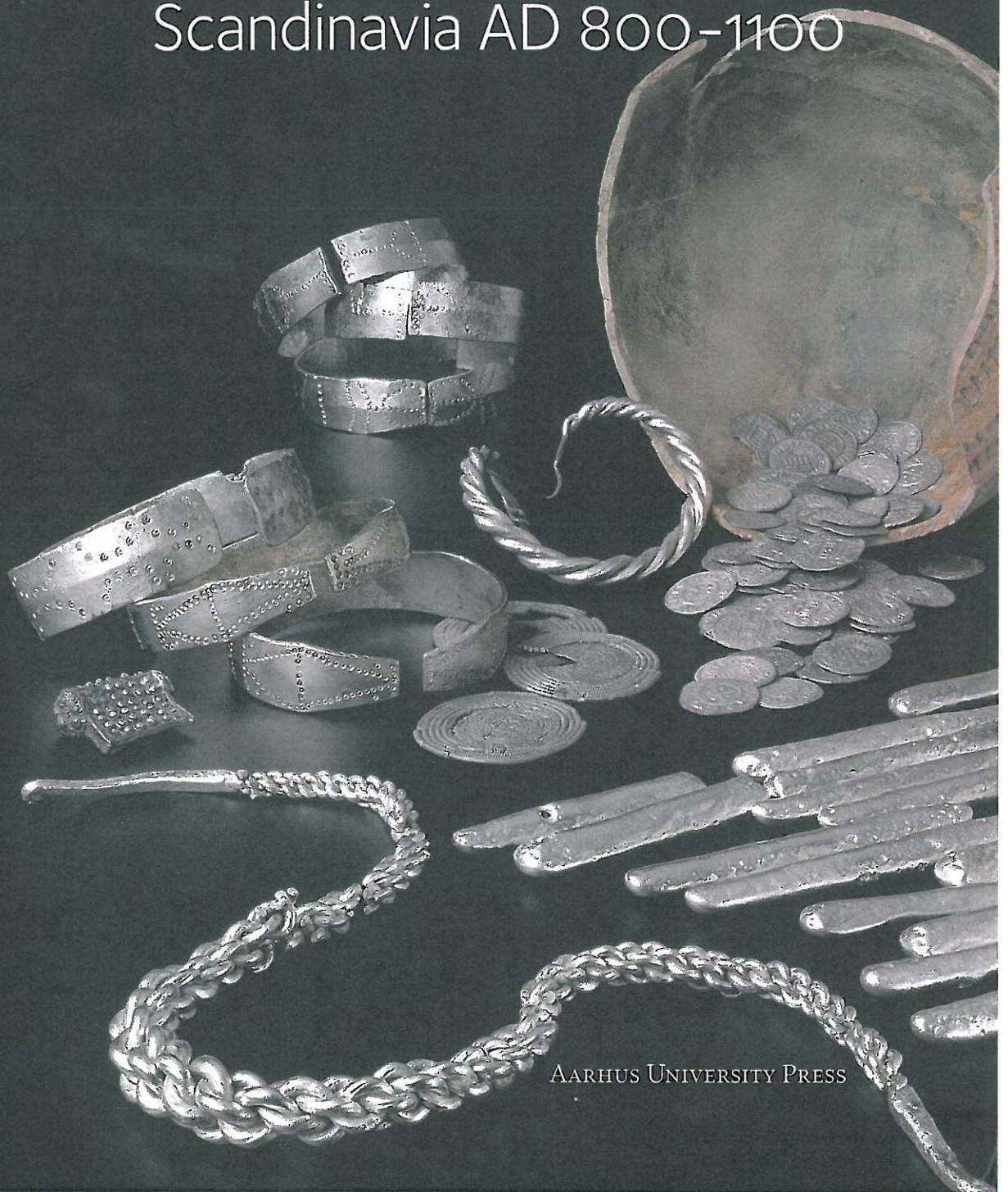


Silver Economies, Monetisation and Society in Scandinavia AD 800-1100



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Hack-Silver, Weights and Coinage: the Anglo-Scandinavian Bullion Coinages and their Use in Late Viking-Age Society

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Ever since their discovery by the Swedish scholar Nicolas Keder, in 1706, the Anglo-Scandinavian coinages have been puzzling (Malmer et al. 1991, 11-12). In the early days of numismatic research their status among other Viking-age and early medieval coinages was not clearly understood, nor was it clear how they should be classified. The Swedish numismatist, Bror Emil Hildebrand, called them 'monstrous products' and he raised the question of whether they should be regarded as 'false coins or contemporary imitations of genuine coins' (Malmer 1997, 13). Today, their status as Scandinavian imitations of English coins – minted in Viking towns such as Sigtuna and Lund – has been recognized. Their numismatic classification has recently been accomplished by meticulous die-studies, but the question of how they were used as means of payment remains unresolved. The aim of this paper is to discuss the monetary use and function of the Anglo-Scandinavian coinages (henceforth, AS coinages), especially the Sigtuna coinage, by combining archaeological and written sources with numismatic evidence.

Basic features of the Anglo-Scandinavian coinages

Based on the design of contemporary Anglo-Saxon pennies, the AS coinages commenced at the turn of the first millennium AD in the three Scandinavian kingdoms (Malmer 1995, 10; Williams 2007, 190-91, 193-94). The Swedish numismatist Brita Malmer has presented a comprehensive analysis of c. 5,000 specimens in two extensive die studies (Malmer 1989a; 1997), based on a detailed catalogue of all known specimens minted between c. 995 and 1020.

