What Olof had in mind
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By Frands Herschend


An investigation of the characteristics of the weight of the Sigtuna coinage as published by Malmer 1989. The first coins, although reflecting several norms, are considered to have been deniers defined as centred around the weight of 1/96 mark of about 208.5 g equal to 16 smaller units. The mark is the same as the one governing the Gotlandic bracelets of Stenberger’s type 2, Herschend 1987. With the New Series the symmetrical ideal was abandoned and the average coin weight dropped since the coins weighing between 12 and 14 small units came to dominate the material.

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The reconstruction of the Viking Age metal weight system on Gotland has made substantial progress during the last 20 years, as proven by studies such as Lundström 1973; Kyhlberg 1973, 1980 and 1982; Saers 1982; Sperber 1986, 1989a and 1989b, or Steuer 1987.

It is therefore only natural when a contemporary coin material from the Mälar Valley, although mainly found on Gotland, is published to look for affinities between the two regions. Such and wider connections have of course already been discussed, e.g. by Kyhlberg (1980) or Sperber (1989a). This is a promising lane of research whereby this article seeks a connection between Gotland and Sigtuna, based on the splendid publication of the Sigtuna coinage c. 995–1005 (Malmer 1989).

The discussion of weight in Malmer 1989 is preliminary within a chronological perspective, pp. 33 ff. Its theoretical base is an assumption that the coinage mirrors definite weight systems, while the methodical approach derives from a comparison of minimum, maximum and mean weights in different subsets of the coinage. As a framework for the initial coinage the reader is offered a comment upon our present day knowledge:

English coin weights can hardly have set the standard for the Crux period of the Sigtuna coinage. Was there another model for its high average weight? Or did Sigtuna set its own weight standard independently? The weight systems in the Baltic region during the Viking period cannot be easily discovered despite the many balances and weights that have been preserved (Steuer 1984, 283–6). At the present time it is hardly possible to determine the early weight standard of the Sigtuna coinage in terms of, for instance, the weight of a mark or its subdivisions. The most ... (Malmer 1989 p. 32.)

The chapter on weight consists of a preliminary presentation of the material and a discussion which implies that some of the opinions held in Malmer 1965 and Petersson 1969 may still be valid, if the analysis, aided by the comparison of minimum, maximum and mean weights, refers to a well structured numismatic material, in which the often small subsets are defined by several intricate numismatic variables. In the discussion of the weight of the Crux imitations pp. 30 ff. only some 12% of the coins are mentioned. They fall into two subsets, 28 and 13 coins, and it is observed that their weight relation is close to three to four. The smallest set is grossly influenced by two extremely heavy and two rather light coins. If we removed just one of the heavy coins the mean weight of the sample would

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drop from 2.46 to 2.35 g, and if on the other hand one of the light ones were substracted the mean would rise to 2.53 g.

One third of all Crux imitations are made with a single die, but the mean weight of these coins seems to be irrelevant to the discussion, although it is an average weight not significantly changed by the loss or addition of an extreme weight.

Bearing the inner structure of the chapter in mind the discussion seems very appropriate, but readers having an eye to metrology must resort to the catalogues and create a database of their own, bearing in mind the numismatic structure of the coinage so splendidly scrutinized in the book. The analysis must be based upon large subsets, and should not rely solely on rough measures, such as the mean in grammes down to two decimal places. Using this approach the analysis will hopefully disclose the general metrology while recognizing the complexity of the Viking Age economy and its currency.

A theoretical point of departure

When, as in this Mälar Valley case, local market-dependent money is introduced, then the weight of the coins is likely to be related to the metrology already existing in the area, since this system has hitherto been used to define prices as equal to weight, in a fair but probably slow silver weight-dependent trade.

The great achievement does not consist in mastering the basic techniques of coin production: on the contrary, it is the ability to create a market on which the nominal value of the money is stable rather than floating, and thus not so strongly bound to the real silver value of the coin. Sigtuna is in my opinion such a market.

