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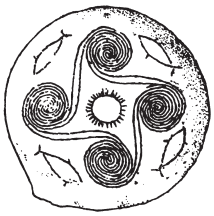

Circuits of Metal Value

Changing Roles of Metals in the Early Aegean and Nearby Lands

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Chapter 3

Greek silver before coinage: Medium of exchange, means of wealth accumulation, or commodity?

Susan Sherratt

There has been some debate as to whether Greece made use of silver as a form of currency before the introduction of coinage in the 6th century BC. By analogy with the Levant, one might expect that it did, but, unlike in the Levant, there is virtually no evidence for this. And in any case the observations that the Phoenicians, in particular, adopted coinage so much later than the Greek cities, and that the earliest Levantine coins were in general of Greek or Persian origin, makes one suspect that the uses of silver preceding and surrounding the introduction of coinage in the two regions were rather different.

This chapter considers the role of silver in Greece in the Early Iron Age and early Archaic periods, at a time when it is clear from both direct and circumstantial evidence that it was being acquired and made use of.

Introduction: Debate over Greek use of silver before coinage

Did Greece make use of silver as a form of currency before the introduction of coinage in the 6th century BC? Several years ago this was debated directly at a colloquium organised by the Archaeological Institute of America and published by the American Numismatic Society (Balmuth 2001). On one side of the debate, the numismatist John Kroll (2001) believed that, pre-coinage, Greeks did use silver in this way; on the other side, the ancient historian David Schaps (2001) believed that they did not.

Kroll's arguments hinged, in part, on a number of laws attributed by later writers to the late 7th–early 6th century Athenian statesman Solon, who was archon in 594–593 BC, which mention weights of silver as a medium of payment (especially of fines, and – by the state – for sacrificial animals) and of interest on loan transactions, at a time which substantially preceded the introduction of coinage at Athens around the middle of the 6th century (Kroll 2001: 77; *cf. Aristotle,* Ἀθηναίων πολιτεία, 8.3; Lysias 10 (*Κατά Θεομνήστου* A).15–18.). Kroll, who suggested that such a usage probably

went back to the late 8th or early 7th century, saw in this an analogy to the use of *hacksilber* in the east, documented in the series of *hacksilber* hoards (sealed hoards of small weighted units of cut-up silver which there is good reason to think were used as 'small change' currency) in the Levant and Cyprus collected by Christine Thompson and others and datable to between the 12th and 7th centuries (Gitin and Golani 2001; 2004; Thompson 2003; *cf.* Balmuth 1975). In Kroll's view, the orientalising period of the late 8th and early 7th centuries was the period when silver probably began to become plentiful enough in Greece to replace the iron spits (obeloi) which, according to some traditional suggestions, acted as standards of value, if not as currency, before this (Kroll 2001: 78, 87–8; *cf.* Tandy 1997: 159–60).

Another part of Kroll's argument rested on the recognisable equivalencies between the various weight systems in use in different Archaic Greek cities – particularly Chalcis and the Euboean colonies in Sicily, and in Corinth, Athens and Aegina – and visible through the coins of these cities (Kroll 2001: 81–4). In particular, all adhered to a common mina of 436 g and a common talent of 26 kg, which were regarded by later authors as originating in the Euboic mina and talent, which Kroll again considered probably went back to the 8th century, when 'the cities of Euboea were among the most enterprising and influential centres of maritime activity in the Greek world' (Kroll 2001: 81). This finds some support in the discovery in a metal workshop context of around 700 BC in the Mazzola complex at Pithecusae on Ischia in the Bay of Naples of a bronze-bound lead balance weight of 8.79 g – exactly one half of a Euboic stater (Ridgway 1992: 95; Buchner 1995: 247, fig. 155). There are also some good metrological reasons, according to Kroll (2001: 82), which seem extremely plausible, for thinking that the Euboic stater and mina standards (though not their later subdivisions) were originally borrowed from Tyre (Kroll 2008a).[1]

In the view of Schaps (2001: 97; *cf.* 2004: 16–17), on the other hand, who believes that Greece was too backward and impoverished to make use of silver as a currency much before the invention of coinage, the progression in Greece was not, as Kroll argued, from *hacksilber* to coinage (as in the Levant), but from utensils like iron spits and bronze cauldrons as media of exchange to (silver) coinage. The bronze cauldrons part of this argument derives ultimately from Homer (where cauldrons have sometimes been interpreted as among measures of wealth accumulation, *e.g. Iliad* 23. 702–3, 885) and particularly from Early Iron Age dedications of such cauldrons in sanctuaries like Delphi and Olympia (Whitley 2001: 144–5). The notion of the iron spits, on the other hand, springs from the word for the small denomination coin 'obol' (ὀβολός), which is supposedly the same word (obelos/ὀβελός) as for a spit, and from the word 'drachma' (δραχμή/δραχμός/δραγμός – *cf.* δράσσομαι, 'grasp with the hand'), denoting a handful (of obols). This etymological link led Plutarch (*Lysander* 17.3) in the 1st–2nd century AD to conclude that iron spits were originally used for coins; and on this have been built a number of elaborate modern accounts constructed out of disparate, vague and almost certainly conflated and confused literary traditions associated with the 7th century Pheidon of Argos. Pheidon was said by Herodotus

(6.127) to have established a system of weights and measures throughout the Peloponnese and was suggested by the 4th century historian Ephorus to have been the first to coin silver money in a mint on Aegina (Strabo 8.6). A 7th century dedication of a large number of spits at the Argive Heraion has been connected by 19th and 20th century Classical scholars with Pheidon of Argos and used to support the results of combining Plutarch's and Ephorus's conjectures (Courbin 1959: 210–11; 1983). However, as several scholars have pointed out, this account, which depends almost entirely on the ingenious deductions of later writers, finds no convincing backing in the archaeological record and seems, in any case, generally implausible (Brown 1950; Haarer 2000; 2001: 257–8). The spits dedicated at the Heraion are arguably no more than spits used in the roasting of sacrificial animals (Kroll 2001: 84–6), and Ephorus's story of Pheidon being the first to coin silver money (thus implying that he made the direct switch from iron spits to silver obols) carries little conviction for a variety of reasons (Brown 1950: 179).

