The Complementary Relationship Between Copper Cash and Silver Tael: The Beijing Mints in the Eighteenth and Nineteenth Centuries

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This paper is based on a larger piece of research that had been carried out within the framework of the DFG project on “State and Handicraft in Peking: 1700-1900.” It concentrates on the economic, social, and administrative problems of running the huge metropolitan mints in Peking which in the 1740s produced from 700,000 to 1.5 million strings of copper cash per annum and had a labour force of more than 3,000 men. Besides compilations of regulations and precedents, the main sources on which this research is based are archival documents and works of traditional historiography and statecraft writing. Of particular importance for enhancing our knowledge on the grass-root level organisation of the mints is documentation on the causes, developments and results of mint strikes. Tumults and strikes took place in the Peking mints already in the Kangxi (1662-1722) and Yongzheng (1723-1735) reign-periods, but more information is available on the spectacular strikes of 1741 and 1816. These events provide important information about the economic and social organisation of the metropolitan mints and areas of dispute between officials and contractors as well as between contractors on the one hand and craftsmen and workers on the other. By studying these strikes we also gain insight into contemporary monetary conditions and problems, especially the coexistence of local currency and grand money as well as on the degree to which these currencies could, or could not, substitute each other. It was the limited degree of mutual substitutionability, paired with social, economic, and institutional factors, that were responsible for the outbreak of unrest at the mints, especially that of 1741. While the co-existence of currency circuits may have well fitted the requirements of local conditions and market forces, this case

1 For a more detailed study of the strikes at the Peking mints see Vogel (2005).
study makes clear that the multiplicity of currencies could also have negative effects and incur social frictions and substantial transaction costs. Moreover, it seems that information of the inner workings of mints in Asian contexts is rather rare, so that the study presented here may throw some light on this otherwise well concealed state enterprise.

**The Furnace Heads**

There can be no doubt that the furnace heads or *lutou* 煉頭 played a crucial role in the organisation and management of the mints. This is made evident by the fact that in economic, social and administrative conflicts the *lutou*, and not the foremen (*lantou* 攪頭 or *jiangtou* 匠頭), are mentioned as the source of abuses, target of criticism and object of reform. Their functions, as intermediaries between state interests above, managing and financing the production of cash as their central duty, and organizing the labour force below, put them at least to a certain extent – in a position enabling them to handle and manipulate affairs in such a way that would be beneficial to them. At the same time this exposed position could also result in a situation where the *lutou* came under pressure exerted by the authorities, the labour force, or by both. At the same time, the *lutou* apparently attempted to collude with the state officials involved in the mint administration in order to obtain economic gains, or they collaborated with them in order to ward off demands from the labour force. Sometimes they also colluded with the workmen and labourers, especially in cases of mint counterfeiting. This shows that alliances could be provisional and shifting, depending on the sometimes quite ephemeral interests of the individual groups involved.

Theoretically, there should have been one furnace head for each furnace so that the number of furnaces, at least of the regular furnaces, would have been identical with that of the furnace heads. In the 1734 regulations contained in the *Tongzheng bianlan* it is stated, however, that in the *baoquanju* there once was one furnace head for each of the fifty furnaces, but that in the course of time the number of furnace heads decreased, reaching now a figure of only 26 names.\(^2\) The furnace heads came from only somewhat more than a dozen families (*jia* 家). For the

\(^2\) TZBL, chap. 4, regulations of 1734, quoted in ZGJDSGYSHL, vol. 1, pp. 117-118.
most part, they formed a close group related to each other in companionship (*duo xi pengtong* 多系朋統).

While there can be no doubt that the close partnership among most of the furnace heads was of great help in formulating and pushing through common strategies and interests and pursuing common business activities, the low number of furnace heads was as much an expression of difficulties in the proper operation of the mint as of economic and financial accumulation and concentration.

Because the craftsmen and workers were probably not permitted to leave the mints at will, the furnace heads provided them with their daily needs. It is therefore perhaps not too far-fetched to assume that the role of the furnace heads was comparable in many respects to that of labour contractors. As we know by Han Guangji’s description of 1739, the mints’ superintendents entrusted the money for work pay to the furnace heads who in turn purchased the food and other daily necessities for the craftsmen and workers. Income and expenditures of the craftsmen and labourers were settled after [each] casting period (*an mao* 按卯) when the remaining work pay was handed over to them.