During the Viking Age a silver surplus accumulated in the Mälar Valley mostly due to peaceful or armed initiatives taken by the most influential or well-to-do peasants of the region. This surplus was one of the reasons why the King created a market. His contribution was a safe market place visited by foreign tradesmen, bringing attractive goods into the town. Such a market is particularly advantageous to peasants with modest fortunes in silver, since they can obtain prestige goods without taking an active part in risky trade expeditions or piracy.

They must of course, as their part of the deal, pay for their goods, which is a two-fold problem. First they pay for the entrance to the market and then they buy at relatively stable prices. The entrance fee would be a real weight payment which may well have been linked to the duty of using only the King’s money on the market. To reconstruct the principle we may picture the following scene: The peasant puts one mark of silver onto one of the pans of the official scales, in order to balance the official mark weight in the other pan. Then the weight is removed and the number of (mixed) coins officially equalling a mark are piled in the pan, to balance the silver. If the coins match the silver, then a certain number of coins, perhaps a eighth, are removed together with the silver, by the officials. The rest of the coins are given to the peasant, who will now know what he has really paid for his money and eventually for his goods.

Whatever fees may have been imposed on those who wanted to enter the market, in order to buy, or to sell, or to establish a production, they must have had to pay a real value charge. The point is of course that for people in the region it is an absolute rather than a relative economic advantage to be on the market. Therefore the King may also favour you in different ways, paying you with his money or giving you a site in his market town.

Between markets the value of the transactions is always a matter of the real values, (the weight of the silver) and for this reason you cannot, when you create a controlled market in a region with an established tradition of a real silver weight economy, very well define the price of your coins on nominal grounds only. On the contrary the silver content must be high, and the mean weight a natural fraction of a mark. When the market expands into the region around the town and when the hoarding of silver has come to an end, then the need for simple metrology declines. Instead it becomes essential that the coins are so over-valued and standardised as to weight and
silver content, that only the few who trade between markets are interested in their real value.

To begin with, when Sigtuna is the only market for the coinage, then the weight and the quality of the silver is more important than the quality of the mintage and the design of the coins.

The first sample
The round coins in Malmer's first catalogue, Classic series, is the obvious first choice if you want to study the initial coinage. The coins included in the sample are those with no comment in column 10, nor comments in column 5 implying a loss or an addition of weight, and moreover no coin with a crack or a hole (column 13). Coins of the last-mentioned quality are included in the sample used by Malmer 1989 when describing the weight of the subsets mentioned above, but with the approach of this case-study, the fact that cracks and holes are secondary traits, on average lowering the coin weight, is enough to exclude them from the sample. The effect is best seen in the 271 coins of chain 1 used in Malmer 1989. They have a mean weight of about 2.14 g, the 239 coins with no crack or hole weigh 2.17 g and the 32 coins with cracks and holes only 2.09 g. For chronological reasons one should also exclude the coins of chain 10 from the initial coinage (Malmer 1989 p. 23 ff).

There are 297 coins in this sample, 239 belonging to chain 1, 39 single coins and 19 in the small chains 2–6 and 17, i.e. 58 coins outside chain 1. The coins of chain 1 no doubt belong to the initial coinage, they may have been produced during a two or three year period in the late 990's. The coins of the small chains and the single ones may or may not be a part of that coinage, since their dies are not, at least not yet, linked to chain 1. Perhaps they are a later or a late part of the coinage (e.g. the Long Cross imitations in chains 5 and 17) if not unofficial coins (e.g. the single ones). Obviously even a small chain may be part of an unofficial coinage, although several of these will probably link up eventually with a larger chain of official coins.

The representative sample
The sample handles some problems of representation (e.g. the problem of unofficial money) without losing too many coins; but at least two or three problems should be discussed since they have no obvious solution. They are reflected in the questions: Was the weight of the coins influenced differently by the soils in which they spent between eight and nine hundred years? Have the economic factors, such as coin sorting by weight, left us with a biased coin weight distribution?

