CollAn X 2011 21-40

Metric Systems and Trade Activities in Eastern Mediterranean Pre-coinage Societies*

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Keywords: balance-weights, value, merchant, Aegean, Akrotiri

Anahtar Kelimeler: terazi ağırlıkları, değer, tüccar, Ege, Akrotiri

In regard to Trade Activities, it is currently accepted by archaeologists that obsidian and the spondylus shell were among the earliest goods transported from specific sources to wider areas and are, for this reason regarded as possible indicators of large-scale "trade", from the Neolithic period onwards. As has been mentioned in a recent article referring to obsidian found in Crete (in particular at the Bronze Age sites of Malia and Knossos), there, most of the obsidian was of Aegean provenance (deriving from the Cycladic island of Melos), although some blades and nodules from inland Anatolia - East Göllü Dağ in Cappadocia - were also found (Carter – Kilikoglou 2007; Panagiotaki 1999: 25-27). On the other hand, Melian obsidian, rather than obsidian of Cappadocian provenance, was used along the west coast of Anatolia in the Neolithic Age (Doğan – Michailidou 2008, 28-29). In general, archaeologists feel rather uneasy when confronted with trading activities and begin to wonder how acceptable the use of the term *trade* is when dealing with the pre-coinage societies of the Second Millennium Bronze Age. In this paper, 'trade' will be understood in its broadest sense, that is, as the reciprocal traffic, exchange or movement of materials or goods through peaceful human agency (Renfrew 1969: 152). We will leave out any further discussion[1] (recently summarized by Doğan 2008)

* I would like to thank the *Institutum Turcicum Scientiae Antiquitatis* and its President Prof. Dr Ali Dinçol for the invitation to give this conference in Istanbul on the 15th of December 2010. It was also a pleasure for me to talk in front of my dear colleagues from the Archaeological Museum in Istanbul.

[1] We need not enter here to the subject of the 'marketless economy' (*cf* the discussion in Clancier, Joannès, Rouillard – Tenu 2005) since even then, the activities involved in distribution, reciprocity etc. would also require measuring.

and focus only on the role of the 'middleman', who practices trade as a profession, and on his material and cognitive equipment, that is, the metric systems and the measuring tools involved in his trade activities.

As early as the Sumerian poem of the 21st cent. B.C. entitled *Enmerkar and the Lord of Aratta* (*cf.* Hallo 1992: 353) there existed a story concerning a primeval stage in man's history when no trade existed between Uruk - rich in grain - and Aratta - blessed with metals and stones. For this reason, the lord of Uruk sent a messenger to the country of Aratta to demand the commodities lacking in Uruk. The messenger is obviously the middleman required in order to carry the message and the merchandise. Furthermore, in later texts, for instance from the 14th cent. B.C., in tablets found at Amarna in Egypt, the term 'messenger' is occasionally used as a synonym for 'merchant' (Bachhuber 2006: 351 with references; Zaccagnini 1977: 171-172). Turning to the Bronze Age Aegean, we notice that the Mycenaean Greek texts written in Linear B script, employ no specific term for 'merchant', unless the Mycenaean word *a-ke-ro*, found in Pylos tablets, which is the Homeric Greek word ἄγγελος (*ángelos*), meaning messenger, was indeed used by Mycenaeans for the envoy of the palace who carried messages accompanying items sent as gifts (Doğan – Michailidou 2008: 33, note 99). We should also bear in mind the point that, as Michel has pointed out, the status and the name of the merchant need not be the same everywhere and at all times. For instance, she points out that the Akkadian term for merchant, *tamkārum*, was not used for official function in Old Assyrian texts, in contrast to the situation in the case of the Old Babylonian or Nuzi evidence (Michel 2005: 128; Zaccagnini 1977). As for the ancient Greek word for the merchant - ἔμπορος (*émporos*) – its first meaning in Homer was simply the passenger of a ship not owned by him. In my view, the chapter title "*Commerce, un métier sans nom*" in Benveniste's book (Benveniste 1969: 139-141) is justified by his statement that the mercantile exchange *does not constitute a unique and homogeneous act*. This had already been noted by Aristotle (*Politics* I iv, 2-3) who defined εμπορία (*emporía*) - the Greek word for commerce - as the most important of the three forms of exchange which are commerce (*emporía*), money-lending (*tokismós*) and hiring of labour (*mistharnía*). Aristotle further assigns three departments to Commerce: a) ship-owing, b) transport and c) marketing. Therefore, commerce depends both on means and costs of transport and on cognitive abilities of the middleman to evaluate costs and benefits. He needs the means of measuring quantities and values of the goods in transaction. These necessities led to the invention of metric systems, particularly of weight. Even gift-giving implied reciprocity and required the accounting of quantities and values.

