A Study on the Introduction of German Coinage Techniques to Korea

WŎN YU-HAN

Introduction

Generally speaking, Western countries developed the stamping process for coinage, while Eastern countries, including China, used the casting method in coin-making up until the turn of this century. Coin-making by casting was first developed in China and introduced to Korea in the early 12th century. The Chinese casting method was used in Korean mints for about seven centuries without any significant modifications or improvements until the late 19th century, when German coinage techniques were introduced to the country.

Unlike the modern, mechanized coin-making by pressing a stamp on flat, circular metal pieces, the casting method was a manual, premodern minting technique.

In the course of shifting from the centuries-old closed-door policy to an open-door policy in its foreign relations, especially in its relations with Japan and Western countries, the Yi dynasty government first established a permanent mint in 1883, the 20th year of King Kojong's rule, in order to introduce modern coinage techniques from Germany. The introduction of the German coinage techniques marked an epoch in the monetary history of Korea, because it was done in an attempt to modernize the monetary order of the country. Although the attempt to introduce and use modern coinage techniques made in the 1880s, a period historians like to call the Era of Enlightenment in Korea, was suspended midway, the endeavor presents an important subject of study for students of monetary developments, including the development of minting techniques, during the declining days of Yi Korea.

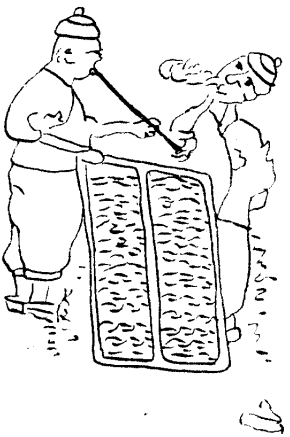
In the following pages, I will first outline the traditional minting techniques of Korea and then discuss the historical background of the introduction of German coinage techniques, how they actually came to the country, the government's attempt to put into circulation coins made with the German techniques, and the reasons for the suspension of this attempt midway.

Traditional Minting Techniques of Korea

The casting method of manufacturing coins had been used in Korea until 1894, the 31st year of King Kojong's reign, when a mint in P'yŏngyang shut down. Few histori-

WŎN YU-HAN is a historiographic researcher at the National History Compilation Committee. He also teaches Korean history at Yonsei University, Seoul.

Lifting a melting pot from the furnace



Pouring moltened metal into a minting mold

cal records describing in detail how the copper coins of those days, called Sang-p'yŏng-t'ongbo, were made by this method are available today. However, a relatively fine description of the casting method believed to have been used in the 1880s is found in "A Korean Mint" contained in No. 3, Vol. 5 of *Korea Review* issued in May 1903. This article is of great help in understanding the traditional minting techniques of Korea, based on the Chinese casting method which was used for centuries without any significant development, though it describes the facilities and processes of a mint of the 1880s.

The mint appearing in this article is a long, low-roofed building, with window-like openings at fixed intervals on the roof to emit smoke and fumes. The inside of the building is divided into compartments of 30 square feet, in each of which are a furnace and other facilities needed to make coins. Near the mint are several thatched cottages where coins just cast in the mint are smoothed and polished.

A cement furnace is in a corner of a compartment of the mint, about five feet underground and three inches above the ground. On the flat top of the furnace is the opening of a cylindrical passage with a diameter of 10 inches, through which a crucible is passed to the bottom of the furnace. When the crucible, containing six pounds of copper, three pounds of tin, and one pound of wax, is placed on the furnace bottom, the fire is blown with a bellows near the furnace in order to melt the metals in the crucible. The mixing rates of copper, tin and wax in the melting pot differ, depending on the circumstances.

At another corner of one compartment is a pile of fine sand. The sand is put into a shallow 3.5 by 1.5 feet wooden box and the surface of the sand is then smoothed with a straight wooden bar after hardening the sand by pressing with the feet. An iron plate with molds of coins set in rows is pressed on the sand surface to make sand molds of the front sides of coins and, using another sand box, sand molds of the back sides of coins are made. The two sand boxes are then put together surface to surface so that the mold of a coin's front side in one box faces the mold of its back side in the other box, and bound with wire. The molten metal in the crucible, which is lifted from the furnace bottom by three men, is poured into the gap between the two boxes. When the molten metal is set in the sand mold and the cast metal cools down, the boxes are separated by unbinding the wire. The coins thus made in rows on a thin cast metal sheet are then pried away with a hammer and carried to the thatched cottages near the mint.