There are no definite answers to the questions. Concerning the first, Metcalf (1987) gives an example of differences in weight obviously due to soil conditions. It has, however, also been shown that coin sorting by weight may result in an intricate weight pattern correlated to the size of the hoard, even though the find circumstances and the quality of the coins are homogeneous, within a defined economic region, as is the case with the Oriental coins found on Gotland (Herschend 1989).

One must, moreover, be aware that the weight of the Sigtuna coins may even vary with distance and time from their main market and period of production. Coins are more likely to be hoarded outside their main circulation area than within it, especially if the region outside the area has no market with controlled prices. One should in other words not use coins from Denmark, Gotland or the Mälar Valley only, even though we cannot possibly know what linds will best mirror the original weight distribution.

For this reason, in order to level out oddities, one should bring all types of hoards and stray finds from different regions into the sample, although single coins found in town layers are probably in a poor condition compared with a hoard discovered in the well-drained calcareous soil of a Gotlandic farm.

In this case it was wholly impossible to conduct a study of weight in the light of the state of preservation, and thus only the demand that the coins be very well preserved can be said in a general way to exclude unsuitable coins from the sample.

Certainly, all told, the demand for differentiated finds is in conflict with the demand for
only well preserved coins. Therefore what matters is the weight pattern dissolved by the analysis of large samples. If the pattern is not relatively simple, no interpretation can be made of it. If on the other hand the pattern is simple then we are entitled to say that neither has the state of preservation distorted the material nor have the oddities caused by economic factors blurred the general picture. Small subsets, however precisely defined, may be, and probably are, significantly influenced by an overwhelming number of unknown factors, making even simple patterns difficult to interpret. The principle of the reasonable weight distribution of the large sample is well illustrated in Melcalf 1987. In a wider perspective the problems touched upon here refer to the general source critical problem of reconstructing intent.

The first interpretations

The diagram of the basic sample, Fig. 1, shows a slightly skew weight distribution. If the material is divided into the coins of chain 1 and those outside, i.e. the unquestionably initial coinage and the probably initial coinage, then the picture changes. First of all the mean weight is split. Among the 297 coins of the first sample it was about 2.11 g, but the 239 coins of chain 1 have an average weight of some 2.16 g, while the mean of the 58 other coins is only 1.93 g or so. Grouped in relation to their mean weight and compared with each other the initial coinage of chain 1 shows itself to be much more symmetric than the single coins and those of the small chains, Fig. 2. The distribution of the unquestionably initial coins, Fig. 3, is still slightly askew, but it is not wrong to assume that a fair part of it was once intended to be symmetric around a weight close to, but due to the skew-

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Fig. 1. The weight of the 297 coins from the Classic Series, Malmer 1989, chosen as a first sample for weight analysis of the initial Sigtuna coinage. – De 297 myntvikterna ur Classic Series, Malmer 1989, som bildar det första urvalet för att studera Sigtunamynningens första fas.

Fig. 2. A comparison based on the percentual distribution of the relative weight of the coins in the first sample, see Fig. 1, divided into two subsets: the coins in chain 1, hatched bars, and those outside chain 1, blank bars. – En jämförelse baserad på den procentuella fördelningen av det första urvalets relative myntviker, se Fig. 1. Mynten faller i två delmängder: mynten i kedja 1, skraffera staplar, och mynten utanför kedja 1, ofyllda staplar.

Fig. 3. The relative weight of the 239 coins in chain 1. The position of the median weight below the mean of 100 is indicated by the point where the cumulative curve meets the 50% line. – Den relativ a mynten hos de 239 mynten i kedja 1. Att medianvikten ligger under genomsnittsvikten indikeras av den punkt där den kumulative kurvan skär 50-procentslinjen.
ness a trifle heavier than the mean weight of 2.1659 g.