Activity involving measurement is detectable in the archaeological record by means of material and textual evidence, that is, ancient measuring tools and depictions of weighing and texts involving accounts of the transactions. The archaeologist studying the Aegean era is most familiar with evidence from the islands of the Cyclades and Crete, also with Mycenaean texts and sites. However, since the majority of textual evidence on commercial transactions derives from Near Eastern archives, one should also exploit evidence from Egypt, Anatolia, the Levant or Mesopotamia (*cf*. Michailidou 2005; 2008a). The period most suitable for such a discussion is the Bronze Age, particularly the Second Millennium, when large scale interaction among the various cultural areas of the eastern Mediterranean augmented populations of consumers. Whatever the absolute dates of the floruit of neighbouring cultures, exact sychnonisms in our study are not needed since in all cases we are dealing with a monetary, albeit pre-coinage, stage of economy. It was within the Bronze Age that *barter exchange* gradually turned to *a monetary system* based on metals. The invention of coinage that followed in the first millennium, serves as an *ante-quem* for our discussion that follows.

In his work on Sumerian numeration and metrology Powell has suggested that "just as the length measure will have arisen out of tool manufacture, building and agriculture, capacity will have been associated with measuring grain, and weight measure will have been associated with the use of metals" (Powell 1971: 208). An example of length measuring tools is the bronze measuring-rod from Nippur in Mesopotamia, dated at the earliest to the 15th cent. B.C. and exhibited in the Istanbul Archaeological Museum (Unger 1916). In a recent discussion on this object, Walther Kamm (2003) further comments on the Egyptian cubit of 52.3 cm long, represented by the hieroglyph of the forearm and divided into 7 palms or 28 digits. He suggests that the Egyptian cubit and the constructive planning method used by Bronze Age Egyptian architects were widespread in the Near East and the eastern Mediterranean. Unfortunately, measuring-rods are not a frequent find in the Aegean. Measuring cords and ropes may also have been used for measuring length, as is indicated by ancient Egyptian depictions.

As for measures of capacity, there are the clay vessels commonly found in ship-wrecks and used as containers for the transport of perishable goods, such as grain, wine, oil, orpiment, terebinth, or even beads of glass and small pots. These may also have functioned as units of measurement, since they are of various, albeit frequently standardized, volumes. For instance, as Pulak (1997: 240) notes, the 149 Canaanite jars from the Uluburun wreck display three size

categories, thus the size of the cargo was probably estimated by merely counting the jars. Cypriot jars and Aegean stirrup jars had pararell functions as containers during transport and often being reused in cargoes (Pulak 2005: 297; Lolos 1999: 54-55; Palmer 1989: 104-105, 118-121, Michailidou 2008a: 33-35).

However, it was the weight measure "associated with the use of metals" (Powell 1971: 208), that was the most essential for estimating the quantity transported and its exchange value. In pre-coinage societies, the concept of *weight* determines the degree of standardization of the particular commodity in circulation and the concept of *value* represents how important the commodity was in the exchange network. Of the measuring tools of weight, the construction of the simple equal-arm balance with two pans arose from the every day need to transport two equal amounts of products suspended from the ends of a pole resting on the shoulders of the bearer (Michailidou 2005: 16, fig. 3). The mechanism for measuring equality in weight actually predates the invention of weights, since anybody can sense which is the heavier of two objects held in each hand. In fact, the balance itself reproduces this action performed by the human body, as is evident in a scene depicted in the Old Kingdom tomb of Kairer (Michailidou 2008a: 20, fig. I.6 from Lauer 1976: pl. 68), thereby confirming the doctrine of the Greek philosopher Protagoras that man is the measure of all things (Michailidou 2010: 71). The absolute measurement of weight started from the moment when a stone was placed on one of the pans, to balance the commodity placed on the other pan. This stone served as a witness to the mass measured. Thus the balance weight is in fact "the stone that measures". Hence this name appears in both Akkadic and Egyptian languages and gradually gave the idea of using a series of stones of a specific interrelated ratio in weight values, some of them occasionally bearing whole inscriptions mentioning the name of authorities verifying their standard true weight (Michailidou 2001a). The high-planning of the metric systems (Powell 1971: 209) resulted in easily identifiable shapes for balance weights; the barrel shape and the duck shape were the prevailing shapes in Mesopotamia (cf. Zeyrek – Kızıltan 2005 for samples in the Istanbul Archaeological Museum). The barrel shape was widely diffused throughout the Eastern Mediterranean, in Egypt, the Levant, Cyprus, Anatolia and, to a lesser extend, the Aegean.