Already the regulations of 1734 recorded in the *Tongzheng bianlan* fixed the procedure by which work pay and food procurement were to be handled. It is stated there that in the case of the *baoquanju* 1 tael pure silver (*wenyin* 紋銀) was to be given for each string of cash earmarked for work and food (*gongshi* 工食) for the craftsmen and labourers (*jiangyi* 匠役). They also stipulated that the accounts were to be settled and payments had to take place every ten casting periods. For the amounts advanced to the craftsmen and workers by the furnace heads for rice, noodles, and vegetables, [the craftsmen and labourers] were ordered to go themselves to the markets to inquire about prices beforehand. The mint’s commissioner-in-chief (*dashi* 大使) then dedresses up a list item for item and handed it over for examination. After the furnace heads had settled the accounts according to this list, a register was set up with the names of those whom silver should be duly paid, and the furnace heads paid out the silver name for name, publicly and in the presence of the

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1 QCWXTK, pp. 4995c-4996.
2 For a passage suggesting a strong tendency among the authorities to keep the craftsmen and labourers within the mints, see QSL:KX, chap. 116, pp. 8-9 (KX 23/7/22; Sept. 1, 1684), quoted in ZGJDSGYSZ, vol. 1, p. 122: “… *bu ling jiangyi chu ju* 不令匠役出局”.
3 QCWXTK, pp. 4995c-4996.
commissioner-in-chief. If craftsmen and labourers received silver or cash from the furnace heads in advance, then this money had has to be advanced in the presence of the commissioner-in-chief and to be registered and filed. During the settlement of the accounts, these amounts were then deducted [from the work pay]. Frank-pledges were issued to the craftsmen and labourers by which they had to confirm that no excessive claims or deductions with regard to work pay and food [had been made by the furnace heads] (bing wu fumao duangei gongshi ganjie 並無浮冒短給工食甘結). These were then filed.

The 1734 regulations also mention that when the furnace heads brought food and goods into the mints on behalf of the craftsmen and labourers, then the mint’s superintendent (jiandu 監督) had to find out the market prices and make them publicly known on a wooden board. Craftsmen and workers were ordered to find out market prices by themselves beforehand. 6

It is interesting to note that although in 1734 the costs for work pay were officially calculated in copper cash and thus deducted from the total cash output of the mints, it is absolutely clear that the furnace heads changed this copper cash into silver and thus paid out silver to the craftsmen and labourers at a rate of 1 string of cash to 1 tael pure silver. Interestingly, this is also the arrangement as it is described in the “Imperially endorsed regulations and Precedents for minting of the Ministry of Revenue” (Qinding Hubu guzhu zeli; thereafter “Regulations and precedents”) describing conditions of about ca. 1765 when likewise copper cash was earmarked for defraying the work pay of craftsmen and labourers and was to be taken from the total cash output of the mints. However, in contrast to the 1734 regulations, in the 1760s the exchange rate between cash and silver that was adopted was explicitly the market exchange rate, and not the official exchange rate of 1 string of cash to 1 tael pure silver. 7 No doubt, in a period of high cash value, the adoption of the market exchange rate benefited the craftsmen and labourers.

Differences in the procedures are also to be noted in the rhythm in which work pay was defrayed. The 1734 regulations say that this was done every ten casting periods. Han Guangji’s report of 1739 suggests that accounts were settled and payments made after each casting period.

6 See the 1734 regulations contained in the TZBL, chap. 4, as quoted in ZGJDSGYSZ, vol. 1, p. 118.

7 QDHBGZZL, 7: 4b-5a.
A palace memorial submitted by Sanhe 三和, Vice-minister of the Ministry of Revenue and Acting Administrator of the Coinage Office, in 1741 mentions defrayment of work pay on a seasonal basis. From another source we know, however, that in the same year this seasonal pattern of wage payments was changed to a monthly rhythm. Defrayment of the costs for materials continued to be carried out on a seasonal basis. This was still the practice valid in the 1760s, when the “Regulations and Precedents” were compiled.

There can be no doubt that the pivotal position occupied by the furnace heads provided them with a number of opportunities to enrich themselves at the expense of both the state and the craftsmen and workers. One potential source of enrichment for the furnace heads was speculation with cash that was handed over to them by the mints’ superintendents for paying labour costs and materials. Thus, in 1739 the Junior Vice-minister of the Ministry of Works, Han Guangji, suspected the furnace heads of hoarding this cash in order to drive up its value. As we have seen above, the wages paid to craftsmen and workers were normally calculated in copper cash, but in reality were changed into, and paid out in, silver by the furnace heads. Thus, the suspicion of speculative cash accumulation by the furnace heads may not have been totally unfounded.

A further tempting source of profiteering was the manipulation of the exchange rate between copper cash and silver and of prices for food and merchandise when settling the accounts with the craftsmen and workers. Such abuses and malpractices were revealed in 1741 and certainly contributed to the unrest among the mint personnel during that unruly year. As is made clear by the 1734 regulations, the furnace heads not only provided the craftsmen and labourers with food and other goods in the mint on a regular basis, but they also acted as moneylenders for the work force of the mints. This, too, certainly constituted a profitable business for them.