Guided by these facts the next step must be to translate the absolute mean weight into a weight unit. This is where the silver weight metrology from Gotland proves useful.

Two mark weights have been defined with reasonable statistical significance, 223.8 g and 208.7 g. Both weights are related to Arabic and further off Roman metrology (Herschend 1987 or Sperber 1989 a, b). The bigger mark contains 103.32 mean weights and the smaller one 96.35. Knowing that the mean weight is slightly below the ideal, we come close to describing the marks as containing either 103 or 96 mean weight units. The latter fractions are the more natural ones when it comes to coin weights since arithmetically 1/96 of a superior weight is the classic definition of a denier. It is thus more than plausible to understand the central weight sought for as a natural fraction, 1/96, of a mark of about 208.7 g.

The probable central weight

There are three steps to follow in order to find the optimum central weight.

You start by defining the weight. Then you divide the central weight into fractions which in their turn define the weight classes of the diagram, at last you check the distribution for symmetry in order to convince yourself, though in this case there is no hope of making the whole distribution symmetrical.

The weight area of the distribution in Fig. 3 is large, some 2.6 g. This is a good reason for understanding the distribution as a result of the coins belonging to different classes and it means that not all coins were considered to weigh the same. None the less the second point mentioned above poses some problems. On what empirical grounds and how should one decide upon a certain class breadth? This is obviously to a great extent a matter of finding a new supporting context. Luckily the small fragments of Oriental coins in the weight purses of the late 10th century boat-graves Valsgärde 12 and 15 (Lindqvist 1956 p. 18) offer a straightforward contextual solution. They clearly show that the most frequent adjustments of coins weighed between 0.08 and 0.16 g (Herschend 1987, p. 190, Fig. 12). If the Viking Age peasant, when testing the weight of a coin detected a difference of more than about 0.12 g, then he would probably not consider the coins to be of the same weight. A class breadth of about 0.12 g is thus not unreasonable. This means that either 1/16 or 1/18 of the mean weight is to be preferred as the width of the weight classes. A test shows that a class breadth 1/16 gives a next to one coin symmetrical distribution among the seven central classes if the central weights is equal to 1/96 of a mark weighing between 208.4 and 208.5 g, Fig. 4. The fraction 1/18 does always lead to an inferior result. This is only natural, given the fact that the coins are designed to be easily divided into four parts. Due to the fact that the distribution must still be slightly affected by a small loss of weight among the coins, since they have at least to some extent been used, I choose the highest value (208.5/96) to designate the central weight, i.e. 2.171875 g. The difference between this and the value which can be obtained from Gotlandic bracelets (Herschend 1987 p. 188 f.) is about 0.002 g, and in my opinion negligible.

The initial Sigtuna coinage seems to be designed to be a symmetrical distribution in which the central class of coins may well have been understood as equal to 1/96 or 16 smaller units of a local mark weighing about 208.5 g. If we check Malmer 1989 for the weight of
In the coins with a specific obverse die, then the symmetric ideal does not link in with the frequent dies. The weight distributions in connection with the dies do, however, differ considerably, while at the same time they match each other. Even if an obverse die seems to be connected with light coins, e.g. number 13, the picture can be complicated. This obverse is nearly always found with the reverse 51, which has in its turn been used together with no less than six different obverses and the heavy "sceut" coins, i.e. the small subset of 13 coins discussed by Malmer (1989 p. 31 f.).

As pointed out by Malmer 1989 the quality of the coinage improves from chain 1 to chain 11. That is to say inter alia that there is a more rational balance between the decreasing number of obverse dies and the growing number of reverse dies, the dies are more evenly used, the tendency to use a reverse die solely with one obverse is a little more noticeable and the links between the obverse dies consequently fewer. As compared with the contemporary Danish chain published by Blackburn 1985, the Sigtuna coinage is, however, still not very developed.

