On coins and trust

In search for the differences between the Ancient Near East and Archaic Greece

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On the author and his research

John Mooring (Amsterdam, 1967) studied History and Antiquity studies ('*Oudheidkunde*') at the Free University Amsterdam. After obtaining his MA grade, he joined ING Group, one of the largest financial institutions worldwide. At the moment he works as a risk manager at NN Group, the European insurance company that was split off from ING as a result of the 2008 financial crisis.

Since 2009 John Mooring is working in his spare time on a PhD research under supervision of Prof. Bert van der Spek. This article is the first, preliminary result, which will be finalized after the workshop; therefore the content is not to be quoted and especially the notes are only indicative. To complete this PhD research more attention will be given to archaeological, literary and epigraphical sources. Also comparisons with other historical developments will be drawn.

All pictures of the coins in this article are taken from www.eBay.de and on actual size.

1. Introduction

Money has already existed, in several shapes, since the third millennium in the Ancient Near East; and also for about as long in Egypt. In the seventh century BCE, the first coined money appears. This may have been invented in the kingdom of Lydia in Anatolia. Coins became rapidly popular in the Greek world, but were largely ignored in the East. Only with the conquests of Alexander the Great coined money was widely used in both the Greek world and the Ancient Near East. Why there was such a difference in popularity? To answer this intriguing question we have to look at Greece but also the Ancient Near East, to cities that used coins and those that didn't, to social and historical developments, to the use of coinage and of course to coinage itself.

2. A history of early coinage

The first coins were produced in Lydia and the neighbouring Greek city states of Ionia around 600 BCE. They were made of electrum, an alloy of gold and silver which can be found in nature, but could also be manmade. There has been a lot of discussion on the development of the earliest coins, but unfortunately there is too little information to answer all questions with certainty. The following narrative could, for all these uncertainties, very well be an accurate description of this process and add to the understanding of the development of early coinage.

In the Lydian kingdom natural electrum was found in the river Pactolus. These natural resources were among other applications used by the Lydian king to 'finance' his expansion towards the Greeks living on the Ionian shores. To achieve this, he needed a lot of support from the elite, but also from mercenaries who wanted to fight for him. To reward the elite for their support and the mercenaries for their services, precious gifts were given, just like it was done for centuries and how it came to be reflected in the ancient stories sung by Homer. However, in Lydia this was done in a more structural way and more regularly, so the Lydian court found a controlled way to support its expansion. The natural electrum riches were made into small pieces[2] with the symbol of the Lydian king: a fierce, roaring lion. This perfect gift from the king would certainly buy him the support of those who received it[3].

This habit of making small gifts was soon also known by the Greeks in the Ionian cities, who were in close contact with the Lydian court, either on friendly terms, at times, or unfortunately sometimes also as the opponents to the Lydian king. They copied this and brought these small pieces of precious metal to the next level, as they produced coinage which was used in all kinds of contacts and transactions[4]. Although the above can hardly be

[2] Pieces ranging from 14.2 to 0.07 (!) grams, being 1 *stater* to 1/192 part of a *stater* were made.
[3] This can be referred to as 'submoney'; a value before it comes to the market, e.g. a painting given by the painter to someone who has helped him (Goudsmit (2004).
[4] Cf. Van Alfen (2012): 27.

substantiated by literary or archaeological evidence, and details may have differed (maybe the Lydians already used these pieces of electrum as money), for me that next step is the most interesting one. How did the Lydian proficiency (call it 'invention' if you like) in making pre-weight, precious gifts become an innovation with such far-reaching implications? And why was this, in the non-Greek world, not considered as a true innovation and largely neglected[5]? To answer these questions, let us first look into the question as to how money in general evolved in society.

3. Theories on the development of money

It is generally accepted that money serves three purposes:

- it's used to quantify wealth. In the third millennium BCE, writing emerged from inventory lists that were made for the kings and temples of Mesopotamia. Next to the question how much wool, sesame oil and barley there was stored in the warehouses, the officials wanted to calculate with these data e.g. when a loan was granted. Therefore the products were valued against some general commodity like barley, dates of silver, which made it possible to compare or add (the value of) products. So money was used as a **means of account** to facilitate the administration of institutions.
- When societies developed, tasks and skills tended to develop correspondingly, which led to specialisation. Professions like those of the carpenter, baker and tailor arose, but these professionals needed to share their products to satisfy their combined needs. This requirement is, of course, the inevitable result of the division of labour. The exchange of these material or immaterial products was facilitated by money, a commodity that was generally accepted. So money was used as a **means of payment**. At the same time it must be stressed that purchases were usually conducted differently from modern shopping practices with direct payment; exchange of goods were registered and only paid once in a while, such as during harvest time[6].
- The specialization and the deferred payments for products needed, as descibed above, also led to another phenomenon. The rather egalitarian tribal society became stratified and social classes arose. Whereas the tribal chieftain had become the leader of his people due to his ancestry or physical strength, an Egyptian vizier or Sumerian commissioner managed to gain power and gather wealth essentailly on account of his skills and his knowledge. Resources accumulated at certain groups, but they were also saved for later use. Money was an ideal instrument for this purpose.