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8 QDDASLCB, vol. 11, p. 34.
9 QCWXTK, p. 4998b.
10 QDHBGZZL, 7: 4b-5a.
11 QCWXTK, pp. 4995c-4996.
The Mint Strike of 1741

Perhaps the most central issue in the disputes between state administration, furnace heads and the labour force was the amount of work pay handed over to the craftsmen and workers and the way in which this was done. Before 1739 expenses for work pay as well as the costs for materials\(^{12}\) – the two major categories of expenses of the mints – were earmarked in copper cash. This means that the funds earmarked for these purposes were directly taken from the cash produced by the metropolitan mints. In April 23, 1739 (QL 4/3\(\text{renxu 王戌}\)), Han Guangji 韓光基, Junior Vice-minister of the Ministry of Works, requested that both the expenses for work and materials in the baoquanju and baoyuanju should be defrayed in silver, and not in copper cash anymore. He argued that the 130,000+ strings that each year were reserved for defraying materials and work pay (ca. 90,000+ strings for the baoquanju, ca. 40,000 strings for the baoyuanju) tended to become concentrated in the hands of the furnace heads. In other words, about two tenths of the total cash output did not leave the mints, but concentrated in the hands of these managers. Unlike the cash of the ordinary people and soldiers, which was spent and dispersed, the cash of the furnace heads accumulated. By cornering a substantial amount of cash, somewhat more than a dozen families could manipulate the market value of cash by keeping it back and thus awaiting its value to rise. Han Guangji argued that for buying large quantities of goods, like coal and crucibles needed by the mints involving transactions to a value of 10 to 20 taels, not cash was usually used, but silver. Thus cash provided for buying materials anyway had to be changed into silver sooner or later anyway. Moreover, itWith regard to the daily needs of the labour force i were the furnace heads that procured and provided them for the craftsmen [and workers] by using the funds destined for “work pay”. The costs advanced by the furnace heads for these provisions were settled after each casting period, and Han Guangji proposed now to pay out the remaining amount of work pay to the craftsmen and workers also directly in silver at a rate of 1,000 cash coins to 1 tael. In this way, so his proposal, not only would more cash be available for the payment of military rations as well as the amount of cash in circulation be augmented

\(^{12}\)“Materials” included not only crucibles, coal, charcoal, yellow sand, salt, and the strings for binding together the cash, but also cash transportation costs and compensation for the furnace heads (lutou) and foremen (lantou). Costs for materials, however, did not include the expenses for the metals which apparently were entered into the account books of the boards.
and its value lowered, but it could also be prevented that the cash coins flowed into the private pockets of the furnace heads. For implementing this method beneficial for both soldiers and the ordinary people, every season the Ministry of Revenue was to provide silver for work pay and materials to the superintendents of both capital mints who had to distribute it [to the furnace heads. Those, in turn, then had to pay the wages to the craftsmen and workers].

From an imperial edict recorded in Qing shilu, dated QL 6/6/wushen (July 27, 1741), we learn that the regulation to defray both work pay and costs for materials all in silver was not totally adopted or was changed quite soon after Han Guangji’s proposal. In this imperial edict we are told that after Han Guangji’s memorial both the Ministry of Revenue and the Ministry of Works requested in a palace memorial only to pay costs for materials in silver, while work pay for craftsmen and labourers should be still defrayed in copper cash.

It is interesting to speculate about the reasons for the rather rapid cancellation of one part of Han Guangji’s proposal. From the regulations of 1734 contained in the Tongzheng bianlan we know that already also before 1739 the craftsmen and labourers had received their work pay in silver. This was due to the fact that although officially work pay was calculated and earmarked in copper cash taken directly from the cash output of the mints, the furnace heads changed this cash into silver, which they then paid to the craftsmen and labourers. From the 1734 regulations we also know that this conversion from cash into silver should have been carried out explicitly according to the official exchange rate of 1,000 coins to 1 tael silver. Theoretically speaking Han Guangji’s proposal would not have changed anything in substance in this respect, because with the new regulation craftsmen and workers also would have received silver instead of cash, likewise at the official exchange rate of 1,000 coins to 1 tael silver. The only difference would have been that with Han Guangji’s regulation the silver now came directly from the treasury of the Ministry of Revenue, while in the former arrangement silver should have reached the craftsmen and workers via a transaction of exchanging copper cash for silver carried out by the furnace heads at the official exchange rate. This difference was, however, crucial. There can be no doubt that under the former arrangement the furnace heads, with the

13 QCWXTK, pp. 4995c-4996; QSL:QL, II, 1409 (QL 4/3/renxu, April 23, 1739); JQ-HDSL, 173: 2a-b, 8b, 684: 2.
toleration of the officials, and certainly with the consent of the craftsmen and workers, did not keep to the requirement of adopting the official exchange rate when changing copper cash to silver but did this according to the market exchange rate. There were certain pressures inherent in the monetary conditions of the period that prompted the furnace heads to do so. First of all, in a period of rising cash value and falling silver value the adoption of the official exchange rate would have caused financial losses in the net income of craftsmen and labourers. Though the furnace heads and the ministries supervising the mints were perhaps less concerned about the financial difficulties which the craftsmen and labourers may have suffered, they certainly worried about social unrest in the metropolitan area which might be caused by the discontent of the labour force, leading to a disruption of coinage operations and profits and endangering the officials’ bureaucratic advancement. Second, adopting the market exchange rate – or, better, an exchange rate near to it – certainly gave the furnace heads a greater leeway in manipulating financial transactions. It is clear that they paid out silver to the craftsmen and workers at a less profitable rate than they had obtained it themselves on the market. It therefore must have been this collusion of furnace heads and officials that prompted them to urge the ministries to memorialize to the throne and, as a result, brought one part of Han Guangji’s proposal to fall.

