

# Wholeness and Holiness: Counting, Weighing and Valuing Silver in the Early Viking Period

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 This chapter examines the use of silver as a medium of payment in the Early Viking Period. Kaupang has yielded comprehensive evidence of craft activity and long-distance trade crossing economic, political and ethnic boundaries. The working hypothesis of this chapter is that exchange across such borders was undertaken outside a socially binding “sphere”, a situation that was made possible by the existence of different forms of market trade. It is argued that there had existed standardised media of value, or “cash/money” in Kaupang, which made calculations and payment for goods possible. Such were the circumstances from when Kaupang was founded at the beginning of the 9th century to the abandonment of the town sometime in the middle of the 10th.

The use of “money” at Kaupang is approached from two angles. For “money” to be acceptable as an item of value depends on the one hand upon unshakable reference points that are rooted in an imaginary conceptual world. The value of “money” was guaranteed in terms of inalienable possessions which stabilized and at the same time initiated exchange relationships. On the other hand, money as a medium of exchange relates to a scale of calculation which legitimates and defines its exchange-value. This scale makes it possible to compare goods and put a price upon them. In this study, it is argued that in the Viking Period there were three different principles of value and payment that were materially embodied in the outer form and weight of the silver object. These were coins, rings/ingots, and fragmented silver respectively. Both coins and rings/ingots were used and valued as complete objects. The wholeness of the object was essential for the concepts of value to exist. The meaning of the coin as an object of value was rooted in a world of Antique-Christian concepts, and its status as a unit of reckoning was guaranteed through seedcorn calculation. The value of the rings and ingots was rooted in the concept of the god Odin’s eternal and stable gold ring, and their character as calculable objects guaranteed through *aurar*-calculation: i.e. a given number of coins per *eyrir* (Norw.: *øre*; “ounce”). Hacksilver, by contrast, has no body, and its meaning as a form of currency was indissolubly dependent upon the use of standardized weights which sanctioned the economic value of this amorphous silver. The status of hacksilver as a calculable substance of value was guaranteed through *ertog*-calculation.

It is argued here that *aurar*-objects were the fundamental media of payment and valuation at Kaupang. Coins were not accepted as items of value because they referred to Christian values and ideas which held sway in the monetized Frankish realm. Coins were used simply as units of reckoning that made *aurar*-objects calculable. The transition all over Scandinavia to an economy based upon hacksilver in the 10th century is described in this chapter as a revolutionary process that brought into question the existing conventions of value that were based upon the concept of the *eyrir* and upon objects which preserved their bodily wholeness. The use of hacksilver apparently obtained a foothold at Kaupang as early as the 9th century. When the use of standardized weights and the practice of fragmentation was accepted in the 10th century, outside of the boundaries of the town as well, Kaupang’s position as an *aurar*-site and the central trading place in Viken was challenged, which contributed to the demise of the town.

## 8.1 Introduction

When Ohthere from Hålogaland tied up at the wharves of Kaupang in Skiringssal and disembarked, his voyage there had been a long one. Of all the Northmen, Ohthere lived furthest north. He had sailed, without a stop, from his harbour in the vicinity of modern Tromsø southwards along the coast of Norway all the way to Skiringssal. There he intended to make a short stay in order to rest before continuing across Viken down to the town of Hedeby. From the account he gave, this was probably not the first time that he had made this voyage and visited Kaupang. The presentation of the distances and the stages, geographical and topographical descriptions of the areas of land he was passing, and the account of the wind conditions and the anchorages, show that he had along experience of the sea and the sailing routes he was recording. We also know from his earlier account of an expedition into the White Sea that he was engaged in exchange trade involving pelts and walrus ivory. As the powerful chieftain in Hålogaland he was, Ohthere collected the tax from the Saami. This tax was paid in hides, whalebone, down, furs, leather clothing and leather ropes in fixed and specific quantities (Lund 1983:20–4). His travelogue is found interpolated into one of the standard reference works of Early-medieval geography, the world history of the Spaniard Paulus Orosius from the 5th century which was translated into an Old English version at the court of King Alfred the Great of Wessex in the 890s (Lund 1983:7–10).

The text does not say whether or not Ohthere engaged in any exchange trade in Kaupang or Hedeby, or whether he was able to find a market for his sought-after wares from the north of Norway. For the English compiler who added Ohthere's account to the text of Orosius, that was of no great interest. One obvious aim was to fill a gap with geographical information on a region that was not discussed in Orosius' original text. It was a matter of real importance to have information on the land of the Northmen since only a few years before Scandinavians had been attacking all around England and they were now settled there in large numbers (Sindbæk 2005: 16–17). Ohthere's travelogue unfortunately gives no information on how he traded his goods, and what customs and conventions were in force in the sites he visited.

That Kaupang in Skiringssal was not only an important resting place and anchorage on the sea-route leading to and from the end of the known world, but also an important exchange and production site, is not stated in any written source. The significance of Kaupang becomes evident when we look at the archaeological remains (Skre 2007b:22). Right across the settlement area, large quantities of silver were used in dealing. Through the most recent investigations there, it has been possible to reveal a large

accumulation of coins, weights and hacksilver. What we find at this site is evidence of exchange activity in the form of silver and weights: namely the medium of payment and the appropriate equipment; but rarely do we find the goods themselves that were the objects of trade. Any organic material has long since disappeared. On a few plots we also have clear evidence of metalcasting, in the form of crucibles, moulds and lumps of melted lead (Pilø 2007d:207–8; Pedersen, in prep.). Traces of silver and gold metal in crucibles show that precious-metalworking was practised (Pedersen, in prep.). A lump of semi-melted dirhams may reveal that coins were melted down in order to make larger units such as the silver ingots of standardized weight (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1). The archaeological finds from Kaupang thus reveal a considerable variety of ways of using silver. The aim of the present chapter is to study the multifaceted exchange relationships of the Early Viking Period that made use of silver and of which evidence is found at Kaupang.

### The northern route, and three different concepts of silver as currency

The route from Northern Norway to Hedeby was also a journey across the wide spectrum of practices in respect of payment and standards of value that we know of in the Viking and early post-Viking Periods. If we look more closely at the Early Viking-period silver finds from along Ohthere's route, several clear regional differences emerge. In Northern Norway and all the way down the coast of Norway to Kaupang there is a large number of silver hoards. As a rule, these do not contain coins, but usually ring-jewellery, normally neckrings (Hårdh 1996:47–8 and 192–6). But there are also hoards consisting primarily of armrings (e.g. Grieg 1929:nos. 15 and 92; Sheehan 1998:177–8; Spangen 2005:nos. 16, 18 and 20). The Norwegian neckrings are amongst the largest that were made in Scandinavia (Hårdh 1996:fig. 16). Both the neckrings and the armrings seem to have been standardized in both form and weight (Hårdh 1996: 60–1 and 64–5; Sheehan 1998:178–9; see also below, 8.4). After Kaupang, the voyage continued across the wide Vik sea-lane and then along the western coast of Sweden down to Jutland and Sjælland. These areas were of great prominence in the 10th century, for the earliest hacksilver hoards in Scandinavia appear here (Hårdh 1996:91–2, fig. 21). In contrast to the jewellery hoards, the silver objects in these hoards had been broken up into tiny fragments. This hacksilver was probably measured with the aid of standardized weighing equipment which came west with the dirhams (Steuer 1987:479–80, 2002:137–40, fig. 5). The journey then came to an end at Hedeby. Here, the traveller from the North encountered yet another way of defining value, namely in the form of coinage. Minting at Hedeby – and possibly also at Ribe –

gained pace from c. AD 825 onwards and continued with occasional interruptions to the second half of the 10th century (Malmer 2002b).

On the basis of the above sketch, I propose that there were three fundamental but distinctive ways of valuing the medium of silver along Ohthere's route:

- silver in the form of rings and ingots of standardized weight;
- silver in the form of fragmented hacksilver;
- silver in the form of coinage.

Ohthere probably had no choice but to familiarize himself with and to respect the conventions of payment and valuation that were in force at the sites he came to. Likewise all other travellers who passed along the northern way and stopped at Kaupang would have had to be familiar with these three ways of valuing silver.

Although there had been extensive contact along this route, these three modes of valuation and payment remained independent from one another for a considerable time, and appear indeed as stable practices in their own regional and local contexts. A number of hacksilver hoards begin to appear in Northern Norway only around the middle of the 10th century (Skaare 1976:173). But hoards with whole objects are found in this region as late as the end of the Viking Period (Spangenberg 2005:19–20). In the Early Viking Period it was only at Hedeby and possibly also at Ribe in the far south of Scandinavia that coins were in circulation as a means of payment (Malmer 2007, Wiechmann 2007). It was not before the beginning of the 11th century that minting began at other sites in Scandinavia, under royal authority at towns such as Lund and Sigtuna (Malmer 1997). In Norway, coins were introduced as a form of currency under King Harald Hardrule in the mid-11th century (Skaare 1976:68–74 and 112–13). Here it was towns such as Trondheim that were the centres of innovation in respect of the use of coinage and which constituted isolated monetized oases in relation to their hinterlands (Risvaag and Christophersen 2004). At Kaupang we have plentiful evidence of the handling of hacksilver, ingots, ring silver and silver coin, along with the use of weights in one and the same place (Blackburn, Hårdh, and Pedersen, this vol. Chs. 3, 5 and 6). Both the composition and this quantity of finds from an Early Viking-period settlement site north of the Skagerrak are as yet without parallel.

### **Bridging disciplinary clefts**

Hacksilver, ingots and ring silver, coins and weights, have rarely been considered together in an integrated interpretative view. The divided treatment of these finds is the result of distinct disciplines in Viking Period research following different sets of questions and being based upon separate research traditions.

Coins have been principally treated by numismatists and historians as quasi-textual sources (Kilger 2005). It has been first and foremost institutional mechanisms such as royal power that have stood at the centre of descriptions and explanations of the use of coins in state-organized societies. The ring, on the other hand, has been regarded by archaeologists, historians of religion, philologists, etc., as a “pre-historic” object. It is suggested that the ring as a symbol of status, power and law played an important role in a chieftain- and clan-based society in which social relationships were predominant (e.g. Steinsland 1991; Brink 1996; Spangenberg 2005). In this way, the ring is considered to be a symbol of the mental and social universe of the Scandinavian Iron Age, while coins are, by contrast, the expressions of a medieval and at the same time an economically motivated worldview. Coins that are found in prehistoric contexts, for instance in settlement layers or graves, are interpreted as jewellery or as pieces of precious metal. Or they indicate contact between the area of minting and the find-spot itself. Thus they are rarely regarded as value-laden objects with a monetary character (for further discussion on this topic, see Horsnæs 2005; Kilger 2005:43; Myrberg 2005:7–8). Coin-specialists have for their part rarely paid attention to the ring as a standardized object of value, despite the fact that there are many conceptual parallels between rings and coins. Many forms of ring known from the 9th century are both standardized in terms of weight and of stereotyped form and design, just like coins. Thus the regionally distinctive distribution of the spiral-twisted neckrings of the Permian and Duesminde I types in the Baltic Sea zone (Hårdh, this vol. Ch. 5.7), or of the armrings of Hiberno-Norse type in the North Sea area (Sheehan 1998), are strongly reminiscent of the geographically defined areas of circulation of coins within the Carolingian realm (Metcalf 1981). In contrast to the coins, however, it is unlikely that we can explain this by postulating a “Lord of the Rings” who was in control of the production and use of the rings within the area of his own authority (for a different view, see Skre this vol. Ch. 10:350). Weights, however, fall into a position intermediary between numismatics and archaeology. Metrological analyses have shown that the weight-standards that are embodied in the weights originated in state-organized societies (Brøgger 1921; Kyhlberg 1980b, 1986b; Sperber 1996). However we rarely find weights in these primary monetized contexts; they are found in graves, on settlements, and sometimes also in hoards in secondary non-monetized contexts.

The purpose of the present study is to try to link up the different groups of categories of artefact that we find at the settlement area, namely coins, weights, ingots and rings, through the characteristic of standardization by weight. The initial hypothesis is that they served the function of money in economic

transactions. What inter-associates these categories of find is the fact that they all represent some way of handling silver. The silver had been weighed, and its quantity calculated by means of balances and weights. Objects of silver were probably broken into fragments in order to yield portions in small units or melted down for the purpose of producing larger units such as rings or ingots. Through these transformations objects of value of the desired weight, contents and form were produced. Silver as a substance was thus probably used both as *whole* objects and as fragments. The two modes of value which preserved their bodily wholeness were the coins on the one hand and the rings and ingots on the other. To break up and weigh silver in smaller *amorphous* units appears therefore to have been a different way of calculating and expressing value. In that case, the basic question is, which conventions and concepts of value governed the use of silver, either as whole silver coin and as ring silver, or as amorphous hacksilver, in the economic transactions that took place at Kaupang? This study is an attempt to build bridges across the disciplinary clefts between archaeology, numismatics and history. The aim is to show the close conceptual relationship between coins, rings and weights, and that all of these were standardized items.

## 8.2 Exchange, money, and value

A study such as this, the purpose of which is to discuss the economic importance of the urban settlement of Kaupang and its economic relationships with the rest of the world, and above all to clarify the use of forms of currency in the Viking Period, has to take the anthropological approach into account. Since the 1970s, an anthropological perspective has dominated our ideas of economic practices in Iron-age and medieval Scandinavia (Norseng 2000b:23–5). More than anything else, models and a set of concepts developed by the “substantivist” school of economic anthropology have been massively influential (Polanyi 1957, 1968, 1998; Dalton 1975; see also Skre this vol. Ch. 9:333–5). Over the years, substantivism has been introduced and discussed in many works of archaeological scholarship dealing with relations in the Viking Period and early Christian Middle Ages (e.g. Thurborg 1988, 1989, Christophersen 1989a, Gaimster 1991, Carelli 1998, Gustin 1999). The substantivist position has also left its mark in historical studies (e.g. Lunden 1972, Monclair 2002) and numismatics (e.g. Klackenberg 1992, Grønder-Hansen 2000, Gullbekk 2003). It can be summarized as follows.

Substantivism posits an essential difference in how economic relations are structured between primitive, i.e. aboriginal, societies and in the modern, market-oriented economy respectively. This idea has been further developed over a more extended historical range to apply also to pre-modern societies. What substantivism stands against is the formalist

point of view of the classic “national economic” theories. These hold that economic structures are independent of time and always function according to the same principles irrespective of the period or the society in question. The substantivists are critical of the fundamental idea of the formalists, that economic relationships are governed in all societies by the notion of profit – the principle of “supply and demand” – and that individuals are always concerned to increase their personal profit. Substantivist theory also asserts that economic relationships in prehistoric and primitive societies must be entirely socially controlled, in contrast to the capitalist system in which those relationships are largely depersonalized. The idea that economic structures within premodern societies were interwoven with the social structure is promoted as the alternative. This situation, in which the economic is inseparably part of the social, is called “embeddedness”. Substantivism also argues that in premodern societies there was no unlimited circulation of goods which could be bought or sold as if in an open market. Economic transactions were either based upon hierarchical gift-exchange systems, in which the distribution of prestigious objects of exchange was channelled through a political centre (redistribution), or the exchange of goods took place on a horizontal plane between two parties by way of simple bartering (reciprocity). Finally, substantivism assumes the existence of a system of “spheres” of transaction in premodern society. In this system, a distinction is drawn between impersonal commodity goods and personal gifts. Commodities and gifts each circulate in their own spheres of exchange, without intersecting.

Substantivist concepts have been highly influential in many studies of economic relationships within the Iron Age and early Christian Middle Ages. The “prehistoric” economy was in all respects different from that of modern society governed by the market economy. In several studies, this prehistoric “otherness” has become the very antithesis of our modern society and values. But the substantivist perspective which has been so eagerly embraced offers a rather simplistic picture of the character of exchange of goods in primitive societies. As later anthropological research has shown, the societies of the Southern Seas have been extensively idealized by, for instance, Bronisław Malinowski (1922), who with his fieldwork at the beginning of the 20th century formulated the essential views of substantivism. Even though anthropologists like Malinowski were living among the people they were studying, the societies concerned were still represented and shaped according to the predilections of the scholars and their own intellectual frames of reference (Thomas 1991:9–14, Weiner 1992:23–8). They were turned into romanticized but at the same time polemical projections of industrialized society’s and the Western world’s social, envi-

ronmental, and ethical decline. Behind substantivism's concept of embeddedness one can detect a belief in an un-modern goodness and innocence which has not been corrupted by the knowledge of profit. The market economy and modern society appear as a form of piratical capitalism. This takes on the role of an immoral and thus negatively charged *alter ego*.

Consequently, it is essentially the same point of view that is emphasized in the archaeological studies, whose authors seek to distance themselves from a concept of reality and plane of understanding which embody capitalist values (e.g. Johansen 1997:11–15). But this approach goes hand in hand with a particular line of argument concerning the relationship between prehistory and our own times. The “soulless” and “uncaring” market economy fulfils a necessary function as the frame of reference for our own evaluations, and for our modern, secular, world-view. It is only through this frame of reference that it is possible to perceive and understand prehistory as different. At the same time, though, one becomes locked into a dichotomous interpretative template involving the “otherness” of prehistory and the “sameness” of the present day (Moreland 2000b:1–5). Thus it is not entirely unreasonable to posit that the “other” reality that is represented in prehistory is still a reflection of our own times. Prehistory becomes a projection of the scholar's own desires.

The starting point for this study is not to return to a national economic viewpoint such as was uncritically accepted in Viking Period scholarship in the first half of the 20th century (see discussion Gustin 2001). Trading sites such as Birka were described as populated by merchants striking bargains (e.g. Schück 1926). Trade was described from a macro-perspective. It was influenced by international flows of coinage and goods between Eastern and Western Europe, and the prices of silver determined the profitability of the long-distance trade network (e.g. Bolin 1953). In this view, the economic relations of the Viking Period were very similar to those of our own times, with a market system that determined prices, commercial trade relations that were driven purely by a profit motive, and a macro-economy with international flows of currency. It is this “anachronistic” picture of the Iron Age that many oppose and seek to replace (e.g. Zachrisson 1998: 12–25; Spangen 2005:21–35). There is no doubt that Iron-age societies were different from industrialized ones. This was a social situation in which notions of social prestige were dominant, along with personal ties, a different world-view, and conceptual frames of reference that seem very strange, even terrifying to the modern mind (Price 2002:25–47). I concur with that representation. However it does not mean that Iron-age societies are unapproachable, virtually incomprehensible to the present day.

In any attempt to pick up the codes, conventions and symbolism that governed economic relations at that time, one is obliged to abandon a distanced and concurrently distancing perspective upon prehistory. An overarching objective in the study of economic relations in prehistory should, in my view, be the identification of the gaps or zones that provided opportunities for non-binding and impersonal forms of exchange. Another objective has to be to address the challenge of looking at the material media as directed and empowered, basic requirements for commodification: namely the determination of price and the comparison of goods in terms of a scale of value. The attempt to understand the phenomenon of commodification in prehistory also opens up the possibility of observing the social constellations and alignments that attempted to monopolize value and to define the concepts of value and price. This is the dimension of prehistoric “economy” I shall try to discuss in this chapter, with reference to Kaupang.

### **A singular world of chieftains and gifts**

The highly dynamic application of substantivist theory in Scandinavian Viking Age scholarship has led to a large number of stimulating propositions but has at the same time had a great deal of influence over how the archaeological evidence is angled. Although its application in the archaeology of the Scandinavian Iron Age has led to the deconstruction of a prehistory that is similar to our own age, a concomitant has been the construction of an economic world that was “singular”, or monodimensional. At the centre of this *singular* world dominated by socio-economic relationships stood an elite-controlled prestige-goods system that governed the circulation of exclusive gifts and day-to-day subsistence needs side-by-side in various spheres (e.g. Christophersen 1989: 120–8; Hedeager 1993:45–49, 64–7). Particularly over long distances in geographical terms, exchange in the Viking Period was controlled by a class of chieftains, and in the following couple of centuries by kings by means of administered exchange trade (e.g. Lindkvist 1989). The class of chieftains controlled both the production of luxury items and their redistribution via the network of exchange. Through these redistributive control mechanisms the chieftains also maintained their own social and political power (e.g. Hedeager 1992:90–1, 2001; Saunders 1995). The same conceptual model has also been applied in Scandinavian scholarship in an attempt to explain the emergence of the first medieval towns at the end of the 10th century. Towns such as Lund, Trondheim and Sigtuna were founded on royal initiative (e.g. Andréén 1985; Tesch 1989, 1990; Christophersen and Walaker Nordeide 1994). The Christian national kings channelled trade and exchange to these sites and so monopolized both access to and the con-

sumption of the goods. With control over both prestige goods and raw materials it was possible to construct alliances or to establish new power relations. Thus those who had power simultaneously managed and governed social capital by means of which they could gather political power into their own hands (for further discussion and criticism on “substantivist” towns, see Skre this vol. Ch. 9).

Most recently, John Moreland (2000b:18–22), basing himself on English scholarship, has argued that the elite prestige-goods model over-emphasizes the exchange relationships that are based upon valuable items at the expense of the production and exchange of “simple” goods. Moreland critically points out that trade in prestige goods becomes automatically a purely aristocratic option. This model is based upon the fact that in the Anglo-Saxon Period trade is concentrated in the 7th and 8th centuries in the *wics* and later, from the 9th century, in the *burhs* that were under the eyes of the kings. The distribution and production of non-high-status goods remained apart from the exchange of prestige goods. They belonged to different spheres. The perception of prestige-goods’ trade, such as it has come to be applied in medieval archaeology, however, does not in Moreland’s view serve to explain the multiplicity of different forms of transaction that were found in Early-medieval England:

I suggest here that the appropriation of the concept of ranked spheres of exchange further enhances the separation of production and exchange (and the lack of consideration given to the former) within this vision of early medieval economics. Here the fruits of agrarian production are generally held to circulate at the lowest levels of exchange, totally divorced of prestige exchange which move at the higher, and more determining levels. (Moreland 2000b:19–20).

The concept that Moreland has described as “ranked spheres of exchange” creates watertight bulkheads along a vertical axis within society. High-status goods such as swords, brooches, glass, and objects of precious metal such as rings and coins, circulated as gifts and prestige items amongst men of equal rank. Bread, cooking vessels, iron nails and more mundane objects were used and exchanged below this high-status sphere.

In the same way, I believe, an economic system divided into spheres – in the way that has been done in the archaeology of the Scandinavian Iron Age – also creates separation on a horizontal, geographical plane. In this case a division is enforced between a gift-economy in Scandinavia and a monetized economy in Christian medieval Europe. Telling is the disappearance of the growth-driving Frisian merchant in the reconstructions based on the theory of spheres, their place being taken by the gift-offering, power-

hungry, and aggressive chieftains (e.g. Samson 1991). In early Viking Period archaeology the Frisians were seen as key agents who could be linked to long-distance trade and the development of urbanism in Scandinavia from the 7th century to the 9th (e.g. Arbman 1937a:13–15; Jankuhn 1956:5–39, fig. 3). This horizontal problem concerning exchange relations is highly relevant to the picture we form of the economic significance of Kaupang, and to how we are to understand the Continental contacts that are so clearly evident in the finds from Kaupang. Taken to the limit, we could ask ourselves how exchange could function at all in a Kaupang that was a meeting point between contrasting notions of value and views of life, Christian and non-Christian, or was a landing place both for Frankish-Frisian merchants who came from a monetized, state-organized society and for chieftains such as Ohthere.

### Means of exchange in non-monetized contexts

What most archaeological applications of the conceptual model of economic spheres have in common is a fundamental scepticism with regard to the existence of monetary mechanisms in premodern societies. By monetary mechanisms, I mean in this case a form of neutral measure of value, standard of value, or “cash” with which one can evaluate and put a price on objects that become involved in transactions. Monetary mechanisms in the form of cash should, under such conditions, render the walls of the various spheres permeable, and thus challenge the redistributive gift-system and so the social and political order in turn. Here may lie the basic idea that everything has a price. The use of money leads irresistably to things being comparable and capable of valuation according to a single scale. In buying and selling, the personal and social ties originally attached to the objects are neutralized. This is also the reason why those works that have discussed the appearance of media of payment in prehistoric contexts have generally referred to the interpretative model comprising *special* and *all-purpose money* that has been strongly advocated by substantivism. Märit Thurborg has formulated the archaeological position in the following terms:

Here there is a fundamental difference between all-purpose money and special money that expresses, in itself, something essential to the structure of the society and the role of the economy ... Put simply, one may say that all-purpose money represents our modern society, in which, in principle, one single medium serves the exchange of goods and services and in which all such circulation is economic in character. Special money, conversely, represents a society in which there are many different media, with distinct and definite functions, and in which the economic aspect does not always play a leading role. (Thurborg 1989:89, translated)

In this way, coins, for example, that appear in Viking-period contexts are not understood as a currency in the full sense but rather described as a medium that had a primarily political and social function (e.g. Christophersen 1989:134–7; Hedeager 1993:60–2; Varenius 1994). Another example is the Viking-period lead weights that several scholars believe were not purely economic in function, and so could also have been used in other situations besides payment (Pedersen, this vol. Ch. 6.4.3). Alternatively, then, the significance of the weights in production is stressed. They were used by silversmiths to produce metal alloys (e.g. Feveile 1994:58; Gustin 1999:246–8; Graham-Campbell 2002:56). Rings are generally identified as gifts, tribute or fines, with a limited role in payment (e.g. Gaimster 1991:116–18). On the other hand, hacksilver indicates a use of silver distinctly more economic in character than the social use of ring-silver (e.g. Besteman 2002:450, 2004a:98). By stressing the social dimension of the object and thus automatically excluding economically motivated use in the widest sense of that concept, artificial lines of division are created. The understanding of means of payment such as coins, weights and hacksilver in particular, but also of the rings, has been analysed from a stereotyping perspective and related to all-embracing socio-economic institutions such as gift-craving chieftainly and kingly power, and the principles of exchange of redistribution and reciprocity.

In my judgment, this is one reason why no one has gone further in analysing the significance of the coins or “cash” in general as a form of currency. “Cash” establishes a form of continuity to monetized societies with their values and so on to market-economic mechanisms and ways of thinking. It neutralizes the social constellations that characterize the closed socio-economic cosmos of the Iron Age; it dissolves *embeddedness* and in the end encourages a positive comparison between prehistory and our own age. The presence of coins, coin-like or standardized items such as rings and weights in prehistoric contexts that may have been of significance as a means of evaluation and payment have consequently not been investigated more fully but rather described schematically as special money serving an entirely social or political role. In this chapter I shall propose an alternative line of approach to currency to that which peeps out from the functionalist division between special and all-purpose money. A fundamental premiss of my position is that it is not possible to determine that cash had either a social or an entirely economic function since neither of those can be separated from the other. Several of the key tenets of substantivism have also been modified in more recent anthropological studies.

In ceremonial and strongly ritualized exchange-systems without money or markets, it has been observed that there are nonetheless various forms of

mechanism for calculation and pricing which promote the personal wealth of individuals (Appadurai 1986:18–20; Godelier 1999:85–93). Anthropological studies within traditional societies show that objects of value can assume two quite different functions both as objects of gift and as cash to pay for services or goods:

The same type of object can take two distinct functions because it enters into two distinct fields of social relations. For, and this is a crucial point, in all of these societies, commodity exchanges and gift-exchanges exist and coexist as two modes of exchange and two areas of social practice which are *consciously* and *purposely* kept distinct and separate, even though the same type of objects circulate in the one and the other, and between the one and the other. (Godelier 1999:165).

The use of objects of value as both gifts and as cash maintains and defines the social relationships within a society. Other studies have shown that commodities exist in one form or another in all societies which engage in exchange (Kopytoff 1986). The commodification of objects is a universal phenomenon and not one restricted to the capitalist system. Where, and under what circumstances, commodification can take place varies from culture to culture. Commodification can primarily be understood as a cultural process that is accompanied by rituals which attempt to alleviate its disturbing effect. It always requires an attitude. The interpretative view I apply in this study is that objects of value that are brought into exchange are regarded as living – that they can be attributed with a complex of ideas and concepts of value. It is this conceptual capacity that influences and shapes the economic value of the object in its social and cultural context.

### The exchange of values

Neither the earlier research school that interpreted prehistory from a national economic perspective nor the representation of the Scandinavian Iron Age shaped by substantivism has discussed in detail *why* objects that were involved in exchange were regarded as valuable. Prestigious gifts are described here as valuable because they were made of precious metals such as gold and silver or, in the form of jewellery, are the product of a complicated and time-consuming process of manufacture. Subsistence goods of the Viking Period, lacking prestige, such as utilitarian iron, soapstone vessels, schist whetstones and quernstones, can be marketed at a foreign market-place because they constitute scarce goods in demand there (e.g. Christophersen 1989:128). A fundamental logic behind both the market-economic model and the prestige-goods model derives from the principle of supply and demand. In these interpretations, in fact, both the profit-motivated trader and the chieftain

seeking honour are remarkably alike. Trade over greater distances was generated by some material need, and the function of exchange was to redress the balance and level out a shortage or surplus of goods or social prestige. A chieftain's wealth was based upon the extent to which he could control the redistribution of prestige goods. It was in his interest to create a shortage of prestigious items which would increase his standing and at the same time underpin his power over others. The real driving force for an engagement in gift-exchange or in market-type transactions thus remains essentially unproblematic and is taken for granted. But what was the stimulus for people to engage in economic relationships?

In his work on the theory of money, *Die Philosophie des Gelds* (English trans. 1990), first published at the beginning of the 20th century, the German sociologist Georg Simmel discussed why objects that are involved in a transaction are regarded as valuable, and what is the essential nature of economic transactions. According to Simmel, value is not a *natural* endowment in itself. The value of objects is defined and redefined in negotiation between different individuals, or "subjects". But it is, at the same time, impossible to draw a categorical boundary line between the world of the subjects and that of the objects. They stand in a many-sided relationship and "infect" one another:

In whatever empirical or transcendental sense the difference between objects and subjects is conceived, value is never a "quality" of the objects, but a judgement upon them which remains inherent in the subject. And yet, neither the deeper meaning and content of value, nor its significance for the mental life of the individual, nor the practical social events and arrangements based upon it, can be sufficiently understood by referring value to the "subject". The way to a comprehension lies in a region in which that subjectivity is only provisional and actually not very essential. (Simmel 1990:63)

The objects that are exchanged thus undergo a constant process of valuation. And even the individuals who participate in exchange are affected by the objects that are being exchanged. Objects can thus assume an active and identity-determining role simply by being exchanged. In no way are they silent or lifeless. Connotations of value develop and function in a border zone between the subject and the object. Value is thus no absolute entity that is already there and which exists purely *in itself*. Value is initially created by the subjects who participate in exchange.

Simmel also argues against the usual ideas of what constitutes value, namely that economic objects are valuable because they are difficult to obtain. Instead he completely inverts the conventional logic behind economic profit. There is a form of economic motivation found above all in what the object makes

of us. Objects are considered valuable because they manage to resist our desires to own them. They become economic objects because of our desires (Simmel 1990:66–7). In order to satisfy our desires we are obliged to bridge the gap or distance between our wishes and their satisfaction through various forms of exchange. But we can only achieve satisfaction by concurrently giving up some object that is the object of someone else's desire. This sacrificial procedure is, according to Simmel, at the root of all forms of what are called economic logic. In practice, exchange involves the making explicit of the value-content of the object itself.

Simmel's view of what constitutes value can be used to understand the intrinsic motivation of exchange of economic objects. This is the case irrespective of whether one is in the capitalist present or was an agent in an Early-medieval exchange system, such as, for instance, a Frisian merchant of the 9th century. As I read Simmel, value is a relative concept, and connotations of value which determine the nature of economic relationships do not have to be universal. From Simmel's concept of value the market and gift systems do not necessarily have to stand as irreconcilable opposites in the way that substantivism asserts. If we accept that all economic relations are formed by social relationships, irrespective of time and place, during the Iron Age and equally today, and that the process of exchange itself produces and defines value, Simmel's (1990:80) goes on to give the following paradoxical formulation a deeper meaning. Economy is based upon an exchange *of value* but at the same time economy deals in *an exchange* of value.

This brings us into a key interpretative issue for this chapter, namely the relationship between the sphere of value and the economic objects that were exchanged. Exchange does not represent solely an exchange of a substance or goods but also the trading of immaterial values that are associated with the objects. The motivation for Early-medieval *mercatores* such as the Frisians to set sail towards the horizon thus did not necessarily rest upon an idea that goods were cheaper along foreign shores. It thus also need not depend immediately upon the commercial value of the goods or upon a shortage of them in the homeland, but also upon a conceptual character they had which initiated exchange. The goods may have had an attraction and irresistibility simply because they were produced beyond the horizon (Helms 1993:192; Moreland 2004:147–8). This motivation for engaging in long-distance trade may, *inter alia*, provide a new perspective upon the trade in Frisian cloth, *pallia fresonica*, in the North Sea zone during the Early Middle Ages which written sources refer to (Pirenne 1909; Geijer 1938, 1965).

Preconceptions about what is valuable are imputed to the objects themselves. The objects are not neutral, or metaphorically lifeless, dead. They do not

stand as empty shells, but rather are filled with ideas, connotations, and narratives from earlier lives, uses and significance (e.g. Hoskins 1998). This makes it possible to regard valuable items, i.e. objects that either make exchange possible or are the objects of exchange in some form or other, as historical objects. Exchanges are therefore *crossing points*, at which the historical contents of the object become the objects of investigation and redefinition that can also go on to colour the relationship between the giver and the receiver. Exchange always involves the negotiation of values and ideas which with the object is imbued. This theoretical perspective holds above all for our comprehension of the central objects of exchange in the Viking Period: the coins, rings, ingots, hacksilver and weights that came to be used in Kaupang.

### **Material and non-material aspects of monetary value**

Why were coins treated as of value by medieval societies? A usual answer is that the king guaranteed the value of the coin by being represented on it by his portrait and his name. The king's political and secular power were the essential prerequisites for him to be able to establish and maintain a system of payment based upon coinage (e.g. Malmer 1996; Gullbekk 2003; Kilger 2004). Another common answer is that minting gives a piece of silver a value beyond its metal contents. It was only through the impression of the coin-die that a monetary value was manifested (e.g. Malmer et al. 1991:42–3). But is this enough for us to understand why coins were used as coins, and why they were accepted as such? It is my belief that these typical answers only provide a superficial understanding of the use of coin and cannot explain how and why monetary values emerge. There is a further relevant factor: namely a mental readiness amongst coin-users to accept the value of coin. There was something in the coin itself beyond its size and purity: an idea and a concept which could persuade and reassure the coin-users that coins were objects of value.

Frans Theuws (2004) has provided an interesting point of view on how coins may be transformed into monetary objects in the Early-medieval, monetized societies of the Continent. Theuws takes as his starting point the minting of gold coins, those known as tremisses in the 7th century, in the Merovingian realm. He argues that an economic value is not based solely upon the object's material properties but also in equal measure upon those ideas and assumptions with which the object can be associated. He bases his line of argument upon the fact that the Merovingian gold coins do not name a king but only moneyers and the mint-place. Thus the coins were not immediately linked to the world of power politics. Theuws alternatively stresses the cult of saints that was found throughout the Merovingian world and which was

locally rooted in the formerly Roman towns. The saints had both a religious and a decisive economic importance to the daily lives of the people. Both long-distance trade and the regional exchange of goods and services were organized during a few days at the local market which was under the protection of the saint. As the best known example Theuws cites the annual wine market at St-Denis outside Paris. It was on these market days that the coins were struck and used. It was by the presence of the saint that the value of the gold coin was sanctioned. Through their linkage with a sacred sphere, the gold tremisses became a holy principle of value in the eyes of the coin-users.

This immaterial source of strength that sanctions the value of the coins has been thoroughly discussed by the anthropologist Maurice Godelier (1999). What makes the coins valuable in the eyes of their users rests first and foremost upon a belief in a transcendent principle or power in which the value of those coins can be rooted:

In order for a precious object to circulate as money, its "imaginary" value must be accepted and shared by the members of the societies trading with each other. A currency cannot exist, cannot circulate as "legal" tender without having "force of law". And laws are not made by individuals. A money must harbour the presence of the gods, be stamped with their symbols or with the seal of the state or the effigy of the king. Even today, on the dollar, the only money known and accepted worldwide, is printed the reference to God, the god of the Bible. (Godelier 1999:166)

According to Godelier (1999:33 and 161–7), objects of value that come to be used as forms of currency depend upon imaginary and impalpable points of reference. It is those points of reference that have the authority necessary to legitimate the value of the currency. These are found in all societies that use any sort of objects of value as media for exchange. In traditional societies this imaginary and impalpable power is made material in holy items that belong to the gods, the ancestors, or to heroes. The objects are untouchable, and for that reason are kept out of circulation. Even the most prestigious medium of currency in modern times, money, was sanctioned by an imaginary but at the same time concrete reference point. In the 19th century and at the beginning of the 20th century it was gold, kept under lock and key in the banks' vaults, that represented the lasting reference point of the monetary system. The gold reserve was the imaginary and mythical capital of industrialism and early capitalism (Godelier 1999:27–9). From its elevated but at the same time separated position, this point of reference constitutes a continuously radiating source of energy which infuses the actual media of payment with the authenticity they need. Through its perdur-

ing and untouchable position this sort of fixed reference point can be likened to an unmoving and eternal axle about which all the economic activities, relationships and concepts of a given society turn (Godelier 1999:166–9). In the same way as gold deep down in the bank vaults gave media of payment above ground in the form of coins, notes and cheques the credibility they required, so the Merovingian saint assumed the roles of a sort of imaginary capital and of the necessary point of validation. Theuws emphasizes the sacred significance in the gold-coin economy of the Merovingian realm (2004:128). The saint was perceived both as an imagined guarantee and as a vivifying force that animated the coins in production and endowed them with a monetary power. Consequently the coins could fulfil their function as a medium of payment on market days. As holy capital, this point, principle, power or object could never itself be the object of economic reckoning and profit, and was kept out of circulation. To use an anthropological term, it was *inalienable*. The saint, in other words, was the society's *inalienable possession*.