[5] Sherratt and Sherratt (1993) link the occurrence of minting activity in Lydia and Greece to the availability of locally mined precious metals. This cannot explain the whole story.

[6] Therefore the deferred payment is sometimes described as lending or credit; see below on the credit theory of money.

So money was used as a **means of storing wealth**[7]. Note that this is something different than the 'accumulation of wealth' caused by gift exchange between chieftains and kings; in those instances the emphasis was on the prestige of the foreign, luxurious object, not on storing local riches. Interestingly enough, the *nouveaux-riches* were also able to purchase these foreign, luxurious objects, and this ability caused tensions in society.

Looking at these purposes, it is possible to fit these functions or applications of money into the theories on the origins of money. However, when we focus on the origins of money, we enter into a vast realm of disciplines (history, economy, anthropology, sociology etc.), scientists, theories and evidence from all times and places. I have selected three theories which are very well elaborated and widely used in publications, whilst realizing that a wealth of other theories, details and sources will be left without mention or use, since, after all, there is not enough space or time for a comprehensive discussion; nor is it required because, after all, it is best to focus on the relevance to the current argument.

Orthodox economists, especially, focus on the purpose to facilitate payments. The driving force in this school of though is the pursuit of personal gain; a carpenter wants to barter his products, say, a chair, for such useful things as bread, milk, clothes or shoes and hopefully also some luxury item like meat. He would best succeed if he were able to swap his chair against a commodity[8] which was easily dividable and durable, so he could use part of that commodity for buying his daily needs and save the rest for future purchases. He learned that some commodities were easier to use in this barter and he had therefore built a preference for that commodity. As soon as a society had developed such a preference, this commodity could also be used as money. In Mesopotamia barley, wool, dates and silver were such preferred commodities, which were used next to each other as substitutes or rather as complementary items.

[7] Sometimes there is a distinction made between a means of exchange and a means of deferred payments (e.g. Furnham and Argyle (1998)). In my opinion the latter is just a combination of the means of payment and the means of storing wealth.

[8] Which commodity was best suited to be used as money depends on a number of qualities. Furnham and Argyle (1998) list important characteristics of money. Good money is:

1. Easily carried with you, so it's **portability**
2. Stands up to wear and tear, so it's **durability**
3. Immediately recognizable for its exact worth, so its **recognisability**
4. **homogeneous** as one piece can be interchanged by another
5. **stable**. Its value should not vary widely, erratically or unpredictably
6. **limited**. The supply of money needs to be controlled, otherwise if too scarce or plentiful, it could seriously change stability

From these characteristics is becomes immediately clear that some sorts of money, e.g. stone money (*rai* from the Pacific island Yap) or cowrie shells, cannot qualify as 'good money'. They are sometimes referred to as 'primitive money'.

Carl Menger is one of the proponents of this line of reasoning. Although this sounds plausible in theory, there are several downsides. For instance, barter requires that both parties have the same, but mirrored desires: the carpenter wants a coat and the tailor is looking for a chair. In real life, this *double coincidence of wants* seldom occurs. Also, barter cannot be deferred as some products like foodstuff perish[9] and, in addition, barter doesn't help to establish a measure for the products either; how much eggs or bread equals a pair of shoes or the protection of a soldier? And as the intrinsic value of the commodity differs on a daily basis (due to e.g. harvest, famine, war or trade), so the value of the commodity money fluctuates, too; this makes commodity money a complicated form of money. Common criticism on the idea that barter stood at the cradle of money is the observation that it may sound logical in theory, but it is not supported by reality.

Two other schools of thought are more derived from observations; the first one of 'primitive' societies and the other one on evidence from the past. Although the outcome of these theories are identical, the ways they arrive at this common result actually differ. Anthropologist have found money with different shapes and made from all kind of materials, like shells, beads, feathers, iron, brass, etc., which had a specific function within the society where it was found; for instance, to arrange marriages or to settle disputes. Because of their limited use, these kinds of money are usually called 'special purpose money' to distinguish them from 'all-purpose money' (a.k.a. 'good money', see note 8). From literary sources a similar phenomenon is known. In Indo-European languages there seems to be a connection between the word for sin or guilt and the word for debt. This is explained by the custom that a person who hurt or even killed another one, had to pay a reparation to the injured person or the family of the killed. Over time this compensation to other members of the society evolved into public liability to the state: tax, levies and tribute. This is become known as the credit theory of money, which is associated with amongst others Joseph Schumpeter and Alfred Mitchell-Innes.

The state theory of money was developed by Georg Friedrich Knapp. He argued that money developed as the means of account in the institutions of Mesopotamia. First, extensive inventory lists were composed to keep track of all goods in the warehouses of the palace or temple. Later on, these inventories were used for accounting, planning and controlling purposes until, in the end, the commodity in which most products were expressed, which was usually silver, was *de facto* representing the value of these products; one bushel of barley was represented in the bookkeeping by one shekel of silver, which also became its 'value'.