However, it was exactly because of corruption and bribery that the emperor decided, in 1741, to return to the proposal originally made by Han Guangji in 1739, that is, to cover not only the expenses for materials in silver, but also the work payments given to the craftsmen and labourers. Already in QL 6/6/wushen (July 27, 1741) the emperor had stated the following:

Now these abuses of [illegal] deductions and bribery committed by the furnace heads are just produced by this [i.e. by defraying work pay in copper cash]. Therefore, it seems that payments in silver are the right thing. Moreover, the furnace heads and others would thus know that bribing would be of no profit, and one could also find out quickly the true facts of the case. It is therefore ordered that [defrayment of both work pay and costs for materials] are carried
out in the way once proposed by Han Guangji [that is, by using silver].

If my interpretation of the few indications available so far is correct, then it seems that the return to the idea of Han Guangji was at first carried out in such a way that the then low value of silver was taken into account. In other words, the amount of work pay defrayed by using funds from the treasury of the Ministry of Revenue was calculated on the basis of, or near to, the market exchange rate. Only in a second step was this amount then reduced to a level suggesting a conversion according to the official rate. This at least is the impression given by the data we can cull from a report of Sanhe 三和, Vice-minister of the Ministry of Revenue and Acting Administrator of the Coinage Office. Sanhe states in his palace memorial that according to former precedents (xiangli 向例) the work pay (gongjia 工價) for the craftsmen and labourers (jiangyi 匠役) in the four subordinate mints (chang 廠) of the baoquanju 鉛局 was paid on a seasonal basis. He also mentioned that some time before QL 6/7 (July/Aug. 1741), when work pay for the autumn term was due, the Ministry of Revenue had decided to reduce the payment from 28 taels per mao by 4+ tael, that is, to an amount of 23.61 taels per mao.

Taking the 1734 regulations as a starting point, we know that the amount earmarked for the work pay of the craftsmen and labourers was 24.936 strings per mao. If our assumption is correct that in a first step the return to Han Guangji’s proposal was based on an exchange rate near to the market rate, then when taking the 28 taels mentioned by Sanhe we arrive at an exchange rate of 890 coins to 1 tael. In other words, this was an exchange rate inferior to the market exchange rate, which stood at 830 coins to 1 tael approximately. Thus, the craftsmen received less silver than they would have received if the conversion had been truly carried out according to the market exchange rate, but the use of an

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15 QSL:QL, III, 2152 (QL 6/6/washen 戊申; July 27, 1741); QCWXTK, p. 4998b.
16 QDDASLCB, vol. 11, p. 34 (Sanhe). See also Shuhede’s palace memorial, QDDASLCB, vol. 11, p. 37.
17 For this figure, see TZBL, chap. 4, as cited in ZGJDSGYSL, vol. 1, p. 119.
18 $24,936 \text{ coins} : 28 \text{ taels} = x : 1 \text{ tael}$; $24,936 : 28 = 890+$.
19 A market exchange rate of 830 to 1 is explicitly mentioned for the year 1739 by the QCWXTK, chap. 18, pp. 6-7 (quoted in ZGJDSGYSL, vol. 1, p. 120), in connection with the payment of the mint wages.
exchange rate above the market exchange rate was probably a practice which had also been adopted previously by the furnace heads when they converted copper cash to silver on behalf of the workmen and labourers. Despite some losses, this may have been a practice still acceptable for the craftsmen and workers. The additional curtailment by another 4+ taels to a level of 23.61 taels, however, brought the patience of the craftsmen and labourers to an end. When taking the market exchange rate of that period into account, those 23.61 taels represented a value of only 18.8+ strings per mao and thus a veritable loss in income. This move by the authorities resulted not only in complaints by the craftsmen that work pay was not sufficient to meet expenditures, but also in a veritable suspension of minting operations by stopping the furnaces (ting lu 停爐) by QL 6/7/27 (Sept. 6, 1741) in all the four subordinate mints.20