In one cottage an iron bar is inserted into square openings of coins so as to set the coins in a row, and in another cottage the rows of coins connected by iron bars are placed in grooved woodwork horizontally set two feet above the ground in order to smooth the rims of the coins with a file. In still another cottage, the coins connected by iron bars are poured into a wooden box one yard in breadth and

10 inches in depth, and fine sand and water are then put into the box. Two persons sitting on sand bags on both sides of the box put their feet into the box and move them back and forth, while singing, so that the coins may be polished by friction with sand and water.

The polished coins are then strung on straw ropes in bundles of 200 to 1,000 pieces, and the bundles are put into bags for handy carrying in the counting cottage. Registering the amounts of coins by denomination in the coinage book, the counting cottage sends the bags of coins to designated places. Of course, policemen accompany the carriers of coin bags.

As seen in the above, the traditional coin-making process of Korea was so simple that it had no instrument for measuring the weights and sizes of coins. Because no special skill was required in coin-making, blacksmiths experienced in the manufacture of brassware or weapons were employed by mints. As a result, illegal coin-making was so rampant during the declining days of the Yi dynasty, when the Sang-p'yong-t'ongbo was designated as legal tender, that the monetary order was in great confusion.

Historical Background of Introduction of Modern Coinage Techniques

The confusion of the late Yi dynasty monetary order was first felt in 1678, the fourth year of King Sukchong's rule, when Sangp'yŏng-t'ongbo coins began to be used as legal tender. The confusion was particularly conspicuous in 1866, the third year of King Kojong's rule, when "bad" coins amounting to a total of 16,000,000 *yang* were made and put into circulation. In 1867, Chinese copper coins to the tune of three to four million *yang* were also put into circulation, only to aggravate the monetary crisis.

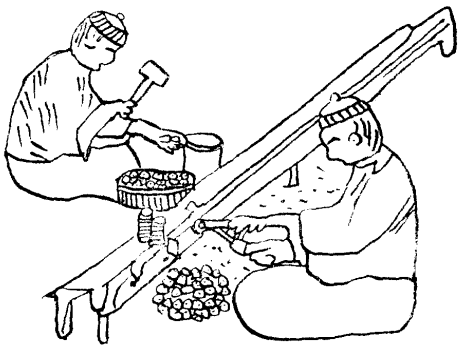
Amdst this monetary crisis, the government concluded a treaty of peace and amity with Japan in 1876, 13th year of King Kojong's reign, in order to open trade relations with Japan. Under the treaty, Japanese trade ships were allowed to call at Korean ports for increased trade relations between the two countries, which had been limited to barter

Threading coins onto a metal wire

trade on a small scale under the closed-door policy pursued by Yi Korea in its foreign relations until then. With increased trade between them, Korea and Japan had to use the moneys of both countries as media of payment. In fact, the Japanese money was in circulation as a medium of exchange in Korea, together with the silver coins of Mexico, which Chinese merchants put into circulation in Korea then, and Chinese and Korean copper coins.

Whereas the Japanese and Mexican silver coins were stable in their intrinsic values, the Korean copper coins fluctuated severely in value, and supply fell short of demand, causing trouble in foreign trade. As a result, Japan and other countries having trade relations with Korea made an issue of the monetary crisis in Korea, demanding a reform of the monetary system. In fact, Japan strongly advised the Korean government in 1891 to modernize its monetary system with an eye to increasing her trade profits from Korea under a modern monetary system in the country.

In 1882, the Yi dynasty government minted gold and silver coins and put them into circulation as new media of exchange in view of the trouble in trade due to the use of copper coins only as a medium of international payment, and in an attempt to realign the monetary order. The silver coins were in three denominations. They were not comparable in design or value to the silver coins of Japan and Western countries under the gold stand-



Filing coins smooth

ard. In 1883, "bad" copper coins with the denomination of five *chŏn* were minted in large quantity in order to meet the urgent financial needs of the government, with the result of inflation and a severe devaluation of the Korean money. Thus, the monetary crisis was further aggravated, necessitating a reform of the monetary order on the basis of the modern monetary system developed in Western countries.

Introduction of Modern Coinage Techniques

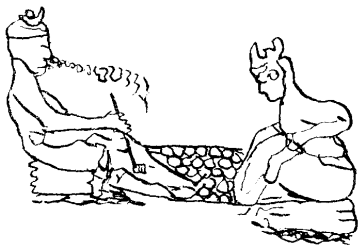
In order to solve the problems intrinsic to the monetary system based on traditional copper coins, and remove the trouble in trade with Japan and Western countries due to the weakness of the Korean money, it was necessary to reform the monetary system. Among the government officials advocating monetary reform was P. G. Von Möellendorff, who was employed as a trade and tariff advisor in November 1882 at the recommendation of Chinese Prime Minister Li Hung-chang. Asserting that Korea must mint gold and silver coins, this German advisor supported Min T'ae-ho and his group in their demand for minting five-*chŏn* copper coins early in 1883, and was deeply involved in the monetary policy pursued by Queen Min, who then held the government under her influence after defeating her father-in-law, the regent Taewŏn'gun.