The earliest known weights in Egypt were linked to the measurement of gold, with a modular unit for gold of 13 grams named *deben*, which was denoted in Hieroglyphic by the sign of the circle. The relation between power and metrology is evident from balance weights that bear the cartouche of the Pharaoh that confirm their weight value. From the 18th dynasty onwards, all

metals were measured by a heavier *deben* of 91 grams, which was divided into ten lower units named *kite* or *qedet.*

The 'metrological organizers' in Mesopotamia had to confront three factors simultaneously (Powell 1971: 209): The current numerical system (sexagemical), the weight of the 'barley corn' (0.046 gr) and the 'old load' - traditionally the maximum weight a man could carry (appr. 28.8 kg). According to Thuraeu-Dangin (1921), the 'old load' which gave the unit of talent (GÚ or *biltu*), was the one of the two poles of the system, the other one being the 'new purely conventional unit' invented, the Sumerian *MA-NA* (appr. 500 gr). This Sumerian word means *to count* or *the counter*. From this word derives the ancient Greek unit *mna* transliterated in Eglish as the *mina*. The Sumerian mina was devided to 60 shekels. Shekel is a Hebrew form of the Akkadian term *siqlu,* the equivalent to the Sumerian *GÍN* (appr. 8.4 gr). The weight of the talent, which varied over time and depending on culture from 30 to 23 kilos, was used as the standard rule for copper circulating in the form of the so-called ox-hide ingots. Only one stone mould for copper ingots of this shape has survived, at near Ugarit, at the site of Ras-Ibn-Hani (*cf.* Muhly 2005: 504, Abb. 1). Large numbers of ingots of this codified shape and weight were distributed widely over the whole Mediterranean (Gale 1991) and recently more specimens, from Corsica and South France, have added further detail to the picture (LoSchiavo 2008). Of course, the most impressive find is the great amount of ox-hide copper ingots from the Uluburun wreck, their average weight being 23 kilos. It is to be expected that the most accurate weighing of the ingots would take place in the ship's port of destination, somewhere in the Aegean (Pulak 2000a: 264). The result of such a process may be represented by the text on the well-known Linear B tablet from the palace at Knossos (Fig. 1). Here, the ox-hide ingots, 60 in number, are followed by the sign for the balance functioning as metrogram for the talent unit (*CoMIK* vol. 1: KN Og 730; *cf.* Michailidou 2010: fig. 7.4). We may recall here that the Greek word *talanton* actually means the pan of the balance.

Up to the Roman period, when the development of the steelyard is attested for the first time, the normal form of the balance was the simple equal-arm balance with two pans, such as this balance from the Late Bronze Age settlement at Akrotiri on the island of Thera (Fig. 2), where bronze pans of seven balances were found in the houses (Michailidou 2008a: 44-45). No truly intact balance has been found in the Aegean, some information on details being perhaps observable on the gold, but non-functional, balances found in Mycenaean shaft grave III (Fig. 3) Interestly, the beam, here consisting of three gold tubes,

originally enclosed a wooden rod (Michailidou 2008a, fig. III 12). Such rods are rarely found, the more recent find being the rod executed in bone from the excavations by Turan Efe in Küllüoba (Efe 2007: fig. 16; Rahmstorf 2006: fig. 3.9). Most of the pans were apparently hung from the beam by means of plant fibres, as shown by the relics on pans from Akrotiti (Fig. 4). Some balance pans were originally stored inside sleeve-like wooden boxes, as a rule one pan upon the other (Pulak 2000a: fig. 17.2; Michailidou 2008a: 52).

To turn to the balance weights, those of the so-called Aegean metric system are easily identified because, in contrast to Egyptian and Near Eastern balance weights, the so-called "Aegean" or "Minoan" balance weights (**Fig. 5**) are of a distinctive discoid shape, very often made of lead and as a rule uninscribed, although sometimes they were marked with signs, some of them being related to the mass of the weights. Balance weights of stone, whether discoid or of other shapes, were also in use in the Aegean of the Late Bronze Age; naturally so, since stone is the appropriate material for precision weighing. The Aegean discoid weights derive from palaces, settlements - especially ports - sanctuaries and tombs. As for the structure of the Minoan ponderal system, mainly studied by Arthur Evans (1906), John Caskey (1969), Nicola Parise (1971) and Karl Petruso (1992), the unit of 62-65 grams is the dominant in the Late Bronze Age, particularly in Crete and the Cyclades of the New–Palace period. This unit was already defined by Evans as the fifth multiple of the Egyptian unit of gold of 13 grams (*cf.* Michailidou 2004). There is also the view that the Aegean unit corresponds to the tenth multiple of a Near Eastern shekel of 6.5 grams (*cf.* Zaccagnini 1986: 420-421). Stone discs of both weight values (13 grams or 6.5 grams) can be found at sites, but it is not easy to decide on their function as balance weights and they may have been simple tokens used in games (Michailidou 2006; 2008a: 61).

