan invited by Tokugawa Shogun government in 1867 . But as the Tokugawa Shogun government collapsed and was replaced by the Meiji Restoration government in 1868, he left Japan in 1868.

He participated in the second French Military Mission to Japan invited by the Meiji Restoration government in 1872 and stayed in Japan six years until 1878. In the first years in Japan, he checked a map manual booklet “Chizu Saishiki” ( Map Color Manual ) edited by his Japanese colleagues including Kosuge Tomohiro( later the founder and the first Director of the Army Land Survey ) in Heigakuryou (Army Study School).

After that, he worked in the Sixth Division, the Bureau of General Staff, for field survey and visited many important places for defense, in 1874 and 1875 southwest Japan, Kagoshima Bay and Seto Inland Sea etc. and in 1876 north coast of Japan, Hakodate, Niigata, Nanao, Tsuruga, and Miyadzu, with Lt. colonel Munier, the Mission Chief, and his French colleague, artilleryman captain Lebon and with many Japanese soldiers including Hayakawa Akiyoshi ( later the first Chief of Drawing Division of Army Land Survey ) to make plans of fortification with survey and mapping.

The Mission Chief presented the reports on the defense of the coast with attached maps to the Ministry of Army for the southwest Japan in 1876 and for the north coast in 1877. But the formal original reports have not been found in Japan, though the handwritten copies of the translated Japanese reports without maps are found in the Historiographical Institute of the Tokyo University.

However, the handwritten copies of the French reports with maps were found in the folder of the activity reports to French government from the chief of the second Military Mission to Japan in the Archive in Paris.

Some of the maps which were signed by Jourdan are as follows:

Kagoshima Bay, Bungo Strait, Hiroshima Bay, etc.

Hakodate Bay, Niigata Port, Nanao Bay, Tsuruga Bay and Miyadzu Bay .

They were compiled from existing most reliable maps available.

For example, the map of ”Baie de Tsuruga ”. is one of the maps which were drawn for battery plan under his direction, This map was drawn on a strong semitransparent Japanese paper of sheet size 60cm x 45cm, at 1/18,000, with four colors, black ( letters, coast line and hachure for steep slopes ), blue ( sea and river), red ( urban areas and planned batteries) and ocher ( flat land near shore ). The water depth was expressed with about 120 points in meter,

This map was compiled by combining two maps: the chart of “Tsuruga” surveyed by the officers of U.S.S Shenandoah in 1867 approximately at 1/74,000 which was included in the chart “Harbours and Anchages on the North-West Coast of Nipon” published by U.K. Admiralty for the southern main part and Ino's Large Map at 1/36,000 for the northern part. Concerning the water depth, 120 depth points data were expressed by converting fathom data into meter from the above-mentioned chart of “Tsuruga”.

As for the map of "Golfe de Hakodate", it was compiled from UK Admiralty chart "Hakodadi Harbour" which was surveyed by the officers of Commodore Perry Squadron in 1854 and published by U.K.

Admiralty in 1859, by adding the newly constructed objects such as Goryoukaku castle which was constructed in 1864.

### **3-3 Vieillard, Ernest**

Vieillard was born in 1844 in Paris. He studied at the Ecole Polytechnique and at the Ecole d' Application d' Artillerie et de Génie as well. He worked at the Ecole Militaire at Saint Cyr as staff in January 1870 and became assistant professor of fortification in July 1871.

He participated in the second French Military Mission to Japan invited by Japanese Government, one year later than other colleagues, probably for the necessity to create the Military School and stayed in Japan about three years from 1873 to 1876. He worked to create and carry on the Military School from the point of curriculum, as well as a teacher of topography and fortification. He directed topographic mapping with plane table in the field military exercises in Narashinohara, 30km east of Tokyo, in 1875. There remain in the Archive in Paris, a few examples of the Japanese first topographic maps at 1/10,000, drawn by Japanese soldiers including Seki Sadateru (later the first Chief of Topography Division of Army Land Survey) in this military camp in Narashinohara under his direction. He directed six teams of topographic surveying and mapping including Kosuge, T. in this field camp.