After some first actions, disputes and investigations negotiations took place between the furnace heads on the one hand and the workers and craftsmen on the other with the result that the furnace heads agreed to return to the former figure of 28 taels per mao and to keep to this amount also in the future. As a consequence, craftsmen and workers resumed coinage operations.21 This compromise, however, was only of temporary nature as in QL 6/8/7 (Sept. 16, 1741) and thereafter leaders of the craftsmen and labourers of the Northern subordinate mint again stopped the furnaces.22 The reason was that in their negotiations about the accounts with the furnace heads they not only demanded a new calculation for the autumn term, but also wanted to balance the accounts of the last two years. What they now demanded for the autumn term was a payment to the amount of 28 strings (chuan 串) of cash, instead of 28 taels of silver, for the work pay per mao. Moreover, they wanted redemption for deductions made by the furnace heads during weighing silver or because of deficiencies in the touch of silver [which had occurred during the last two years]. Only if these redemptions were made would they agree to resume coinage.23 In spite of repeated proclamations by the superintendent the craftsmen and labourers “obstinately adhered to their error” (zhì mì bù wù 指迷不悟), and this even when the Vice-minister of the Board of Revenue, Sanhe, together with the superintendent, came personally to the mint taking along with him all the

20 QDDASLCB, vol. 11, p. 34 (Sanhe); vol. 11, p. 37 (Shuhede).
21 QDDASLCB, vol. 11, p. 37 (Shuhede).
22 QDDASLCB, vol. 11, p. 35 (Yuntao et al.).
23 QDDASLCB, vol. 11, p. 37 (Shuhede).
copies of the original palace memorials in order to explain and point out
the situation to them. Moreover, presuming on their large number, they
even started to clamour noisily.\(^{24}\) This pattern was “imitated and even
exceeded” by the Eastern, Southern and Western subordinate mints.\(^{25}\)
Troops were deployed secretly in the vicinity of the four subordinate
mints in order to be prepared for the case of more serious trouble.\(^{26}\) The
situation calmed somewhat down because it was agreed between the
negotiating parties that after having balanced the accounts coinage would
be resumed.\(^{27}\)

But events became even more dramatic when during checking all the
new and old accounts it was found out that amounts of 500 to 600 taels of
silver were owed per furnace to the craftsmen and workers. They
demanded the payment of these amounts from the furnace heads in ready
and declared money that only after these amounts had been cleared
would the furnaces resume operation.\(^{28}\) In QL 6/8/17 (Sept. 26, 1741)
Shuhede’s vice commandants reported that after several days of
negotiations the furnace heads of the northern subordinate mint agreed to
proceed as it was demanded by the workers and craftsmen, but that
presently they would not be able to organize these [large] amounts of
money within such a short period. One day later, in QL 6/8/18 (Sept. 27,
1741) at the first night watch [ca. 7-9 p.m.], the vice commandants
reported from the western subordinate mint that when the workers and
craftsmen there had heard about the figures agreed upon at the northern
subordinate mint they, too, demanded from their furnace heads a re-
negotiation of the old accounts according to the pattern set by the
northern subordinate mint. In order to bring their demands home they at
the you 西 hour [ca. 5-7 p.m.] climbed on an earth mound within the
mint, clamouring and shouting, and throwing bricks and tiles.\(^{29}\) Later on
the soldiers of the Metropolitan Infantry Command marched forward to
suppress the agitation.\(^{30}\) It was reported that the workers and craftsmen
returned to their respective workshops and there were no further

\(^{24}\) QDDASLCB, vol. 11, pp. 34-35 (Chen Dehua et al.).
\(^{25}\) QDDASLCB, vol. 11, p. 35 (Yuntao et al.); vol. 11, p. 36 (Chen Dehua et
al.).
\(^{26}\) QDDASLCB, vol. 11, p. 37 (Shuhede).
\(^{27}\) QDDASLCB, vol. 11, p. 36 (Chen Dehua et al.).
\(^{28}\) QDDASLCB, vol. 11, p. 36 (Chen Dehua et al.).
\(^{29}\) QDDASLCB, vol. 11, p. 35 (Yuntao et al.); vol. 11, p. 36 (Chen Dehua et
al.); vol. 11, p. 37 (Shuhede).
\(^{30}\) QDDASLCB, vol. 11, pp. 37-38 (Shuhede).
manifestations during the days from QL 6/8/19 to 6/8/21 (Sept. 28-30, 1741), also because the furnace heads were ordered to continue the negotiations and eventually agreed to the proposals made by the craftsmen and workers.\(^{31}\) The craftsmen of the southern and eastern subordinate mint had also stopped their furnaces and likewise demanded a re-negotiation of the old accounts.\(^{32}\)

One result of the official investigations was that it indeed turned out to be true that the furnace heads had made inappropriate deductions during several years and had now expressed their willingness to repay silver [money] to the craftsmen and labourers.\(^{33}\) However, the financial situation of the furnace heads appears to have been not very solid either. Therefore, Chen Dehua, Sanhe and Shuhede proposed that the state should lend them silver now stored in the [baoquan]ju’s treasury destined for defraying the winter term’s work pay and costs for materials. Repayment of the money advanced to them should take place in seasonal instalments over the coming years until the loan made from public funds was cleared off. Moreover, the furnace heads were to be ordered to distribute the due amounts to the individual craftsmen so that those would reopen the furnaces and take up coinage again.\(^{34}\)

Apart from punishing the craftsmen and the workers’ ringleaders of the tumult of QL 6/8/18 (Sept. 27, 1741), Jiang Bing, the Prefect of Shuntian Prefecture, also requested the emperor to have the furnace heads punished, not only because of the fact that they had made deductions from the wage pay, but also because they were the people who had hired the craftsmen and labourers\(^ {35}\) and were thus responsible for their behaviour.