By contrast, it seems very likely that the original core meaning of ὀβολός/ὀβελός (which was probably originally a non-Greek word: Beekes 1969: 54) was simply 'portion' or 'division', and that it was only through a secondary, transferred meaning that it came to signify a spit on which a division or portion of meat could be roasted. An obol is, after all, a division of one-sixth of a drachma (Frisk 1970: 344–5 – see also for doubts over any connection with βέλος),[2] while a drachma, which first appears as a denomination in Herodotus, but which originally meant a handful of anything, typically represents the number of obols that could be held comfortably in one hand.

With regard to the question of Solon's laws, Schaps (2001: 97–9) concedes that at the time of Solon silver appears to have been accumulated, kept and sometimes expended by the Athenian state, but disputes that it was used as anything more than a standard of exchange, with exchanges agreed in relation to weights of silver, rather than a medium of actual payment. In other words, while silver may have been used – at least at Athens – as a means of accumulating, storing and perhaps calibrating wealth, it was not used as a currency before coinage came along.

Hacksilber and coinage

Whatever one thinks about this, one very important point that Schaps makes is that one cannot assume that Greece followed the pattern of the Levant in making use of *hacksilber* as a prelude to coinage, even though for large transactions it may have made use of silver bullion. For one thing, there is little or no evidence for *hacksilber* in Early Iron Age or early Archaic Greece, although Kroll (2001: 78) offers several more-or-less convincing reasons (to do with the motives of modern chance finders of silver hoards and the lack of pristine 8th–7th century urban sites) why such evidence might elude us, and indeed points to a late 8th century *hack**geld*** hoard found below the floor of a house at Eretria (Themelis 1983; Kroll 2001: 77–8, pl. 5.1; Thompson 2003: 91–2).[3] Partly on the grounds of this, Julien Zurbach (2016) has argued recently that before

the 7th century gold acted as a standard and medium of exchange in Greece. The evidence for this, however, seems to me somewhat nebulous, and raises the question of the contrast between the comparatively large amounts of gold as against the general lack of silver deposited in Early Iron Age graves at sites like Lefkandi or Athens, since if gold was used in this way, one would not expect it to be deliberately deposited in graves.[4] Much more important, however, in relation to the question of silver is the observation that the Levant eschewed coinage until long after Greece had adopted it. The Phoenicians started to mint coins only in the later 5th century, and before then coins in use in various parts of the Levant were Greek silver tetradrachms or Persian gold staters, which presumably were treated simply as small-weighted units of precious metal (Acquaro 2001; Alram 2002: 64; Lehmann 2014: 848). We thus cannot see coinage as simply a logical and inevitable next step following the use of weighed units of silver as currency; otherwise it follows that this step would have been taken earlier above all in the Levant, where evidence for the use of *hacksilber* is so strong. On the other hand, it could be argued that the earliest Greek silver coinages effectively became the first Greek equivalents of *hacksilber*.

In fact, it can be argued that coinage has far less to do with creating a standardised form of currency than with the desire of states or powerful individuals, particularly those with access to precious metals within or in close proximity to their territories, to associate themselves visibly and publicly with stamped guarantees of weight and purity. Thus it is arguably no coincidence that coins were first invented and first found favour initially in regions like Lydia, with its sources of electrum (the naturally occurring or artificial alloy which formed the earliest Lydian coins), and in the Aegean, with its various silver resources, than in the Levant, where silver had all to be imported from more distant regions. Lydia's initial choice of electrum is particularly interesting, since the proportions of gold and silver in this natural (or possibly artificial) alloy (Konuk and Lorber 2012: 13–14) tended to vary, with the implication that the official guarantee was the only mitigator of the lack of reliability of the relationship between a coin's actual content in terms of the mixture of gold and silver and its face value (Kroll 2008b: 18). This meant in turn that these coins were originally suitable mainly for state expenditure or for localised exchange within the jurisdiction of the issuing authority, at the same time ensuring that anyone paid in such coins was firmly tied into the local economy (Osborne 1996: 250–6). Once they introduced silver coinage, it also probably helped to ensure that Lydian rulers' stocks of silver bullion (as indicated by the quantities of silver that the Lydian king, Gyges, sent as offerings to Delphi around the beginning of the 7th century [Herodotus 1.14], and by the fabled wealth of his descendant, Croesus) did not involuntarily gravitate eastwards, where by this time in the Near East in general, and Mesopotamia and the Levant in particular, the demand for silver was limitless (Gitin and Golani 2004: 204). The Lydian invention of coinage was above all to do with local control rather than simply facilitating the needs of commerce.[5]

Silver in Homer and Linear B

So where does all this leave us? Schaps, in particular, takes a somewhat substantivist view of ancient trade and as an ancient historian also firmly believes in a traditional view of a 'Dark Age'. He believes that Greece experienced a period of extreme economic backwardness in the period between the end of the Mycenaean palaces at the beginning of the 12th century and the early Archaic period and maintains that there was virtually nothing in the way of internal trade in this period – with even international trade not resuming until the end of the 8th century (Schaps 2001: 94–5; 2004: 16–17, 81–2). Instead, he regards the kind of personal gift-giving between heroes that we see in Homer as virtually the only kind of exchange which took place during the Early Iron Age.