Different units of weight have been proposed for the earlier pre-palace periods in the Aegean (Petruso 1978; 2003; Rahmstorf 2003; 2006). A variety of units developed and circulated in vast areas from the Early Bronze Age onwards. We may gain an idea for the distribution of two shapes, the spool-shaped items and the sphendonoid or barrel shaped weights, from a map by Rahmstorf (2006: fig. 5). Rahmstorf is of the opinion that in the EBA Aegean Near Eastern influence on metric systems was dominant, whilst the MBA Aegean was more oriented towards Egypt, this being the reason why the Minoan unit is related to the Egyptian unit of gold. In the Mycenaean period, Petruso distinguishes between early Mycenaean units, which are closer to Minoan and Syrian units, and Late Mycenaean units, which are perhaps

closer to the Hittite unit (Petruso 2003). The Mycenaean double mina (denoted by the so-called metrogram M in the Linear B script) corresponds to a value frequently employed in Anatolia and the Near East.

I believe that we are still in the middle of a very interesting discussion on interrelations among different metric systems of weight. Many scholars have compiled tables on "Numismatic" equivalences among various systems of weight, particularly those of the more developed of the Late Bronze Age (e.g. Aberti-Parise 2005: tav. XIII). Obviously, more than one metric systems of weight functioned in important trade posts. For instance, the dependence of the Ugaritic weight system on foreign trade is indicated by the dominance of the West Syrian mina of 470 grams (as opposed to the Mesopotamian mina of 504 grams). This mina formed the meeting point for three metric systems and the differences begin at the level of its division in shekels. Nicola Parise divides the Syrian mina into 40 Hittite shekels of 11.75 grams, or 50 Syrian shekels of 9.4 grams, or 60 Karkemish shekels of 7.83 grams. Few weights of the Minoan standard have also been identified in Ugarit (according to Courtois 1992: 120).

In the Late Bronze Age Akrotiri on the Cycladic island of Thera where a great deal of tools and equipment from the settlement has been preserved, sealed by the layers of pumish and volcanic ash of eruption during the 17th cent. B.C., clusters of lead discoid balance weights have been found. They were based on the Minoan metric system (Michailidou 1990; Petruso 1992). Akrotiri is again a port of trade, where other metric systems are also expected. Some stone weights can easily be identified as of foreign, or at least less usual, shape and are made of non local stones: a barel-shaped weight of 478 grams, a half-sphendonoid haematite weight that perhaps was intentionally adapted to the value of 1/3 of the Minoan unit and others (Michailidou 2006; 2008a: Figs II.65, V.28, V. 49, V. 71-72).

In view of the Mycenaean Linear B texts (e.g. Figs. 1 and 8) and the evidence given by Near Eastern texts, we may conclude that the commodities accounted by weight were metals, wool and goat's hair, linen (possibly also counted in bundles?), yarn, textiles (when tested in relation to the raw material used), ropes, alum, wood, ivory, precious stones, hides, wax, tendons and some condiments, perfume and dyes (such as *ponikijo*, red safflower, saffron, celery). As for foodstuffs, these were mainly measured by volume, although in some cases fish and meat and loaves of bread were recorded by weight (Michailidou 2010).

In regard with metals, no Mycenaean texts giving procedures for producing alloys are preserved (Michailidou 2008b), in contrast to the case with Near Eastern texts. However, the archaeological record provides us with an idea of which balance weights may have been used for particular quantities of metal and of what kind of items a given quantity of raw metal may produce. Two copper lavers of the same shape and weight from Akrotiri, Thera, could each have been weighed by a balance weight similar to that from Mochlos, Crete (Figs. 6a-6b). A fragment of copper ingot from the settlement at Akrotiri, weighs 2,956 gr. It was hidden among the stones of a loosely-built wall added to the upper floor of a house, along with two clay animal rhyta (Michailidou 2008a: 102, Figs II 85-II 90). On both sides of the ingot fragment, there are traces of the manner in which the piece was broken, by means of a heavy tool, perhaps after pre-heating, too, as has already been observed by Pulak in regard to ingots from the Uluburun wreck (Pulak 2000b: 145). The breaking of a copper ingot into fragments of specific weights destined for the manufacture of specific items, is mentioned in a Hittite text (Kempinski & Kosak 1977: 88-89). The deficit caused by breaking is mentioned in Old Assyrian texts: "*Hudurla is bringing you under my seal 4 talents of copper – there was a deficit of 2.5 minas from breaking up*" (Dercksen 1996: 40-41). Breaking the ingot facilitated the weighing of the metal and also gave the chance for checking the inside of the ingot and therefore the quality of the copper (cf. Dercksen 1996: 25, 58-59).