After the five-*chŏn* coins, more copper coins were made in August 1883 when the government established a permanent mint designed to manufacture better coins. Min T'ae-ho, who was named as director of the mint, launched an active campaign for the introduction of Western minting techniques in cooperation with Moellendorff, who said in a letter to the king that the minting of coins amounting to one million *hwan* a year would bring about profits equivalent to 1.3 billion *yuan* in the value of the Chinese money. The German advisor's recommendation carried weight with the government in spite of many people opposing it. American Legate H. Foote said that the minting of new coins was not suitable to the economic situation of Korea at the time, and General Yüan Shih-kai of China, who had strong influence on the domestic affairs of Korea, said in a letter to the Korean king that the introduction of Western coinage techniques was premature in Korea. In addition, many Koreans, including Yun Ch'i-ho, who was well acquainted with the situation both at home and abroad, were opposed to Moellendorff's plan to introduce Western minting techniques. However, the campaign to import Western minting equipment was supported by the king and many government officials, in view of the need to maintain smooth trade relations with foreign countries through modernization of the monetary system, and an imported plant of coin-making equipment was prepared toward the end of 1883. The government transferred Moellendorff to the mint as its advisor in March 1884 in order to push through the plan.

In October 1885, German Vice Consul H. Budler in Seoul notified Trade and Tariff Minister Kim Yun-sik, at the request of Moellendorff, that parts of the equipment to be installed in the Mint of Korea had arrived at Inch'on. In March 1886, five months after the arrival of the equipment, the mint concluded a contract with a German firm for the import of coin-making equipment from Germany. The gist of the contract follows:

1. The German firm shall purchase minting equipment worth approximately 30,000 *yuan* in the value of Chinese money for the Korean government.

2. The German firm shall purchase up-



Polishing coins

to-date machines at reasonable prices.

3. In case the purchased machines are found inappropriate, they shall be replaced by appropriate ones, and disputes arising in the demand for such replacement shall be fairly settled by a third party.

4. The German firm shall pay freight charges and other expenses at the lowest possible rates for the Korean government.

5. The Korean government shall pay interest of 0.85 *yuan* for every 100 *yuan* of the prices of machines the German firm paid under this contract.

6. The German firm shall purchase and ship machines to Korea at the earliest possible date.

7. The Korean government shall pay 10,000 *yuan* in Mexican silver coins as part of the purchase price within 10 days after the signing of this contract, and pay interest of 0.85 *yuan* for every 100 *yuan* of every expense incurred by the German firm in addition to the initial payment of 10,000 *yuan*.

8. In case the Korean government purchases additional minting equipment and other equipment, it may import them through the German firm. However, it may request a third party to purchase them if it offers lower prices than those offered by the German firm.

9. In purchasing machines under this contract, the German firm shall not make profits other than those stated under Paragraph 5.

10. The Korean government shall pay, without fail, the Mexician silver coins in the amount as stated under Paragraph 7.

No list of machines imported from Germany under this contract remains today. But the imported machines included three stamps, two drawing machines, one press, two lathes, two cutters, one drill, three rolling machines, one automatic balance, one grinder, one bolier, etc., according to historical records. The purchase which required 30,000 *yuan* (about 21,000 *yang* in Korean money) was the biggest ever made by the Korean government in those days.

The machines were transported from Inch'on to Seoul by land. Some machines weighed 7.5 tons and they could not be unloaded from the ship at Inch'on because of its poor unloading facilities and were carried to Seoul on the Han River. In view of the poor transportation facilities at the time, there must have been many difficulties in carrying the machines from Inch'on to Seoul.

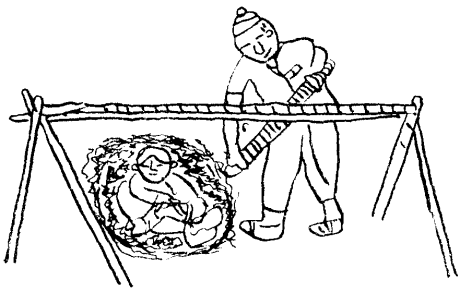
With the import of German coin-making equipment, the Korean government had to employ German technicians who could install and operate the equipment. At the recommedation of the German firm which supplied the equipment, C. Diedricht arrived in Seoul in October 1885 as mechanical engineer of the mint, and F. Kraus and C. Riedt came to Korea the following month. Kraus replaced Moellendorff as an advisor to the mint because the latter returned to Germany and Riedt served as chemical engineer to analyze gold and silver.