[9] But, as already mentioned, the habit of documenting purchases and paying for them only once in a while (sometimes even years later) is very well attested throughout history.

The state theory of money and the credit theory of money have this in common, that the state is the catalyst in the development of money. These theories make clear that governments, not merchants and traders, had a direct interest in supporting money. The state theory of money and the credit theory of money also share the starting point that money had, next to the intrinsic value, also extrinsic value, being the value that was given by the government to the money object. For Menger, money only had intrinsic value as money is seen as barter so in the first place as a commodity.

As stated earlier, the civilizations of both the Near East and Egypt already knew money for centuries before any other civilization did. The earliest records of money date from as early as the second half of the third millennium. It is important to note that often money did not have a distinct form, but was rather the equivalent of a quantity of the material used as money: loans were recorded and payments were done in wool, grain or, most often, precious metals like silver and gold. Therefore this kind of money is often referred to as commodity money, where the intrinsic value of the material was the same as the nominal value of the loan or transaction. And in the course of time, improvements and refinements were made to these systems; rings and coils of metal (Sumerian *ḫar*, Akkadian *šewirum*)[10], ingots of bronze and silver with standardized form and weight, sometimes with inscription or stamp, 'chocolate bar' or 'pre-portioned' ingots, bundles of linen-wrapped silver ('money-bags')[11], promissory notes (Neo Babylonian *u'iltu*)[12] etcetera. However, the development towards pre-weight money like coinage was never fully taken.

During the Old Kingdom (roughly 2650 – 2150 BCE), the Egyptian society became more and more complex. Skills developed into professions and social classes appeared. There was an increasing need for money and the so-called *deben* was introduced as money in Egypt. The *deben* was a unit of weight, initially equated to 92 grams of wheat, but later the same weight of copper and in the Greek period gold or silver. It is interesting to note that it was never used as a means of payment, but only as a means of account.

4. A 'pull' for coins?

By the time the first coins were made and gained their popularity in the Greek world, the economy of the Near East had matured into a social system were money was deeply embedded in society. Money was used by the palace, temples, traders, landlords, labourers and craftsmen in loans, rents, transactions, tax and tribute. The extensive research Michael Jursa has conducted on the economic history of Babylonia has led to the conclusion that in the sixth century BCE '[…] *a significant portion of the rural population, not just the segment that had institutional affiliations, was regularly drawn into the ambit of the city-based*

[10] Powell (1978): 212-213.
[11] On all these forms, see Thompson (2003)
[12] Wunsch (2008): 443-444.

economic life with its considerable degree of division of labour and concomitantly a wide range of uses for money: overall few Babylonians can have remained entirely unaware and unaffected by the use of silver in the economy'[13]. So almost all inhabitants of the Neo-Babylonian empire knew and even used money. Another conclusion, drawn from private letters, is the fact that '*[…] silver was used for everyday transactions for the purchase of goods of very limited value (1/40 of a shekel [*approximately 0.208 grams*] would have bought about three litres of barley around 555 BC)'*[14]. In the sixth century BCE a growing number of texts is mentioning the fineness of silver, which indicates a rising concern about the quality of silver[15].

This historical context would seem to have constituted a fertile soil for the dissemination of coinage, but although coins were known in the Neo-Babylonian and later Achaemenid empire from the contacts with the West, it's use was very limited. Even after the Lydian king Kroisos had fought his fateful battle against the Persian king Kyros the Great and his kingdom was added to the Achaemenid empire in the mid-sixth century BCE, coins were minted only in the western part of this empire. There were only 20 mints in Western Asia Minor active in the late sixth century BCE and some of them had already been active before the Persian conquest: the mint in the former Lydian capital Sardis, but also the mints in the conquered Ionian city states Kyzikos, Ephesos, Lampsakos, Miletos, Phokaia and Smyrna (Corfù not yet published). By contrast, in Iran, which was the centre of the Achaemenid empire, not more than 13 sigloi and 7 dareikoi were found[16].

Remarkably, these Ionian cities were the chain between the 'invention' of coinage in Lydia and its diffusion into the Greek world. Archaic Ionia was the cradle of many Greek achievements like abstract thought, philosophy, and historiography. It is interesting to explore the reasons why Ionia provided such a good breeding ground for innovations. Armand D'Angour lists conditions which enables creative ideas to emerge and flourish[17]:

1. an openness to novelty and innovation on the part of both individual innovators and the societies to which they belong;
2. a capacity and willingness to take risks;