If we look to Homer, we see that values are sometimes expressed in terms of numbers of cattle – for instance in *Iliad* 23.885, where a cauldron is said to be worth an ox; in *Iliad* 23. 702–5, where a tripod is said to be worth 12 oxen and a skilled woman worth four oxen; also in *Iliad* 6.236, where a set of bronze armour is worth nine oxen and a set of gold armour worth over ten times that; and in *Odyssey* 1.431, where Laertes paid the equivalent of 20 oxen for Eurykleia. Except perhaps in the case of Eurykleia, where the 20 oxen could be seen as the equivalent of a 'bride price', nobody suggests that oxen would normally actually have played a physical part in such transactions. This is just a convenient way of indicating relative value in a mainly notional (and to a large extent 'ideal') society in which oxen were regarded as particularly valuable, both for agricultural purposes and as sacrifices. There is plenty of silver mentioned in Homer. The *Iliad* and *Odyssey* are packed full of silver, which includes any number of silver basins, several silver kraters, silver door hooks, silver sword hilts, silver greave fastenings, silver chariot fittings, silver inlays on furniture, silver bathtubs, silver bows, silver hair-rings, a silver workbasket, a silver toolbox and even a silver string – all this before we even count the many silver-studded chairs and swords. When it comes to explicit indices of wealth, however, silver seems to be missing, and instead we have the thrice-repeated formulaic line 'bronze, gold and iron wrought with much labour' (χαλκός τε χρυσός τε πολύκμητός τε σίδηρος) as expressions of a hero's accumulated treasure – apparently in ascending order of value (*Iliad* 6.48, 10.379, 11.133). We also have the twice-repeated line (*Iliad* 9.366, 23.261) that details women and iron as spoils of war, and we have a passage in the *Odyssey* (21.61–2) where iron and bronze figure as the store of prizes won in the past by Odysseus. There is something odd about these, not least since silver kraters figure quite prominently as valuable gifts between heroes (*Iliad* 23.741–5; *Odyssey* 4.615; 9.203; 15.115; 24.275), and I would suggest that, like the unworked iron lump which Achilles offers as a prize for the throwing contest at Patroclus's funeral games and which had previously spent its life as a spoil of war and treasured for its own sake (*Iliad* 23.826–9), all these passages reflect or preserve a pre-Iron Age, Late Bronze Age attitude to iron in which iron was regarded as the most valuable and expensive of all metals, prized for its own sake rather than

the practical uses to which it could be put. This is in marked contrast to the second part of the same passage (*Iliad* 23.833–5), in which Achilles contradictorily describes the real value of the lump of iron he is offering as a prize as lying in the number of practical agricultural and pastoral tools it can be turned into, and which betrays the attitudes of a true Iron Age, which Greece had undoubtedly entered by the later 8th century. The main point, however, whatever the date that all these lines or passages reflect, is that, unlike bronze, iron or gold, silver, despite its evident perceived value to heroes, appears nowhere as a regular index of wealth.

When we look further back at the 13th century Linear B documents, we find a similar puzzle. There, the only mention of silver is in the case of a pair of silver-bound (or silver-studded) chariot wheels on a tablet from Pylos (PY Sa 287: Ventris and Chadwick 1956: 374 no. 290; Palmer 1963: 325 no. 227; *cf.* Aura Jorro 1985: 53). Is this an indication that, in the Late Bronze Age, silver was largely ignored by the inhabitants of the Aegean? The answer to this is almost certainly not.

Silver in the Aegean from Early Bronze Age to Early Iron Age

What light does archaeology shed on all this? Here, I should like to begin at the beginning (or at least in the 3rd millennium BC) and work my way forward. We know that silver was being exploited in the Aegean – in Attica, on Thasos, on Siphnos and in western Anatolia – at least as early as this, and, in some cases, from the late 4th millennium onwards (Pernicka *et al.* 1984: 568, 598, *cf.* figs. 22–3; Rahmstorf 2015: 164–6, 180). Several silver vessels of 3rd millennium date are known particularly from Early Cycladic graves, and the suggestion that the weights of some at least of these – in particular the Kapros bowl – fit into Syrian weight systems is concordant with the idea that they represented bullion – in other words stores of weighted silver which could be accumulated, exchanged or otherwise passed on (Sherratt 2000: 36–7; see also for other finished silver objects Rahmstorf 2016: 32–3). From the mid-3rd millennium on, we have silver ingots from Troy and Mahmatlar in Anatolia as well as from various places in northern Mesopotamia (Koşay and Akok 1950; Peyronel 2010: fig. 1; Rahmstorf 2015: 167). Moreover, Lorenz Rahmstorf has convincingly argued that the Aegean decorative hardstone 'spools' are actually balance weights, which fit into an Aegeo-Anatolian weight system, in turn compatible with weight systems known throughout the east, and that these are perhaps most plausibly related to exchanges of silver between the Aegean and regions further to the east (Rahmstorf 2003; 2006: 67–79; 2015: 165–7). This can perhaps be associated, particularly in the latter part of the millennium, with Vasif Şahoğlu's far-reaching Anatolian trade network, which there is good reason to believe was based on the acquisition and movement of metals, including silver (Şahoğlu 2005). Moving forward into the Middle Bronze Age, we have the probability that Aegean silver was feeding into the Old Assyrian karum network in Central Anatolia and thus finding its way back to Assur (Barjamovic 2008, with map 3). At this time we also still have the occasional silver vessel in the Aegean,