The employment of three German coin-making experts was the biggest employment of foreign technicians by the Korean government in those days, and their service was of significance in that they not only contributed to modernization of Korea's minting techniques but also provided Korea with opportunities to make direct contact with modern Western science and technology.

The three Germans served under individual employment contracts with the mint. A copy of Riedt's employment contract still remains, and the gist of this contract follows:

1. Riedt shall work as an analyst of gold and silver in the operation of newly-installed minting equipment, and his employment period shall be three years from the date of his arrival in Korea.

2. Riedt shall work only for the mint and shall not engage in other work.



Final procedure of coin-minting

3. The Korean government shall pay all travel expenses incurred by Riedt in his trip from Germany to Korea and his monthly salary shall be 100 *yuan* the first year and 125 *yuan* the second year. He shall be provided with housing and paid medical expenses and other necessary expenses. When he returns to Germany, he shall be paid 300 *yuan* in travel expenses.

4. The 540 marks Riedt received from the German firm which supplied minting equipment to Korea when he left Germany shall be deducted from his monthly salarly, and the mint shall pay to the firm's branch office at Inch'on the 360 marks he borrowed from the firm in addition to the 540 marks.

Riedt's starting salary of 100 *yuan* a month was equivalent to 72 *yang* in the value of the Korean money which could buy about 15 liters of rice in September 1884. This means that his pay was not very good.

Attempt at Monetary Reform

With the import of German coin-making equipment and employment of three German technicians, the mint launched a project to mint new coins and put them into circulation. Under the project, it first built three new buildings to house the imported equipment and offices, according to the plans prepared by the German firm which supplied the equipment, near the South Gate of Seoul because the buildings in Wŏnsŏ-dong, Chongno, in the city were too small. Dedicated in November 1886, the new buildings housed a boiler in the first one, gold bullion, chasing (engraving) facilities and measuring instruments in the second; and melting, drawing, stamping and analyzing facilities in the third. The installation of the equipment in the buildings was completed in December 1887 to start coin-making the following year.

When the equipment was imported from Germany, circular gold molds of coins were also imported. However, because their designs were not beautiful, two Japanese engravers—Hikotaro Inagawa and Takao Ikeda—were invited for modification of the designs. Another Japanese man named Koku Mitani was employed as a boiler man. The employment of Japanese technicians was included in Moellendorff's plan, which called for the making of coins in 15 denominations—gold coins with the denominations of 20 *hwan*, 10 *hwan*, five *hwan* and one *hwan*; silver coins with the denominations of one *hwan*, five *yang*, two *yang*, one *yang* and a half *yang*; and copper coins with the denominations of 20 *mun*, 10 *mun*, five *mun*, two *mun* and one *mun*. But the coins actually made in 1888 in celebration of the 497th year of the founding of the Yi dynasty amounted to a total value of 4,000 *yuan*, including some 1,300 one-*hwan* silver coins and an unknown number of 10-*mun* and five-*mun* coins. The mint then suspended operations.

The coins made by the mint were similar in design to the Japanese coins. The purpose of the original plan to make gold, silver and copper coins in 15 denominations was to adopt the gold standard, following the Ja-

Piles of newly minted coins

panese example. The differences between the Japanese coins and the Korean coins made in 1888 were the chrysanthemum and the paulownia leaves on the front side of the Japanese coins and the T'aegŭk (Korean national flag) and damson leaves on the front side of the Korean coins. On the back side of the Korean coins were two dragons. The T'aeguk symbolizes Korea, the damson leaves the Yi dynasty and the dragons the authority of the coins.

With the making of these new coins discontinued, the government issued at random the traditional copper coins, using the old casting method. As a result, the German equipment set up in the Mint was left unused and German analyst Riedt, who remained in Korea by extending his employment contract, left Korea in 1889, following Kraus and Diedricht who returned home upon termination of their contract periods. Also, the three Japanese technicians left the country.

Failure of Monetary Reform

As for the frustration in 1888 of the monetary reform plan which was launched in 1883 to modernize the monetary system, the following reasons can be considered.

First, beset by chronic financial difficulties, the Yi dynasty government could not afford to continue the operation of a modern mint requiring high expenses. The financial shortage was so severe that the government had to borrow 1,400 *yuan* from the German firm which supplied modern equipment to the mint in order to pay salaries and travel expenses to Kraus for his return to Germany. So it was impossible for the government to provide high operating expenses for the mint equipped with modern equipment.