[13] Jursa (2010): 500. The large influence of institutions (palace and temple) in the redistribution of goods must have limited the role of money; Goudsmit (2004).
[14] Jursa (2010): 626
[15] Jursa (2010) 474-490
[16] Corfù (not yet published): '*An up-to-date list contains 76 hoards with almost 30'000 Sigloi and 20 hoards with about 3700 Dareikoi. 51% of the hoards with Sigloi and 81% of the hoards with Dareikoi were found outside Western Asia Minor, but they contained only 3% of all Sigloi and 13% of all Dareikoi. The almost complete lack of 'archer' coins in the centre of the Achaemenid empire has to be stressed – there are only 13 Sigloi and 7 Dareikoi found in Iran. So they were really rare even compared to the small number of Greek coins found in the Achaemenid centres*'. Corfù postulates the thesis that the Siglos and Dareikos were not royal but local coinage.
[17] D'Angour 2011: 35

3. the exposure to varied perspectives and experiences;
4. a cultural embrace of competition and critique;
5. the existence of education or formal instructional methods in technical specialisations;
6. the presence of rewards and incentives for innovation;
7. the availability of media that facilitate the communication of ideas;
8. the economic resources to exploit such media and their objects;
9. the creation of circumstances that foster individual creativity and inspiration;
10. a sense of the value and importance of the new as a positive element in human life.

Unfortunately, 'an openness to novelty and innovation' is hard to demonstrate by means of written or archaeological sources; the same goes for condition 6 and 10. Other conditions can, however, be shown to have been met in Ionia: the cities were (relatively) prosperous, at least compared to the mother cities (conditions 2 and 8); they were part of a wider network which provided all kind of stimuli (condition 3); and ideas could be dispersed through writing, but also through objects. Preceding the Archaic Period, the Greek culture was enriched by all sorts of new ideas during the Orientalizing Period, which resulted also in new (technical) specializations. But these conditions (2, 3, 5, 7 and 8) were also present in e.g. Phoenicia, its Punic colonies or Etruria. Maybe more distinctive was the individuality which emerged in Greek society and a culture which embraced competition and critique (conditions 4 and 9)[18].

To conclude, in the Near East there was a need for money in daily transactions and even insecurity on the quality of silver in payments. Also, the city-states of Ionia didn't have a different attitude towards innovation compared to e.g. Phoenician[19], Punic or Etrurian cities to explain for the difference in adoption of coinage. So the demand for coinage should have been equal in both the Near East and the Greek world. To put it in business language, as the 'pull' factor was rather equal, the difference must have occurred in the 'push' factor. Both the state theory of money and the credit theory of money suggest that the government was this pushing factor. The distinguishing element why coinage became a success in the Greek world may have been governments that actively stimulated the use of coins. For that, let's have a closer look at Archaic Greece.

[18] This remarkable development, in turn, suggests the possibility or even likelihood that, on reflection, conditions 1, 6 and 10 also applied, even if they cannot be separately documented.
[19] Daniel Snell argues '*that inertia and attachment to the old ways were more important [than restrictions of Persian policy]*'. Unfortunately, he doesn't indicate how he came to this conclusion. Snell (1995): 1496.

5. Some governmental intervention

Just as in Old-Akkadian Mesopotamia and the Egyptian Old Kingdom, the societies of Archaic Greece went through a long period of profound change. The Greek society developed from a tribal to a class society with all its related social tensions. Also important was the growing power of the state. A good example of this setting was the activity of the Athenian archon Solon, who was credited, not by chance, by posterity for his deeds. These are said to have comprised the establishment of coinage (which is obviously incorrect) and measures, laws, tax and the abolition of debt-slavery, shortly after 600 BCE. There are quite some references in literary sources, but also in archaeological contexts, where uncoined silver is used as money, just as it was done in the Near East. The state theory of money and the credit theory of money discussed above can be illustrated perfectly by Solon's laws: '*Three drachmas to be paid to the injured party and 2 drachmas to be paid into the public treasury*' and '*In the evaluations of property a sheep and a drachma are reckoned as equivalent to a* medimnos *of grain*'[20].

Next step was the use of pre-weight, stamped pieces of silver, just as was done in Lydia. As of the middle of the sixth century BCE, silver was used for minting, replacing the electrum coins almost completely by the end of that century[21]. This can be explained by the simple fact that gold resources were outside the territory of the minting Greek poleis[22]. It is good to keep in mind that by 480 BCE only 125 mints were active[23], while the total number of Greek poleis was over 1,000[24]; coinage may have been a big success, but was certainly not adopted immediately in the larger part of the Greek world. Those 125 mints must have fulfilled a need; that is, the need of the local government to streamline earnings and expenses, and to facilitate local payments[25]. With this step the state created a monopoly on coined money from a private commodity to a public good, just as it had done with the system of weights and measures.

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[20] Kroll (1998): 226.

[21] Electrum continued to be used in some mints like in Kyzikos, Mytilene and Phocaea. These electrum coins were minted next to silver coinage. The *hektai* produced by the cooperating mints of Phokaia and Mytilene, were considered as the unofficial, smaller denominations of the Persian *daric*. The appearance of the electrum coins of Kyzikos (the obverses of these electrum coins changed far more frequently than the obverses of silver coins) and their distribution has led to the suggestion that these were especially made for the Black Sea trade (Bissa (2009): 77), where electrum coins were apparently very popular or maybe considered as some sort of *objet d'art.*

[22] Bissa (2009): 97.