Malmer's careful work provides a good basis for assessing some important features of the AS coinages from this period, such as the output of coins minted, when the coinages started and ended, the extent of interconnection with the Anglo-Saxon coinages (in terms of types used), the export and reuse of English original dies, and the regional distribution of the imitations in late Viking-age silver hoards.

During the period c. 995-1020, several mints were probably in operation in Scandinavia (Malmer 1997, 53). Two major mints have been recognized: a Southern Scandinavian mint, probably situated in Lund in Skåne, the capital of the Danish king, Svein Forkbeard (Fig. 13.1); and a northern mint in Sigtuna, the town of the Swedish king, Olof Tribute-king (Malmer 2007, 38) (Fig. 13.2). In addition, there probably existed a mint in the realm of the Norwegian kings, Ólaf Tryggvason and Ólaf Haraldsson (Skaare 1976, 58-63). It was the mint in Southern Scandinavia which had the largest output, followed by the northern mint, with the size of the Sigtuna coinage being comparable to the mint output of a medium-sized English town (Malmer 1995).

The AS coinages were clearly inspired by coin types valid in the realm of the Anglo-Saxon kings (Malmer et al. 1991, 14-16). At that time the Anglo-Saxon kingdom operated the most advanced monetary system in Western Europe, characterised by periodic re-coinages. Only one coin type with a representative portrait of the ruler was allowed to circulate at any given time in the kingdom (Jonsson 1987, 188-95; Malmer 2010, 12). In its initial phase, the coinage in Sigtuna seems to have been organized by English moneyers who were accustomed to the monetary standards of their homeland (Malmer et al. 1991, 17-18; Malmer 1995, 14-16). Another numismatic discovery, proving close contacts with the English monetary system, is that original dies from English mints were imported and used in Lund and Sigtuna. Numismatic research has also provided interesting clues that there had existed connections between Denmark and England on the highest level. This has been illuminated by Mark Blackburn's studies indicating that dies with the Danish king's title were commissioned and produced in the Anglo-Saxon kingdom (Blackburn 1990). There is also evidence that dies were transported within Scandinavia (Malmer 1997, 15, 54; 2007, 38-40) and that some moneyers had been active in both Lund and Sigtuna, using their own dies in both mints (Malmer 1999).

Although the AS coinages had been initiated and organized with the aid of experts from abroad, this was to have no lasting effect. When the English moneyers finally left Sigtuna, the inscriptions became blurred and the style more 'un-English' (Malmer 1997, 33), with the Scandinavian die-cutters in

Lund and Sigtuna developing their own independent styles (Malmer 2006). The English 'Long Cross type' was more frequently copied than any other type and was being reused long after the minting of this coin type had ceased in England, c. 1003 (Fig. 13.2). Over 60% of all known Scandinavian dies from the most active minting period, stretching from c. 995 to the early 1020s, are of Long Cross type (Malmer 2006, 437). The existence of huge die-chains with a mixture of different types seems to indicate that the AS coinages were organized differently from contemporary coinages in Western European kingdoms (Malmer 1997, 45-48, 53-54).

A distinctive feature of the Sigtuna coinage is that many coins were struck on square flans (Fig. 13.2). There is scant evidence that square flans were used in the Danish coinage – or elsewhere (Malmer 1997, 29). The peculiar character of the Sigtuna coinage, in terms of monetary standard, is further stressed by the fact that coins could be struck with reverse dies only, meaning that the royal bust – the central feature of a coin – was simply omitted (Malmer et al. 1991, 43). From the perspective of the issuing authorities, this makes no sense. Why did the Swedish king bother to sustain such an expensive undertaking as a coinage, when he was not clearly identifiable on his own coins? Metrological data also proves that AS coinages lacked one of the most important elements of medieval coinages: the weights of individual coins could differ to a great extent, e.g. the weight of individual coins within chain 1 from Sigtuna varies from 1.08-3.75g (Malmer 1997, 35). Recently, Malmer (2003) has published a histogram demonstrating the fluctuating pattern of coin weights for the Danish chain 105 C-D, minted by Knut the Great in the late 1010s (Fig. 13.3).

When Knut introduced the Serpent type in Lund, in the late 1020s, the weight pattern changed considerably because, by then, the average coin weight had clearly been regulated. The Serpent type resembles, in most aspects, ordinary medieval coinages with a regulated weight, a uniform fabric and a clear definition of type on the obverse and reverse (Fig. 13.4). Thus the change to a coin standard of medieval type seems also to indicate a change in how the coins were being used. By then, the nominal status of each individual coin was clearly evident to the coin users. The situation in Sigtuna in the 1020s is, however, still elusive. The numismatic evidence from the reign of Anund Jakob is scarce, but attempts seem to have been made to introduce a more regulated weight and a more consistent type-definition in his coinage (Lagerqvist 1968; Malmer 1989b). However, some coin types from this period, such as the *Agnus dei* emission (originally attributed to Sigtuna), seem to have been minted in Lund (Malmer 1999, 109-10).

The general impression is that the AS coinages, at least in their earlier phase (i.e. between c. 995 and the early 1020s), were not as regulated in the manner of typical medieval coinages – or were simply not regulated at all. From a numismatic perspective, the monetary structure of the AS coinages from this period seems difficult to understand. How were the Viking rulers able to exclude foreign silver coins from circulation? And how did the kings manage to force people to accept their own coins at their face value? Was the unregulated weight a sign of weak control by the Scandinavian kings – or even of chaos in the mint? (Malmer 1997, 37). The question as to how the AS coinages were used as means of payment is difficult to answer without taking into account the different ways in which silver was handled and valued in late Viking-age society. In addition to meticulous coin studies, more evidence from other sources is needed. The archaeological context from the late Viking town of Sigtuna provides some unexpected clues which link the Sigtuna coinage to the Viking-age bullion economy.