The basic idea behind *inalienable possession* was originally developed by the anthropologist Annette B. Weiner (1992) through her fieldwork in Oceania. Weiner (1992:28–33) attacked the established understanding that is to be found within both the national economic and the substantivist theories, that economic relations in all societies rest upon the principles of reciprocity and consensus. The purpose of all forms of economic transaction ought, according to this view, to be to create political and social stability. But exchange, in Weiner's view, is not only a matter of a supply of goods being balanced between different dealers but also above a matter of power: specifically the power to determine and control the most prestigious objects for society. *Inalienable possessions* are the actual driving force behind exchanges and the relationships of power which control those exchanges. According to Weiner, inalienability is an essential quality of the material goods, and because of this essential character it is never itself negotiable. What makes a possession *inalienable* and, ultimately, exclusive is that it accumulates a history and thus, over time, presents its own, impalpable, identity. Weiner (1992:33) compares this untouchable object with treasures that are authentic in the popular view because they reflect both fictive and real genealogies, origin myths, the sacred ancestors, and the gods. It is these immaterial and transcendental ideas that form the very core of the actual exchanges. To own or pass on an inalienable, sacred object gives a person access to his or her own group's identity and self-understanding. Thus this also provides power over others. Weiner stresses the point that there is a categorical difference between possessions that are alienable, in other words exchangeable, and inalienable possessions, which must be kept for ever.

*Inalienable possessions* thus fulfil an elementary function in imparting nobility and life to objects of value, which then circulate in exchange with the authenticity and originality they need. This applies not only to gifts but also to objects that have achieved the position of being of value and as being media of value in the economic sphere:

Gift objects and valuables are caught ... between two principles: between the inalienability of sacred objects and the alienability of commercial objects. Like the former, they are inalienable, and at the same time, like the latter, alienable. This ... is because they function both as substitutes for sacred objects and as substitutes for human beings. They are both powerful objects, like the former, and wealth, like the latter. ... In reality what is present in the object, along with the owner, is the entire imaginary of society, of his society. It is all of the imaginary duplicates of the human beings to whom have been attributed ... the powers to reproduce life, to grant health and prosperity, or the opposite, to cause death, famine, the extinction of the group. (Godelier 1999:94–5).

The idea of *inalienable possessions* does not immediately appear applicable in an explanation of why money was both regarded as valuable and could be given away at the same time. Cash is thoroughly alienable, and is the most blatant material symbol of commodification, i.e. saleability. Money is really the very opposite of everything *inalienability* stands for. But it is always a material substitute or replacement for the unsaleable possessions of the society. It is in and through money that these absolute possessions are duplicated and so split. Money represents a society's own untouchable perception of value at one and the same time as it brings that into the market place.

The conversion of objects of value into money in the sense of anonymous and impersonal values and currency, however, is not an automatic matter but must rather be understood to be the result of an extended process of cultural transformation (Godelier 1999:166). Godelier draws a clear distinction between objects of value that come to be used in exchange and money. The idea behind money is formed in the context of organized exchanges of goods in quantities that exceed the scope of simple bartering. Here money fulfils an elementary function in allowing the calculation and determination of the exchange-value of the goods. The use of money, unlike the exchange of gifts, created no social debt between two parties (Godelier 1999:42–3). There are no obligations between the giver and the receiver after a deal has been done. This means that goods or services that are bought and sold are absolutely *alienable*. It is therefore only under certain preconditions that a need for money appears to fulfil requisite functions outside any socially binding sphere. We can, as a result, expect money to appear and price-determin-

ing mechanisms to be developed only in association with emergence of long-distance contacts, the exchange of large quantities of goods, specialized agents who participate in and organize this exchange, and specific sites at which the goods can be marketed. In my view, Kaupang and other Viking-period sites for long-distance trade and the exchange of goods meet all of these criteria.

The second fundamental aspect of the use of money that Theuws has taken up in his article is the social arena and the rituals that are required in order to put coins into circulation. Here again the market days of the saints served a legitimating function. On those days it was possible for the coins to cross between different spheres of transaction. The precondition was that this transgression of boundaries was accompanied by rituals and festivals such as the market days of the saints which could mask the transgressive power of the coin. Theuws compares these festivals with the *tournaments of value*, a concept that was introduced by the anthropologist Arjun Appadurai (1986:21–2). Characteristic of *tournaments of value* is that they are held at specific times of the year and at selected sites. They represent something beyond the usual, and participation gives those in power status and the opportunity to contest their positions amongst themselves. But it is not status, social position or renown that is the driving force behind these “tournaments” but rather the opportunity to influence and redefine the role of the crucial and most prestigious objects of value that are in circulation within that society. This, then, influences the whole economic system. In other words the nominal value of coins is defined and stabilized through “tournaments of value”. This can only happen when the population is assembled at the market in order to trade amongst themselves. Comparable “tournaments” which defined the nominal status of the critical objects of value would also, in my view, have been found in Iron-age Scandinavia. It was at the *thing*, for example, that the nominal reckoning of the *eyrir*-unit was declared and confirmed. That was also the occasion on which the quality of the silver that was included in the *eyrir*-ring was determined. The Icelandic reckoning of rings *Baugatal* is a good example. *Baugatal* is discussed more fully below (see p. 282–3)

Theuws’s interpretative approach may provide us with a framework for understanding coins as both valuable and simultaneously exchangeable objects. The monetary power of coinage was rooted in a transcendental and unattainable principle, and the exchange-value of money, its nominal function, was defined in a social area between various agents. But this does not show us how in practice coins functioned as objects of value throughout the series of transactions. The use and significance of coins remains a solemn and religious affair. In Theuws’s view the gold coins belong to what he calls the *trans-*

*action of the long term*, which reproduces the cosmic and thus also the social order of society. According to John Moreland (2004:145–6) Theuws’s model cannot explain *in what way* coins as the sacred objects of value of the saint communicated with other types of transaction which, for instance, made it possible to sell and pay for day-to-day commodities such as wine or grain, as are frequently documented in the historical sources, or how one could pay craftsmen or for their products at market sites or in trading places.

In order to be able to make the links between money and different types or spheres of transaction, there is one further consideration which neither Theuws or Moreland has discussed. This is the possibility that money and other objects of exchange are regarded as calculable and quantifiable: in other words that they can be compared according to a single scale. This makes it possible to examine the significance of Kaupang as a site at which exchange was practised from a monetized perspective. To illuminate this, I shall analyse the concept of “money” in the following sections of this chapter on the basis of two different questions and perspectives:

- What mechanisms allow forms of currency such as coins, rings and ingots, hacksilver, and even equipment for payment such as weights, to be calculable? Against what scale was their exchange and reckoning value defined? These questions thus involve metrological issues to a very large extent.
- What immaterial connotations of value made media of payment valuable? What *inalienable* characteristic was represented in the object in order for it to assume the authenticity necessary as money?

I have divided this chapter up according to the three ways in which silver was handled and valued during the Viking Period. In section 8.3 I analyse how coinage was sanctioned as a standard of payment and value in the Early Middle Ages of Western Europe, in areas which had direct contacts with Kaupang in the 9th century. In the same way, in section 8.4, I take a closer look at the meaning of the ring as an object of value and how *aurar*-reckoning came to be established as a standard of value in Iron-age society. In section 8.5 the connexion between the fragmentation of silver and the introduction of the standardized Oriental weight-system in the form of cubo-octahedral and spheroid weights in the second half of the 9th and at the beginning of the 10th centuries is explored.

### 8.3 Coins and coinage around the North Sea

Travellers who took the same route as Ohthere down the west coast of Norway to Hedeby were presumably thoroughly familiar with the use of coin. Those who

visited Hedeby may have seen how the residents of that town dealt with coins along the harbour area, and in other parts of the town too.<sup>1</sup> Ohthere also visited the court of Alfred the Great in Wessex, England. Many Scandinavians who lived in England at the time when Ohthere's report was written down will very probably have seen how people used coins to make payments all over the kingdom. It is not impossible that people of Scandinavian origin themselves made use of coinage when they were staying there. At the end of the 9th century the Vikings initiated their own minting, following English prototypes, in the town of York in Northern England (Grierson and Blackburn 1986:316–25). But as soon as one sailed back to Scandinavia one left all of this behind. In Ohthere's own homeland it is likely that people had a quite different perception of minted silver. That coins were not accepted and used as a means of payment is implied by a variety of archaeological find-contexts.

Western European coins of the 9th century and the very early 10th are very rare in Scandinavia. The few Anglo-Saxon pennies and Carolingian deniers that are known from Norwegian finds appear almost without exception in female graves where they were used as pendants (Garipzanov 2005:47–50). The small number of Western European coins known from Early Viking-period settlement contexts are from Kaupang, amongst other sites. Altogether six 9th-century coins have been found, including three Carolingian deniers struck under Louis the Pious (814–40), two Anglo-Saxon pennies of King Coenwulf of Wessex (796–821), and a putatively Scandinavian coin of the Wodan-Monster type, possibly struck in Ribe after c. AD 825 (Blackburn, this vol. Ch. 3.3.2, Fig. 3.17.a–c; Rispling et al., this vol. Ch. 4:Nos. 6–11). The Western European silver coins from Kaupang were struck before c. 840 and thus long before Ohthere's day. There is also the remarkable find of a Frisian gold coin, the type known as a *tremissis*, struck in Dorestad in the middle of the 7th century (Blackburn, this vol. Ch. 3.3.3, Fig. 3.18.b; Rispling et al., this vol. Ch. 4:No. 5). This gold *tremissis* is hitherto the only specimen of its kind in both Norway and Sweden. In comparison with the coin finds from Dorestad, one of the largest trading sites in the Frankish realm, the finds from Kaupang are distinctly meagre. A series of archaeological investigations have recovered more than 200 separately found Frankish deniers. Besides these single finds there are also three coin-hoards with a total of over a hundred coins (van Gelder 1980:222, tab. 13).<sup>2</sup>

From other categories of archaeological finds from Kaupang we can conclude that the contacts with the Frankish world were good. As an example we can take the sherds of pottery manufactured in the Badorf region of the Rhine Valley down to the end of the 9th century, and which was in all probability not

brought to Kaupang to be traded but rather for practical personal use (Pilø, in prep.). Another category of finds that implies that individuals from the West Frankish territories had been in residence in the settlement area of Kaupang are the run-of-the-mill items and personal dress-accessories. The concentrated distribution of these objects may show that people from the Frankish realm lived in their own quarter in Kaupang (Wamers, in prep.). Sherds of Frankish glassware are another important evidence for good contacts with the Carolingian world (Gaut, in prep.).

The Franks and Frisians who discharged their cargo at Kaupang were probably quite familiar with the use of coin as a form of currency and as a generally recognized standard of value in their homelands. Had coins been adopted as cash in Kaupang they ought to have been circulated in larger quantities and presumably have left clearer traces behind them in the form of single finds in the settlement area (for a different view, see Skre this vol. Ch. 10). However, coins evidently had no monetary value, either in Kaupang or beyond the town (for a different view, see Skre this vol. Ch. 10:347–8) and the question is “why?”. Why did the use of coin fail to establish itself in Kaupang as it did in the other contemporary Southern Scandinavian towns of Ribe and Hedeby? Is it a question of whether or not coins were rejected because they *themselves* were regarded as tokens of value? Or could the method of calculation and with that the scale of value that Western European coins represented, not have been accepted beyond the monetized area in which they originally were meant for use? Were people at Kaupang rejecting in this way both the concept and the notion of value that they represented?

I believe that the answer to these questions lies in understanding the monetary context that regulated the use of coin in the Carolingian Empire. In the following section I shall, therefore, take a closer look at how monetary value was legitimized and how people handled coin as a means of making payments in the monetized societies of Western Europe. By way of introduction I shall examine the character of the coin as a measure of value and a means of standardized calculation. The question I shall consider first is: why, and in what way, coins could be used in calculation.

### Counting seeds and coins – an Antique and medieval way of reckoning

The ideological and conceptual ancestry of all of the monetary systems of medieval Europe, Byzantium and the Caliphate can be traced back to the Roman coinage. In order to understand the use of coins in the Carolingian realm we need to look in more detail at its structure: the theoretical rules of play and the practical conventions that governed the minting of coins and their use both in the Late Roman Empire

and in its Merovingian successor. How was the weight and purity of gold coin defined?

The Emperor Constantine the Great introduced a new standard gold coin early in the 4th century with the *solidus aureus*. He reformed the Late-Roman monetary system which, since the beginning of the 3rd century, had been afflicted with continuous debasement. Alongside the *solidus* smaller coins such as a half-*solidus*, called a *semmissis*, and a third of a *solidus*, the *tremissis* or *triens* were introduced. What made this reform so progressive in the Late Roman Empire was that its official gold coin standard was, as the word supposed, *solid*. Constantine's gold coin was of reliable average weight and was made of pure gold (Spufford 1988:7). It was the practice with Antique coinage that the basic coin that a monetary system rested upon could be reconstructed and adjusted precisely with the help of seeds and grains (Ridgeway 1892:181). It was known that the weight of these was constant.<sup>3</sup> A certain amount of gold could thus be calculated to a high degree of accuracy. Chosen as the cornerstone of the *solidus* system was the seed of the carob tree, which was found growing in Western Asia and the Eastern Mediterranean area. The seed of this tree was called *κεράτιον* (*carat*) in Greek and *siliqua* in Latin. According to Constantine's reform, a *solidus* of pure gold should weigh 24 carats (Grierson 1960:251–2).<sup>4</sup> A *semmissis* therefore weighed 12 carats and a *tremissis* 8.<sup>5</sup>

The seed was not only the foundation stone of the Antique monetary system; at the same time it defined both the weight- and the counting-units employed in trade and exchange. The stable reference point of the Roman weight system was the gold *solidus*. A Roman pound (*libra*) was, after Constantine's reform, 72 *solidi*. Transposed into the modern metric system this corresponds to about 327 g (Witthöft 1985:402; Grierson and Blackburn 1986:14). It should be noted from the beginning that in the Ancient World and later in the Middle Ages people thought and counted using seeds and coins. Relationships of quantity were expressed in specific units which corresponded to a given number of coins. Weights and numbers of coins were thus conceptually synonymous. The metric system – using grams – that we are used to think in nowadays was only introduced in the 19th century (Sperber 1996:11–12). With the metric system the physical and mental connexion with the coins and so back to the seedcorn was broken. The grains were the smallest, indivisible building blocks, and thus were the atoms of many premodern weight and counting systems all over the world (Ridgeway 1892:169–94).

The minting of gold coins continued after the fall of the Roman Empire. In the areas under Germanic control barbarian kings from the 5th century onwards struck a number of *solidi*, but mostly smaller coins that corresponded to the standard of the Roman *tremisses* (Grierson 1991:4–5). As in Antique

coinage, the principle of value applied was the grain. But the weight-standard of Frankish and Anglo-Saxon gold coins was changed at the end of the 6th century. In place of the carat or *siliqua*, the coin-weight was adapted to the type of seed that was used as grain in the Germanic areas, i.e. barley. The coin-weight of the new Frankish *tremisses* was then 20 grains.<sup>6</sup> This reduced the average weight of the *tremissis* from c. 1.5 to 1.3 g (Grierson and Blackburn 1986: 92; Grierson 1991:17). We can trace this reform in the Frankish monetary system in the gold coins themselves. In contrast to the Frankish heartlands, there was a reaction against this Germanic change to the basic coin-standard in the Romanized Provence and Southern Gaul. In towns such as Marseilles, Arles and Mâcon this change could be seen in the coins. Provençal *tremisses* were marked VII to show the

- 1 Coin hoards in Hedeby containing Scandinavian deniers of the 9th century: Wiechmann 1996:225–30, Nos. 4–5, Busdorf I–II.
- 2 According to Simon Coupland (1988:9–10) Enno van Gelder's survey does not provide a complete conspectus of all the coin finds from Dorestad. A considerable number of finds made in the 19th century are not included in the table.
- 3 Royal decrees from 13th- and 14th-century England require that the wheat grain that was used for calibration should be round, dry, and always picked from the centre of the row of grains (Ridgeway 1892:180).
- 4 In Latin, the carat was termed *ceratonia siliqua*. A Roman *siliqua*, in the metric system, weighed 0.189 g, giving us a *solidus* of 4.54 g (Grierson 1991:1). In Ethiopia carob seeds are still used as a unit of weight for calibrating gold weights. Here they are also a little heavier than the Roman *siliqua* weighing around 0.2 g (Thingstad 2007:40–1).
- 5 We must point out here that the Roman and the later Byzantine and Arabic monetary units followed a base-12 or duodecimal system (Grierson and Blackburn 1986:14). Under such a system the units were divisible by several factors such as 2, 4 and 6. This differed from the simpler vigesimal system of calculation based upon the units of 10 or 20 (Stenroth, in prep.). Both ways of counting re-appear in the Viking Period. In the earlier *eyrir*-system, counting was apparently done in units of 5, 10, 20, 30, 40 and so on (below, 8.4). In the late *eyrir*- and *ertog*-system counting was done with duodecimal units such as 2, 3, 4, 6, 8, 9, 12, 16, 18, 24 etc. (below, 8.5).
- 6 This grain (Troy grain) weighed, according to Grierson, 0.065 g. The Troy grain that is referred to as the grain-unit in the written sources is probably to be identified with the barley grain (Ridgeway 1892:180–2). William Ridgeway (1892:194) assigns a nominal weight of 0.064 g to the barley and Troy grain. The difference in weights seems minimal, but the discrepancy in the third decimal place makes a bigger difference to the size of the coins. A Frankish *tremisses* should in principle weigh 1.28 g, according to Ridgeway's figures (20 x 0.064 g), and a *solidus* 3.84 g (60 x 0.064). If we apply Grierson's figures a *tremissis* weighs 1.3 g and a *solidus* 3.9 g.



reduction of weight which meant they weighed only 7 rather than 8 siliquae (Fig. 8.1). The reduced-weight solidus was marked either XX or XXI (Grierson and Blackburn 1986:107, pl. 20; Grierson 1991:fig. 43). As I shall show in the next section, this change in the numerical value of coins in the Merovingian realms came to have major consequences for the weighing of gold and silver in Scandinavia (Kilger, this vol, Ch. 8.4). It was the lighter Merovingian tremissis that was the basic unit for the Scandinavian *eyrir*-system (Steinnes 1927:15–16).

The need for distinguishing and calculating weight according to different regional gold coin-standards can also be seen in the development of a precise-weighing tradition in Europe involving exceptionally sensitive balances. Byzantine balances in particular could discriminate at levels of a hundredth of a gram (Steuer 1987:435). Consequently it was possible to work with the weight-units that corresponded to a Roman siliqua.<sup>7</sup> It was particularly in the 6th and in the early 7th century that regional gold coin-standards were introduced into the Frankish and Anglo-Saxon lands as scales and balances became part of regular grave furnishings (Werner 1962). The rich grave from Gilton in Kent, England, shows that alongside sensitive balances, various kinds of weight of lead and bronze were used, plus Roman bronze coins (Fig. 8.2). This grave is dated to the first half of the 7th century (Kyhllberg 1980b:164).

Scales and weights were presumably owned by some professional coin-changer, a *nummularius*. The set of weights from Gilton makes possible a large number of combinations with which one could measure the weight of gold coins as fragments of a solidus.<sup>8</sup> With the help of the additive and subtractive method of weighing it was possible to calculate the number of siliquae or grains and thus the exact weight of gold in the balance-pan.<sup>9</sup> The extraordinary precision of balances in the Late Roman and

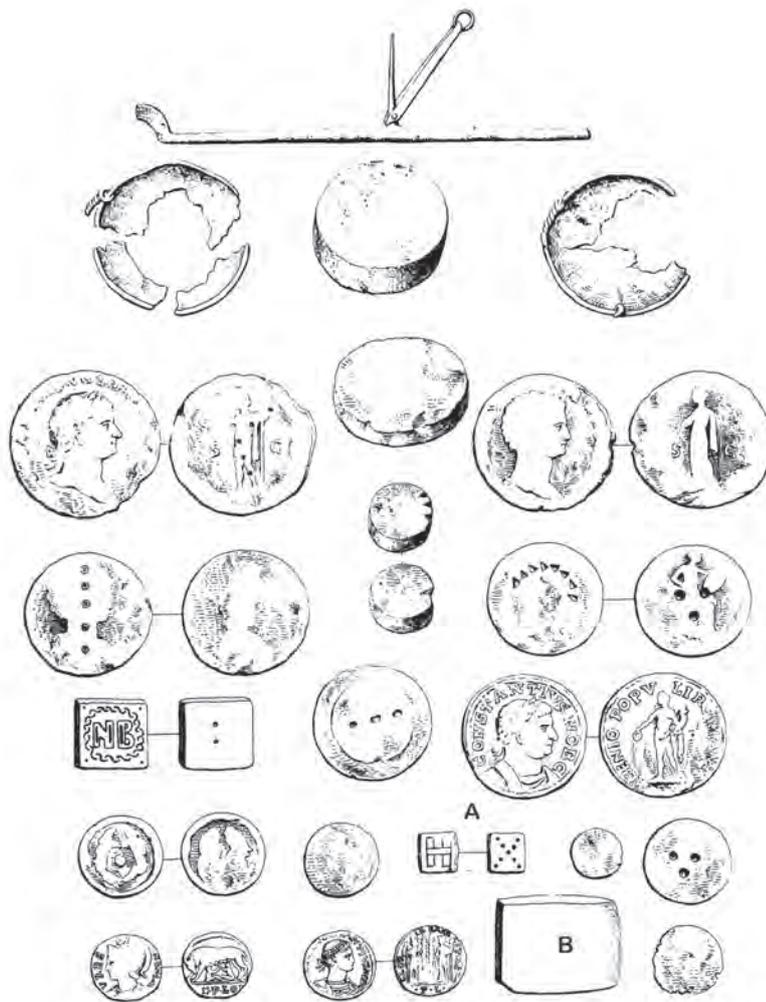
Byzantine era is also demonstrated by metrological studies of sets of weights from Egypt.<sup>10</sup> Similar balance-sets as that from Gilton also appear in Norway in this period, as, for instance, in the grave finds from Bråten and Enebø (Kyhllberg 1980b:167–71). The set of weights that we have from Bråten was probably calibrated by the coin-changers themselves with the aid of gold coins whose exact weight in siliquae or grains was known.

The Frankish grain-standard was also the prototype for the massive coinage in *sceattas* that burgeoned from the late 7th century in the North Sea region. Silver *sceattas* were used as coins for payment on both sides of the English Channel (Grierson and Blackburn 1986:164–89). The earliest Frisian and Anglo-Saxon *sceattas* were very carefully weighed, and like the Merovingian gold tremisses maintained practically the exact weight of 20 grains (Grierson and Blackburn 1986:14). This may mean that in minting *sceattas* too, the grain itself was used to check the weight of the silver coinage in the same way as had previously been done with gold coins. Indications of this practice, namely the checking of the weight of the coins, are provided sporadically by hoards of *sceattas*.<sup>11</sup> People were highly conscious of the weight of each single silver coin, and that it was supposed to observe a precise weight-standard. But there is no direct evidence from the written sources that confirms this practice in North-Western Europe during the Merovingian and Viking Periods.

The grains were the building blocks of the Antique and Early-medieval monetary systems. The value of the coins – or rather their soul and spirit – was rooted in the type of life-producing seed that grew in the fields and was renewed each year. The gold coins also established a metaphorical relationship with the warming sun that enabled the corn to grow and ripen. Here, I believe, lies a crucial element for our understanding of coinage. The seedcorns were

Figure 8.1 *Merovingian tremissis, Mâcon, post-c. 580. 1.25 g. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

Figure 8.2 *The set of weights from Gilton, Kent, England (Kyhberg 1980b:165).*



regarded as natural constants, as the undivisible, smallest elements – the atoms, by the monetized societies of the Antique and medieval worlds. At the same time these seedcorns were also a symbol of fertility and of the gods', later of God's, blessing, which guaranteed the continuation of human society. The aspect of calculation that resides in all use of coin was legitimated by reckoning in grains. From such a perspective, one is obliged to argue that it was through the potential of the seedcorn as the bringer of life that the populations of monetized areas sanctioned the connexion of weight with value. Specific intervals of a certain number of grains created a usable scale of reckoning, as was manifested and applied in the official gold coin standards of the Roman and Merovingian Empires. As we shall see in the next section, it was equally by means of this scale of reckoning based upon the grain that it was possible to undertake measurements and counts in day-to-day exchange relationships even in areas where gold coin was not in use.

### The use of silver coins in the Frankish realm

Sometime after the middle of the 7th century, the striking of tremisses in silver began in Western Europe, and by the end of the century now very pale gold coins had been replaced by a proper silver coinage (Grierson 1991:19–28). The various types of silver coin that we refer to as denars, deniers and pennies remained the current coin over much of Europe right through to the High Middle Ages. The silver penny was the only and the fundamental coin-unit in the medieval monetized economy until the 12th century. The individuals from the Frankish realm who resided in Kaupang, apparently in the first half of the 9th century, came from a monetized society in which the Carolingian silver denier was the central element of reckoning and payment. They were undoubtedly familiar with the conventions operative within a monetary system and with the principles that defined

- 7 I.e. intervals of weight of 0.189 g.
- 8 A metrological analysis has shown that there were two different sets of weights represented in the grave, of which one was calibrated against the Roman-Byzantine solidus and the other series against the lighter Merovingian solidus (Kyhberg 1980:164–7). The set of weights also included a touchstone (marked B on Fig. 8.2).
- 9 Despite corrosion and wear, the margins of error between the weights were less than 1 per cent (Kyhberg 1980:167).
- 10 It has been discovered that one could calibrate the weights in relation to each other with very great precision. The margins of error between the weights corresponded to the weight of 2.4 grains, i.e. 0.156 g (Steuer 1987:435).
- 11 In the hoard of Frisian sceattas from Barthe, 28 coins that had been struck from the same dies, weighed between c. 18 and 21 grains (Grierson and Blackburn 1986:14). The grain-unit (Troy) corresponds to 0.065 g. This means that the coins weighed between 1.17 and 1.36 g.



the exchange-value of the denier. We shall now take a closer look at those conventions and principles, and at how silver coin was used in practice in the Carolingian realm.

Soon after the first of the Carolingian kings, Pippin III, had been crowned in AD 751, he raised the standard weight of the silver denier from 1.1 to 1.3 g. The diameter of the coin flan was increased and it became a thinner coin (Fig. 8.3, c.f. Grierson 1991:pl. 76). Pippin's decree, which was promulgated in Vernon in the year 754/5, stipulated that no more than 22 solidi should be struck from 1 *libra*, i.e. the Roman pound (Grierson and Blackburn 1986:108).<sup>12</sup>

Pippin's son, Charles the Great, in his great reform of measures and weights of the year 793/4, subsequently increased the weight of the denier to c. 1.7 g. The weight of the silver coins was raised without change to its nominal value. A denier was still a denier although it contained a great deal more silver than before the reform. The old Roman weight-unit of the *libra* was also superseded by the Carolingian pound.<sup>13</sup>

The heavier new deniers struck, which were minted in every part of the Empire after the reform, are also different in respect of the design of the die, the location of Charles's monogram and the cross, and the form and position of the legends from earlier silver coins (Fig. 8.4, c.f. Grierson and Blackburn 1986:pl. 33). But what was it that stimulated the Carolingian coin-reforms, and what was the idea behind them?

Many believe it is possible to see the growing economization of the Early-medieval societies of Western Europe in the coin-reforms and the introduction of a system of payment based upon silver coin by the first Carolingian rulers. Pippin's adjustment of the weight of the coin has been interpreted as an attempt to centralize coin-production in the Frankish realm (e.g. Hodges 1982:41–2). Charlemagne's reforms have also been cited as an indication of increasing use of coin within the Carolingian Empire. Silver coin came to be used as a common way of making payments in towns and markets (e.g. Steuer 2003:162–3). Amongst other things, Charle-

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Figure 8.3 *Pippin III's deniers of post-754/5. Dorestad? Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

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Figure 8.4 *Charlemagne's "denarius novus" after the reform of 793/4. Bourges. 1.76 g. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

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magne's coin-reform has been described as a stroke of genius that virtually pushed into life an economization that went hand-in-hand with the increasing monetization of Frankish society (Hodges and Whitehouse 1983: 110). I believe, however, that these ideas are based on a far too stereotypical conceptual model which has been borrowed from substantivism namely that the use of coinage had only a limited, social function in pre-state or only embryonically state-organized societies. It was only under the centrally governed Carolingian state that coins became a fully functioning currency as all-purpose money. With the adoption of a silver coinage, then, according to this view there must have been a spread of coin-use so that coinage was no longer confined as special-purpose money to an elite, but now involved all social classes. However the coin-reform may, as I shall show, have had a quite different basis.

According to Harald Witthöft (1985), who has compared and combined the written and numismatic evidence with metrological studies, the monetary system in the Frankish realm was regionally based. The apparently unmotivated raising of the denier weight cannot be a direct result of the changing price differentials between gold and silver in the Caliphate and the Frankish realm as, for instance, the Swedish historian Sture Bolin (1953) proposed. Witthöft, by contrast, stands firmly against the national-economic point of view implicit in Bolin's theory. Even though the Frankish denier was, in economic terms, a fully functioning currency, the prices were not necessarily determined by market forces which reflected the purchasing power of silver in an internationally based trading system (Witthöft 1985:414–15). One of Witthöft's counter-arguments is that the silver penny was the only official coin-type in Europe for 500 years. The circumstances in which the standard weight of the Frankish denier was reduced or increased were not the result of an international silver

supply that continually balanced the surplus or deficit in trade between East and West. The silver denier was, just like the gold coins before it, linked to the crucial role of the grain in exchange relations in the Frankish realm (Witthöft 1985:416–20). Counting in quantities of grains per unit thus equally constituted the essential matrix of reckoning in the Carolingian coin- and weight-systems.

The connexion between coin-weights and grain-weights has been most influential in the works of the numismatist Philip Grierson (1960, 1965). According to Grierson, the reform was primarily an administrative instrument intended to coordinate the various weight-standards of different regions into a common system (Grierson and Blackburn 1986:206). The raising of the mean weight of the denier after 793/4 was, in his view, probably the result of the introduction of the smallest and lightest of all types of seed, the wheat grain, as the basic unit of reckoning (Grierson 1991: 34). The wheat grain has the lowest specific weight of all forms of seed.<sup>14</sup> This replaced the earlier Merovingian grain-standard. Witthöft's further metrological studies have shown that the heavier denier could also be correlated with the grain-weights of other current but regionally specific grain-types in the Frankish Empire such as the "Netherlandish as" and "Paris grain", as well as with the Arab carat, which was the smallest unit of reckoning in the Islamic coin-system (Witthöft 1985:416–17).<sup>15</sup> The introduction of Charlemagne's new weight-unit, *pondus*

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12 In terms of silver coins, 22 solidi of 12 coins means a maximum of 264 pence. If the minting was done according to the al pondo rule, i.e. to produce a specific number of coins per pound, the coins could vary in weight by some tenths of a gram (Grierson and Blackburn 1986:164; Morrison 1964:414–22).

13 At this juncture the weight of the pound was raised from c. 327 to c. 408 g (Witthöft 1985:410). It is assumed that two different official pound-weights existed as standards in the Carolingian realm. The weighing pound was probably that of c. 408 g following Charles's reform and the coin pound c. 435 g. This gave 240 Carolingian deniers or 20 solidi to a weighing pound or 264 deniers and 22 solidi to a coin pound. The coin pound was probably a product of the taxation of minting itself in the Frankish realm (Morrison 1963:417).

14 The nominal weight of the denier of 1.7 g corresponds to 32 wheat grains at 0.053 g (Paris grain) instead of the earlier Pepinid denier of 1.3 g, based on 20 grains of 0.065 g (Troy grain) (Grierson 1991:34).

15 The heavier Carolingian denier could also be correlated with a reckoning in carats as was practised in the Caliphate. The coin weight of 1.7 g is almost exactly 8 Syrian-Arabic qirāt of 0.212 g. Witthöft also believes that Charlemagne's reform used the Islamic gold dinar as the basis for defining the pound (1985:410). There were 96 dinars to the Carolingian counting pound:  $96 \times 4.25 \text{ g} = 408 \text{ g}$ .

*Caroli*, should not be viewed solely as a monetary reform but also as the assimilation of various regional weights and measures standards. None of the three components – coinage, measure and weight – can really be distinguished in the Carolingian view, but are rather interwoven also with one another.

### The Frankish commodity-money economy

Silver coins represented the central yardstick of value in the Frankish kingdom, but in mundane transactions constituted only one of several current ways of making payments – or forms of “money”, to put it simply. The Frankfurt Capitulary of AD 794 provides a good example of this. The capitularies were juridical decrees that were written down on the king’s authority and directed how the Frankish realm was supposed to be governed. In the Frankfurt Capitulary, Charlemagne’s *denarius novus* is equated with a measure of volume, the *scapilus* or *modius* (trans. King 1987:225). The various types of grain have both different specific weights and different volumes. There were more wheat grains in a *modius* than, for example, grains of oats (Witthöft 1985:419). People were highly conscious of this, as the capitulary shows. Wheat was regarded by the capitulary as more valuable than the barley grain that was the earlier standard of the Merovingian and early Carolingian Periods. A *modius* of wheat was worth 4 new deniers, but a *modius* of barley grain only 2 (Tab. 8.1).

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1 <i>denarius novus</i>	=	1 <i>modius publicus</i> (oats)
2 <i>denarii novi</i>	=	1 <i>modius</i> (barley)
3 <i>denarii novi</i>	=	1 <i>modius</i> (rye)
4 <i>denarii novi</i>	=	1 <i>modius</i> (wheat)

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Table 8.1 Official exchange rates between coinage and types of grain in the Frankfurt Capitulary (trans. King 1987:225).

The capitulary also prescribes prices should one make use of bread as a means of payment. Here too the coins could be correlated with grains, albeit transformed into bread. A new denier should be of the same value as 12 loaves weighing 2 lb (*pounds weight*) each (Tab. 8.2). Coins and food are described as two synonymous and interchangeable ways of making payments.

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1 <i>denarius novus</i>	=	12 wheaten loaves of 2 lb
	=	15 rye loaves ”
	=	20 barley loaves ”
	=	25 oaten loaves ”

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Table 8.2 Relative values of 1 new denier and various types of bread in the Frankfurt Capitulary (trans. King 1987:225).

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Figure 8.5 The coin-changing scene in the Utrecht Psalter. First half of the 9th century. Photo, University Library Utrecht, Netherlands.

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In the capitulary of 797 which made juridical orders for the Saxon area, it is stipulated how much a *solidus* should count for in relation to other goods (trans. King 1987:232). A *solidus* was used as a larger unit of reckoning which is described in the capitulary of having the value of 12 deniers. One-year-old cattle of either sex are valued at a *solidus* in both autumn and spring. After that the value rises with age. But the capitulary also gives directions as to how a *solidus* is to be reckoned in terms of oats, barley and honey (Tab. 8.3). Neither wheat nor barley are used as units of value. In this context, the capitulary distinguished between *Bortrini* and *Septentrionales*, presumably two primary regional units or population divisions amongst the Saxons.

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1 *solidus* = 1 cow

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#### Bortrini

1 *solidus* = 40 *scapili* oats =  
 20 *scapili* rye = 1½ *scapili* honey

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#### Septentrionales

1 *solidus* = 30 *scapili* oats =  
 15 *scapili* rye = 2 *scapili* honey

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Table 8.3 Relative values between the *solidus* as a unit of reckoning and various foodstuffs in the Second Saxon Capitulary (trans. King 1987:232).