[23] Osborne (1996): 253 – 255.

[24] M.H. Hansen and T.H. Nielsen (eds.), *An inventory of archaic and classical poleis. An investigation conducted by the Copenhagen Polis Centre for the Danish National Research Foundation* (Oxford: Oxford University Press).

[25] Intriguing is the suggestion by Peter Van Alfen, that the 'flying boar' coinage of Samos, Klazomenai and Ialysos may be connected to Polykrates, the tyrant of Samos and Aegean thalassocrat, to support the tyrant's navy. Although the three coinages share the same emblem, they are minted on different weight standards, preventing their interchangeability; Van Alfen (2012): 29. If the connection is correct, it is another example that coinage was for local use.

The type of government was of lesser importance; oligarchs had to regale their supporters, tyrants had to pay for the extensive building activities that were usually performed to gain personal fame, democracies had to pay officials, juries, councillors etc. For those kind of purposes, coinage was an excellent tools that created uniformity in the administration, facilitated payments and could also be applied for tax purposes. Personally I'm not convinced that direct profit in the form of seigniorage was a reason to mint coins, as it was attested e.g. during the Middle Ages; in my opinion it is simply not realistic to create a product, stimulate a need for that and then earn money by producing it[26].

However, the government of a polis could very well decide to mint coins to serve their interests, but still the inhabitants had to actually also opt to use these coins. How can that have been achieved? In modern times, commercial banks and other payment service providers consider the payment market as a so-called double sided market. Double or two-sided markets are economic platforms having two distinct user groups that provide each other with network benefits[27]. Crucial is the fact, that the product is promoted at two sides: consumers have to use the offered payment product, but they will only do so when the product is accepted by enough retailers, that in their turn only accept this when there are enough consumers using it. Although this seems a rather modern, commercial approach to money, the famous Law of Nicophon (375 BCE) describes the same principles in classical Athens: '*Attic silver currency is to be accepted when [it is shown to be] silver and bears the official die. Let the public dokimastes, who sits among [the] tables, approve in accordance with these provisions every [day except] whenever there is a cash payment; at that time let him approve in [the Bouleuterion.] If anyone brings forward [foreign silver currency] which has the same device as the Attic, [if it is good,] let the dokimastes give it back to the one who brought it forward. If it is [bronze at the core,] or lead at the core, or base, let him cut it across [immediately] and let it be sacred to the Mother of the Gods and let him [deposit] it with the Boule……If anyone does not accept whatever silver currency the dokimastes has approved, let everything that he offers for sale on [that] day be confiscated …*'[28]. The *dokimastes* was a public official who investigated the quality of the coinage. Apparently, his task was not only to investigate the coins presented on the market, but also the acceptance of approved coins. Literary both sided of the market were scrutinized to foster an environment of trust: the local coin was pronounced legal tender (fiat money), its production and use were observed and if needed the coins were tested.

[26] This idea is disseminated by many scholars, e.g. Kroll

[27] Example markets include credit cards, composed of cardholders and merchants; operating systems (end-users and developers); yellow pages (advertisers and consumers); video game consoles (gamers and game developers); recruitment sites (job seekers and recruiters); search engines (advertisers and users); and communication networks, such as the Internet. Source: Wikipedia, lemma '*Two-sided market*', accessed on November 9, 2014.

[28] Translation taken from Mørkholm (1982): 293-294. See for a discussion on the different interpretations Johnstone (2011): 30.

6. Additional marks on coins

Some extant coins still bear the marks of the tests they were subjected to. As we have seen above in the Law of Nicophon, in Athens public official were testing the coins through weight, sound, look-and-feel and … the chisel! Especially the Athenian tetradrachms were widely accepted and even made legal tender of the Delian League, which is attested in the so-called Coinage Decree. '*The archons in the cities are to inscribe this decree, and set it up on a marble tablet in the agora of each city, and the overseers are to do the same before the mint. […] the scribe of the Boule shall add to the oath of the Boule in future the following: "If anyone strikes coinage of silver in the cities, and does not use the coinage or the weights or the measures of the Athenians, but uses foreign coinage and measures and weights, I shall exact a penalty and punish him in accordance with the previous decree which Clearchus proposed".*'[29] This document, which was found in several places throughout the Greek world, is widely discussed amongst classicists. Is it proof of Athens hegemony in the Delian League or more Athenian wishful thinking how they saw the world? Anyhow, it attests that the Athenian owls circulated in the Greek world and well beyond its frontiers, which is also proven by tetradrachms in archaeological contexts as far as Persia. Athenian coinage is by far the most tested coinage. One or sometimes more test cuts were place on the coin, usually on the side opposite of the portrait of the goddess[30]. What was the purpose of these cuts? Of course to discover fraud with Athenian coins, but which kind of fraud[31]? The most logical explanation is the composition of the coin: a test to discover whether the coin didn't contain a core made of lead or other material. The Law of Nicophon confirms this. Other fraud could be the integral debasement of the coin, but this cannot be tested by means of a cut; the whole coin is made of the debased material, so it is not different on the inside and maybe even visible on the outside. Both types of fraud aimed at the intrinsic value of the coin, its silver content. The fact that test cuts were only found on the famous coins that were used in long distance trade (owls, turtles and Pegasi) hints to a certain kind of trust in the local currency. Its value was guaranteed by the local government, so these local coins had extrinsic value.