He was followed by Kreitmann, Galopan and Barre as the engineer teachers of the Military School until 1883.

## **4 DEVELOPMENT OF JAPANESE TOPOGRAPHIC MAPPING in 1880s**

### **4-1 General Staff Office and Survey Project of the Whole Country**

After Meiji Restoration in 1868, the composition of the government organizations changed frequently in the first ten years. The records of surveying and mapping remained relatively few, especially before 1880.

After Seinan (Southwest) War in 1877, the biggest and last revolt, headed by Army General Saigou Takamori, hero of the Meiji Restoration, against the central government after the Restoration, the Army changed its model from French model to German one.

In 1878, the Bureau of General Staff was separated from the Army Ministry and became an independent organization under the Emperor, General Staff Office, where the Map Division and the Survey Division were set.

Major Kosuge T. was appointed to the chief of the Survey Division in 1879. He presented to General Yamagata, the Chief of the General Staff Office, "Rapid Survey Project of the Whole Country" without the triangulation survey to reduce the cost, and this project was accepted by the Chief of General Staff Office in 1879. In this project the map was to be made for military use by plane table survey with graphical control points.

In 1880s, "Rapid Topographic Maps" were drawn by Army soldiers and surveyors manually at 1/20,000 in color with contour lines of 5 meters interval for Kanto Province including Tokyo in 921 sheets of mapping size 21 cm x 26 cm, following "Heiyou Sokuryou Kiten" ( Military Survey Manual ) edited by Seki, S. and others, from a textbook of the Ecole d' Application d' Artillerie et de Génie.

These maps were said to be made in French type in Japan. However, they were not similar to Etat Major map. They were drawn in French military map type.

In 1884, the triangulation works of the Ministry of Interior was transferred to the General Staff Office. In the same year, the mapping two divisions of the General Staff Office developed to the Bureau of Survey which was composed of three divisions: Triangulation, Topographic Survey and Map.

### **4-2 Foundation of Army Land Survey**

The Army Land Survey was created on the basis of the Bureau of Survey, and composed of Triangulation, Topography and Drawing Divisions with Surveyor Training School in 1888. It worked as a government unified mapping organization until 1945. After the world war, it was transformed to a civil government organization as the Geographical Survey Institute.

## **5 CONCLUSION AND FUTURE PLANS**

Some of the Japanese officers who studied French modern topographic mapping from French engineer officers grew top class surveyors who lead Japanese surveying and mapping later.

Kosuge Tomohiro, who worked with Jourdan in Heigakuryou, and participated in the field exercise of topographic mapping under the direction of Vieillard as a teacher of the Military School in 1875, promoted the development of the national mapping as a leader in the General Staff Office and founded the Army Land Survey in 1888, and was appointed to its Director.

Seki Sadateru, who participated in the field exercise of topographic mapping in 1875 as a teacher of "Kyoudoudan", noncommissioned officer-forming school, and practiced plane table mapping as a team

leader in the field camp in Narashinohara with his pupils under direction of Vieillard, edited a manual book, "Heiyou Sokuryou Kiten" (Military Survey Manual) for the "Rapid Topographic Mapping" with reference to a textbook on topography of Ecole d' Application d' Artillerie et de Génie in 1880. He was appointed to the Chief of the Topographic Division of the Army Land Survey in 1888 and directed the early topographic survey in Japan until 1898.

Hayakawa Akiyoshi, who accompanied with Jourdan in the survey trips for defense planning with maps of the southwest coast in 1874 and 1875, and of the north coast in 1876, participated in the work of "Rapid Topographic Mapping" in the field and drew its sheets with plane table. He was eager to found the Surveyor Training School and appointed to the principal of the school temporarily before the chief of the Drawing Division of the Army Land Survey and directed map preparation at various scales until 1903.

Thus, the engineer members of the second French Military Mission to Japan contributed to the Japanese topographic mapping as instructors and some of Japanese officers who worked with them became top leaders of national mapping in Japan, such as Kosuge, Seki and Hayakawa.

I am going to try to obtain related information further.

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