The New Series

The difference between the weight distribution of the Classic Series and that of the New Series consists in a change of proportions and a general loss of weight, Fig. 5. The 238 round coins in the New Series fall in two big chains, 10 and 11 (192 coins), a dozen small ones (42 coins) and a few (4) single coins. The latter are most often square coins and weakly represented among the round ones. The connection between the two series is made up at least by the coins of the chains 5 and 10.

It may be argued that the division into series gives a false impression of an abrupt change which was in reality gradual, but a comparison between the early chain 1 and the later chain 10, or chain 11, or the late Long Cross imitations with blundered obverse legends starting with an O, shows the same type of contrast as the one between the classic and new series, Figs. 5 and 6. Although the old central weight of 16 units is still visible the main classes have shifted from 15–17 to 12–14 units and the mean weight has dropped from about 2.17 to about 1.72 g. In chain 1 44.4% of the coins could be found in the three main classes, but in the samples of Fig. 6a–c there are 59.7, 57.5 and 63.3% respectively in these classes. The standard coin is thus becoming lighter but also more standardized in an asymmetric weight distribution with only about 15% of the coins above the three most frequent classes instead of some 25% in chain 1. There is nothing to indicate that this change was gradual rather than abrupt, and as a parallel to the material in chain 1 in the Classic Series it is reasonable to say that the material in the two big chains of the New Series should be chosen to show the contrast between the coinages which circulated at the end of the first millennium and the beginning of the second, Fig. 7.

The character of the symmetry

The weight classes of 20 and 21 units in Fig. 4 are more likely to have belonged to an original ideal of symmetry than the classes 11 and 12. The frequencies of the last two, together with that of the classes above 21 units seem rather to mirror a wish to create a slightly asymmetric distribution. In these classes one may say that coins have been added to an originally symmetric ideal.

Before the analysis continues it must be decided whether or not the distribution of
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Fig. 6. a–c. A comparison between the 297 coins from the Classic Series (hatched bars) and three different subsets from the New Series (blank bars) – Subset a: the 72 coins of chain 10. Subset b: the 120 coins of chain 11. Subset c: the 98 coins of the O-style, Malmer 1989 p. 17f. – En jämförelse mellan de 297 mynten från Classic Series (skraffade staplar) och tre skilda delmängder från New Series (ofyllda staplar). Delmängd a: de 72 mynten i kedja 10. Delmängd b: de 120 mynten i kedja 11. Delmängd c: de 98 mynten i O-stil (Malmer 1989 p. 17f.).

chain 1 is normal. There is of course a variation among the coin weights which should be attributed to chance, but can that variation be responsible for the distribution between the seven central classes?

Fig. 7. A comparison between the 239 coins from chain 1 (hatched bars) and the 192 coins from chains 10 and 11 (blank bars). – En jämförelse mellan de 239 mynten från kedja 1 (skraffade) och de 192 mynten från kedjorna 10 och 11 (ofyllda staplar).

Using the mean weight and the standard deviation of the 195 coins of chain 1 which fall in these seven classes it can be computed how the coins would have been distributed had they been part of a normal distribution. The difference between the expected normal and the observed norm can be studied in Fig. 8. The observed distribution is not normal if you test it with a $\chi^2$-test, nor is it significantly different from a normal distribution in the seven classes.