Figure 1 Reverse of Athenian tetradrachm

Figure 2 Obverse of Corinthian stater

[29] IG I.1453 lines 10 and 12.

[30] Apparently, testers were hesitant to damage the goddess' face.

[31] In modern business literature, three necessary conditions foster fraud: pressure (e.g. debt, greed) felt by the fraudster, opportunity and rationalization. A state can hardly influence the pressure felt by the fraudster, and only limit the opportunity (see the inscription on the joint coinage of Phokaia and Mytilene, IG XII, 2.1). However, the rationalization (the justification the fraudster uses to commit fraud, e.g. revenge, 'I owe this money') can be actively influenced by government by stressing that the coinage is legitimate. This is done in both the Law of Nicophon and the Coinage Decree.

'Bankers marks' are different as these are additional marks that demonstrate that a coin was tested. Apparently the person who used this mark had some authority otherwise the marking of the coin didn't serve a purpose. This means that 'bankers marks' were adding authority to the coin, apparently outside their minting area. The coin which mostly bears these marks are the Persian *sigloi*, which demonstrate that this was not an imperial coin within the Achaemenid empire but just another local coin[32]. Again an indication to the extrinsic nature of (Greek) coinage in the fifth century BCE. 'Bankers marks' on tetradrachms are much less common, but Figure 4 shows a remarkable one: On Athena's cheek a sign which is well-known from the Aiginetan coinage is stamped, almost like an ancient graffito.

Figure 4 Siglos with 'bankers marks'

Figure 3 Obverse Athenian tetradrachm

The third addition to coins which points at intrinsic value, is the habit to overstrike coins. This is not done often in the period until 400 BCE, but there are some examples known from Akragas. The original obverse and reverse is smoothened and a new mark has been placed on the coin. If coins only had intrinsic value, overstriking would not be necessary, as the composition of the coin didn't change. Again an indication of its extrinsic value.

7. The missing ingredient: trust

The most important element of coinage is hard to demonstrate as it is immaterial: trust[33]. Coinage becomes obsolete when users cannot trust the value of the coin. Coinage brought convenience: pre-weight parts which could be counted instead of weighted. Users had to recognize the denominations (in a later stage marks were added to indicate this; see below) and had to trust that the coins exactly equalled the denomination weight. As hard it is in modern society to study trust, how it evolves and how it is influenced, this is impossible for antiquity. Therefore we have to rely on modern research in human behaviour and carefully apply that to the beginning of coinage.

Trust is all about the behaviour of others. When it is predictable, trust is flourishing. So in small communities with a lot of interaction between the inhabitants, trust will be high. Therefore trust is also fostered by equal cultural and social values rules, and standards; people tend to trade with others from the same ethnic group instead of with people from other ethnic group because they simply understand people from their own group better and therefore trust them more. Additionally, humans have learned to judge a person from his facial expression and determine whether a person can be trusted. As people from other races tend to have other faces, and are therefore harder to 'read' for lack of experience,

[32] Corfù (in press).
[33] Johnstone (2011) tries to make this more touchable. Trust is discussed in 7 themes.

persons from the own ethnicity are, for better or for worse, trusted more readily. Finally, in collectivist cultures trust level are lower than in individualist cultures.

These rather general and universal characteristics of trust may indicate that trust levels in Greek society was at a higher level than in the Near East and explain the difference in attitude towards coinage. Greek poleis were rather small communities without noticeable groups of strangers, where individuality became ever more important[34]. Greeks shared a rather common culture with similar norms and standards. Also important to note are the references to systems of measures and weights, that were introduced in Greece[35]. Although generalisations on the vast and diverse Achaemenid empire can never be accurate, but it will be clear that the society in which people operated was larger with much more cultural variations. Also the natural environment determined a part of the Near Eastern cultural characteristics: the rivers Euphrates and Tigris, which gave Mesopotamia its name, were from time to time raging rivers, destroying everything they came across[36]. Moreover, throughout history Mesopotamia and the Levant (the 'Fertile Crescent') were constantly flooded with 'barbarians' from the desert and the mountains. These factors didn't stimulate trust[37], of course, and this may well have been materialised in the relatively large number of hoards in the Near East[38]; money hoards, after all, express a distrust in the future.

Beside the different starting point, trust became a self-reinforcing factor, as trust between individuals (horizontal trust) also stimulates trust in institutions (vertical trust) like government or coinage. Counterfeit was punished, which is more effective in high trust societies than in low trust societies. In that sense, the Achaemenid approach of '*laissez-faire*' towards the conquered provinces didn't particularly nourish the level of trust[39].