Second, since the time when the traditional copper coins were first used as legal tender, the government had frequently issued new coins as a means to increase its revenues. In fact, coin-making in those days was a profit-making business of the government, rather than a project designed to stabilize the monetary order through control of the money supply. In addition, the monetary reform which started with the introduction of Western coinage techniques was partially aimed at profit-making for the government, although it was chiefly for modernization of the monetary system, because profit-making was the traditional purpose of coin-making in those days. Because of the low cost of making the traditional copper coins, the profitability of this business was high, and it was higher when coins in high denominations were made. On the contrary, the operation of the mint equipped with Western equipment and staffed with foreign technicians required a very high production cost of coins. In other words, the mint incurred business losses instead of profits, and this caused the shut-down of the mint in spite of the fact that it was intended to make coins usable as a medium of payment in foreign trade.

Third, the monetary reform was not in conformity with the socio-economic needs of the Korean society in those days. It was motivated first by the need for a handy medium of payment in trade with Japan and other countries, as the volume of foreign trade sharply rose after the country opened its doors to these countries. The Japanese and Mexican silver coins were in circulation in limited areas of the country related to foreign trade, and the chief medium of exchange was still the traditional copper coin. Under the circumstances, the plan to produce gold, silver and copper coins in 15 denominations was unrealistic and irrational, because the Korean economy at the time was not mature enough to require so many denominations of coins. In other words, the monetary reform was started without considering the limits of Korean society in accepting things Western in those days.

Fourth, conservatism prevailed among the Korean people of those days. In fact, the people at the time preferred traditional copper coins to the new gold and silver coins. Most people were critical of the monetary reform, therefore. Several government ministers argued that the Yi dynasty had lived through five centuries without gold and silver coins to oppose those who held that monetary reform would increase government revenues.

In addition, the return to Germany of Moellendorff soon after the monetary reform started, in spite of the fact that he played a vital role in drafting the reform, the poor

transportation facilities between Seoul and Inch'on, and the factional strife between the conservatives headed by Queen Min and the progressives in the government can also be considered as reasons for failure of the monetary reform.

Conclusion

Up until 1876 when a treaty of peace and amity was concluded with Japan, Korean society had been closed tightly to foreign countries, including Japan, and foreign trade had been limited to barter trade on a very small scale. After the treaty of peace and amity with Japan, the trade volume between the two countries rose sharply, to the extent that the moneys of the two countries had to be used as media of payment in their trade. But the traditional copper coins of Korea were unstable in value and inconvenient to carry compared with the Japanese silver coins under the gold standard. Moreover, the supply of Korean copper coins fell short of demand, causing trouble in foreign trade. In addition, the circulation of the Japanese and Mexican silver coins in Korea put the Korean monetary order, based on the traditional copper coins, into great confusion. The government felt the need to modernize the monetary system, and this need was accelerated with the employment of the German monetary expert Moellendorff. At his recommendation and under the support of the king and many government officials, a permanent government mint was established in order to carry out a reform of the monetary system.

Again at the recommendation of Moellendorff, the government imported German minting equipment and employed three German coin-making experts in the 1880's. The introductions of German coinage techniques was made in an attempt to modernize coin-making techniques based on the manual casting method and the monetary system based on the traditional copper coins only. It was significant because it provided Korea with opportunities to make direct contact with modern science and technology of the West for the first time, which had been introduced to Korea by way of China or Japan until then.

In 1888, the mint was to produce gold, silver and copper coins in 15 denominations, using the German equipment, in order to introduce the gold standard, following the Japanese example. But coins in only a few denominations were actually made before the mint shut down because of the conservative opinion against the monetary reform, and due to the pre-modern view of money, seeking the value of money only in its practical use in society, the repeated process of trial and error in monetary policy, and the chronic financial difficulties of the government.

As trade relations with foreign countries increased, the Yi dynasty government which had kept its doors tightly closed until 1876 felt the need to take defensive measures against economic advances of foreign countries. Under such measures, it launched a plan to modernize the monetary system in order to establish its control over money. But the plan failed, after producing silver and copper coins amounting to a total value of 4,000 *yuan* in 1888. The making of these coins in an attempt to adopt the gold standard in the 1880's marked a milestone in the monetary history of Korea.

The mint which shut down in 1888 resumed operations in 1892 to make new coins. Thus the import of German coinage techniques in the 1880's contributed much to modernization of the monetary system during the declining days of the Yi dynasty.