Although the material is too small to show a significant deviation from the normal distribution there are clues to understanding the principles behind the symmetry. First of all it seems as if the proportions between the classes 15–21 among the chain 1 coins are similar to the proportions of the classes 8–14 among the round coins of chains 10 and 11. One might say that they constitute the upper and the lower seven classes of a symmetrical distribution comprising 11 classes. This is especially clear if you compare the percentage distribution of the two subsets as in Fig. 9. The diagram shows well above half of the lower and upper part of two distributions of the same character. The upper classes are taken from a symmetrical distribution, namely the initial coinage. The lower half, which is made up of the round coins in chains 10 and 11, has never had all its symmetrical counterparts, only some few coins in the classes 15–19 and 23.
Fig. 8. A comparison between a normal distribution, defined by the mean weight and the standard deviation of the observed distribution, i.e. the 195 coins of chain 1 in the seven central classes of Fig. 4, and the observed distribution of the coins themselves. — En jämförelse mellan en normalfördelning definierad av genomsnittsvikten och standardavvikelsen hos de 195 mynten i kedja 1 i de sju centrala klasserna i Fig. 4 och myntens observerade fördelning.

Comparable to the coins of chain 1 in the classes 22–24 and 27, Figs. 4 and 5.

So, from a symmetrical point of view class 13 equals class 16, and 12 and 14 are equal to 15 and 17. Having observed this we should be able to use the frequencies in the weight classes 13 to 21 among the coins in chain 1 and the frequencies in the classes 8 to 15 among the round coins of chains 10 and 11 to reconstruct the symmetry once intended. When you start to calculate this mean distribution you will soon discover that it is probably a distribution consisting of 96 units in 11 classes of the following frequency proportions: 1:4:7:12:16:16:16:12:7:4:1.

This means that each of the three central classes contains 1/6 of the material or half of it together. The third fourth of the coins are found in the two classes next to the three central ones, and the last fourth in the six extreme classes, Fig. 10.

Tested with a $\chi^2$-test for $n-1=8$ degrees of freedom (the expected values of the extreme classes are too low to fit the test) the chance that the sample was drawn from a population with the suggested proportions is greater than 99.9995%. Obviously this is a reconstruction of a possible ideal which was never executed in detail. In Roman metrology, however, similar 96 part distributions can be found (Herschend in press).

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In the mind of Olof Skötkonung practical economy and metrology mingled with the theoretical ideals of these subjects.

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Fig. 9. A comparison between the distribution of the seven lower classes of chains 10 and 11 (Fig. 7 blank bars) and their counterparts in chain 1 between 15 and 21 units (Fig. 7 hatched bars). — En jämförelse mellan fördelningen i de sju lägsta viktklasserna i kedja 10 och 11 (Fig. 7 ofyllda staplar) och deras symmetriska motsvarighet i kedja 1 nämligen klasserna 15 till 21 (Fig. 7 skraffrade staplar).
To approach the economic side let us assume that the coins in chain 1 show the coinage which circulated on the Sigtuna market in the late 990's. Moreover, let us take the symmetry for granted and compare the ideal with the observed practice, Fig. 11. Two interpretations of the diagram should be emphasized. Either the coinage was designed from the very beginning to be slightly askew, or the symmetrical ideal was abandoned after a few years. The asymmetry is certainly not prominent and cannot be compared with the tip of scales established by the later coinage. The dividing line should therefore run between chain 1 and chains 10 and 11, and not between the ideal and the initial coinage. Thus one should understand the few heavy coins in chain 1, in the mean weighing 24 units instead of 16, as a lure for the merchants to increase their turnover and thereby be in a better position to obtain the few heavy coins, an increase from which even the King would profit. To compensate for the heavy coins without losing silver the coinage must contain some light ones, and instead of making a few very light, but obviously counterfeit coins, the balance is created mainly by an over-production of coins in the classes of 11 and 12 units.

In the diagram the coins below the ideal amounts to 190 units and those above to 189 units. That too is an indication of the King's will to accelerate coin circulation rather than falsify the coin weights.