Having dealt with metals, we now turn to the next type of trade goods par excellence, that is to textiles. A suitable starting for an examination of their importance is again Sumerian literature, where in the myth of *Enki and the World Order*, textile industry is among the cycles necessary for maintaining world order in Sumer and it is classified immediately after the cycle referring to urban organization (Averbeck et al. 2003). The best overall picture of their circulation in long-distance trade is to be gained from the correspondence of the Old Assyrian traders, mainly found in Kültepe near Kaiseri. These texts provide a wealth of information on household textile production back in Assur and on the varieties of textiles transported by the caravans to Anatolia. As Veenhof notes, 25 pieces of cloth were the greatest load that a donkey regularly transported, which corresponded to two talents weight. Thus he suggests an average of 5 minas weight for each piece of cloth. The only information available so far regarding their size is the following Old Assyrian text: *"A 'finished textile' which you make, should be nine cubits long and eight cubits wide"* (Veenhof 1972: 92-95). It is not surprising that palaces in the Aegean

took great interest in the control of textile production. In both Aegean scripts, Minoan Linear A and Mycenaean Linear B, textiles are recorded by numbers and their varieties are denoted by special ideograms (Fig. 7 after Tzachili 2001, 192, table 2). Control of the palace was exercised through the so-called *ta-ra-si-ja* mode of production (Duhoux 1976), which rested on the weighing of the raw material distributed by the palace to the craftsmen, and on checking the weight of the finished products sent in return. In Linear B accounts, each type of cloth, denoted by the ideogram TELA, is recorded as produced by a fixed amount of wool, measured by a special unit of wool, denoted by the ideogram LANA. For instance, on one of the Linear B tablets (Fig. 8) we have entries for the varieties *pa-we-a ko-u-ra* TELA, TELA+*TE*, *tu-na-no* TELA, followed by the unit of wool (LANA) in quantities required for these qualities of cloth (*CoMIK* vol. 1: KN Lc (1) 527+7143+7331). The LANA unit, of a value of 3 kilos, was the target weight for the wool produced from the shearing of 4 sheep and it is found both in records of sheep and wool, as well as in records of textiles and wool. Furhermore, the weight is equivalent to the special unit for wool of six minas (= 3 kilos), the *nariu* wool unit attested in Nuzi tablets (Zaccagnini 1990; Petruso 1986).

Let us turn to an example provided by the settlement of Akrotiri on Thera. In one of the houses, a cluster of 26 lead balance weights was found in the upper floor cellar, while in the largest upper floor room with a central column, more than 400 clay loom-weights indicate that the area functioned as a weaving workshop. Petruso noticed that one of the balance weights has the weight of 3 kilos (Petruso 1986) and so it would seem that the unit of LANA already existed in the period of the – earlier - Linear A script. Furthermore, since the balance weights of the cluster correspond to multiples and fractions of the LANA, I have suggested that they served for weighing wool received in this house for the needs of the textile workshop (Michailidou 1990; 2008a: 66-73; 2010).

Wool has not so far been textually attested at Akrotiri but fortunately material evidence of wool has been identified consisting of about fifty minute pieces of woolen threads (Michailidou 2008a, 230; Moulhérat-Spantidaki 2008). In another house of the settlement, tablets inscribed in the Linear A script were found kept in a private deposit. On one of them, the ideogram TELA for cloth is followed by the number 200, the greatest record as yet found in Linear A script (Boulotis 1998; 2008). Thus, although the owner of the looms in the house with the 26 balance weights, was evidently the individual who produced the trade item of cloth in his/her workshop, it is the tenant of the other house containing the deposit of the tablets who is thought to have

been a textile dealer (Michailidou 2008a: 256-259). The clay sealings found in his house, made of foreign clay and bearing Cretan motifs, apparently testify to contacts with Crete. Whether the contacts were administrative or purely commercial, is, however, always the question.