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The impression is given that the prices of grain and thus the use of and valuation of deniers were not primarily governed by the price-setting mechanics of the open market economy. The capitularies thus provide us with evidence of a mixed economy, in which both coin and food were used as forms of currency. Although the Frankfurt Capitulary specified penal-



ties for those who were not willing to accept the king's new coin in towns or any market places, they also left space for traditional forms of transaction. Natural produce such as grain and other foodstuffs were defined in fixed units such as, for instance, volume measures by the *scapilus*, and were thus interchangeable. They could be reckoned as currency and converted into coin. A denier can thus be understood both as a true coin and as a unit of reckoning. This double mode of reckoning was produced out of reckoning in grain. The silver denier was not just a minted piece of silver in the Carolingian realm; as the "grain denier" it was also a symbol of food. As an official standard of value and reckoning, coinage was thus only one of many different media of exchange in the Carolingian realm. The fixed prices for goods given in the capitularies had always to be convertible into the ruling coin-values. In the Frankish realm there was thus a monetary and commodity-money economy in action at one and the same time.

#### Dorestad – a hub for coin silver in the North Sea region

More than anywhere else, it was in areas where economic relations were densest, as in the towns or markets and significant trading sites, that silver coin came to be used in greater quantity. That large numbers of silver coins were dealt with in the Frankish realm using balances is shown by a weighing scene involving a coin-changer in the Utrecht Psalter, from what are now the Netherlands (Steuer 1997:257–9, fig. 178; Fig. 8.5). That coins were circulating in large quantities in Dorestad, one of the most important trading sides of the Carolingian Empire, is indicated by finds of heavy lead weights with coin stamps on them. Four specimens with impressions of Louis the Pious's and Charles the Bald's deniers are known from the emporium. Karl Morrison has attempted to correlate them metrologically with the Frankish pound. With certain margins of error they may fit various coin- or counting pounds (Morrison 1963:

423–4 and 431). The weights from Dorestad were made of lead. Lead is easy to shape and is also invulnerable to damage and corrosion. The unusual weights should therefore, in my view, be understood as the personal equipment of the coin-changers who were active in Dorestad and who needed to weigh and reckon in coined silver in larger quantities.

It was particularly in Dorestad – one of the great places of exchange of silver coins in the Carolingian realm (Coupland 1988) – that there was also a need to be able to correlate and calculate weights of silver in non-Carolingian silver coins and perhaps also in silver ingots against the current pound-weight or fractions thereof. It may be such a scene of coin-changing in which two individuals are making use of both balances and coins that is shown in the Utrecht Psalter. This psalter is dated to the first half of the 9th century and thus belongs to the same period in which a Frankish presence at Kaupang can be demonstrated (Wamers, in prep.).

There is manifestly a connexion between the regional use of coinage in the formerly Roman provinces of the Frankish Empire and the existence of coins that were based upon a tradition of reckoning that is based upon Antique models. The penny-based conventions of payment that were found in Dorestad involved massive exchanges of silver on a daily basis, taken care of by professional coin-changers. Dorestad guaranteed access to the North Sea region for the Frankish Empire. The contrasts between Dorestad, a major exchange site for silver coins, and Kaupang, with its few finds of Western European pennies, are thus stark.<sup>16</sup> In this case, the situation strengthens the impression that there was a quite different view of coinage in Kaupang in spite of the close contacts with the Frankish territories. The conventions for making payments comprising silver coin did not establish themselves here. In this respect, we might suggest that the lack of a strong political authority provides at least part of the explanation. It was in the Frankish realm, and in towns such as Ribe and Hedeby, that the conditions were present for the establishment of a monopoly of coinage. Such a monopoly always involves some form of taxation of goods and services, which consequently provided the royal authority with the chance to gain an income. In my view, however, political power is only one aspect of a practical monetary economy. Another aspect, perhaps even more important, is the credibility of the coins and thus their value in the eyes of those who use them: this is essential for them to be accepted. The question is, then, what mechanisms and ideas sanction the

16 As of yet, the finds from Kaupang offer no direct evidence of contacts with Dorestad — one of the principal trading sites of Western Europe — itself, but it is reasonable to presuppose that this was the case.

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Figure 8.6 *Louis the Pious portrayed as a Christian lord.* From the work of Hrabanus Maurus, *De laudibus s. crucis*, fol. 4<sup>v</sup>. Manuscript dated c. 840. Reg. Lat. 124 f. 4<sup>v</sup>, Photo, Biblioteca Apostolica Vaticana.

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value of coinage in a Christian context? What eternal point of reference gave spiritual being to the value of the coins? In this regard, we need to look in more detail at the role the silver coins played in the worldview and self-perception of medieval Man.

**“Give us this day our daily bread...”**

The Carolingian, and later the Ottonian, emperors developed the right to strike coins into an exclusively royal right. In the Roman Empire, the right to mint was restricted to the emperor. It is, correspondingly, the secular-political aspect of the royal authority as coiner that is generally emphasized in numismatic history (e.g. Jonsson 1987:188–9). It was in the strength of the king’s political authority and his power that he was able to introduce coins and practically force the population to adopt their use (e.g. Kilger 2000:93–4, 2004). But the emperors and kings did not represent political power alone; they were also the personification and representative of divine power. They were, in addition, religious leaders of the highest status. The Carolingian ruler guaranteed the value of the coin not only in his capacity of head of state but also in his capacity as God’s representative on Earth (Steinsland 2000:92–6). It was first in the middle of the 7th century that the Merovingian kings were crowned as Christian rulers. The Frankish ruler no longer derived his character as a charismatic leader from the pagan gods but rather, via the sacrament, directly from the Christian God. He became *rex et sacerdos*, “king and leading pastor” (Duby 1987: 25). In the 9th century, Emperor Louis the Pious was represented as a shepherd with a crossed stave and simultaneously as Christ’s soldier, *miles Christi*. His sacrosanct holiness is shown in the halo around his head and the inscription that goes with the picture (Fig. 8.6). The inscription on the halo declares “Thou, O Christ, crownest Louis” (Mütheric and Gaehe 1977:55).



The capitularies also state that it was the king's duty to create a just society and to protect the poor from exploitation. The king personally sold his own grain at half price in the market (King 1987:225). In this way the king accepted his responsibility as the highest protective lord appointed by God over the people. As the representative of God and Christ on Earth, the kings were responsible for the distribution of the annual harvest. The capitularies state that the

king answered for the equity of the prices for the necessities of life, such as grain at a fixed price, and that he guaranteed that all had food for the day (King 1987:225). It was only the emperor and the king who had the right to strike coins and it was the king, in his capacity as Christian leader, who could sanctify the coin and sanction its value. Coins, in the Carolingian realm, thus cannot be regarded as a solely political manifestation, but should also be seen as religious



expressions of food, the daily bread. In its standard character, the coin was a symbol of the king's divine and juridical power.

On the deniers of Charlemagne, the cross as the symbol of Christianity is very conspicuous. His final issue shows him as the diademed Roman Emperor on one face, while on the other face we see a temple building with a cross surrounded by the legend adapting Greek lettering XPISTIANA RELIGIO (Wamers 2005:155–8). Charlemagne's son Louis the Pious subsequently separated off the Christian statement in the markedly uniform and – for coin-users in the Carolingian territories – readily recognizable XPISTIANA RELIGIO issue (Fig. 8.7, c.f. Grierson and Blackburn 1986:pl. 36). It is also the deniers of Louis that are most commonly represented in finds from Scandinavia (Moesgaard 2004:13; Garipzanov 2005:56, tab. 1).

As I argued above, in the Antique conceptual world and even on into that of the Middle Ages, coins stood in a metaphorical relationship with the harvest and so with food (see p. 266–7). The nominal value of the coins was related to a specific quantity of grain, which guaranteed its metal contents and weight. In German, we have the expression that bread is of good “Schrot und Korn”. *Schrot* refers here to the grade of ground grain that is used to bake bread. This expression is also found in a monetary context, when the reliability of the coin is referred to at the same time as establishing a connexion between coin and bread. Coins must be of good and pure metal, “Schrot”, and weight, “Korn”. The written sources also note that grain was one of the most important traded goods in the Frankish realm. Quantities of grain were counted in barrels, within which it was also transported (Doehaerd 1978:153–7).

It was the Church in particular which, starting in the Carolingian Period, initiated the use of coins as a method of making payments more widely in the pop-

ulation. Landbooks from the monasteries provide evidence of the widespread use of coin as form of cash. It was first and foremost the monasteries, that in their capacity as landowners could demand their dues and tithes in the form of coin. But it was also possible for the farmers to pay their dues in natural produce. The small monastery of Prüm was a major landowner. Of its 1,700 farms, 63% paid their taxes in coin. At the end of the 9th century Prüm could count on an annual income of over 80 pounds in coin, corresponding to about 19,400 pennies (Hess 1990:113). It was above all at local and regional markets and in towns which were under not only the saint's and the Church's blessing, but also the king's protection, that the year's harvest could be sold (Doehaerd 1978: 152–6). It was the monasteries that were the driving participants in the trade of foodstuffs such as grain and wine in the markets, and it was also the monasteries that regularly handled coin in large quantities both during and after the Carolingian Period. Various levies that the Church and landowners could exact from, for instance, merchants and farmers, have also been described as a primary motor for the establishment of the use of coinage amongst a wide segment of the population (Kilger 2000:96–7, 2004: 222–4).

But the compulsory element of monetization in the form of taxation provides us with only a superficial explanation and does not really get to the heart of coinage. What we also see is that ecclesiastical institutions and lords were able to root and legitimate coinage in a sacred sphere of value: in the Christian world-view. The connexion between coins, grain and bread is made prominent in the edicts on prices of the Frankish Empire (Tabs. 8.1–2). Wine too was a crucial element in the liturgy and so a traded commodity of the same importance as grain in Early-medieval Europe (Doehaerd 1978:153–7). Wine was bought by Frisian and Anglo-Saxon traders, every

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Figure 8.7 *Louis the Pious's XPISTIANA RELIGIO denier*. 1.69 g. 822–840. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.

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year at the same time in central wine markets such as that at St-Denis outside Paris (Doehaerd 1978:186; Theuws 2004:126). Bread is the foodstuff that is referred to in the Creed and the Paternoster. Bread and wine represent the body and blood of Jesus in the Eucharist. In my view, one can thus argue that there was a metaphorical association of the immaterial value of the coin with Christian values. What could not be obtained but was at the same time desired by all – and that which sanctioned the monetary power of the Carolingian silver coinage – was the promise of the forgiveness of sins and the hope for daily bread. The value of the coinage can thus be linked also to the Christian understanding of salvation and eternal life. It was in this way that the silver coin gained its *inalienable* point of reference, one inhering in the Christian world-view. The coin derived its monetary power from an unreachable kingdom in Heaven. This impalpable heavenly fixed point rendered the coin a value exceeding its weight and contents. It was through the coin's connexion in the mundane contexts of payment for bread, grain and wine that coined silver gained its credibility in the eyes of the Christian community.

The metaphorical relationship between harvest, coinage and profit was also celebrated annually in the autumn at Michaelmas when the coins came to be used in the market and the year's harvest was exchanged. On this occasion the coin-lord was also able to introduce a new type of coin and compel the old type to be exchanged for it (Spufford 1988:383). The market days have commonly been regarded as a political and institutional arena for the power politics of the coin-lord, as a practical situation in which coins came to be used and circulated amongst a considerable proportion of the population. But the annual marketing of the harvest was also a religious ritual, the participants in which could cross boundaries and redefine the value of objects of exchange. It

was then that the *face*-value of the coin, with the portrait of the king or the saint and the town or temple on the one face and the cross on the other became of value, but at the same time became *alienable*: in other words, exchangeable. Through the process of exchange of coin at the market place the nominal relationship both between one coin and others and against other exchange goods was defined. It was only at these festivals where large numbers of people were assembled that the elite could deal with and redefine the status of the crucial objects of value (Theuws 2004:125–6). Through the metaphorical relationship of the coin with food such as grain and bread, a very wide range of different forms of transaction were covered.

In my view, the Frankish silver coins were both materially and immaterially rooted in a world of Christian concepts. From such a viewpoint, coins were not only objects of value in both political and economic terms, but also woven into a Christian reality and the self-perception of the faithful. As we shall see in the next section, however, coins were also struck and used in Scandinavia: in other words, in a non-Christian context. A fragment of such a non-Christian coin, probably struck in Ribe after c. A.D. 825, was found in the settlement area of Kaupang (Blackburn, this vol. Ch. 3:58, Fig. 3.17.c; Rispling et al., this vol. Ch. 4:No. 5). Does this find face us with a concept in which immaterial and sacred concepts of value were integrated with features that symbolized a nominal unit of reckoning, just as with the Carolingian coins?

#### **The snake, the long-haired man, and the monster: the use of coin outside the Romano-Christian orbit**

As we have already seen, Carolingian coin was endowed with value from an Antique-Christian ideological tradition by being linked to the potency of the seedcorn as life-giver and normative building block. The Christian symbolism centring on the cross is most evident with the Frankish issues of the 9th century. On one group of the Southern Scandinavian coins contemporary with the XPISTIANA RELIGIO deniers, and which are possibly to be attributed to Hedeby, alternative motifs to the cross appear, such as the ship, house, fish, animal/stag, snakes, cocks/grouse, or a man with a horn (Malmer 1966:47–8, 58–63 pl. 1–2). Although the motifs may in some cases allude to Christian symbolism, such as, for instance, with the fish, and to motifs that are also found on Frankish coins, such as the ship, these are nonetheless in respect of specific details very different from the contemporary Carolingian deniers (Malmer 2002a, 2002b). On the other connected group of Southern Scandinavian coins there is a stylized human mask, small human masks with a moustache, snakes and a zoomorphic body (Fig. 8.8) (Malmer 1966:48, 63–7, pl. 2–3). The group with the “radiate



mask” and “stag” or “animal” is clearly modelled upon earlier sceattas with what is known as the Wodan-Monster motif, which in all probability reflects no Christian concepts. It is a matter of contention whether or not the minting of these sceattas took place in Frisia or in Ribe in the 8th century (Metcalf 1984, 1985; Malmer 2002b:118–20).

The pictorially rich early Nordic issues are found primarily in the cemeteries of Birka, and are consistently from rich female graves. Here they were reused as pendants and associated with other pendants as part of sets of jewellery (Malmer 1966:184–5). But in their original places of use, at Hedeby and Ribe, they were used as a standardized form of currency which was directly linked to the Carolingian monetary system. This is indicated by both the technical production and the weight, which was almost exactly half that of Charlemagne’s heavier *denarii novi* (Malmer 2002b: 120–1). However this was probably not sufficient for the coins to have been accepted as currency in Hedeby and Ribe without also being linked, as the Carolingian deniers, to an overordinate concept or religious belief that could endow them with credit. In this context, we need to look more closely at the motif that was displayed upon the coins and whether that could contain the associations necessary for the coins to be regarded as of value. How are we to understand the Wodan-Monster motif in this respect?

What Brita Malmer describes as the “radiate mask” on the 9th-century Scandinavian coins is as far as I can see really a highly stylized human mask. The lines that radiate out from the eyes and nose in two symmetrically opposed fields resemble a human mask with long hair and a parting. The curved lines below the nose represent a moustache and beard. This central motif is surrounded by small, bearded masks along with coiled snakes and figure-of-eight motifs. On the obverse we see a hatched, zoomorphic

body with the head turned backwards. Below the body there is a coiled snake and a three-pointed symbol (Fig. 8.8). This typical representation of a human mask is found on many other objects besides coins. The same elements – animal, snakes and human masks with long parted hair – recur in pictorial art in Scandinavia from the Iron Age to the Christian Middle Ages (Johansen 1997:75–107). The scene is also portrayed on female jewellery such as brooches and buckles such as the Scandinavian oval (“tortoise”) brooches (Jansson 1985). The composition is also found on brooches from the Merovingian Period. It is found, for instance, on the famous splendid buckle from the Åker find in Norway (Nybruget 1992:24; Solberg 2003). On the Åker buckle the man becomes part of the fabulous animal. His body is scaly like a snake and his feet transformed into two shining dragons’ heads. The scene on the buckle, on coins, and on other artefacts, is probably the same one, presumably representing a known mythological motif of the North. It is a scene with some ecstatic content in which a man is wrestling along with one or more animals and snakes in various permutations.

Investigation of the different iconographic components of the Nordic animal style indicates that the scene represents Odin’s battle with the wolf Fenrir and Midgard-serpent (Neiss 2004). This motif, which starts to appear first on Migration-period bracteates and is subsequently found represented in both Vendel- and Viking-period animal styles, consists of a man with one or more snakes which are battling with two animals. Those consist of a ribbon-shaped animal and an h-shaped animal which are interlocked. Starting from the cosmological outline given by Snorri in *Gylfaginning*, Michael Neiss (2004: 20–1) interprets one of the figures as the Midgard-serpent which surrounds Midgard and bites on to his own tail. The other figure is Fenrir, who is fettered with a strap and is then chained fast, deep in the

Figure 8.8 *Scandinavian coin with a radiate mask and animal. Malmer KG 5 (Malmer 1966). Ribe? c. 825–850/77. Björkö, Adelsö parish, Uppland. Birka grave no. 508. SHM, no accession number. Scale 3:1. Photo, Frédéric Elfvér, Stockholm University.*

ground. The snakes that are biting the two animals or are coiled around the man's hands represent the powers of order. These are interpreted as the gods' retinues and auxiliaries in the battle against Loki's offspring. In a shamanistic perspective, both the snake and the gripping beast can be viewed as a vessel for Odin's soul which borrows that body for the journey to another world where, together with the snakes, it will do battle with the menacing wolf which threatens the cosmic balance. In order to carry out this perilous journey the shaman was dependent upon helpers in the form of animals whose duty it was to protect his soul (Hedeager 2003:131–2). It was the gods Odin and Loki more than any others who could change shape (Jennbert 2004:205). In *Skáldskaparmál*, we read how Odin first changed himself into the shape of a serpent and then into that of an eagle in order to steal the giant Suttung's mead (Byock 2005: 85–6). The three-pointed triangular shaped object that is shown on the obverse of the coin is apparently interpretable as a representation of the world tree Yggdrasil (Andrén 2004), and the zoomorphic body as the dragon Nidhöggr who lived in the nether region of Niflheim and chewed at the roots of the tree (*Grimnismál* 35). Odin also had two by-names, Ofnir and Svafnir, which are also the names of the two snakes that are coiled around and bite the roots of Yggdrasil (*Grimnismál* 34 and 54). The animal is also shown on some coins as a stag, which may reflect the four stags who dwelt beneath the shady canopy of the ash tree Yggdrasil (Malmer 1966:pl. 2; Byock 2005:27). The design on the coin is polysemous, and has space for further plausible interpretations (e.g. Malmer 2002a). To read the mask as a representation of Odin seems attractive, but there are also bronze figurines from Uppåkra amongst other sites which represent the god with only one eye (Bergkvist 1999:119–21). However I consider it most credible to regard the human mask as a representation of the

god Odin, and this gives a deeper sense to the monetary angle that I wish to impart to the Scandinavian coins.

The first Scandinavian coins may, in my opinion, show that there were other systems of thought and understanding – possibly in direct competition with the Christian ideology of lordship – which, in the eyes of the coin-user, make the struck metal “valuable”. But in contrast to the Christian conceptual elements embedded in the Carolingian deniers the Scandinavian coins derived their monetary power from a different religious universe. It was the serpents, the monster-stag, the three-pointed object and above all the shape-changing long-haired man with his parting as a mythological projection which formed the basis for associations of value. Like the cross in the Christian context, the human mask presumably had a legitimating character – as did the snake. The Danish leader who introduced the minting of coin, apparently at Ribe, using the famous Wodan-Monster motif, may himself have assumed the role of the powerful individual in the myth who suppressed the wolf Fenrir and who had the power to change shape. The myth had the power to create value. Odin subdues the forces of chaos and thus guarantees the maintenance of balance and so of order in the world. Projecting the familiar myth on to himself, the leader was also capable of breathing life into the coin and guaranteeing its nominal value within the area of his own power. It was Odin who guaranteed the continuation of the world and who provided coinage with a cosmological authenticity and religious aura, and with that made it of value in the eyes of the coin-user.

From the iconographical perspective, the first, pictorially rich, coinage of Southern Scandinavia represents nothing new, but in its selection of motifs was rather a continuation of the extensive application of symbolism in the sceatt coinage of the North Sea area. The same composition of pictorial elements and symbols is also found in the Northumbrian coinage of Northern England in the 8th and 9th centuries (Pirie 2006:pls. 6–7). The use of sceattas reached its zenith during the first half of the 8th century in the emporia and productive sites of England as well as around the North Sea (Blackburn 2003). Neither sceattas nor Scandinavian coins came to be used in any monetary way outside of Ribe and Hedeby in Southern Scandinavia. It is evident that the use of coinage was only established in Scandinavia at sites which were in direct contact with other coin-using areas on the Continent and Britain during the 8th and 9th centuries. When the Viking-period production of coinage got under way in the second quarter of the 9th century, written sources testify to the close political contacts between the Danish elite and the Carolingian royal house (Varenius 1994). Outside of these early monetary zones in Southern

Scandinavia, meanwhile, the monetary character of the Scandinavian coins as a form of a currency fell away. They were used in the same way as other coins such as dirhams, Carolingian deniers and Anglo-Saxon pennies as pendants in richly furnished women's graves or outstanding mixed hoards (Garipzanov 2006; Kilger 2008). In these hoards, such as that from Hoen, the largest Viking-period gold treasure from Norway, the coins were re-used as pendent ornaments (Skaare 1988:54–7). Here they probably carried a different set of value-associations than in their original monetary context. I shall now attempt to summarize this section of the chapter and to answer the question I posed to begin with. Why was the use of coinage able to establish itself in the Frankish realm and in certain parts of the North Sea area but not in others? And why were coins not used as a form of currency in Kaupang?

### Conclusions

In order to be able to understand the distinctive situation regarding coin-finds over most of Scandinavia and at Kaupang in the 9th century, I presented, by way of introduction, the way in which monetary systems were defined and conventions of payment put into effect in the Frankish realm. In that territory, gold and later silver coins were filled with meaning and associations of value so that they could be integrated into various economic constellations. Decisive for the understanding of monetary methods of payment in the Carolingian Empire and previously in Late Roman and Merovingian contexts was the existence of fixed relations of count that the system of coinage was based upon. By using grain in the reckoning of coinage, a holy unity was created between coins as a medium of value and coins as counters with which to make calculations. Grain was not only the indivisible base unit of the monetary system but also the fundamental constant used in the weight-system. The use of coin in the Frankish realm reflects conventions of valuation and payment that stretch back to Antique models.

As a result of the archaeological studies, we now have good evidence that there were contacts with the Frankish realm from Kaupang in the first half of the 9th century. The gold tremissis struck in the 7th century by the moneyer Madelinus in Dorestad may have been brought by a merchant from that Frisian emporium to Kaupang in the Viking Period. Finds of brooches, shoe-buckles and other ordinary dress-accessories show that individuals from the western areas of the Frankish realm resided in Kaupang (Wamers, in prep.). These people were undoubtedly familiar with the use of silver coin as a form of currency but they evidently did not take coins with them on their trading journeys to the North. The reason why there are so few Carolingian deniers in Southern Scandinavia in the Viking Period is probably that

they were melted down before they could pass into circulation. Coined silver was re-worked into uncoined metal in the form, for instance, of ingots, before being re-distributed within Scandinavia. This may have been done in Frisia itself. In Dorestad, for example, soapstone moulds for ingots of the common Scandinavian type have been found (Besteman 2004b:28–9 and 33). People were familiar with the practice in Scandinavia of handling and valuing silver in larger quantities rather than in the form of coin silver. The lump of semi-melted dirhams that was found in Kaupang during the most recent excavations and which appears to have been standardized in terms of weight may also bear witness to this practice (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1).

All the same, the use of coin in exchange relationships during the Viking Period did not rely solely upon an acceptance of the principles of reckoning to be found in a conventional monetary system. A further precondition was a group of people with a common world-view and shared values. Monetary ideas, in my opinion, were only traded in a community that accepted and shared the sacred principles that resided in coin, not only as a medium of valuation, but above all as an object that had a value *in itself*. The Frankish denier represented the Christian world-view and the social and political order of the Frankish realm sanctioned by God. The same identity-forming mechanisms were probably also in effect in the earliest Scandinavian coin-production of the 9th century. The Odin cult presumably provided the spiritual matrix for the infusion of the coin with the credibility needed. The earliest Scandinavian coinage probably did not derive all of its diverse symbolic elements directly from Carolingian contexts but also from the sceatt culture that flourished in the North Sea region from the late 7th century onwards. This monetary culture had its foundations in the large number of wics found along the North Sea coasts and was probably in the hands of the local traders that we know of from the written sources (Lebecq 2005:646–53). Although the minting of coins at Hedeby and Ribe alluded to a pagan symbolism, the coin-standard of the Carolingian realm was respected: the coin-weight of Charlemagne's reformed denier was used, and the new Carolingian reckoning pound was the point of reference. As Scandinavian coins weighed nearly half what Carolingian coins weighed, this probably meant that in and around Hedeby and Ribe the Carolingian coins were counted as of double the value of the Scandinavian ones.<sup>17</sup>

Silver coins probably never came to be used as “money” at Kaupang. We do not see any evidence of a powerful lord who succeeded in introducing, controlling and bringing a monetized system to life. And there was probably also no *community* of coin-users, a commonality of value, who shared a set of cultural norms and who had common religious frames of ref-

erence. The use of coin was accompanied by a system of calculation for reckoning goods in trade and exchange. The monetary system produced a matrix for different systems of measuring and reckoning which formed both a consciousness and also a knowledge of how one could relate different goods to one another. Although the knowledge of such a monetary matrix was in all probability shared by Scandinavians in the 9th century, they did not bring coins back with them. Nor did anyone try to introduce a monetary *habitus* that observed the same rules of play and ideas as on the Continent or in Britain. There was evidently an invisible threshold that no one was prepared to cross. Looked at in a monetary perspective, Kaupang was a site which had neither the political nor the ideological or mental conditions for the use of coinage to have been able to take root gradually in the same way as it did at Hedeby, Ribe and Dorestad. (For a different view, see Skre, this vol. Ch. 10:347–51.)

But how were economic relations in Kaupang governed if coin was not brought into use there? Was there some other form of “money” in Kaupang, which allowed exchange across ethnic, cultural, religious and economic boundaries? It was such a situation which men like Ohthere, who were engaged in long-distance trade and who travelled between important trading sites in Scandinavia, had to deal with. This is the issue that we shall examine in more detail in the following section. In so doing, we shall move our viewpoint from the use of coin in medieval Western Europe to the unmonetized Iron-age societies of Scandinavia.

#### 8.4 Traces of the *eyrir*-standard at Kaupang

The most recent archaeological investigations have shown that Kaupang was a central place for exchange and production in Viken from the beginning of the 9th century (Pilø 2007c:175–8, 2007d:195; Pedersen and Pilø 2007:187–90). In one form or another it had exchange relations with areas of Western Europe where monetary rules and concepts were in force. As I have already discussed, people from the Frankish lands who were resident in Kaupang were undoubtedly thoroughly familiar with the significance of the Carolingian denier, both as a form of currency and as a standard. Although coins were not accepted as currency in Kaupang, was there nevertheless some standard or scale of value that those who came to the site could use to reckon with and think in, and to compare diverse goods with one another? Was there any other form of “money” at Kaupang that permitted exchange across ethnic, cultural and economic boundaries?

I believe that some part of the answer lies in the evident standardization by weight of precious-metal objects such as gold rings (Bakka 1978; Munksgaard 1980; Graham-Campbell 1999) and silver rings and ingots (Hårdh 2006, this vol. Ch. 5.6.1 and 5.7). This

standardization by weight of finds from the Iron Age was first systematically described by the Norwegian archaeologist Anton W. Brøgger (1921), in his dissertation on the Scandinavian *eyrir*. Brøgger made a meticulous attempt to link information on a Scandinavian weight-system as it was described in Norwegian law-codes from the High Middle Ages with concrete archaeological finds: weights, gold rings and coins. In the introduction to *Ertog og Øre*, he wrote:

The sources for the study of the history of the earliest Norwegian weights are first and foremost archaeological. In the old Norwegian laws we find a fully developed and firmly fixed theory of weight, the origins of which reach back long before the time at which the laws came to be written down. The prehistory of this system has to be sought in the corpus of weights unearthed from the ground, and then in the gold and silver finds that have been made in great quantities in Norwegian soil (1921:1, *trans.*).

At the heart of Brøgger’s work was a comparative metrological analysis of Norwegian weight-sets from the Early Iron Age and the Viking Period. The weights in the sets were very precisely calibrated – in other words, they conformed to a single standard. That the individuals who produced these sets thought in terms of a weight-standard is manifested in two different ways. In the first case, the weights in each set were so finely adjusted that they varied from one another only by as little as a tenth of a gram. In the second case, Brøgger was able to demonstrate quite unambiguously that all weight-sets – looked at in terms of the modern metric system – are calibrated to a basic unit of c. 26.3–26.8 g. Brøgger then connected this archaeological weight-unit with written and numismatic evidence from the Middle Ages. Accord-

17 The mean weight of the pictorially rich Scandinavian coins was placed by Brita Malmer at 0.8 g (2002b:121). If one started with the Carolingian reckoning pound of c. 408 g, one would get c. 480 Hedeby coins to the pound. Counted against the grain standard, the weight of a Scandinavian coin comes to 15 wheat grains by the Paris standard (i.e. 15 x 0.0053 = 0.795 g); against the lighter Frisian as standard 17 wheat grains (i.e. 17 x 0.048 g = 0.816 g) (Witthöft 1985:416). In order to deal with silver in smaller units than the pound, the moneyer at Hedeby could also make use of the weight-unit lod. The lod was introduced as a practical unit of reckoning with Charlemagne’s reform. There were 30 lod in a Carolingian reckoning pound: i.e. 408 g/30 = 13.6 g (Witthöft 1985:409). The lod corresponded to 8 Carolingian deniers or 16 Scandinavian coins in weight. We do not know which grain-standard was used in Hedeby and Ribe. But with the large-scale exportation of basalt quernstones from the Rhine valley to Hedeby we can probably assume that Frisian and Frankish wheat also followed that trade (Schön 1995).

ing to those sources, the Norwegian mark defined by royal authority in the year 1286 could in modern terms – according to the metric system – be reckoned to a value of 211.3 g, and correspondingly the *eyrir* to about 26.4 g (Brøgger 1921:95). As a result, Brøgger could argue that the *eyrir*-unit had existed for several centuries and that the same weight-standard was already in use in the Early Iron Age (1921:5–8). It was this basic unit that Brøgger called the early Scandinavian *eyrir* (Norw. *øre*). In my view, thinking in terms of the *eyrir*, pl. *aurar* (also *øre*), was a reality for those who had to deal with precious metal in larger and properly compared quantities.

From Scandinavian written sources we know that alongside the *øre* in the medieval weight-system there were two other units of reckoning. The system comprised the mark, the *øre* and the *ertog*. There was an unvarying set of relations whereby 1 mark = 8 *øre* = 24 *ertogs*. One *øre* was therefore the equivalent of 3 *ertogs* (Brøgger 1921:9; Rasmussen 1955:421). However, none of the finely calibrated early *øre* weight-sets that Brøgger had examined could be made to conform to this system of relationships. None of the weights in the set was adjusted to represent the *ertog*. This means that none of the weights could be multiplied by three to match the weight of the *øre* in the set (Brøgger 1921:9). It is not before weight-sets of the 10th and 11th century that the division of 1 *øre* into 3 *ertogs* becomes apparent. This is the case in particular with those sets that contain the Oriental weights of oblate spheroid type (Brøgger 1921:82–5). What Brøgger was also able to observe was that the *øre* in these weight-sets displays a clear reduction in mean value. Instead of an average of 26.4 g it weighs around 24 g. Brøgger called this lighter unit the later Scandinavian *øre* or the *ertog*-system. For the *ertog*, he could identify a metric weight of about 8 g from the weights. Reckoning in *ertogs* thus seems to be an innovation of the weight- and reckoning systems of the Viking Period which became established at a later date. However this did not drive the early Scandinavian *øre* out of use. As a result, there appear to have been two parallel weight-systems in the later Viking Period which are also still evident in the coinage and weight-systems of the Christian Middle Ages.

There is a big gap between the archaeological *øre* represented in the weight-sets and anything that can be identified in the documentary evidence. The *ora* is referred to as a unit of reckoning for the first time in the treaty between Edward the Elder, King of Wessex, and the Danish leader Guthrum (Attenborough 1922: 103–8). The dating of Edward's law is uncertain, but it is thought to have been written down at the latest in the reign of either Edward or his son Æthelstan, in the first half of the 10th century (Attenborough 1922: 97). Edward's overlordship was then recognized in those areas of the Danelaw south of the Humber (Keynes 1999:69). In clause 2, a fine of 12 *øre* (*oran*) is

stipulated for priests in the Danish areas who do not fulfil their duties in providing the sacrament of baptism (Attenborough 1922:105). In clause 7, trading on a Sunday, *sunnandæges cypinge*, is punished. Besides the loss of one's goods, there is a fixed fine of 12 *øre* in the Danish territories and 30 shillings in the English (Attenborough 1922:107).

The other early textual evidence of the *øre* is the runic inscription on the Forsa ring, from Hälsingland in Sweden. Aslak Liestøl (1982) has dated this inscription to the late 9th century. The majority of scholars who have worked on the Forsa ring, however, argue for a later dating, to the 12th century (Engeler 1991: 128). Liestøl's suggestion has nevertheless recently been corroborated by Stefan Brink's studies. Brink (1996:36–9) interprets the inscription as an order to maintain a pre-Christian cult place in an orderly manner. The inscription on the ring specifies a fine that is to be paid both in livestock and *øre*, and which is doubled on repeated contraventions. One ox and 2 *øre* are to be paid on the first occasion, 2 oxen and 4 *øre* on the second occasion, and 4 oxen and 8 *øre* on the third. Based upon the few contemporary documentary sources of the Viking Period, the *øre* appears to have been a familiar unit of reckoning that was used in paying fines. In the English law-codes and on the Forsa ring the *øre* appears as a quantifiable unit of value which came to be used in the juridical sphere. But was the *øre* also significant as a normative value in the economic sphere? We shall examine this question carefully here, in connexion with Brøgger's early Scandinavian *øre*. The later Scandinavian *øre*, or *ertog*-system, will then be discussed in the following section.

What makes Brøgger's discovery less applicable to an understanding of the significance of the *øre* in the system of exchange within the Iron Age is the fact that he was absolutely convinced that it had a Roman origin. This confidence was systematically expressed in his works, in which several of his reckonings look artificial and arbitrary. He consistently relates all of his calculations to Antique coin- and weight-units. It is Brøgger's theory of a Roman source that I shall modify from both archaeological and numismatic angles. I propose instead that the *øre* was established as the standard in Scandinavia, not during the Roman Iron Age or the Migration Period but rather in the Merovingian Period. A second set of problems I discuss in this section is how to relate the *øre*-standard methodically to the use of silver as a medium of payment and valuation. To do that, I must take a detailed look at the mutual relationships between coins, weights and rings.

### Gold coins and the concept of *aurar*

There is generally agreement that the Old Norse term *eyrir* is a loanword derived originally from the Latin adjective *aureus*, "golden" (Engeler 1991:128). *aureus*

is itself an abbreviation of *aureus nummus*, the term for the normative basic gold coin of the Roman Empire before the coin-reform of Constantine the Great (see above, p. 265). It seems likely that this appeared as a loanword in the North Germanic language of Scandinavia as early as the Roman Iron Age. If so, this must have taken place before the introduction of the solidus as the new gold standard in the early 4th century. Early Roman aurei are rare, but do occur in Scandinavia, particularly in Denmark.<sup>18</sup> The solidus, the “solid gold coin”, became very familiar as a coin in currency in the Roman Empire, as is noted in the ancient written records (Brøgger 1921:64; Engeler 1991:128). The great influx of gold coin into Scandinavia, however, did not begin until the Migration Period. The earliest solidi known in Scandinavia were struck under the Western Emperor Honorius (395–425). A high proportion of solidi are also from the Eastern Empire. The importation of solidi from the Roman Empire lasted some 150 years and came to an end in the mid-6th century.<sup>19</sup> If we look at the finds of gold coin from Scandinavia altogether, it is probable that the word *eyrir* refers first and foremost to the solidus.

There is a range of evidence that solidi in this period were used as raw material in the production of solid gold objects. According to Kyhlberg (1980b: 26–9), analyses of both the metal contents and weights show that the snake-headed rings of the Late Roman Iron Age (c. AD 200–400) and the Migration-period *Kolben*-armrings (c. AD 400–550) were in all probability made from gold from solidi. It was in the Scandinavian Age of Gold in particular, the Migration Period, that gold coins such as solidi may have become generally familiar in Scandinavia. This is also the period for which we can conceive that the preconditions for a Latin word for gold coin being adopted in the local vocabulary were met. But why, then, do we not find the word *solidus* rather than *eyrir/aureus* as the loanword in North Germanic? And how, then, can *eyrir* refer to earlier Roman gold coins that are scarcely represented as coin finds in Scandinavia? There are both philological and numismatic grounds for concluding that *eyrir* need not necessarily refer to a type of Roman gold coin but rather to a Frankish one. Let us look at these grounds in more detail.