such as the crinkly silver kantharos from Gournia on Crete, which somehow escaped being recycled (Weingarten 2016), and the unmistakably skeuomorphic echoes of silver vessels in Gray Minyan and Trojan Gray ware (Nakou 2007). Silver vessels make a comeback in visibility in the special funerary strategies of the Early Mycenaean period (Dickinson 1977: 79–82), a state of affairs which lasts down until the Dendra and Kokla tombs in the earlier part of the 14th century (Persson 1942: 87–91, fig. 99; Demakopoulou 1990: 117–19, figs. 6–12). Thereafter, they appear to lose visibility again, although in the context of what has been said above about the lack of mentions of silver in the Linear B documents it is worth remembering that the remnants of several silver drinking vessels were found in the main megaron at Pylos at the time of its destruction around 1200 BC (Bendall 2004: 122–3, fig. 6.2). This might suggest that, although silver vessels may have had no part in official or collective palatial wealth, they may well have figured in the purely personal wealth of individuals within the palace circle. Silver vessels are also conspicuous by their absence from tombs in the 12th and subsequent centuries, although a few silver personal ornaments, such as fibulae, rings, earrings and pins, are found in graves at sites such as Eretria and Athens in the Geometric period, at Knossos in the Protogeometric and later periods, and at Perati in the 12th century (*e.g.* Snodgrass 1971: 263, 270, 290 n.34; Evely 1996: 633–4, fig. 155, pls. 266–7; Dickinson 2006: 83, 165, 170; Crielaard 2007: 171–2). More importantly, we have good evidence for either the renewed or continued extraction and cupellation of silver at Laurion-Thorikos in eastern Attica in the late Protogeometric or Early Geometric period, and for cupellation at Argos even earlier, in the late 11th century (Desborough 1972: 314).

Euboea and Phoenicians

Interestingly and, I would argue, significantly, there is, as far as I know, only one silver object (a silver ring from the mid-10th century female burial in the so-called 'Heroon') in the late 11th–9th century graves at Lefkandi in Euboea (Lemos 2002: 128), the site that has done so much to provide plentiful evidence for interaction with the east in these centuries. Does this mean that the Lefkandiots had little access to, or interest in, silver in the Early Iron Age? The answer to this question, I suspect, is also 'no', although the arguments for this answer have necessarily to be indirect and circumstantial and to hinge largely on pottery – particularly on Protogeometric pottery, and especially on the so-called Subprotogeometric pottery made of clay from the copious Lelantine claybeds of south-west Euboea, which was distributed widely in the 9th century around the Aegean and in the East Mediterranean.

I have often been intrigued by the way in which the Protogeometric pottery of eastern central Greece is succeeded around 900 BC in south-west Euboea by Euboean Subprotogeometric, among the characteristics of which are the famous pendent semicircle skyphoi (with the semicircles drawn with the aid of compasses), and the much rarer pendent semicircle plates, the latter of which are found rather more frequently

in the East Mediterranean than in the Aegean, where they occur mainly at Lefkandi and Eretria (Coldstream and Bikai 1988: 38–9; Popham 1994: fig. 2.12; Coldstream 2000: 23–4, figs. 7, 9–10).[6] This happens at just the same time as pottery at Athens changes from Protogeometric to Geometric – which differs in various significant ways from both Protogeometric and Euboean Subprotogeometric. Protogeometric has often been described as 'metallic'-looking in appearance, with its taut shapes, conical feet, sharp angles and its frequent decoration of compass-drawn concentric circles – a decoration which seems particularly characteristic of incised metalwork (*e.g.* Desborough 1948: 261–3; and see Wilkinson this volume, Ch. 1 for ceramic skeuomorphs of metal vessels). Also characteristic of incised metalwork are the zigzag-decorated offset rims frequently found on Protogeometric cups, which find matches in Central European bronze cups (see Kytlicova 1991: 55–60 nos. 30, 32, 33, pl. 60: 30, 32, 33; *cf. e.g.* Desborough 1972: fig. 10: E–F). Protogeometric also sees the introduction of a lustrous, often blue-black paint, which is the distant forerunner of the 'black gloss' of the Archaic period, and which not only makes drinking cups with interiors coated with this much more pleasant to drink from, but also (as Michael Vickers has argued in the case of Black Gloss and Attic 6th–5th century pottery) is reminiscent of the appearance of tarnished silver (Vickers and Gill 1994: 123–9). Euboea's Subprotogeometric pottery, as its name suggests, continues this metallic appearance already found in Protogeometric. On the other hand, contemporary Attic Geometric develops a rather different, textiley or basketry appearance which extends to features of shapes (for instance, the tied-on laundry basket-type handles) as well as of decorations (see *e.g.* Coldstream 1996: fig. 4; *cf.* Schweitzer 1971: 30; Barber 1991: 366). Since clay does not have a natural aesthetic of its own but is often dependent on what dominates within the visual environment of potters and their clientele, it seems to me that south-west Euboean potters may well have had metal (perhaps particularly silver) vessels in their minds' eyes when they produced their Subprotogeometric pots, in contrast to Attic Geometric potters who seem to have been more conscious of textiles.

Many of these 9th century Subprotogeometric pots, particularly the skyphoi and the plates, travelled as far as the East Mediterranean, where the earliest and most varied selection of these seem to have ended up in Tyre (Coldstream and Bikai 1988: fig. 1; Coldstream 1989: 91, fig. 1: a), with the implication that they travelled on eastern, probably Tyrian, ships. Their appeal to a sub-elite Tyrian market would seem to reside in their echoes of silver vessels (which their users could probably not themselves afford), and, in the case of the pendent semicircle plates, the fact that they fitted into a longstanding repertoire of metal (and ceramic) vessels in the East Mediterranean (Coldstream and Bikai 1988: 39; Coldstream 1989: 92; 1998: 354). This further suggests to me that these pots, some of them specially produced as export shapes for an eastern market, may well have accompanied smaller numbers of real silver vessels produced, perhaps, at places like Lefkandi or elsewhere in south-west Euboea on a smaller scale for the elites of the East Mediterranean.[7] This would have allowed such centres to gain some additional value-added profit from the flow of

materials like silver passing through them. At any rate, I have no doubt that the relationship between Lefkandi and the east, which is apparent already from the later 11th century, was initiated by the east, and that its key lay in the position of Lefkandi on a choke point south of the Euripos on the important sea route (still a major sea route today) which, as it happened, linked the silver resources of eastern Attica with the polymetallic (including silver) resources of the north-west Aegean: on Thasos, around Mount Pangaion and in the Chalcidice, where Euboean pottery turns up in the 10th century (Papadopoulos 2005: 486–8).[8] As the implications of the eastern *hacksilber* hoards suggest (as pointed out by Gitin and Golani [2004: 204]), the east by this time could not have too much silver – to the extent that, by the end of the 10th century, Tyrians were willing to travel as far as south-western Iberia to acquire yet more at the reduced exchange costs offered by a region not yet integrated (as the Aegean may have been beginning to be by this time) into the values of an increasingly wide and ever expanding economic system (González de Canales, Serrano and Llompart 2006; Nijboer and van der Plicht 2006).