The mint in Sigtuna

In September 1990, archaeological excavations conducted in the town quarter of Urmakaren, in Sigtuna, revealed traces of a late Viking-age building which was used both as a dwelling and as a workshop. In the corner of this building were the remains of a forge which had been used for both bronze- and gold-working. Near the forge, hundreds of crucible fragments were discovered, together with lumps of silver, threads of gold and a cut piece of a coin, minted by King Olof Tribute-king (Malmer et al. 1991, 8-10). The most intriguing finds from the building, which enabled it to be identified as a mint, were two lead pieces used for testing dies, the larger of which displays, on both sides, impressions of dies of Long Cross type (Malmer et al. 1990, 26-37).

Analysis of the crucible fragments deposited in the building has added further astonishing results which have shed more light on the Sigtuna coinage and its use. The debris consisted of metallurgic ceramics, so-called 'melting-bowls', which are burnt clay fragments with textile impressions. The presence of such melting-bowls indicated production in the mint of standardized Viking-age weights, of the so-called 'oblate spheroid' type (Söderberg 1996). Such oblate spheroid weights of Viking type usually consist of an iron core, enveloped in a thin metal shell of copper alloy. Melting-bowls are fragments of closed clay packages in which the copper-alloy coatings were brazed onto

the iron core (Söderberg 2004, 116-17). A total of c. 7.5kg fragments of melting-bowls were found inside the mint (Söderberg 2006, 66-68).

Excavations (in 2007) of Viking-age and medieval plots, in the town quarter of Humlegården, revealed more evidence for the production of oblate spheroid weights. In and close to the eleventh-century Building X, which functioned both as a smithy for forging iron and as a glass workshop, some 8.8kg of debris from melting-bowls was found. Altogether a total of 15.8kg was discovered over the whole of the excavated area, with probably all of these metallurgic ceramics deriving originally from Building X (Söderberg 2008, 104-05). More than 520 weights could have been produced in the smithy, which makes it the largest find of melting-bowl fragments known from Sweden (Söderberg 2008, 122). Furthermore, the depositional context indicates that the weights were produced in huge numbers during a very short period of time. A possible explanation is that the production of weights in the king's mint was probably insufficient and more workshops needed to be engaged in order to close the gap in the production line by supplying more weights (Söderberg 2008, 123). Although the fabrication of each weight was a relatively time-consuming process, efforts seem to have been made to produce many weights as fast as possible (Söderberg 2008, 122-23).

According to Ingrid Gustin (1997, 174-76), the production of weights in Sigtuna seems to have been initiated or at least approved by the king. The use of weights was a back-up strategy in periods when royal power was not strong enough to maintain a payment system with overvalued coins. The manufacture of weights commenced when coinage failed and there was a need to maintain trade and exchange. Commercial activity bound to Sigtuna was vital for the king, because it provided important income by collecting dues and tariffs from the merchants and peasants visiting the town. Anders Söderberg (2008, 122-24) has, however, proposed a slightly different explanation, suggesting that the production of weights could be interpreted as a co-ordinated reform of coins and weights by the ruler. The Swedish king not only tried to establish a new system of payment, but also controlled the production of weights (Söderberg 2006, 68-69).

However, it is not quite clear how such a new weight-system as that proposed by Söderberg could have been introduced by the king – and how it could have replaced the existing one. There are no indications so far of Sigtuna weights being recognisable as such, following a different weight-standard. Furthermore, establishing a Sigtuna weight-system under the control of the Swedish king would only make sense if such a reform was co-ordinated with

efforts to establish a regulated coinage which was obviously not achieved. In order to understand the monetary function of the AS coinages it is important to reassess the Scandinavian kings' ability – and above all their will – to introduce a totally new payment system based on coins. Right from the start the kings had probably neither the power nor the means to introduce a full-scale monetary system based on coins of medieval standard in their territory. On the contrary, it is more reasonable to suppose that the kings were obliged to respect the ruling bullion economy. The oblate spheroid weights were one key-element in the Viking-age bullion economy which is also commonly referred to as 'Gewichtsgeldwirtschaft' (Steuer 1984; 1987; 1997). Instead of two different payment systems existing side by side, as argued by Gustin and Söderberg, it is supposed that the archaeological context of Sigtuna indicates that the coinage produced there was merged with the concept of the 'Gewichtsgeldwirtschaft'.

Oblate spheroid weights and the bullion economy

Oblate spheroid weights probably originated in the eastern part of the Caliphate, or in its neighbouring territories, and were in widespread use in Scandinavia from the beginning of the tenth century (Steuer 1997, 46-50). Their appearance coincided with the earliest hack-silver hoards in Northern Europe and the Baltic Sea zone (Hårdh 1996, 92-93). The tenth century marked in many ways the breakthrough of a payment- and valuation-system based on hack-silver among a considerable segment of the population. Standardized weighing-tools, such as oblate spheroid weights (as well as the smaller cubo-octahedral ones), played an important role in this development (Gustin 2004). Oblate spheroid weights were highly standardized for two reasons: (i) their characteristic design was easily recognizable; and (ii) the weight-modules applied were calibrated according to the official weight-standard valid in the Muslim Caliphate – the Islamic *mitqāl* gold standard, corresponding to c. 4.23g (Sperber 1996; Steuer 1997, 285-89). The Islamic *mitqāl* was the model for the weight-system in the 'Gewichtsgeldwirtschaft', even though there existed different basic modules ranging from 4.23-4g in the Baltic Sea zone (Sperber 1996). It has also been realized that the oblate spheroid weights were metrologically related to the medieval Scandinavian *ertog* weight-standard (Brøgger 1921, 81-85; Jansson 1936, 12-13). Various explanations have been put forward of what the word *ertog* actually meant. Linking together the evidence from metrology, the archaeological evidence of how spheroid weights were

produced and etymological evidence, it has been suggested that it was these weights themselves which could have been called 'ertogs' in Scandinavia (Kilger 2008, 307-09).