The Germanic kingdoms that emerged in the formerly Roman provinces such as those of the Franks in Gaul, the Visigoths in Spain, and the Ostrogoths and the Langobards in Italy, continued minting coins in the 6th and 7th centuries (Grierson 1991:9–28). Historical evidence shows that gold coins were known by several names in the new kingdoms. In the famous encyclopedia written by the Visigothic Father of the Church Isidore of Seville in the 620s, it is recorded that *aurei* was the current term for gold coins that were formerly known as solidi in the Gallo-Germanic

lands (Brøgger 1921:44 and 96–7, 1936:80). Bishop Gregory of Tours (ob. AD 594) refers to both the *aureus* and the *triens* – a one-third gold coin – as the coin units in the Frankish territory (Grierson and Blackburn 1986:102). Another Germanic word for gold coin was *skilling*. The shilling is first referred to in Ostrogothic texts from the 6th century, and in the Ostrogothic territory the term was used of Byzantine gold coins (Grierson and Blackburn 1986:15; Engeler 1991:167). In the 7th century, *scilling* was the term for gold tremisses struck in the Anglo-Saxon kingdoms (Grierson 1991:18 and 24–6).

A credible explanation of the diversity of terminology for gold coins in the Germanic kingdoms is that autonomous minting of gold coins was beginning. This process accelerated in the 6th century with attempts to mark political and economic independence from the powerful Byzantine Emperor in Constantinople (Blackburn 2005d). But it was particularly the reduction of the standard gold coin in the Merovingian kingdoms after around AD 580 that made it necessary to distinguish between the heavier Roman-Byzantine gold coins and the lighter Frankish issues (see above, pp. 265–6). *Eyrir* could, then, be a loanword from the Frankish *aureus* which found its way into the North Germanic through contacts with the Merovingian kingdoms following the collapse of the Western Empire. However we have very few finds of gold coins from the Merovingian Period in Scandinavia (Hatz 1981). How could *aureus* as a coin-term with primary reference to a Frankish gold coin have become so significant that it came to denote a weight-unit in the Scandinavian languages? In this respect, there is another critical piece of the jigsaw to put in place in order to understand what *eyrir* seems to have meant.

A significant clue is the fact that the øre-unit never corresponds to the weight of Roman gold coins, be that the earlier aureus or the Constantinian solidus. Rather, the Scandinavian øre is clearly related by weight to the Roman ounce (*uncia*) (Engeler 1991:130). But what was a Roman ounce? This ounce was used as a small, practical weight in the Roman and Frankish territories in order to measure substantial collections of gold coin in an easy way. *Uncia* lit-

18 A perforated aureus struck in the year AD 141 under Faustina the Elder is known from the Danish weapon hoard in the bog at Ejsbøl, Southern Jutland (Horsnæs 2003:337, fig. 3). This coin was found together with four fragmented gold neck-rings. The assemblage in this bog is dated to the second half of the 3rd century (Andersen 2003:250–1, fig. 7). In the gold hoard from Brangstrup on Fyn 27 aurei and three forgeries were found (Jørgensen et al. 2003:425, pl. 7.3).

19 The latest coins known in hoards in Scandinavia were struck for the Byzantine Emperor Justinian I (527–65) and the Frankish King Theodebert (534–48) (Kyhlberg 1980:39).

erally means a twelfth of some unit, in this case a twelfth of the Roman pound-weight, the *libra*. The Roman ounce could be produced by 6 gold solidi and the Frankish ounce by 20 gold tremisses.<sup>20</sup> There is evidence that the ounce as a weight-unit remained in use even later, in the 9th century, on the fringes of Western Europe. This is the case, for instance, in areas such as Ireland, which did not yet then have its own coinage. Examples are the prices given in the Book of Armagh. These are cited in the unit of the *unga*, a loanword that derives from Latin *uncia* (Wallace 1987:213–14). According to Patrick Wallace, *unga* may refer to a standard weight that has been recognized in the corpus of weights from Dublin. The same standard is also found in the large collection of ingots and armrings from Ireland (see p. 286, Fig. 8.11).<sup>21</sup> This Irish weight-standard seems to have the same modular value as the Scandinavian øre identified by Brøgger (1936:79). The øre, in turn, probably relates to the practice of producing substantial, well-proportioned modular units of precious metal with the aid of a set number of coins. A linguistic analysis of the term points the same way. Philologists point out that *eyrir* has an archaic plural form in the texts. In the Old Norse area we find *aurar* rather than *\*eyrar* (Engeler 1991:128–9).<sup>22</sup> The preservation of this plural form may have a very particular meaning. In the spoken language, it may have represented how people sought to express the practice of producing large units of reckoning with the aid of a certain number of coins.

My conclusion, then, is that in the North Germanic area *eyrir/aurar* did not denote a coin as an object but rather objects of standardized weight that could be calibrated with the help of gold coins. In this way, *aurar* become units of reckoning at the same time as referring to an abstract unit of weight and value. *Aurar* was in all probability a Scandinavian word for the Merovingian ounces. Using the term *aurar*, people probably referred to gold coins that in the Merovingian realm were called *aurei* and *trientes*. I believe, therefore, that *aurar* had several concurrent meanings. It may originally have denoted objects that were made of Frankish gold coin or of gold coins generally. In a more specific sense, it may have referred to gold objects, standardized by weight, which were manufactured with the aid of Merovingian gold coin that served as a means of calibration. It is in this specific sense that I use the term *aurar* henceforward in this chapter. I suggest that *aurar* represent something like a monetary concept amongst non-monetized societies. In monetized societies, coins are used as money. There, counting coins creates the scale required. In Scandinavia, *aurar* probably had a comparative sense, as a measure both of payment and of value. Reckoning in *aurar* referred to a single scale which was thus calculable.

### Reckoning *aurar* according to the Early Scandinavian law-codes

That *aurar* as the units of weight and reckoning were composed of several coins is also stated in Norse law-texts of the 12th century. It is in the famous counting of rings, *Baugatal*, which was incorporated in the Icelandic law-code *Grágás*, that coins are linked to the øre as the basic unit of account (Karlsson et al. 1992:455–6). *Baugatal* is one of the earliest written accounts from Scandinavia on how one should measure an øre and is therefore a crucial source in the present context. The text describes a complex system of compensation for manslaughter which is to be paid by one kindred to another in the form of rings. In the last section of *Baugatal* it is stipulated what the criteria for a compensation ring of silver being regarded as an acceptable object of value at the *thing*:

Það er silfur sakgilt í baugum, og svo í þökum og þveitum, er eigi sé verra heldur en var lögsilfur hið forna, það er tíu penningar ger eyri, og meiri sé silfurs á en messingar og þoli skor og sé jafnt utan sem innan. (Konungsbók 113).

The silver valid as atonement in rings, and in supplements and bits, is such as is no worse than the ancient legal silver was with ten pennies making an *eyrir* (author's translation), looking more like silver than brass, standing up to the test of a cut and of one quality inside and out. (Trans. Dennis et al. 1980:183).

The reliability of *Baugatal*, which was written down in the 12th century in order to represent the current legal organization of Iceland, is disputed. The payment of rings extends to the fourth generation between kindreds. A number of historians have consequently rejected the value of *Baugatal* as a credible source (Sawyer 1982:44–5; Miller 1990:144–5). Although the complicated arrangements for compensation that *Baugatal* expresses can be questioned over matters of detail, there is sound archaeological evidence for the same practices for the valuation and checking of the silver content of rings, and also coin and hacksilver. The purity and consistency of silver were tested by cutting into the metal with a knife (Kilger 2006b). There are examples of silver rings having been forged by putting a thin coat of silver over a copper core (e.g. Stenberger 1958:233–4). And there are several examples of silver in rings and ingots having been alloyed with other metals (e.g. Arrhenius et al. 1973; Kruse and Tate 1992). This section of *Baugatal* on *lögsilfur hið forna*, “the ancient legal silver”, therefore in all probability describes a current practice for assessing the weight, purity and consistency of the old legal silver (Hatz 1974:100). In my view, this section is most unlikely to be a fiction of the 12th century, but rather reflects a detailed knowledge of the use of silver in the Viking Period. This may change our view of the whole of *Baugatal* and put its

compensation arrangements in a more credible light.

However, let us take a closer look at the øre that are referred to in the text. For the øre to gain legal force, it had to consist of a specified number of pennies. This is stated in the formulaic expression “pen-ninar ger eyri” (Engeler 1991:152). The *aurar*-convention as it is described in *Baugatal* differs in one fundamental way from the Roman and Merovingian *uncia*-unit. Instead of 6 or 20 gold coins it is to consist of 10 silver pennies. Here we have yet another calibration rule for the production of an øre. According to Brøgger, the earlier Scandinavian øre of the Early and Late Iron Age weighed between c. 26 and 27 g, and the later øre around 24 g. This means that these pennies should weigh some 2.4–2.7 g each. No silver coins that heavy were ever struck in Western Europe between the 8th century and the beginning of the 13th century. The pennies that *Baugatal* was able to refer to, however, which match this weight per coin, were in all likelihood Islamic dirhams, silver coins from the Islamic Caliphate, which began to circulate in large quantities in Scandinavia at the end of the 9th century (Hatz 1974:90; Kilger, this vol. Ch. 7.8). This is yet further evidence that the compensation arrangements in *Baugatal* may go back to the Early Viking Period.

In order to be able to trace the way in which the *aurar* measure was established in Scandinavia, and when, we need to go back to the archaeological evidence in the form of weight-sets and rings, and the numismatic evidence of coins. In the following sections I examine how *aurar* were manifested as the standard in the corpus of weights from Southern Scandinavia and the North Atlantic in the Norwegian Merovingian Period and Viking Age. I shall apply the *aurar* principle to a Viking-period ring hoard from Trøndelag. This metrological survey is an essential basis for approaching the conventions concerning payment which I believe may have been present in Kaupang.

### Evidence of weighing practices in the Norwegian Merovingian Period

The few weight-sets of the Early Iron Age known from Norway show that gold was weighed according to units that followed the Merovingian ounce-standard of the Continent. The well-preserved set of weights from Bråten in Ringerike may show us how gold was reckoned in larger and smaller units.<sup>23</sup> The set consists of ten copper-alloy weights. Detailed examination has shown that all of the heavier weights relate to a basic unit of 1.32 g (Tab. 8.4). This unit corresponds approximately to the weight of the reformed Frankish gold tremissis (Steinnes 1927:15). At the end of the 6th century the monetary system of the Merovingian kingdoms was changed with a shift from the Roman siliqua to the Frankish grain-standard (see above, pp. 265–6).<sup>24</sup> It was this monetary development in the Merovingian coin-system that

we can see directly reflected in the Bråten weight-set. There is another piece of evidence supporting this. The Frankish and Visigothic coins issued after c. AD 580 made very deliberate use of a new range of symbolism. The Roman goddess Victory was replaced by a free-standing cross (Fig. 8.1; Grierson and Blackburn 1986:92; Grierson 1991:14–15).<sup>25</sup> All of the weights from Bråten that have a punched wheel-cross are correlated by weight with the Frankish tremissis (Fig. 8.9). It is likely that a tremissis marked with the cross was the original reference point for the calibration of the heavier weights in this set at intervals of 20, 40 and 60 units (Nos. 7–9).<sup>26</sup> The remaining weights in the Bråten set respect with minor discrepancies the carat-unit of Roman-Byzantine gold coins (Nos. 1–4) and the grain-unit of Frankish gold coins (Nos. 5–6). The heavier weights from Bråten were used to measure larger quantities of gold in terms of ounces. The much lighter weights were probably

20 The Roman uncia should weigh 27.24 g (6 x 4.54 g). A solidus of 4.54 g is defined by siliquae or carats (24 x 0.189 g). The lighter Frankish uncia that was standardized in the Merovingian kingdom had a nominal weight of 26 g (20 x 1.3 g). The smaller Merovingian tremissis of 1.3 g is defined by barley-grain standard (20 x 0.065 g) (Withöft 1985:402).

21 The familiar armrings of Hiberno-Norse type seem to respect a modular unit of 26.15 g (Sheehan 1998:178–9). These armrings are dated from the middle of the 9th century to c. 930/940 (Fig. 8.11). The large assemblage of weights from the excavations in Dublin has produced a broadly similar module of 26.6 g (Wallace 1987:206–7). These Irish weight-units correspond to the module of 26.4 g that Brøgger has identified as the early Scandinavian øre (1936:79).

22 Attempts have been made to explain this feature of the Old West Norse linguistic zone — which is, however, also evidenced in Old East Norse — by postulating that when the word was borrowed into Proto-Old Norse there may have been a desire to distinguish between the singular and a distinct plural form (Kock 1911–1916:151). The singular form *eyrir* evolved from a Proto-Old Norse \**auriaR*, which in turn derives from Latin *aurius/laureus*. The plural form found in our sources, however, *aurar*, preserves an original Proto-Old Norse \**auroR* (Engeler 1991:128–9).

23 C525.

24 Rather than 8 siliquae, a Frankish tremissis weighed 7 siliquae or 20 grains (barley grains) according to the new measure of coin-weight (Grierson 1991:26).

25 Anglo-Saxon gold shillings also make use of the cross-motif when the independent minting of those commences in the second quarter of the 7th century (Grierson 1991:26).

26 In the Anglo-Saxon weight-set from Gilton referred to above, there is one weight that is close to the Merovingian tremissis-standard marked with a punched cross (marked A on Fig. 8.2). This weight weighs 1.27 g (Kyhllberg 1980:164 and 167).

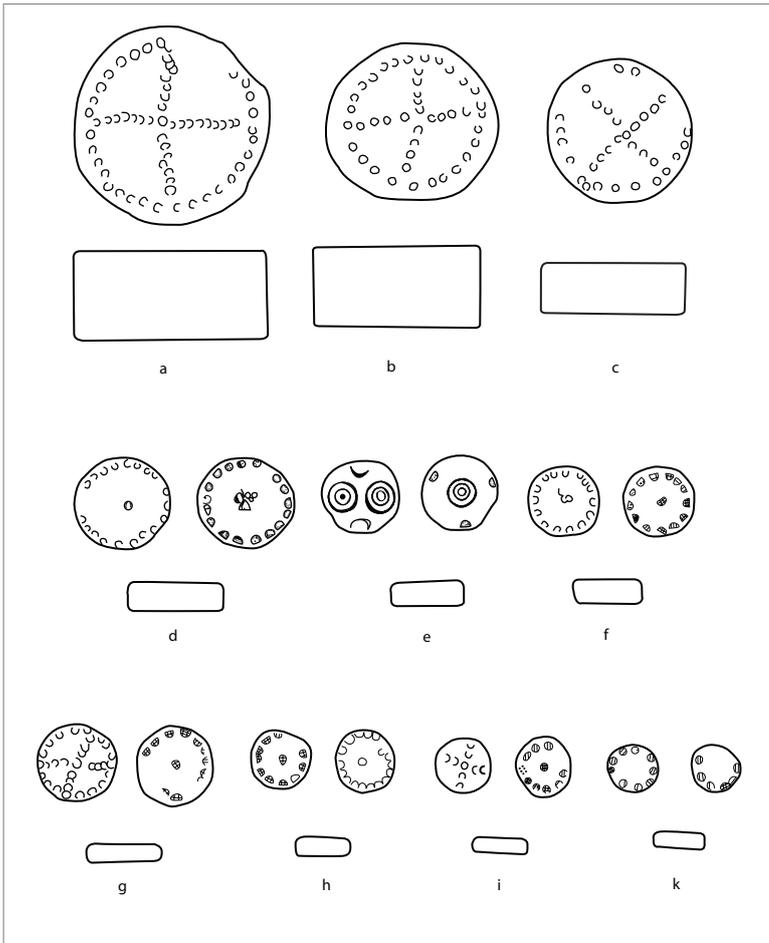


Figure 8.9 The set of weights from Bråten.  
After Brøgger 1921:fig. 3.

Figure 8.10 Lead and pewter weights from the set from Kiloran Bay, Colonsay, Scotland. Photo, The Trustees of the National Museum of Scotland.

used to calculate and compare the weight of different gold coins with one another.<sup>27</sup>

If we accept Bråten as a representative find, several conclusions follow. To begin with, *aurar* as units of reckoning cannot have been introduced before the end of the 6th century. The introduction of this weight-unit in Scandinavia may perhaps be linked to the custom of precise weighing that is so clearly evident in the grave finds of the Eastern Frankish and Anglo-Saxon lands of the 6th and 7th centuries (Werner 1962:327, fig. 15; Scull 1993). Secondly, the *aurar*-modules correspond to 20 Frankish tremisses (Steinnes 1927:15–16). This vigesimal system is also referred to in several written sources from the early 7th century which describe the exchange rates between coin-units and weight-units.<sup>28</sup> Finally, the *aurar*-module was not based upon Roman denarii as Brøgger (1921:17–23) assumed, but was rather calibrated against the lighter, cross-marked gold coins that were struck in the Germanic kingdoms.

It may be more than mere coincidence that the only gold coin that has been found in Kaupang is a Frisian tremissis struck in Dorestad around the year 650 (Blackburn, this vol. Ch. 3.3.3, Fig. 3.18.b; Rispling et al., this vol. Ch. 4:No. 5). This coin weighs 1.25 g, but since it has a little damage on the edge the original weight may have been a bit more, possibly as much as 1.3 g. The Madelinus coin is unworn, and was probably never in circulation. Up to now, eight examples of Merovingian gold tremisses have been recorded in Southern Scandinavia, seven of which are from Jutland alone (Hatz 1981). The distribution of the finds follows the North Sea coast from the island of Föhr northwards to the Limfjord. The gold tremissis from Kaupang is the only specimen outside of Jutland, and the northernmost found hitherto. In the same way as gold tremisses may represent contacts between Southern Scandinavia and the Mero-

	Carat/silique (á 0.189 g)			
	Roman-Byzantine solidus			
1	0.985 g	0.196 g x 5	dots	
2	2.926 g	0.195 g x 15	"	
3	3.654 g	0.183 g x 20	circles	
4	5.481 g	0.183 g x 30	dots	
	Barleycorn (á 0.065 g)			
	merovingian tremissis			
5	1.327 g	0.067 g x 20	cross	
6	2.626 g	0.066 g x 40	"	
	Merovingian uncia		cross	
7	26.319 g	1.315 g x 20	"	1 <i>eyrir</i>
8	53.095 g	1.327 g x 40	"	2 <i>aurar</i>
9	79.319 g	1.322 g x 60	"	3 <i>aurar</i>
	Unit ?			
10	2.227 g			

Table 8.4 The set of weights from Bråten, Norway. The metric weight-measurements are as given in the first publication from 1832 (Kyhllberg 1980b:168).



vingian kingdoms in the 6th and 7th centuries (Blackburn, this vol. Ch. 3.3.3, Fig. 3.19), we cannot reject the possibility that they also came to be used as prototypes for calibration in the production of Viking-period weight-sets. Knowledge of the fact that people used gold coins marked with the cross to produce weight-sets according to the *aurar*-standard may have lived on in Kaupang in the 9th century. So it is to the 9th century that we now turn. How were weight-sets of the Early Viking Period calibrated?

#### Weights with mounts and armrings with a cross

In order to demonstrate the function of coins as calibration models, let us take a closer look at the weight-set from a richly furnished male grave at Kiloran Bay on the island of Colonsay, Western Scotland (Fig. 8.10; Grieg 1940:46–60). This contained both lead and tin weights with metal mounts that are very common in Norwegian Viking-period finds and in the areas of Scandinavian settlement around the North Sea. The weight-types from Colonsay show the typical application of metal mounts on the surface of the object. Similar weights have been found at Kaupang (Pedersen, this vol. Ch. 6.4.4). At Kiloran Bay there were also two weights with imitation writing reminding one of Arabic lettering, while the smallest weight is a knob from a penannular brooch of Finnish type (Kyhllberg 1980b:173). The grave also contained three Northumbrian stycas, one of which was struck in York under Archbishop Wigmund, who held this office from 831–854 (Brøgger 1921:79; Grieg 1940: 58–9). The grave is therefore to be dated to the second half of the 9th century, which is consistent with the other artefacts it contained.

The weights from Colonsay seem to be calibrated

according to a simple scheme of reckoning that corresponds to approximately 10, 20, 30, 40, 50, 60 and 100 units of a coin module between c. 1.24 and 1.31 g (Tab. 8.5). The brooch-knob that is the smallest weight, weighs 12.94 g, which may mean that a coin weighing c. 1.29 g was used as the minimum building block (Kyhllberg 1980b:154).<sup>29</sup> This set, very probably, does not display the original precision that was aimed at when weight-sets were produced.<sup>30</sup> My point here, however, is that a coin was used in the production of these weight-sets, for which reason it was impossible to produce absolutely equal weight-sets. All sets of

27 Only weight no. 10 cannot be related to reckoning in terms of gold coin.

28 The earliest Anglo-Saxon law-code which was formulated under King Æthelberht of Kent in the year 603 specifies that the gold-unit – the shilling – consists of 20 sceattas (Grierson and Blackburn 1986:15). The Visigothic bishop Isidore of Seville states in his *Encyclopedia*, probably written in the 620s, that the exchange rate amongst the Gauls between the ounce and the denar was supposed to be 1:20 (Brøgger 1921:96–7; Kyhllberg 1980:153).

29 The weights had been produced at regular intervals based upon a module of c. 12.94–12.96 g (Kyhllberg 1980:173). The brooch-knob was probably used to calibrate the remaining weights. Kyhllberg has suggested that the brooch-knob exactly represents the weight of 200 grains at the Merovingian grain-standard.

30 The deviations from the basic module of 12.94 g in weight nos. 3 and 4, 1.7 and 2.2 g respectively, amount to c. 4.5%. This margin of error was presumably acceptable in the Viking Period when larger quantities of silver were being weighed (Sperber 1996:115–17, fig. 3.5; Steuer 1997:116).

weights are individual. The specific *aurar*-module in each weight-set could fluctuate by a tenth of a gram depending on how much the coin weighed, and what sort of coin had been used: in other words, what conventions were in force when the set of weights was produced.

The same types of weights with gilt metal appliqués as those from Colonsay are found all around the North Sea in the Viking Period, from Norway in the East to Ireland in the West. The principal area of distribution in Norway is along the western coast where such items are primarily found as grave goods (Pedersen, this vol. Ch. 6.4.4, Fig. 6.41). In this connexion we should also note that silver armrings, which first appear during the 9th century in the North Sea zone, seem to have been adjusted by weight to the *aurar*-unit. Amongst the most typical Viking-period armrings in Norway are what are known as decorated Hiberno-Norse broadband armrings (Sheehan 1998: 177–81), which usually have punched transverse strips and a cross (Fig. 8.11). The distribution of these is largely limited to Ireland, the Viken area, and the North Sea coast of Norway. John Sheehan (1998:178) dates the active period of production and use of broadband armrings to c. 850–930/40. As Patrick Wallace has pointed out, this type of ring and the weights from Dublin respect approximately the same weight-standard. The usual Hiberno-Norse armrings follow a weight module of around 26.15 g (Sheehan 1998:178–9), and the weights centre around 26.6 g (Wallace 1987:206–7 and 212). These correspond to multiples of twenty of a coin-weight at 1.3 and 1.33 g respectively. That is slightly heavier than the coin-unit that was found in the weight-set from Kiloran Bay, Colonsay.

On the Hiberno-Norse armrings the cross symbol is conspicuous (Fig. 8.11). The cross need not be understood exclusively as a Christian symbol but may also indicate that the rings were standardized by weight in relation to a coin marked with a cross. It is possible that Anglo-Saxon pennies carrying the cross from the first half of the 9th century will have been used as the calibration prototypes.<sup>31</sup> But the weight of

pennies was not as finely maintained as that of the Merovingian gold coins (see above, p. 269). Two pennies marked with the cross struck for Coenwulf of Mercia in the early 9th century have been found in Kaupang (Blackburn, this vol. Ch. 3.1.1 and 3.3.2, Fig. 3.17.a; Rispling et al., this vol. Ch. 4:Nos. 9–10). Rather than pennies, it was first and foremost gold coins carrying the cross, such as the Merovingian tremisses, that maintained a very consistent weight. People were presumably still aware of this in the early Viking Period when weight-sets had to be made. The 7th-century Frisian gold tremissis from Kaupang could therefore be interpreted as a calibration coin for a silversmith whose workshop was in the town. Only one coin was needed to produce a complete set of weights.

### Looking for *aurar* in ring hoards

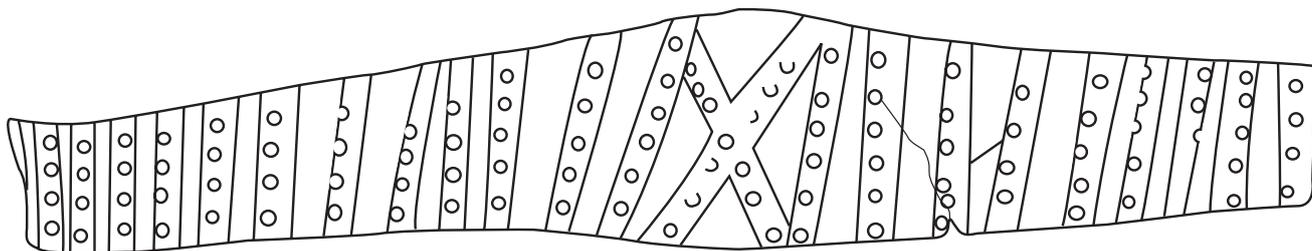
Metrological analysis of the weight-set from Kiloran Bay, Colonsay, shows that precious metals were handled in larger quantities in accordance with the *aurar*-reckoning. The heaviest weight in the set weighed around 129 g, which corresponds to about 5 øre reckoned by a module of 25.8 g. But there is evidence for even heavier weights, such as one well-preserved specimen with an Insular mount from Berg, Hurum, South-Eastern Norway.<sup>32</sup> This weighs 294.8 g, corresponding to 11 øre at a module of 26.8 g (Pedersen 2000:76–7, this vol. Ch. 6.4.4, Fig. 6.41.a). In her study of the Kaupang finds, Unn Pedersen argues that the Viking-period weights with gold inlays or gilt appliqués may have been used in weighing gold (this vol. Ch. 6.4.4). This is highly plausible, although the association with gold may also allude to a higher level and more abstract level, namely that the gold-mounted weights establish an association with the coined gold-based *aurar*-standard. More than anything else it is the Viking-period gold neckrings that seem to have been calibrated to that standard (Brøgger 1921: 40; Skovmand 1942:72; Hårdh 1996: 160–1). As an example we can take the gold neckrings from the Hoen hoard (Graham-Campbell 1999:64) or the largest Viking-period gold hoard that was found in Sweden on the island of Grönsö near Birka. The Grönsö hoard consisted of two massive gold armrings linked together by a gold peg (Zachrisson 1998: 238–9). Altogether the hoard weighed 528.7 g, corresponding to exactly 20 øre at a module of 26.4 g (Kyhberg 1980b:156). It thus seems reasonable to infer that the large lead weights may have been used for weighing gold rings.

But the question arises whether or not the *aurar*-standard was also used for weighing and calculating silver rings? In the case of the armrings of the Hiberno-Norse type, referred to above, or the Oriental spiral-twisted Permian neckrings, there seems to be a consensus that these were standardized by weight (Munksgaard 1963:101–4; Lundström 1973:76–7;

		coin-weight		<i>aurar</i>
1	12.94 g	1.29	x 10	½
2	25.11 g	1.25	x 20	1
3	37.11 g	1.24	x 30	1 ½
4	49.56 g	1.24	x 40	2
5	65.73 g	1.31	x 50	2 ½
6	77.32 g	1.28	x 60	3
7	129.30 g	1.29	x 100	5

Table 8.5 *The set of weights from Kildoran Bay, Colonsay, Scotland (Kyhberg 1980b:173).*

Figure 8.11 *Armring of Hiberno-Norse type. Slemmedal, Aust-Agder C36000 (t.p.q. 914). (Blindheim 1982:18, fig. 12).*



Sheehan 1998:178–9). In the case of other groups of Viking-period neckrings, however, any such standardization is less easy to detect in comparative metrological studies, and thus less probable. However it is not proper to exclude the possibility that different regional scales of calibration may have existed, as Hårdh has indicated (1996:59–65). We shall now take a closer look at the so-called plaited and multi-rod neckrings that start to turn up in hoards at the end of the 9th century and are amongst the largest types of silver ring of the Viking Period (Fig. 8.12; Graham-Campbell 1999).<sup>33</sup> This type of neckring is very common in Norwegian hoards where it is usually deposited with no associated coins. It is only in hacksilver finds that coins and rings appear together. The plaited neckrings are also represented all around the Baltic Sea zone and in most regions of Scandinavia (Hårdh 1996:42–3, fig. 2).<sup>34</sup> Fragments of rods for plaited arm- or neckrings have also been found amongst the material from Kaupang (Hårdh, this vol. Ch. 5.8, Fig. 5.14). Analyses of the finds indicate that the multi-rod neckrings may have been manufactured in the same region they were deposited in (Hårdh 1996:76). Birgitta Hårdh argues that the rings may have had a short period of use in Norway, from the end of the 9th century into the 10th (1996:67–8). Further east this type of ring may be considerably later; as in Finland and the Baltic states, where it is dated to the 12th and 13th centuries (Hårdh 1996:80–1; Spangen 2005:41).

In contrast to the spiral-twisted neckrings of Oriental type such as those known as Permian rings, the multi-rod neckrings do not really constitute an equivalent corpus of carefully weighed items. There are indications, however, that even these may have been calibrated according to specific units of weight. As Hårdh (1996:59–60) points out, several rings from single hoards seem to have been weighed to an approximately common module. To be able to detect this, we need to convert weights in grams to coin-units. I shall demonstrate this using the neckrings from Vulu, Malvik, near Trondheim (Fig. 8.12; Hårdh 1996:195–6). These neckrings appear to have

been weighed in terms of two different *aurar*-modules. The heaviest rings may have been weighed in terms of a module of c. 25.69 g at 11 and 22 øre. In this case a set of weights that were calibrated against a coin of 1.28 g may have been used. The other four silver rings were weighed almost exactly, but had been calibrated according to a slightly heavier *aurar*-module between c. 26.23 and 26.47 g (Tab. 8.6). Beyond this there seems also to have been reckoning in half-øre. The occurrence of half-øre weights can also be observed in the weight-sets from Bråten and Colonsay (Tabs. 8.4–5).

The hoard from Vulu is but one, as yet, of a few cases of ring hoards in which the *aurar*-module can be so clearly found. A survey of Birgitta Hårdh's catalogue of other Norwegian hoards containing silver neckrings does not produce the same results in terms of calibration (Hårdh 1996:192–6). This may indicate that the rings circulated through several different stages and were mixed together before ending up in a particular hoard. In such circumstances a common *aurar*-module becomes harder to distinguish. A clear pattern of calibration seems to emerge only when the ring hoards contain several specimens that had been

31 The weight-standard of Anglo-Saxon pennies apparently observed the Troy grain-unit. The weight of the penny rose successively from 18 to 21 grains in the period from c. 760/70 to 880; i.e. from 1.17 to 1.36 g (Grierson and Blackburn 1986:270, cat. nos. 584–8, pls. 53–4).

32 Copenhagen CM XXX–XXXII.

33 Typical of this type of ring is that it consists of at least two or more rods which are twisted together or plaited. The ring could be fastened with the help of hooks and eyes. The fastening mechanisms show great variation in form but appear to be standardized (Hårdh 1996:45, fig. 4). The fastening mechanisms have been used to create a regional subclassification of this otherwise highly uniform type (Hårdh 1996:45–53, 78–83, fig. 19).

34 Concentrations of this type of ring in hoards are found particularly in Vestfold, Agder, South-Western Norway, Trøndelag and North Norway (Hårdh 1996:figs. 2 and 16).



manufactured in one workshop using the same weighing equipment. What Vulu may also be an example of is that the absolute value of the *aurar*-module in grams was governed by the weight of the coin that was used to calibrate the set of weights. The standardization of rings by weight is consequently difficult to confirm if one only uses the modern metric scale in studying them. In other words, metrological analyses of both weight-sets and rings need a methodology that is able to reveal the pattern of calibration at the foundations of coin-based *aurar* reckoning. Nonetheless it emerges clearly that the silver rings do not represent the same clear pattern of calibration as the gold rings. On the other hand it is inappropriate to exclude the possibility that the silver rings were also regarded, in their original circumstances, as being of standard weights. As I shall show later, the weight of any particular ring could be deliberately changed after it left the workshop. In written

sources the silver ring is described in its character as the payment ring at the *thing* as a “public” object (*Grágás*, trans. Dennis et al. 1980:175). The weight of the ring could be increased by attaching further silver rings to it, or it could be divided into smaller portions after it had publicly been handed over to the party to the case (below, pp. 315–16). But the great variation in weight amongst the Scandinavian silver rings may have yet another cause, namely the existence of yet another tradition of calibration using coin, which was apparently found alongside the *aurar* standard. This is what we shall examine in the following section.

#### Dirhams as weights, and *grivnas*

At the end of the 9th century a new group of silver coins began to dominate the circulation of silver throughout Scandinavia. These were the Islamic dirhams, which had the same impact in terms of establishing confidence in the weighing and valuing of silver as the Western coins marked with the cross. The dirham formed part of a system of reckoning that followed a different tradition of calibration than that of the Merovingian gold tremisses and Anglo-Saxon silver pennies. Like the gold tremisses these were very consistent in weight, and in the Caliphate state coin-weights made of glass were used to check the weights of the dirhams (Fig. 8.15; Balog 1976, 1980). In the Icelandic *Baugatal* already referred to, it is stated that 10 pennies make up 1 *eyrir* (see above, p. 283). This really can only refer to the heavier silver dirhams which may have been used as coins for calibration. But was there really another system of reckoning

silver neckrings	<i>aurar</i> -module	coin-unit	<i>aurar</i>
1. 158.34 g	26.39 x 6	1.32 x 120	6
2. 211.8 g	26.47 x 8	1.32 x 160	8
3. 236.64 g	26.29 x 9	1.31 x 180	9
4. 327.99 g	26.23 x 12.5	1.31 x 250	12½
5. 282.43 g	25.69 x 11	1.28 x 220	11
6. 566 g	25.69 x 22	1.28 x 420	22

Table 8.6 *Plaited silver neckrings, Vulu, Malvik, Trøndelag (Hårdh 1996:195–6).*

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Figure 8.12. Silver neckrings: plaited with triangular terminals. Vulu, Malvik, Sør-Trøndelag. Hårdh type 3. Photo, Birgitta Hårdh.

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alongside the *aurar*-system for weighing silver in larger and well-proportioned units during the Viking Period? Can we find archaeological evidence of this possibly Eastern coin-based method of reckoning and valuation? In my opinion there are several pieces of evidence for this.

In the harbour basin at Hedeby, immediately adjacent to the wharves, 9 die-identical Abbasid dirhams struck in the year 807/8 in Baghdad under Caliph Harun al-Rashid were found in 1980. These were not made of pure silver but were rather made in a tin-lead alloy. Traces of a casting sprue around the end – in the same place on five of these coins – show that a single coin had been used as the model. These, then, are copies of a single Abbasid dirham (Steuer 2002: 155–7). That all these copies are identical and come from the same stratigraphical context also shows that they were made, and perhaps also used, in Hedeby. A number of scholars have considered these copies to be forgeries (Steuer 2002:158–9; Gustin 2004c:172–3). There are several cases of coin-forgery in other Viking-period finds (Gustin 2004c:173). The purpose of the Hedeby copies was doubtless fraudulent, to pretend that these were genuine dirhams. But in my view, pseudo-dirhams are not forged coins in a monetary sense. The pewter dirhams were probably not used as currency in Hedeby. The attempt to deceive may have been enacted in a quite different way.

During the same excavations that uncovered these copies, five genuine dirhams were found.<sup>35</sup> These included an early, complete Abbasid dirham struck in the year 803/4 under Harun al-Rashid in Baghdad, three Samanid dirhams struck at the beginning of the 10th century, two of which were in fragments, and one unidentified coin-fragment. It is not immediately apparent from the preliminary account of the finds how close these coins lay to one another in their stratigraphical contexts. It is, however, entirely reasonable to assume that the nine copies were

lost together by the wharf on a particular occasion (Steuer 2002:158).<sup>36</sup> I believe that this circumstance offers a fine opportunity to see how silver was handled in the Viking Period. Rather than nine different forged coins there could have been a complete set of weights which originally consisted of ten pieces. In that case the set would fulfil the requirements of *Baugatal*, in which 10 pennies would make 1 *eyrir* (see above, pp. 282–3). Just like the gold tremissis, so too the dirham could, in the Viking Period, have been regarded as a guarantee of value when weighing. The early Abbasid dirhams down to the reign of Harun al-Rashid are very consistent in weight.<sup>37</sup> But the trust enjoyed by dirhams as markers of quality was abused in this case. The average weight of the Hedeby copies is much lighter than genuine dirhams, 2.29 g rather than the current norm in the Caliphate between c. 2.7 and 2.9 g (Welin 1958). Altogether, the copies weigh 20.57 g. But what has become of the tenth coin?