Silver as a commodity?

I realise that this may already have pushed speculation based on largely circumstantial evidence too far for some readers (see also Sherratt 2019), but if they are willing to indulge me a little further then I would suggest that the implications are not that Early Iron Age Euboea in general, and Lefkandi in particular, had no access to, or interest in, silver or that silver played no part in its economy, but that silver was presumably far more valuable as a *commodity* for overseas exchange, either as raw material or (more likely) as finished goods, than kept at home and buried in the ground for the sake of funerary display. This, I suggest, may also account for the lack of silver in the Late Bronze Age Linear B tablets, concerned as they are exclusively with official palatial inventories and internal transactions, while by contrast the silver drinking and other vessels found in the Pylos megaron were presumably the personal possessions of individuals who took part in activities there, perhaps particularly useful as forms of wealth in times of relative insecurity (*cf.* Jursa 2016). Nor does it follow from the lack of silver vessels in Mycenaean palatial period tombs that silver was not regarded as bullion for wealth accumulation (for instance in the form of silver vessels), since, if it were, the last places one would expect to find it would be buried in tombs (except in circumstances where funerary display was socially or politically unusually advantageous), or voluntarily abandoned in settlement contexts.

The idea that in the Late Bronze Age Aegean silver was sent to Egypt in exchange for Egyptian gold has been suggested by David Gill (2010) and Jorrit Kelder (2016). In both cases, this at least partly rests on the observation that, as pointed out above, silver (as opposed to lead) objects were largely missing from the archaeological record of Mycenaean Greece in the mid-14th to 13th centuries. Particularly by Kelder, however, who has argued on somewhat flimsy grounds for a monopoly exercised by Mycenae

over silver from Laurion, it seems to be envisaged predominantly in terms of direct, official exchange of one metal for the other between the rulers of Mycenae and Egypt. While equally convinced that Aegean silver regularly found its way eastward from much earlier than the Late Bronze Age, I am not persuaded that this was the result of exchange of such a direct, one-for-one nature at any time, even in the Late Bronze Age. In the Middle and early Late Bronze Age the patterns of inter-Aegean connections suggest that it seems most likely that Aegean silver reached Egypt and the east by being funnelled through Crete, while in the later Late Bronze Age there is little or no evidence for the direct diplomatic relations that would have facilitated such organised and regular transactions, particularly between Mycenae and Egyptian rulers.[9] Instead, what the later Late Bronze Age archaeological record suggests is that exchanges between the Aegean and East Mediterranean were mainly in the hands of chains of middlemen carriers: in the 14th and early 13th centuries a combination of Aegeans (particularly perhaps Cycladic islanders) and Cypriots, and in the later 13th and 12th centuries probably mainly Cypriots (Sherratt 2001: 219–24). By the later 11th century, the baton had probably passed to predominantly Tyrian carriers, but even then there is little reason to suppose these operated under any formal state organisation or on a strict one-for-one exchange basis. Already in the Late Bronze Age but perhaps even more so in the Early Iron Age, we should probably envisage a net flow of silver, drawn as if by gravity to the East Mediterranean where demand was constantly rising, so that gradually any significant quantities of silver circulating in the Aegean were drained eastward. In the course of this process, particularly in the Late Bronze Age, it may have passed through a number of hands before leaving the Aegean, but after the mid-11th century its escape was potentially on a larger scale and probably more rapid. Nor is it necessary to imagine it being carried east in the form of bulk consignments of standardised silver ingots, for example, which are so far undocumented in the Aegean, though not in the Neo-Assyrian empire, before the later Archaic period (Kroll 2008b); instead, we should probably envisage it travelling as finished objects, including perhaps silver vessels of the type reflected in the exported Subprotogeometric pottery of south-west Euboea. We should also envisage it in a context of recycling and mixing, at least once it arrived in the East Mediterranean, of silver from a potentially wide and diverse range of original sources in Anatolia, the Aegean and regions much further west (Wood, Montero-Ruiz and Martinón-Torres 2019). The materials and objects that found their way to the Aegean as part of a return flow would appear to have been varied and to have differed at different times. In the Late Bronze Age (and relatively indirectly) these included raw materials like ivory, precious stones and possibly gold, and manufactured 'raw' materials like blue glass ingots, all of which were used in Mycenaean palatial manufactures (Bennet 2008), as well as perhaps some spices or aromatics used in the perfumed oil or unguent industry.[10] In the Early Iron Age, to judge by the contents of the Lefkandi graves, returns included glass and faience objects, items of bronze and gold (some of which seem likely to have been robbed from graves in the East Mediterranean: Sherratt 2012: 161),

very probably purple-dyed textiles[11] and other exotic novelties or 'prestige' items that were either (like glass or faience) of greater perceived value to the inhabitants of Lefkandi than they were in the east in their area of manufacture or (like robbed metal items) had arguably been acquired for next to nothing by those who brought them westward.