What were, after all, the results of this unrest and the protests of the mints’ craftsmen and workers in financial respects? Based on circumstantial evidence, it can be clearly shown that the craftsmen and workers were not able to realize their demand for 28 strings of work pay per mao. Given a market exchange rate of 830 coins to 1 tael, this naturally would have been a substantial gain for them as these strings would have brought 33.7 taels of silver on the market, that is, 5.7 taels more than the 28 taels first fixed in 1741 and more than 10 taels than the

\(^{31}\) QDDASLCB, vol. 11, pp. 37-38 (Shuhede); vol. 11, p. 38 (Jiang Bing).

\(^{32}\) QDDASLCB, vol. 11:35 (Yuntao et al.); vol. 11, p. 36 (Chen Dehua et al.).

\(^{33}\) QDDASLCB, vol. 11, p. 35 (Yuntao et al.); see also vol. 11, p. 39 (Jiang Bing).

\(^{34}\) QDDASLCB, vol. 11, pp. 36-37 (Chen Dehua et al.).

\(^{35}\) QDDASLCB, vol. 11, p. 39 (Jiang Bing).
The Complementary Relation between Copper Cash and Silver Taels

A curtailed sum of 23.61 taels of shortly thereafter. As often in life, a compromise was reached. First of all, work pay was again given in copper cash, whereas costs for materials were continued to be paid in silver. The copper cash earmarked for work pay was taken from the mints’ output and was, as usual, exchanged on the market by the furnace heads for silver which was then handed out to the labour force. This regulation should have been carried out perpetually (yongyuan zunxing 永遠遵行). Second, the craftsmen and labourers received the work pay on a monthly basis, while costs for materials were still paid to the furnace heads in a seasonal rhythm. This meant that craftsmen and workers had to wait less time for their compensation, describing conditions ca. Fifth, it is very probable that the craftsmen and labourers were successful in demanding compensations for the illegal deductions and frauds committed by the furnace heads. In a palace memorial of Chen Dehua and other officials an amount of 500 to 600 taels of silver per furnace is mentioned. If this sum referred to the regular furnaces (75) of the two capital mints, then the furnace heads would have had to redeem between 37,500 and 45,000 taels. If the assisting furnaces (75 + 16 = 91) are included, a sum between 45,500 and 54,600 taels would result. We have seen that Chen Dehua, Sanhe and Shuhede had proposed that, because the furnace heads were in financial straits, state funds should be advanced to them, which they had to repay in seasonal instalments over the coming years. So far, we have not any concrete data about the way by which the furnace heads had to redeem this state loan. That it was not unusual to advance state funds to the furnace heads and the craftsmen of mints and then to have them paid off by making deductions from the costs of materials and work pay is shown by such a procedure adopted, for instance, during the establishment of the Guangxi mint in 1742.

36 QSL:QL, IV, 2211-12 (QL 6/8/xinchou; Sept. 18, 1741); IV, 2224 (QL 6/8; Sept./Oct. 1741); JQ-HDSL, 173: 2b, 684: 3; QCWXTK, chap. 16, (QL 6; 1741), pp. 25-26; chap. 18 (QL 38; 1773), pp. 6-7, quoted in ZGJDSGZSZL, vol. 1, pp. 120-121. Total wages for both capital mints amounted to 72,189 strings per annum; costs for material are indicated with 59,925 taels. 39 QDDASLCB, vol. 11, p. 36 (Chen Dehua et al.). 40 QDDASLCB, vol. 11, pp. 36-37 (Chen Dehua et al.). 41 See QSL:QL, IV, p. 2625 (QL 7/10/gengzi; Nov. 11, 1742). Money was also advanced to the furnace heads of the Jiangsu mint, established in 1740. This loan was also repaid by deductions. See QSL:QL, III, p. 1911 (QL 5/9/guiwei; Nov. 4, 1740).
from a palace memorial of Xiao Zhen 蕭鎮 of JQ 21/6/27 (July 21, 1816) we know that advancing of state funds to the furnace heads was a quite common practice also in Peking during the eighteenth as well as the early nineteenth centuries.\(^{42}\)