Balance weights have been regarded by Karl Petruso as tools of industry and trade and by Barry Kemp as the nearest step on the road to money (Petruso 1992: 65; Kemp 1991: 248). They are therefore very important tools for the examination of societies of the past at both macro-economic and micro-economic levels (*cf.* Michailidou 2008a: 215-287). We now come to the question how commodities were evaluated in societies that had no coins. As metals were the type of trade goods par excellence, 'value' came to mean 'metal value'. In Near Eastern texts, the term *šaqālum* (to weigh), is used for the action of paying (*cf.* Renger 1984: 102). Metal items were more easily used for payment if they were intentionally made of a standardized weight, equivalent to codified units as, for instance, is the case with two copper lavers, each one of 1.5 kg weight (Fig. 6a) and particularly with the gold vessels, also recorded in Aegean texts (*cf.* Michailidou 2001b). In the Near East, rings of gold or silver, jewels, and vessels of precious metals were commonly used as forms of currency (Dallley 1984: 59, 65-69; Zaccagnini 1991). We know that in the Near East, silver was the predominant index of value for goods and services. Furthermore, silver was itself occasionally exchanged upon weight in payment for high-valued objects and in compensation for special services. Fines also were occasionally paid in silver, for instance, the considerable amounts laid down by Hittite Laws that merchants who were involved in recycling stolen goods were compelled to pay (Floreano 2002: 222).

For the Aegean/Minoan world, a monetary system based on metals is therefore equally likely (*cf.* Michailidou 2008a: 266-267), although there is no secure textual documentation, as yet, to support this hypothesis. I have attempted to show that small non-functional precious metal axes from Arkalochori in Crete, in addition to having some symbolic significance, may also have served as a form of currency. I conceived this idea after reading a text from Mari recording compensation made by the king to officials in the form of silver-and-gold axe-heads (Michailidou 2003). Close to the Arkalochori miniature axes is a miniature silver double-headed axe (7.3 cm long), from Semayük/Karataş, thought to be a votive model. It is decorated with incisions in the front side, the back being plain, and bears a shaft hole in the centre. Dating to the EBA (II-III) it is described as being of Anatolian type, "perhaps the earliest known precious metal *labrys* from the Eastern Mediterranean,

about contemporary with the Early Minoan II copper and lead models from Mochlos" (Mellink 1967: 265-6, Pl. 84 fig. 50a). The axe heads from the sanctuary of Juktas, in Crete (Michailidou 2005: fig. 9), are simply cut from copper plate. They may have functioned as a cheaper form of currency.

Texts from Mari, too, give information on weighing deficiencies and how these were corrected. The weighing process involved one or two specialists in handling the balance, who were artisans experienced in weighing precious metals or were specialist administrators. There was also the scribe who recorded the result and gave various details, regarding what particular weight-units were used, how many successive operations of the balance occurred and whether a counterweight was placed on the same pan with the commodity. One or more persons, named *ebbû* (translated in French by Cecil Michel as the '*Prud'Hommes*') supervised the weighing process, to ensure the exactness demanded at a level of one shekel (Joannès 1989). The *ebbû* were (Michel 1990) the *experts* and *arbitrators,* fully conversant with the weighing techniques used by the artisans, trained in calculations related to the conversion of different metric systems. They were appointed by the king for a certain task each time (e.g. to guarantee the quantity *and* quality of the transported merchandise) and very seldom working alone, since usually two or more are simultaneously appointed. I have therefore suggested elsewhere the possibility that the two Mycenaeans aboard the Uluburun ship (as Pulak 2005), may have been of the status of the *ebbû* mentioned in the Mari tablets, that is, they had the skills required for estimating the merchandise they escorted. Such a case brings us back to the beginning of our discussion in order to comment once again on the messengers/merchants. The two Mycenaean passengers, traveling on a ship probably not owned by them (as the current view maintains) are very near the Homeric concept of the *emporos*. They were not only high rank official messengers (Pulak 2005: 296, 309.). They were acting as royal merchants, even though they did not carry with themselves balance weights of the Aegean standard (the current objection against their role as merchants). They simply did not need them aboard this ship (*cf.* Michailidou 2010: 83).

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Sikke Öncesi Doğu Akdeniz Toplumlarında Ölçü Sistemleri ve Ticari Faaliyetler

Bu makale Yakındoğu'nun sikke öncesi toplumları üzerine olmakla birlikte, Tunç Çağı Ege'sine ağırlık vermektedir. Ticareti iş olarak yürüten "aracının" rolünden başlayarak onun ticari ilişkilerinde kullandığı ölçü birimleri ve ölçü aletleri üzerinde genişlemektedir.