The problem is, of course, that neither the use of silver bullion as a medium for storing wealth nor an attitude to silver that regards it above all as a commodity for overseas exchange is likely to result in its regular or deliberate deposition in the ground, so that neither of these scenarios is susceptible to conclusive proof. Nonetheless, what we can say, on the one hand, is that, as others have pointed out, there is neither textual nor archaeological evidence for much use of silver in the Mycenaean palatial period of the later 14th and 13th centuries, despite the fact that silver – especially in the form of vessels – is very much in evidence in graves in the preceding two centuries. On the other hand, we can also say that there is extraordinarily little silver left in the ground (and then exclusively in the form of small personal ornaments) at sites like Lefkandi in the 11th–9th centuries at a time when we are fairly certain that silver was being produced in Greece and at a time when, not only were East Mediterranean objects reaching the site in considerable quantities, but its Protogeometric and Subprotogeometric pottery plausibly echoes silver drinking vessels, and when demonstrable Phoenician contacts are matched by an insatiable demand for silver in the Levant.

Still on the issue of Greek relationships with silver in the Early Iron Age, there is another observation I wish to make and another question I wish to raise. The observation concerns the relatively impressive number of silver personal ornaments between ca. 750 and ca. 725 from the cemeteries at Pithecusae on Ischia, the trading settlement with which both Greeks and easterners were associated, and which was very well placed for plugging into the maritime circuits of the Tyrrhenian. These include fibulae, earrings, hair spirals, bracelets, armlets and finger-rings, and also the settings of scarabs of Levantine manufacture (Ridgway 1992: 114; Kelley 2012: 249; Reiterman 2016: 208–9, 214, 299, 301–2, figs. 113–14, 117). Although some of these may have been imported from the Levant, it is also probable that silver was worked in the metalworking quarter at the Mazzola site (Ridgway 1992: 95; *cf.* Kroll 2008a), and it would seem unreasonable to suppose that silver ornaments were only in the hands (or on the bodies) of Phoenicians or perhaps indigenous Italics, rather than Greeks (if, indeed, such distinctions had any clear validity at Pithecusae in the 8th century). What it suggests is that in general those inhabiting or frequenting Ischia had a strong interest in silver, to an extent not archaeologically visible in contemporary Greece itself (Coldstream 1994: 55). In any case, what this silver does is lend credence to the supposition that Greeks, no less than Phoenicians, may have had an interest in Central Mediterranean silver – for example from Sardinia or the polymetallic resources of northern Etruria.[12] The fact that silver was deposited in noticeable quantities in 8th century Pithecusan graves may suggest not only that there was plenty

of silver circulating in the Central Mediterranean but possibly that it was deposited in an environment in which some elements of the population may not habitually (or not yet) have regarded silver primarily as a commodity rather than simply as a desirable material for ornaments or possibly as a means of wealth accumulation. Its presence may even suggest that Greeks living far removed from the Aegean, and perhaps influenced by native Italic cultural customs, could afford to use silver for personal ornamentation. However, together with the presence of the lead balance weight weighing half of a Euboic stater, it may also suggest that Greeks – despite the presence of plentiful silver sources in the Aegean – were following Phoenicians in seeking to obtain silver from further afield, perhaps partly for the sake of the reduced exchange costs involved in acquiring it from regions not yet fully integrated into the values of an eastern Mediterranean/Aegean economic system, and partly because, in their particular role as handlers of silver as a commodity, they could never get their hands on quite enough silver. Here one should certainly consider, too, the unmistakably silver appearance of 7th century Etruscan bucchero, which suggests that silver vessels were prominent in the visual environment of elites in Central Italy;[13] and, indeed, some silver vessels survive from 7th–6th century Etruria, including at least one silver drinking vessel with incised concentric semicircle decoration from Marsiliana d'Albegno in Etruria, which finds a precise counterpart in a bucchero kotyle now in the Ashmolean Museum (Cristofani 1970: 272–3, pl. 25b; *cf.* Vickers and Gill 1994: figs. 5.7–5.8). Moreover, when we come to consider where cities like Corinth, which had no silver resources in its own territory, later acquired at least some of the silver which allowed it to mint its own silver coins from the mid-6th century, it is perhaps worth remembering the resources of the Central Mediterranean, in which Corinth was one of the earliest and most active of Greek cities.[14]

The question I wish to raise – and to which I do not have an obvious answer – is when did the silver mines at Lavrion/Thorikos, which we now know had been exploited, possibly continuously, since the end of the Final Neolithic, come under Athenian control? It is conventional, I think, to assume that this happened relatively early, perhaps along with a process of synoecism which is often supposed to have occurred sometime before the onset of the Archaic period. However, this is merely an assumption, based on the premise, from our modern point of view, that the mines must always have come under the control of some sort of central authority. We know, on the other hand, that copper, silver and obsidian resources in different parts of the Aegean were exploited on a kind of free-for-all basis back in the 3rd millennium BC. The main limitations on the ability to do so consisted in possession of the means to travel to the sources and in access to the network of practitioners of different skills that allowed the ores to be extracted and go through various stages of processing, often by different groups of people and in different places (Torrence 1986; Broodbank 2000: 294–8). As things stand at the moment, I can see no reason to suppose that this sort of arrangement need have changed in either the 2nd millennium or the earlier centuries of the 1st millennium. It is possible that, by the time of Solon

at the beginning of the 6th century, and certainly by the time that Athens minted its first silver owls towards the end of that century, Athens thought of the mines at Laurion as belonging to Athenian territory and coming increasingly under Athenian supervision; and it might well be that the competition mentioned rather vaguely by Herodotus (5.82–9; 6.49–51) between Athens and Aegina in the 6th century had something to do with the use of Laurion silver by Aegina (traditionally the earliest mainland state to mint silver coins, probably no later than the mid-6th century).[15] However, several hundred years earlier, in the 10th and 9th centuries, it would make better sense to suppose for example that Phoenicians and Euboeans then had as free access to the silver of Laurion as anyone else.[16] The concept of coinage, in which the state puts its stamp on – and ideally lends its authority to – a guarantee of the purity and weight of the silver of which its coins are made, and which is also bound up with state identity, seems to me to provide an incentive for the notion of central control (where possible) over the silver itself – a notion which was arguably unnecessary much before the introduction of coinage.