A few late Viking-age silver hoards from Southern Scandinavia provide a direct link between the bullion economy and the use of oblate spheroid weights. A good example is the hack-silver hoard from Sturkö, in the Swedish province of Blekinge, with a *tpq* of 1002. Sturkö contained 10 weights of spheroid type, together with 3 lead weights, 62 pieces of uncoined hack-silver and c. 300 coins. Altogether the silver weighed 355g (von Heijne 2004, no. 2.14; Hårdh 1976a, no. 10; SHM, no. 8770). Another example is provided by the mixed hoard from Borgeby in Skåne, coin-dated to c. 990, which contained more than 32 coins, a scale, 10 weights, hack-silver and objects of lead, glass, bronze and iron (von Heijne 2004, no. 1.7; Hårdh 1976a, no. 39; SHM, no. 11340).

Researchers have normally interpreted the Viking-age bullion economy (*Gewichtsgeldwirtschaft*) and the coin-based economy as representing two different currency systems, which in principle were not compatible. In coin economies, the concept of standard and value is embodied in one single coin, the coin itself uniting all basic monetary functions: standard of value, means of payment, and means of savings. The issuing authority guaranteed the face-value of the coin, its weight and its silver content. In contrast, the concepts of value and standard in the bullion economy were separated. In order to use silver as means of payment, the bullion economy required the use of weights and the concept of a weight-standard in terms of common weight-units accepted by all participating in the bargain (Kilger 2008, 312-18). The concept of standard in the Viking bullion economy was represented by the weights on one scale-pan, silver as a means of value being weighed and valued on the other scale-pan (Kilger 2008, 309). In an economy based on hack-silver, the weights fulfilled a crucial monetary function. Hack-silver could only be valued by means of weights and a scale of reckoning, the Islamic *mitqāl* system which provided a nominal matrix for both quantifying and valuing silver (Kilger 2008, 304-07). Valuation of silver as means of payment was thus guaranteed by trust in a weight-system and safeguarded by standardized weights which were regarded as being trustworthy.

The Viking-age bullion economy was not simple or primitive, but required – on the same terms as the coin-based economy – a high level of abstraction. From this perspective, it is important to reconsider how the use of silver in Viking-age society, in all its diversity, was related to the concept of money (Williams 2007, 179). The introduction of coinage was not necessarily a

revolutionary step towards a more developed economy; on the contrary, the introduction of coinage – apart, of course, from its ideological implications in the political sphere – was only one possibility for making payments. The archaeological context in Sigtuna and the numismatic features when taken together may indicate that the use of the AS imitations was, in one way or another, related to the Viking bullion economy, but the question is how.

Weighing in batches

One important methodological problem which remains to be discussed is how the AS coinages were handled and valued in transactions. An indication that the AS imitations were not reckoned piecemeal, in the manner of ordinary coins, but more likely in batches, is provided by the remarkable composition of some late Viking-age hoards from Southern Scandinavia, such as Everlöv and Igelösa in Skåne, or Skovvang on Bornholm, have large numbers of die-identical coins (Malmer 1997, 51-52). Most of these coins are from Southern Scandinavian chains and were thus probably minted in Lund (Table 13.1). A similar concentration of die-identical specimens has, according to my current knowledge, not been observed for other coin groups. The homogenous composition of these hoards suggests that the coins were not in circulation for a long time, even though they were pecked and bent to a considerable degree, e.g. in the Skovvang hoard (Malmer 1997, 52). Hoards with clusters of die-identical coins also show a slightly skewed geographical distribution, being often found in the vicinity of a supposed mint. Two early Swedish hoards from Eskilstuna (*tpq* 1002) and Österåker (*tpq* 1002), now lost, contained hundreds of die-identical specimens; both hoards were deposited less than 100km from Sigtuna (Malmer 1997, 51).

Igelösa has the largest concentration, with 100 AS imitations out of which 81 are die-identical on both sides (Malmer 1997, 51). The hoard also contains the largest batch in Malmer's catalogue (1997, 328), which consists of 48 specimens linked by the obverse die (Table 13.1). Altogether the coins in this parcel weighed c. 72g, corresponding to c. 9 *ertogs* or 18 *mitqāls*. One batch in the Skovvang hoard consists of 20 die-identical coins weighing c. 27g, corresponding to 3 ½ *ertogs* or 7 *mitqāls* – or more likely to the weight of one *eyrir* (ounce). However, the suggestion that each batch represents a carefully weighed sample, based on *mitqāl* or *ertog* units, is difficult to prove. The sample only provides evidence for the minimum amount of coin silver exchanged on

	<i>Tp̄q</i>	Chain	Die-comb.	Batch	Weight	<i>ertog</i>	<i>mitqāl</i>
Igelösa	1003	101	15.1080	45 ex	71.83g	9	18
			15.1077	1 ex			
			15.1075	1 ex			
			15.1024	1 ex			
Everlöv	1018	105	604.1833	1 ex	16.68g	2	4
			604.1810	6 ex			
			604.1759	4 ex			
Skovvang	1018	3-L	715.1738	13 ex	20.64g	2½	5
		105	952.1793	17 ex	27.33g	3½	7
			378.1793	1 ex			
			115.1793	2 ex			

Table 13.1. Batches of die-identical AS coins in hoards from Southern Scandinavia (based on Malmer 1997)

one and the same occasion. It also has to be mentioned that hoards in other regions, such as Gotland, show a more heterogeneous composition, with only few clusters of die-linked imitations. However, it is reasonable to believe that the phenomenon of die-identical clusters in some hoards is a good indication that the AS imitations were handled and valued by weight only.