It is difficult to decide whether or not the genuine and complete coins such as the early Abbasid dirham or one of the Samanid specimens was part of the set originally. The Abbasid dirham was not found in its original stratigraphical context but only later during sieving. Interestingly enough, this coin too, like the copies, is much lighter, weighing only 2.26 g, which is very unusual. If this coin was part of the original assemblage the whole set would only have weighted 22.83 g. The Samanid dirham that is the other possible candidate was struck in the year 894/5 in Shash. According to the preliminary publication of the find it was found together with a fragment in approximately the same area as the copies (Wiechmann, in prep.). This coin, which weighs 4.0 g, belongs to a later phase in coin-production in the Caliphate, when the average weight of the dirham was heavier and less consistent than with earlier Abbasid issues.<sup>38</sup> If we add this coin to the copies the whole set comes to weigh 24.57 g. If, then, the pseudo-coins from Hedeby are an example of deceit, the nature of the

35 My thanks to Dr Ralf Wiechmann who has kindly supplied me with a list of coins, with information on weight and context, for my use. This list of finds will be included in his forthcoming publication discussing the use of coin in Hedeby (Wiechmann, in prep.).

36 However even the copies do not appear to have lain in a single group but rather were spread through more than one layer (layers III–IV) and grid-unit (G42–44 and D26–28: Wiechmann, in prep.). Coins which may originally have lain together, for instance in a purse, can later be dispersed over a wider area. Supporting this is the fact that the objects had lain both in water and silt for a long period of time, and were subject to wave-movement.

37 See below, note 39.

38 See below, note 39.



Figure 8.13 Abbasid dirham. Caliph Harun al-Rashid. 786–809. Madinat al-Salam 193 (808/9). 2.8 g. From *Stora Vellinge I* (1936), Gotland. Private ownership. Scale 3:1. Photo, Kenneth Jonsson, Stockholm University.

fraud lay rather in pretending there was a larger quantity of silver on the scales than was actually there. The quantity of silver that the other party would have expected should have weighed something between 27 and 29 g, which would correspond to the weight of ten complete dirhams if we work from the earlier Abbasid dirham standard.

That it apparently was the practice at larger trading sites to use the dirhams themselves as weights in weighing silver in larger quantities is also shown by the latest coin finds from Kaupang. The majority of the 92 dirhams from Kaupang are cut or broken coins. Amongst these, however, there are eight early Abbasid dirhams that are whole (Rispling et al., this vol. Ch. 4:Nos. 23, 26, 32, 37, 38, 39, 40 and 44). Four of these were apparently perforated or folded and so are excluded (Tab. 8.7).

As in the set from Hedeby, the coins from Kaupang were struck under the early Abbasid caliphs, principally in the reign of Harun al-Rashid (786–809) in Madinat al-Salam and al-Muhammadiyya, nowadays Baghdad and Tehran. Like the Merovingian gold tremisses, the dirhams derive from a strictly regulated monetary system, and the weight of the coins was of immense importance in the economic system of the Caliphate. The weight of both the gold dinars and the dirhams was checked by means of *exagia*: state control weights (see below, pp. 302–3; Fig. 8.15). It was possible to check the weight of individual coins to a very fine degree (Steuer 1978:257). The Arabic

coin-weights were made of glass, and later also of brass (Balog 1976). The average weight of dirhams changed a little in the course of the Viking Period while at the same time different regional weight-standards were employed within the Caliphate.<sup>39</sup>

It is possible that the monetary situation within the Caliphate is also reflected in the use of dirhams as coin-weights in Hedeby and Kaupang. It is only dirhams that maintain a consistent weight and which respect Caliph Abd al-Malik's original weight-standard that were certainly used in this way. Obviously people could not read the texts on the coins, but the early Abbasid dirhams, down to the end of Harun al-Rashid's issues, were easily recognized. All of them have ring symbols or annulets in the outer ring on the coin-face (Fig. 8.13). These annulets can still be traced early in the reign of Caliph al-Mamun (813–833). They are depicted on dirhams which were minted until the Hijrah date 204, which means the years 819/820. After that they disappear as an element of decoration (e.g. Leimus 2007:pls. 21–23).

The reason why it was specifically Harun al-Rashid's dirhams from Baghdad and Tehran that were selected as coin-weights is also that they are amongst the most common 9th-century dirhams in Scandinavian finds. Other than the Hedeby copies, and texts such as *Baugatal*, we have no concrete evidence of this method of valuation. Dirhams were probably not used to calibrate the Western, Viking-period weights of lead or pewter with appliqué. This

23.	al-Mahdi	Madinat al-Salam	779/780	2.33 g	corroded
38.	Harun al-Rashid	Madinat al-Salam	804/05	2.30 g	damaged
39.	Harun al-Rashid	al-Muhammadiyya	804/05	2.83 g	
40.	Harun al-Rashid	al-Muhammadiyya	804/05	2.49 g	corroded

Table 8.7 Whole dirhams from Kaupang (Rispling et al., this vol. Ch. 4).

obviously cannot be entirely ruled out until a greater number of such weights have been examined in light of this question. Patrick Wallace's investigations (1987:212) of the finds from Dublin show at least that the Western weights remain on the whole approximately centred on the earlier *aurar*-module of c. 26.6 g. The same basic unit was also observed by Brøgger (1921:80) in his study of the lead weights with metal mounts in Norwegian finds.

When dirhams start to predominate in the silver in circulation in the last quarter of the 9th century, as was the case at Kaupang (Kilger, this vol. Ch. 7.9), yet one further practice for reckoning and valuing a quantity of silver besides the Western *aurar* weight-sets apparently came into use. The coins themselves were used as the means of valuation. The dirhams were then the smallest unit for the production of silver rings to standardized weights. Here we may see an Eastern European tradition of calibration according to which silver was reckoned in bigger units (Hårdh 2007). This is probably reflected in the Arab envoy Ibn Fadlan's account of his meeting with Russian merchants in the 920s at the Volga Bulgars' capital of Bulgar. The Russian traders earned large sums in dirhams which they converted into neckrings and gave as gifts to their wives.<sup>40</sup> A neckring was produced every time the merchant had earned a sum of 10,000 dirhams; two rings from a sum of 20,000 coins; etc (Montgomery 2000:6–7). However no information is provided on how many dirhams were included in each ring. What is interesting is that the multiple of 10 appears here as a fixed unit of quantity in terms of which people counted the number of dirhams they had made.

This Eastern ring tradition was probably the basis of the Russian weight-unit *grivna*, which etymologically has its roots in the Slavonic languages and can be translated as "ring" (Hårdh 2007:141–2). The *grivna* is an Eastern European counterpart to the Scandinavian ring *baugr* (Pritsak 1998:41).<sup>41</sup> The *grivna*, like the *baugr*, was a symbol of personal wealth and eminence, characterizing its possessor. With the Eastern tradition in which the dirhams themselves were used as calibration prototypes and in which people apparently began to calculate the øre in terms of ten coins, the *aurar* weight-unit was raised from c. 26.5 g to a value between 27 and 29 g. In certain cases, such as the clump of melted dirhams from Kaupang (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1), we cannot entirely exclude a value around 30 g. The clump of coins that was found in Kaupang consisted of dirham-fragments and weighed 29.81 g (Blackburn, this vol. Ch. 3; Rispling et al., this vol. Ch. 4:No. 102). Taking dirhams not only as prototypes for calibration but as representing, at the same time, an Eastern calibration tradition, we establish a way of understanding the variation in weights in the corpus of Scandinavian rings.<sup>42</sup>

Examination of the weight-sets from Bråten and Colonsay, the dirham finds from Hedeby and Kaupang, and the ring hoard from Vulu, has yielded indications of the existence of two forms of calibration in Scandinavia during the Viking Period in which coins were used as the calibration prototypes: on one side the *aurar*-standard and on the other the Eastern, dirham-based, *grivna*-standard. The *aurar*-standard had apparently been employed since the Norwegian Merovingian Period to weigh gold in exactly equal portions; later, in the Viking Period, for weighing silver too. I have also argued for the conceptual and metrological linkage of objects of standardized weights, such as rings, weights and coins. The handling of precious metals was thus calculable and subject to reckoning in the same way as coins were in monetized societies. Thus *aurar*-objects fulfilled the same essential requirement that is definitive of the position of money as a standardized form of currency. But why were *aurar*-objects regarded as of value? Why were they accepted as media of value and valuation in societies that had no strong central authority? In order to be able to answer these questions, we need to look more closely at the gold ring and how it has been described in Old Norse mythology.

39 Exagia, which were introduced with every change of ruler, reflect both these changes and the regional variation in the weight of the dirham. Up to around the 830s, when the earlier Abbasid period of minting ends, the dirham weighed on average 2.7–2.9 g. An analysis of Umayyad and early Abbasid glass weights has yielded a value between 2.72 and 2.82 g (Welin 1958:510; Fig. 8.15). After c. 833 a new phase of Abbasid coining began. The quality of minting deteriorated visibly and the weight of the dirhams became less consistent (Miles 1965:319). In the 10th century dirhams can weigh up to about 3 g. This is also consistent with the weight of Fatimid glass exagia from Egypt of this period (Welin 1958:510).

40 James E. Montgomery's translation, which attempts to keep as close as possible to the expressions of the original text, refers to necklaces rather than neckrings.

41 The word *grivna* was subsequently used in 12th-century Russia for ingots of normalized weight, e.g. the Kiev *grivna* and Novgorod *grivna* (Melnikova 1996:68–72).

42 I have not discussed the manifest standardization by weight of the Oriental spiral-twisted neckrings of the Permian and Duesminde types. The basic module for these rings of 25–26 g is a little lighter than the *aurar*-module. It is possible that North African dirhams struck in the 8th century served as the calibration prototypes for this type of ring (Kilger, this vol. Ch. 7.3). In Egypt, a lower standard weight was employed for dirhams than in the rest of the Caliphate (Miles 1965:319–20). A *grivna*-unit of c. 25 g could be produced using 10 North African dirhams. North African dirhams are very common in Russian finds from the first quarter of the 9th century (Kilger, this vol. Ch. 7.4, Tab. 7.6). This matches the period in which the spiral-twisted neckrings began to circulate in the Baltic area (Kilger, this vol. Ch. 7.4, Fig. 7.11).

**Odin's inalienable property:  
the stable and eternal gold ring**

Just like coins in Christian kingdoms, the ring, the most prominent of the *aurar*-objects, was imbued with transcendental and sacred associations so that it became a symbol of standards and value. The concept of value can only be made concrete by being embodied within an object that can be laden with stories and ideas. In Snorri's *Edda* the gold ring is referred to as a sacred symbol of Norse mythology. Snorri here may provide us with a key that enables us to understand the ring as an object of value in the Northern world of ideas. In *Skáldskaparmál*, Snorri wrote that the dwarf Brokk made a gold ring called Draupnir which he gave as a gift to Odin (trans. Byock 2005:92–3). Draupnir has a special characteristic. Every ninth night the ring increases to a total of eight rings, all of the same weight. This uniformity of weight is expressed by the word *iafnhöfgr*, which appears both in the eddic poem *Skírnismál* and in *Skáldskaparmál* as a poetic way of stating that the rings which dripped off Draupnir were absolutely equal. The number of eight, which is also recorded in another context, is of interest from the viewpoint of the history of weights. This was the relationship between øre and the Scandinavian mark. A mark was always reckoned as 8 øre. This canonical relationship is recorded as early as the agreement between Guthrum and Alfred that established the Danelaw in the late 9th century (Attenborough 1922:103–9). Draupnir ought, then, to be regarded as a mythological representation of the mark as a weight-unit made up of eight parts of equal weight.

Draupnir is a symbol of the power of creation and rejuvenation. It has the quality of reproducing itself at the same weight. In Odin's hands it embodies an eternal status quo, an inexhaustible power of reproduction which always produces the same result. The same idea is also at the root of the weighing of precious metal: namely the ability to create exactly equal portions. In addition to the fertility symbolism latent in the ring's rejuvenating power that a number of scholars have identified (Steinsland 1991:149–51), I believe that this "eternal" gold ring also represents the idea of predictability. The carefully weighed gold ring respecting the *aurar*-standard can thus also be seen as a symbol of rectitude. At the same time, *aurar*-objects such as rings can be quantified and so, just like coins, can be dealt with according to an abstract scale of reckoning. The quantifiability of the ring is furthermore an essential prerequisite for the maintenance of social order in the community. Both documentary sources and archaeological evidence reveal the ring to have been a legal object that oaths were sworn upon and compensation paid in (Brink 1996). It was the all-embracing idea of a divinely sanctioned justice that delivered the sense of security and confidence which is at the bottom of all forms of exchange trade. It was

these general and immaterial associations of value – justice and predictability – that hover over the *aurar*-ring and invest it with an aura of inalienability and so of value. It is also the gold ring that is generally referred to in skaldic poetry, as the kings' most valuable possession that could only be given as a gift to others. However even this invaluable quality had a price put upon it in the Viking Period. The weight of gold rings is often given in the texts in marks (Engeler 1991:125–6). This is also implied by the fact that in Anglo-Saxon documentary sources concerning the Danelaw, such as the treaty of Alfred and Guthrum, marks are given in gold (Engeler 1991:115).

By means of the gold ring, Odin introduced an order of justice. The gold ring was sacred in character to the highest degree, and could not be sold under any circumstances. It belonged to the gods, not to men. This is reflected in the fact that gold was often interred in wetlands and close to water (Hårdh 1996: 134; Zachrisson 1998:117–18). Gold rings are practically never found in normal silver hoards except in special assemblages with outstanding artefacts that relate to the feminine sphere. A very typical example of these "female hoards" is the gold treasure from Hoen, about two days' journey from Kaupang (Kilger 2008). This also contained other objects of unambiguously feminine character, such as glass beads, pendants, and a gold trefoil brooch (Fuglesang 2005: 174–6). The gold rings were not meant for this world and were kept out of circulation. It was through its association with the god Odin that the *aurar*-ring was invested with mythical capital. The divine and carefully proportioned gold ring was the absolute and essential point of reference for the system of value and payment of the Viking Period. It thus imbued *aurar*-objects in silver such as rings and ingots with the necessary associations of value so that they could assume a function as "money". The significance of the ring as a calculable object of value was thus rooted in the world of the gods. The gold ring was the Viking Period's supreme *inalienable possession*.

That Draupnir produced eight further rings of equal weights every ninth night was probably no random detail. Eight was regarded as a sacred number in the Norse conceptual world. It was probably the Old Norse *átt* that is at the root of the number eight. *Átt* is the term for the eighth part of the horizon that the sun passes in the course of three hours. Thus the horizon was considered to be constituted of eight equal parts or subdivisions, *áttir*, each of which had its own name (Cleasby et al. 1874:47). The older futhark also consisted of three *áttir*, with eight runes in each (Antonsen 2002:43). But the number eight is also used as a relative quantity to define the value of pure silver according to Icelandic law codes (Naumann 1987:377) (below, p. 297).

The number eight refers to absolute and unchanging phenomena in nature such as the course of

the sun in the sky, and to the sacred order in the rune-row, which itself embodied secret knowledge. As an eternal and mythical figure, eight also fulfilled an essential function in the economic sphere. Using this as an absolute number of account, the division of wholeness into eight equal parts created a divinely rooted matrix of counting with which one could reckon the value of various goods in relation to one another. It was Odin's gold ring as the inalienable possession of Viking society that guarded and guaranteed this economic order. The absolute completeness consisting of eight parts was employed to define the value of pure and good silver, and thus the fundamental significance of silver as "money" in the circulation of goods. However one important question remains to be answered in this section: if it developed in the Early Iron Age in Scandinavia, how could the *aurar*-system have been passed on to the Viking Period and so into Kaupang? To answer that, we have to examine what factors may have led to the establishment of reckoning in *aurar* in Scandinavia. To do so, we need to turn back to Brøgger's øre theory and his conclusions.

#### "Aurar-sites" in Southern Scandinavia

Bråten was one of the few sets of weights of the Early Iron Age that Brøgger was able to refer to in his case for the øre-standard having an ancient origin and thus to be datable to the Roman Iron Age (Brøgger 1921:12–16). He assumed that denarii of the Roman Republic had been used to calibrate the weights (1921:17–23). The earlier Scandinavia øre had, according to Brøgger, its immediate prototype in the Roman ounce of about 27 g. However it was the Norwegian historian Asgaut Steinnes (1927) who, on metrological grounds, was able conclusively to refute Brøgger's theory. Steinnes (1927:15–17) showed, using the evidence of Bråten amongst others, that it was not the Early Roman but the Merovingian ounce that had been the model for the øre-weight. Brøgger (1936:77 and 81) was acquainted with Steinnes's work but did not change his view. Brøgger's longer Roman chronology for the øre-weight remained unchallenged in later scholarship (e.g. Bakka 1978). In analyses of gold finds such as the rings, the Roman ounce has been automatically associated with the Scandinavian øre (e.g. Munksgaard 1980).

By locating the introduction of *aurar*-reckoning in the Norwegian Merovingian Period, however, we also change the basis for understanding why standardized sets of weights such as that from Bråten are found in Southern Scandinavia. With a shorter chronology, the phenomenon is placed in a different archaeological and cultural context. With a redating to the Merovingian Period, we find ourselves in the post-Roman world and at the beginning of a new epoch, with new economic constellations (Lebecq 2005). This is the period in which trade expanded in

the North Sea region and the urban settlements known as wics were founded all around the North Sea coasts under the control of petty kings (Hodges 2000:77). Initially, it was Frankish, Byzantine and Anglo-Saxon gold coins that first circulated around this trading network; then, at the end of the 7th and in the 8th centuries, the silver coins known as sceattas (Grierson and Blackburn 1986:155–89). The question is, then, whether or not the same period saw the introduction of a uniform standard of reckoning in those areas that were manifestly participants in this system of exchange but were unwilling to accept coins as a standard form of payment. The burgeoning North Sea trading network may have provided the requisite conditions for the establishment of common conventions and rules for the comparison and valuation of goods being exchanged. With the idea of øre, we may see the outlines of a system of valuation that made it possible to buy and sell goods at seasonal sites which also produce evidence of craft and trade, particularly in Southern Scandinavia.

Such a site may have been Gudme/Lundeborg on the island of Fyn. At the coastal settlement site of Lundeborg, which was established sometime in the 3rd century AD, a complete set of seven bronze weights has been found on which the cross-symbol is as conspicuous as in the find from Bråten (Fig. 8.9; Thomsen 1993:96–7). Detailed metrological studies of the weight-set have yet to be undertaken, but it is reasonable to assume that this find belongs to the Norwegian Merovingian Period, and to the 7th century. The Gudme/Lundeborg complex is also well known for its finds of gold rings of standardized weights from the same period. At the farm of Broholm in the immediate neighbourhood of Gudme one of the largest gold hoards from Denmark was found. The Broholm treasure consisted of various kinds of gold ring and gold bracteate, together with silver ingots containing some gold (Fig. 8.14). According to Brøgger (1921:31), who undertook a metrological study of Broholm, the gold rings respect the øre-weight within a range between c. 26 and 27.2 g. The ring-weights fall at intervals of 50, 30, 20 and 2 øre. There is also a gold capsule which Brøgger interpreted as a weight at 26.1 g. The case I made above implies that the method of reckoning in øre was not introduced before the Norwegian Merovingian Period (see above, pp. 280–2). The Broholm hoard contains gold objects weighed according the øre-unit and should therefore be dated no earlier than the 7th century, despite the fact that the hoard also contains Migration-period gold bracteates.

Although the seasonal activities at Lundeborg apparently diminished in the 5th century after the fall of the Roman Empire, they carried on to the beginning of the 8th century (Thomsen et al. 1993:97; Thrane 1993:17–20). Further continuity in settlement in the area into the Viking Period is evident at

Gudme. It is shown by remains of buildings and finds of weights, neckrings, sceattas and dirhams (Thrane 1993:26–44, figs. 28–9, 33 and 39). Unlike Kaupang, which was not founded until the beginning of the 9th century, the Gudme/Lundeborg complex displays an unbroken history over a long period of time (for a more thorough discussion of Gudme/Lundeborg, see Skre 2007:446–8). But Kaupang/Skiringssal and Gudme/Lundeborg can be compared in one respect. Evidence of bronze-, silver- and goldsmithing has been found at Lundeborg and Gudme in the same way as at Kaupang (Thrane 1993:51, fig. 34; Jørgensen 2003:177). Both complexes were sites for the collection, exchange and possibly also remelting of precious metals. A conceivable scenario is, therefore, that it was at sites such as Lundeborg, and later Gudme, that the idea of *aurar* was put into practice and so passed on from the 7th century to the Viking Period. Other sites in Southern Scandinavia showing continuity from the Early Iron Age to the Late, and with evidence of metalworking, such as Uppåkra in Skåne (Kresten et al. 2001), may have functioned as *aurar*-sites too. Boeslunde on Sjælland and Stenninget in North Jutland display a higher level of craft-specialization in the 6th and 7th centuries. These sites are particularly rich in metal finds when compared with ordinary agrarian settlements. Here we have, amongst other things, evidence of the reworking of metals and the use of weights, balances, and bronze and lead ingots (Jørgensen 2003:178–9). It was at sites such as these that the concept of *aurar* may have gained an early foothold and become part of the routine practices of payment and valuation that are also reflected at Kaupang. The emergence of the “*aurar*-sites” in Scandinavia seems to coincide with the development of a tradition of precise weighing that is also richly reflected in grave finds from the territory of Eastern Frankia (Werner 1962).

The most conspicuous material reflexes of the

existence of the *aurar*-system at Kaupang in Skiringssal are the copper-alloy and lead weights (Pedersen, this vol. Ch. 6). Lead and copper-alloy weights are found at all significant sites with evidence of trade and craft in Scandinavia. Such weights have been found, for example, at Helgö (Kyhllberg 1980b: 177–97) and Birka (Gustin 2004a:18–18 and 21), Uppåkra in Skåne (Gustin 1999:258–9) and Lundeborg/Gudme on Fyn (Thomsen 1993:80). In the settlement area at Kaupang a total of 338 lead weights has been found – the largest single group here (Pedersen, this vol., Ch. 6.1.1:Tab. 6.3 and 6.4). According to Unn Pedersen, lead weights may have been used to weigh silver. Her contextual analyses show that in one case the use of these weights and the occurrence of silver can be related to a single plot in Kaupang (this vol., Ch. 6.4.1, Fig. 6:29). In the most recent excavations 1990–1995 in the old town area of Birka of, some 200 weights were recorded on a plot with copious evidence of bronzecasting (Gustin 2004a:21). As of yet at Birka, however, these lack any clear connexion with the production of objects of gold or silver. In Kaupang, on the other hand, there is archaeological evidence that silver may have been handled alongside casting waste (Pedersen, this vol., Ch. 6:162–4; Pedersen, in prep.).

The finding of lead weights in association with archaeological contexts with evidence of metalcasting is thus not intrinsically inconsistent with the idea that these weights may have had some function in economic transactions. Without being able yet to demonstrate this directly through archaeological finds, the weights may have been used in the craft zones in producing *aurar*-objects of precious metals. It is valid to argue that it was in the silver- and bronzsmiths’ workshops that *aurar*-objects such as ingots and rings were produced and the quantities of silver and gold were also – perhaps – like those of bronze and lead, calculated using weights. The pre-



cise weighing of metals in workshops may, then, have followed the same practices and procedures as in the trading site. The weights in øre were thus part of the equipment of the metalworker as much as of the merchant (Pedersen 2001:24–6). The use of weights in both production and exchange was by no means mutually exclusive.

The Kaupang/Skiringssal central-place complex (Pilø and Skre, this vol. Ch.2:Fig. 1.2), which I interpret as an *aurar*-site, could have had the economic, political and indeed legal preconditions for a system of payment and valuation based upon the øre to be put into practice (Skre 2007j:446–8 and 450–5). The central place comprised the urban settlement of Kaupang with its evidence of trade and craft (Pilø 2007c:175–8, 2007d:195; Pedersen and Pilø 2007:187–90), the chieftainly seat at Skiringssal with the hall at Huseby (Skre 2007e), and the *thing*-site at Tjølling (Skre 2007g). The assembly place, which seems to have functioned from the Early Iron Age to the early Christian Middle Ages (Skre 2007g:403–6), was simultaneously a juridical and a social arena. The *thing*, I believe, may have fulfilled a major function in legitimating the nominal function and convertibility of the means of payment and the øre-unit. As the Icelandic *Baugatal* shows, it was at the *thing* that the øre-weight was defined and it was likewise there that the payment value of the compensation rings was determined. The *thing* may thus have been a central juridical authority and a social area legitimating *aurar* as a principle of value. The annual assembly at the *thing* may, then, have been similar to the market days of the town saints in the Merovingian realm that Frans Theuvs has discussed using the anthropological concept of *tournaments of value* (see above, p. 263). It was at the *thing* that the chieftains and the leading farmers met regularly in order to settle legal problems, undertake exchange, make alliances, and confirm their position within the community. It was here, too, that the weight and value of *aurar*-objects such as the rings was legitimated in a public place, before people's eyes. At the *thing*, the purity and weight of the legal silver was determined, together with how many pennies would count as an *eyrir* (see above, pp. 282–3). In this way the central-place complex Kaupang/Skiringssal was similar to an economically sanctioned space in which several stages in the life-cycle of *aurar*-objects were brought together. *Aurar*-objects were produced in the workshops of the silversmiths; they circulated at the *thing* and in the trading site and changed hands; they came back and were broken up in the workshops only to be re-made once again.

#### **Verðaurar and vaðmál – Commodity-money in Late Iron-age Scandinavia**

There is yet one more facet to economic practice in the Late Iron Age. Objects of precious metal such as ingots and rings were not utterly essential as media of

transactions in which the øre-standard had to be materialized. This standard could probably also be embodied in non-metal objects. In the same way as the denier in the Carolingian realm was both a material coin and an immaterial unit of reckoning (see above, pp. 270–1), so too the øre comprised simultaneously a material and an abstract principle of reckoning and payment that may have been in use in Late Iron-age Scandinavia. Just as the denier, *aurar* could be expressed and counted in the goods one was dealing in and of which we only find traces in later written sources. In relatively early law-codes of the 12th century such as the Icelandic *Grágás*, the Norwegian Gulathing Law, and the earlier Swedish Västgöta Law, there are references to a system of commodity-cash in the North in respect of which reckonings were made in *verðaurar* (Engeler 1991:132–3). Etymologically, *verð* can be translated with the words “price” and “value”, although also with “purchase” and “payment” (Naumann 1987:374–6). In a transferred sense, I believe that we can see here a separation from the bodily rooting of *aurar* in gold and silver objects. The concept of *verðaurar* can then also be applied to other objects which correspond to a value of a certain number of øre.

A further medium in which relationships of price and value could be expressed in øre was textiles: wadmal of a certain length, which was measured in ells. The term wadmal (Old Norse *vaðmál*) is a compound of *vað*, “woven cloth”, and *mál*, meaning “measure” or “unit” (Finnur Jónsson 1936:155 n.6). This term can be translated as “measure of cloth” or in a further monetary sense as “cloth-money” (Engeler 1991:80–1). Unlike “metal-øre”, the unit of wadmal was not calculated in terms of weight of silver but rather in terms of the quantity of cloth in length and breadth and the quality of the cloth in respect of material, colour and technical quality. In the same way as silver, textiles could be the subjects of economic calculation and even themselves be used as a way of making payments or valuations in transactions separate from the socially binding sphere.

According to documentary sources from Iceland, there was a firmly fixed rate of exchange between wadmal, i.e. textile of a certain length, width and quality, and a weighed øre of silver (Ebel 1985:117–8). Wadmal was consequently counted in terms of the nominal and legal units *lögaurar*. One *lögeyrir* was the equivalent to an unused woollen cloth of lower quality that was 6 ells in length and 2 ells wide (Engeler 1991:80–1). These relative values are documented from the 12th and 13th centuries in the law-codes *Grágás* and *Jónsbók* (Finnur Jónsson 1936:155). *Grágás* also contains the information that around the year 1000 a distinction was drawn between silver of two different qualities. Four *lögaurar* of wadmal were then the equivalent of an øre by weight of *bleikr silfr* – “pale” or, in other words, impure silver – but 8 *lögau-*

*rar* of wadmal were the equivalent of an øre of pure silver, which was referred to in the sources as *brent* (“burnt”) *silfr* (Naumann 1987:377).

It may be more than mere coincidence that evidence of organized textile-production coincides with the period in which *aurar* were introduced as a principle of reckoning and value in Scandinavia. In Denmark there is archaeological evidence of specialized and large-scale production of textiles which may go back to the 7th century. At Bejsebakken in North Jutland a settlement consisting of five longhouses and more than 350 sunken huts has been recorded which produced a large number of spindle-whorls and loomweights. At Næs on Sjælland it was not only remains of sunken huts with weaving equipment that were found but also structures that indicate that flax was retted on a large scale for the manufacture of linen. This complex is dated to between the late 7th and early 9th centuries (Jørgensen 2003:179). In the same way as with *aurar*, the growing North Sea trading network of the 7th century may have fulfilled the necessary preconditions for cloth being both dealt with as trade goods and at the same time serving a function as “money”.

Both silver øre and cloth-money were counted in the abstract units of *lögaaurar* and could thus be correlated with other goods. From the end of the 12th century we have data on prices that were proclaimed at the Icelandic Althing. Thus six arctic fox skins were worth 1 *lögeyrir* (Naumann 1987:387–9). If we follow the information from Iceland, 48 arctic fox skins would be worth 8 *lögaaurar*. This is the same as 1 *eyrir* of pure silver, i.e. a silver ingot between about 26 and 29 g. Although some scholars warn against projecting information on commodity-money and prices from later medieval texts back into the Iron Age (e.g. Hatz 1974:93), few, if any, attempts to reconcile written, archaeological and numismatic evidence on the same terms have ever been made. Although there must be doubt as to whether relative prices from the 12th and 13th centuries in Iceland were also valid in Kaupang in the 9th and 10th centuries, this need not count as an argument against a system of commodity-money during the Late Iron Age (for a similar approach to commodity-money, see Skre this vol. Chs. 9:324, 327–8, 10:340–8). The archaeological and metrological evidence seem to be in support of this. If Ohthere offered his goods from the far north for sale in Kaupang he presumably thought in terms of øre both as a weighed silver unit and as the units of reckoning, *lögaaurar*. He need not, however, have had access to silver to be able to participate in exchange. All that was necessary was for the other party to the deal to accept øre as a basic unit of value.

## Conclusions

In the present section I have discussed the principles behind the *aurar*-standard on the basis of archaeo-

logical and numismatic evidence such as coins, weights and rings, along with historical evidence. The examples come from a period stretching from the end of the 6th century to the beginning of the 10th, and illustrate the practices of weighing and valuing both gold and silver according to a common convention in non-monetized societies. The ability to reckon and think in terms of *aurar* through coins may give us an insight into and understanding of how standards could be employed and transmitted in societies that lacked a strong central authority. Although coins were not accepted as a form of currency in Scandinavia during the Late Iron Age because they themselves were not regarded as having value, the idea of value, and of countability, was made material in other objects. The *aurar*-system did not depend upon a royal authority to guarantee its value. As standard units of reckoning, *aurar* were rather given legitimacy by the carefully weighed gold ring. This gold ring, made from gold coin, can also be understood to have been a transcendental principle, a divine and proper order of which we find reflexes in the story of Odin’s eternal ring Draupnir. The gold ring belonged to the world of the gods, and as an inalienable possession it gave the *aurar*-units their permanent and untouchable stability. It imbued *aurar*-objects of silver with the authenticity they needed to be accepted as media of value. Gold was deposited in marginal zones between water and land. The carefully secreted gold ring was an imaginary but at the same time a firm axle around which notions of value and price in the human world could develop. In the concept of *aurar*, I believe, lies the idea of the coherency of an order sanctioned by the gods.

It may have been the expanding North Sea trading network of the 7th and 8th centuries that provided the necessary preconditions for the establishment of the *aurar*-system. Reckoning in øre may have developed as a method of making payments and valuing in craft and trading sites in Scandinavia that were in contact with this network. The underlying unit of reckoning for the *aurar*-system was the Merovingian ounce. The use of øre in Scandinavia should therefore – in the same way as counting in coins in monetized societies – be understood as the practice for valuing precious metals according to their weight and purity in carefully proportioned quantities. At sites whose economic activities were based on the øre there was a close connexion between metalworking and the use of weights.

*Aurar*-rings are like coins in being nominal units of value and reckoning. This is shown in Norse law-codes. In *Baugatal* and the Frostathing Law the weight of compensation rings is defined as, for instance, *baugr tólf-eyringar* – i.e. a ring worth 12 øre – or *tvitug auri*: a ring worth 20 øre (Engeler 1991:131). In contrast to coins, the rings had always to be weighed, in order that their weight in øre could be

established. They were checked for weight and tested in public. We are told so in the Icelandic *Baugatal*, which gives the rules on how manslaughter may be paid for in the form of silver rings. The suits and the payment had to be made at the *thing* in the presence of witnesses. After the payment of the sum in compensation the security of the man who had committed the offence and of his kin was guaranteed (Dennis et al. 1980:182–3). It was also on this occasion that payment in rings was sanctioned and the nominal value of the rings in terms of øre and marks was determined (see Ch. 8.5, Tab. 8.10). I believe, however, that the ring of silver was not the same as coin in that coins could also be used in economic transactions outside of any socially binding sphere. The significance of the ring as a medium of value was linked to the sphere of jurisdiction and the code of honour of the kin-based society. In this way, the silver rings presumably served first and foremost as blood-money in the case of a killing.

In economic relations, the authenticity of the gold ring was transposed instead to other items such as the silver ingots which were used as silver currency in Kaupang (Hårdh, this vol. Ch. 5.6). It was these ingots that were the media of value of the Early Viking Period, and which served as currency. Large ingots were weighed in øre-units just like the rings (Hårdh, this vol. Ch. 5.6). Ingots could be bought and sold, they could be counted, and they could be related to other goods and so define the exchange-value of those items. Finds of moulds for ingots at Kaupang (Hårdh, this vol. Ch. 5.6.3), as at Hedeby, for instance (Gjølstein Resi 1979), or Dorestad (Besteman 2004b: 28–9 and 33), indicate that the melting down of precious metals to produce larger units was practised at the major trading sites of Northern and Western Europe. This is probably one reason why so few Western pennies found their way to Scandinavia in the 9th century.

The recasting of coined metal, which may have been done on the Continent itself, may also explain why Merovingian gold coins of the 7th century and silver sceattas of the 8th are almost entirely absent from Scandinavia. One illuminating exception is the largest gold hoard of the Early Viking Period, from Hoen near Kaupang, with its unique combination of rare gold coins re-used as pendants (Skaare 1988) including one Merovingian solidus or *aureus*. Hoen demonstrates that gold coins like silver coins, did not circulate freely in Southern Scandinavia during the Early Viking Age but were melted down. Coined metal was transformed into valuable *aurar*-objects. In the same hoard there were also massive gold rings which appear to have been weighed to the øre-standard (Graham-Campbell 1999). In contrast to the exceptional character of the Hoen hoard, the Broholm treasure at Gudme contained not only bracteates and *aurar*-rings of gold but also cut gold

wire and ingots of silver alloyed with gold (Fig. 8.14). Broholm ought therefore to be interpreted as a smith's hoard at Gudme, which, unlike Hoen, therefore still belonged to the human world.

Finally, the øre as a basis of reckoning could be transferred to other items which became the objects of economic transactions. Since *verðaurar* and *lögaurar* as a scale of reckoning were based upon metal-øre, implicitly of gold or silver, or also of valuable cloth, a system of exchange could take shape that was able to function separately from the sphere of gift or simple barter. There is no doubt that there was a scheme of things that was based upon the distributional principle of a gift-economy, but gifts and luxuries could be commodified too: in other words they could be bought and sold in appropriate circumstances. This could perhaps take place at sites such as Kaupang, where the conditions allowed for reckoning in *verðaurar*. Perhaps only there was it possible to buy a prestigious Frankish Ulfbert sword, which otherwise only chieftains could obtain as a gift. That could be facilitated by weighed silver, cloth or other quantifiable goods which people both traded and produced in Kaupang – such as schist whetstones, soapstone vessels, beads and the like. At *aurar*-sites such as Kaupang, it was possible to negotiate or haggle over a price using øre as a stable and unalterable point of reference.

But the whole *aurar*-system that was constructed in Scandinavia during the late Merovingian Period came under pressure when different conventions of payment became established outside of the *aurar*-sites towards the end of the 9th century. This process of transformation seems to coincide with the introduction of normalized weighing equipment from the monetized areas of the Middle East and Central Asia via Eastern Europe and the Baltic Sea area. This was the age of fragmentation and of the ertog, which we shall examine more closely in the following, final section of this chapter.