Finally, if we wish to consider how, from the point of view of the inhabitants of the Aegean, treating silver primarily as a commodity for exchange with the east in the later 2nd and early 1st millennia might actually have worked, I can suggest a broad analogy from the later 20th century. There was a time, in the early 20th century and previously, when marine and riverine resources, such as lobsters, oysters and salmon, were widely available to and consumed by all classes of British society living in environments (*e.g.* the north-west of Scotland) where these were naturally plentiful. However, from the mid-20th century, when transport (especially transport by air) became easier and more commonplace, it became more and more difficult to procure these products for consumption in their resource areas. Instead, they began to be flown straight to the markets of London or Paris, which were willing to pay unprecedented prices for such commodities, newly fashionable as luxuries in upmarket restaurants and hotels. The producers themselves gained only a small proportion of the prices paid by the ultimate consumers of such fashionable luxuries, but it was still a great deal more than they could ever command from local consumers.[17] I suggest that silver in the Aegean presents a similar picture in the centuries before it was harnessed for coinage. Although it may have been valuable to a degree for personal ostentation and/or for capital accumulation in the form of bullion (perhaps chiefly in the shape of vessels) for the few with an ability to take advantage of it in this way, in general it brought far greater returns as a commodity ultimately for overseas exchange.

Conclusions

So, what is it possible to conclude? First, I do not believe that it is necessary to see a phase of use of *hacksilber* as currency (in other words as a medium of everyday exchange) as inevitably forming an immediate prequel to the introduction of coinage in Greece. This is not just because there is little or no concrete (archaeological)

evidence for it, but, more positively, because such a phase in the Levant manifestly did *not* lead on to the introduction of coinage there. Rather, it arguably inhibited it; and instead Levantines, who had to import their silver, were happy to go on using *hacksilber* long after the introduction of coinage in the Aegean. On the other hand, like Kroll, but unlike Schaps, I see no reason to suppose that silver (and probably also gold) bullion, particularly perhaps in the form of items like vessels conforming to certain weights, did not continue to have some role as a medium of personal wealth accumulation (and even, in the early Archaic period, of high-value payment) in the Aegean, as it arguably did from an early period, and as it clearly does in Homer, where heroic gifts of silver kraters (of which there are several) are clearly desirable and highly prized. Without some such role for silver in the Greek world, it would make little sense to introduce a silver coinage. In such circumstances, however, one would normally hardly expect to find the material evidence deposited in graves or left unretrieved in abandoned settlements. The fact that, in Homer, a formulaic measure of heroic wealth and reference to materials aspired to as spoils of war do not mention silver, but do mention iron, may simply preserve a fossilised attitude to iron characteristic of the Bronze Age, when iron was valued many times more highly than silver; or, perhaps just as likely, it may (like the general absence of silver in the Linear B documents or in the Lefkandi graves) reflect the fact that silver was regarded as having more value as a commodity for outward exchange than hoarded at home. After all, some Aegean silver seems to have supplied the east probably since the 3rd millennium, and it seems likely that it continued to do so in increasing quantities at least down to the Archaic period, when the advent of coinage not only gives it a new use but also marks the beginning of the claims of different Greek cities to control and exercise authority over their stocks and resources of silver.

To sum up, there are several possible reasons for thinking, tentatively and speculatively, that silver was probably not a regular medium of relatively small value payments in Greek cities much before the advent of coinage, but probably was to some extent a vehicle for personal wealth accumulation, and, perhaps to an increasing extent, a commodity for overseas exchange from at least the Early Iron Age, if not longer. Such reasons include: the lack of evidence for *hacksilber*, unlike in the East Mediterranean, which suggests it was not used as a regular or widely used form of currency; the scarcity of silver (in constrast to gold) in Early Iron Age graves in Greece, not least at sites, such as Athens or Lefkandi, in relatively close proximity to silver sources and with strong connections with the East Mediterranean; the idiosyncratic skeuomorphic peculiarities of south-west Euboean pottery in the 9th–8th centuries, which was widely exported to the east and with indications that some shapes were produced specially for an eastern market; and, finally, the possible interest of Greek (particularly perhaps Euboean) interest in the north-west Aegean (especially the Chalcidice) in the 10th–9th centuries, and in the Tyrrhenian region and approaches to it in the 8th century. These reasons may be indirect, but they provide at least a

circumstantial case for suggesting that in the Early Iron Age, and possibly earlier, silver could indeed be regarded in the Aegean as a commodity.

Notes

1 The word mina itself was originally an eastern word (see Balmuth 1975: 295).

2 See Kroll 2008b: 16 for the Greek word ὀβολοστάτης (literally 'weigher of obols') used to denote petty usurers in the 5th and later centuries BC, implying that obols had once been weighed rather than counted.

3 The question that perhaps most needs asking is why so many unretrieved *hacksilber* hoards have been found in the Levant. For a variety of past answers see Kletter 2003, who suggests that these acted as the equivalent of 'safe-deposit boxes', often hidden by individuals under floors or in equivalent spaces. The implication of this might be that they were intended as reserves of wealth at a small-scale household or individual level – rather like keeping one's money in a teapot or under a mattress – and in a form suitable for expenditure in series of small amounts. Regardless of the immediate reasons, however, their sheer number should probably be taken simply as an index of the amount of silver in circulation at a variety of social levels at this time.