Knowing what happened a few years after the introduction of Olof's denier, when he started to circulate coins like those in chains 10 and 11, we can be relatively confident that Olof had at least two consecutive steps in mind, when he decided to engage in minting. First he took the expensive step toward the creation of confidence in, and a need for, money. For this reason he started by introducing a coin which was both a reasonably fair currency and a product of some interest to those who profit from inter market exchange. He then introduced the more lucrative coinage with only a few coins to satisfy those who sought to match or outdo the original real value definition of the coin. The difference between the heavy parts of the distributions can be described in a more precise terms as follows: In chain 1 the average number of coins more than 5 weight units heavier than the norm is 3.4%. In chains 10 and 11 the corresponding percentage is 1.6%. According to the Poisson distribution this means that the chance of obtaining more than two of these heavy coins in a sample of 100 coins in chains 10 and 11 is 21.6%, while the chance of finding more than four such coins in a corresponding sample of chain 1 coins is 29.4%. One might say that to small dealers a coinage like that of chains 10 and 11 is of little interest from the point of view of real value. The King and the tradesmen with a large turnover benefit from this in a way we would today find unfair.
Fig. 12. Mark division and weight in Svealand c. 1000 A.D. – Markdelningssystemet och dess vikter i Svealand ca 1000 e. Kr.

Some traits in the coin weights of the late coinage suggest that there was even then from time to time a positive ring to the King's opinions in the fields of economic decency and necessity. One such trait is the lack of coins in the classes below eight units. There are seven coins of both forms and all three chains in that class. Compared to the distribution of the coin weights of chain 1 this is odd, since from that currency you would expect the extreme to be a coin in the class of say 5 units. It seems in other words as if the King, perhaps for some moral reasons, was opposed to the circulation of coins of less than half of the stipulated weight. Turning to the square coins, geometry tells us that a round coin of a given diameter weighs about 63% of a square coin with sides equaling the diameter of the former. Thus there are five coins among the square ones that would have fallen below the class of 8 units had they been stamped out round. Even this is a hint that there was a test at the 8-unit level, which all coins must pass.

To summarize, one might say that Olof started by recognizing that the value of a coin was equal to its weight and silver content. After a few years he added the value of his market to the equation. This allowed him in principle to reduce the weight of the coin without changing its value, thereby making the coin less relevant to the real weight economy outside the market. In this paper the development has been described as a simple transition from one principle to another. Generally speaking this may have been true, but in reality it is difficult to convince people that the value of the market should be reflected in the weight of the coins used there: Olof probably needed privilege as well as political power both to drive home his message, and to balance the two economies of real and nominal weight. Even though the transition between the two systems could well have been abrupt, it is also possible that the King made several vain attempts to introduce the lighter coins, and even when he had succeeded, there might from time to time have been a need to strike some obviously heavy coins, e.g. the square ones, in order to satisfy the need for coins with a high real value.

The reconstruction of the metrology in the Mälar Valley is advanced by the analysis, which established that trade weight, the Gotlandic bracelets, and coin weight, the Sigtuna coinage, refer naturally to the same mark. The most interesting fact beside the mutual support of the two materials, is the definition of the coin weight as equal to 16 smaller units. This means that the mark consists of 1,536 units. This small unit, the common denominator (c, d, in Fig. 12) of all weights, is difficult to name, but was probably a trade weight. The question is now whether the drachma weight in the Gotlandic bracelets, i.e. 1/64 of a mark, (Herschend 1987 p. 184 f) or the coin weight in Sigtuna, is the more natural fraction of the metrology. Guided by Medieval knowledge of the mark division system in Svealand, (e.g. Rasmusson 1966 col. 438) one would favour the coin weight, 1/96, in this respect. It is a quarter of an örtug while the drachma is one eighth of an öre and not a natural fraction of an örtug. So far the drachma is known only from Gotland and there it is a weight connected with adjusted jewellery. Thus the recon-
struction of the metrology in Svealand c. 1000 A.D. should resemble Fig. 12.

It seems evident that Olof Skötkonung chose to use a natural fraction of the mark weight to define his coin. When after centuries of precise metrological practice in connection with bullion you make your first local coin, this is your only recourse, if your purpose is to create confidence in the currency. A denier silver coin is the only respectable starting point.