Arkeolojik sit alanlarından ve muhasebe kayıtlarından bilinen teraziler ve ağırlıklar, eski çağlarda ticari malların miktarını ve değerini hesaplamanın yolları hakkında bilgi vermeleri açısından değerlidir (Res. 1). Terazinin normal formu, iki kefesi olan iki kollu basit teraziydi (Res. 2) ve tunç teraziler üzerindeki kalıntılar, bunların terazi koluna sıklıkla bitki lifleriyle bağlandığını gösterir (Res. 4). Detaylara dair bazı bulgular, bir Miken sandık mezarındaki semiyotik işleve sahip altın terazilerden elde edilmektedir.

"Ege" ya da "Minos" adı verilen terazi ağırlıkları (Res. 5) özgün bir disk şekline sahiptir ; çoğunlukla kurşundandır ve 62-65 gramlık ağırlık değeri, Yeni Saraylar Döneminde Girit ve Kiklatlarda egemen birim olarak kullanılmıştır. Bu birim 13 gramlık Mısır altın biriminin beş katı olarak belirlenmiştir. Aynı zamanda da 6,5 g gramlık Yakındoğu şekelinin 10 katıydı.

Miken Linear B metinleri (Res. 1 ve 8) ve Yakındoğu metinlerinin ışığında metaller, yün ve diğerlerinin ağırlıkların göre hesaplandığı, diğer taraftan yiyeceklerin genellikle hacim birimlerine göre ölçüldüğü sonucu çıkar.

Metaller ve kumaşlar mükemmel ticaret kalemleriydi. Arkeolojik kayıtlar belirli malların –mesela aynı formda ve aynı şekilde kodlanmış (?) ağırlıktaki kaplar- üretimi için hangi terazi ağırlıklarının kullanılmış olabileceğine dair bir fikir verir (Res. 6a-6b). Minos Linear A ve Miken Linear B olmak üzere her iki Ege yazısında kumaşlar sayılarına göre kaydedilmiş ve kendilerine özel ideogramlar verilmiştir. Bunlar sıklıkla her bir tür kumaş için gerekli yünü gösteren Miken yün birimi (LANA) tarafından takip edilir. Bu LANA birimi 3 kg değerindeydi ve yün için özel altı minalık birime, yani Nuzi tabletlerindeki nairu yün birimine eşitti.

Görünüşe göre, aynı 3 kiloluk yün birimi Linear A yazısının kullanıldığı dönemde de mevcuttu. Thera Adası'ndaki Akrotiri yerleşmesinde, içinde bulunmuş 400'den fazla kil ağırşak nedeniyle bir dokuma işliğine işaret eden bir evden 26 kurşun terazi ağırlığı buna işaret etmektedir. Bu evdeki ağırşakların

sahibi açıkça işliğinde ticari amaçlı kumaş üretiyordu. Öte yandan, Linear A tabletleri ve kil mühürlerin ortaya çıkarıldığı bir başka evin sakini muhtemelen bir kumaş satıcısıydı. Evdeki tabletlerden birinde 200 parça kumaş kayıtlıdır.

Terazi ağırlıkları geçmiş toplumlar hem makra hem de mikroeonomik düzeyde incelemeye yarayan önemli araçlardır. Buradaki tartışma sikke kullanmayan toplumlarda malların nasıl değerlendirildiği sorusu doğrultusunda genişlemektedir. Metaller baskın ticari mallar olduğu için, Yakındoğu'da "değer", "metal değeri" anlamı taşımaya başlamıştır ve bu yüzden Ege/Minos dünyası için de metallere dayalı bir para sistemi geçerli olabilir. Para birimi olarak kullanılması muhtemel metaller arasında, Mari'den gelen yazılı kanıtlara bakılırsa, işlevsel olmayan metal baltalar da vardı.

Mari metinleri ayrıca tartma kusurlarından ve bunların nasıl düzeltileceği dışında tartma işlemine dâhil insanların kim oldukları hakkında bilgi verirler. Bu kişiler teraziyi kullanan uzman, sonucu kaydeden kâtip ve tartma işlemin göz kulak olan ebbû adlı şahıstır. *Ebbû*, zanaatkârların kullandığı tartma tekniklerine aşina ve farklı ölçü sistemlerini birbirine çevrilme hesapları konusunda eğitim almış uzman ve yargıçlardı. Kral tarafından her bir sefer belirli bir görev için (mesela nakledilen malın miktarını ve değerini garanti altına almak amacıyla) atanırlardı.