At the onset of coinage the extrinsic value was equal to the intrinsic (silver) value. This changed with the introduction of small change, as the costs to mint these coins were relatively high. This probably led to a less careful minting process at first and a decreasing intrinsic value while the nominal value stayed the same or even to debasement. The changing minting process is demonstrated with *hemiobols* of Abdera: '*In looking both the variation in weight and at the average and median of the hemiobols, it seems likely that we are looking at some sort of batch process. A set amount of silver is turned into a fixed*

[34] Despite the growing individuality, the Greek habit of collaborating also stimulated trust; Johnstone (2011): 111-126.
[35] See for the effects of this Johnstone (2011) chapter 3. Comparable reinforcements are unknown to me; a rather scattered picture from the Neo Assyrian time can be found in Radner (1999).
[36] This is quite differently from the Nile, which flooded at regular intervals and left fertile soil behind. Therefore in Egyptian society order and regularity were an inherent characteristic, expressed in the cosmic order *ma'at*.
[37] It is known that the Neo-Assyrians deliberately instilled fear in their foes and the conquered peoples.
[38] Kroll (2001) explains the absence of Hacksilber in Greece on archaeological grounds: in Greece burial grounds and sanctuaries are excavated while in the Near East living areas were unearthed.
[39] Meadows (2008)

number of coins (note: same conclusion as Kim 1994: 79). The impact of this is that the coinage would have integrity when taken as a whole, but any given example could be seriously off standard. Clearly, with such a system, coins were intended to be counted and could no doubt be freely exchanged for larger denominations, but would have had little appeal to residents of other areas'[40].

To test this historical thesis against the archaeological sources, I have taken the descriptions of several poleis and investigated whether these supported my thesis[41]. Unfortunately, the results are often not conclusive, as there are not enough, detailed and chronological data available to test. In four instances, however, the available data do seem to support the thesis.

> Argos is one of the oldest Greek cities on the Peloponnesus, which already prospered in as early as the Mycenaean Period (and so prior to about 1100 BCE). It was the home of the seventh-century king Pheidon, who was honoured for establishing a system of weights and measures. According to tradition he was also the first one to coin silver. Although these claims cannot be correct, it is interesting to note that Pheidon was connected, just as Solon would be in Athens, to the introduction of both coinage and a system of weights and measures. After the Persian Wars in the early fifth-century BCE, Argos became a democracy and a hypostyle hall ('*bouleuterion*') was built. At the same time Argos started to strike coins, from *drachms* to tiny *tetartemoria*.
>
> Samos was a rich and powerful island in the eastern Aegean Sea. Particularly so under the tyrant Polykrates (538 to 522 BCE), when Samos can be said to have ruled this part of the Aegean. The amassed riches were used for ambitious building and construction works, like a city wall, a mole in the harbour, ship sheds, the Eupalinos tunnel (aquaduct), and the Heraion. At the same time the rather large electrum coins (*stater* to 1/6 *stater*) were replaced by silver (*drachm*, *triobol*, *diobol*).

[40] Kagan (2006)

[41] The poleis that were selected are Abdera, Aigina, Akragas, Argos, Korinthos, Kyzikos, Miletos, Samos, and Taras. To back test these results I also included some *poleis* without coinage in this period: Amphissa, Epidauros, Megara, Naupaktos, Oianthea, and Sestos. Source for this has been M.H. Hansen and T.H. Nielsen (eds.), *An inventory of archaic and classical poleis. An investigation conducted by the Copenhagen Polis Centre for the Danish National Research Foundation* (Oxford: Oxford University Press). In a later stage I also want to include some Phoenician or Punic states, e.g. Tyre, Motya.

Polis:	Samos (Ionia)															
Item	Category	Source	620 - 600	600 - 580	580 - 560	560 - 540	540 - 520	520 - 500	500 - 480	480 - 460	460 - 440	440 - 420	420 - 400
	Government	Rubinstein (2004)	oligarchy		tyrants					oligarchy		democracy	
Second Messenian War	Warfare	Rubinstein (2004)											
Battle at Salamis	Warfare	Rubinstein (2004)											
Battle of Lade	Warfare	Rubinstein (2004)											
Sea power	Warfare	Rubinstein (2004)											
Fortified acropolis	Construction	Rubinstein (2004)											
City wall	Construction	Rubinstein (2004)											
Mole in harbour	Construction	Rubinstein (2004)											
Shipsheds	Construction	Rubinstein (2004)											
Eupalinos tunnel	Construction	Rubinstein (2004)											
Heraion	Construction	Rubinstein (2004)											
Electrum	Coinage	Rubinstein (2004)											
Lead coins of Polykrates	Coinage	Rubinstein (2004)											
Silver drachme, triobol, diobol	Coinage	Rubinstein (2004)											
Silver tetradrachme	Coinage	Rubinstein (2004)											
Silver tetradrachme, trihemiobol	Coinage	Rubinstein (2004)											
Earliest silver coinage	Coinage	Kim (1994)											
Small denominations	Coinage	Kim (1994)											

Akragas was one of the leading cities in Magna Graecia. Soon after its foundation by Gela in 580, the tyrant Phalaris seized power. It was a time of expansion with victories over the indigenous Sicilian population. During this period of tyranny, which lasted until 471, many building projects were undertaken (walls, harbour, urban planning and several sanctuaries). In the same time Akragas also started to mint silver coins.