### 8.5 Ertogs, *þveiti* and fragments

This section attempts to put in place the final pieces of the jigsaw that will adumbrate the full picture of how silver was dealt with and valued as a form of currency at Kaupang. When Ohthere visited Kaupang in Skiringssal some time in the last quarter of the 9th century, the exportation of Islamic silver coins, dirhams, from the Baltic Sea area to the West on a greater scale had begun. He must surely have seen such coins with his own eyes. Analyses of dirham finds show that this stream of silver from the East was not evenly spread over the whole of Southern Scandinavia, but rather was channelled and re-distributed through urban settlements such as Kaupang (Kilger, this vol. Ch. 7.9). The dirhams came in with new ideas about how precious metals should be weighed and valued. The silver was divided into smaller por-

tions and weighed using normalized weight-sets (Steuer 1987:474–9; Gustin 2004c:97–107). Widely-travelled individuals such as Ohthere will, in all probability, have been aware of the growing access to silver over Scandinavia as a whole, and of the new procedures for payment with different weighing equipment.

The process by which the Oriental weights were introduced has itself most recently been discussed in Ingrid Gustin's dissertation (2004c). She focussed primarily on the smaller, so-called cubo-octahedral weights, also known as polyhedric weights. Her principal topic for investigation was how ideas of a standard could achieve a foothold even in non-state societies. As Gustin stresses (2004c:123–51), the notion of a standard is expressed by the standardized weight and stereotypical design of the cubo-octahedral weights (Pedersen, this vol. Ch. 6:Fig. 6.21.b). The polyhedric form was copied as a meaningful element in several items of Scandinavian jewellery and tools (2004c:269–308). This was already familiar, as a formal element, from the Merovingian Period, and perhaps earlier still. The acceptance of the cubo-octahedral weights in Scandinavia during the 9th century is, in Gustin's view, a result of this unvarying form having already long been known. It provided confidence in exchange situations where the parties did not know one another but had to come to an agreement (2004c:174–81). In her work, Gustin attaches particular importance to the cultural codes that led to the acceptance of the standardized weights in contexts where organized exchange over long distances was emerging. Here there was an urgent need to ensure dependable modes of transaction (2004c:203–5).

There were several congruent factors which led to these special weights becoming an accepted item of weighing equipment. This was when large quantities of dirham silver from the East began to circulate in the Baltic Sea area, and the exchange of goods was growing. The decisive factor, however, was the emergence of a group of individuals who were engaged in long-distance trade and who developed a common identity and similar values that were reflected, *inter alia*, in material culture. It was at this point that the cubo-octahedral form became a prominent and meaningful element of costume; on ring-brooches, for instance (2004c:205–34). It was likewise at this point that the cubo-octahedral weights were developed into a common standard amongst the individuals of this group.

In this section, I shall examine this process from a different perspective, and take a closer look at what was placed in the other half of the pair of scales, namely the hacksilver. It is the relationship between the normalized weights and the fragmented silver I wish to investigate. As a synonym to the terms hacksilver, or fragmented silver, I shall here use a term that refers to the shapeless state of the silver. Silver as

a substance that has lost its body and thus also its intrinsic connotations of value I shall call *amorphous* silver. This is the perspective from which I shall discuss the influence of hacksilver on exchange relations. I shall make a suggestion concerning what the spheroid weights of the Viking Period may have been known as.

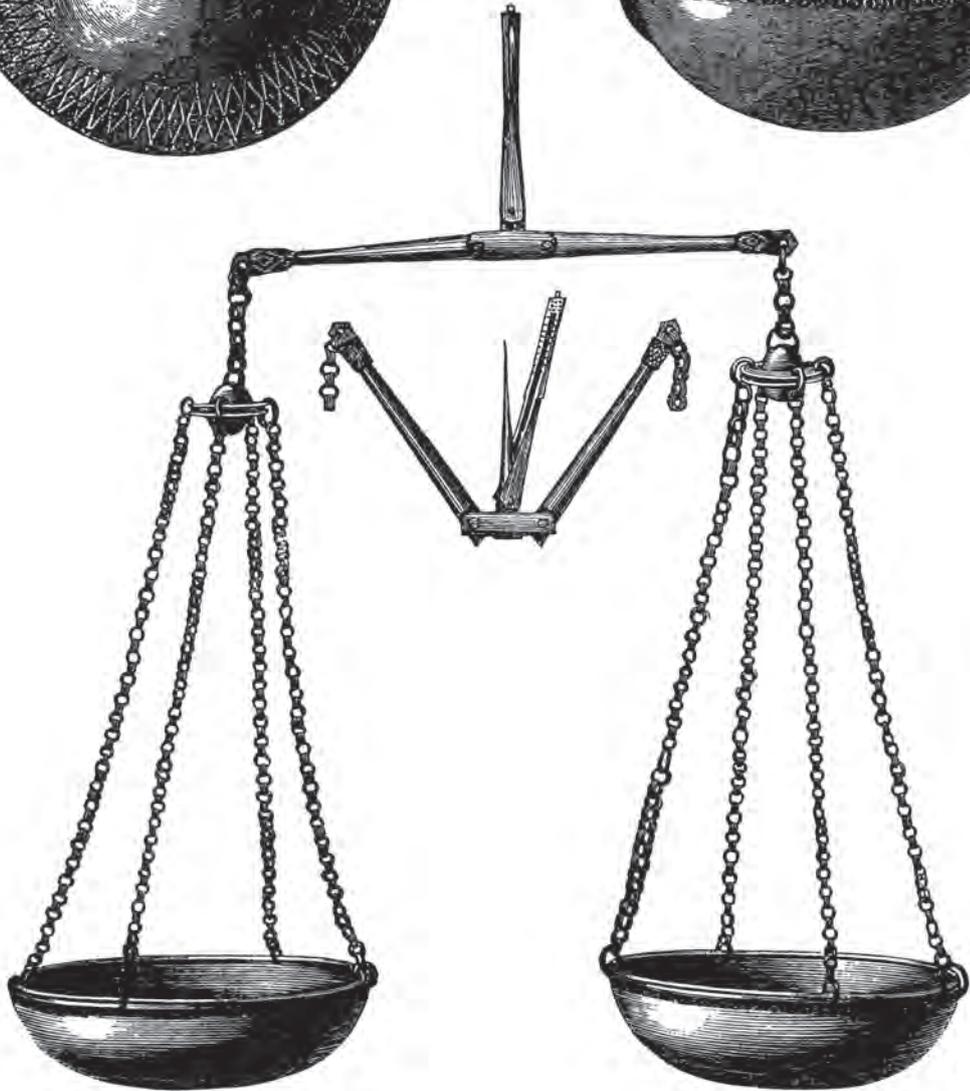
## Two models of Early-medieval silver economy

Our understanding of the connexion between the hacksilver economy and the use of what is known as Oriental weighing equipment depends to a large extent on Heiko Steuer's many works (e.g. 1984, 1987, 1997, 2002). Steuer has employed an interpretative model which enables him to describe the introduction of the hacksilver economy in a wide, European perspective. It is appropriate, therefore, briefly to recapitulate this. Steuer distinguishes between two different economic systems of the Viking Period: the *Gewichtsgeldwirtschaft*, which was based upon weighed silver, and the *Münzgeldwirtschaft*, in which coins were the standard means of payment. The *Gewichtsgeldwirtschaft* established itself in Scandinavia and the Slavic areas of Eastern and Central Europe at the end of the 9th century with the introduction of sensitive weighing equipment of Oriental character based upon Islamic prototypes (Fig. 8.15). This was precision equipment such as folding balances which made it possible to weigh silver very finely. But it was more than anything else two characteristic types of weight that were the essential components of the *Gewichtsgeldwirtschaft*. These were the smaller cubo-octahedral and the heavier spheroid weights with flattened poles (= "oblate") (Figs. 8.18 and 8.20; Pedersen, this Vol. Ch. 6:Fig. 6.21.b). Both types respect the same system of weights. They are also highly uniform in terms of form. Steuer therefore describes them as "normalized" (Germ. *genormt*). With their unvarying design these weights are essentially different from the very common but formally very diverse lead weights of Scandinavia. Under the *Gewichtsgeldwirtschaft*, according to Steuer, silver was valued according to its purity and weight. Silver could be dealt with in any form, such as ingots, jewellery or coin, as well as in the form of hacksilver. Measuring the quantity and quality of the silver was the responsibility of the individual merchant, and not checked by any state institution. Areas where the *Münzgeldwirtschaft* was in practice counted coins by quantity. According to Steuer, this economy ran according to a quantitative principle of reckoning, while the *Gewichtsgeldwirtschaft* ran according to a qualitative principle (1987: 406).

Here, however, lies one of the fundamental problems with Steuer's model. The opposition between quantitative and qualitative principles of reckoning was not the essential difference between these economies. Both qualitative and quantitative features of



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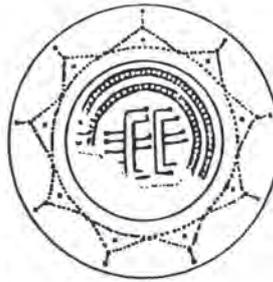
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Figure 8.15 Weighing equipment: folding balance (1); balance case (2); spheroid weights with flattened poles (3–4 and 6); cubo-octahedral weight (5) (Jansson 1988:fig. 4).

reckoning and valuation were present in both the coin- and the weight-economies. What is essential to economies based upon coinage, in my view, is that the coin as an object was dealt with and valued as an *indivisible* nominal unit. It was the coin *itself* that was the smallest object of reckoning and of value. Nominal principles were present in just this way also in the Scandinavian *aurar*-reckoning. The basic idea of *aurar*-reckoning was that a calculable number of coins made up the *eyrir* (see above, pp. 282–3). As a result *aurar*-objects could also assume a nominal function. In the same way as coins in monetized areas, *aurar*-objects such as rings or ingots were *nominal*, and in principle *indivisible*, items. The value of the coin, like that of the ring/ingot, was manifested in the completeness of the object. In this sense, both the coin and the ring as an object of reckoning was *whole*; and, as an object of value, *holy*. I believe that this insight emphasizes a different aspect; one that is more fundamental than Steuer's principle of quantity. What, however, of the qualitative principle of reckoning which in Steuer's view was characteristic of the weight-economy? Steuer stresses, quite rightly, that silver alone was regarded as an equivalent for payment. The qualitative principle of reckoning was concerned with the quantity and purity of the silver. I, however, would rather emphasize a different aspect of the *Gewichtsgeldwirtschaft*, namely the formlessness of the silver; in other words, its *amorphous* and thus non-nominal character. The external form of the silver no longer mattered. Rather it was handled as broken up silver, irrespective of whether it had previously been coined, or in the form of jewellery or ingots. Fragmentation negated the nominal meaning of the silver object.

One may ask whether Steuer's term *Gewichtsgeldwirtschaft* has not created a certain amount of confusion rather than clarity. The German term could be translated as "weight-money economy": in other

words an economy based upon the weighing of metal and thus weight (Germ. *Gewicht*); or as an economy using balance-weights as money, and thus focussing upon those weights, attributing them with some sort of monetary function (e.g. Kyhlberg 1980b:196–7, 1986:160–2).<sup>43</sup> In some interpretations, Steuer's *Gewichtsgeldwirtschaft* has been understood in the first sense: namely the use of silver according to weight (e.g. Malmer 1996:90; Hårdh, this vol. Ch. 5.4). This suggests to me that Steuer's quantitative and qualitative principles of reckoning may have created the impression that silver was not weighed under the *Münzgeldwirtschaft*; just that coins were counted. But we have to remember that balances and weights were in common use in monetized areas too. Weighing equipment, as Steuer himself was able to show, was brought into use alongside coins in a various monetized situations. It was particularly in periods of transition, or in situations of crisis that put the monetary system under pressure, or in areas where coins of different weights and purity were in circulation, that weighing equipment was essential.<sup>44</sup> Scales were also used for checking the weight of coins. Scales and weights may have also been used at larger trading sites in handling large quantities of coin in terms of larger weight-units such as the Carolingian pound-weight (see above, pp. 271–2). There is also ample evidence in written sources from Norway of the 12th–14th centuries for the practice of weighing coins (Gullbekk 2003:215–39). Thus coins were both counted and weighed in the *Münzgeldwirtschaft*. What constituted the most typical trait of the *Gewichtsgeldwirtschaft* was not the practice of weighing alone but rather the acceptance of the normalized weights in connexion with payment in hacksilver. These weights symbolized a monetary concept, albeit at a quite different level of abstraction from either coins or *aurar*-objects. It is this process of abstraction that we shall consider more closely in the following section, leading on to the fragmentation of *whole* and *holy* silver objects such as coins and rings.

#### Commerce and fragmentation in the Caliphate

There are two fundamental considerations helping to explain how weight-standards such as, for example, the øre gained a foothold in Scandinavia during the

<sup>43</sup> Steuer has hinted (1987:448) at an interpretation consistent with the second meaning, namely that the normalized weights themselves assumed a function like cheques or bills of exchange.

<sup>44</sup> Steuer's best known and most quoted work (1987) investigated the relationship between the use of coin and the employment of weighing equipment. This study examines, amongst other things, the use of the weighing equipment in the Late La Tène Period, in the Roman Empire, and the Byzantine, Merovingian and Viking Periods.



Iron Age. One of these is that the *øre*-weight that is represented in the weight-sets and the finds of rings from the Norwegian Merovingian Period and Viking Period was originally defined in states with an established monetary system. The other is that the *øre*-weight came to be used in exchange relationships in unmonetized societies in a very concrete form. In other words, relations of value and reckoning were given material form. The concept of *øre* was preserved and transmitted in the form of coins, rings and weights. The same fundamental considerations can also be used, I believe, to explain the establishment of the *Gewichtsgeldwirtschaft* in the Viking Period. There must surely have been a consciousness and a knowledge of the original monetary function and significance of the normalized weight-sets, even in Northern and Eastern Europe. This holds at least for the phase of introduction when these first came to be used. But what weight-standard was it that was made material in these normalized weights? To start with, we need to take a brief look at the monetary situation in the Caliphate.

There is considerable agreement in metrological studies that the Islamic unit of reckoning, the *mitqāl* is represented by the normalized weights (Sperber 1996:110; Steuer 1997:281–5). *mitqāl* actually means “weight” and thus, in the same way as the Greek *stater* and Latin *pondus*, stands for the ideal weight that pieces of precious metal should have (Grierson 1960:255). Just like the *solidus* of the Late Roman Empire, the *mitqāl* was the basic unit of reckoning of the Caliphate. It was also, in metrological terms, identical with the Islamic gold *dinar* (Grierson 1960:255). The *mitqāl* was used to define the weights of both the gold coin, the *dinar*, and the silver coin, the *dirham* (Welin 1958:510). There is disagreement over the value of the *mitqāl* in the modern metric system (Witthöft 1985:400–1; Steuer 1997:287).<sup>45</sup> In the Caliphate the exchange rate between gold and silver

was constantly changing. The basic gold coin-unit, the *mitqāl*, remained a constant, but the prices of silver in relation to gold were altered several times (Bolin 1953:16–17). The cost of silver and gold thus had to be under constant review when payments were being made. As a result, silver was dealt with in two different ways. One was in the form of the coin, the *dirham*, which was of standardized weight in relation to the coin-base *mitqāl*. According to inscriptions on weights the weight of the *dirham* was presumably counted as two-thirds of a *mitqāl* (Balog 1976:25–6; Welin 1958:510). The other way in which silver was used was in the form of heavier, so-called “market weights”. In this case, the *dirham* was probably regarded as an abstract unit of reckoning and weight, also called the *dirham al-kail* (Hinz 1955:2–3; Welin 1958:508). Both the coin-*dirham* and the weight-*dirham* were probably reckoned to a certain number of *harrūba* or *qirāṭ*, which was the Arabic carat (Hinz 1955:1–2; Welin 1958:509). Controls were maintained by means of state-sanctioned coin-weights of glass which were apparently recalled or destroyed when the ruler changed (Balog 1976:10–11, 1980:55; Steuer 1978:257) (Fig. 8.16).

Other factors also promoted the use of weighing equipment in the Caliphate. In the Islamic empire the monetary system was not under the absolute control of the central government, i.e. the caliph, who was both its political and its religious leader. The Islamic coin-scale was introduced at the beginning of the 8th century when the new basic gold coin, the *dinar*, was defined against the *mitqāl* (Grierson 1960; Bates 1986). However already in the same century several regional coin-standards were established in which the *dirham* had subtly different weights, as, for example, in North Africa and in the Middle East. Another typical feature of the Islamic coin-system is that there were no coin-recalls such as there were in medieval Europe. Both gold and silver coins circulat-

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Figure 8.16. *Egyptian coin-weight made of black, opaque glass issued under the governor and finance director Abd al-Malik. B. Yazid (A.D. 751–3 and 755–8) during the rule of Caliph Al-Mansur (A.D. 754–75). The inscription declares that the coin-weight is of the weight of a dirham of full weight. Scale 2:1. Weight 2.78g. (Balog 1976:129, no. 357).*

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ed freely all around the Caliphate so that issues from different centuries and regions came to be mixed (Kilger, this vol. Ch. 7.4). In order to be able to calculate the value of coins of different exact weights coined metal was primarily reckoned in terms of weight. This means that people would think initially in units such as the *mitqāl* and the *qīrāṭ* rather than in numbers of coins. Gold and silver coins were used as currency but also as trade goods in themselves. This is shown by documentary sources of the 11th and 12th centuries from the Caliphate (Goitein 1967:230–3). In a monetary system of this kind, then, scales and weights that were calibrated by the *mitqāl* and *qīrāṭ*, were absolutely essential. The Islamic monetary system was created using the Roman-Byzantine coin-system as its model (Hinz 1955:1). The same duodecimal counting system was employed. This is the monetary background against which, I suggest, we need to consider the normalized weights. Using the expressions I employed before, I consider that the normalized weights materialized the Islamic *mitqāl*-system and so also the practice by which coined metal was calculated.

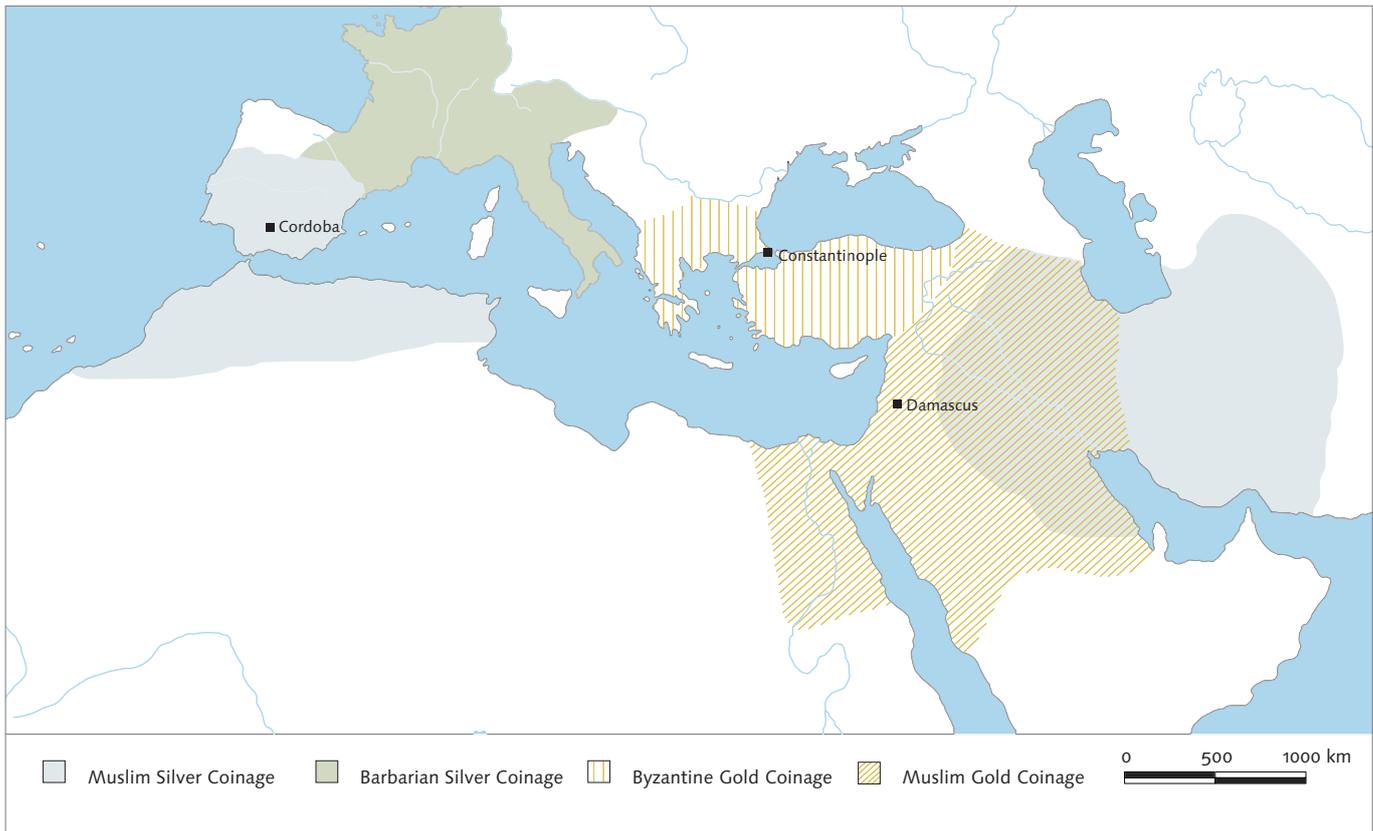
However the weighing and valuing of coined metal in the Caliphate was different from the use of dirham silver in Eastern and Northern Europe in a crucial way. In those areas it was apparently acceptable to break up the original form or the nominal unit that was represented by the actual body of the coin. This practice was most definitely not the norm within the Caliphate. In the Caliphate's monetary system the coin retained its bodily wholeness and thus its fundamental significance as a nominally defined object. There are, however, exceptions. Lutz Ilisch (1990) has drawn attention to the occurrence of small quantities of dirham-fragments in a number of hoards from the monetarily re-organized Caliphate. These fragmentary dirhams are usually broken up rather than clipped. The earliest hoard containing

fragments known as yet is Sinaw in the Middle East (t.p.q. 840/1). The historical evidence tells us that the fragmentation of coins was a very controversial matter in the Caliphate. The legal implications of breaking coins up were discussed in the 9th and 10th centuries by the four juridical schools of Islam (Ilisch 1990:122–3). As Ilisch emphasizes, the dirham always retained its nominal and thus its monetary nature as minted silver. The coin-fragments were used, in his opinion, rather to adjust the weight of the whole dirhams that were placed in the balance-pan. This very probably unofficial practice of breaking coins up was probably a reaction to a clear weakening of the monetary system after the death of Caliph Harun al-Rashid in the first half of the 9th century. After that, coin-production was of a lower standard both in respect of weight and the striking of the dirhams (Kilger, this vol. Ch. 7.5). When dirham hoards appear in the Baltic Sea area in the 9th century, we encounter the first signs of the fragmentation of silver. In some hoards the dirhams are very highly fragmented.<sup>46</sup> It is conceivable that the monetary crisis in the Caliphate gave rise to the practice of fragmentation that was further developed and modified in the Baltic zone. If the fragmentation of coin was an exceptional practice in the Caliphate to allow coins to be weighed according to a particular standard weight, it developed into an accepted convention outside the borders of the Caliphate.

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45 Walther Hinz (1955:1–2) has reconstructed the *mitqāl* at 4.23 g using the coin-weights known as *exagia* that were employed in the Caliphate. Other scholars, for instance Philip Grierson (1960:253–4) assume a higher theoretical weight of 4.25 g. Grierson based his view on G. C. Miles's metrological studies of both dinars and glass weights. However it has also been suggested that *mitqāl* may not necessarily refer to the basic Arabic gold coin, but that in the eastern parts of the Caliphate in the 8th and 9th centuries it could also have been the earlier and lighter Persian-Sassanid basic silver coin of 3.9 g (Welin 1958:510). Grierson (1960:255–6) believes that the *mitqāl*, which Arab sources reckon as being 20 *qīrāṭ*, was an earlier metric unit which may originally have been based upon the Attic drachma of 4.37 g. Drachmas circulated in great quantities in the Arabian peninsula in pre-Islamic times.

46 All of the dirhams in one of the earliest of the Gotlandic hoards, Norrgårda-Norrby II (t.p.q. 833), for instance, are fragmentary. Most of these fragments are no larger than a quarter of a coin (CNS:1.2.10). The uncoined silver objects such as the rings, however, were not broken up. That this fragmentation of the silver took place outside the Caliphate is shown by the small cut marks, "nicks", found on even the smallest fragments. This testing of the coins was very probably undertaken beyond the borders of the Caliphate (Kilger, this vol. Ch. 7.5).



### Reflexes of the Islamic weight-system in Northern Europe

The Islamic *mitqāl*-system may be represented physically by the cubo-octahedral and oblate spheroidal weights. The cubo-octahedral weights may embody a system of weighing in fractions of the *mitqāl*. The smallest specimen found weighs 0.35 g. This might correspond to one-twelfth of the *mitqāl*. The largest weigh up to 4.25 g, which would be approximately one full *mitqāl* (Steuer 1997:112). Another indication of the *mitqāl* having been the unit of reference is the punched markings typical of these weights (see also Pedersen, this vol. Ch. 6:3.4). The punchmarks are placed symmetrically in two rows on the square faces. The positioning of the punchmarks is very like what we are familiar with on dice. The multifaceted weights have from 1 to a maximum of 6 punchmarks on each side. Adding together the punchmarks on two opposite sides, one cubo-octahedral weight can carry up to 12 punchmarks, or possibly 12 units (Steuer 1997:281–3). What is striking is that units of 5 or 10 are absent, indicating that these weights followed a duodecimal system of reckoning (Steuer 1997:284). This is yet another link to the Roman-Byzantine counting system. In contrast to the cubo-octahedral weights, the spheroidal weights were calibrated to intervals of a basic unit of c. 4.0–4.25 g (Steuer 1997:285–9). These may represent multiples of a *mitqāl* (Steuer 1997:fig. 205). The heaviest can weigh as much as 200 g (Steuer 1997:46). As on the

cubo-octahedral weights, here too we see punchmarks on the weights, with values up to 12 punchmarks and double that (Steuer 1997:285–6).

As many have noted, the punchmarks do not reflect absolute weights. They are thought rather to indicate the position of the weight in a set of weights (Kyhberg 1980b:270–1; Sperber 1996:66; Steuer 1997:281). This is unquestionably correct, although at the same time it is a fact to be modified. I believe that the punchmarks show that a weight-unit was being referred to which everyone who used the weights was familiar with. This was equally the case with those weights with the same number of punchmarks from different find-places which may vary in weight – often quite considerably – if we measure them in grams. The variation between the weights with the same number of punchmarks may be the result of corrosion, or of post-depositional damage. The differences may also derive from the process of manufacture. It was the weight of the calibration-weights that the various workshops referred to that determined the absolute value of the basic unit which was represented by the set of weights. It may have been the cubo-octahedral weights themselves that were used for calibration. Small changes in absolute weight were copied and reproduced in this way via a large number of workshops over a considerable geographical area and a long period of time.<sup>47</sup> The variations could also be explained as a result of the fact that local grain-standards with different specific

Figure 8.17 *Distribution map showing the medieval states of Europe, the Mediterranean and the Middle East using silver or gold coins. Re-drawn by Elise Naumann, based on Spufford 1988:map 3.*

weights were used in calibration (Stenroth, in prep.). Thus there were no essential reasons why weights with the same number of punchmarks should weigh exactly the same.<sup>48</sup> The spheroid weights from mainland Sweden, for instance, observe a lighter mitqāl module than the weights on Gotland (Sperber 1996: 55, 70, 83–5 and 110). This, however, is probably not a question of two different weight-systems, as Erik Sperber has suggested, but rather, perhaps, the result of the use of different grains (Swedish *kornsorter*) in calibrating the weights. This will be more thoroughly discussed in a following section (below, p. 314).

Despite these inconsistencies in weight, it was always possible to check individual weights by applying the principle of double-weighing. There are recent ethnographic analogues that describe double-weighing as a complex process between two parties to a trade, by which each checks the weights of each other's set of weights, and the quantity of precious metal that is paid, in two separate procedures. This means that one can establish that the quantity of silver or gold that is transferred in the transaction is absolutely the same from both the seller's and the buyer's standpoint (Steuer 1987:500). Through double-weighing it was possible to exclude individual weights that diverged too far from the calibration model, be they in the seller's or the buyer's set of weights. Although double-weighing did not guarantee that weights with the same punchmarks were exactly the same weight – if we measure them by the modern metric system – but this practice was able to confirm that one was close to the ideal theoretical weight represented by the punchmarks.

At present we do not know in which monetized areas the cubo-octahedral weights were first produced and used (Gustin 2004c:318–21). There are finds from the Middle East and the Ottoman Empire (Kisch 1965:97 and 101, fig. 53; Steuer 1997:46). There

is ethnographic evidence of weights of cubo-octahedral and cylindrical shape being used as weighing equipment by merchants participating in the gold trade in Western Ethiopia as recently as the 1930s (Sandvik 1935:70; Thingstad 2007). From a metrological viewpoint, it is conceivable that cubo-octahedral weights were used in the fine weighing of gold coins in their area of original use. This may be implied by the calibration of the basic gold coin in terms of grains.<sup>49</sup> It was particularly in the Eastern Mediterranean lands that gold coin was in use in the 7th and 8th centuries (Spufford 1988:37–9). The territories of the Caliphate which bordered directly upon the Byzantine Empire, namely Palestine, Syria and the northern parts of what are now Iran and Iraq, belong in this area, while Egypt and the Arabian peninsula are also credible candidates (fig. 8.17).

The spheroid weights were derived from Roman prototypes (e.g. Kisch 1965:97, fig. 51). Down to the 6th century spheroid weights were made of solid bronze or brass in the Byzantine territories (Steuer 1987:427 and 432). Then the trail disappears, and, just as with the cubo-octahedral weights, use of this type in the area subject to Islamic cultural dominance cannot, as of yet, be demonstrated from archaeological evidence. Spheroid weights were familiar in the area of what is known as the Saltowo-Majazkoi Culture between the Rivers Don and Donec in the ancient area of Khazar settlement (Steuer 1997:46). However the Roman, Byzantine and Khazar weights

47 Unfinished finds from Gotland show that the small weights were manufactured in Scandinavia (Östergren 1989:171–2, fig. 156).

48 The metric system of weights and a decimal counting system which we use for our metrological studies seem to me paradoxically to create an expectation of absolute precision in terms of our modern measures.

49 According to Steuer, the smallest cubo-octahedral weights weigh around 0.35 g. No carat-units that heavy are known in states that used gold coin. This module should rather refer to a doubled unit of 0.175 g. In that case, the Roman-Byzantine carat of 0.189 g ( $2 \times 0.189 \text{ g} = 0.378 \text{ g}$ ) is the closest, rather than the heavier Egyptian qīrāṭ of 0.212 g ( $2 \times 0.212 \text{ g} = 0.424 \text{ g}$ ) (Grierson 1960:252–4). A different and more credible explanation is that the cubo-octahedral weights were based upon the smaller Arab grain-unit the habba rather than the qīrāṭ. Documentary evidence shows that three habba were counted to the qīrāṭ (Hinz 1955:2; Ridgeway 1892:179). Hinz has calculated a theoretical weight of the so-called Iraqi gold habba of 0.0706 g which would be in accordance with a mitqāl weight of c. 4.23 g ( $60 \times 0.0706 = 4.236 \text{ g}$ ). The smallest unit amongst the cubo-octahedral weights could then be produced from 5 habba grain-units, if we assume a slightly higher value for the latter than Hinz came to ( $5 \times 0.0708 \text{ g} = 0.354 \text{ g}$ ). The heaviest cubo-octahedral weights of around 4.25 g were equivalent to the weight of 60 Iraqi habba.



of the spheroid type are different from those from Scandinavia and Russia in one decisive way. They were solid, and do not show the typical shell of copper alloy around an iron core that is highly typical of the majority of spheroid weights from Northern and Eastern Europe (Steuer 1997:47).

There is some evidence that the spheroid weights with copper-alloy shells were introduced into Scandinavia later than the smaller, cubo-octahedral weights. As Gustin points out (2004c:314), both types of weight are frequently considered together without this point being properly discussed. According to Gustin, the most recent excavations at Birka place the spheroid weights in a later find-horizon than their cubo-octahedral counterparts. At Birka, the small,

die-like weights first appear in stratified layers after c. 860 (Gustin 2004c:312–14).<sup>50</sup> She is cautious, however, and unwilling to make too much of this conclusion before the settlement contexts have been examined in more detail. There are, however, other contextualized finds that corroborate her suggestion. At the detector-site of Torksey, England, a large number of die-shaped weights and dirhams, and uncoined hacksilver, have been found, but no spheroid weights (Blackburn 2002). The find-context at Torksey can very reasonably be identified as the camp of the Great Viking Army that settled here in the years 872 and 873 (Blackburn 2002; Kilger, this vol. Ch. 7.6). I believe, then, that these normalized weights may pertain to two different waves of introduction seen in the Baltic Sea region. The cubo-octahedral weights were circulating by the 860s and 870s at the latest in urban settlements such as Birka and amongst the Danish Vikings who were campaigning in England. The introduction of the spheroid weights started probably later, not before the end of the 9th century.

We shall now take a closer look at the weight-set from Norelund, Gästrikland, Sweden, which exemplifies the principles of weighing using the heavier spheroid weights (Fig. 8.18, c.f. Jansson 1936:13). Norelund demonstrates the situation that began to establish itself over the whole of Scandinavian in the 10th century (Hatz 1974:119). The markings on the weights show, as already noted, their relative position within the set, and thus the value of the weight (Kyh-

		<i>mitqāl?</i>	Punch- marks	ertogs
1	3.99 g	1 x 3.99	1?	½
2	8.22 g	2 x 4.11	1+1	1
3	22.92 g	6 x 3.82	3+3	3
4	31.37 g	8 x 3.92	4+4	4
5	39.32 g	10 x 3.93	5+5	5

Table 8.8 *The set of spheroid weights from Norelund, Valbo parish, Gästrikland, which respect a module of c. 4 g. Before conservation (Hatz 1974:119; Kyhlberg 1980b:245–6).*

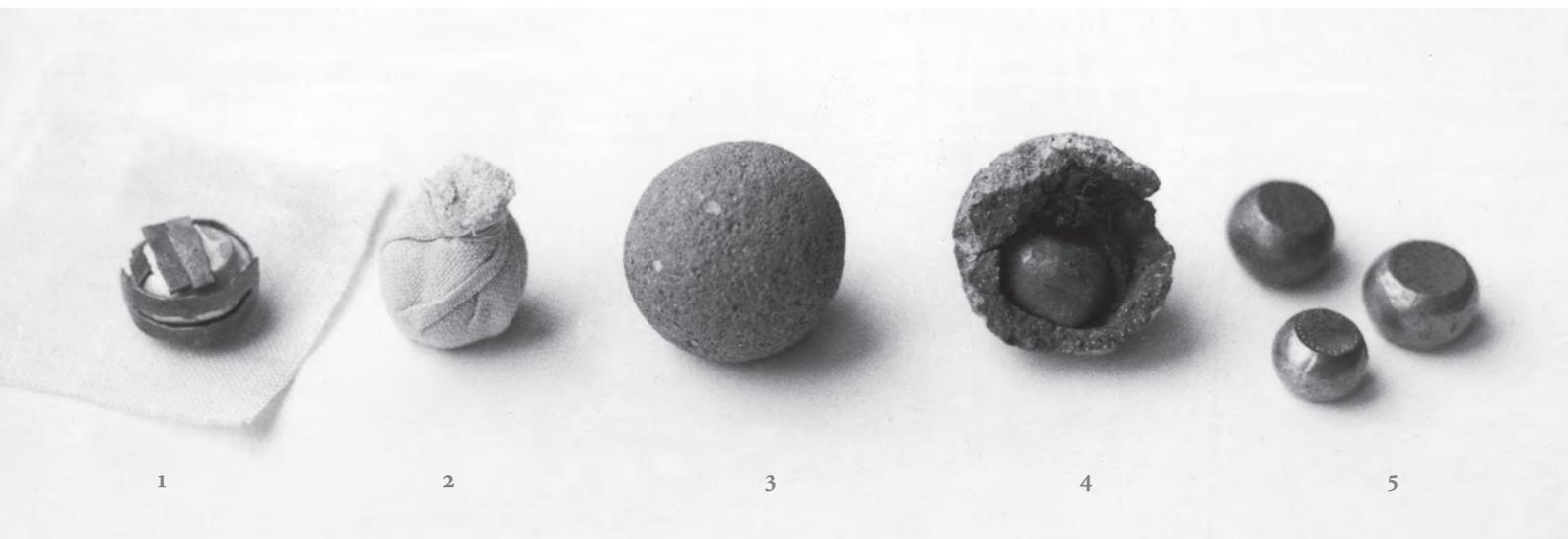


Figure 8.18 Set of oblate spheroid weights from Norelund, Valbo parish, Gästrikland, Sweden. Photo, H. Andersson, Antikvarisk-topografiska arkivet, Stockholm.