Counted and weighed coins in the Norwegian Middle Ages

Nothing is known about the legal status of AS coinages and their monetary value from contemporary written sources. The earliest written evidence as to how coinage was used in Scandinavia is from the kingdom of Norway. Recent research on both numismatic and written sources has given useful insights into how the Norwegian kings used coinage as a powerful tool for royal income from the eleventh to the fourteenth centuries (Gullbekk 2009). According to the early Norwegian law codes and price-lists preserved from the end of the thirteenth century, there existed a legal option, respected both by the coin users and the issuing authority, to reckon coins either by weight or by number (Gullbekk 2009, 189-200). The Viking-age weight-system, based on units like the *mark*, *eyrir* and the *ertog*, was still in use and referred to in monetary transactions which involved coins (Gullbekk 2009, 195-98). The

reason why a double mode of valuing coins was practised is obviously the manipulation of the coinage by the medieval rulers (Gullbekk 2009, 189). If the nominal value of a coin was generally accepted by the public, the rulers had two basic options to manipulate the value of the coin and to gain profit: the coins could be debased by blending the silver with copper, or the average weight could be reduced, with the face-value remaining the same. In such a monetary system, with unstable nominal values and with shifting exchange-rates between debased and more solid coinages, it was necessary to have a reliable means, such as a weight-system, for measuring and assessing the real value – meaning the intrinsic exchange-value of coinage.

A good example of the two modes for reckoning minted silver, as practised in the twelfth century, is Magnus Erlingsson's saga in *Heimskringla* (Magnus Erlingssons saga, ch. 16). After Eystein had been ordained archbishop of Niðaróss, it is told that he accepted payment of dues in coin only under a certain condition. The peasants of Trøndelag and Halågaland should pay their share of dues, which were reckoned in coins, in pure silver (*silfrmetinn eyrir*). Eystein had already earlier received dues in coin, but these coins were officially valued at double the price of pure silver. The exchange rate between one *eyrir* of minted silver and one *eyrir* of pure silver was 2:1 in the twelfth century (Gullbekk 2009, 133). According to the official exchange rate, the peasants had to pay 30 bracteates for each counted *eyrir*, but by demanding dues in *silfrmetinn eyrir*, the saga clearly tells us that Eystein succeeded in doubling his revenues. He received 60 bracteates, worth two counted *aurar*, which was equivalent to one weighed *eyrir* (Gullbekk 2009, 61, 109, 113-14, 191).

One could argue that the situation described in Magnus Erlingsson's saga is characteristic for an established monetary system based on overvalued coins in a society which accepted coins as means of payment, but it is also possible to argue the other way round. The coin system in medieval Norway required a weight-system as a means for determining the exchange-value of coined silver (Gullbekk 2009, 191-93). The importance of this double mode of reckoning minted silver is still evident in the written sources of thirteenth- and fourteenth-century Norway (Gullbekk 2009, 156). The exchange-rate between *mork brenda*, which means pure silver, and valid silver, *gangs silfr*, which means coined silver of current value, was still reckoned in the ancient weight-unit of the *mark*. The weight of the coins and their silver content could change significantly during the Middle Ages and, because of that, there developed a value difference between the *mork brenda* and the minted mark of coin silver. According to the written sources, the exchange-value between *gangs silfr* and

the *mork brenda* changed from 2:1, during the twelfth century, to 5:1 at the end of the thirteenth. This monetary situation was symptomatic in monetized medieval society where the exchange-value of coinage was unstable (Gullbekk 2009, 129-57).

Archbishop Eystein could execute his manoeuvre because there existed a clear perception in the coin-using community of the difference between the coins' nominal value and their exchange-value, which was based on the silver content. By demanding dues in silver of burned quality, Eystein could take advantage of the difference in value between pure and coined silver. In other words, Eystein was able to use the current exchange-rate as a powerful tool of taxation. The question is: did a similar monetary situation exist in the late Viking Age? Could kings like Svein Forkbeard and Olof Tribute-king use coinage which was regulated neither by weight nor by type as a source of income? Is it conceivable that these rulers used their own coinages in a similar way to Eystein? In such a case, two preconditions had to be in place: (i) a general perception will have existed in the bullion economy of different qualities of silver; and (ii) different types of silver were valued and handled by weight according to established exchange-rates.

The bullion economy in transformation

When the Sigtuna coinage commenced in the 990s, the import of minted silver from Western Europe had already started on a large scale (Hatz 1974, 38-69; Jonsson 1993). There are some indications that the handling of silver as bullion also changed in this period, given that the amount of both fragmented silver and non-minted silver reduced significantly in the silver hoards. This development can be observed in different regions of Scandinavia, such as Norway, Southern Sweden and Gotland (e.g. Gullbekk 1994; Hårdh 1976b; Lundström 1973). In hoards from Southern Sweden, the amount of minted silver rises continuously from the early tenth century to the first quarter of the eleventh. The share of coins which consisted of only some 15%, in the period c. 900-50, rises to c. 83% in the period 1000-25 (Hårdh 1976b, 130). According to Birgitta Hårdh (1976b, 142), the important role of hack-silver as a means of payment had by then been taken over by minted silver. A similar development for Norwegian hoards has been recognised by Svein H. Gullbekk (2009, 34-35), but this appears to have started later in Norway than in Southern Sweden, with minted silver starting to dominate at the beginning of the eleventh cen-

ture. Before the national coinage under Harald *harðráði* started in the 1050s, Norwegian hoards contained more than 80% minted silver.