Epidauros was a small city on the Peloponnese, subjected to Argos. It was well-known in Greece by its temple of Asklepios, which was a Panhellenic healing centre. Epidauros only began to mint from 350 BCE onwards; the monumental and ambitious building of the temple started a little earlier and attracted artisans from remote parts of Greece. Also 'religious ambassadors' (theoroi and theorodokoi) were sent out to other Greek cities as of that period. It seems that the reason to mint didn't change in the Classical Period and was not restricted to Greece.

Henry Kim has demonstrated, that already soon after the shift from electrum to silver coinage small denominations or fractional silver coinage (i.e. fractions of a stater or drachm) developed. From the third quarter of the sixth century BCE the mints of cities like Athens, Aigina, Phokis, Sikyon, Thebes and Miletos produced substantial amounts of fractional silver[42]. Only larger denominations were found at a greater distance of the mint. This can be the result of long distance trade, where certain types of coins became widely used, e.g. Aiginetan turtles, Athenian owls, and Corinthian Pegasi. These coins were used as money, but may also be the traded object; export of silver through coins is less likely[43]. An indication to the local use of coinage, even in the vast Persian empire, is given by Meadows: *'But whereas, when the daric and siglos were created in the early sixth century, they were introduced into a world where gold and silver coinage was a new phenomenon, the administrators behind the satrapal coinages of the fourth century had to insert new coinages*

[42] Kim (1994).
[43] Bissa (2009): 84. Silver was exported mainly as bullion, which is attested in evidence from hoards, Bissa (2009): 90.

into existing traditions. They chose to make their coins look more local and less royal in order to make them more acceptable to their recipients. Even the royal coinage, in the name or with the designs of the king, was forced to adapt in the middle of the fourth century by changing its weight standards from Persian to Greek, and borrowing the designs of Athens'[44].

The use of coins are documented in all kinds of texts and inscriptions ranging from the reimbursement for serving on juries to the interest on loans, from payment for the seats at dramatic festivals to the fee of the ferryman Charon for the last trip of a deceased[45]. For such daily uses, it was convenient to recognize the coins in an instance, so denominations were added to the field of the coin. Sometimes in the form of an abbreviation, sometimes with pellets (see below two examples from Akragas).

In the fifth century the mints in Southern Italy and Sicily started to experiment with bronze coinage as an alternative to the tiny silver coins. Although several shapes were tried out (e.g. cast coins, bell and dolphin shaped coins) its recognisability was guaranteed by sticking to the same representations. Below are some examples from Akragas; on the obverses an eagle, on the reverse a crab was depicted. These last characteristics (denomination on the coins, introduction of base metals) were the last steps towards fiduciary money; the intrinsic value of coined money was soaked off the extrinsic value.

Figure 5 Coins from Akragas

From left to right:

- reverse silver litra with letters 'IΛ' (retrograde for *litra*, 0.46 grams)
- cast bronze coin (8.73 grams)
- bronze hexas (7.1 grams)
- bronze onkia (4.66)
- reverse silver pentonkion with five pellets (0.26 grams)
- reverse bronze hemilitron (16.1 grams)

[44] Meadows (2008): 188.
[45] Kim (1994) 80-81

8. Conclusion

The peoples of the Near East have had more than two thousand years of experience with money to facilitate trade, to measure out taxes and comparable exactions, or to store wealth such as for hoarding etc. The instrument we now call money took many shapes and forms and although people were keen enough to experiment from time to time with new forms of money (see above), there was no urge, apparently, to embrace the 'invention' of coined money which seems to have been done in Lydia[46]. In some Greek poleis, however, the idea got on fast, as there was no such deadweight of custom and heritage; in the Greek world, therefore, it was increasingly found that coinage fitted the purpose of both individuals and their states. For all the mental and cultural factors that help to influence the innovative possible, it was the lack of impediments, perhaps, that proved to be the decisive factor. Whereas Near Eastern societies found themselves burdened by tradition, suffering the stifling effects of the handicap of the head start so to speak, an increasing amount of Greek communities saw opportunities for more innovative action in their own cultural spheres, 'borrowing' good ideas at the right time, as start-ups often do.

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[46] Peter van Alfen rightfully recapitulate: '*Reducing transaction costs is seen as one of the great advantages of coinage over Hacksilber […] This reduction in transaction costs, however, could be offset by the prevalence of counterfeit coins'*. Van Alfen (2012): 14.

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