Figure 8.19 The stages of manufacture of spheroid weights. Photo, Anders Söderberg.

berg 1980b:245). This set was calibrated at regular intervals of 1, 2, 6, 8 and 10 units of a module of around 4.0 g (Tab. 8.8).<sup>51</sup> Minor discrepancies were apparently tolerated by those who used sets of spheroid weights. However weights that were considered too heavy or too light could be excluded by double-weighing (see above, p. 305).

It has long been realized that the spheroid weights and the weight-system they represent are congruent with the duodecimal ertog-system we are familiar with from medieval documents from Scandinavia (Arne 1914; Jansson 1936:12–13; Lundström 1973:39–40; Hatz 1974:119). In this, the ertog is related both to the mark and to øre in the ratio of 1 mark: 8 øre: 24 ertogs (see above, p. 280). Thus 1 øre was 3 ertogs (Hatz 1974:118). Brøgger (1921:81–5), in his metrological analyses of Norwegian Viking-period graves with spheroid weights, was able to identify weight-units grouping around 2, 4–5, 6–8, 11–13 and 23–24 g. Minimum modules of approximately 2 and 4 g seem to fit the Scandinavian ertog-system best (see also Pedersen, this vol. Ch. 6.4.1). But what did “ertog” actually mean, and how was this medieval unit of weight and reckoning related to the spheroid weights? We shall examine this in more detail in the following section.

#### Weights with a copper-alloy shell and pseudo-Arabic characters

The smallest unit of weight and reckoning recorded in Scandinavian documentary sources is the ertog.

Just like the *aurar*, there are no references to the ertog outside Scandinavia. The use of the ertog as it is expressed by the law-codes was centred in Eastern Scandinavia (Engeler 1991:144). The origin and meaning of the term “ertog” is unclear. It appears only in legal texts and is never referred to in skaldic or eddic poetry. “Ertog” appears most commonly in Swedish, less so in Norwegian, and very rarely in Danish or Icelandic law-codes. The ertog was also used as a coin-unit only in the Baltic Sea area, from the beginning of the 14th century (Engeler 1991:145).

Hitherto, two etymological hypotheses concerning the origin of the term have been proposed. It is assumed that *ertaug*, recorded in Old Gutnish (= Gotlandic) is the most original form (Engeler 1991: 141–2). *ertaug* is a compound of two distinct concepts. According to one hypothesis, its meaning derives

50 Cubo-octahedral weights were found in the Black Earth within the settlement area in the course of the most recent excavations. A larger number appeared in Phase 6, dated by the bead-chronology c. 860–885. Gustin emphasizes that the weights appear already within the earliest layers (A 50) of this phase (2004c:314).

51 Before conservation, the variance around this module lies in the range of 3.92–4.11 g. There is a discrepancy within the set of 0.29 g between weight no. 4 and weight no. 2. If we ignore no. 2, which is considerably heavier than the other specimens, the discrepancy falls to 0.17 g.



Figure 8.20 *Oblate spheroid weight with pseudo-Arabic inscription. Hedeby. Scale 1:1. 85.23 g. From Steuer 1997:295, fig. 212–1.*

from a common Germanic compound *\*aruti-taugo*, which can be translated as “metal wire”.<sup>52</sup> The other suggestion is that *ertaug* is a loanword of an originally Latin compound *argentum-pondus*, which developed in Germanic to *\*argentinaR-wagu* and so to *\*erta-vág* and *ertog*, which would then have meant “silver weight”. Sigrid Engeler (1991:142–3) did not regard this hypothesis as convincing since philologically it presupposes a very early use of the word. The interpretations that assume that the term has a very long history base themselves upon the concrete appearance of the form of currency and its primitive role in payment, conceivably as “metal wire” or “bits of metal” by weight. That *ertaug* is used virtually unchanged and undergoes no sound-changes either in West or East Scandinavian also argues, in Engeler’s judgment, against a very great age. It is also noteworthy that the Anglo-Saxon texts of the 9th century that refer to the units of mark and øre make no reference to the *ertog* (see above, p. 280). The linguistic evidence and the written records may indicate that this term first came into use in the 10th or 11th century. I believe that the archaeological evidence supports this.

There is new archaeological evidence of how spheroid weights were made which I consider to shed new light on what “*ertog*” might mean. Spheroid weights usually consist of an iron core enveloped in a thin metal shell of copper alloy. The copper-alloy shell prevented anyone from manipulating the weight at the same time as protecting the iron core from corrosion which would itself affect the weight. There is now unambiguous archaeological evidence of the complex production process for spheroid weights. Burnt clay fragments known as “melt bowls” with textile impressions have been found in several Viking-period urban contexts, including Hedeby, Birka and Sigtuna (Drescher 1983; Söderberg and Holmquist Olausson 1997). Anders Söderberg (2006: 66–8, fig. 1), who has undertaken a careful study of

these distinctive melt bowls, believes that they represent the production of spheroid weights (Fig. 8.19). In the production process, the iron core was covered with thin sheet copper-alloy strips, and then were all wrapped in a piece of cloth to hold them together (Fig. 8.19.1–2). The wrapped bundle was then invested in clay (Fig. 8.19.3). The dried clay ball was then heated up to 1100°C. During this part of the process the sheet copper-alloy melted and ran around the iron core. The textile pouch, which was carbonized in this process, prevented the copper alloy coming into contact with the clay. The weight was then polished, filed and adjusted to the desired weight (Fig. 8.19.5). Melt bowls are, then, the remains of the original clay ball with the carbonized traces of the pieces of cloth and the metals (Fig. 8.19.4).

The metrological connexion between the *ertog* as a weight-unit and the spheroid weights has, as already noted, been recognized since Ture Arne and Anton Brøgger’s studies. But no one has ever attempted to go further, and thus explain why the spheroid weights were associated with this unit. Here I return to the idea I have already introduced, namely that weight-standards like the *aurar*-reckoning, for instance, were conceptualised by being made material. It was precisely the spheroid weights *themselves* that, in my view, were considered to be the standard. The weights *themselves* represent, then, their own reckoning system for weighing silver. As a result they needed their own name, which was presumably provided by “*ertog*”, referring to the typical appearance of the weights.

The Old Gutnish *ertaug* that is first recorded presumably referred to the very distinctive appearance of

<sup>52</sup> *\*aruti* is identified as an ancestral form of German *Erz*, “metal”, also found as Old Saxon *arut* and Old High German *aruzzi*.

the spheroid weights, and possibly to the technique of coating itself. The philological suggestion that places the compound *ert-taug* at the root is presumably correct, but as yet lacks a satisfactory explanation. German *Erz*, which can also be translated “bronze”, refers, in my view, to the characteristic metal shell of the weight. *taug*, which in Old Norse means “rope”, “fibre” or “thread”, may refer to the textile or the pouch that made it possible to improve the iron core as a weight. It was through the process of refinement in itself that a lump of iron was transformed into a trustworthy weight with the aid of bronze and textile. This process can in turn be interpreted as an act of creation, in which the spheroid weights were animated and turned into living objects.

There is one further argument against the interpretation of “ertog” as “metal wire”. The latter is too unspecific to constitute a term for a unit of measurement and weight. The ertog as “a weight with a metal casing” is materially highly specific. It is because it could be perceived as an animated and thus a powerful object that the ertog legitimated the destruction of silver artefacts. In its property of being a standardized object, it made it possible to quantify silver in specific portions. In my view, this more specific interpretation reconciles the significance of the spheroid weights as pieces of weighing equipment, their production, the metrological facts, and the etymology of the word “ertog”. But there is further evidence that this type of weight was regarded as a norm in its original period of use.

Several spheroid weights weighing between 100 and 150 g also have inscriptions on the flat upper face that are reminiscent of Arabic writing (Fig. 8.20). This is not true Arabic but rather imitations of Arabic phrases that are also found on dirhams. One phrase is reminiscent of *rasul Allah*, “Allah’s prophet”, and another of the Arabic *bakh*, which can be translated as “of good quality”. The models for *bakh* are found on Abbasid dirhams struck from AD 766–75 (Sperber 1996: 96–7). Here we find an opportunity for a direct connexion between coins and weights. The qualitative properties of the dirham, in terms of purity and weight, were transferred to the weight. The inscription thus legitimated the weighing of silver coins. In Eastern Europe and Scandinavia, the spheroid weights were integrated into exchange relations at the end of the 9th century. Here, these distinctive weights may have been associated with notions of good quality and with reliability when metal was weighed. In that case they had a coin-like, confidence-raising character, and thus assumed a sort of monetary function.

Another suggestion that has been made by Pedersen (2001:26–8) in this regard is that the Arabic writing was imitated with a view to symbolizing access to Islamic silver. Dealing with an object of this kind in public could give its owner social prestige as it

signalled to others an ability to gain silver on trading expeditions. Pedersen’s hypothesis may explain why the spheroid weights are generally over-represented in burial contexts and may often be found on their own rather than in complete sets of weights in both graves and hoards.

What is clear is that the normalized Oriental weights introduced a different principle for reckoning the quantity of silver from the use of *aurar*-weights. When the dirham hoards start to appear in greater numbers in the North Sea region from the beginning of the 10th century (Kilger, this vol. Ch. 7.1, Fig. 7.1), we see that both the coined and, to a certain extent, the uncoined silver is starting to be broken up. Coins and silver rings in these hoards are manifestly reduced to the substance itself, silver, to be weighed and therefore no longer *themselves* to be counted in terms of nominal units. Thus the silver object lost both its physical and its nominal basis. As I have already argued, silver in Southern Scandinavia in the 9th century, in the physical form of rings and ingots, was bound within morphologically recognizable and therefore acceptable forms. But this *morphological identity* and the immaterial associations intrinsic to the physical form of the ring were neutralized by fragmentation. The object of trust was moved from one side of the pair of scales to the other: in other words, from the silver items of standardized weight such as coins and rings to the ertog. It was by means of the ertog that silver could leave its morphologically fixed and significant form and turn into hacksilver. It was through the ertog that “hacksilver in itself” became a medium of exchange. An economic value was thereby defined in a completely different way from *aurar*-reckoning. The silver fragments had no soul or spirit and so were not objects of value any more. The connotations of value and calculability that were previously linked to physical objects such as coins, rings and ingots had been abstracted and transferred to another object that replaced them, the weight. This replacement, I believe, may have triggered off a revolutionary process of change in the conceptual and cognitive worlds by which the value of the metal became inseparably linked to a conceptual understanding of the normalized weight. We shall now look at another source of evidence that has been associated with the process of fragmentation, namely the so-called hacksilver hoards that first appear during the first half of the 10th century all over Scandinavia.

#### **A new time of threat: the fragmentation of silver objects**

Birgitta Hårdh (1996:93) has studied fragmentation within Viking-period silver hoards and the regional development of the phenomenon of hacksilver. Very recently she has also examined the fragmentation of silver in settlement contexts such as Kaupang and

Uppåkra (Hårdh, this vol. Ch. 5.5.1). According to her definition, in a hacksilver hoard at least 50% of the uncoined objects weigh less than 5 g and at least 50% of the objects have to be fragmented. This allows her both to quantify and to date the development of fragmentation within the mixed hoards of the Baltic Sea region and in Scandinavia. Hacksilver hoards meeting Hårdh's definition first appear in South-Western Scandinavia, in Jutland and the Viken area, at the beginning of the 10th century (Lundström 1973: 21, tab. 3.1; Hårdh 1996:92–3, fig. 21, tab. 12 and 94–130, fig. 27).<sup>53</sup> A methodological premiss of Hårdh's studies (1996:84) is the development of a diagnostic means of studying the regional development of the process of fragmentation and thus also of the use of silver as a form of currency. Fragmentation represents a higher level of use of silver over a range of transactions than with silver which is bound up in larger, complete objects such as, for instance, rings or coin. Hårdh sees the changing use of silver in different hoard-areas as evidence of different economic systems.

Hårdh also brings out a number of essential points about how one may interpret fragmentation. Fragmentation gives us an insight into the circulation of silver and with that an idea about the extent of economically motivated transactions in a given region. Another line of thought is that the degree of fragmentation is an indirect indication of access to silver in an area. Put differently, fragmentation is intensified in an area when the price of silver rises. As a third perspective, the practice of fragmentation can be regarded as a stage in a process that leads to the use of coins as currency. Hacksilver may show us that access to coin was insufficient and unable to satisfy the need for currency. Hårdh thus allows us to consider the pieces of hacksilver as nominal and monetary units in a situation of general shortage. Hacksilver can therefore be seen as an intermediary stage between barter trade and a monetized economy. This is the case even though coins were *de-nominalized* and could simultaneously be used as weighed silver (Hårdh 1996:86; Kilger 2000:117–18). The explanation of exactly why the hacksilver tradition emerged in Southern Scandinavia at the beginning of the 10th century is, in Hårdh's view, the proximity of the monetized and economically highly developed Carolingian realms. Contacts with the monetized site of Hedeby will also, in her model, have promoted payment in very small quantities of silver (Hårdh 2004:215–16). As a result it should also have become possible to trade mundane, day-to-day products (Hårdh, this vol. Ch. 5.4).

A similar set of ideas has been propounded by Ralf Wiechmann (1996:173–8). Wiechmann, however, goes a step further than Hårdh. According to him, coin-fragments may themselves be adjusted to various basic monetary-units and to the average weights of Continental issues such as Carolingian, Scandi-

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Figure 8.21 *The hacksilver hoard from Cuerdale, Lancashire, NW. England (t.p.q. 905). Photo, The Trustees of the British Museum.*

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navian, Anglo-Saxon and German coins, and dirhams. A coin-fragment should, then, have the monetary function as a piece of minted silver. If we accept Wiechmann's train of thought, the hacksilver regions would be practising an earlier and more advanced system of reckoning and payment than the monetized territories themselves. This seems implausible. It is also unclear how, in such circumstances, one was supposed to be able to distinguish between, for instance, a third and a quarter of a coin in the actual situation of payment, or which fragments observed the Carolingian, Anglo-Saxon or German coin-standards respectively; and, how far the nominal use of hacksilver could be reconciled with the effective rules of a weight-economy (Kilger 2000:120–1). Something that on further reflection also argues against a quasi-monetary use of hacksilver is the fact that the partition of coins with a view to creating smaller nominal entities is not evidenced in Western Europe before the end of the 10th century. At the end of the 9th century and in the first half of the 10th the striking of *obols*, or half-coins, corresponding to half a penny, began in England.<sup>54</sup> In the German realm, half-

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53 The West Slavonic lands and the South-East of mainland Sweden followed suit in the middle of the 10th century. The regions north of Mälaren, in Southern Norrland, have typical hacksilver hoards first at the end of the 10th century. On Gotland, a tendency to fragment uncoined silver appears from about AD 940, but really breaks through only at the beginning of the 11th century.

54 There is evidence of struck halfpennies for, inter alios, Coenwulf II of Mercia (874–80), but such half-coins were struck first and foremost under Viking rule in York at the end of the 9th century. It was only after Edgar's coin reform of 973 that the official clipping of pennies to produce halves and quarters (halfpennies and farthings) began (Jonsson 2004:2–3, fig. 6).



denars and obols were regularly struck during the 10th century and later, as in the Dukedom of Oberlothringen. However here too, as in England, in certain circumstances the practice of clipping coins began in the late 10th century (Jonsson 2004:3 and 8–10, fig. 7, tab. 2).

It is clear that the partition of coins practised was not an accepted procedure in the monetized areas of Western Europe any more than it was in the Caliphate, be that in official circles or amongst those who had to use the coins (see above, p. 303). I conclude, therefore, that when the clipping of coin began in Western Europe it was on the basis of a change in attitude towards coined silver and in the principles that defined a monetary value. The inspiration for this change in attitude may rather have come from Scandinavia to the West, not the other way around as Wiechmann and Hårdh have proposed. The clipping of coin in England and Germany seems, indeed, to coincide with the importation of German and Anglo-Saxon coins to Scandinavia in the second half of the 10th century (Jonsson 1990). There may be a link here too. The fragmentation of silver in Scandinavia in the Viking Period first affects the dirhams and later spreads over to other, uncoined objects (see above, note 46). When the fragmentation of whole objects such as ring silver began, hacksilver finds appear. This is the process that Hårdh has been able to explicate in her studies.

In my view, the beginning of the hacksilver phase implies a period of revolutionary changes all over Scandinavia. During this period of transition certain groups who were engaged in long-distance trade may have been prepared to abandon the trusted *aurar*-objects for a different principle of reckoning and valuation which went with the normalized weights. The use of those weights was not evenly spread geographically, but rather seems originally to have been regionally concentrated. In the same way, we can suppose that the use of hacksilver as of equivalent value was originally very narrowly restricted to the trading sites. The tendencies towards this Orientally derived ideology of fragmentation can perhaps be observed in the middle of the 9th century when cubo-octahedral weights came into use at Birka, but it first really broke through right across Scandinavia with the spheroid weights in the course of the 10th century. It was with the spheroid weights that one could weigh large quantities of hacksilver. One of the earliest examples of the use of spheroid weights may come from the beginning of the 10th century in the lands around the Irish Sea in the large hacksilver hoards from Cuerdale in the North-West of England (Fig. 8.21) and Dysart Island, Ireland. These contained a larger numbers of dirhams, but also uncoined silver that was fragmented to some extent (Graham-Campbell 1992a:10–11, 1992b:112–13; Keynes 1999:63; Sheehan 1998:169–70). The quantity of fragmented objects

in these hoards clearly denotes a change in the handling of silver and may indicate that much greater amounts of hacksilver were being passed through the scales than before. An area of innovation in Scandinavia with respect to the use of spheroid weights may be detectable in Jutland in the first quarter of the 10th century, where the earliest Scandinavian hacksilver hoards are found (Hårdh 1996:95–6). But before I proceed further with a sketch of the breakthrough of the concept of hacksilver in Viking society and its possible social consequences, I shall take a closer look at the practice of weighing that was present before – and chronologically alongside – the use of the normalized weights. This is the lead-weight tradition, which may run back to the Early Iron Age in Scandinavia (Pedersen, this vol. Ch. 6.2.2). The question I shall examine in the next section is how lead weights may also have been used as weighing equipment in the calculation of fragmented silver.

### One set and two systems of weights

The archaeological work at Kaupang has more than doubled the number of Viking-period weights known from Norway. From both the settlement area and the cemeteries around Kaupang we now have a total of 420 objects that have been identified as weights (Pedersen, this vol. Ch. 6.1.1, Tabs. 6.3–4). Other than at Kaupang, about two hundred weights from the Viking Period have been recorded. In the settlement area lead weights predominate at more than 82% (338 specimens) compared with 16% for the copper alloy weights (72 specimens). In the cemeteries around Kaupang, by contrast, only 10 weights have been found, all of which are of the normalized type of copper alloy or with a copper-alloy shell (Pedersen, this vol. Ch. 6.1.1, Tab. 6.3, Fig. 6.13). The transitional phase in which the lead weights went out of use in the regions of Norway is difficult to identify as we have largely to refer to poorly dated burial contexts (Pedersen, this vol. Ch. 6.2.2–3). But the large number of lead weights in the settlement area may indicate that these were still in use at Kaupang in the early 10th century when the normalized weights were beginning to become established as trading equipment in several parts of Scandinavia. A minority of the lead weights which are similar in shape to the normalized weights indicate that both types of weight were used side-by-side in the town (Pedersen, this vol. Ch. 6.2.3, Fig. 6.16). It has formerly been argued, that the lead weights with metal appliqué were calibrated in øre (see pp. 285–6); but how are we to interpret the large number of weights that weigh less than an øre? What system of weights was observed by the lead weights that weigh less than one whole, or half, an øre: less than 26 or 13 g respectively?

Metrological analysis of the lead weights from Kaupang reveals that many of the weights seem to be calibrated around units of 4 and 8 g (Pedersen, this

Figure 8.22. Weight-set from Jåtten, Jæren, Southern Norway dating to the 10th century, with lead weights and a tin-plated balance (B4772). Photo, Svein Skare, Bergen Museum.



vol. Ch. 6.3.3, Figs. 6.18–19). These amounts are supposed to agree with the Islamic *mitqāl* and the Scandinavian *ertog* respectively. It is also possible to identify clusters around 2, 12 and 24 g, which could be fitted to Brøgger's later øre-system. According to Brøgger, the original øre underwent a slight reduction in weight from c. 26 to c. 24 g in the course of the Viking Period (1936:78–9). He distinguished, as a result, between an earlier and a later øre. The later øre was divisible into 3 ertogs, which was not possible with the earlier øre-system. At first sight, it would appear possible, therefore, to argue that the lead weights from Kaupang are similar to the normalized weights in many respects. They were used to weigh and to value hacksilver and they seem to respect Brøgger's later øre-system.

Since all of the weights from Kaupang are individual finds, it is not possible to study the original calibration code that the weights followed within their original sets. As has been shown above using the finds from Bråten and Kiloran Bay, the analysis of complete weight-sets makes it possible to study the minimum common factor within a set. It is also possible to obtain information on the intervals of calibration that determine the relative positions of the weights within the set. The find from Jåtten (Fig. 8.22, Tab. 8.9) in Jæren in South-West Norway – a hoard, to judge by the records of the find – contained a complete set of eight lead weights.<sup>55</sup> In this well-preserved and whole find all of the contextual information is available that is needed to determine what system of weights any single weight may relate to. Together with the weights, which were wrapped up in a small textile pouch, there was also a very well-preserved, tin-plated balance with its own case richly decorated with patterns of the Celtic style. This type of tin-plated balance with chains is only known from the North Sea area, with a particular concentration in Western

Scandinavia (Steuer 1987:462, fig. 6a, 1996: 23–4, fig. 3). The distinctive type of balance dates the Jåtten find to the 10th century. Jåtten should therefore be useful as a possible model to shed light on the lead weights found at Kaupang. Let us take a closer look at the structure of this complete set of weights (Tab. 8.9).

Three weights from the Jåtten seem to have been calibrated to the earlier øre-standard using a coin of 1.34 g to 1 and ½ øre (nos. 2–3). However four of the lighter weights are calibrated to a basic module of approximately 2 g (nos. 4–7). There is no known standard coin that corresponds to this weight. A different object may then have been used which was considered to have a consistent weight. One possible candidate would be the cubo-octahedral weights. Comparative studies of a large corpus of these show that those specimens with 3 punchmarks cluster from 2.47 to 2.17 g (Steuer 1997:284, fig. 204). Cubo-octahedral weights with this marking would be closest to a unit of around 2 g.

However there is an alternative and perhaps more plausible explanation that would also correlate all of the weights in the set metrologically to a common

<sup>55</sup> B4772.

	coin?		<i>aurar</i>		grain (à 0.067 g)
1.	2.68 g	1.34	X 2		40
2.	13.45 g	1.34	X 10	½	200.7
3.	26.80 g	1.34	X 20	1	400
mitqāl / ertogs unit?					
4.	1.96 g	1.96	X 1	½ ¼	29.3
5.	4.04 g	2.02	X 2	1 ½	60.3
6.	5.99 g	2.00	X 3	1½ ¾	89
7.	7.66 g	1.91?	X 4	2? 1?	114?
aurar / mitqāl / ertogs unit?					
8.	40.34 g	2.01	X 20		
		1.34	X 30	1½ 10 5	602

Table 8.9 *The set of lead weights from Jåtten, Hetland, Southern Norway (Brøgger 1921:4 and 15).*

unit. All of the weights could be calibrated by means of the grain. If we recalculate the metric weights in numbers of grains, the entire set shows very high precision in calibration (Tab. 8.9). The minimum common factor for all weights is a grain of 0.067 g. This precision argues against the use of any larger object such as a coin or cubo-octahedral weight by which to calibrate. The weights that observe the earlier øre-standard are calibrated in terms of a vigesimal system (see above, p. 284). It is possible that weight no. 1 was produced first with 40 grains. Afterwards this weight – in order to simplify the procedure – could have been used to calibrate the two larger weights at ½ and 1 øre respectively. But weights Nos. 4–6 are calibrated according to a trigesimal system that could not be employed with the earlier system of reckoning in øre. The number 3 appears as a coefficient in a duodecimal system of reckoning, such as is found, for instance, in the Roman, Byzantine and Islamic systems of coinage. Weight no. 7 may have been damaged, as it departs slightly from the trigesimal pattern. It was perhaps originally meant to weigh 120 grains, which would give a value of around 8 g. Weight no. 8 which weighs around 40 g or 600 grains seems to represent the maximum consistent unit in the set. This weight could have been produced using weights Nos. 2 and 3 or by doubling weights Nos. 4, 5, 6 and 7 together.

The pattern of calibration suggests that the owner of this set wanted to be able to deal with precious metal according to two different systems of weights. The smallest unit that could be weighed and valued with this set was 2 g or 30 grains. It is interesting that

the heaviest weight is calibrated to fit both systems. This weighs ½ øre or 600 grains according to the older Scandinavian øre-standard. This unit was directly compatible with the Islamic mitqāl- and the Scandinavian ertog-systems, at 10 mitqāl and 5 ertogs. Using the set of weights from Jåtten, it was thus possible to measure the same amount of silver according to either the earlier or the later øre-standard. It was particularly with weight no. 8 that it was possible to calculate a larger quantity of silver using both weight-standards. The scope for recalculation also renders it highly likely that this weight-set was used to weigh fragmented silver rather than whole objects. But what system of weights is represented by the smaller weights, calibrated at intervals of 2 g? Or, to look at this from a Viking-period calibration perspective, was there a system of reckoning that made use of 30, 60, 90 and 120 grains to produce recognized units of weight? There is a real possibility that this was so.

The Syrian-Arab mitqāl-unit was reckoned as 20 qīrāṭ, or 60 habba-grains (Hinz 1955:2; see above, note 49). The weights would therefore be consistent with the intervals we are familiar with from reckoning with the Islamic mitqāl. Rather than an Iraqi habba, which weighed around 0.071 g, lighter Scandinavian types of grain available to the person who manufactured the set of weights were used. As we have seen, the grain used for calibration for the Jåtten set weighed 0.067 g. This produces an overall reduction of the weight of the mitqāl from 4.26 to 4.02 g.<sup>56</sup> Erik Sperber has come to a similar result in his studies. From a metrological study of the spheroid weights, he has concluded that the Islamic mitqāl-unit was followed on Gotland. In mainland Sweden, at Birka, by contrast, a lighter module of 4.0 g was used, which he calls the Swedish-Islamic unit (1996: 85 and 110–11).<sup>57</sup> Sperber was unable to explain this conspicuous difference, but from the viewpoint of weighing in grains such a reduction in weight is a

56 4.02 g = 60 x 0.067 g; 4.26 g = 60 x 0.071 g.

57 As a sub-module of the so-called Swedish-Islamic standard of 4.0 g, Sperber reconstructs a unit of 0.8 g. The Islamic mitqāl-system at 4.26 g, by contrast, was based upon a sub-module of 0.71 g (Sperber 1996:87). What is inconsistent and confusing in Sperber's model is that in the case of the Birka system he assumes a division into 5 units (4.02 g/5 = 0.8 g), while he reckons with 6 units to the Islamic standard mitqāl (4.26 g/6 = 0.71 g). Sperber's otherwise outstanding metrological analyses would fit better if the Birka system were likewise based upon a duodecimal number of 6 and a much smaller sub-module (4.02 g/6 = 0.067 g). This would match the grain-unit inferred from the weight-set at Jåtten. The key to understanding Sperber's Swedish-Islamic module is that the same intervals of calibration were used as in mitqāl-reckoning, but a lighter grain was applied in copying this in Scandinavia.

familiar practical consequence of weights being calibrated using local types of grain.

The small lead weights from Jätten presumably observed the same idea of calibration as is represented by the cubo-octahedral weights. According to Ingmar Stenroth (in prep.), the cubo-octahedral weights are based upon a 60-grain system that is divided into 12 units. Each unit, marked with one punchmark on the weights, corresponded to an interval of 5 grains. In theory, then, 30 grains would be the same as a cubo-octahedral weight with 3+3 punchmarks. As I have noted already, however, the cubo-octahedral weights with this number of punchmarks are usually heavier, so that they themselves could not have been used as prototypes for calibration. Rather it may have been the counting system itself that the cubo-octahedral weights were based upon, and reckoning in grains, that were accepted. If we pursue these observations on a more general level, a basic unit reckoned as 60 grains would be the definite link between cubo-octahedral weights and oblate spheroid weights. Using the cubo-octahedral weights one could reckon in fractions of the unit of 60 grains, and using the spheroid weights in multiples of that unit. This basic unit was presumably also used in the production of the Southern Scandinavian lead weight sets at the end of the 9th and beginning of the 10th centuries. The lead weights from Jätten not only provide us with an insight into how calibration was done but also into how fragmented precious metal was measured in small portions.

From the point of view of the user of the weights, it was important that the weights in the set were perfectly consistent with one another. Outside of the set of weights and the intrinsic calibration code that determined the use of the weights within the set, the lead weights that imitated the Islamic mitqāl-unit could not be separated from weights in lead which followed the older øre-standard. Jätten shows too that the *aurar*-standard based upon gold coin did not disappear in the hacksilver period. This find can consequently be interpreted as a hybrid set of weights, the use of which made it possible to reckon fragmented silver in terms of two different standards. This was probably a pragmatic necessity when fragmentation really established itself in exchange relations in the 10th century. A high proportion of the lead weights from Kaupang may then have been used in the same way as the weight-set from Jätten. It was also in Kaupang that there was a need to be able to switch between payment using hacksilver and payment using larger, whole *aurar*-objects such as ingots. This may provide us also with an explanation of why lead weights predominate in the settlement site and why they were not immediately displaced by the normalized weights. This ability to switch between two standards was not so easily offered by the normalized weight-sets. What the basic unit of 60 grains – with

its similarity to Islamic mitqāl-reckoning – was called in Scandinavia we do not know. In the following section I shall offer a conceivable answer.

### Wholeness, holiness and dissolution

In the saga of Harald Greycloak in Snorri's *Heimskringla*, the final section narrates the fate of the skaldic poet Eyvind *skáldaspillir* [= “robber of poets”] (trans. Johansson 1991:185–6). This episode is set in the 960s, when Eyvind was forced to take care of himself after the death of his patron, King Hakon the Good. The poet had been given a gift from all the Icelanders after having composed a *drápa* in their honour. Each Icelander contributed three pennies of pure silver in payment. At the Althing it was decided to honour him with a gift that would make the silver finer still. The silver was made into a cloak-brooch equivalent in value to the huge sum of 50 marks of silver. But after Eyvind had the gift sent from Iceland, he broke the brooch up in order to buy himself a farm. The saga also tells of a great famine that afflicted Norway and of snow lying on the fields in the summer. Eyvind and the people of his farm were suffering too, and they put out to sea to fish. The purchase of the farm had cost the poet everything, and he was forced to pay for herring with his bow and arrows. In the final stanza that is quoted by Snorri, the great poet expresses his remorse at having squandered not only the Icelanders' beautiful gift but even his arrows. This composition reveals the conflict that had been dominating Eyvind's thoughts since he had broken up such a valuable and personal gift in order to buy a property. His personal situation and his responsibility as leader of his household compelled him to take that drastic step. This episode may also indicate that the fragmentation of a beautiful silver brooch in order to use it as currency was a feasible practice in Eyvind's day. Although the saga was composed much later, in the 13th century, it evidently reproduces a knowledge of a method of payment that was current in the 10th century amongst a wide swathe of the population. Fragmentation was an option of which even famous but powerless chieftains such as Eyvind could make use. This is the mental change in general perception that I believe we can also read in the hacksilver hoards that started to spread throughout Scandinavia in Eyvind's time.

The ambivalent attitude that people held towards hacksilver is also expressed in the Icelandic law-code *Baugatal*. In *Baugatal* the various components that made up a fine to pay for manslaughter were specified (trans. Dennis et al. 1980:175). These were the ring, *baugr*, as a larger unit, and smaller units that are referred to as *baugþak* and *þveiti*. Morphological identity is still recognizable in *baugr* and *baugþak*. What, though, does *baugþak* mean? The word is a compound of *baugr* and *þak*. *þak* can be translated as “roof” or “covering”. The related verb

*þekja* means “to increase a sum by adding to it” or “to contribute to a price or fine” (Engeler 1991:90). *baugþak* may then refer to the small rings that are linked around the larger rings: pendant rings. An example of a ring that corresponds to the normal fine and the various units that are noted in *Baugatal* has been found in a hoard from Krapperup in Skåne (Hårdh 1976:39 and 106, tab. 22:II). This hoard comprised two rings: a plaited neckring and an armring. Linked to the smooth armring were seven smaller rings (Fig. 8.23, c.f. Hårdh 1976:tab. 22.II). Four of these smaller rings in turn had dirhams fastened around them. The whole assemblage weighs c. 100 g, corresponding to approximately four units of the earlier standard øre. Both the rings and the coins may, then, be understood as *baugþak*: supplements adjusting the weight of the main compensation-ring, which may have been a plaited neckring. If both the rings and the coins from Krapperup together should be identified as *baugþak*, then each corresponds to the weight that is stipulated for the second ring in *Baugatal*, namely half a mark or about 100 g (Tab. 8.10). But *Baugatal* goes on to state that the sum of the fine is to be made up with *þveiti* in addition to the *baugr* and *baugþak*.

The heaviest of the four compensation-rings is paid by the kin of the miscreant to the closest kinsmen of the man who has been killed, father to father, son to son, or brother to brother (trans. Dennis et al. 1980: 175). The ring weighs 3 marks, and in *baugþak* a sum of 6 øre is given too. However the family must also pay an additional sum of 48 *þveiti*. *þveiti* are also referred to with the other three compensation-rings (Tab. 8.10). *þveiti* are clearly some distinct entity that is not reckoned in marks or øre. The fines due in *þveiti* seem also to follow a duodecimal reckoning that is divisible by the numbers 4 and 8. Could it be that the Icelandic *þveiti*-units represent an Icelandic and West Scandinavian counterpart to the ertog-system? What does *þveiti* actually mean?

*þveiti* are also named as a unit in the earliest Norwegian laws (Storm and Hertzberg 1895:750). The term is usually translated as “pieces” or “fragments”. Etymologically, *þveiti* is related to the Norwegian

Figure 8.23 Silver armring with *baugþak* from Brunnby, Krapperup, Skåne (t.p.q. 913) (Hårdh 1976:106, pl. 22:II).

word *tveita* and Swedish *tveta*, meaning “cut”, “cleave” (Hellquist 1980:1251–2). In Old English the verb *þwitan* is found, meaning “cut”, “cut off” (Engeler 1991:90–1). *þveiti* has been interpreted as a very small coin-unit or cut coin (Storm and Hertzberg 1895:750). The clipping or partition of coins is very common with Anglo-Saxon pennies from the end of the 10th century onwards. But there is no unambiguous evidence that partition was also practised with Norwegian medieval coins (S. Gullbekk, pers. comm.). There is therefore scope for suggesting an interpretation of *þveiti* as “fragment” or “fragmented silver”.

As I have suggested above, the heavier spheroid weights were probably given their own particular name as ertogs. “Ertog”, then, referred both to the very distinctive and readily recognizable type of weight and to a unit of weight. Using this term it was possible to specify and to calculate large quantities of fragmented silver. We do not know, however, what the smaller cubo-octahedral weights were called in Scandinavia, as no units smaller than the ertog, in other words lighter than about 8 g, were codified and preserved in the weight- and reckoning systems of the High Middle Ages. The ertog was the smallest unit of reckoning. The find of lead weights from Jåtten shows that silver was dealt with in portions of 60 grains (see above, p. 314–15). This is the equivalent of an Islamic *mitqāl* or half an ertog. This, perhaps, is the unit that was referred to by the term *þveiti*.

It was probably with the cubo-octahedral weights that fragmented dirham silver was processed in the 9th century. The centres for the use and diffusion of these small weights in Northern Europe may have been urban settlements such as Birka. It is at Birka that we have, as yet, the earliest dates for this type of weight (see above, p. 307, note 50). We must remember, however, that the finds from Birka may date the beginning of their use in the town, and not necessari-

	ring	<i>baugþak</i>	<i>þveiti</i>
Ring 1	3 mark	6 øre	48
Ring 2	20 øre	½ mark	32
Ring 3	2 mark	3 øre	24
Ring 4	12 øre	2 øre	16

Table 8.10 Compensation-payments specified in *Baugatal* in units of marks, øre and *þveiti*.



ly the absolute introduction of the cubo-octahedral weight as an item of weighing equipment in the Baltic Sea area. The possibility cannot be excluded that other sites with even earlier dated examples may turn up.<sup>58</sup> Using these special weights, which were normalized both in form and in weight, it was possible to weigh and divide silver into portions according to a different, previously unknown, scale. The use of cubo-octahedral weights in transactions made it thinkable for the trading parties to deal with body-less or *amorphous* silver in small quantities. It is this process, I believe, we can read from the term *þveiti*. The use of *þveiti* in exchange relations involved the splitting and so the dissolution of wholeness. The term *þveiti* manifestly refers to the object-free condition of silver: the non-morphological state that fragmentation brings with it. As a unit of reckoning, *þveiti* implies a certain quantity of fragmented silver, while in a transferred sense the term probably also reflects the dissolved wholeness and the partition of the silver's intrinsic value. *þveiti* may be a Scandinavian word for the Islamic weight-unit *mitqāl*, and for the system of reckoning the *mitqāl* represented. In terms of Viking-period weighing and valuation, then, *þveiti* should be understood as the basic unit for fragmented silver.