The last point to be stressed in an article about the weight of the Sigtuna coinage is the definition of the coin as a denier, and many readers will feel that they have read that once or twice somewhere before. It might well have been in Hildebrand 1887 or in Thordeman 1936.

The mean weights which made up the point of departure for Hildebrand or Thordeman were not correct and their insights in the complex Sigtuna numismatics not those of today, but in their overall conceptual understanding of the rough mean weights, guided by common sense, they were nevertheless right in their interpretation. In a confused heap of coin types and weights they used Ockham’s razor and favoured a simple solution where it could be found—arguing that a coin weighing a little more than 2 grammes in Middle Sweden c. 1000 A.D. is probably a denier. Thordeman’s approach was strongly criticized by Malmer 1965. Having showed the complexity of the coinage Malmer concludes:

Even Malmer’s opinion is reasonable. It is in the nature of things that there is little to deduce in these matters due to the uncertainty of the premises, but there is reason to believe that the coins do mirror several norms. Yet this does not mean that these norms need to be defined in different metrological systems. On the contrary, in this case-study 20 different norms belonging to the same system (the weight classes 8 to 27) are used to describe the complexity of the weights, and the initial ideal (the denier) remains.

From a methodological point of view it is interesting to see that the three major die chains in the early Sigtuna coinage, established in Malmer 1989, have worked in principle as Hildebrand’s and Thordeman’s rough mean weights. Both the mean weight and the chains are ways of cutting through complex patterns which cannot readily be grasped. Such a cut does not disclose the intricate complexity, but it may give a clue to a general structure not otherwise found.

References


Sammanfattning


Den förhistoriska ekonomin leder till ett silveröverskott i Mälardalen. I en outvecklad ekonomi går det inte att förbruka det silver och guld, som man av och till kan ha turen att komma över vid utfärd. För människor som deltar i mer utvecklade ekonomier kan det vara intressant att handla sig till detta silveröverskott på lokala marknadsplatser genom att importera varor dit. Lika intressant är det dock för en begynnande kungamakt att organisera en sådan marknad och kanalisera importen till denna mot att de stim begagnar sig av marknaden betalar en form av avgift. Även kungens syfte är att få tag i en del av det silver som befinner sig som inaktiv förmögenhet hos regionens bondefamiljer.

Kungens mål måste vara att få marknaden att fungera som övervärderade mynt. Men dessa är knappast naturliga i en region som finns det naturligt att använda sig av metallvikt i sina värdemetalltransaktioner. Därför är det sannolikt att mynten skildrar övergången, eller en del av övergången, från metallviktsekonomi till penningekonomi med övervärderade mynt. Då är det också naturligt om de första mynten har en god anknytning till det existerande metrologiska systemet.

Mynten i den klassiska seriens kedja 1 speglar bäst de mynt som cirkulerade under de första åren. De avslöjar sig som en i huvudsak symmetrisk fördelning i 11 viktklasser (11 t. o. m. 20) relaterade till en mark om ca 208,6 gram. Det mest frekventa myntet finns i fördelningens centrala klass och dess vikt är lika med 16/1536 eller 1/96 av denna mark dvs. en denar.

Myntningens kvalité utvecklas i och med mynten i den nya serien. Det betyder förmodligen att marknaden börjar fungera och att rationell myntproduktion snarare än metrologiskt lätt genomskådliga mynt blir viktig. Viktfördelningen ändrar sig nu radikalt. Det vanligaste myntet kommer att väga 13 enheter i stället för 16 och i stället för att präglan sätta en symmetrisk fördelning i 11 klasser präglar...
man huvudsakligen de 7 lägsta viktklasserna (8 t. o. m. 14). Eftersom man förmodligen fortfarande rör sig med ett mynt, som nominellt är en denar, ser man troligtvis en begynnande tendens till övervärdering av myntens värde. Detta är ett uttryck för kungens makt och Sigtunamarknadens etablering.