**Defrayment of Work Pay and Costs for Materials in the Late Eighteenth and Early Nineteenth Centuries**

The regulation to hand over the work pay for craftsmen and labourers in cash coins to the furnace heads who then exchanged them for silver on the market was in force well into the 1760s and thus also found its reflection in the “Regulations and Precedents” of ca. 1765.\(^ {43}\) Another source tells us, however, that already since 1763 and 1764, i.e. during the final editing and revisions of the “Regulations and Precedents”, this practice ran into difficulties because the value of cash began to drop and that of silver to rise.\(^ {44}\) With a market exchange rate from 850, 870, to 890 coins per tael around Peking\(^ {45}\) deficits of 13,300+ taels per annum were incurred in the defrayment of the work pay in the baoquanju alone. These losses in handling annual work pay defrayments were made good by the furnace heads and others,\(^ {46}\) certainly also because of serious worries that similar disastrous events like in 1741 may occur again. Because the furnace heads got into ever deeper financial difficulties when the exchange rate continued to rise, it was decided in 1773 that payments for work and food (gongshi 工食) of the craftsmen and labourers should be defrayed again in silver provided by the treasury of the Ministry of Revenue. Every season the furnace heads had to go to the Ministry of Revenue’s treasury to receive the due amount of silver which was then stored in the mints and paid out to the craftsmen and labourers on a monthly basis. In the case of the baoyuanju the superintendents went to the Ministry of Revenue’s treasury to pick up the silver and bring it to the mint. It is interesting to note that it was stipulated that the amount paid out to the furnace heads was calculated on the basis of some kind of mean value [of silver] current on the market. During 1773 there were paid 102,345+ taels for the baoquanju’s wages, and 48,762 taels for those of the baoyuanju. At the same time it was decided that costs for materials

\(^{42}\) See GZDCZL, reel 63, 2636 (Xiao Zhen).
\(^{43}\) QCWXTK, p. 5020a-b.
\(^{45}\) QCWXTK, p. 5020a-b.
The Complementary Relation between Copper Cash and Silver Tael s

should be paid from now on in cash coins, at a rate of 900 coins to 1 tael silver. In other words, for the baoquanju 65,772 strings were earmarked for this purpose, for the baoyuanju 30,693.6 strings. These data reveal that apparently different exchange rates were used in the conversion of work pay and costs for materials respectively. In the later case, the exchange rate adopted was explicitly 900 coins to 1 tael, which exactly fits the quota figures then current. In the case of labour pay, however, the rate was about 860 coins to 1 tael, as is borne out by a calculation with the figures given by the sources. The market exchange rate during that period was about 950 coins for 1 tael. In other words, the craftsmen and workers seemed to fare quite well, although in terms of silver the absolute amount paid to the craftsmen and workers of, e.g., the baoquanju was reduced from 106,066 taels of silver in 1741 to 102,344 taels in 1773. Given the rising prices for rice and perhaps also other goods in silver, the regulation of 1773 would have meant a net loss for craftsmen and workers, if they spent their wage payments in silver. If the workers of the baoquanju, however, took their 102,344 taels (originally 88,035 strings) which they had received at a favourable exchange rate of 860 coins to 1 tael to the market and exchanged it there for cash at a rate of 950 coins to 1 tael, they would have received 107,730 strings.

The furnace heads’ expenses for materials were affected rather negatively by the 1773 regulation, because the decision to convert the costs for material from silver payments into cash payments at a rate of 900 to 1 was certainly not an advantage in a period when the market exchange rate stood at 950 to 1. Granted that the furnace heads of, e.g., the baoquanju purchased material mainly by using silver, then the amount of 65,772 strings of 1773 represented a market value of about only 69,234 taels (950 coins to 1 tael), when compared with the figure of

46 QCWXTK, p. 5020a-b; JQ-HDSL, 173: 3b-4, 684: 4a-b, 14b-15. For both mints together these were annually 96,466 strings for costs of materials and 151,107 taels for work pay.
47 According to the “Regulations and Precedents” (see QDHBGZZL, 7: 5a-b) 73,080 taels were earmarked for costs for materials for the 75 mao: 73,080 taels x 9/10 = 65,772 strings.
48 According to the “Regulations and Precedents” (see QDHBGZZL, 7: 4b-5a) 88,035 strings were earmarked for work pay for the 75 mao: 88,035 strings : 102,345 taels = x : 1 tael = 88,035 / 102,345 = 860 coins.
50 The following statements replace my erroneous account in Vogel (2005), p. 416.
73,080 taels for the costs for materials in 1741 and around 1765. To this we have to add the rising prices for goods in silver. Do we have to assume that this may have represented some kind of arrangement between the furnace heads and state officials dealing with the redemption of the wage payment deficits accumulated by the furnace heads in the 1760s?

The Mint Strike of 1816

The financial conditions for the mints, their managers, and their labour force certainly deteriorated in the late eighteenth and early nineteenth centuries. The main reason for this development was that the value of cash was dropping and that especially in the period from 1794 to 1794 coinage was drastically reduced. While almost all provincial mints were closed, also the metropolitan mints reduced their output so that craftsmen and workers ran into financial difficulties. In the case of the baoquanju, the casting periods were reduced from 75 in 1793 to 30 from 1794 to 1795 and to 40 from 1796 to 1798. Only in 1799 were operations increased again to 75 mao per annum. The same pattern applies to the baoyuanju with figures of 70, 30, 40 and again 70 mao respectively. The increase from 30 to 40 mao in 1796 was carried out explicitly in order to ease the financial problems of the craftsmen and workers. Another disadvantage for the labour force in a period of an increasingly depreciated copper currency was that in 1794 the payments perhaps both for work and materials were executed in copper cash.