The fragmentation of coined and ring silver that began to become common throughout Scandinavia in the 10th century can therefore be viewed from a different perspective. The breaking up of silver ob-

jects can perhaps be seen as an act of *sacrilege* against the principle of the bodily *wholeness* of the coin, ring or ingot, and so too against its intrinsic *holiness*. Established conventions of payment that were based upon *aurar*-objects were challenged. For those who were accustomed to think and to reckon in *aurar*, this fragmentation may have represented a state of chaos in which the intrinsic quantitative relationship between coins and rings was dissolved. The system of *þveiti* and ertogs based upon fragmentation could have been seen as an assault upon the principle of value that was embodied in coins, rings and ingots.

However the transformation of fragmented metal objects to whole ones and back again was practised all through the Iron Age. The practice of breaking objects up was not necessarily introduced along with normalized weights in the 9th century. Late Roman

58 One possible candidate is the settlement at Janów Pomorski on the southern shore of the Baltic in the Old Prussian territory (Jagodzinski and Kasprzycka 1991). The archaeological studies of the last few years have produced a large number of individual finds of dirhams here (Bartczak et al. 2004). About four hundred weights have also been found, the majority of which are the cubo-octahedral type (M. Bogucki, pers. comm.). In the Old Prussian and West Slavic lands there is also a large number of dirham hoards that are amongst the earliest in the Baltic Sea area (Kilger, this vol. Ch. 7.5).

Iron-age metal hoards consisting of silver fragments are known from, amongst other places, Gudme on Fyn (Thrane 1993:36, pl. 10). What constituted a decisive qualitative difference was that the fragments could be used as a token of value in various transactions of economic character. The development to hacksilver as a calculable substance of value did not happen all at once but, rather, was presumably first established locally, where the conditions were right. The centres of this innovation in economic life in Scandinavia were probably the early urban trading sites such as Birka and Kaupang. This was also, perhaps, the case at Hedeby for a while, where the striking of Scandinavian coins was suspended during the second half of the 9th century (Malmer 1966:212–9 and 246–7). To conclude, I shall now try to pick out various details that I have referred to earlier on in this chapter to form a coherent picture of the various stages of the hacksilver economy in Southern Scandinavia and the North Sea zone.

### **The early use of hacksilver around the North Sea and at Kaupang**

It may have been at Kaupang that a silver economy based upon hacksilver first appeared in Viken. The Orientally inspired practice of fragmentation that was based upon the use of normalized weights was able to establish an initial foothold in the market area at Kaupang which was a meeting place for long-distance trade. But when did that happen? There is, as yet, no concrete archaeological evidence of when the use of the normalized weights may have been introduced to Kaupang. We have no surviving stratified layers later than c. 840/50 (Pedersen and Pilø 2007: 185, fig. 9.2). The date of introduction may have coincided with the first importation of large quantities of Abbasid dirham silver to the settlement area in the second half of the 9th century (Blackburn, this vol. Ch. 3; Kilger, this vol. Ch. 7.9). The practice of valuing and reckoning fragmented silver presumably came with the dirhams. As I have already noted, it was dirhams that appeared first as fragmented objects in the silver hoards (see above, p. 303). The widespread fragmentation of dirham silver can be observed in the earliest dirham hoards of the Baltic Sea zone. This is the case, for instance, with a number of Gotlandic finds from the first half of the 9th century (see above, note 46). If we move over to the North Sea region, the practice of fragmentation and the use of dirham silver seem not to be in evidence until a later date. A very good example is the metal-detector site at Torksey, Lincolnshire, in the North-East Midlands of England. Here the combination of the use of fragmented dirham silver, cubo-octahedral weights and uncoined hacksilver is very clear (Blackburn 2002).

Torksey was, according to documentary sources, the camp site of the great Viking army that con-

quered much of England. This army apparently camped here for twelve months in the years 872–3. The finds from Torksey are apparently interpretable as the earliest evidence of an economic practice that made use of hacksilver, albeit on a small scale, in the western North Sea region. Besides 16 cubo-octahedral weights, a large number of lead weights has been found, including conical weights, inlaid lead weights, and weights with metal appliqué – all of which have also been found at Kaupang (Blackburn 2002:98–9; Pedersen, this vol. Ch. 6.4.4). The use of cubo-octahedral weights at Torksey indicates that hacksilver could have been dealt with in very small units. The smallest weight is only 0.86 g (Blackburn 2002:97, tab. 1). The dirham-fragments are also very small. Of the eleven specimens published hitherto, nine weigh between 0.18 and 0.60 g. Two fragments weigh 0.8 and 1.6 g respectively (Blackburn 2002: 92–3). Without the metal-detector finds from Torksey we should have had no knowledge of this practice of fragmentation, since hacksilver has left practically no traces in the other coin hoards deposited in England during the last quarter of the 9th century (Blackburn 2003). One exception is the small hoard from Croydon near London, which contained a few fragments of ingots and armrings (Graham-Campbell 1992b). In Northern Friesland a further hacksilver hoard of Viking-period character has been recorded on the island of Wieringen (Besteman 1999; Kilger, this vol. Ch. 7.6, Fig. 7.18). The hacksilver finds from Croydon and Westerkief II were apparently deposited in the 870s and thus are contemporary with Torksey (Kilger, this vol. Ch. 7.6, Tab. 7.11). Looked at in a larger geographical and chronological perspective, however, all three of these finds are isolated. It is only from the beginning of the 10th century that hacksilver hoards begin to be especially evident in the British Isles (Fig. 8.21). In this respect, the situation in England is like that encountered in Southern Scandinavia. The hacksilver and dirham hoards are, with a few exceptions, conspicuous by their absence in the 9th century and enter the scene in the 10th (Hårdh, this vol. Ch. 5.4; Kilger, this vol. Ch. 7.1, Fig. 7.1).

The connexion between the use of hacksilver as currency and the use of cubo-octahedral weights in the 9th century seems to be corroborated by the collection of finds from Torksey. Pedersen, (this vol. Ch. 6.4.2, Fig. 6.29), argues that the lead weights may have been used to weigh and value hacksilver. Her contextual studies of the most recent excavations in Kaupang show that the distribution of lead weights and hacksilver can be related to one and the same plot. This context is dated to the second quarter of the 9th century, which would then imply a very early use of hacksilver in Kaupang. But were the conditions met for the lead weights also to have fulfilled the same function as, *inter alia*, the cubo-octahedral weights?

As we have already seen, using what was found at Jåtten, it would have been possible to use the originally Islamic system of reckoning by mitqāl-units to produce a set of weights. The know-how in respect of the matrix of reckoning that thus materialized in the cubo-octahedral and spheroid weights was transferred in the Jåtten set to another material, lead. Erik Sperber's metrological analyses (1996:72–4) of lead weights from the trading site of Paviken on Gotland reveals that reckoning by mitqāl may have served as the matrix for their production too. Pedersen's metrological studies (this vol. Ch. 6:146–8, Tab. 6.9) give further support to this possibility, as some of the lead weights with secure context may have calibrated to the þveiti/ertog-system. Both the hacksilver and the lead weights seem, furthermore, to have been used in association with the building that stood on this plot (Pedersen, this vol. Ch. 6:162). But why, then, do we not find normalized weights and dirhams in the same layers? The very early dating of the context may also lead us to question Pedersen's interpretation.

The weights from Kaupang with secure contexts provide a limited stratigraphical basis for metrological studies. It is also not possible to exclude the possibility that their weights – although they seem well preserved – have been changed, since the conditions for the preservation of metals in the surviving layers are not optimal. Despite these few criticisms, however, it is equally impossible to exclude the possibility that an economy based on hacksilver might have been introduced in Kaupang already at a very early date when the plots are showing evidence of permanent occupation (Pilø 2007d:195–200). The situation with the finds from Kaupang may reflect the resilient but flexible tradition of lead weights.

One final possibility is that fragmented silver could be involved in transactions at sites like Kaupang even before the introduction of the normalized weights. The very early use of hacksilver is documented at other urban settlements. In Birka the first appearance of hacksilver can be identified in the earliest layers from the 8th century (Gustin 1998:76, tab. 1). The crucial question is whether the hacksilver in those contexts can reasonably be interpreted as a form of currency or as raw material for the silversmith. Based on the assumption that silver, in the original *aurar*-economy, was handled and valued in the form of whole objects, this second possibility appears a more reasonable alternative. However, hacksilver may have been used, for instance, to weigh and complete the weight of ingots in a transaction between two traders. Without more thorough metrological studies that take this question as their starting point, this is difficult to determine as things currently stand.

When, over a longer or shorter period, hacksilver developed into an accepted medium of value in Kaupang, the boundaries between the embodied *ma-*

*nifest* and the body-less *amorphous* silver would have become much less clear. It was at sites such as Kaupang that people began to conjoin reckoning by *aurar* and reckoning by the originally Islamic mitqāl, which in Scandinavia was apparently reformulated as reckoning by *þveiti* and ertogs. Mental dexterity was needed to make the differentiation in exchange relations with these two quite different principles of value possible. I believe that this can be demonstrated with the set of lead weights from Jåtten. The use of hacksilver in the North Sea region seems, in the 9th century, to have continued to be the exception rather than the rule. It was only sites such as Kaupang that seem to have practised this use of hacksilver. And it was in peculiar situations such as, for example, the Viking camp at Torksey, that this method of valuing and payment was accepted at such an early date within the North Sea zone. The finds from Kaupang may show that an economy based upon *aurar* and a hacksilver economy could co-exist. Here there may have been *mental elbow-room* between those who may have wanted to use either whole objects or fragments as currency. What makes Kaupang stand out, as it then stood at the northern limit of the Danish-influenced area of Southern Scandinavia, was that hacksilver was apparently used in exchanges of an economic character as early as the first half of the 9th century. The practice of weighing and valuing fragmented silver may have been difficult to accept beyond the limits of the settlement, at least in its earliest phase.

Paradoxically, the introduction of a hacksilver economy may, in the longer term, have contributed to the undermining of Kaupang's position as a central place for trade and exchange in silver in Viken. A system of market exchange and a regime of value that was based upon reckoning and thinking in terms of *aurar* was itself a precondition for the exceptional status of the site in relation to its hinterland. But the practice of fragmentation changed the distribution of silver in the longer term, reaching a wider tranche of the population. The normalized weights embodied a different regime of value and an alternative view of what constituted economic value, at least during their period of introduction. The valuing of silver as a substance in this phase was no longer essentially bound to *aurar*-objects. This perspective may give us an insight into why hoards containing fragmented dirham silver do not appear in Southern Scandinavia during the 9th century but rather are limited to the Baltic Sea area. It was the "*aurar*-sites" of Southern Scandinavia, such as Kaupang, Uppåkra and Tissø, that "sucked up" the Oriental silver coin in the initial phase and re-cast it as standardized *aurar*-objects (Kilger, this vol. Ch. 7.9). When the influx of Samanid coin from the East broke into the circulation of silver in Southern Scandinavia during the second quarter of the 10th century, the influence of the "*aurar*-sites" diminished seriously (Kilger, this vol.

Ch. 7.7). This may have coincided with a more habitual use of the larger spheroid weights beyond Kaupang, using which one could deal with hacksilver in much greater quantities. In this phase we see the first hacksilver hoards in the hinterland of Kaupang, and the use of hacksilver was established as an accepted form of currency beyond the limits of the trading site.

### Conclusions

In this section, I have taken a closer look at the connexion between the fragmentation of silver objects and the introduction of normalized weights. Steuer's dualistic model of *Gewichts-* and *Münzgeldwirtschaft* has given us a good image of the appearance of the new, Oriental, silver economy at the end of the 9th century and its establishment in Scandinavian society in the 10th and 11th centuries. At the same time, though, Steuer's polarized conception contrasting the use of coinage, on the one hand, and an economy based upon weighted and fragmented silver on the other, leaves a blind zone with regard to the economic practice previously to be found in Scandinavia, namely reckoning in *aurar*. Alongside the coin- and weight-economies in Scandinavia one could put a third means of valuing and making payment, the ring-/ingot-economy. The coin-economy and ring-/ingot-economy are related to each other, since the associations of value were embodied in whole objects. It was primarily the ring-/ingot-economy that was confronted by the weight-economy in Scandinavia at the end of the 9th century. Rings and ingots were the principal objects of value that were used outside of the monetized areas of Western Europe. During the Viking Period a ring-zone stretched from Ireland in the West to Russia in the East. In theory it was only whole objects that could be used in various forms of transaction under the ring-/ingot-economy. Under the weight-economy, by contrast, silver was valued by a quite different principle. In this case fragmented and amorphous silver could also be used in transactions.

With the introduction of the normalized weight-types came a new way of reckoning – i.e. of weighing silver in both larger and smaller portions. However it was not just a different economic order, in accordance with which people started to weigh silver using precise weighing equipment, that characterized the Orientaly inspired weight-economy, but rather a concurrent change in attitude: a preparedness to dissolve the wholeness of the silver object. There was a nagging uncertainty, yet paradoxically also a liberation from the influence of the sacred *aurar*-objects in various social and economic situations, that came in with the use of hacksilver. As Anton Brøgger was able to show long ago, the øre was dealt with in two different ways in Scandinavia right up to the High Middle Ages: both following the earlier øre-standard and the later ertog-based øre-standard. The earlier øre,

which was originally based upon Merovingian gold coinage and its reckoning, was used to calculate whole objects such as rings during the Viking Period, and later on in the Middle Ages also coins. A clear example is Harald Hardrule's coin-reckoning of the mid-11th century in which the earlier øre-weight was apparently applied (Skaare 1976:79). Using the later øre, people apparently dealt with and calculated larger quantities of hacksilver. It was the spheroid weights, which may have been known as "ertogs" in the Viking Period, that were the fundamental and legitimating element of the hacksilver economy from the beginning of the 10th century onwards. When the spheroid weights fell out of use over much of Scandinavia, the significance of hacksilver as a counterpart of value in exchange relations also vanished. As a type of weight the ertog began to be taken out of use at the end of the 11th century (Steuer 1997:327–30).<sup>59</sup> However the ertog survived as a unit of reckoning, and was integrated as the smallest module weight into the weight-systems in use in the Scandinavian kingdoms of the 12th and 13th centuries.

Several authors have described hacksilver as small change that facilitated trade (e.g. Suchodolski 1977; Hårdh 1996:24–5). However the introduction of hacksilver as a counterpart of value was presumably no intrinsically self-evident economic process. A number of preconditions had to be met for payment with pieces of silver to be able to claim an autonomous and recognized place in the sphere of exchange. The recognition of hacksilver not only required items of equipment such as the normalized weights; in its initial phase it was also restricted to specific sites. It was the early urban sites of the Baltic Sea region that were the nodes of the growing and ever-increasingly regular long-distance trade of the Early Viking Period (Sindbæk 2005) which may have developed and put into practice the conventions of payment that were based upon fragmented silver. This is the practice that we can probably then trace in the North Sea region in the 9th century at sites such as Kaupang. The inception of the use of hacksilver as a counterpart of value in the sphere of exchange outside of the trading sites may very likely have provoked conflicts in Viking-period society, since fundamental concepts of what constituted value were called into question. This "new" convention respecting payment may, to certain groups, have appeared alien and irrational.

Both Steuer's (1987, 1997) and Gustin's (2004c) studies present the introduction of the weight-economy at the end of the 9th century as a peaceful and innovative process. This economic system is described as a convention for making payments that created trust and which was established amongst those groups that were engaged in long-distance trade and who dealt with large quantities of silver. The employment of the normalized weights for eco-

conomic purposes, however, was not necessarily an immediately conflict-settling and confidence-raising innovation, as the works of both of those scholars might lead one to believe. As anthropological studies of recent years have argued, especially the work of Annette Weiner, the motivation behind economically directed exchanges is not necessarily based upon the principle of reciprocity – i.e. a principle that always aims at a mutual balance in economic relations (see above, p. 262). Economy is rather a matter of monopolizing value: of defining what is valuable and so exercising influence. The use of hacksilver as a counterpart of value may then have ushered in new constellations within society and in respect of political power in the transitional phase.

New groupings appeared in Viking-period society at the end of the 9th and beginning of the 10th centuries which could perhaps be linked to payment using hacksilver and so indentified themselves with the alternative approach to valuation. A series of archaeological complexes indicate that in certain cases the normalized weights can be associated in their phase of establishment with a male-dominated sphere: with weaponry and warfare. An example of this is the use of cubo-octahedral weights at the metal-detector site of Torksey, England (Blackburn 2002). The earliest hacksilver hoards of Western Europe around the Irish Sea and in England, such as Croydon and Cuedale, or in the Netherlands, such as Westerkrief, may be linked principally with the activities of Danish Vikings (Graham-Campbell 1992b:110–14; Higham 1992; Richards 2000:31; Besteman 2002). It is possible that these groups of fighting men, campaigning in Western Europe, were amongst the first in Southern Scandinavia to accept the system of value that went with the normalized weight-sets. The grave finds around Kaupang can be included in this case. Two burials at Nordre Kaupang which contained both balances and normalized weights were rich male graves. It is possible that the individuals who were buried in the northern cemetery were primarily associated with the chieftain's seat at Skiringssal and less so with Kaupang itself (Pedersen 2001:28). In this context, the rich male burial from Rolfsøy in Østfold should also be noted,<sup>60</sup> a grave that contained a complete set of eight spheroid weights, one cuboctahedral and three conical lead weights (Pedersen 2000: appendices 4 and 5, V 5). The picture that these archaeological complexes present is not, however, an entirely simple one, and could be interpreted in various ways. Alongside the military element which may be hinted at in the Southern Scandinavian context there is also an undeniably peaceful aspect to the use of cubo-octahedral weights. There were individuals engaged in long-distance trade in the Baltic Sea region who identified themselves with the use of the normalized weights (Gustin 2004c:203–34). This is exemplified in the

cemeteries at Birka, in which the normalized weights reveal a different symbolic language and were used as a conspicuous feature in women's, men's and even children's graves (Kyhllberg 1980b:203, 1986:150–1, tab. 17.2). These may have been groups whose domiciles were linked to the urban trading site and who wished to mark their identity as merchants in their funerary practice (Welinder 1999:132–5).

From the Southern Scandinavian perspective, the use of hacksilver as a form of currency which first began to spread beyond urban settlements like Kaupang in the 10th century can be interpreted as a break with the ideological and economic power that was represented at the old *aurar*-sites. It was at sites such as Kaupang that *aurar*-objects were made and sanctioned as objects of value. It was also there that hacksilver was first used as a medium of exchange. The early hacksilver hoards of Southern Scandinavia and the British Isles may represent not only the introduction of the spheroid weights and thus of fragmentation as a practice beyond these centres, but above all show that silver had generally become available to a wider group of people outside the towns. The demise of Kaupang during the second quarter of the 10th century – which could have been for various reasons (see discussion Skre 2007j:468–9) – thus coincides with a decentralization of the handling of silver in the Viken area.

## 8.6 Summary

This chapter has considered how silver was used and valued as a form of currency at Kaupang. The basic problem tackled in this essay is that of approaching the concept of “money” in light of three different principles of value and payment that dominated exchange relations in Scandinavia and Western Europe during the Viking Period. These were, firstly, the use of coinage by monetized societies; secondly, the use of *aurar*-objects such as rings and ingots of standard weights; and thirdly, the use of hacksilver by non-monetized societies. Using the story of Ohthere, the much-travelled chieftain from Northern Norway, who visited Kaupang in Skiringssal late in the 9th century, as a frame, I have tried to illustrate the complicated knowledge of ways of making payments and value-norms, which those who participated in the long-distance trade of the Viking Period had to have. Those travellers who followed the “northern way”

59 This is shown, for instance, by the stratigraphical evidence from the town of Schleswig. In some areas, for instance in the Baltic states, the use of spheroid weights may have continued into the 12th century (Steuer 1997:328). The latest hacksilver hoards were deposited at the beginning of the 12th century in the Elbe-Slavic area of Vorpommern (Kilger 2000:140 and 157–8).

60 C4188–4197.

could in all probability distinguish these three methods of using and valuing silver.

It was at Kaupang in Skiringssal that Ohthere encountered merchants and craftsmen from both the North Sea region and the lands around the Baltic. The most recent excavations have provided evidence that individuals from the Frankish Empire came to the site (Gaut, in prep.; Wamers, in prep.). Pieces of Slavonic cooking pots show that merchants or craftsmen from the Slavonic area may have resided in Kaupang (Pilø, in prep.). The maintenance of regular contacts with Birka, one of the largest urban settlements in the Baltic zone, is indicated by the burial practice in the cemeteries at Kaupang (Stylegar 2007: 99–101), by casting workshops employing similar processes of manufacture (Pedersen, in prep.), and finally by the dirham finds (Kilger, this vol. Ch. 7.7). There were also influences from the Hiberno-Scandinavian settlement areas in Ireland and Scotland in the form of the distinctive lead weights with metal appliques (Pedersen, this vol. Ch. 6.5.5). At Kaupang in Skiringssal, interaction between these groups was intensified in the densely populated settlement of the town. Here, I believe, was all that was needed for the development of a quite unique situation. Different moral preconceptions in respect of relations of exchange, with regard to what was appropriate or unacceptable, needed to be clearly explained; different views about what was a reasonable and just price had to be channelled; and conventions and rituals that established trust had to be defined and re-affirmed. It was in an urban context of this kind that exchange could cross over cultural, economic, religious and social boundaries. It was this disorderly and multifaceted urban culture that defined Kaupang as an enclave and differentiated the site from its hinterland.

A counterpart to the spatial density that characterized Kaupang as a town may be found in the character of silver as a medium of payment, value and reckoning. During the Viking Period, silver was dealt with and valued in various forms, including coins, ingots, rings or hacksilver. In specific bodily forms, the regimes of value were focused and materialized. It was in the silver body that ideas and concepts of value could find a place and be transmitted. I propose that the crucial objects of value in the Viking Period – coins on the one hand and the rings on the other – were regarded in the economic thought-world of the age as living things of the highest order. One of the fundamental problems to address in this study has been to reach an understanding of how conventions for making payments could develop and be diffused within non-state societies lacking any strong central authority. My theoretical premiss has been that ideas of standard were embodied, or in other words materialized, in objects that served as a form of currency. These objects bore associations that were considered

to be of value by those who used them. Here I make use of the anthropological concept of *inalienable possessions* in order to show that economic relations must always be related to a durable and transcendental point of reference. This point of reference may be materialized in holy objects which can never themselves be the object of exchange; they rather initiate exchange. It is this point of reference, this principle or power, which animates the valuables that are included within economic transactions in a given society and provides them with the authenticity they need. One example of an inalienable possession in Scandinavia in the Iron Age is the gold ring, which belonged to the gods but which simultaneously legitimated the use of silver as currency in the form of rings and ingots of standard weights. *Inalienable principles* likewise sanctioned the use of coin in monetized societies. Forms of currency always referred to an aspect of value that was considered by the users to be unobtainable, yet which was something that people always desired to achieve. As I have also argued, these associations of value were not universal but rather differed from society to society. The second theoretical premiss of this discussion is based upon the belief that ideas of a standard could only emerge and be manifested in human consciousness if the currency was calculable according to a scale that was considered to be trustworthy. Thus these objects of value had the same characteristics that “money” has. It has been from this perspective that I have tried to comprehend the use of “money” at Kaupang.

In the section “Monetary Concepts around the North Sea”, I have looked at coins as objects of reckoning and value in the Late Roman, Merovingian and Carolingian empires from the 4th century to the 9th. The coin-section itself forms the foundation in this chapter for going on to analyse the øre in a methodical manner, which I attempt to trace in archaeological evidence. Here, too, I discuss the underlying mental acceptance that was implicit in the monetization of the Carolingian realm. This section thus creates a framework explaining why the use of coin failed to gain a foothold at Kaupang. The point of reference in the system of payment using coin constituted what is called “coin-reckoning”. Coin-reckoning was based upon grains, which served as an absolute point of reference. It was particularly in the reckoning by gold coins – the practice of the Late Roman Empire and subsequently in the Merovingian realm – that the weight and purity of coins were measured by use of a certain number of grains. Through the symbolic power of the grain, the coin was linked to fertility and well-being. It was religious values and cosmological concepts that the coin, as an imaginary form of capital and therefore of sanctioned value, referred to above all. In the Carolingian Empire the silver denier derived its value by alluding to elemental concepts of the Christian faith, namely salvation and the daily

bread. However the denier also derived its monetary power through the lord, in his character as Christ's representative on Earth, endowing the coin with spiritual life. Similar mechanisms of value were probably also involved in the earliest Scandinavian coinage, at Ribe and Hedeby in the 9th century. The Ribe coins alluded to the cult of Odin and to Odin's battle with the forces of chaos. Odin guaranteed the order of the universe and thus the survival of the world. It was this myth that the Danish ruler alluded to and so rooted the value of the coins in a non-Christian cosmology. Because the coin was connected to an important immaterial aspect of the human conceptual world, they became valuable in the eyes of those who used them. In this section I have also discussed the function of the silver denier as a central measure of value in Carolingian society. In its capacity as a generally accepted standard, the denier could lend legitimacy to a system of commodity-money. Under a commodity-money system one did not necessarily have to use coin itself for making payments; rather, it was possible to reckon in other media such as grain, livestock, honey or wine. The conclusion drawn at the end of this section is that coinage never came to be used in Kaupang despite the close connexions with the Frankish realm in the 9th century. Presumably the immaterial facet of the value of coins was not accepted because it referred to a set of Christian concepts. At Kaupang there was also no royal power or politico-religious authority that could animate coins with a monetary value.

In the section "Traces of the *eyrir* standard at Kaupang", I have attempted to trace a monetary standard that came to be used in Kaupang. I find a materialization of this standard in the large corpus of rings and ingots in the Viking-period hoards of Scandinavia. Just like coins, rings and ingots were standardized by weight. This standard, I believe, corresponded to reckoning in *øre* or *aurar*, of which we have evidence in written sources such as law-codes and runic inscriptions. In the same way as coins, *aurar*-objects united the principle of countability with immaterial associations of value. *Aurar*-objects became calculable as they contained a given number of coins per *øre* and thus were of constant weight. This was the convention that was expressed in the formula "penningar ger eyri" which is quoted already in the early medieval Scandinavian law-codes. The building blocks of the *aurar* are "pennies" of very consistent weight such as the Merovingian gold coins of the 7th century, which may indeed have been the source of the term *aurar*. Merovingian gold tremisses were used as calibration prototypes for the fine-adjustment of weights that were used to weigh precious metal in perfectly equal portions. Silver coins such as sceattas from the end of the 7th century and Anglo-Saxon pennies from the 9th century may also have functioned as calibration models in the production

of *aurar*-weights. These coins respected the same weight-standard as the Merovingian tremisses. Gold rings and subsequently silver rings were reckoned, from the beginning of the 7th century onwards, using an *aurar*-unit of 20 pennies. There is also some evidence of a heavier *aurar*-unit based upon multiples of 10 pennies. Those "pennies" were probably Abbasid silver dirhams struck in the Caliphate in the 8th century and at the beginning of the 9th, and used as calibration prototypes.

Reckoning in *aurar* was not a practice that arose in Scandinavia; rather it had its origins in the Merovingian realm, where gold coin was in use. There, this originally Roman practice of using a specific number of coins as a unit of reckoning, was called the *uncia*- (ounce-) standard. Evidence of the Merovingian ounce is found all around the North Sea region. The ounce was given different names around this region but in fact refers consistently to a single convention of value, namely the reckoning of 20 pennies per unit. The principle of reckoning a fixed number of coins to a unit was apparently also practised in Eastern Europe. Here it appears that 10 dirhams were used per unit in the production of larger objects of standardized weight such as rings. This practice was probably the origin of the Eastern *grivna*-standard. "*Grivna*" means "ring" but is a unit of weight at the same time. Evidence of both the Western ounce-/*aurar*-system and the Eastern *grivna*-system is found at Kaupang. In Scandinavia, the concept of *aurar* may have been linked to the myth of Odin's eternal gold ring Draupnir. This mythical ring produced eight rings of equal weight every ninth night. In such a way, I suggest, the ring was associated with the ideas of predictability and justice, and with fertility at the same time. The myth of Draupnir probably made use of the canonical relationship in reckoning between the mark and the *øre* as weights that is recorded in documentary sources.

I have linked the introduction of the *aurar*-standard in Scandinavia to the growth of North Sea trade in the 7th and 8th centuries. Large quantities of coin were in circulation within this network, on both sides of the English Channel. In Scandinavia, however, although there may have been contacts with this trading network, coins apparently were not accepted as currency but rather were melted down to make larger and carefully weighed *aurar*-objects such as ingots and rings. This practice of melting down may explain why gold coins from Western Europe are so rare in Scandinavia after the Migration Period. They appear only in very unusual hoards such as the Viking-period gold hoard at Hoen. One possibility is that the system of reckoning in *aurar* first established a foothold at production and exchange sites in 7th-century Scandinavia. As a possible "*aurar*-site" I discussed the Lundeborg/Gudme complex on Fyn, in Denmark. A good sign of an *aurar*-site is evidence of met-

alworking, casting, and the presence of weights, particularly of lead. Lead weights like those found in craft contexts may have been used by the smith to weigh precious metal in exact portions in the process of producing *aurar*-objects such as gold rings in the Norwegian Merovingian Period and silver rings in the Viking Period. Kaupang can be regarded as a Viking-period *aurar*-site, with clear evidence of casting. Dealing with silver in accordance with the *aurar*-standard provides us with yet one more basis upon which to understand why coins are so rare in the earlier phases at Kaupang and indeed generally all over Scandinavia throughout the 9th century. The distribution and handling of silver in the various super-regional exchange network was done through larger, re-cast units such as ingots. The melting down of coined metal to make larger *aurar*-objects was the central custom in the handling of metal in Southern Scandinavia in the Early Viking Period; perhaps in the preceding Merovingian Period too. This custom is, in my opinion, also the key to the explanation of the absence of coin in hoards all over the area down to the beginning of the 10th century when hacksilver hoards start to appear.

Finally, I argue for the presence of a commodity-money system in Kaupang. There is written evidence for the existence of a fully developed commodity-money system based upon øre in Scandinavia only from the 12th century. However the archaeological evidence in the form of finds of weights, ingots and rings respecting the øre-standard indicates that such a system may have been in existence as early as the Late Iron Age. If the silver denier was the point of reference for relations in terms of value and price in the Frankish realm, this role was taken by the øre in Scandinavia. In the same way as, conceivably, people thought and calculated by the denier-unit, people in Kaupang thought and reckoned in terms of both metal *aurar*-objects that were materialized in silver and of other, non-metallic media such as, inter alia, textiles of a certain length and breadth.

The øre may have been employed as an immaterial unit of both reckoning and value because it was thus possible to compare and measure the value of different goods. The øre-standard may thus have laid the foundations in Kaupang for the use of money and for quasi-market trade separate from any socially binding sphere. The Kaupang/Skiringssal central-place complex can, consequently, be regarded as an economically closed space in relation to its hinterland. This space was an entity within an interwoven economic complex. In the workshops in Kaupang metal *aurar*-objects were manufactured which were used as currency. At the *thing* the reckoning in *aurar* was annually defined and legitimated. And in the town itself, goods of varying quantity and quality could be bought and sold using *aurar*/øre as the standard of reckoning.

The third and last conventional practice for making payment that shaped the economic relations in Kaupang is considered in the section “Ertogs, *þveiti* and fragments”. In this section I discuss the use of hacksilver as a form of currency which involved a rupture with the principles of valuation that were represented both in coins and in *aurar*-objects. Yet even in the use of hacksilver there is, paradoxically enough, an objectification of standard. How, though, could that standard be maintained when the silver that was being used was shattered into tiny fragments? The answer lies, in my opinion, in the use of the normalized weights that began to spread around the Baltic Sea region during the second half of the 9th century. The principle of calculability resides in the standardization by weight of the normalized weights. The idea of value is symbolized and materialized in their uniform and very distinctive appearance. The small cubo-octahedral weights and the large oblate spheroid weights follow the weight-standards that were employed in the Caliphate. Methods of payment in the Caliphate depended, on the whole, upon the weighing of coined metals such as gold and silver. Reckoning was done by the unit of the mitqāl, and to a lesser extent in numbers of coins. The same practice of weighing and valuing silver by the mitqāl was established in Northern and Eastern Europe when and through the fact that people began to use the normalized weights. As I use the term, I believe that the mitqāl-standard was *materialized* in these weights. The decisive difference from the monetary system of the Caliphate was the preparedness to split up, in other words to destroy, whole silver objects such as coins and pieces of jewellery and so to change them into fragments. The fragmentation of coined silver was only exceptionally accepted in the Caliphate, where it was a controversial issue. Under a hacksilver economy the essential associations of value were no longer found in the silver objects themselves but rather were transferred to a substitute object such as the normalized weights.

Here, then, we see steps taken towards a different abstraction of value from that implicit in coins and *aurar*-objects. The weight and value of the silver could only be determined by means of the normalized weights. It was also through the fragmentation of silver that the weights received a name of their own. By the 10th century, this process of substitution in the silver economies of Scandinavia resulted, I believe, in the establishment of the ertog-standard. I make the case that it was the oblate spheroid weights that were originally called “ertogs”. An etymological explanation of this term can be connected to the highly distinctive copper-alloy shell on the weights, and perhaps also the process of coating by which the outer copper-alloy shell was added to the iron kernel. Both spheroid and cubo-octahedral weights were probably calibrated according to a unit of reckoning

of 60 grains which also was the basic unit of the Islamic *mitqāl*-standard. This standard unit of 60 grains, which may have been known as *þveiti* in Old Norse, was probably also used to calibrate lead weights. An etymological interpretation of that term shows that what was referred to was the very fact of splitting; specifically the fragmentation of silver objects. The introduction of the normalized weights to Scandinavia involved a new way of measuring value, which later seems to have embraced the use of lead weights such as those at urban trading sites like Kaupang too. In fact, the majority of the lead weights found at Kaupang seem to have been calibrated according to the *þveiti/ertog*-standard.

The employment of the normalized weights led to a process of the dissolution of conventional ways of making payments and of concepts of value that the earlier *aurar*-system had been based upon. The faith in the intrinsic value of *aurar*-objects had been rooted in their indivisibility and therefore their wholeness. However the fragmentation of silver objects involved a direct attack upon this principle; it “took apart” the body of the *aurar*-object and thus dissolved the associations of value that were physically embodied within it. The original system of valuation of the Viking Period that was rooted in the whole and simultaneously holy objects was thus challenged. A readiness to break objects up probably led to social tensions. In the course of the 10th century the new ideology of value appears in the growth of the hacksilver tradition in every part of Scandinavia.

According to my historical model, the hacksilver hoards initially represent a situation of disorder, in which the wholeness of silver was of little significance. In the early period of fragmentation new groups, who were prepared to adopt the new principle of valuation which resided in the use of the normalized weights, came to the fore. The fragmentation of silver and of *aurar*-objects can also be identified earliest amongst marginal groups such as the Scandinavian warriors who were raiding in Western Europe towards the end of the 9th century. Over a longer period, however, the use of the normalized weights also led to the use of silver being diffused across a much wider section of the population. Para-

doxically, fragmentation led to the loosening of the religious hold that *aurar*-objects had over economic relations. It was probably part of this process that Kaupang’s monopoly of value in its character as an *aurar*-site was undermined and the site lost its importance as the dominant trading site in Viken.

In my survey of the three principles of value and valuation in this chapter, in the form of coin, *aurar*-objects, and normalized weights plus hacksilver, I have been arguing that the use of “money” in some form or other was not alien to Iron-age societies. The use of “money” is not restricted to commercialized and market-adapted systems alone. Calculation and pricing are not limited to the modern market economy; they appear in all societies which engage in organized economic relations crossing political, social, ethnic and mental boundaries. “Money” is always ambivalent: it is moral and amoral at the same time; it bears inalienable qualities but is at one and the same time alienable. To put it another way, “money” both questions and simultaneously confirms the concept of value current in a society, because the value and acceptance of money is always linked directly to this idea of value. As a result, it is impossible, in my view, to differentiate between the social and economic functions of money. This artificial division of money has been a prominent interpretative view in scholarship on the Iron Age in Scandinavia in the 1980s and 1990s. As I see things, economic relations in modern, primitive and prehistoric societies alike remain difficult to understand if they are analysed from the outset on the basis of an opposition between anonymous and social – i.e. personal – structures. The use of “money”, in contrast, is also a matter of relations of power: namely of the right to make material and so to define value.

#### Acknowledgements

My thanks to Stefan Brink, Gunilla Gonon-Sabelström, Svein H. Gullbekk, Karl-Gunnar Johansson, Julie Lund, Hanne Monclair, Unn Pedersen, Dagfinn Skre, Ingmar Stenroth, Anders Söderberg and not least my wife Erikka Wessel for their valuable and encouraging comments.