One might suspect that the price of silver was reduced at the end of the tenth century due to the large influx of Western European silver. Silver was handled in larger quantities which made the process of fragmentation of silver objects into smaller pieces unnecessary. This could be one possible explanation, but more likely is that the reduction of fragmented silver in the hoards has to do with a change in attitude to silver in exchange-relations. Hack-silver was not trusted as a reliable medium of value. Due to its heterogeneous condition the quality of a pile of hack-silver is difficult to estimate and prove. Hack-silver usually consists of small bits and pieces from different types of silver object, such as fragmented coins (predominantly Islamic dirhams) and unminted objects, such as ingots, rings and other jewellery. This change in attitude to hack-silver might have been prompted by the severe debasement of Eastern coinages in the tenth century. Metallurgical analyses indicate that the silver content of Islamic dirhams was significantly reduced during the second half of the tenth century.^x Samanid dirhams minted before 950 consist of 5% copper, but the proportion of copper then increases steadily to reach 35-40% towards the end of the tenth century (Steuer 2002, 153-54). On the other hand, the silver content of Western coinages, e.g. the German and English, was stable consisting of more than 90% silver (Steuer 2002, 146; Zwicker et al. 1991). Another advantage with whole coins is that they are much easier to handle as cash than fragmented silver. It is much more difficult to test the silver content of bits of hack-silver than it is of complete coins. There is also evidence from the hoards themselves that the appearance of silver – its brightness and its colour – was considered important. In some instances, the finders of Viking-age hoards have reported that the silver was stored in vessels covered on the inside with birch bark (Kilger 2000, 131-33). It is conceivable that substances in the bark prevented the silver from altering colour, so preserving the lustre of shiny silver. Hack-silver, in particular, was obviously more exposed to oxidation because of its fragmented state.

The severe debasement of Central Asian silver, such as Samanid coins, during the second half of the tenth century might, in the long run, have caused a chain-reaction in the bullion economy in Northern Europe. Despite the import of Islamic silver to Scandinavia having already ceased in the 960s, the reputation of dirhams and hack-silver in exchange-relations had changed forever. As a consequence, unfragmented and coined silver might have been valued at a higher exchange-rate than hack-silver. This development in the

transactional sphere was possibly accelerated by the arrival of large quantities of new and 'good' silver from Western Europe after c. 990. Seen from this perspective, it could be argued that it was no coincidence that the Scandinavian kings started their own coinages when the bullion economy was transforming. The kings were able to establish a payment-system based on coins, because one of the basic requirements for accepting coins was already in place. A higher exchange-value of coined silver was already accepted among common people who had been accustomed for generations to the rules and means of the *Gewichtsgeldwirtschaft*, such as oblate spheroid weights.

Quality of silver according to written and archaeological sources

The written sources also provide ample evidence that the quality of silver was a matter of contention in late Viking-age society. The observation from hoards that hack-silver might have lost its status as customary means of payment during the course of the eleventh century seems to be corroborated by *Bandamanna saga*. This saga, referring to events in Iceland, c. 1055, provides not only an authentic metaphor for hack-silver, but also demonstrates that the use of fragmented silver had social significance (*Bandamanna saga*, ch. 10). In his speech to his greedy fellow chieftains, Egil uses *skjaldaskriflum og baugabrotum* as a poetic expression for hack-silver. Compounded of two nouns, *skjaldaskriflum* (meaning 'battered shields') is a kenning for fragmented coins, with the second element, *baugabrotum*, meaning fragmented rings (Engeler 1991, 49, 86-87). According to Egil, hack-silver is suitable as compensation in legal matters only for poor people because one can only use it to buy the shabbiest things. *Bandamanna saga* might reflect changed attitudes to hack-silver in the days of King Harald *harðráði*. In the context of Egil's speech, it becomes evident that both fragmented coins and other forms of hack-silver were regarded as means of payment not worthy for powerful chieftains.

Men of the highest rank and of honourable reputation in society were worthy to be paid only in good silver. The famous quarrel between the Icelander, Halldórr Snorrason, and the Norwegian king, Harald *harðráði*, mentioned in the saga compilation *Morkinskinna* (Jónsson 1932, 149-51), has often been referred to in this context (Gullbekk 2009, 30-31, 36-38, 201-02; Skaare 1976, 9-10; Williams 2007, 178-79). Halldórr refused to accept payment in Harald's coinage, the *harallz slatta* which was heavily debased and contained more copper than silver. The saga writer tells that Halldórr was

gazing upon his pay in a fold of the cloak – and the silver did not look good. The Icelandic text actually uses here the word *skirt*, which means ‘shiny’, ‘of bright colour’. Finally, Halldórr’s complaints were accepted by the king and he was paid in fine silver worth 12 ounces. This is expressed in the saga text as *xii. aura brenda*, meaning 12 ounces of silver of burned quality. Whether this sum was paid in coins or other silver objects is not specified in the text.