Again, in 1816 the mints’ craftsmen and labourers did not hesitate to protest noisily and to make use of violence in order to defend their interests and push through their demands. From a palace memorial submitted by Censor Xiao Zhen and the ensuing commentary by the Jiaying emperor we learn that the craftsmen and workers of the baoyuanju had stopped the furnaces, brought coinage to standstill, and intimidated the officials. The reason for these spectacular actions was that

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51 GX-HDSL, chap. 684, p. 5; QCXWXTK, chap. 204, qianbi kao 2, p. 1, both quoted in ZGJDGYSZL, vol. 1, p. 121.
52 See Vogel (1989), Table D1.5.
54 JQ-HDSL, chap. 684, p. 15a. The passage is not totally clear as it speaks of gongjiang liaoqian 工匠料錢.
they wanted to have a share of [some extra] money granted by the state to the furnace heads for covering costs for materials.

The emperor naturally had no good words for the craftsmen and workers either. For him these were all inferior people who were greedy and insatiable in their demands. By greedily demanding a share from the money for material costs that originally had been destined to recompense the furnace heads they clearly had overstepped their proper place [in the hierarchy and social order]. Therefore, they [or at least some of them] were ordered to be put into the cangue as a warning and in order to restrain them.55

Conclusions

The Peking mints operated in a complex monetary situation. While in the early 1740s it would have been natural to use the cash coins produced by the mints themselves to pay the labour force and costs for materials, a number of factors operated against this obvious solution during those years. For the procurement of “materials”, such as fuel, crucibles, charcoal etc., silver was required for purchasing the substantial amounts of these items consumed by the mints. These transactions involving values of 10 to 20 taels were normally not carried out in cash, but in silver. A more complex situation existed in the payment of wages, for which, at least during a period of high cash value, workers would have preferred cash coins. However, because for obvious reasons cash coins were not permitted to be brought in or taken out of the mints by the workers, the actual payment of wages, though accounted in copper cash, took place in silver. We have seen that this complex operation provided the furnace heads with opportunities for profiteering – for their own benefit but also partly for covering expenses in the minting business. Being aware of the appreciation of cash, the craftsmen and workers even demanded payment in copper cash during the strike of 1741, but this was not granted by the government so that in the end the workers were still receiving silver and thus had to exchange this silver for copper coins on the market, at least for the part of their wages to be used in daily transactions.

At the mints, the government basically had the tendency to pay in silver when cash was appreciated and silver depreciated, and to pay in

cash when vice versa. There were, however, economic and social factors which counteracted against these tendencies, such as the necessity of using silver in larger transactions, the importance of wages for buying daily necessities, or the preferential treatment of craftsmen and workers in wage payments as a preventive measure against a recurrence of the events of 1741. Thus, monetary transactions at the mints were not only a reflection of purely monetary conditions and developments, but also comprised more or less concealed social and economic obligations between the actors that sometimes took place in other arenas and included such acts as concessions, favouritism and compensations.

Whatever the particular monetary situation and political decisions, silver tael and copper cash could be substituted for each other to only a limited degree. Hence quite complex exchange operations became necessary that not only involved transaction costs, but also opportunities for cheating. An example for the complexity of the situation are the wages of craftsmen and workers that were taken by the officials from the cash coins produced by the mint, but changed by the furnace heads at a mint-internal rate into silver which was then paid to the workers who then presumably had to exchange at least a part of the silver again for copper cash on the market at the market exchange rate. And while the exchange within the mint was accounted in terms of pure silver and standard coins, the exchange of current silver for current coin on the market probably took place at its own conditions – in the sense of the diversification of currencies within both the silver and cash coin sector. While thus the diversity and coexistence of complementary, multiple monies may have evolved in response to the requirements of the markets and thus fulfilled a useful and beneficial function, the concrete case of the Peking mints shows that the existence of multiple monies entailed considerable costs of transactions and could become the cause of social disruption, especially in the case of economic and financial relationships between government agencies and private groups.

This investigation has also shown that endeavours at attaining standardization and unification, as they were intended by such works as the "Regulations and Precedents", were only of limited success, especially in the light of rapidly changing economic and social conditions. A good example of this problem is regulations concerning the quantity and modes of work pay defrayment. These regulations were much too rigid in view of the rather unpredictable fluctuations within the monetary system. At least in some areas these social, economic, and monetary dynamics eroded the efforts of the bureaucracy at
standardization and unification, compelling the officials to tolerate deviations or to search for make-shift solutions. Thus, while in some respects the “Regulations and Precedents” reflect actual and valid bureaucratic practice, in other, and perhaps more crucial, fields, they do not, because shortly after their stipulation they were undermined by social and economic pressures and arrangements different from those that had existed before and had formed the basis for the formulation of regulations.

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