Bu da bizi bir kez daha elçi/tüccarın rolü üzerine yorum yapmak üzere tartışmamızın başına geri getirmektedir. Uluburun gemisindeki iki Miken tüccarın Mari tabletlerinde geçen *ebbû* statüsüne sahip olduklarını düşünüyoruz; yani eşlik ettikleri malların miktarının hesaplama becerileri bulunmaktaydı. Ege standardında terazi ağırlıkları taşımamalarına rağmen (bu kişilerin tüccar olma ihtimallerine karşı önre sürülen mevcut itiraz), kraliyet tüccarları olarak faaliyet gösteriyorlardı. Sadece bu ağırlıklara gemide ihtiyaçları yoktu.

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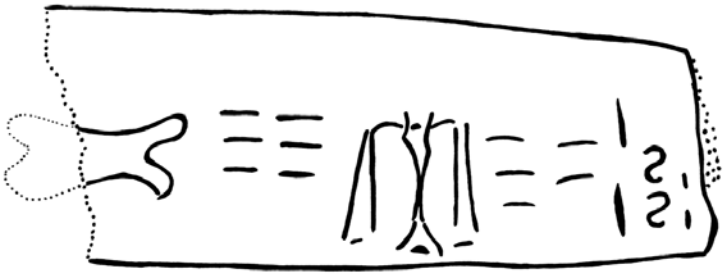


Fig. 1 A Linear B tablet from Knossos recording 60 ox-hide copper ingots

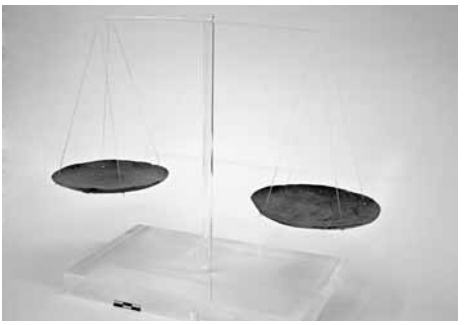


Fig. 2 Balance pans from Akrotiri, Thera



Fig. 3 Two gold balances from a Mycenae shaft grave



Fig. 4 Relics of plant fibres on a balance pan from Akrotiri, Thera



Fig. 5 Lead balance weights from Akrotiri, Thera



Fig. 6a Two bronze lavers from Akrotiri, Thera, each one weighing circa 1.5 kg



Fig. 6b The two faces of an inscribed lead weight from Mochlos, Crete, of 1.5 kg weight value

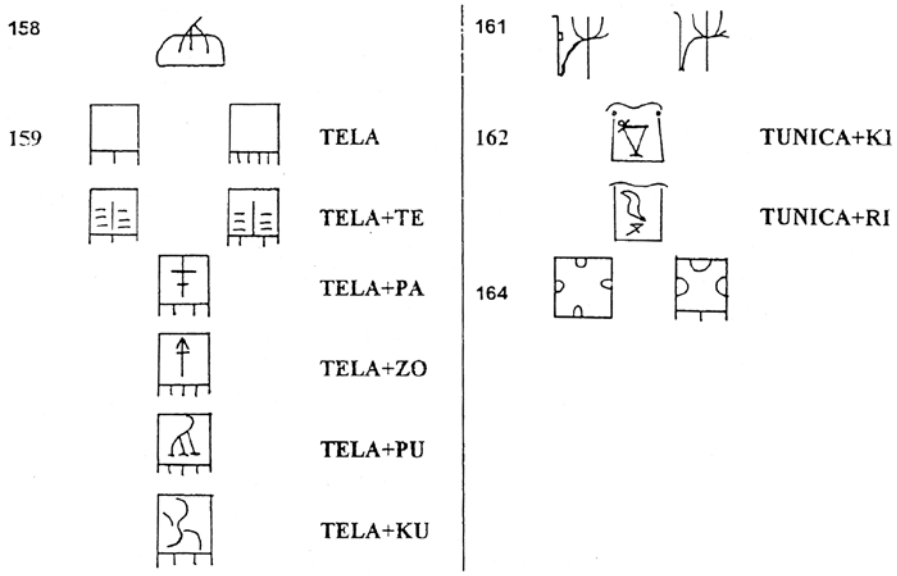


Fig. 7 The varieties of cloth (TELA) denoted by special ideograms in Linear B script



Lc(1) 553 + 7379 F10 103

.A pa-we-a ko-]u-ra TELA[1] 50 LANA 82[

.B tu-na-no TELA[1]]2 LANA 6 TELA[1]+*TE* 10 LANA 70[

.B 70[probably complete.

Fig. 8 A Linear B tablet with a text recording varieties of cloth (TELA) and the quantities of wool required (LANA)