Another written source which provides valuable information as to how silver was handled during the Viking Age is the Icelandic law code of *Grágás*. *Grágás* has not only preserved the wergeld’s list, *Baugatal*, which mentions how to assess the weight, purity and consistency of the ancient legal silver (Kilger 2008, 282–83), but also reference as to how silver was valued c. 1000 (Naumann 1987, 377–79). Two different qualities of silver were distinguished and defined by the nominal account of *lögaurar*. This is shining or burned silver (*skírt silfr*, *brent silfr*), worth 60 *lögaurar*, and the ancient legal silver or pale silver (*lögsilfr hið forna*, *bleikr silfrs*), worth only 30 *lögaurar*. Thus the value of burned silver was reckoned to be double the value of the legal silver.

The exchange-rates for the different types of silver mentioned in *Grágás* have been discussed and doubted by earlier researchers (e.g. Guðmundsson 1909; Hatz 1974). One of the main reasons was of course that the sources were written down in the thirteenth century in a society which had been used to a payment-system of a regulated coinage for more than 200 years. In contrast to Icelandic sources like *Grágás*, references to burned silver first appear in Norwegian documents around the mid-thirteenth century (Gullbekk 2009, 156; Hatz 1974, 91). There is of course the difficulty of deciding whether these sources provide reliable accounts of the silver bullion economy of the tenth and eleventh centuries, or if they were referring to the unstable and shifting qualities of silver used in medieval coinages (Hatz 1974, 91–92). However, there is reason to believe that, in some instances, texts such as *Bandamanna saga* and *Morkinskinna* have preserved knowledge as to how hack-silver and coined silver were valued during the late Viking Age. The practice of handling different types and qualities of silver, and valuing them according to different exchange-rates, thus need not be an invention of the Scandinavian Middle Ages. One of the key questions in this respect is to comprehend what exactly ‘burned silver’ means.

In this respect, the archaeological sources provide evidence on the meaning of burned silver and that the concept of good and reliable silver could have been present, c. 1000, in Sigtuna. ‘Burned silver’ probably refers to the testing and purifying silver by means of the fire-assaying process (Söderberg 2004; 2006).

In the Sigtuna mint, ceramic trays were found which probably functioned as assaying vessels (Söderberg 2004, 121). Well-preserved heating trays for assaying silver have also been discovered at Birka and on earlier sites such as Helgö, dating the presence of this technique in Scandinavia back to the Migration Period (Söderberg 2004, 122). The presence of assaying vessels in the Sigtuna mint probably provides a hint concerning the legal status of King Olaf's coins. Coinage was an expensive undertaking, which not only demanded huge sums of silver, but also silver of good quality. The king guaranteed that the silver used in his coins was of 'burned quality'. If hack-silver was used as material in the coinage, there was a necessity to check it. To conclude, the craftsmen in the workshop were not only producing coins and weights, but also ensuring that the king's coins kept their legal status in the eyes of the public.

The late Viking-age bullion coinages

In this paper I have tried to link together evidence from different sources and from different parts of Scandinavia. As a result of piecing together the numismatic evidence with the archaeological evidence and written sources, it is suggested that the AS imitations did not necessarily have a nominal value, but an officially sanctioned exchange-value, which could only be reckoned and valued by weight and not by number. In such a monetary system, which had both elements of a coin-based and a bullion-based economy, weighing (according to my argument) was the only way in which to settle the exchange-value of the king's money. The archaeological evidence from the Sigtuna mint seems to suggest that the Sigtuna coins – and also foreign silver – were weighed with oblate spheroid weights. These weights follow the Islamic *mitqāl* standard which was the basis for the Scandinavian *ertog* standard. From this point of view, the hybrid qualities of the AS coinages, and their intermediary position between old and new ways of payment and valuation, becomes evident.

But how were the kings able to use their coinage as a source of income? There is reason to believe that at some stage in the bullion economy, coined silver was preferred to hack-silver in transactions. Because of that there might have existed a similar situation in the transactional sphere in the Viking Age, as later during the Middle Ages, whereby different qualities of silver were recognized and valued according to different exchange-rates. This change in the transactional sphere had probably been influenced by the arrival of Western European silver coins to Scandinavia at the turn of the first millennium AD.

In such circumstances, it would have been bad timing to initiate a regulated coinage of medieval type. The kings had no means to exclude foreign silver from their own markets or to guarantee the face-value of their coins. Instead this argument can be turned on its head. The coinages started *because of* the new silver imports from the West. The huge import of Western European coins to Scandinavia was the precondition for the AS coinages to flourish (Runer 2006, 83-85). If this is true, there existed a good opportunity for the kings to introduce a system with overvalued silver coins of burned quality in their strongholds, such as markets and towns, which enabled them to impose a tax on the use of hack-silver and foreign coined silver by means of different exchange-rates. The mass production of oblate spheroid weights in Sigtuna conducted in the course of a very short period of time accords with such an interpretation. It seems to imply that there did, indeed, exist a need to handle large amounts of silver either in the mint or at other sites in the town.

The written sources tell that there had existed custom fees for Viking-age traders in Western Scandinavia. More interestingly, they permit some conclusions as to the quality of silver demanded by the rulers and current exchange-rates. Snorri, *Íslendingabók* and *Grágás* mention – with slightly differing details – that Icelanders had to pay a landing fee to the Norwegian king, called *landaurar*. The versions preserved in *Heimskringla* and *Íslendingabók* tell that Icelanders entering the harbour of Nidaros were forced to pay *landaurar* to both Sveinn Jarl and his enemy, King Ólaf Haraldsson (Jesch 2001, 65). In *Grágás* more details are mentioned for this episode dated to 1022. *Landaurar* could either be paid with 6 fur cloaks and 6 *alnir* of *vadmal* or one half mark of silver. The exchange-rate between fur cloaks, *vadmal* and silver, specified in *Grágás*, presumes that the silver requested by the king was probably reckoned in silver of half quality (Naumann 1987, 378). This passage also implies that there might have existed exchange-rates in the transactional sphere during the late Viking Age which were easy to reckon by weight. The exchange rate of 2:1 re-emerges again in the twelfth century, denoting the value of weighed versus counted coins, as in *Magnus Erlingsson saga*.