4 For the particularly impressive quantities of gold jewellery in 10th–9th century graves at Lefkandi, see Popham, Sackett and Themelis 1980: 418–20; Popham and Lemos 1996: table 1. Although by the late 8th century (the time of the Eretria gold hoard), there was probably a variety of sources of gold available (for example from Mount Pangaion or Etruria), one might speculate that much of the gold jewellery found in graves of the 10th–early 8th centuries may well be gold that easterners may have exchanged with the inhabitants of regions like Euboea and Attica for silver. Examples of gold artefacts that certainly originated in the east include the granulated pendant from the female burial in the 'Heroon' at Lefkandi (Popham, Calligas and Sackett 1993: 15–20), the granulated 'mulberry drop' earrings from Toumba T. 5 at the same site (Popham, Sackett and Themelis 1979: pl. 231(d); Higgins 1980: 221), fragments of figured diadem(s) from Toumba T. 33 (Popham, Sackett and Themelis 1979: pl. 232(c); Higgins 1980: 219); and possibly gold rings from tombs and pyres in a number of different Lefkandi cemeteries (Popham, Sackett and Themelis 1979: pl. 230 (d)-(i); Higgins 1980: 221). From Attica come similar gold rings from the Kerameikos with repoussé decoration (Coldstream 1977: 52; Higgins 1980: 221), and a couple of pairs of lunate earrings from Anavysos and the Isis grave at Eleusis (Coldstream 1977: 79–80, fig. 25b). Others among the many pieces of gold jewellery may well have been fashioned from what was originally gold brought from the east (Coldstream 1977: 42), especially since some of them, like the earrings from the grave of the 'rich lady of the Areopagus', dated to ca. 900 BC, incorporate oriental features (Coldstream 1977: 56, fig. 13: e).

For five gold bars, three gold dumps (chunks of pre-weighed but unmarked metal of more or less regular size and shape), a silver dump and an electrum dump from the Khaniale Tekke tholos near Knossos, see Boardman 1967: 61–2. The consensus has been that these are an oriental jeweller's stock-in-trade, rather than an indication of a regular use of currency in late 9th century Crete (but see Thompson 2003: 90–1), although there is no reason why they could not have fulfilled both functions (Balmuth 1975: 296).

5 However, once Greek cities in general started minting their own silver coins from the mid-6th century (probably mainly for ease of maritime trade, since Aegina seems to have been one of the first to do so), it appears that they rapidly came to be treated essentially as commodified bullion or minted and stamped *hacksilber* (Rowan 2013).

6 Euboean pendent semicircle plates are also found at Huelva, in south-west Spain, where there is evidence for Phoenician activity from ca. 900 BC (González de Canales, Serrano and Llompart 2006: 19, figs. 23–4).

7 See Kroll 2008a: 46 for the probability that the Levantine shekel-based weights found in the 9th century Toumba T.79 at Lefkandi were used for weighing precious metal.

8 It seems to me quite probable that there is a connection between these north-west Aegean silver resources and the presence of some Euboean pottery at sites like Torone in the Chalcidice in the 10th–9th centuries (Papadopoulos 2005: 486–8). However, whether this was the result of Euboeans travelling north, northern Aegeans travelling south or Phoenicians linking both remains something of a moot question (Sherratt 2019: 139).

9 If the much bruited faience plaques attributable to the reign of the pharaoh Amenhotep III really are evidence for such direct diplomatic relations (Cline 1990: 210–12; Gill 2010: 23–4; see also Phillips and Cline 2005), then they must have arrived at Mycenae no later than the early 14th century, at a time when silver is still found in tombs such as those at Dendra and Kokla – so that arguments based on the absence of silver in the archaeological record lose much of their force.

10 It is perhaps worth noting that, in addition to the word for ivory, the Greek word for gold (χρυσός; Linear B ku-ru-so) is also a Semitic loanword, as are the words σησαμή (sa-sa-ma), κύμινον (ku-mi-no) and κύπαιρος (ku-pa-ro), which apparently refer to spices or aromatics used in unguent-making (Ventris and Chadwick 1956: 135–6; Aura Jorro 1985: 401, 404, 409; 1993: 284; see also Palaima 1991: 278). We do not know when these loan-words made their way into Greek vocabulary, although all are there by the Late Bronze Age. Ivory and gold were probably arriving before the end of the third millennium, but in this and the subsequent millennium it seems more likely that, even if originating in Egypt, they reached the Aegean indirectly via the Levant. The same applies to the Late Bronze Age blue glass ingots as found, for example, on the Uluburun wreck (Bass 1986: 294).

11 Traces of purple dyed textile have apparently recently been detected among the contents of the 'heroon' grave at Lefkandi (I. S. Lemos, pers. comm.).

12 For the suggestion that the acquisition of silver in the Central Mediterranean was more a concern of Phoenicians than Greeks, see Markoe 1992.

13 Even earlier, the wheelmade grey and grey-on-grey wares, which were produced alongside locally produced pottery of Aegean type at sites such as Broglio di Trebisacce in Calabria, seem likely to have been inspired by silver vessels (Vagnetti 1999: 142–50).

14 Limited, including some quite old, analyses of Corinthian coins from the early 5th century Asyut hoard suggest that a variety of sources, including perhaps Laurion, may have provided the silver for these (Gentner *et al.* 1978: 279–80, 284; Wood *et al.* 2017: 8; see also n. 15 below).

15 See preceding note for suggestions of the the varied sources of silver, including Laurion, in Aeginetan coins in the Asyut hoard. See also more recently Wood *et al.* 2017: 8–9, where Laurion as a source of the silver for a number of Aeginetan coins from the same hoard seems to be confirmed, but where other sources (possibly Anatolian) for the other Aeginetan coins are also suggested (Wood *et al.* 2017: 10–11).

16 *Cf.* van den Eijnde (2010: 403-405) who argues for the independent identities of separate Attic communities before the 6th century; also Morris (1992: 338–9) who suggests that the idea of the unification of Attica cannot have much pre-dated the Cleisthenic reforms of the 6th century.

17 In the case of salmon, this was reversed by the introduction of salmon farms from the 1980s, so that salmon has now become one of the cheapest native fish, available in supermarkets everywhere.

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