Finally, if a monetary system based on weighed coinage had existed in Viking towns such as Sigtuna, how did this system work in practice? An inexperienced person today would have difficulties in recognising AS coinages and separating them from official contemporary Anglo-Saxon pennies. A skilled person, such as a numismatist, would of course recognize them as imitations because of the crude style, blurred legends and the fabric. In the late Viking Age, it may be supposed that the situation would have been the same.

Ordinary people would not have been able to distinguish the king's own coins from the official English ones – or to distinguish between coins minted in Sigtuna, Lund or somewhere else. Because of the resemblance with/to English pennies in fabric and style, Olaf's coins could have been perceived as more authentic and trustworthy than other coins such as German pennies, which were more heterogeneous in design and appearance. Whether this difference had any effect on the coins' monetary value is difficult to decide.¹

The Anglo-Scandinavian coinages probably did not have any monetary value outside the strongholds in which they were minted. They were intended for use only by people visiting the town and using its market. It would be reasonable to suggest a short time period of value and use during which these coins were regarded as being worth more than ordinary weighed silver. Another conclusion based on this observation is that both English coins and Anglo-Scandinavian imitations were regarded as being of the same silver quality, and handled for a higher exchange-rate than, for instance, German coins or hack-silver in the Sigtuna market. As long as the peasants were inside Sigtuna, the king would guarantee the value of his money, which was presumably rated double that of hack-silver or foreign coins. This means that the peasants were still free to use other silver in Sigtuna as long as they respected the official exchange-rate between the king's money and foreign silver. As long as King Olaf's coins circulated in Sigtuna they were overvalued, but when they left the town they were reduced to ordinary silver.

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Endnotes

- 1 About 6,000 medieval coins, among them 3,800 dirhams were analysed between 1996-98 by the project 'Mittelalterliche Münzprägungen in Bergbauregionen' financed by the Volkswagen-Stiftung
- 2 Two small coin hoards discovered recently in and outside Sigtuna may indicate that German pennies and English-style coins were treated differently in circulation. In

Sigtuna, a small hoard was discovered (in 2000), in the remains of a burnt-down house of Viking-age date. It has a *tpq* of 1027 and consists of 156 coins: 148 German, 1 Italian, 1 Bohemian, and 6 English (Jonsson 2004). The lack of any Sigtuna coins in this hoard has suggested to Malmer (2010, 74) that it was concealed after minting had stopped in the town. Interestingly, the English coins consist only of the Pointed Helmet type, which was the last type issued from the Sigtuna mint by the Swedish king, Anund Jakob. So far, no other late Viking-age hoard is known from Sweden that consists almost exclusively (95%) of German coins. According to Jonsson (2004, 15), it is possible that the German coins in the hoard had been deliberately chosen for use outside the town. A small hoard, with a completely different composition was found in the countryside, c. 30km south-east of Sigtuna, was found (in 2008) at Broby bro, outside the modern village of Täby, which has a completely different composition (Malmer 2010, 75). It was contained in a purse, deposited in a male burial. This hoard (*tpq* 1014) consists of 8 coins: 5 English, 2 AS (probably Danish), and 1 German. Thus, in contrast to the Sigtuna hoard, Broby bro has a composition based on English types. With the exception of one AS coin (a Long Cross/Small Cross hybrid), all its pennies display the bust of a ruler – even the German penny issued in Strasburg.

Abbreviations

AS: Anglo-Scandinavian

SHM: *Statens Historiska Museum*

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Figure 1. Danish imitation, CRVX type, probably minted in Lund, chain 101, die-combination 8.1007 (Malmer 1997).



Figure 2. Swedish imitation, Long Cross type, probably minted in Sigtuna, struck on a square flan, chain 114, die-combination 331.1428, Karlberg, Sweden (tpq 1018), 1.95 g (Malmer 1997).

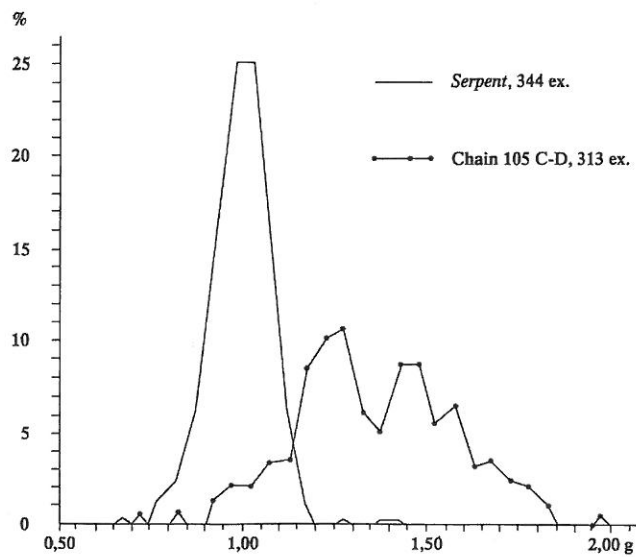


Figure 3. Weight distribution of Danish chain 105, part C-D compared with 'Serpent' type (Malmer 2007, fig. 4).



Figure 4. The serpent type minted in Lund during king Harthaknuts reign (1035-1040) (Gullbekk 2009, 40), Museum of Cultural History, University of Oslo, Coin cabinet.